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# North Carolina Community College System
# College and Career Readiness

## Adult Secondary Education

## Content Standards

## Level 5, Grade Levels 9.0 – 12.9

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# Introduction

This notebook contains standards to help instructors understand what adult secondary students should know and be able to do in the four content areas of language arts, math, science, and social studies. Adult secondary students function in grade level equivalents 9.0 to 12.9 and study in adult high school diploma and high school equivalency programs. These standards should guide programs as they create and align their curricula.

## Language Arts and Math Standards

The language arts and math standards come from the College and Career Readiness Standards for Adult Education (CCR) which were released by The Office of Career, Technical, and Adult Education (OCTAE) in April 2013. The CCR Standards were distilled from the Common Core State Standards and reflect the essential skills and knowledge that adult students should have to be prepared for postsecondary education and training, work, and citizenship. The CCR standards recognize that adult learners need a manageable set of standards since adult learners usually attend class less than 100 hours over the course of a program year, have some prior schooling, and benefit from previous life experiences.

Language arts encompass standards from speaking and listening, reading, writing, and language. Students are expected to read increasingly complex texts and gain the ability to evaluate arguments while understanding challenging works. Writing standards guide students as they learn to create arguments and write informative, explanatory, and narrative texts. Language standards provide rules for written and spoken English as well as for acquiring new vocabulary.

The language arts and math standards have both been divided into four parts based on the North Carolina Community College System Career and College Readiness Adult Secondary Education Credential courses facilitated by Adult Basic Skills Professional Development at Appalachian State University. These divisions are as follows, and each course covers these topics:

**Language Arts**

ASE LA 1-Production and Distribution of Writing: How to write informative and narrative texts

ASE LA 2-Using Research in Writing Endeavors: How to conduct research, evaluate sources and create argument based writing

ASE LA 3-Understanding and Analyzing Literature: How to analyze and understand literature including poetry and prose

ASE LA 4-Understanding and Analyzing Informational Texts: How to analyze and understand informative texts

**Math**

ASE MA 1-Algebraic Concepts and Expressions: How to understand and solve radical expressions along with performing operations on polynomial and rational expressions

ASE MA 2-Algebraic Equations and Inequalities: How to create, represent, explain, and solve algebraic equations and inequalities

ASE MA 3-Algebraic Functions and Models: How to interpret and evaluate functions and model mathematical expressions in various forms

ASE MA 4-Geometry, Probability, and Statistics: How to interpret and solve problems in geometry, probability, and statistics

## Science and Social Studies Standards

As the College and Career Readiness Standards for Adult Education only cover math and language arts, the science and social studies standards are based on the North Carolina Essential Standards and the Next Generation Science Standards. The Essential Standards guide secondary instruction for North Carolina high school students and were developed by the North Carolina Department of Public Instruction. These Essential Standards were adopted to ensure the most rigorous and relevant standards to guide instruction for 21st Century students. The Next Generation Science Standards were developed by teams of writers from 26 states. The standards include the core ideas science students should know, the practices scientists engage in as they work, and the crosscutting concepts that link the different domains of science.

The science and social studies standards have both been divided into four parts based on the North Carolina Community College System Career and College Readiness Adult Secondary Education Credential courses facilitated by Adult Basic Skills Professional Development at Appalachian State University. These divisions are as follows:

**Science**

ASE SC 1-Living Organisms and Ecosystems: How to understand various life forms as they interact with each other across the Earth

ASE SC 2-Genetics, Molecular Biology, and Evolution: How genetic material and molecules function on Earth

ASE SC 3-Physical Science: How to conduct scientific inquiry while understanding the physical principles and chemistry of the natural world

ASE SC 4-Environmental, Earth and Space Science: How the atmosphere, hydrosphere, oceans, and biosphere work together on Earth and other planets

**Social Studies**

ASE SS 1-US History (Colonial Period to 1877): How to understand, see the relevance of, and think about the major events in United States history from early exploration through Reconstruction

ASE SS 2-Modern US History (1877 to the Present): How to understand, see the relevance of, and think about the major events in United States history from Reconstruction through recent events

ASE SS 3-Civics and Economics: How to understand and apply fundamental concepts in civics and economics including personal finance applications

ASE SS 4-World History: How to understand, see the relevance of, and think about the major events in world history from the mid-1500s through recent events

All areas of the Adult Secondary Education Standards have checklists that both instructors and students can use to track their progress of standard mastery. These checklists appear at the end of each of the four major sections.

# North Carolina Community College System

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# Level 5, Grade Levels 9.0 – 12.9

# Language Arts

## Adult Secondary Education Speaking and Listening Standards

Including, but not limited to, skills necessary for formal presentations, the Speaking and Listening Standards require students to develop a range of broadly useful oral communication and interpersonal skills. The standards ask students to learn to work together, express and listen carefully to ideas, integrate information from oral, visual, quantitative, and media sources, evaluate what they hear, use media and visual displays strategically to help achieve communicative purposes, and adapt speech to context and task. These standards should be integrated though out Language Arts instruction.

**CCR Anchor 1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.**
Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.
c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. (SL.9-10.1)

**CCR Anchor 2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.**
Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. (SL.11-12.2)

**CCR Anchor 3: Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.**
Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. (SL.11-12.3)

**CCR Anchor 4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.**
Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. (SL.9-10.4)

**CCR Anchor 5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.**
Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (SL.11-12.5)

**CCR Anchor 6: Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.**
Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (SL.11-12.6)

## ASE LA 1: Production and Distribution of Writing

| **LA.1.1: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. CCR Anchor 2** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.<br>a. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use appropriate and varied transitions to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). | Students are expected to write informative texts that examine and communicate complex ideas, concepts, or information clearly and accurately. They should effectively select, organize, and analyze their content.<br>Selecting includes:<br>• Using relevant and sufficient facts, definitions, details, and quotes<br>• Using sources that are appropriate to task, audience, and purpose<br>• Choosing precise words and domain-specific vocabulary<br>Organizing includes:<br>• Introducing a topic<br>• Arranging ideas, concepts, and information to show interrelationships<br>• Formatting effectively<br>• Developing a topic<br>• Organizing graphics<br>• Providing multimedia when useful<br>• Using transitions to link together the major sections of the text<br>• Writing a concluding statement that supports the information presented<br>• Choosing a formal style and objective tone<br>Analyzing includes:<br>• Deciding what organization is most effective for purpose, audience, and task<br>• Determining how many facts, definitions, details, quotations and other information are needed | **Writing Expository (Informative) Texts**<br>https://owl.english.purdue.edu/owl/resource/685/02/<br><br>**Examples of Informative/Explanatory Essay**<br>http://achievethecore.org/page/504/common-core-informative-explanatory-writing<br>See the grade 9-10 example Gains of the Great Depression that shows examples of each objective<br><br>**Expository Essay**<br>https://www.youtube.com/watch?v=i_tZLtmwesU<br><br>Note: To be college- and career-ready writers, students must take task, purpose, and audience into careful consideration, choosing words, information, structures, and formats deliberately. These skills work in tandem with reading expectations--as expressed in the reading standards for informational texts--so that students are examining authors' craft and style and applying what they have observed to their own writing. In the ninth grade as students explore writing informational text they need to learn how to make deliberate choices as writers. They need to understand that establishing task, audience, and purpose prior to writing will then influence their word choice, the supporting details they choose, the tone they use, and the organizational features they will need to effectively communicate. Ninth graders should learn how to organize their writing. Often students do not see the correlation between developing a topic and organizing a paper. As students become more skilled with writing informational texts, they should pay more attention to the words they use to communicate ideas. They should develop a strong formal style appropriate for their task. They should be able to maintain a tone that is free of bias. They should learn how to integrate multimedia when appropriate and effective. |

| **LA.1.2: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. CCR Anchor 3** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.<br>a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.<br>b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.<br>c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole.<br>d. Use precise words and phrases, telling details, and sensory language to convey vivid picture of the experiences, events, setting, and/or characters.<br>e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative. | Students are expected to write narratives – conveying an experience that is real or imagined – and using time as its deep structure. The writing should have form or structure based on a progression of events that build upon each other. As with all good writing, students should select effective details using precise language. They should establish point of view(s), introduce a narrator, provide characters, and present a situation. Students should be aware of and apply narrative techniques including dialogue, description, and plot in order to develop experiences, events, and/or characters choosing words that create vivid pictures. Students should provide a conclusion to the events they set out at the beginning of their narrative. | **Narrative Essays**<br>https://owl.english.purdue.edu/owl/resource/685/04/<br><br>**Narrative Essay Example**<br>http://achievethecore.org/page/505/common-core-narrative-writing-list-pg<br>Scroll down to find "The Day the Tractor Came" example<br><br>**Narrative Writing**<br>https://www.youtube.com/watch?v=DTft-l5LTG4 |

| **LA.1.3: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. CCR Anchor 4** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. | Students are expected to produce writing that is clear and understandable to the reader. Task (type of writing assignment), audience (the intended reader), and purpose (the writer's designated reason for writing) should be reflected in the student's style, organization, and development of a topic. | **Analyzing a Writing Prompt to Determine Task, Audience, and Purpose**<br>https://learnzillion.com/lessons/2244-analyze-a-writing-prompt-to-determine-the-task-purpose-and-audience |

| LA.1.4: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. CCR Anchor 5 | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. | Students should plan their writing, develop strong revising and editing skills, rewrite or try a different approach always mindful of the audience and the purpose for the writing. They need to determine what details or information is most important for a particular audience and specific purpose. They need to understand writing as a process rather than solely as a product. Writing as a process requires thinking and being able to articulate those thoughts. | **Revising and Editing Writing Assignments**<br>http://www.studygs.net/writing/revising.htm<br><br>**How to Revise and Edit**<br>http://www.readwritethink.org/parent-afterschool-resources/tips-howtos/revise-edit-30116.html<br><br>**Steps for Revising Your Paper**<br>https://owl.english.purdue.edu/owl/resource/561/05/ |

| LA.1.5: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. CCR Anchor 6 | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. | Adult education standards recognize that students need to be able to use technology strategically when creating, refining, and collaborating on writing. Students should not only use technology for producing and publishing writing but also to collaborate with others. | **Using Blogging and Web Tools to Improve Writing**<br>http://ferrellmw.wix.com/abs2014 |

| LA.1.6: Demonstrate command of the conventions of standard English including grammar, capitalization, punctuation, and spelling when writing. CCR Language Anchors 1 and 2. | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.<br>a. Use parallel structure.<br>b. Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent, noun, relative, adverbial) to convey specific meanings and add variety and interest to writing or presentations.<br>c. Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses.<br>d. Use a colon to introduce a list or quotation.<br>e. Spell correctly. | An understanding of language is essential for effective communication. The inclusion of language standards in their own strand should not be taken as an indication that skills related to conventions, knowledge of language, and vocabulary are unimportant to reading, writing, speaking, and listening; indeed, they are inseparable from such contexts.<br>To be college and career ready in language, students must have a strong command of the grammar and usage of spoken and written standard English.<br>Students should be able to apply the understanding that language is ever-changing. Students need to investigate choices in language and usage by using reliable | **Conventions of Edited American English**<br>https://owl.english.purdue.edu/engagement/2/2/61<br><br>**Sentences and Sentence Structure**<br>https://owl.english.purdue.edu/engagement/2/2/62<br><br>**Word Choice**<br>https://owl.english.purdue.edu/engagement/2/2/66 |

| **LA.1.7: Acquire and use accurately general academic and domain-specific words and phrases at the college and career readiness level; demonstrate independent in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate. CCR Language Anchor 4 and 5** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Acquire and use accurately general academic and domain-specific words and phrases at the college and career readiness level; demonstrate independent in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.<br>Determine or clarify the meaning of unknown and multiple-meaning words and phrases, choosing flexibly from a range of strategies.<br>a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.<br>b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).<br>c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology or its standard usage.<br>d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). | CCSS expect that students will grow their vocabularies through a mix of conversations, direct instruction, and reading. Students will determine word meanings, appreciate the nuances of words, and steadily expand their repertoire of words and phrases—preparing them for both college and 21st-century careers.<br>This will be accomplished through use of the following: context clues, patterns of word changes, dictionaries and thesauruses.<br>Students at this level should also be able to explain figurative language, word relationships and subtle differences in word meanings. As well, students should be able to explore the subtle differences in words that have similar literal meanings. Students at this level should be comfortable incorporating appropriate vocabulary into their modes of communication while showing the ability to take the initiative to gather vocabulary that is necessary to understand while reading, writing, speaking, and listening. To be college and career ready in language, students must come to appreciate that language is as much a matter of craft as rules and be able to choose words, syntax, and punctuation to express themselves and achieve particular functions and rhetorical effects.<br>General academic words are more likely to appear in written text rather than in speech. They often represent subtle or precise ways to say relatively simple things (saunter instead of walk). They are highly transferable.<br>Domain-specific words are specific to a domain or field of study. Because of their specificity and close ties to content knowledge, they are more common in informational texts. | **The Ten Best Vocabulary Learning Tips**<br>http://www.sheppardsoftware.com/vocabulary_tips.htm<br><br>**Understanding Jargon**<br>http://rpdp.net/files/ccss/ELA/ELA_9-10_Curr_Res/Language%209-10/Language%20Standard%206%20%289-10%29.pdf<br><br>**Tips for Teaching Vocabulary**<br>http://www.edutopia.org/blog/vocabulary-instruction-teaching-tips-rebecca-alber |

## ASE LA 2: Using Research in Writing Endeavors

| **LA.2.1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. CCR Anchor 1** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence<br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from and supports the argument presented. | The CCSS emphasize students' ability to produce strong arguments on important topics or texts. Students should write argumentative papers that support their analysis of a text or topic using enough relevant evidence to legitimately support their claim(s).<br>Students need to understand how much evidence is needed to satisfactorily support a point. Students need to learn how to introduce their argument(s) clearly and accurately with regard to counterclaims. Students should use concise and effective language that supports the organization of their argument. Students should structure their argument so that there is an association and correlation between the claim(s), counterclaim(s), reasons, and evidence.<br>As students develop their argument, they should treat their claims and counter-claims equitably taking into account what their audience knows as well as what concerns they might have. They should develop unity and consistency in their text with their words and structure, paying attention to the relationships they create between the claims, counterclaims, evidence, and reason. They also should maintain an appropriate style and tone for the task – omitting personal bias. Students should conclude with a statement that supports the argument. | **Using Research in Writing Packet**<br>http://abspd.appstate.edu/ase-la-2-using-research-writing<br>Page 5: Introduce and develop claims, writing the conclusion<br>Page 6: Formal style<br>Page 6: Transitions<br>Page 7: Argument writing vocabulary<br><br>**Preparing for Argument Writing**<br>Using Research in Writing packet:<br>http://abspd.appstate.edu/ase-la-2-using-research-writing<br>Pages 9 – 12: Techniques to prepare students for argument writing<br><br>**Organizing Argument Writing**<br>https://owl.english.purdue.edu/owl/resource/588/03/<br><br>**Establish and Maintain a Formal Style and Objective Tone**<br>https://learnzillion.com/lessons/2202-establish-and-maintain-a-formal-style-and-objective-tone<br><br>**Writing a Conclusion**<br>http://writefix.com/?page_id=1591 |

| **LA.2.2: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. CCR Anchor 7** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. | In the CCSS research—both short, focused projects (commonly required in the workplace) and longer term in depth research —is emphasized throughout the standards but most prominently in the writing strand since a written analysis and presentation of findings is so often critical. Students need to learn how to synthesize information by combining parts from a variety of sources into a one unified understanding, achieving a new insight. To accomplish this, students need to be able to recognize what is important in a source, how it supports the topic, and how it relates to other source information. | **Writing a Research Paper**<br>https://owl.english.purdue.edu/owl/owlprint/658/<br><br>**Research Paper PowerPoint**<br>https://owl.english.purdue.edu/owl/resource/750/1/<br><br>**How to Write a Research Paper Video**<br>http://www.youtube.com/watch?v=0FPvQQQCUT8 |

| LA.2.3: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. CCR Anchor 8 | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. | Students need to find information that is relevant from reliable and authoritative sources. They should be adept at using advance searches finding print and digital sources that answer their research question. Students should know how to integrate the information effectively, avoiding plagiarism and using a standard format for citation. | **Better Google Searches**<br>See handout Better Google Searches at:<br>http://abspd.appstate.edu/ase-la-2-using-research-writing<br><br>**Analyzing Website Credibility**<br>Handout Rubric for Website Credibility at:<br>http://abspd.appstate.edu/ase-la-2-using-research-writing<br><br>**Criteria to Evaluate the Credibility of Non Web-based Sources**<br>http://mason.gmu.edu/~montecin/eval-sources.htm<br><br>**Avoiding Plagiarism**<br>https://owl.english.purdue.edu/owl/resource/930/01/<br><br>**APA Citation Style**<br>https://owl.english.purdue.edu/owl/resource/560/01/ |

| LA.2.4: Draw evidence from literary or informational texts to support analysis, reflection, and research. CCR Anchor 9 | | |
|---|---|---|
| **Objectives** | **What Learner Should Know, Understand, and Be Able to Do** | **Teaching Notes and Examples** |
| Draw evidence from literary or informational texts to support analysis, reflection, and research. | Apply Reading standards to literature (e.g., —Analyze how an author draws on and transforms source material in a specific work [e.g., how Shakespeare treats a theme or topic from Ovid or the<br>Bible or how a later author draws on a play by Shakespeare]).<br>Apply Reading standards to literary nonfiction (e.g., —Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning). | **Writing a Literary Analysis Example**<br>https://learnzillion.com/lessonsets/639<br><br>**Close Reading Informational Text**<br>See handout Close Reading Example from:<br>http://abspd.appstate.edu/ase-la-2-using-research-writing |

## ASE LA 3: Understanding and Analyzing Literature

| **LA.3.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 1** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. **Note:** Students are required to use textual evidence that is convincing and complete to support their ideas. Citing from the text may include a formal citation or a verbal reference. Analysis should include a formal citation or a verbal reference as well as inferred and literal meanings. Students should be introduced to the skill of determining the difference between "strong evidence" and insufficient or unreliable details. They should understand how much evidence is needed to support a claim. These skills should build as students continue to cite evidence both formally and informally. They should be able to distinguish between text that provides strong support and text that is not related, uncertain, or is insufficient as evidence. Their analysis should offer insights that show they can derive understanding from details that are directly stated as well as from those that are implied. | • Demonstrate the behaviors of a strategic reader.<br>• Analyze text clues that affect meaning.<br>• Analyze relevant denotative, connotative, and figurative language.<br>• Analyze and evaluate available evidence for thoroughness, completeness, and relevance.<br>• Explain and analyze complexities and ambiguities in the work of literature.<br>• Participate actively and appropriately in discussions about literature.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing literature.<br>• Use knowledge of language and its conventions when speaking and writing. | Discussion Web. Students read through an assigned text with varying levels of independence and support. Before the students begin reading, they are introduced to a focus question related to a text. Students closely analyze the text develop their viewpoints as to how the text explicitly responds to the focus question as well as inferences which may be drawn. Students then discuss their views in small groups. Each group draws a conclusion about what the text says explicitly, what inferences can be made and what particular sentences, paragraphs, or larger portions of text support their conclusion. Source: Alvermann, D. (1991). The discussion web: A graphic aid for learning across the curriculum. The Reading Teacher, 45, 92-99. |

| **LA.3.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 2** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.<br><br>Note: Students need to examine not only how a theme is developed but also how details in the story influence and mold a theme or central idea into being. Students will need to use the key details of a text to provide a summary that is free of personal opinions or feelings.<br><br>Students are required to recognize complex characters and understand their role in a text. They need to identify the development of complex characters, explain their interactions with other characters, and tell how these characters contribute to plot or theme development. | • Objectively summarize a text by including the appropriate details.<br>• Analyze ideas, literary techniques, and specific details in a text that develop a theme(s) or central idea(s).<br>• Analyze how multiple themes interact in a text and explain how they clarify and extend meaning.<br>• Participate actively and appropriately in discussions about literature.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing literature.<br>• Use knowledge of language and its conventions when speaking and writing. | Text Mapping. Students will fill out a narrative text mapping sheet which contains rising action, setting, author's theme, opening scene, conflict/problem, climax, falling action and resolution and/or character maps noting the motivations, interactions with other characters and how each character influences the plot and each other.<br><br>Thematic Journaling/Anticipation Guides. Before beginning a text such as John Steinbeck's The Grapes of Wrath, students are prompted to answer a set of statements with which they either agree or disagree. An Anticipation guide for John Steinbeck's The Grapes of Wrath might include statements such as: 1) Money is the most important thing in life. 2) In times of crisis you need to take care of yourself before others. 3) The only people you can truly trust in life are your family. |

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| Along with recognizing complex characters, students should be able to identify the details that developed characters as complex rather than as static or flat. They should see how the author developed a complex character over the course of the text, consider how the character interacts with others, and begin to recognize how complex characters propel the action in the story or add to the development of a theme. Students need to be challenged to complete their analysis with strong textual support and deeper understanding of characterization. | | 4) You cannot buy happiness. 5) The American Dream is unattainable for most Americans. 5) If you work hard in life, you will be rewarded for it eventually. Follow-up: What words did the author specifically use that led you to your conclusion.<br>The statements chosen should reflect one or more of the themes within the content of the novel. After students complete the anticipation guide, they choose one of the statements and use it as a prompt from which to free write for 20 minutes, highlighting thoughts, feelings, memories, and experiences associated with their chosen statement. This exercise prompts students to begin contemplating the emergent themes in the novel before reading, and consider their implications more broadly. Source: Herber, H. (1978). Teaching reading in content areas. (2nd ed.). Englewood Cliffs: Prentice-Hall.<br><br>Tracking Theme: Students return to these statements in the anticipation guide at various times throughout the novel in order to track how the theme develops and is refined by details from the text. When writing, students update their responses by citing evidence from the text that may have changed their view of the theme since the beginning of the novel. |

| **LA.3.3: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 4** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).<br><br>Note: After determining the figurative and connotative meanings of words, students need to consider the significant influence of the author's word choice as a whole on the text's tone or overall understanding. | • Analyze the meaning, use, and effect of word connotations, colloquialisms, idioms, and figurative language.<br>• Analyze and explain how an author uses techniques to establish and maintain a specific literary style and tone.<br>• Analyze and explain the cumulative impact of an author's deliberate manipulation of language (word choice, diction, structure) on meaning, imagery, mood, and tone.<br>• Participate actively and appropriately in discussions about literature.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing literature.<br>• Use knowledge of language and its conventions when speaking and writing. | Diction/Dialect. Students begin the activity by sharing and discussing examples of different types of dialect from varying regions, countries or time periods. The discussion is guided toward readings or writings written in dialect (e.g., John Steinbeck's The Grapes of Wrath). The discussion is driven by guiding questions such as;<br>• What can you tell about the narrator by the way he or she speaks?<br>• Where is the narrator from?<br>• Is the narrator educated or uneducated?<br>• How old is the narrator?<br>• What is the narrator's race? How can you tell what his/her race is?<br>Students continue to elaborate on what led them to their conclusions.<br><br>Literature Circles: Students are grouped into small literature circles. Each circle |

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| | | selects a writer and a speaker to present the main points of their discussion to the class. The groups are given 5 minutes to construct a definition for the term "Dialect". After group definitions are shared orally with the class, a timed literature circle discussion begins using guiding questions such as:<br>• Why did the author choose to include lines in dialect?<br>• In what type of dialect is it written?<br>• How does dialect help/hinder your understanding of the characters?<br>• What, if anything, does dialect (or lack thereof) reveal about the characters?<br>Source: Morretta, T.M., & Ambrosini, M. (2000). Experiencing and responding to literature. Practical approaches for teaching reading and writing in middle schools. (pp. 18–39). Newark, DE: International Reading Association. |

| **LA.3.4: Assess how point of view or purpose shapes the content and style of a text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 6** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).<br><br>*Application:* Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States, drawing on a wide reading of world literature. | • Identify and explain an author's point of view or purpose in an informational text.<br>• Demonstrate understanding of rhetorical appeals.<br>• Analyze and explain the author's use of rhetoric and its contribution to meaning, point of view, and/or purpose of the text.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Making Connections to Global Literature. The following strategy represents a three-fold approach to making connections with literature from outside of the United States.<br><br>Self-to-Text. This approach requires students to relate their own experiences, ideas, and background knowledge to the text at hand. Students compare their own cultural and individual background with that of one or more of the characters in the text. Students can use a self-to-text table to compare/contrast their experiences to those of the character. Learning scaffolds can be utilized by posing questions that lie at the heart of the text (e.g., the question "Who am I?" is a common thematic question in many coming-of-age tales). Students reflect on their own responses to these questions as characters in the text do the same.<br><br>Text-to-Text. Students conduct a comparison and synthesis of ideas between texts carrying similar or antagonistic themes, questions, or issues (e.g., students synthesize the varying approach to indigenous peoples as "primitive" through the text "Things Fall Apart," by Chinua Achebe and Joseph Conrad's Heart of Darkness).<br><br>Text-to-World. Students connect the text |

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| | | to world/current issues. In the example of Things Fall Apart students draw on historical or current issues that relate to the European Colonization of much of Africa's indigenous regions.<br>Students incorporate issues of how globalization is increasingly re-defining what it means to be a member of an "indigenous" culture. Students will connect the text to a contemporary issue such as this, and reflect on its broader implications by written and artistic expression. Source: Keene, E. O., & Zimmerman, S. (1997). Mosaic of thought teaching comprehension in a reader's workshop. Portsmouth, NH: Heinemann. |

| **LA.3.5: Read and comprehend complex literature independently and proficiently. CCR Anchor 10** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| **R**ead and comprehend literature at this text complexity band proficiently, with scaffolding as needed at the high end of the range.<br>**Note:**<br>• By the end of grade 9, read and comprehend literature in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range.<br>• By the end of grade 10, read and comprehend literature at the high end of the grades 9– 10 text complexity band independently and proficiently.<br>• By the end of grade 11, read and comprehend literature in the grades 11– CCR text complexity band proficiently, with scaffolding as needed at the high end of the range.<br>• By the end of grade 12, read and comprehend literature at the high end of the grades 11– CCR text complexity band independently and proficiently. | • Demonstrate understanding of a wide range of sufficiently complex literary nonfiction.<br>• Comprehend texts of steadily increasing complexity, with scaffolding as needed.<br>• As an emerging adult reader, set personal reading goals to self select and explore texts of different disciplines and increasing complexity.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Measuring Text Complexity according to grade-bands: The Text Complexity Grade Bands are organized in a progressive fashion, and as such, teachers from different grade levels will need to coordinate and discuss whether their standard ten asks them to introduce a new level of text complexity via scaffolding, or promote proficiency and independence within the same grade band. The following chart shows the progressions for standard ten at each grade level.<br>Three Measures for Text Complexity: When deciding which grade band a text aligns to, the teacher should consider all three measures for text complexity, and make a decision based the textual factors that correspond to each.<br>1) Quantitative Measures<br>2) Qualitative Measures<br>3) Reader and Task Considerations |

## ASE LA 4: Understanding and Analyzing Informational Texts

| **LA.4.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 1** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.<br><br>*Reading Historical/Social Studies Text Application:* Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.<br><br>*Reading Scientific and Technical Text Application:* Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. | • Demonstrate the behaviors of a strategic reader.<br>• Analyze text clues that affect meaning.<br>• Analyze relevant denotative, connotative, and figurative language.<br>• Evaluate available evidence for thoroughness, completeness, and relevance.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Close Read. Students conduct a close read of a text such as Patrick Henry's "Speech to the Second Virginal Convention. After reading the text each student makes a "Citation Table" that contains two columns: Specific Phrase or Sentence and Specific Purpose for recording data as they conduct a second read. Within the table, students write specific phrases or sentences from the text and articulate the significance of each. The strategy is modeled prior to beginning the exercise and students are able to "read like a detective" to determine the specific message the author is trying to convey. This activity could also be used to conduct a close read of Margaret Chase Smith's "Remarks to the Senate in Support of a Declaration of Conscience" or any other text with a level of complexity aligned to this grade band.<br><br>Comparison and Synthesis of Ideas (CSI). After closely analyzing separate texts, students compare and contrast ideas from each; being certain to cite the specific words each author used. This strategy can also be used to help students recognize thematic content that is common to both texts. Students should be able to generate both differences and similarities among texts, as well as synthesize the information that each text shares.<br><br>Statement Starter: Present a statement to the class such as: "Ladies and gentlemen, Patrick Henry was a pacifist!" or "Margaret Chase Smith believes people should have the right to criticize." Students then work collaboratively with their partner to generate a cited summary in agreement with or dispute of the statement starter. As students write, they use the following questions to guide their responses: (1) Are we interpreting the text correctly? (2) Are we citing specific language from the text? (3) Is our evidence convincing? Continual objective feedback is evident throughout the exercise which utilizes both discussion and diagnostic questioning techniques. |

| **LA.4.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 2** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.<br><br>*Reading Scientific and Technical Text Application:* Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. | • Objectively summarize a text by including the appropriate key ideas, issues, and specific details.<br>• Analyze ideas, issues, rhetoric devices, and specific details in a text that develop the central idea and/or claim.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Magnet Summary. Students conduct a close read of a short text such as Anna Quindlen's "A Quilt of a Country" or Learned Hand's "I am an American Day Address." While reading, they identify the specific words or phrases (magnets) that drive the text. Students record each magnet on a separate index card and list with them specific supporting words or phrases used by the author to anchor the magnet firmly within the text.<br><br>One Sentence Summations. Randomly selected members of the class read a selection of the text aloud. Student facilitators lead the class in a brief whole group discussion of the section, resulting in a short list of significant ideas conveyed by the author. The student facilitators are then given a short amount of time to quickly transform the list of ideas into an objective, one sentence summary which includes the proper use of a colon or semicolon thus modeling the activity. The remaining text is divided into sections and students repeat the process independently. |

| **LA.4.3: Analyze how and why individuals, events, and ideas develop and interact over the course of a text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 3** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.<br><br>*Reading Historical/Social Studies Text Application:* Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.<br><br>*Reading Scientific and Technical Text Application:* Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. | • Analyze and explain the structure of the text and how it contributes to meaning and/or purpose.<br>• Analyze and explain the impact of events and individuals in the texts.<br>• Analyze, explain, and evaluate the author's development of complex ideas, concepts, events, and individuals within informational texts.<br>• Analyze and explain the interrelation-ship among complex ideas, concepts, individuals, and sequence of events within informational texts.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Utilizing Abraham Lincoln's "Second Inaugural Address" students conduct an analysis of the ideas that led to the Civil War, as outlined by the text. Students can conduct a similar analysis & connection of Martin Luther King's "Letter from Birmingham Jail" or similar texts with an appropriate level of complexity for this grade band. Students adhere to the following guiding questions as they investigate the text: (1) In what order are the points made?, (2) How are the points introduced and developed? and (3) How does the author skillfully connect the various points?<br><br>Analysis and Connection: While reading the text independently or in small groups, students begin their investigation by documenting the order in which the points are made. It may be helpful for students to use graphic organizers such as Semantic Maps to illustrate how an author introduces a point, how he/she develops |

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| | | the point and how the point itself is finally stated or Venn Diagrams to illustrate the similarities and differences between various points.<br><br>Close Read. Utilizing a text such as Ralph Waldo Emerson's "Society and Solitude", students conduct an analysis of Emerson's points regarding solitude and its relationship to society as a whole. Students adhere to the following guiding questions as they investigate the text: (1) In what order are the points made? (2) How are the points introduced and developed? (3) How does the author skillfully connect the various points? (4) How does the author summarize his point in the conclusion? |

| **LA.4.4: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 4** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).<br><br>*Reading Scientific and Technical Text Application:* Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. | • Analyze the meaning, use, and effect of word connotations, multiple meanings, and technical vocabulary.<br>• Analyze the meanings of colloquialisms, idioms, figurative language, and other words and phrases as they are used in context and influence text meaning and tone.<br>• Analyze and explain the cumulative impact of the author's manipulation of language (syntax, diction) on meaning and tone.<br>• Compare and contrast the syntax and tone of informational texts written for differing audiences and purposes.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Students record key words from the text and provide the following for each word (1) a contextual clue, (2) explanation and (3) meaning.<br><br>Written Comparison and Synthesis of Ideas. Students conduct a close read of texts such as Martin Luther King's "Letter from Birmingham Jail" and Elie Wiesel's "Hope, Despair and Memory." Words, phrases, and sentences that significantly shape the meaning and tone of each text are highlighted as they read. Without the aid of classroom discussion, students independently proceed to complete a written comparison and synthesis of ideas between the two pieces of text. Students portray a clear analysis of how the texts are similar and how they differ in terms of meaning and tone.<br><br>Students work individually or in pairs utilizing a variety of resources to define selected words as well as compare and contrast specific language from within the text. They make a "Meaning and Tone Table" with the following headings: (1) Specific Sentence from Text, (2) My Sentence (underline the word(s), clause(s), and/or phrase(s) altered), and (3) How do the changes alter the meanings or tone of the text. Students can use their tables to create word/phrase/ sentence alternatives to display an understanding of the cumulative impact word choice has on meaning or tone. |

| **LA.4.5: Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 5** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).<br><br>Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging. | • Analyze and evaluate the effect of the structural characteristics on meaning and/or purpose in an informational text.<br>• Describe the structure of an argument; identify its claims and evidence; and evaluate connections among evidence, inferences, and claims.<br>• Analyze and explain how an author deliberately manipulates language and text structures to develop and refine ideas or claims.<br>• Analyze and evaluate the effectiveness of an author's organization, structure, and syntax as they contribute to a text's overall meaning, purpose, and effect.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Close Read. Students read an appropriately complex text with varying levels of independence and support. Expectations are such that lower level students receive more support as they stretch their literacy levels toward independent reading and analysis of complex texts. As students finish reading they are introduced to a focus question related to a text. Students return to the text for further study. Through text analysis, students develop viewpoints as to how the text explicitly responds to the focus question as well as inferences which may be drawn.<br><br>Students form groups to discuss the focus question, discuss the text analysis and complete a discussion web. Each group draws a conclusion about what the text says explicitly, what inferences can be made and what particular sentences, paragraphs, or larger portions of text support their conclusion.<br>Online Discussion Forum. Students utilize an online discussion forum to engage in the discussion web. For example, a blog is created for an assigned text. Student "blog facilitators" post specific sentences, paragraphs, or larger portions of text within the blog and the remaining students add comments to each post as a way to engage in an online text analysis.<br><br>Evaluating an Argument: Students read through an excerpt of a text such as H.L. Mencken's, The American Language, 4th edition. They proceed to analyze the way the author structures his central idea/thesis statement, and its supporting points. Students use an *Argumentative essay visual organizer* to promote a clearer understanding of how the author chooses to structure his argument. Students can use this process of analysis to later inform and structure their own argumentative writing pieces. |

| **LA.4.6: Assess how point of view or purpose shapes the content and style of a text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 6** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.<br><br>*Reading Historical/Social Studies Text Application:* Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. | • Identify and explain an author's point of view or purpose in an informational text.<br>• Demonstrate understanding of rhetorical appeals.<br>• Analyze and explain the author's use of rhetoric and its contribution to meaning, point of view, and/or purpose of the text.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Prior to the activity, students are competent in the key differences between argumentative, informative/ explanatory and narrative writing. Students are given access to a text exemplar of appropriate complexity within each style of writing; one for each style.<br><br>Read-Only, Purpose Statement, Support. Students begin the activity by deliberately reading one of the texts start to finish without highlighting or note taking. After completing a deliberate read, students author a single sentence narrative highlighting the author's purpose of the text. Students clearly acknowledge that a quality "purpose sentence" includes appropriate clauses and phrases. When the purpose sentence is complete, students utilize sticky notes to cite specific words, phrases and clauses from the text the author used to advance their intent.<br><br>Questioning the Author. After developing an understanding of authorship, students read a complex text and engage in objective discussions. Students can use the following questions to advance the discussions: (1) What is the author trying to tell you?, (2) Why is the author telling you that? (3) Does the author say it clearly? (4) How could the author have said things more clearly? (4) What would you say instead? |

| **LA.4.7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 7** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.<br><br>*Reading Historical/Social Studies Text Application:* Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.<br><br>*Reading Scientific and Technical Text Application:* Translate quantitative or technical information expressed in words | • Analyze print, non-print, and digital text for explicit details that are emphasized in an informational text that are relevant to addressing a question or solving a problem<br>• Compare, contrast, draw conclusions, and connect significant details and ideas between and among different media or formats .<br>• Evaluate information from multiple sources of print, non-print, and digital texts, for relevance, reliability, and validity.<br>• Integrate information from multiple sources of print, non-print, and digital | Close Read and Comparison. Students read a complex text with varying levels of independence and support. After a text is closely analyzed, students will view a video or theatrical interpretation of the same subject matter in order to compare the subject matter in both mediums.<br><br>Written Comparison and Synthesis of Ideas. Students begin by conducting a close read of the full text of The Declaration of Independence or a text of similar complexity. After reading, students complete a written summary of the major points of the text. Within their written |

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| in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. | texts to address a question or solve a problem.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Demonstrate the behaviors of a strategic reader, listener, or viewer of print, non-print, and digital text.<br>• Use knowledge of language and its conventions when speaking and writing. | summary, students place special emphasis on how the text has been summarized, characterized, and remembered throughout history. Upon completion of the summary, students watch a John Adams video clip (http://www.youtube.com/watch?v=nrvpZxMfKaU), view the original print document, and analyze the Trumbull painting of the signing of the declaration. After discussing the different associations and implications of each media, students will read a summarized version of the text from one the top resources retrieved via online search (http://www.eduplace.com/ss/socsci/books/content/ilessons/5/ils_tn_gr5_u1_c02_l1.pdf), as well as a Spark Notes Summary (http://www.sparknotes.com/history/american/declaration/summary.html) of the document itself. Students conduct an analysis of which details are emphasized and which are absent in each account. |

| **LA.4.8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 8** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning. | • Analyze and evaluate connections among evidence, inferences, and claims in an argument.<br>• Analyze an author's implicit and explicit assumptions and beliefs about a subject.<br>• Identify and explain common logical fallacies (e.g., the appeal to pity, the personal attack, the appeal to common opinion, the false dilemma).<br>• Evaluate the credibility of an author's argument by analyzing the manipulation of language, as well as the range, sufficiency, quality, relevance, and validity of the claims.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Written Comparison and Synthesis of Ideas. Students closely read and conduct an analysis of texts such as George Washington's "Farewell Address" and Franklin Delano Roosevelt's "State of the Union Address". Students evaluate each text with the purpose of conducting a comparison and synthesis of ideas. Particular emphasis can be placed upon tone, purpose or how each text outlines the author's vision of America's place in the world.<br><br>Save the Last Word for Me. Students are given a specific amount of time to read through a text. While reading, students highlight specific claims made by the author. When time has expired, students record a certain number of sentences from their collection of highlighted claims. As this task is completed, students organize into predetermined small groups and discuss their recorded claims. Each student reads one of the sentences that he or she selected aloud, then listens to the other student's responses to that sentence, and then explains his or her own response. This strategy can be adapted so that students record and discuss valid reasoning, relevant evidence, false statements and fallacious reasoning. |

| **LA.4.9: Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 9** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.<br><br>Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.<br><br>*Reading Historical/Social Studies Text Application:* Compare and contrast treatments of the same topic in several primary and secondary sources.<br><br>*Reading Scientific and Technical Text Application:* Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. | • Analyze and explain the historical, cultural, and literary significance of specific seminal U. S. documents.<br>• Analyze author's purpose in foundational U. S. documents of the seventeenth-, eighteenth-, and nineteenth- centuries.<br>• Analyze and explain the historical, cultural, and literary significance of specific foundational U. S. documents of the seventeenth-, eighteenth-, and nineteenth- centuries.<br>• Compare, contrast and analyze the treatment of related themes, concepts, and rhetorical devices in foundational U.S. documents of the seventeenth-, eighteenth- and nineteenth- centuries.<br>• Identify and explain themes and concepts common to specific time periods in American history.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Written Comparison and Synthesis of Ideas. Students conduct a CSI between texts such as The Declaration of Independence, Abraham Lincoln's "Gettysburg Address", Martin Luther King's "I Have a Dream" Address, The Warren opinion of Brown vs. Board (or use more complex text such as The Declaration of Independence, Preamble to the Constitution, and Lincoln's Second Inaugural Address). As students analyze each text, the following guiding questions can be used; What does this word or phrase mean? What tone does this word usage convey? Why did the author write in this particular style?<br><br>Change Frame. Students read a text and then organize the information in a table which has the following headings: (1) What does it say about equality?, (2) Similarities with other texts?, and (3) What makes this text unique? The completed table provides for relationships to be represented as well as comparisons to be made. |

| **LA.4.10: Read and comprehend complex informational texts independently and proficiently. CCR Anchor 10** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| **R**ead and comprehend literary nonfiction at this text complexity band proficiently, with scaffolding as needed at the high end of the range. | • Demonstrate understanding of a wide range of sufficiently complex literary nonfiction.<br>• Comprehend texts of steadily increasing complexity, with scaffolding as needed.<br>• As an emerging adult reader, set personal reading goals to self select and explore texts of different disciplines and increasing complexity.<br>• Participate actively and appropriately in discussions about informational text.<br>• Interpret, explain, and apply appropriate academic and/or domain-specific vocabulary when responding and discussing informational text.<br>• Use knowledge of language and its conventions when speaking and writing. | Comparative Analysis of Literary Nonfiction. Similar to other standards, scaffolding is targeted to move learning forward so students are able to independently and draw cross-textual connections among multiple texts with proficiency. The following guiding questions can be used as scaffolding as students build competency within this standard;<br>• How does word choice and text structure compare/contrast between texts of similar topic written in different eras?<br>• How does word choice and text structure compare/contrast between texts of similar topic written for different audiences?<br>• What symbols and/or images appear |

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| | | frequently in one or more texts?<br>• How does each author view an important historical/cultural issue differently or the same?<br>• How does each work use a particular meaning or tone to illustrate a point or support an argument?<br>• How does the historical context of each work influence its meaning?<br>• How does a specific social movement influence each work? |

## ASE LA 1: Production and Distribution of Writing – Instructor Checklist

| **LA.1.1: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. CCR Anchor 2** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. | | |
| a. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. | | |
| b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. | | |
| c. Use appropriate and varied transitions to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. | | |
| d. Use precise language and domain-specific vocabulary to manage the complexity of the topic. | | |
| e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. | | |
| f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). | | |

| **LA.1.2: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. CCR Anchor 3** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. | | |
| a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events. | | |

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|---|---|---|
| b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. | | |
| c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole. | | |
| d. Use precise words and phrases, telling details, and sensory language to convey vivid picture of the experiences, events, setting, and/or characters. | | |
| e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative. | | |

| **LA.1.3: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. CCR Anchor 4** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. | | |

| **LA.1.4: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. CCR Anchor 5** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. | | |

| **LA.1.5: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. CCR Anchor 6** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. | | |

| **LA.1.6: Demonstrate command of the conventions of standard English including grammar, capitalization, punctuation, and spelling when writing. CCR Language Anchors 1 and 2.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. | | |

| | | |
|---|---|---|
| a. Use parallel structure. | | |
| b. Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent, noun, relative, adverbial) to convey specific meanings and add variety and interest to writing or presentations. | | |
| c. Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses. | | |
| d. Use a colon to introduce a list or quotation. | | |
| e. Spell correctly. | | |

| **LA.1.7: Acquire and use accurately general academic and domain-specific words and phrases at the college and career readiness level; demonstrate independent in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate. CCR Language Anchor 4 and 5** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Acquire and use accurately general academic and domain-specific words and phrases at the college and career readiness level; demonstrate independent in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. | | |
| Determine or clarify the meaning of unknown and multiple-meaning words and phrases, choosing flexibly from a range of strategies. | | |
| a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. | | |
| b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). | | |
| c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology or its standard usage. | | |
| d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary). | | |

## ASE LA 2: Using Research in Writing Endeavors – Instructor Checklist

| **LA.2.1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. CCR Anchor 1** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence | | |
| a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. | | |
| b. Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns. | | |
| c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. | | |
| d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. | | |
| e. Provide a concluding statement or section that follows from and supports the argument presented. | | |

| **LA.2.2: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. CCR Anchor 7** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. | | |

| **LA.2.3: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. CCR Anchor 8** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. | | |
| **LA.2.4: Draw evidence from literary or informational texts to support analysis, reflection, and research. CCR Anchor 9** | | |
| Objectives | Curriculum – Materials Used | Notes |
| Draw evidence from literary or informational texts to support analysis, reflection, and research. | | |

## ASE LA 3: Understanding and Analyzing Literature – Instructor Checklist

| **LA.3.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 1** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. | | |

| **LA.3.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 2** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text. | | |

| **LA.3.3: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 4** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper). | | |

| **LA.3.4: Assess how point of view or purpose shapes the content and style of a text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 6** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement). | | |

| **LA.3.5: Read and comprehend complex literature independently and proficiently. CCR Anchor 10** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Read and comprehend literature at this text complexity band proficiently, with scaffolding as needed at the high end of the range. | | |

## ASE LA 4: Understanding and Analyzing Informational Texts – Instructor Checklist

| **LA.4.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 1** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. | | |

| **LA.4.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 2** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text. | | |

| **LA.4.3: Analyze how and why individuals, events, and ideas develop and interact over the course of a text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 3** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text. | | |

| **LA.4.4: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 4** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper). | | |

| **LA.4.5: Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 5** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter). | | |
| Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging. | | |

## ASE LA 4: Understanding and Analyzing Informational Texts – Instructor Checklist, Page 2

| **LA.4.6: Assess how point of view or purpose shapes the content and style of a text. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 6** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose. | | |

| **LA.4.7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 7** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. | | |

| **LA.4.8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 8** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning. | | |

| **LA.4.9: Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. (*Apply this standard to texts of appropriate complexity as outlined by Standard 10.*) CCR Anchor 9** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts. | | |
| Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features. | | |

| **LA.4.10: Read and comprehend complex informational texts independently and proficiently. CCR Anchor 10** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| Read and comprehend literary nonfiction at this text complexity band proficiently, with scaffolding as needed at the high end of the range. | | |

## ASE LA 1: Production and Distribution of Writing – Student Checklist

| **LA.1.1: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. CCR Anchor 2** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can write to convey ideas with guidance and support. | | | | |
| I can write to convey ideas and information using clear organization as well as graphics and multimedia. | | | | |
| I can write to convey ideas and information using clear organization and including facts, details, and other information. | | | | |
| I can write to convey ideas and information clearly, grouping ideas into categories including facts, details, and other information. | | | | |
| I can write to convey ideas and information clearly, using precise language and domain specific vocabulary. | | | | |
| I can establish and maintain a formal style and objective tone when writing to convey ideas and information clearly. | | | | |
| I can provide a concluding statement that follows form and support the information presented when writing to convey ideas and information clearly. | | | | |

| **LA.1.2: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. CCR Anchor 3** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can write about a personal experience with guidance and support. | | | | |
| I can introduce an experience or situation and include at least one character and one event. | | | | |
| I can introduce an experience or situation, at lease one character, and describe multiple events in sequence. | | | | |
| I can introduce an experience or situation including multiple characters and the description of multiple events in sequence. | | | | |
| I can introduce an experience or situation using precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters. | | | | |
| I can introduce an experience or situation and provide a conclusion that follows from and reflect on what is experienced, observed, or resolved over the course of the narrative. | | | | |

## ASE LA 1: Production and Distribution of Writing – Student Checklist, Page 2

| **LA.1.3: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. CCR Anchor 4** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can write with guidance and support. | | | | |
| I can produce writing that is appropriate to the task, purpose or audience with support and guidance. | | | | |
| I can produce writing that is appropriate to the task, purpose or audience. | | | | |
| I can produce coherent writing that is complete and appropriate to a particular task, purpose, and audience. | | | | |

| **LA.1.4: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. CCR Anchor 5** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can, with guidance and support, develop and strengthen writing by planning and revising. | | | | |
| I can develop and strengthen writing by planning and writing. | | | | |
| I can develop and strengthen writing as needed by planning, revising, editing, and rewriting. | | | | |
| I can develop and strengthen writing as needed by planning, revising, editing, and rewriting for a specific purpose and audience. | | | | |

| **LA.1.5: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. CCR Anchor 6** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can use technology to produce a writing sample. | | | | |
| I can use technology, including the Internet, to produce an individual or shared writing project. | | | | |
| I can use technology, including the Internet, to produce, publish, and update an individual or shared writing project. | | | | |
| I can use technology, including the Internet, to produce, publish, revise, and update individual writing products based on feedback. | | | | |

## ASE LA 1: Production and Distribution of Writing – Student Checklist, Page 3

| **LA.1.6: Demonstrate command of the conventions of standard English including grammar, capitalization, punctuation, and spelling when writing. CCR Language Anchors 1 and 2.** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can understand the meaning of words. | | | | |
| I can use complete sentences to convey information in spoken and written English. | | | | |
| I can use a variety of parts of speech (nouns, verbs, pronouns, adjectives, and prepositions) in writing or communication to convey information. | | | | |
| I can use correct punctuation when writing writing. | | | | |
| I can spell most high frequency words correctly and apply knowledge of word chunks including common prefixes, suffixes, and roots in spelling longer words. | | | | |
| I can use language to meet a variety of communication purposes. | | | | |
| I can apply knowledge of conventions of English grammar to convey desired meaning in writing and communication. | | | | |

| **LA.1.7: Acquire and use accurately general academic and domain-specific words and phrases at the college and career readiness level; demonstrate independent in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate. CCR Language Anchor 4 and 5** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can determine the meaning of a word in a sentence. | | | | |
| I can use context to determine the meaning of unknown words. | | | | |
| I can consult reference materials (dictionaries, online vocabulary supports) to clarify the meaning of unfamiliar words encountered when reading. | | | | |
| I can recognize when a multiple meaning word is used two ways. | | | | |
| I can recognize general academic language. | | | | |
| I can understand common phrases. | | | | |
| I can understand common idioms and figures of speech. | | | | |
| I can interpret simple figures of speech encountered while reading or listening. | | | | |
| I can distinguish understanding of multiple meaning of words and figures of speech. | | | | |
| I can use academic and domain-specific words and phrases for communication appropriately for my own educational plan and career goals. | | | | |

## ASE LA 2: Using Research in Writing Endeavors – Student Checklist

| **LA.2.1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. CCR Anchor 1** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can write a claim and reason with guidance and support. | | | | |
| I can write an argument to support claims with one clear reason and a piece of evidence with guidance and support. | | | | |
| I can write about a personal opinion and give more than one reason supporting and rejecting the claim. | | | | |
| I can write to express an opinion with supporting information about a topic or text and a concluding statement. | | | | |

| **LA.2.2: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. CCR Anchor 7** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can answer questions based on a text or other sources of information with guidance and support. | | | | |
| I can conduct short research projects to answer questions using one or more sources of information. | | | | |
| I can conduct short research projects to answer questions posed by self and others using multiple sources of information. | | | | |

| **LA.2.3: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. CCR Anchor 8** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can with guidance and support, use information from one source to answer a question. | | | | |
| I can with guidance and support, select information from multiple sources and use the information to write answers to research questions. | | | | |
| I can select information from multiple sources and use the information to write answers to research questions. | | | | |
| I can select information, including quotes, from multiple sources and use the information to write answers to research questions. | | | | |

| **LA.2.4: Draw evidence from literary or informational texts to support analysis, reflection, and research. CCR Anchor 9** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can participate in shared writing activities applying *Essential Elements of Reading Standards* to informational text with guidance and support. | | | | |
| I can participate in shared writing activities applying *Essential Elements of Reading Standards* to literature with guidance and support. | | | | |
| I can apply *Essential Elements of Reading Standards* to informational text with guidance and support. | | | | |
| I can apply *Essential Elements of Reading Standards* to literature with guidance and support. | | | | |
| I can apply *Essential Elements of Reading Standards* to literature. | | | | |

## ASE LA 3: Understanding and Analyzing Literature – Student Checklist

| **LA.3.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. CCR Anchor 1** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can use text to make inferences. | | | | |
| I can use text to draw conclusions. | | | | |
| I can use text to support details. | | | | |
| I can identify quotes from a text. | | | | |

| **LA.3.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. CCR Anchor 2** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can determine the central idea of the text and select details that relate to it. | | | | |
| I can recount details that relate to the text. | | | | |
| I can identify between the central idea and details in a text. | | | | |
| I can describe the theme of the novel. | | | | |

| **LA.3.3: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. CCR Anchor 4** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can identify the meaning of words as they are used in a text. | | | | |
| I can identify meaning of multiple meaning words as they are used in a text. | | | | |
| I can determine how words or phrases with multiple meanings have an impact on meaning or tone of a text. | | | | |
| I can give two or more examples of how the author's choice of words and phrases impact the meaning(s) and tone of the story. | | | | |

| **LA.3.4: Assess how point of view or purpose shapes the content and style of a text. CCR Anchor 6** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can identify something a character said. | | | | |
| I can recognize the literal meaning of what the author said. | | | | |
| I can identify the intended meaning to match what an author wrote. | | | | |
| I can describe the difference between what the author or a character said and what he or she really meant. | | | | |
| I can identify the experience of a character in a story or drama from outside the United States. | | | | |
| I can connect the experiences of characters in a story or drama from outside the United States with personal experience. | | | | |

| **LA.3.5: Read and comprehend complex literature independently and proficiently. CCR Anchor 10** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can identify words from a text. | | | | |
| I can determine which citations demonstrate what the text says explicitly. | | | | |
| I can determine which citations demonstrate what the text says explicitly as well as inferentially. | | | | |
| I can cite textual evidence to draw inferences from the text. | | | | |

## ASE LA 4: Understanding and Analyzing Informational Texts – Student Checklist

| **LA.4.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. CCR Anchor 1** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can identify words from a text. | | | | |
| I can determine which citations demonstrate what the text says explicitly. | | | | |
| I can determine which citations demonstrate what the text says explicitly as well as inferentially. | | | | |
| I can cite textual evidence to draw inferences from the text. | | | | |

| **LA.4.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. CCR Anchor 2** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can recognize a detail from text. | | | | |
| I can recall details from the text. | | | | |
| I can determine the central idea of the text and select details that support it. | | | | |
| I can determine central and key ideas throughout the text and identify details that support them. | | | | |
| I can provide a summary of an information text. | | | | |

| **LA.4.3: Analyze how and why individuals, events, and ideas develop and interact over the course of a text. CCR Anchor 3** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can recognize how ideas or events in a text are related. | | | | |
| I can determine connections drawn between ideas or events to make a point in informational text. | | | | |
| I can identify the relationship between events in an informational text. | | | | |
| I can explain how several events develop and interact over the course of a text. | | | | |

| **LA.4.4: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. CCR Anchor 4** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can recognize words and phrases used in a text. | | | | |
| I can determine meanings of words and phrases in informational text. | | | | |
| I can determine meanings of words and phrases in informational text including figurative language. | | | | |

| **LA.4.5: Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. CCR Anchor 5** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can identify one detail from an article. | | | | |
| I can determine which sentences in a text support the claims of the author. | | | | |
| I can determine the author's claims and identify which sentences support his or her claims. | | | | |
| I can identify key words that support author's choice of structure. | | | | |
| I can determine how the author uses argument to contribute to the meaning. | | | | |
| I can explain how the author's choice of structure makes an argument more convincing. | | | | |

## ASE LA 4: Understanding and Analyzing Informational Texts – Student Checklist, Page 2

| **LA.4.6: Assess how point of view or purpose shapes the content and style of a text. CCR Anchor 6** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can identify the purpose of informational text. | | | | |
| I can determine an author's purpose or point of view. | | | | |
| I can determine how the author's style affects the purpose of the text. | | | | |
| I can determine an author's purpose and point of view and identify an opposing point of view. | | | | |
| I can determine the author's point of view and explain how the author's style affects the purpose of the text. | | | | |

| **LA.4.7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. CCR Anchor 7** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can attend to text in various media. | | | | |
| I can use visually presented materials to answer questions. | | | | |
| I can compare and contrast a selection from text about a person with other mediums. | | | | |
| I can compare and/or analyze information presented from different media to answer questions or solve problems. | | | | |

| **LA.4.8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. CCR Anchor 8** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can recognize that an event occurred. | | | | |
| I can identify a fact from a text. | | | | |
| I can delineate statements that support an argument. | | | | |
| I can use evidence and statements to support an argument. | | | | |

| **LA.4.9: Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. CCR Anchor 9** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can classify fact and fantasy. | | | | |
| I can recognize a historical fact. | | | | |
| I can make connections between U.S. document of historical and literary significance based on related themes and concepts. | | | | |
| I can match significant U.S. document with their representations. | | | | |
| I can identify important U.S. documents. | | | | |
| I can determine the purposes of foundational U.S. documents of historical significance. | | | | |
| I can compare and contrast foundational U.S. documents of historical significance for their purposes. | | | | |

| **LA.4.10: Read and comprehend complex informational texts independently and proficiently. CCR Anchor 10** | | | | |
|---|---|---|---|---|
| Learning Targets | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % | Date & Mastery Level % |
| I can identify words from a text. | | | | |
| I can determine which citations demonstrate what the text says explicitly. | | | | |
| I can determine which citations demonstrate what the text says explicitly as well as inferentially. | | | | |
| I can cite textual evidence to draw inferences from the text. | | | | |

# North Carolina Community College System
# College and Career Readiness
# Adult Secondary Education Content Standards
# Level 5, Grade Levels 9.0 – 12.9

# Mathematics

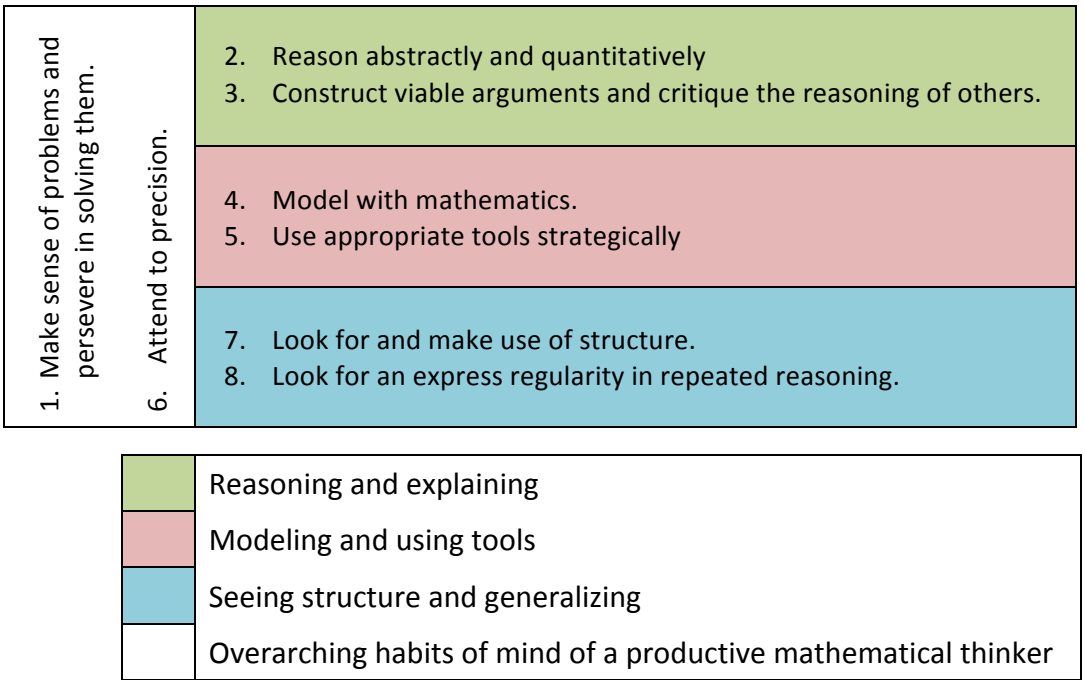
## The Standards for Mathematical Practices

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

**Managing the Mathematical Practices:** The Mathematical Practices can seem overwhelming to weave into the curriculum, but once you understand the relationships among them and their potential use in mathematical tasks, the task becomes more manageable. Because of their interrelated nature, the Mathematical Practices are rarely used in isolation from one another. Consequently, we can expect students to learn the practices concurrently when they are engaged in mathematical problem solving.

The Mathematical Practices are articulated as eight separate items, but in theory and practice they are interconnected. The Common Core authors have published a graphic depicting the higher-order relationships among the practices (see Figure below). Practices 1 and 6 serve as overarching habits of mind in mathematical thinking and are pertinent to all mathematical problem solving. Practices 2 and 3 focus on reasoning and justifying for oneself as well as for others and are essential for establishing the validity of mathematical work. Practices 4 and 5 are particularly relevant for preparing students to use mathematics in their work. Practices 7 and 8 involve identifying and generalizing patterns and structure in calculations and mathematical objects. These practices are the primary means by which we separate abstract, big mathematical ideas from specific examples.

**Higher-Order Structure of the Mathematical Practices**



## The Eight Standards for Mathematical Practice

**MP.1: Make sense of problems and persevere in solving them.** Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Less experienced students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

**MP.2: Reason abstractly and quantitatively.** Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

**MP.3: Construct viable arguments and critique the reasoning of others.** Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Less experienced students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later. Later, students learn to determine domains to which an argument applies. Students at all levels can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

**MP.4: Model with mathematics.** Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. This might be as simple as writing an addition equation to describe a situation. A student might apply proportional reasoning to plan a school event or analyze a problem in the community. A student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

**MP.5: Use appropriate tools strategically.** Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

**MP.6: Attend to precision.** Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. Less experienced students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

**MP.7: Look for and make use of structure.** Mathematically proficient students look closely to discern a pattern or structure. Students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 x 8 equals the well-remembered 7 x 5 + 7 x 3, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, students can see the 14 as 2 x 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5– 3(x-y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

**MP.8: Look for and express regularity in repeated reasoning.** Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Early on, students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, students might abstract the equation (y-2)/(x-1) = 3. Noticing the regularity in the way terms cancel when expanding (x–1) (x+1), (x-1) ($x^2 + x + 1$), and (x–1)($x^3 + x^2 + x + 1$) might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

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**ASE MA 1: Algebraic Concepts and Expressions**

| **MA.1.1 Number and Quantity: The Real Number System and Quantities.** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| **MA.1.1.1** Rewrite expressions involving radicals and rational exponents using the properties of exponents. For example: The expression $\sqrt{5a^4b^{12}}$ can be re-written as; $(5a^4b^{12})^{1/2}$ which can also be re-written as: $5^{1/2}.(a^4)^{1/2}.(b^{12})^{1/2}$ | Convert from radical representation to using rational exponents and vise versa. | **Examples**<br>https://www.illustrativemathematics.org/HSN-RN<br><br>**Rewrite Expressions Involving Radicals and Rational Exponents**<br>https://learnzillion.com/lessonsets/646-rewrite-expressions-involving-radicals-and-rational-exponents<br><br>**Radical to Rational Expressions**<br>https://www.khanacademy.org/math/algebra/exponent-equations/simplifying-radical-expressions/v/radical-equivalent-to-rational-exponents-2h |
| **MA.1.1.2** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. | Interpret units in the context of the problem.<br><br>When solving a multi-step problem, use units to evaluate the appropriateness of the solution.<br><br>Choose the appropriate units for a specific formula and interpret the meaning of the unit in that context.<br><br>Choose and interpret both the scale and the origin in graphs and data displays | For example, Speed = Distance/Time. That is why the units of measurement of speed are in miles (distance) / (per) time (hour)<br><br>**Use Units as a Way to Understand Problems**<br>https://learnzillion.com/lessonsets/397-use-units-as-a-way-to-understand-and-solve-problems<br><br>http://www.virtualnerd.com/common-core/hsn-number-quantity/HSN-Q-quantities/A/1 |
| **MA.1.1.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. | Determine the accuracy of values based on their limitations in the context of the situation. | **Choosing Appropriate Accuracy**<br>https://learnzillion.com/lessonsets/399-choose-a-level-of-accuracy-appropriate-to-limitations-on-measurement- |

| **MA.1.2 Algebra: Seeing Structure in Expressions** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| **MA.1.2.1** Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients | Identify the different parts of the expression and explain their meaning within the context of a problem.<br>For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P. | **Interpreting Expressions: What is a Variable/Coefficient/Constant**<br>http://www.virtualnerd.com/common-core/hsa-algebra/HSA-SSE-expressions-seeing-structure/A/1<br><br>**Interpret Real World Expressions**<br>https://learnzillion.com/lessonsets/649-interpret-complicated-expressions-in-context-understanding-the-meaning-of-specific-terms-factors-and-coefficients |
| **MA.1.2.2** Use the structure of an expression to identify ways to rewrite it. | Rewrite algebraic expressions in different equivalent forms:<br>• Use factoring techniques such as common factors, grouping, the difference of two squares, the sum or difference of two cubes, or a combination of methods to factor completely.<br>• Simplify expressions including combining like terms, using the distributive property and other | For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.<br><br>**Use the Structure of an Expression to Identify Ways to Rewrite It**<br>http://www.virtualnerd.com/common-core/hsa-algebra/HSA-SSE-expressions-seeing-structure/A/2<br><br>**Using Different Factoring Techniques**<br>https://learnzillion.com/lessonsets/718 |

| | | |
|---|---|---|
| | operations with polynomials. | **Factoring Using Common Factors**<br>https://www.khanacademy.org/math/algebra/multiplying-factoring-expression/Factoring-simple-expressions/v/factoring-linear-binomials |
| **MA.1.2.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.<br>Factor a quadratic expression to reveal the zeros of the function it defines. | Write expressions in equivalent forms by factoring to find the zeros of a quadratic function and explain the meaning of the zeros.<br>• Given a quadratic function explain the meaning of the zeros of the function. That is if f(x) = (x – c) (x – a) then f(a) = 0 and f(c) = 0.<br>• Given a quadratic expression, explain the meaning of the zeros graphically. That is for an expression (x –a) (x – c), a and c correspond to the x-intercepts (if a and c are real). | **Choose and Produce Equivalent Forms Examples**<br>https://www.illustrativemathematics.org/HSA<br><br>**Factor Quadratics to Reveal Zeros**<br>http://www.virtualnerd.com/common-core/hsa-algebra/HSA-SSE-expressions-seeing-structure/B/3/3a |

| **MA.1.3 Algebra: Arithmetic with Polynomials and Rational Expressions** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| **MA.1.3.1** Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. | Emphasis should be on operations with polynomials.<br>Understand the definition of a polynomial.<br>Understand the concepts of combining like terms and closure.<br>Add, subtract, and multiply polynomials and understand how closure applies under these operations. | **Simplify Polynomials**<br>https://www.khanacademy.org/math/algebra/multiplying-factoring-expression/polynomial_basics/v/simply-a-polynomial<br><br>**Adding Polynomials**<br>http://www.virtualnerd.com/algebra-1/polynomials-and-factoring/addition-example.php<br><br>**Subtracting Polynomials**<br>https://www.khanacademy.org/math/algebra/multiplying-factoring-expression/polynomial_basics/v/subtracting-polynomials<br><br>**Multiplying Polynomials**<br>https://www.khanacademy.org/math/algebra/multiplying-factoring-expression/multiplying_polynomials/v/multiplying-monomials-by-polynomials |
| **MA.1.3.2** Rewrite rational expressions. | Rewrite simple rational expressions in different forms using inspection, or, for more complicated examples, a computer algebra system. | **Simplifying Rational Expressions video**<br>https://www.khanacademy.org/math/algebra2/polynomial_and_rational/simplifying-rational-expressions/v/simplifying-rational-expressions-introduction<br><br>**Using Wolfram Alpha to Rewrite Rational Expressions**<br>http://www.wolframalpha.com/input/?i=factorize+%285x6+–+4x2+–+5x%29+++%286x6+–+7x2+++2x%29+ |

**ASE MA 2: Equations and Inequalities**

| **MA.2.1 Algebra: Creating Equations** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| **MA.2.1.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions and simple rational and exponential functions. | Create linear, quadratic, rational and exponential equations and inequalities in one variable and use them in a contextual situation to solve real world problems.<br>**Example:** A contractor is purchasing some tiles for a new patio. Each tile costs $3 and he wants to spend less than $1000. The size of each tile is 1 square foot. Write an inequality that represents the number of tiles he can purchase with a $1000 limit then figure out how large the patio can be. | **Create Equations and Inequalities in One Variable**<br>https://learnzillion.com/lessonsets/120-create-equations-and-inequalities-in-one-variable-and-use-them-to-solve-problems<br>**Inequalities Video**<br>https://www.khanacademy.org/math/algebra/linear_inequalities/inequalities/v/inequalities |
| **MA.2.1.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | Create equations in two or more variables to represent relationships between quantities.<br>Graph equations in two variables on a coordinate plane and label the axes and scales. | **Create Equations in Two or More Variables**<br>https://learnzillion.com/lessonsets/122-create-equations-in-two-or-more-variables-to-represent-relationships-between-quantities-linear-functions |
| **MA.2.1.3** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. | Write and use a system of equations and/or inequalities to solve a real world problem. Recognize that the equations and inequalities represent the constraints of the problem. Use the Objective Equation and the Corner Principle to determine the solution to the problem. (Linear Programming) | For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.<br>**Modeling Equations or Inequalities**<br>https://learnzillion.com/lessonsets/256-represent-constraints-by-equations-or-inequalities-and-by-systems-of-equations-andor-inequalities<br>**Example Problems**<br>https://www.illustrativemathematics.org/HSA-CED |
| **MA.2.1.4** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. | Solve multi-variable formulas or literal equations, for a specific variable.<br>Make a variable the subject of a given formula or algebraic expression. When rearranging a formula or algebraic equation, all operations on the right hand side must be repeated on the left hand side of the equal sign. | **Solve a Formula for a Variable**<br>http://www.virtualnerd.com/common-core/hsa-algebra/HSA-CED-/A/4/isolate-variable-from-formula<br>**Example:** How long will it take David to cover a distance of 26 miles if he was running at 7mph? Re-arrange the equation Distance = Speed x Time to highlight Time and solve the problem. Dividing **both** sides by Speed gives: Distance/Speed = Time →26/7 = 3.7 Hours |

| **MA.2.2 Algebra: Reasoning with Equations and Inequalities** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| **MA.2.2.1** Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. | Assuming an equation has a solution, construct a convincing argument that justifies each step in the solution process. Justifications may include the associative, commutative, and division properties, combining like terms, multiplication by 1, etc. | **Justify Steps in Solving Equations Using Properties of Equations**<br>https://learnzillion.com/lessons/2865-justify-each-step-in-solving-an-equation-using-properties-of-equations-part-1<br>http://www.cpm.org/pdfs/state_supplements/Justification_for_Solving_Equations.pdf<br>http://mathbitsnotebook.com/Algebra1/LinearEquations/LEjustify.html |

| | | |
|---|---|---|
| **MA.2.2.2** Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. | Solve simple rational and radical equations in one variable and provide examples of how extraneous solutions arise. | **Solve Simple Rational and Radical Equations**<br>https://learnzillion.com/lessonsets/280-solve-simple-rational-and-radical-equations-in-one-variable<br><br>**Extraneous Solutions to Radical Expressions**<br>https://www.khanacademy.org/math/algebra/exponent-equations/radical_equations/v/extraneous-solutions-to-radical-equations |
| **MA.2.2.3** Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | Solve linear equations in one variable, including coefficients represented by letters.<br><br>Solve linear inequalities in one variable, including coefficients represented by letters. | **One Step Inequalities**<br>https://www.khanacademy.org/math/algebra/linear_inequalities/inequalities/e/one_step_inequalities |
| **MA.2.2.4** Solve quadratic equations with one variable. | Solve quadratic equations in one variable by simple inspection, taking the square root, factoring, and completing the square. | **Using Different Methods to Solve Quadratic Equations**<br>https://www.illustrativemathematics.org/illustrations/618<br><br>**Solve Quadratic Equations by Inspection**<br>https://learnzillion.com/lessons/743-solve-a-quadratic-equation-by-inspection<br><br>**Solve Quadratic Equations by Taking the Square Root**<br>https://www.khanacademy.org/math/algebra/quadratics/quadratics-square-root/e/solving_quadratics_by_taking_the_square_root<br><br>**Solve Quadratic Equations by Factoring**<br>http://www.virtualnerd.com/algebra-1/quadratic-equations-functions/solve-by-factoring.php<br><br>**Solve Quadratic Equations by Completing the Square**<br>http://www.virtualnerd.com/algebra-1/quadratic-equations-functions/completing-the-square-solution-example.php |
| **MA.2.2.5** Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. | Solve systems of equations using graphs. | **Solve a System of Equations by Graphing**<br>http://www.virtualnerd.com/common-core/hsa-algebra/HSA-REI-equations-inequalities-reasoning/C/6/equations-solution-by-graphing<br><br>**Solve a System of Equations by Graphing**<br>https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-systems-topic/cc-8th-systems-graphically/v/graphings-systems-of-equations |
| **MA.2.2.6** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). | Understand that all solutions to an equation in two variables are contained on the graph of that equation. | **Represent and Solve Equations and Inequalities Graphically**<br>http://www.virtualnerd.com/common-core/hsa-algebra/HSA-REI-equations-inequalities-reasoning/D<br><br>**Using Technology to Solve Equations: Wolfram Alpha**<br>Input $x^2$+5x+6 into Wolfram Alpha to see the graph of the equation:<br>http://www.wolframalpha.com/input/?i=+x%5E2+5x+6+=+0h |

**ASE MA 3: Algebraic Functions and Modeling**

| **MA.3.1 Interpreting and Modeling Algebraic Functions: Understand the concept of a function and use function notation.** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| MA.3.1.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f(x)* denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y = f(x)*. | A function occurs when each input *(x)* has only one output *(y)*. Shown an equation, table, or graph, students can determine whether it is a function. Students understand that the domain is the set of x values and the range is the set of y values. In a function, *f(x)* is used instead of *y*. | A function defines the relationship between algebraic variables. For a function f(x); x is used an input into the function to produce a set or series of outputs depending on the numerical value of x. So if f(x) = x+5; if x=0 then f(0) = 5; if x=1 then f(1) = 6; if x=2 then f(2) = 7. The values of x (0, 1, 2) is called the domain while the outputs (5, 6, 7) are called the range. The input is the domain, the output is the range.<br><br>**What is a Function?**<br>https://www.khanacademy.org/math/algebra2/functions_and_graphs/copy-of-relationships_functions-2014-03-28T18:09:49.924Z/v/what-is-a-function<br><br>**Functions: Domain and Range**<br>https://www.khanacademy.org/math/algebra2/functions_and_graphs/copy-of-relationships_functions-2014-03-28T18:09:49.924Z/v/relations-and-functions |
| MA.3.1.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. | Students recognize *f(x)* function notation. Students can evaluate function for different inputs.<br><br>*f(x)* = 2x + 5 What is *f(4)*?<br>f(4) = 2(4) + 5<br>f(4) = 8 + 5<br>f(4) = 13 | **Evaluating with Function Notation**<br>https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-relationships-functions/cc-8th-function-notation/v/linear-function-graphs |
| MA.3.1.3 Interpret functions that arise in application in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. | For example, for a quadratic function modeling a projectile in motion, interpret the intercepts and the vertex of the function in the context of the problem. Key features include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. | **Examples from Illustrative Math**<br>https://www.illustrativemathematics.org/HSF<br><br>**Algebra Functions and Modeling Handout**<br>http://abspd.appstate.edu/teaching-resources |
| MA.3.1.4 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.<br><br>For example, if the function *h(n)* gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function. | Students identify an appropriate domain from a graph based on context. Students also identify the meaning of a point in terms of context.<br><br>Example: Jennifer's cell phone plan charges her $20 each month for the phone and 10 cents for each minute she's on the phone. What domain would describe this relationship? Describe the meaning of the point (10,21).<br><br>Solution: The domain is the set of positive integers since there cannot be a negative number of minutes and parts of minutes are not charged. (10,21) means the charge for 10 minutes of service would be $21. | **Relate the Domain of a Function to its Graph**<br>https://learnzillion.com/lessonsets/679-relate-the-domain-of-a-function-to-its-graph<br><br>**Examples from Illustrative Mathematics**<br>https://www.illustrativemathematics.org/HSF |

<table>
<tr>
<td>MA.3.1.5 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</td>
<td>Estimate the average rate of change during an interval from a function's graph. In the example below, between hours 1 and 2, a person drove 50 miles so the average rate of change is 50.
<table>
<tr><th>Hours</th><th>Miles Driven</th></tr>
<tr><td>1</td><td>50</td></tr>
<tr><td>2</td><td>100</td></tr>
<tr><td>3</td><td>150</td></tr>
<tr><td>4</td><td>200</td></tr>
</table>
</td>
<td>Average Rate of Change<br>https://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/average-rate-of-change/v/average-rate-of-change-example-1</td>
</tr>
<tr>
<td>MA.3.1.6 Analyze functions in different representations. Graph functions expressed symbolically and show key features (properties described above) of the graph, by hand in simple cases and using technology for more complicated cases.</td>
<td>Given the function y = 2x – 6, students can provide a written description (y is equal to two times a number minus six) and show the function in a table or graph.</td>
<td>Words, Equations, Tables, and Graphs<br>http://www.youtube.com/watch?v=apktS70tYPo</td>
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<tr>
<td>MA.3.1.7 Use properties of exponents to interpret expressions for exponential functions.</td>
<td>For example, identify percent rate of change in an exponential function and then classify it as representing exponential growth or decay.</td>
<td>Introduction to Exponential Functions<br>http://www.youtube.com/watch?v=PEtIQqvIoGU<br><br>Examples from Illustrative Math<br>https://www.illustrativemathematics.org/HSF</td>
</tr>
<tr>
<td>MA.3.1.8 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).</td>
<td>Compare the following functions to determine which has the greater rate of change.<br>Function 1: y = 2x + 4<br>Function 2:
<table>
<tr><th>x</th><th>y</th></tr>
<tr><td>-1</td><td>-6</td></tr>
<tr><td>0</td><td>-3</td></tr>
<tr><td>2</td><td>3</td></tr>
</table>
Solution: The rate of change for function 1 is 2; the rate of change for function 2 is 3. Function 2 has the greater rate of change.</td>
<td>Understanding and Comparing Functions<br>http://www.youtube.com/watch?v=Mq6iePhLQGM<br><br>http://www.youtube.com/watch?v=6AjBsO4qsww</td>
</tr>
</table>

| **MA.3.2 Build a function that models a relationship between two quantities.** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| MA.3.2.1 Write a function that describes a relationship between two quantities. | Understand how to interpret words into independent and dependent variables.<br>Understand how to map the variables into numerical values.<br>Understand how to identify the relationship between the variables by mapping the generated values into a graph by hand or using computational methods for complex relationships. | **Introduction to Linear Functions**<br>http://www.youtube.com/watch?v=n7QeVeghB9A |

| **MA.3.3 Construct and compare linear, quadratic, and exponential functions models and solve problems. Interpret expressions for functions in terms of the situation they model.** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| MA.3.3.1 Distinguish between situations that can be modeled with linear functions and with exponential functions. | Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.<br><br>Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. | Example: Given a function that contains the following points: (1,11); (2,14); (3,19); (4,26); (5,35). Determine whether the function is linear or non-linear.<br><br>**Understanding Linear and Exponential Models**<br>https://www.khanacademy.org/math/algebra/algebra-functions/one-variable-modeling/v/linear-exponential-models |
| MA.3.3.2 Interpret the parameters in a linear or exponential function in terms of a context. | Based on the context of a situation, explain the meaning of the coefficients, factors, exponents, and/or intercepts in a linear function.<br>**Example 1:** Given a linear function $y=mx+b$; the coefficient $m$ is the slope of the line, and $b$ is the y intercept. X is the independent variable, and y is the dependent variable.<br>**Example 2:** Given an exponential decay function $A=A_oe^{-kt}$; $A_o$ is the starting point, $k$ is a constant, $t$ is the time (an independent variable) and A is the dependent variable. | **Exploring Linear Relationships**<br>https://www.khanacademy.org/math/algebra/linear-equations-and-inequalitie/graphing_solutions2/v/exploring-linear-relationships<br><br>**Exponential Growth and Decay Word Problems**<br>https://www.khanacademy.org/math/algebra2/exponential_and_logarithmic_func/exponential-modeling/v/word-problem-solving--exponential-growth-and-decay |

**ASE MA 4: Geometry, Probability, and Statistics**

| **MA.4.1 Geometry: Understand congruence and similarity.** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| MA.4.1.1 Experiment with transformations in a plane. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.<br>**Example:** How would you determine whether two lines are parallel or perpendicular? | A point has position, no thickness or distance. A line is made of infinitely many points, and a line segment is a subset of the points on a line with endpoints. A ray is defined as having a point on one end and a continuing line on the other.<br>An angle is determined by the intersection of two rays.<br>A circle is the set of infinitely many points that are the same distance from the center forming a circular are, measuring 360 degrees.<br>Perpendicular lines are lines in the interest at a point to form right angles.<br>Parallel lines that lie in the same plane and are lines in which every point is equidistant from the corresponding point on the other line. | Definitions are used to begin building blocks for proof. Infuse these definitions into proofs and other problems. Pay attention to Mathematical practice 3 "Construct viable arguments and critique the reasoning of others: Understand and use stated assumptions, definitions and previously established results in constructing arguments." Also mathematical practice number six says, "Attend to precision: Communicate precisely to others and use clear definitions in discussion with others and in their own reasoning."<br><br>**Experiment with Transformations in a Plane**<br>http://www.virtualnerd.com/common-core/hsf-geometry/HSG-CO-congruence/A |
| MA.4.1.2 Prove theorems involving similarity. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. | Students use similarity theorems to prove two triangles are congruent.<br>Students prove that geometric figures other than triangles are similar and/or congruent. | **Solve Problems using Congruence and Similarity**<br>https://learnzillion.com/lessonsets/668-solve-problems-using-congruence-and-similarity-criteria-for-triangles<br><br>https://www.illustrativemathematics.org/HSG |

| **MA.4.2 Geometric Measure and Dimension: Explain formulas and use them to solve problems and apply geometric concepts in modeling situations.** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| MA.4.2.1 Explain perimeter, area, and volume formulas and use them to solve problems involving two- and three-dimensional shapes. | Use given formulas and solve for an indicated variables within the formulas. Find the side lengths of triangles and rectangles when given area or perimeter. Compute volume and surface area of cylinders, cones, and right pyramids. | **Geometry Lesson Plans**<br>http://www.learnnc.org/?standards=Mathematics--Geometry<br>Example: Given the formula $V = \frac{1}{3}BH$, for the volume of a cone, where B is the area of the base and H is the height of the. If a cone is inside a cylinder with a diameter of 12in. and a height of 16 in., find the volume of the cone. |
| MA.4.2.2 Apply geometric concepts in modeling of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). | Use the concept of density when referring to situations involving area and volume models, such as persons per square mile.<br>Understand density as a ratio.<br>Differentiate between area and volume densities, their units, and situations in which they are appropriate (e.g., area density is ideal for measuring population density spread out over land, and the concentration of oxygen in the air is best measured with volume density). | Explore design problems that exist in local communities, such as building a shed with maximum capacity in a small area or locating a hospital for three communities in a desirable area.<br>**Geometry Problem Solving**<br>http://map.mathshell.org/materials/lessons.php?taskid=216&subpage=concept |

| **MA.4.3 Summarize, represent, and interpret categorical and quantitative data on (a) a single count or measurement variable, (b) two categorical and quantitative variables, and (c) Interpret linear models.** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| MA.4.3.1 Represent data with plots on the real number line (dot plots, histograms, and box plots). | Construct appropriate graphical displays (dot plots, histogram, and box plot) to describe sets of data values. | **Represent Data with Plots**<br>https://learnzillion.com/lessonsets/513-represent-data-with-plots-on-the-real-number-line-dot-plots-histograms-and-box-plots<br><br>http://www.virtualnerd.com/common-core/hss-statistics-probability/HSS-ID-interpreting-categorical-quantitative-data/A/1 |
| MA.4.3.2 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). | Understand and be able to use the context of the data to explain why its distribution takes on a particular shape (e.g. are there real-life limits to the values of the data that force skewness? are there outliers?)<br><br>Understand that the higher the value of a measure of variability, the more spread out the data set is.<br><br>Explain the effect of any outliers on the shape, center, and spread of the data sets. | **Interpreting Categorical and Quantitative Data**<br>http://www.shmoop.com/common-core-standards/ccss-hs-s-id-3.html<br><br>http://www.thirteen.org/get-the-math/teachers/math-in-restaurants-lesson-plan/standards/187/ |
| MA.4.3.3 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. | Create a two-way frequency table from a set of data on two categorical variables. Calculate joint, marginal, and conditional relative frequencies and interpret in context. Joint relative frequencies are compound probabilities of using AND to combine one possible outcome of each categorical variable (P(A and B)). Marginal relative frequencies are the probabilities for the outcomes of one of the two categorical variables in a two-way table, without considering the other variable. Conditional relative frequencies are the probabilities of one particular outcome of a categorical variable occurring, given that one particular outcome of the other categorical variable has already occurred.<br>Recognize associations and trends in data from a two-way table. | **Interpreting Quantitative and Categorical data**<br>http://www.ct4me.net/Common-Core/hsstatistics/hss-interpreting-categorical-quantitative-data.htm<br><br>http://www.virtualnerd.com/middle-math/probability-statistics/frequency-tables-line-plots/practice-make-frequency-table<br><br>http://ccssmath.org/?page_id=2341 |
| MA.4.3.4 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. | Understand that the key feature of a linear function is a constant rate of change. Interpret in the context of the data, i.e. as x increases (or decreases) by one unit, y increases (or decreases) by a fixed amount. Interpret the y-intercept in the context of the data, i.e. an initial value or a one-time fixed amount. | **Interpreting Slope and Intercepts**<br>http://www.virtualnerd.com/common-core/hss-statistics-probability/HSS-ID-interpreting-categorical-quantitative-data/C/7<br><br>https://learnzillion.com/lessonsets/457-interpret-the-slope-and-the-intercept-of-a-linear-model-using-data |
| MA.4.3.5 Distinguish between correlation and causation. | Understand that just because two quantities have a strong correlation, we cannot assume that the explanatory (independent) variable causes a change in the response (dependent) variable. The best method for establishing causation is conducting an experiment that carefully | **Correlation and Causation**<br>https://learnzillion.com/lessonsets/585-distinguish-between-correlation-and-causation<br><br>https://www.khanacademy.org/math/probability/statistical-studies/types-of-studies/v/correlation-and- |

| | | |
|---|---|---|
| | controls for the effects of lurking variables (if this is not feasible or ethical, causation can be established by a body of evidence collected over time e.g. smoking causes cancer). | causality |

| **MA.4.4 Using probability to make decisions.** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| M.4.4.1 Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. | Develop a theoretical probability distribution and find the expected value.<br>**For example**, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple choice test where each question has four choices, and find the expected grade under various grading schemes. | **Probability**<br>http://www.shmoop.com/common-core-standards/ccss-hs-s-md-4.html<br><br>**Using Probability to Make Decisions**<br>https://www.khanacademy.org/commoncore/grade-HSS-S-MD |
| M.4.4.2 Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. | Develop an empirical probability distribution and find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households. | **Probability Distribution**<br>http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=7&ved=0CEAQFjAG&url=http%3A%2F%2Feducation.ohio.gov%2Fgetattachment%2FTopics%2FOhio-s-New-Learning-Standards%2FMathematics%2FHigh_School_Statistics-and-Probability_Model-Curriculum_October2013-1.pdf.aspx&ei=ec0RVNHBN8-UgwSYvYD4Dg&usg=AFQjCNHpyffrA7UVkDyKCXIkYRDSw1nsyQ&bvm=bv.74894050,d.eXY |
| M.4.4.3 Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. Find the expected payoff for a game of chance. | Set up a probability distribution for a random variable representing payoff values in a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant. | **Expected Value**<br>http://www.youtube.com/watch?v=DAjVAEDil_Q<br><br>**Weighing Outcomes**<br>https://www.illustrativemathematics.org/illustrations/1197 |
| M.4.4.4 Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator). | Make decisions based on expected values. Use expected values to compare long- term benefits of several situations. | **Using Probability to Make Decisions**<br>http://www.shmoop.com/common-core-standards/ccss-hs-s-md-6.html |
| M.4.4.5 Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game). | Explain in context decisions made based on expected values. | **Analyzing Decisions**<br>http://www.ct4me.net/Common-Core/hsstatistics/hss-using-probability-make-decisions.htm<br><br>**Money and Probability**<br>http://becandour.com/money.htm |

**ASE MA 1: Algebraic Concepts and Expressions – Instructor Checklist**

| **MA.1.1 Number and Quantity: The Real Number System and Quantities.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| **MA.1.1.1** Rewrite expressions involving radicals and rational exponents using the properties of exponents. For example: The expression $\sqrt{5a^4b^{12}}$ can be re-written as; $(5a^4b^{12})^{1/2}$ which can also be re-written as: $5^{1/2}.(a^4)^{1/2}.(b^{12})^{1/2}$ | | |
| **MA.1.1.2** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. | | |
| **MA.1.1.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. | | |

| **MA.1.2 Algebra: Seeing Structure in Expressions** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| **MA.1.2.1** Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients | | |
| **MA.1.2.2** Use the structure of an expression to identify ways to rewrite it. | | |
| **MA.1.2.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.<br>Factor a quadratic expression to reveal the zeros of the function it defines. | | |

| **MA.1.3 Algebra: Arithmetic with Polynomials and Rational Expressions** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| **MA.1.3.1** Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. | | |
| **MA.1.3.2** Rewrite rational expressions. | | |

**ASE MA 2: Equations and Inequalities – Instructor Checklist**

| **MA.2.1 Algebra: Creating Equations** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| **MA.2.1.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions and simple rational and exponential functions. | | |
| **MA.2.1.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | | |
| **MA.2.1.3** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non- viable options in a modeling context. | | |
| **MA.2.1.4** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. | | |

| **MA.2.2 Algebra: Reasoning with Equations and Inequalities** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| **MA.2.2.1** Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. | | |
| **MA.2.2.2** Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. | | |
| **MA.2.2.3** Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | | |
| **MA.2.2.4** Solve quadratic equations with one variable. | | |
| **MA.2.2.5** Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables. | | |
| **MA.2.2.6** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve. | | |

**ASE MA 3: Algebraic Functions and Modeling – Instructor Checklist**

| **MA.3.1 Understand the concept of a function and use function notation and degrees of functions.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| MA.3.1.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f(x)* denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y = f(x)*. | | |
| MA.3.1.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. | | |
| MA.3.1.3 Interpret functions that arise in application in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. | | |
| MA.3.1.4 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. | | |
| MA.3.1.5 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. | | |
| MA.3.1.6 Analyze functions in different representations. Graph functions expressed symbolically and show key features (properties described above) of the graph, by hand in simple cases and using technology for more complicated cases. | | |
| MA.3.1.7 Use properties of exponents to interpret expressions for exponential functions. | | |
| MA.3.1.8 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). | | |

| **MA.3.2 Build a function that models a relationship between two quantities.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| MA.3.2.1 Write a function that describes a relationship between two quantities. | | |

| **MA.3.3 Construct and compare linear, quadratic, and exponential functions models and solve problems. Interpret expressions for functions in terms of the situation they model.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| MA.3.3.1 Distinguish between situations that can be modeled with linear functions and with exponential functions. | | |
| MA.3.3.2 Interpret the parameters in a linear or exponential function in terms of a context. | | |

**ASE MA 4: Geometry, Probability, and Statistics – Instructor Checklist**

| **MA.4.1 Geometry: Understand congruence and similarity.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| MA.4.1.1 Experiment with transformations in a plane. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. | | |
| MA.4.1.2 Prove theorems involving similarity. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. | | |

| **MA.4.2 Geometric Measure and Dimension: Explain formulas and use them to solve problems and apply geometric concepts in modeling situations.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| MA.4.2.1 Explain perimeter, area, and volume formulas and use them to solve problems involving two- and three-dimensional shapes. | | |
| MA.4.2.2 Apply geometric concepts in modeling of density based on area and volume in modeling. | | |

| **MA.4.3 Summarize, represent, and interpret categorical and quantitative data on (a) a single count or measurement variable, (b) two categorical and quantitative variables, and (c) Interpret linear models.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| MA.4.3.1 Represent data with plots on the real number line. | | |
| MA.4.3.2 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). | | |
| MA.4.3.3 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data. Recognize possible associations and trends in the data. | | |
| MA.4.3.4 Interpret the slope and the intercept of a linear model in the context of the data. | | |
| MA.4.3.5 Distinguish between correlation and causation. | | |

| **MA.4.4 Using probability to make decisions.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| M.4.4.1 Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. | | |
| M.4.4.2 Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. | | |
| M.4.4.3 Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. Find the expected payoff for a game of chance. | | |
| M.4.4.4 Use probabilities to make fair decisions. | | |
| M.4.4.5 Analyze decisions and strategies using probability concepts. | | |

**ASE MA 1: Algebraic Concepts and Expressions – Student Checklist**

| **MA.1.1 Number and Quantity: The Real Number System and Quantities.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can, using the properties of exponents, rewrite a radical expression as an expression with a rational exponent. | | |
| I can, using the properties of exponents, rewrite an expression with rational exponent as a radical expression. | | |
| I can calculate unit conversions. | | |
| I can recognize units given or need to solve problems. | | |
| I can use given units and the context of a problem as a way to determine if the solution to a multi-step problem is reasonable (e.g. length problems dictate different units than problems dealing with a measure such as slope). | | |
| I can choose appropriate units to represent a problem when using formulas or graphing. | | |
| I can interpret units or scales used in formulas or represented in graphs. | | |
| I can use units as a way to understand problems and to guide the solution of multi-step problems. | | |
| I can identify appropriate units of measurement to report quantities. | | |
| I can determine the limitations of different measurement tools. | | |
| I can choose and justify a level of accuracy and/or precision appropriate to limitations on measurement when reporting quantities. | | |
| I can identify important quantities in a problem or real-world context. | | |

| **MA.1.2 Algebra: Seeing Structure in Expressions** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can, for expressions that represent a contextual quantity, define and recognize parts of an expression, such as terms, factors, and coefficients. | | |
| I can, for expressions that represent a contextual quantity, interpret parts of an expression, such as terms, factors, and coefficients in terms of the context. | | |
| I can identify ways to rewrite expressions, such as difference of squares, factoring out a common monomial, regrouping, etc. | | |
| I can identify ways to rewrite expressions based on the structure of the expression. | | |
| I can use the structure of an expression to identify ways to rewrite it. | | |
| I can classify expression by structure and develop strategies to assist in classification. | | |
| I can factor a quadratic expression to produce an equivalent form of the original expression. | | |
| I can explain the connection between the factored form of a quadratic expression and the zeros of the function it defines. | | |
| I can explain the properties of the quantity represented by the quadratic expression. | | |
| I can choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the original expression. | | |

| **MA.1.3 Algebra: Arithmetic with Polynomials and Rational Expressions** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can identify like terms. | | |
| I can use the distributive property. | | |
| I can combine linear and quadratic polynomials with addition and subtraction. | | |
| I can multiply a constant by a linear or quadratic polynomial. | | |
| I can multiply two polynomials using the distributive property. | | |
| I can identify that the sum, difference, or product of two polynomials will always be a polynomial, which means that polynomials are closed under the operations of addition, subtraction, and multiplication. | | |
| I can define “closure.” | | |
| I can apply arithmetic operations of addition, subtraction, and multiplication to polynomials. | | |
| I can rewrite rational expressions using inspection or a computer algebra system. | | |

**ASE MA 2: Equations and Inequalities – Student Checklist**

| **MA.2.1 Algebra: Creating Equations** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can solve linear and exponential equations in one variable. | | |
| I can solve inequalities in one variable. | | |
| I can describe the relationships between the quantities in the problem (for example, how the quantities are changing or growing with respect to each other); express these relationships using mathematical operations to create an appropriate equation or inequality to solve. | | |
| I can create equations (linear and exponential) and inequalities in one variable and use them to solve problems. | | |
| I can create equations and inequalities in one variable to model real-world situations. | | |
| I can compare and contrast problems that can be solved by different types of equations (linear and exponential). | | |
| I can identify the quantities in a mathematical problem or real-world situation that should be represented by distinct variables and describe what quantities the variables represent. | | |
| I can create at least two equations in two or more variables to represent relationships between quantities. | | |
| I can justify which quantities in a mathematical problem or real-world situation are dependent and independent of one another and which operations represent those relationships. | | |
| I can determine appropriate units for the labels and scale of a graph depicting the relationship between equations created in two or more variables. | | |
| I can graph one or more created equation on a coordinate axes with appropriate labels and scales. | | |
| I can recognize when a modeling context involves constraints. | | |
| I can interpret solutions as viable or nonviable options in a modeling context. | | |
| I can determine when a problem should be represented by equations, inequalities, systems of equations and/or inequalities. | | |
| I can represent constraints by equations or inequalities, and by systems of equations and/or inequalities. | | |
| I can define a "quantity of interest" to mean any number or algebraic quantity (e.g. 2(a/b) = d, in which 2 is the quantity of interest showing that d must be even; $\pi r^2 h/3 = V_{cone}$ and $\pi r^2 h = V_{cylinder}$ showing that $V_{cylinder} = 3* V_{cone}$) . | | |
| I can rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (e.g. $\pi * r^2$ can be re-written as ($\pi$ *r) *r which makes the form of this expression resemble b*h). | | |

| **MA.2.2 Algebra: Reasoning with Equations and Inequalities** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can demonstrate that solving an equation means that the equation remains balanced during each step. | | |
| I can recall the properties of equality. | | |
| I can explain why, when solving equations, it is assumed that the original equation is equal. | | |
| I can determine if an equation has a solution. | | |
| I can choose an appropriate method for solving the equation. | | |
| I can justify solution(s) to equations by explaining each step in solving a simple equation using the properties of equality, beginning with the assumption that the original equation is equal. | | |
| I can construct a mathematically viable argument justifying a given, or self-generated, solution method. | | |

**ASE MA 2: Equations and Inequalities – Student Checklist, Page 2**

| | | |
|---|---|---|
| I can solve radical equations in one variable. | | |
| I can solve rational equations in one variable. | | |
| I can give examples showing how extraneous solutions may arise when solving rational and radical equations. | | |
| I can recall properties of equality. | | |
| I can solve multi-step equations in one variable. | | |
| I can solve multi-step inequalities in one variable. | | |
| I can determine the effect that rational coefficients have on the inequality symbol and use this to find the solution set. | | |
| I can solve equations and inequalities with coefficients represented by letters. | | |
| I can use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2 = q$ that has the same solutions. | | |
| I can solve quadratic equations in one variable. | | |
| I can derive the quadratic formula by completing the square on a quadratic equation in x. | | |
| I can solve systems of linear equations by any method. | | |
| I can justify the method used to solve systems of linear equations exactly and approximately focusing on pairs of linear equations in two variables. | | |
| I can recognize that the graphical representation of an equation in two variables is a curve, which may be a straight line. | | |
| I can explain why each point on a curve is a solution to its equation. | | |

**ASE MA 3: Algebraic Functions and Modeling – Student Checklist**

| **MA.3.1 Understand the concept of a function and use function notation and degrees of functions.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain the meaning of domain and range. | | |
| I can determine the difference between the domain and range of a function. | | |
| I can determine if a relation is a function. | | |
| I can recognize when a graph is a function. | | |
| I can use an equation and the values in the domain to calculate the values in the range, and then determine if the equation is a function. | | |
| I can graph a function on the coordinate plane. | | |
| I can evaluate functions using function notation. | | |
| I can use values from a context to evaluate a function. | | |
| I can solve real-world problems given in function notation. | | |
| I can determine the subset of the real numbers over which a function is defined. | | |
| I can identify a function's intercepts and local minimums/maximums. | | |
| I can identify intervals where functions are increasing or decreasing. | | |
| I can identify whether or not a graph has symmetries. | | |
| I can determine the end behavior of linear, quadratic, and exponential functions. | | |
| I can translate a verbal description of a graph's key features into a graph. | | |
| I can give a verbal description of a graph's key features. | | |
| I can give intervals where the function is increasing and intervals where the function is decreasing. | | |
| I can give intervals where the function is positive and/or negative. | | |
| I can relate a table of values to its graph. | | |
| I can relate coefficients and constants to a function. | | |
| I can relate the domain of linear, exponential, and quadratic functions to their graphs. | | |
| I can relate coefficients and constants of a function to their real life meaning. | | |
| I can identify the domain of linear, exponential, and quadratic functions from their graphs. | | |
| I can determine appropriate domains in context. | | |
| I can identify reasonable values for the domain in a real-world context. | | |
| I can determine if the domain is continuous or discrete. | | |
| I can calculate the slope of a line. | | |
| I know that slope is a rate of change. | | |
| I can calculate the average rate of change for functions using a table over a given interval. | | |
| I can calculate the average rate of change for functions algebraically over a given interval. | | |
| I can use a graph of a function to estimate the average rate of change over a given interval. | | |
| I can properly assign units to the average rate of change in context. | | |
| I can explain the meaning of the average rate of change in context. | | |
| I can graph linear functions and show intercepts. | | |

**ASE MA 3: Algebraic Functions and Modeling – Student Checklist, Page 2**

| | | |
|---|---|---|
| I can graph quadratic functions and show intercepts, maxima, and minima. | | |
| I know the properties of exponents. | | |
| I can differentiate between exponential growth and exponential decay. | | |
| I can identify the percent rate of change in exponential functions. | | |
| I can convert the two functions to a common representation or form for comparison. | | |
| I can interpret key features (e.g., end behavior, intercepts, maximum and minimum, slope) of functions represented as graphs, tables, or in equation form. | | |
| I can compare key features of two functions. | | |
| I can compare functions represented in different ways including algebraically, graphically, numerically in tables and by verbal descriptions. | | |

| **MA.3.2 Build a function that models a relationship between two quantities.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can combine two functions using the operations of addition, subtraction, multiplication, and division. | | |
| I can evaluate the domain of the combined function. | | |
| I can build standard functions to represent relevant relationships/quantities given a real-world situation or mathematical process. | | |
| I can determine which arithmetic operation should be performed to build the appropriate combined function given a real-world situation or mathematical process. | | |
| I can relate the combined function to the context of the problem. | | |

| **MA.3.3 Construct and compare linear, quadratic, and exponential functions models and solve problems. Interpret expressions for functions in terms of the situation they model.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can recognize that linear functions grow by equal differences over equal intervals. | | |
| I can recognize that exponential functions grow by equal factors over equal intervals. | | |
| I can distinguish between situations that can be modeled with linear functions and with exponential functions to solve mathematical and real-world problems. | | |
| I can identify, regardless of form, the y-intercept and vertical translation of an exponential function. | | |
| I can rewrite the base, b, of an exponential as 1 + r and identify r. | | |
| I can identify the slope and y-intercept of a line. | | |
| I can explain the meaning of an exponential function's base, end behavior, and rate of growth in context. | | |
| I can explain the meaning of a linear function's slope and intercepts in context. | | |
| I can explain the meaning of the coefficients, factors, exponents, and intercepts in a linear or exponential function. | | |

**ASE MA 4: Geometry, Probability, and Statistics – Student Checklist**

| **MA.4.1 Geometry: Understand congruence and similarity.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can define an angel based on my knowledge of a point, line, distance along a line, and distance around a circular arc. | | |
| I can define a circle based on my knowledge of a point, line, distance along a line, and distance around a circular arc. | | |
| I can define perpendicular lines based on my knowledge of a pint, line, distance, along a line, and distance around a circular arc. | | |
| I can define a line segment based on my knowledge of a pint, line, distance, along a line, and distance around a circular arc. | | |
| I can define parallel lines based on my knowledge of a pint, line, distance, along a line, and distance around a circular arc. | | |
| I can describe the relationship between similarity and congruence. | | |
| I can set up and write equivalent ratios. | | |
| I can identify corresponding angles and sides of two triangles. | | |
| I can determine a scale factor and use it in a proportion. | | |
| I can solve geometric problems using congruence and similarity. | | |
| I can prove relationships using congruence and similarity. | | |

| **MA.4.2 Geometric Measure and Dimension: Explain formulas and use them to solve problems and apply geometric concepts in modeling situations.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can apply the formula for the perimeter of a rectangle to solve problems. | | |
| I can apply the formula for the area of a rectangle to solve problems. | | |
| I can apply the formula for the area of a triangle to solve problems. | | |
| I can apply the formula for the volume of a cone to solve problems. | | |
| I can apply the formula for the volume of a cylinder to solve problems. | | |
| I can apply the formula for the volume of a pyramid to solve problems. | | |
| I can apply the formula for the volume of a sphere to solve problems. | | |
| I can find the surface area of right circular cylinders. | | |
| I can find the surface area of rectangular prisms. | | |
| I can use geometric shapes, their measures, and their properties to describe objects. | | |
| I can apply concepts of density based on area and volume in modeling situations. | | |

| **MA.4.3 Summarize, represent, and interpret categorical and quantitative data on (a) a single count or measurement variable, (b) two categorical and quantitative variables, and (c) Interpret linear models.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can classify data as either categorical or quantitative. | | |
| I can identify an appropriate scale needed for the data display. | | |
| I can identify an appropriate number of intervals for a histogram. | | |
| I can identify an appropriate width for intervals in a histogram. | | |
| I can select an appropriate data display for real-world data. | | |

**ASE MA 4: Geometry, Probability, and Statistics – Student Checklist, Page 2**

| | | |
|---|---|---|
| I can construct dot plots. | | |
| I can create a frequency table. | | |
| I can construct histograms. | | |
| I can construct box plots. | | |
| I can identify a data set by its shape and describe the data set as symmetric or skewed. | | |
| I can use the outlier rule (e.g., Q1 – 1.5 x IQR and Q3 + 1.5 IQR) to identify outliers in a data set. | | |
| I can analyze how adding/removing an outlier affects measures of center and spread. | | |
| I can interpret differences in shape, center and spread in the context of data sets. | | |
| I can compare and contrast two or more data sets using shape, center, and spread. | | |
| I can organize categorical data in two-way frequency tables. | | |
| I can interpret joint frequencies and joint relative frequencies in the context of the data. | | |
| I can interpret marginal frequencies and marginal relative frequencies in the context of the data. | | |
| I can interpret conditional frequencies and conditional relative frequencies in the context of the data. | | |
| I can recognize possible associations between categorical variables in a two-way frequency or relative frequency table. | | |
| I can determine the y-intercept graphically and algebraically. | | |
| I can determine the rate of change by choosing two points. | | |
| I can determine the equation of a line using data points. | | |
| I can interpret the slope in the context of the data. | | |
| I can interpret the y-intercept in the context of the data. | | |
| I can differentiate between causation and correlation/association. | | |
| I can interpret paired data to determine whether correlation implies causation/association. | | |

| **MA.4.4 Using probability to make decisions.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can develop a probability distribution for a random variable defined for a sample space of theoretical probabilities. | | |
| I can calculate theoretical probabilities and find expected values. | | |
| I can develop a probability distribution for a random variable for a sample space of empirically assigned probabilities. | | |
| I can assign probabilities empirically and find expected values. | | |
| I can weigh the possible outcomes of a decision and find expected values. | | |
| I can assign probabilities to payoff values and find expected values. | | |
| I can evaluate strategies based on expected values. | | |
| I can compare strategies based on expected values. | | |
| I can explain the difference between theoretical and experimental probability. | | |
| I can compute theoretical and experimental probability. | | |
| I can determine the fairness of a decision based on the available data. | | |
| I can determine the fairness of a decision by comparing theoretical and experimental probability. | | |
| I can use counting principles to determine the fairness of a decision. | | |
| I can analyze decisions and strategies related to product testing, medical testing, and sports. | | |

# North Carolina Community College System

# College and Career Readiness

# Adult Secondary Education Content Standards

# Level 5, Grade Levels 9.0 – 12.9

# Science

## Adult Secondary Education Science Practices

| **Science Practices: These practices should be integrated with study of the content topics for all science instruction. Engaging in the practices of science helps students understand how scientific knowledge develops; such direct involvement gives them an appreciation of the wide range of approaches that are used to investigate, model, and explain the world.** | |
|---|---|
| Science Practice | What Learner Should Know, Understand, and Be Able to Do |
| **Practice 1: Asking Questions and Defining Problems**<br>A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world(s) works and which can be empirically tested. Scientists also ask questions to clarify ideas. | Asking questions and defining problems in adult secondary education builds on earlier educational experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.<br>• Ask Questions<br>  ○ that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.<br>  ○ that arise from examining models or a theory, to clarify and/or seek additional information and relationships.<br>  ○ to determine relationships, including quantitative relationships, between independent and dependent variables.<br>  ○ to clarify and refine a model, an explanation, or an engineering problem.<br>• Evaluate a question to determine if it is testable and relevant.<br>• Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.<br>• Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.<br>• Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations. |
| **Practice 2: Developing and Using Models**<br>A practice of science is to use and construct models as helpful tools for representing ideas and explanations. These tools include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations.<br>Modeling tools are used to develop questions, predictions and explanations; analyze and identify flaws in systems; and communicate ideas. Models are used to build and revise scientific explanations. Measurements and observations are used to revise models and designs. | Modeling in adult secondary education builds on earlier educational experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.<br>• Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria.<br>• Design a test of a model to ascertain its reliability.<br>• Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.<br>• Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.<br>• Develop a complex model that allows for manipulation and testing of a proposed process or system.<br>• Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems. |
| **Practice 3: Planning and Carrying Out Investigations**<br>Scientists plan and carry out investigations in the field or laboratory, working collaboratively as well as individually. Their investigations are systematic and require clarifying what counts as data and identifying variables or parameters. | Planning and carrying out investigations in adult secondary education builds on previous educational experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical, and empirical models.<br>• Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.<br>• Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the |

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| | design accordingly.<br>• Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.<br>• Select appropriate tools to collect, record, analyze, and evaluate data.<br>• Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.<br>• Manipulate variables and collect data about a complex model of a proposed process or system to identify failure points or improve performance relative to criteria for success or other variables. |
| **Practice 4: Analyzing and Interpreting Data**<br>Scientific investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists use a range of tools—including tabulation, graphical interpretation, visualization, and statistical analysis—to identify the significant features and patterns in the data. Scientists identify sources of error in the investigations and calculate the degree of certainty in the results. Modern technology makes the collection of large data sets much easier, providing secondary sources for analysis. Advances in science make analysis of proposed solutions more efficient and effective. | Planning and carrying out investigations in adult secondary education builds on previous educational experiences and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.<br>• Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.<br>• Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.<br>• Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data.<br>• Compare and contrast various types of data sets (e.g., self-generated, archival) to examine consistency of measurements and observations.<br>• Evaluate the impact of new data on a working explanation and/or model of a proposed process or system.<br>• Analyze data to identify design features or characteristics of the components of a proposed process or system to optimize it relative to criteria for success. |
| **Practice 5: Using Mathematics and Computational Thinking**<br>In science, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for a range of tasks such as constructing simulations; solving equations exactly or approximately; and recognizing, expressing, and applying quantitative relationships.<br>Mathematical and computational approaches enable scientists to predict the behavior of systems and test the validity of such predictions. | Mathematical and computational thinking in in adult secondary education builds on previous educational experiences and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.<br>• Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.<br>• Use mathematical, computational, and/or algorithmic representations of phenomena or design solutions to describe and/or support claims and/or explanations.<br>• Apply techniques of algebra and functions to represent and solve scientific and problems.<br>• Use simple limit cases to test mathematical expressions, computer programs, algorithms, or simulations of a process or system to see if a model “makes sense” by comparing the outcomes with what is known about the real world.<br>• Apply ratios, rates, percentages, and unit conversions in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m3, acre-feet, etc.). |
| **Practice 6: Constructing Explanations and Designing Solutions**<br>The end products of science are explanations. The goal of science is the construction of theories that provide explanatory accounts of the world. A theory becomes accepted when it has multiple lines of empirical evidence and greater explanatory power of phenomena than previous theories. | Constructing explanations and designing solutions in adult secondary education builds on previous educational experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories.<br>• Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.<br>• Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students’ own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in |

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| | the future.<br>• Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.<br>• Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.<br>• Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations. |
| **Practice 7: Engaging in Argument from Evidence**<br>Argumentation is the process by which evidence-based conclusions and solutions are reached.<br>In science, reasoning and argument based on evidence are essential to identifying the best explanation for a natural phenomenon or the best solution to a design problem. Scientists use argumentation to listen to, compare, and evaluate competing ideas and methods based on merits.<br>Scientists engage in argumentation when investigating a phenomenon, testing a design solution, resolving questions about measurements, building data models, and using evidence to evaluate claims. | Engaging in argument from evidence in adult secondary education builds on previous educational experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science.<br>• Compare and evaluate competing arguments or design solutions in light of currently accepted explanations, new evidence, limitations (e.g., trade-offs), constraints, and ethical issues.<br>• Evaluate claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.<br>• Respectfully provide and/or receive critiques on scientific arguments by probing reasoning and evidence, challenging ideas and conclusions, responding thoughtfully to diverse perspectives, and determining additional information required to resolve contradictions.<br>• Construct, use, and/or present an oral and written argument or counter-arguments based on data and evidence.<br>• Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.<br>• Evaluate competing design solutions to a real-world problem based on scientific ideas and principles, empirical evidence, and/or logical arguments regarding relevant factors (e.g. economic, societal, environmental, ethical considerations). |
| **Practice 8: Obtaining, Evaluating, and Communicating Information**<br>Scientists must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity.<br>Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations as well as orally, in writing, and through extended discussions. Scientists employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs. | Obtaining, evaluating, and communicating information in in adult secondary education builds on previous educational experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs.<br>• Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.<br>• Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.<br>• Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.<br>• Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible.<br>• Communicate scientific and/or technical information or ideas (e.g. about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically). |

**ASE SC 1: Living Organisms and Ecosystems**

| **SC.1.1 Structures and Functions of Living Organisms: Understand the relationship between the structures and functions of cells and their organelles.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.1.1.1 Summarize the structure and function of organelles in eukaryotic cells (including the nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and ways that these organelles interact with each other to perform the function of the cell. | • Identify these cell organelles in diagrams of plant and animal cells.<br>• Explain how the structure of the organelle determines its function. (Example: folded inner membrane in mitochondria increases surface area for energy production during aerobic cellular respiration.)<br>• Summarize how these organelles interact to carry out functions such as energy production and use, transport of molecules, disposal of waste, and synthesis of new molecules. (Example: DNA codes for proteins, which are assembled by the ribosomes and used as enzymes for energy production at the mitochondria.) | **Plant Cell Diagram:** http://upload.wikimedia.org/wikipedia/commons/0/08/Plant_cell_structure.png<br><br>**Animal Cell Diagram:** http://commons.wikimedia.org/wiki/File:Animal_cell_structure_en.svg<br><br>**Cell Structures and Functions:** http://library.thinkquest.org/12413/structures.html<br>The cell theory developed in the early 1800's by Scheiden and Schwannn focused on the concepts that the cell is the basic limit of life and that all living things consist of one or more cells.<br>As a result of additional study and the integration of studies of cell life functions, a modern cell theory has been developed. The modern cell theory, in addition to the tenants of the traditional cell theory, states<br>• energy flow (metabolism and biochemistry) occurs within cells;<br>• cells contain hereditary information (DNA) that is passed from cell to cell during cell division; and<br>• all cells are basically the same in chemical composition in organisms of similar species.<br>Cellular activities necessary for life include chemical reactions that facilitate acquiring energy, reproduction, and maintaining homeostasis. Relationships between structure and function can be examined at each of the hierarchical levels of organization: molecular, cellular, organism, population, community, and ecosystem. |
| SC.1.1.2 Compare prokaryotic and eukaryotic cells in terms of their general structures (plasma membrane and genetic material) and degree of complexity. | • Proficiently use proper light microscopic techniques as well as determine total power magnification to observe a variety of cells with particular emphasis on the differences between prokaryotic and eukaryotic as well as plant and animal cells.<br>• Infer that prokaryotic cells are less complex than eukaryotic cells.<br>• Compare the structure of prokaryotic and eukaryotic cells to conclude the following:<br>a. Presence of membrane bound organelles – mitochondria, nucleus, vacuole, and chloroplasts are not present in prokaryotes.<br>b. Ribosomes are found in both.<br>c. DNA and RNA are present in both, but are not enclosed by a membrane | The development of the cell theory was accelerated by the ability to make observations on a microscopic level. The development and refinement of magnifying lenses and light microscopes made the observation and description of microscopic organisms and living cells possible.<br>Continued advances in microscopy allowed observation of cell organelles and ultrastructure. Current technology allows the observation of cellular processes underlying both cell structure and function. While students are not expected to understand how scanning and electron transmission microscopes work, they should recognize they reveal greater detail about eukaryotic and prokaryotic cell function.<br><br>**How Big is a… Animation:** http://www.cellsalive.com/howbig.htm<br><br>**Cell Size and Scale Animation:** http://learn.genetics.utah.edu/content/begin/cells/scale/<br><br>The simplest life forms exhibiting cellular structure are the prokaryotes. Earth's first cells were prokaryotes. Prokaryotic cells exist in two major forms: eubacteria and archaebacteria. Prokaryotes are Earth's most abundant inhabitants. They can survive in a wide range of environments and obtain energy in a variety of ways.<br>Cell structure is one of the ways in which organisms differ from each other. The diversity that exists ranges from simple prokaryotic cells to complex multicellular organisms. Eukaryotes differ from prokaryotes based on size, genetic material surrounded by a nuclear membrane, and the addition of membrane bound organelles including mitochondria and |

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| | in prokaryotes.<br>• Contrasts in chromosome structure – circular DNA strands called plasmids are characteristic of prokaryotes.<br>• Contrasts in size – prokaryotic cells are smaller. | chloroplasts.<br><br>**Prokaryotic Cell:** Prokaryotic cells contain no nucleus and have DNA, which is found within the cytoplasm. This type of cell is known as a prokaryote and is found in single-celled organisms such as bacteria. There is not a nucleus; but a nucleoid that holds the cell's DNA, it also contains the plasma membrane, cytoplasm, and ribosomes that are common in other cells.<br><br>**Prokaryotic Cell Diagram:**<br>http://commons.wikimedia.org/wiki/File:Average_prokaryote_cell-_en.svg<br><br>**Eukaryotic Cell:** Eukaryotic cells are much bigger than prokaryotes. These cells have been found in many organisms ranging from fungi to people. Eukaryotic cells are more complex than prokaryotic cells. All the parts that are lying in the cytoplasm are called organelles. Each one of these organelles has its own function. These organelles allow the eukaryotic cell to carry out more functions than the prokaryotic cell.<br><br>**Eukaryotic Cell Diagram:**<br>http://commons.wikimedia.org/wiki/File:Plant_cell_structure.png |
| SC.1.1.3 Explain how instructions in DNA lead to cell differentiation and result in cells specialized to perform specific functions in multicellular organisms. | • Compare a variety of specialized cells and understand how the functions of these cells vary. (Examples could include nerve cells, muscle cells, blood cells, sperm cells, xylem and phloem.)<br>• Explain that multicellular organisms begin as undifferentiated masses of cells and that variation in DNA expression and gene activity determines the differentiation of cells and ultimately their specialization.<br>• During the process of differentiation, only specific parts of the DNA are activated; the parts of the DNA that are activated determine the function and specialized structure of a cell.<br>• Because all cells contain the same DNA, all cells initially have the potential to become any type of cell; however, once a cell differentiates, the process cannot be reversed.<br>• Nearly all of the cells of a multicellular organism have exactly the same chromosomes and DNA.<br>• Different parts of the genetic instructions are used in different types of cells, influenced by the cell's | Some organisms exist as a single cell, while others are composed of many cells, each specialized to perform distinct metabolic functions. The basic processes necessary for living things to survive are the same for a single cell as they are for a more complex organism. A single-celled organism has to conduct all life processes by itself. A multicellular organism has groups of cells that specialize to perform specific functions.<br>Cellular differences between plant and animal cells include the presence of a cell wall that gives the plant cell a defined shape, the presence of chloroplasts in many plant cells, and the number of vacuoles.<br><br>**Cell Structure and Function Flash Cards and Games:**<br>http://quizlet.com/172368/chapter-7-cell-structure-and-function-flash-cards/<br><br>The many body cells of an organism can be specialized to perform different functions, even though they are all descended from a single cell and contain essentially the same genetic information. This specialization process is called differentiation and is controlled by following the instructions on only the appropriate sections of DNA.<br>Cell Differentiation: Meiosis produces either sperm cells or egg cells. One sperm and one egg combine to form a zygote, the first cell of a new life. As soon as the DNA of the sperm enters the egg and moves toward its DNA the zygote begins to divide. In other words, two haploid (n) cells combine to form one diploid (2n) cell. In humans, the first mitosis occurs within a few hours.<br>As additional mitoses produce a ball of cells, those cells begin to differentiate to become different types of cells. Different types of cells are called tissues, such as muscle tissue, nervous tissue (making up nerves, brain and spinal cord), etc. Tissues can be organized into organs (such as the heart, skin, and brain). Many organs are part of an organ system (such as the digestive system).<br>Obviously, there must be different kinds of cells to do the different jobs of the testes, ovaries, brain, stomach, heart, etc. You can see that for every need, there is a system of organs that is responsible for taking care of that need. All of these systems come from two simple cells that form a zygote: a sperm and an egg. |

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| | environment and past history.<br>• Recall that chemical signals may be released by one cell to influence the development and activity of another cell.<br>• Identify stem cells as unspecialized cells that continually reproduce themselves and have, under appropriate conditions, the ability to differentiate into one or more types of specialized cells.<br>• Embryonic cells, which have not yet differentiated into various cell types, are called embryonic stem cells.<br>• Stem cells found in organisms, for instance in bone marrow, are called adult stem cells.<br>• Scientists have recently demonstrated that stem cells, both embryonic and adult, with the right laboratory culture conditions, differentiate into specialized cells. | Cell differentiation means that all of these cells – heart, skin, bones, nerves, and ovaries – essentially come from one zygote. This zygote has to divide enough times and make enough changes each time so that all of these different cells can be made. Even though mitosis produces two cells that have the same DNA, these two cells may not look or act the same!<br>**Note:** It is not essential for students to understand the details of how the process of transcriptional regulation in a cell produces specific proteins, which results in cell differentiation.<br>Which DNA sections are read during a cell's development is primarily controlled by chemical signals from neighboring cells. Chemicals from neighboring cells work together to tell a cell which DNA sections it should transcribe, and when during development that transcription should be turned on, then turned off again. In many respects the most important thing is keeping some DNA sections turned off when the proteins they code for should not be present.<br>Various techniques for directing the differentiation of stem cells into cells of a particular kind and function are currently being studied experimentally. Some diseases are being treated with adult stem cells and embryonic stem cells may soon be used in medical applications.<br><br>**Video: Embryonic Stem Cells:**<br>https://www.khanacademy.org/science/biology/cell-division/v/embryonic-stem-cells |

| **SC.1.2 Structures and Functions of Living Organisms: Analyze the cell as a living system.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.1.2.1 Explain how homeostasis is maintained in a cell and within an organism in various environments (including temperature and pH). | • Explain how cells use buffers to regulate cell pH and how cells can respond to maintain temperature, glucose levels, and water balance in organisms.<br>• Compare the mechanisms of active vs. passive transport (diffusion and osmosis).<br>• Conclude how the plasma membrane structure functions.<br>• Explain changes in osmotic pressure that occurs when cells are placed in solutions of differing concentrations. | Homeostasis of a cell is maintained by the plasma membrane comprised of a variety of organic molecules. The membrane controls the movement of material in and out of the cell, communication between cells, and the recognition of cells by our immune system. Homeostasis is maintained by moving various chemicals in or out of the cells.<br>Facilitated diffusion occurs in cells when larger substances are moved from an area of higher concentration to an area of lower concentration with the assistance of a carrier protein without the use of energy. Osmosis refers to the movement of water molecules through a semi-permeable membrane from an area of greater water concentration or pressure (lower solute concentration) to an area of lesser water concentration or pressure (higher solute concentration).<br><br>**How Osmosis Works Animation:**<br>http://highered.mcgraw-hill.com/sites/0072495855/student_view0/chapter2/animation__how_osmosis_works.html<br><br>Active transport refers to the movement of solid or liquid particles into and out of a cell with an input of energy. Only active transport can move chemicals from an area of lower concentration to an area of higher concentration.<br>The fluid mosaic model of a membrane emphasizes the arrangement and function of a bilayer of phospholipids, transport proteins, and cholesterol. All living cells have a plasma membrane. Its function within a cell is to hold contents inside the cell and serve as a semi-porous barrier to control any foreign outside invaders. The plasma membrane is permeable to specific molecules. Permeable means that it allows certain materials inside. These |

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| | | important things that are allowed through the plasma membrane are nutrients and other essential elements. The plasma membrane also allows waste to leave the cell.<br><br>**Complex Structure of the Plasma Membrane Diagram:** http://commons.wikimedia.org/wiki/File:Cell_membrane_detailed_diagram_ca.svg<br><br>**Membrane Transport Animation:** http://www.wiley.com/college/pratt/0471393878/student/animations/membrane_transport/index.html<br>Diffusion occurs in cells when substances (oxygen, carbon dioxide, salts, sugars, amino acids) that are dissolved in water move from an area of higher concentration to an area of lower concentration. That movement may cause the cell to swell up as water moves in or deflate as water moves out.<br><br>**Video - Diffusion and Osmosis:** https://www.khanacademy.org/science/biology/human-biology/v/diffusion-and-osmosis |
| SC.1.2.2 Analyze how cells grow and reproduce in terms of interphase, mitosis and cytokinesis.<br><br>Note: When students learn about meiosis, they should compare it to the process of mitosis. | • Outline the cell cycle – Growth1, Synthesis, Growth2, Mitosis, and Cytokinesis.<br>• Recognize mitosis as a part of asexual reproduction.<br>• Organize diagrams of mitotic phases and describe what is occurring throughout the process. | All living cells come from other living cells. A typical cell goes through a process of growth, development, and reproduction called the cell cycle.<br>Cell Cycle: Cell division involves an ordered series of phases called the cell cycle. The cell cycle is divided into two vastly unequal periods, interphase and the mitotic phase. Interphase is composed of these three stages: G1, S, and G2.<br>• During G1 the cell increases in size and duplicates many organelles.<br>• During S, for synthesis, DNA replication occurs.<br>• During G2 many of the raw materials necessary for cell division are produced<br><br>**Cell Cycle Animation:** http://www.cellsalive.com/cell_cycle.htm<br>Mitosis produces two genetically identical cells. During mitosis, the nucleus of the cell divides, forming two nuclei with identical genetic information. Mitosis is divided into 4 phases, each phase is defined by distinctive events:<br><br>• Prophase: The chromosomes condense and become visible. The nucleoli and nuclear envelope disappear. The microtubules that form the spindle attach to the chromosomes, and the chromosomes are dragged toward the middle of the cell.<br>• Metaphase: The mitotic spindle is very obvious and the chromosomes are lined up in the center of the cell.<br>• Anaphase: The centromeres split and the sister chromatids are pulled apart, moving to opposite poles of the cell.<br>• Telophase: The nuclear envelope and the nucleoli reappear. The spindle and the chromosomes disappear. Cytokinesis, separation of the cytoplasm, often begins during telophase. As a result, the two new daughter cells are usually completely formed shortly after mitosis ends.<br><br>**Animal Cell Mitosis Animation:** http://www.cellsalive.com/mitosis.htm<br><br>**The Cell Cycle & Mitosis Tutorial:** http://www.biology.arizona.edu/cell_bio/tutorials/cell_cycle/main.html<br>The Cell Cycle & Mitosis tutorial is designed to introduce the events that occur in the cell cycle and the process of mitosis that divides the duplicated genetic material creating two identical daughter cells.<br>**Cell Biology Animation:** http://www.johnkyrk.com/index.html |

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| SC.1.2.3 Explain how specific cell adaptations help cells survive in particular environments (focus on unicellular organisms). | • Explain how various structures of unicellular organisms help that organism survive. Emphasis is on contractile vacuoles, cilia, flagella, pseudopods, and eyespots.<br>• Summarize adaptive behaviors – examples include chemotaxis and phototaxis. | **Video - Single Cell Organism:**<br>http://www.teachersdomain.org/asset/tdc02_vid_singlecell/<br><br>This video segment explores the world of microorganisms -- what they eat, how they move, what they have in common, and what distinguishes them from one another.<br>Almost all organisms use taxis, movement toward or away from a particular stimulus. Such stimuli include chemicals (chemotaxis), light (phototaxis), gravity (geotaxis), and the geomagnetic poles (magnetotaxis). Responses to environmental cues are critical for survival. If the signal is positive, called an attractant, the organism will move toward the stimulus. If the signal is negative, called a repellent, the organism will move away from the stimulus.<br>The response exhibited by plant shoots as they grow toward light is called positive phototaxis (toward light). This response allows the shoots to capture sunlight. When snails are held in a jar, they will climb to the top of the jar. The stimulus is gravity and the response is negative geotaxis (away from gravity). This response allows snails to avoid drowning or ground-dwelling predators. |

| **SC.1.3 Ecosystems: Analyze the interdependence of living organisms within their environment.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.1.3.1 Analyze the flow of energy and cycling of matter (such as water, carbon, nitrogen and oxygen) through ecosystems relating the significance of each to maintaining the health and sustainability of an ecosystem. | Deconstruct the carbon cycle as it relates to photosynthesis, cellular respiration, decomposition and climate change.<br>Summarize the nitrogen cycle (including the role of nitrogen fixing bacteria) and its importance to synthesis of proteins and DNA.<br>Identify factors that influence climate such as:<br>• greenhouse effect (relate to carbon cycle and human impact on atmospheric $CO_2$)<br>• natural environmental processes (relate to volcanic eruption and other geological processes)<br>Explain the recycling of matter within ecosystems and the tendency toward a more disorganized state.<br>Analyze energy pyramids for direction and efficiency of energy transfer.<br>• Living systems require a continuous input of energy to maintain organization. The input of radiant energy, which is converted to chemical energy, allows organisms to carry out life processes.<br>• Within ecosystems energy | Carbon Cycle: (Cycling C) In terrestrial environments, the carbon reservoir is in the atmosphere as carbon dioxide. Plants utilize the carbon dioxide during photosynthesis and convert it into organic compounds. As organisms undergo cellular respiration, carbon dioxide is returned to the atmosphere. In aquatic ecosystems, the carbon reservoir is bicarbonate ions ($HCO_3^-$). Bicarbonate ions are a source of carbon for photosynthetic algae. When aquatic organisms undergo cellular respiration, they release carbon dioxide, which combines with water to form bicarbonate ions.<br>Living and dead aquatic and terrestrial organisms are also carbon reservoirs, the most obvious being fossil fuels that were formed during the geologic past when large amounts of organic matter were buried. When they are burned, they release carbon dioxide back to the atmosphere. It took millions of years to make fossil fuels and they are being returned to the atmosphere very rapidly. This is the basis of the global warming issue.<br>Nitrogen Cycle: (Cycling N) Although the atmosphere contains 79% nitrogen gas, it is unavailable to most living organisms in this inorganic form. Nitrogen fixation is the conversion of atmospheric nitrogen to ammonium, ($NH_4^+$), by cyanobacteria in aquatic ecosystems and by nitrogen-fixing bacteria living in the roots of legume plans such as beans, peas, and clover in terrestrial ecosystems. Nitrogen gas is converted to nitrates, ($NO_3^-$), by lightning in the atmosphere. Aquatic and terrestrial plants can absorb and utilize these ions to synthesize proteins and nucleic acids. Nitrogen is now in an organic form and can enter the food chain when these plants are eaten. Nitrogen gas is returned to the atmosphere as bacteria decompose urine, excrement, and proteins of dead organisms. Humans impact this cycle by releasing nitrous oxides when burning fossil fuels and by fixing atmospheric nitrogen to make chemical fertilizers.<br>Since the turn of the 20th century, temperatures have been rising steadily throughout the world. But it is not yet clear how much of this global warming is due to natural causes and how much derives from human activities, such as the burning of fossil fuels and the clearing of forests.<br>Global warming is caused when carbon dioxide and other gases warm the surface of the planet naturally by trapping solar heat in the atmosphere. This is a good thing because it keeps our planet at a temperature where |

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| | flows from the radiant energy of the sun through producers and consumers as chemical energy that is ultimately transformed into heat energy. Continual refueling of radiant energy is required by ecosystems. | humans, animals and plants can live. However, by burning fossil fuels such as coal and oil and cutting down forests humans have dramatically increased the amount of carbon dioxide in the Earth's atmosphere and hence the overall temperatures are rising.<br>Scientists agree that global warming is happening and that it is the result of our activities and not a natural occurrence. We're already seeing changes, i.e., glaciers are melting, plants and animals are being forced from their habitat, and the number of severe storms and droughts is increasing.<br>The chemicals that make up any living thing are organized into various biochemicals and structures. When that organism dies, it is decomposed by bacteria, fungi and other "decomposers" until its chemicals are free to reenter the carbon, nitrogen, phosphorous, sulfur, and other cycles.<br>Energy flows in an ecosystem from producers to various levels of consumers and decomposers. This flow of energy can be diagramed using a food chain or food web. An energy pyramid represents the efficiency of this flow of energy.<br>Living organisms require energy for many life processes. They must be able to use energy from various sources and direct it to biological work.<br>The ultimate source of energy for the earth is, of course, the sun. The sun produces over 3.86 x 1033 ergs/sec. Let's make this incredible number easier to understand: In 15 minutes, the sun radiates as much energy as is used by all organisms on earth in one year! Some of this energy is converted into the energy of chemical bonds by autotrophic organisms, such as plants and cyanobacteria (photosynthetic bacteria). All other organisms depend on these *primary producers* for their energy. Energy transformations are critical for the maintenance of life on earth. Chemical potential energy is constantly transformed, shifted, and stored in living organisms. Complex metabolic pathways bring about these energy transformations. |
| SC.1.3.2 Analyze the survival and reproductive success of organisms in terms of behavioral, structural, and reproductive adaptations. | Analyze how various organisms accomplish the following life functions through adaptations within particular environments (example: water or land) and that these adaptations have evolved to ensure survival and reproductive success.<br>• Transport and Excretion – how different organisms get what they need to cells; how they move waste from cells to organs of excretion. Focus is on maintaining balance in pH, salt, and water. Include plants - vascular and nonvascular.<br>• Respiration – how different organisms take in and release gases (carbon dioxide or oxygen, water vapor) and cellular respiration.<br>• Nutrition – feeding adaptations and how organisms get nutrition (autotrophic and heterotrophic) and how they break down and absorb foods.<br>• Reproduction, Growth and Development – sexual versus asexual, eggs, seeds, spores, | Like other organisms, human beings are composed of groups of cells (tissues, organs, and organ systems) that are specialized to provide the human organism with the basic requirements for life: obtaining food and deriving energy from it, maintaining homeostasis, coordinating body functions, and reproducing. Organ systems function and interact to maintain a stable internal environment that can resist disturbance from within or without (homeostasis).<br>For the body to use food for energy, the food must first be digested into molecules that are absorbed and transported to cells, where the food is used for energy and for repair and growth. To burn food for the release of energy, oxygen must be supplied to cells and carbon dioxide removed. The respiratory system responds to changing demands by increasing or decreasing breathing rate in order to maintain homeostasis. The circulatory system, which moves all of these substances to or from cells, responds to changing demands by increasing or decreasing heart rate and blood flow in order to maintain homeostasis. The urinary system disposes of dissolved waste molecules; the intestinal tract removes solid wastes; and the skin and lungs rid the body of thermal energy.<br>Specialized cells of the immune system and the molecules they produce are designed to protect against organisms and substances that enter from outside the body and against some cancer cells that arise from within.<br>Communication between cells is required for coordination of body functions. The nerves communicate with electrochemical signals, hormones circulate through the blood, and some cells secrete substances that spread only to nearby cells.<br>Most animals have organ systems quite similar to humans, with some variations in birds and reptiles. Less developed animals perform the same functions with similar groups of cells even though some of their organs may differ significantly. Plants generally do not have the same organs as animals because they get food, water, and oxygen in a very different way. |

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| | placental, types of fertilization.<br>Analyze behavioral adaptations that help accomplish basic life functions. | However, like animals, they have the ability to transport materials, digest food, and eliminate waste products.<br>Such as suckling, taxes/taxis, migration, estivation, and hibernation, habituation, imprinting, classical conditioning (e.g. Pavlov's dog–stimulus association), and trial and error learning. |
| SC 1.3.3 Explain various ways organisms interact with each other (including predation, competition, parasitism, mutualism) and with their environments resulting in stability within ecosystems. | • Identify and describe symbiotic relationships such as mutualism and parasitism. Note: There is much debate about whether commensalistic relationships are just early mutualism. We may just not understand the benefits to each organism.<br>• Exemplify various forms of communication and territorial defense including communication within social structure using pheromones, courtship dances, and territorial defense.<br>• Explain patterns in predator/prey and competition relationships and how these patterns help maintain stability within an ecosystem with a focus on population dynamics. | Symbiosis is a close and permanent relationship between organisms of two different species. Examples include mutualism, commensalism, and parasitism.<br>Mutualism benefits both organisms whereas commensalism benefits one without helping or harming the other. Parasitism is a non-mutual relationship between organisms of different species where one organism, the parasite, benefits at the expense of the other, the host.<br>Pheromones: bees, ants, termites<br>Territorial defense: fighting fish. Many predatory birds and non-herd animals (for example, a mountain lion) establish a territory that they protect so others do not take prey from that territory (birds sing to announce their territory and warn other birds of that species to stay away).<br>As any population of organisms grows, it is held in check by interactions among a variety of biotic and abiotic factors. For example, predators and disease will eliminate excess individuals in a natural environment and then, as the predator population increases much more of their prey will be taken. And then, the predator population will decrease when its numbers exceed the number of prey available for food cannot support the predator population. |
| SC.1.3.4 Explain why ecosystems can be relatively stable over hundreds or thousands of years, even though populations may fluctuate (emphasizing availability of food, availability of shelter, number of predators and disease). | • Generalizing that although some populations have the capacity for exponential growth, there are limited resources that create specific carrying capacities and population sizes are in a dynamic equilibrium with these factors. (e.g. food availability, climate, water, territory).<br>• Interpret various types of population graphs – human population growth graphs indicating historical and potential changes, factors influencing birth rates and death rates, and effects of population size, density and resource use on the environment.<br>• Explain how disease can disrupt ecosystem balance. | Abiotic factors are the nonliving elements in an ecosystem, such as temperature, moisture, air, salinity, and pH. Biotic factors are all the living organisms that inhabit the environment, including predators, food sources, and competitors.<br>A community is a collection of interacting populations. Biotic factors that limit growth of a population include competitors, number of prey, number of predators and increased diseases in more dense populations.<br>Population growth curves exhibit many characteristics, such as initial growth stage, exponential growth, steady state, decline, and extinction. Limiting factors are the components of the environment that restrict the growth of populations. Carrying capacity is the number of organisms that can be supported by the resources in an ecosystem.<br>If a particular disease becomes epidemic, the population can crash leading to a decrease in predators but an increase in prey and competitor species. Examples: AIDS, influenza, tuberculosis, Dutch Elm Disease, Chestnut Blight, Pfiesteria, etc. |

| SC.1.4 Ecosystems: Understand the impact of human activities on the environment (one generation affects the next). | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.1.4.1 Infer how human activities (including population growth, pollution, global warming, burning of fossil fuels, habitat destruction and introduction of nonnative species) may impact the environment. | • Summarize how humans modify ecosystems through population growth, technology, consumption of resources and production of waste.<br>• Interpret data regarding the historical and predicted impact on ecosystems and global climate.<br>• Explain factors that impact North Carolina ecosystems. | As the human population increases, so does human impact on the environment. Human activities, such as reducing the amount of forest cover, increasing the amount and variety of chemicals released into the environment, and intensive farming, have changed Earth's land, oceans, and atmosphere. Some of these changes have decreased the capacity of the environment to support some life forms.<br>Ocean pollution and sea level rise are just two factors that could affect coastal communities and hence the state's economy. Global warming could affect agriculture by causing changes in weather patterns. Acid rain effects in mountains, beach erosion, urban development leading to habitat destruction and water runoff, waste lagoons on hog farms, Kudzu as an invasive plant, etc. |
| SC.1.4.2 Explain how the use, protection and conservation of natural resources by humans impact the environment from one generation to the next. | • Explain the impact of humans on natural resources (e.g. resource depletion, deforestation, pesticide use and bioaccumulation).<br>• Exemplify conservation methods and stewardship. | As the population increases so does the demand for energy, housing, etc. More roads and cities mean less forest and farmland. |

**ASE SC 2: Evolution, Genetics and Molecular Biology**

| **SC.2.1 Evolution and Genetics: Explain how traits are determined by the structure and function of DNA.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.2.1.1 Explain the double-stranded, complementary nature of DNA as related to its function in the cell. | Develop a cause-and-effect model relating the structure of DNA to the functions of replication and protein synthesis:<br>• The structure of DNA is a double helix or "twisted ladder" structure. The sides are composed of alternating phosphate-sugar groups and "rungs of the DNA ladder" are composed of complementary nitrogenous base pairs (always adenine, A, to thymine, T, and cytosine, C, to guanine, G) joined by weak hydrogen bonds.<br>• The sequence of nucleotides in DNA codes for proteins, which is central key to cell function and life.<br>• Replication occurs during the S phase of the cell cycle and allows daughter cells to have an exact copy of parental DNA.<br>• Cells respond to their environments by producing different types and amounts of protein.<br>• With few exceptions, all cells of an organism have the same DNA but differ based on the expression of genes.<br>Infer the advantages (injury repair) and disadvantages (cancer) of the overproduction, underproduction or production of proteins at the incorrect times. | DNA is a polymer consisting of nucleotides. A DNA nucleotide is identified by the base it contains: adenine (A), guanine (G), cytosine (C) or thymine (T). DNA is a double-stranded molecule. The strands are composed of covalently bonded sugar and phosphate molecules and are connected by complementary nucleotide pairs (A-T and C-G) like rungs on a ladder. The ladder twists to form a double helix.<br><br>**DNA from the Beginning**<br>http://www.dnaftb.org/<br>*This site gives an overview of the history of genetics and* is organized around key concepts. The science behind each concept is explained by: animation, image gallery, video interviews, problem, biographies, and links.<br><br>**Video: DNA**<br>https://www.khanacademy.org/science/biology/evolution-and-natural-selection/v/dna<br><br>Some proteins form tissue and some are hormones, constructive enzymes or digestive enzymes. Health depends on the individual proteins in each of those groups being present in the right amount at the right time.<br>In order for cells to make proteins, the DNA code must be transcribed (copied) to messenger RNA (mRNA). The mRNA carries the code from the nucleus to the ribosomes in the cytoplasm. RNA is a single-stranded polymer of four nucleotide monomers. A RNA nucleotide is identified by the base it contains: adenine (A), guanine (G), and cytosine (C) or uracil (U). |
| SC.2.1.2 Explain how DNA and RNA code for proteins and determine traits. | Explain the process of protein synthesis:<br>• Transcription that produces an RNA copy of DNA, which is further modified into the three types of RNA<br>• mRNA traveling to the ribosome (rRNA)<br>• Translation – tRNA supplies appropriate amino acids<br>• Amino acids are linked by peptide bonds to form polypeptides. Polypeptide chains form protein molecules. Proteins can be | At the ribosome, amino acids are linked together to form specific proteins. The amino acid sequence is determined by the mRNA molecule.<br>The expression of genetic information requires two processes – *transcription* and *translation*. During transcription, which occurs in the cell nucleus, a copy of the gene message is made using RNA (ribonucleic acid) building blocks. Protein synthesis is accomplished by transcription and translation: during transcription, RNA is made using DNA as a template, then during translation, a protein is made using RNA as a template. During translation, the RNA messenger provides the information necessary to construct proteins. Transfer RNA (tRNA), and ribosomal RNA (rRNA) are required for translation and they are also made during transcription. During translation, mRNA is decoded by tRNA.<br><br>**Video: Transcription and Translation**<br>http://www.youtube.com/watch?v=41_Ne5mS2ls<br>Ribosomes are made of rRNA and proteins. Ribosomes act as work |

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| | structural (forming a part of the cell materials) or functional (hormones, enzymes, or chemicals involved in cell chemistry).<br>Interpret a codon chart to determine the amino acid sequence produced by a particular sequence of bases.<br>Explain how an amino acid sequence forms a protein that leads to a particular function and phenotype (trait) in an organism. | benches during protein synthesis. A ribosome is composed of a large and a small subunit, each containing a specific combination of rRNA molecules and proteins. The rRNA molecules create the 3-dimensonal structure of a ribosomes and help to orient the proteins, most of which appear to assist with the assembly of new proteins during translation.<br><br>**Genetic Code Codon Chart**<br>http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/C/Codons.html<br>Human proteins are created from 20 different amino acids like words are created from letters. Proteins exist in a variety of shapes. A protein's shape results from chemical links between the amino acids of that protein, so shape depends on amino acid sequence. |
| SC.2.1.3 Explain how mutations in DNA that result from interactions with the environment (i.e. radiation and chemicals) or new combinations in existing genes lead to changes in function and phenotype. | • Understand that mutations are changes in DNA coding and can be deletions, additions, or substitutions. Mutations can be random and spontaneous or caused by radiation and/or chemical exposure.<br>• Develop a cause and effect model in order to describe how mutations occur: changing amino acid sequence, protein function, phenotype. Only mutations in sex cells (egg and sperm) or in the gamete produced from the primary sex cells can result in heritable changes. | Inserting, deleting, or substituting DNA bases can alter genes. An altered gene may be passed on to every cell that develops from it, causing an altered phenotype. An altered phenotype may be neutral, beneficial or detrimental. Sometimes entire chromosomes can be added or deleted, resulting in a genetic disorder. These abnormalities may be diagnosed using a Karyotype.<br>If the sequence of amino acids in a protein is changed or the number of some amino acids changes, the protein may have a different shape. Protein function is very dependent on shape. |

| **SC.2.2 Evolution and Genetics: Understand how the environment, and/or the interaction of alleles, influences the expression of genetic traits.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.2.2.1 Explain the role of meiosis in sexual reproduction and genetic variation. | • Recall the process of meiosis and identify process occurring in diagrams of stages. (middle school review) Note: *Students are not expected to memorize the names of the steps or the order of the step names.*<br>• Infer the importance of the genes being on separate chromosomes as it relates to meiosis.<br>• Explain how the process of meiosis leads to independent assortment and ultimately to greater genetic diversity.<br>• Exemplify sources of genetic variation in sexually reproducing organisms including crossing over, random assortment of chromosomes, gene mutation, nondisjunction, and | Many organisms are capable of combining genetic information from two parents to produce offspring. Sex cells are produced through meiosis. This allows sexually reproducing organisms to produce genetically differing offspring, and maintain their number of chromosomes. Meiosis occurs in sexual reproduction when a diploid germ cell produces four haploid daughter cells that can mature to become gametes (sperm or egg).<br>You have 46 total chromosomes in all your somatic (body) cells; that's 2 each of 23 different chromosomes. Twenty-three (23) chromosomes were in the sperm from your father and 23 were in the egg from your mother. So, sperm and egg, called the gametes, have half the usual number of chromosomes; they have only one copy of each of the 23 chromosomes. They are haploid (n) as opposed to body cells which are diploid (2n). Think about what would happen if the sperm and egg were not haploid (23 chromosomes) but diploid (46 chromosomes). When a sperm fertilized an egg, the resulting cell or zygote would have 92 chromosomes not 46. With each generation, the chromosome number would double. As you can imagine, this would not work.<br>Sperm and egg with their 23 chromosomes come from normal cells with 46 chromosomes but not through mitosis. Mitosis produces exact copies. A process is needed that makes cells with half the number of chromosomes, but not just any half. The new cells must have 1 each from the homologous pairs of chromosomes. This process is meiosis. **Meiosis** involves a reduction division to reduce or halve the number of |

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| | fertilization.<br>• Compare meiosis and mitosis including type of reproduction (asexual or sexual), replication and separation of DNA and cellular material, changes in chromosome number, number of cell divisions, and number of cells produced in a complete cycle. | chromosomes in the resulting cells.<br>**Animal Cell Meiosis Animation:** http://www.cellsalive.com/meiosis.htm<br>**Meiosis Tutorial:** http://www.cellsalive.com/meiosis.htm<br>In meiosis, one member of each pair of chromosomes is randomly selected for each genetic gamete. That way the offspring can get some of its grandmother's genes and some of its grandfather's genes.<br>With 23 chromosome pairs, the number of possible combinations of grandmother's chromosomes and grandfather's chromosomes is huge ($2^{23}$). Genetic diversity in offspring is further enhanced by homologous chromosomes within each pair breaking and recombining with each other (called "cross over").<br>Genetically diverse populations are more likely to survive environmental changes because a change in the environment might kill most all of the individuals in a population that lacked genetic diversity. Recombination and mutation provide for genetic diversity. Some new gene combinations have little effect, some can produce organisms that are better suited to their environments, and others can be deleterious.<br>Mitosis and meiosis refer to division of the nuclear material. Cytokinesis is the division of the cytoplasm and organelles.<br>**Cell Biology Animation:** http://www.johnkyrk.com/index.html<br>**Video: Mitosis, Meiosis and Sexual Reproduction (19 minutes)**<br>https://www.khanacademy.org/science/biology/cell-division/v/mitosis--meiosis-and-sexual-reproduction |
| SC.2.2.2 Predict offspring ratios based on a variety of inheritance patterns (including dominance, co-dominance, incomplete dominance, multiple alleles, and sex-linked traits). | • Interpret Punnett squares (**monohybrid only**) to determine genotypic and phenotypic ratios. Understand that dominant alleles mask recessive alleles.<br>• Determine parental genotypes based on offspring ratios.<br>• Interpret karyotypes (gender, and chromosomal abnormalities).<br>• Recognize a variety of intermediate patterns of inheritance (codominance and incomplete dominance).<br>• Recognize that some traits are controlled by more than one pair of genes and that this pattern of inheritance is identified by the presence of a wide range of phenotypes (skin, hair, and eye color).<br>• Interpret autosomal inheritance patterns: sickle cell anemia including the relationship to malaria (incomplete dominance), cystic fibrosis (recessive heredity), and Huntington's disease (dominant heredity).<br>• Solve and interpret codominant crosses involving multiple alleles including blood typing problems. (Blood Types: A, B, AB and O | Mendel's laws of heredity are based on his mathematical analysis of observations of patterns of inheritance of traits. Geneticists applies mathematical principles of probability to Mendel's laws of heredity in order to predict the results of simple genetic crosses. The laws of probability govern simple genetic recombinations.<br>Genotype describes the genetic make-up of an organism and phenotype describes the organism's appearance based on its genes. Homozygous individuals have two identical alleles for a particular trait, while heterozygous individuals have contrasting alleles. When one allele masks the effect of another, that allele is called dominant and the other recessive.<br>**Video: Introduction to Heredity (18 minutes)**<br>https://www.khanacademy.org/science/biology/heredity-and-genetics/v/introduction-to-heredity<br><br>**Karyotype Lab**<br>www.ed.gov.nl.ca/edu/k12/curriculum/guides/science/.../app_b.pdf<br>**Incomplete Dominance**: Another inheritance pattern is called incomplete dominance. In incomplete dominance, both alleles are fully expressed and the offspring show an intermediate phenotype. For example, a red flower and a white flower may produce pink flowers. A similar inheritance pattern called co-dominance is displayed on the cellular level. Blood type AB results from expression of both the gene for type A blood and the gene for type B blood.<br>**Multiple Alleles**: Sometimes, there may be more than one allele for a given gene -- multiple alleles. In budgies (parakeets), for example, one allele causes blue feathers, another causes yellow feathers, and yet another causes no color in the feathers. An individual bird will only have two of the three alleles. The ABO blood group in humans is another example of multiple alleles. There are three alleles that code for the placement of certain cell surface markers, called A and B, on red blood cells. One allele codes for the A marker, one codes for the B marker, and the third codes for no marker.<br>**Polygenic Inheritance**: For many traits, inheritance is controlled by groups of several genes. Each allele may intensify or diminish the outcome of |

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| | and Alleles: $I^A$, $I^B$, and i). Students should be able to determine if parentage is possible based on blood types.<br>• Understand human sex chromosomes and interpret crosses involving sex-linked traits (color-blindness and hemophilia). Students should understand why males are more likely to express a sex-linked trait.<br>• Interpret phenotype pedigrees to identify the genotypes of individuals and the type of inheritance. | another. The variation in the phenotype is continuous. Instead of red vs. white, you may have red on one end, white on the other, and all possible shades in between. Traits in humans such as height, shape, skin color, and metabolic rate are controlled in this way. Think about the variation in human heights and skin colors to get a feel for these patterns.<br>English biologist Reginald Punnett developed a simple method for predicting the ways in which alleles can combine. It is called a Punnett square. In a Punnett square, dominant allele and recessive alleles are represented by uppercase and lowercase letters, respectively. Each zygote (fertilized egg) contains two alleles for every trait. One allele is inherited from the female parent and one allele is inherited from the male parent.<br>An organism is homozygous if it has identical alleles for a particular trait. An organism is heterozygous if it has nonidentical alleles for a particular trait. There are three possible combinations of alleles of an organism for a particular trait: homozygous dominant (PP), heterozygous (Pp), and homozygous recessive (pp).<br><br>**Video: Punnett Square Fun (26 minutes)**<br>https://www.khanacademy.org/science/biology/heredity-and-genetics/v/punnett-square-fun<br><br>**Video: Sex-Linked Traits (15 minutes)**<br>https://www.khanacademy.org/science/biology/heredity-and-genetics/v/sex-linked-traits<br><br>Human ***Inheritance*** and ***Pedigree*** Analysis Lab<br>*www.mrulrichslandofbiology.com/.../Lab-...* |
| SC.2.2.3 Explain how the environment can influence the expression of genetic traits. | Develop a cause-and-effect relationship between environmental factors and expression of a particular genetic trait. Examples include the following:<br>• lung/mouth cancer – tobacco use<br>• skin cancer – vitamin D, folic acid and sun exposure<br>• diabetes – diet/exercise and genetic interaction<br>• PKU – diet<br>• heart disease – diet/exercise and genetic interaction | Environmental factors that impact human health include diet, exercise, sleep, stress, toxic substances that enter the body, viruses, and other living organisms that infect the body. |

| **SC.2.3 Evolution and Genetics: Understand the application of DNA technology.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.2.3.1 Interpret how DNA is used for comparison and identification of organisms. | • Summarize the process of gel electrophoresis as a technique to separate molecules based on size. Students should learn the general steps of gel electrophoresis – using restrictions enzymes to cut DNA into different sized fragments and running those fragments on gels with longer | **Gel Electrophoresis Animation:**<br>www.dnalc.org/resources/animations/gelelectrophoresis.html<br><br>DNA technologies allow scientists to identify, study, and modify genes. Forensic identification is an example of the application of DNA technology. |

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| | fragments moving slower than faster ones.<br>• Interpret or "read" a gel.<br>• Exemplify applications of DNA fingerprinting - identifying individuals; identifying and cataloging endangered species. | |
| SC.2.3.2 Summarize how transgenic organisms are engineered to benefit society. | • Generalize the applications of transgenic organisms (plants, animals, & bacteria) in agriculture and industry including pharmaceutical applications such as the production of human insulin.<br>• Summarize the steps in bacterial transformation (insertion of a gene into a bacterial plasmid, getting bacteria to take in the plasmid, selecting the transformed bacteria, and producing the product). | Genetic engineering techniques are used in a variety of industries, in agriculture, in basic research, and in medicine. There is great benefit in terms of useful products derived through genetic engineering (e.g., human growth hormone, insulin, and pest- and disease-resistant fruits and vegetables).<br><br>**DNA Transformation Animation**<br>www.dnalc.org/resources/animations/transformation1.html |
| SC.2.3.3 Evaluate some of the ethical issues surrounding the use of DNA technology (including cloning, genetically modified organisms, stem cell research, and Human Genome Project). | • Identify the reasons for establishing the Human Genome Project.<br>• Recognize that the project is useful in determining whether individuals may carry genes for genetic conditions and in developing gene therapy.<br>• Evaluate some of the science of gene therapy. (e.g. Severe Combined Immunodeficiency and Cystic Fibrosis)<br>• Critique the ethical issues and implications of genomics and biotechnology (stem cell research, gene therapy and genetically modified organisms). | The Human Genome Project is a collaborative effort to map the entire gene sequence of organisms. This information may be useful in detection, prevention, and treatment of many genetic diseases. The potential for identifying and altering genomes raises practical and ethical questions.<br>Genetic predisposition towards diseases impacts human health. Awareness of genetic predisposition allows individuals to make lifestyle changes that can enhance quality of life.<br>Severe Combined Immunodeficiency (SCID) may be best known from news stories and a movie in the 1980s about David, the Boy in the Bubble, who was born without a working immune system. Caused by defects in any of several possible genes, SCID makes those affected highly susceptible to life-threatening infections by viruses, bacteria and fungi. Because David's brother had died of the disease, doctors immediately placed him into a plastic isolation unit to protect him from infections. He lived in such isolators for nearly 13 years. David died in 1984 following an unsuccessful bone marrow transplant, an attempt to provide him with the capacity to fight infections on his own and thus free him from the bubble.<br>Although a rare disease, SCID has been extensively studied over the past several decades because of the insights it provides into the workings of the normal human immune system. In addition, one form of SCID became the first human illness treated by human gene therapy in 1990, a process in which a normal gene was transferred into the defective white blood cells of two young girls to compensate for the genetic mutation. These pioneering patients are still alive and continue to participate in on-going studies by physicians at the National Human Genome Research Institute.<br>**National Human Genome Research Institute**<br>http://www.genome.gov/13014325<br>**Video: Bioethics of Human Genetic Engineering Documentary**<br>www.dnatube.com/video/2520/Bioethics-of-Human-Genetic-Engineering-Documentary-Video |

| SC.2.4 Evolution and Genetics: Explain the theory of evolution by natural selection as a mechanism for how species change over time. | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.2.4.1 Explain how fossil, biochemical, and anatomical evidence support the theory of evolution. | • Summarize the hypothesized early atmosphere and experiments that suggest how the first "cells" may have evolved and how early conditions affected the type of organism that developed (first anaerobic and prokaryotic, then photosynthetic, then eukaryotic, then multicellular).<br>• Summarize how fossil evidence informs our understanding of the evolution of species and what can be inferred from this evidence.<br>• Generalize what biochemical (molecular) similarities tell us about evolution.<br>• Generalize what shared anatomical structures (homologies) tell us about evolution. | Eukaryotes arose from prokaryotes and developed into larger, more complex organisms, from single-celled protists to multicellular protists, fungi, plants, and animals. The first life forms were anaerobic but when photosynthetic organisms evolved and photosynthesis released $O_2$ into the atmosphere it killed most of the anaerobic organisms. Eukaryotic evolution included development of mitochondria; the first mitochondria were probably free-living organisms that were engulfed by larger unicellular organisms.<br>Biological classifications are based on how organisms are related. Organisms are classified into a hierarchy of groups and subgroups based on similarities that reflect their relationships over a period of time.<br>A fossil is any evidence of an organism that lived long ago. Scientists have used the fossil record to construct a history of life on Earth. Although there is not a complete record of ancient life for the past 3.5 billion years, a great deal of modern knowledge about the history of life comes from the fossil record.<br>Fossils are the most direct physical evidence of evolution. Fossils are petrified organisms, parts of organisms or their imprints, such as footprints. In many places the fossils are arranged in layers or strata with the oldest fossils found in the deepest layers. This fossil record gives an orderly view of the appearance or disappearance of species on earth. The oldest fossils that have been found date back to 3.5 billion years ago and were of prokaryotes or bacteria. Not only does the fossil record provide the relative age of species but, in some cases, fossils of species that connect extinct species with species living today have been found giving us a hint of how the existing species may have evolved. There is a series of skull fossils showing the progression from reptile to mammal. There is also a series of fossils linking whales and dolphins with a four-legged land dwelling ancestor.<br>In 2006, scientists at the University of Chicago discovered a new fossil tetrapod (fossil fish known as a 'fishapod'). They call it *Tiktaalik*. Learn more about **Tiktaalik roseae** at http://tiktaalik.uchicago.edu/<br>Similarities among organisms on the structural and metabolic levels are reflected in the large degree of similarity in proteins and nucleic acids of different organisms. Diversity is the product of variations in these molecules.<br>Molecular biology is the newest tool of evolutionary biologists. The nucleotide sequences of DNA and RNA and/or the amino acid sequence of proteins of two species of interest can be analyzed. The more similar the sequences are, the more closely related the species are. Through examination of the structure of hemoglobin in vertebrates, it can be seen that humans are much more closely related to rhesus monkeys than to frogs and lampreys. This conclusion is supported by comparative embryology and anatomy, as well.<br>The organisms that live on Earth today share many structural and metabolic features, including cellular organization, common molecular mechanisms for energy transformation, utilization and maintenance of homeostasis, common genetic code, and mechanisms for the transmission of traits from one generation to the next.<br>Comparative anatomy is the comparison of body structures found in different species. Related species have similarities in body structures, even if those structures now have different functions. For example, all vertebrate forelimbs are made of the same bones: humerus, ulna, radius, etc. So, even though a whale swims, a bat flies, and a human types on a keyboard, we have strong similarities in the structures of our forelimbs. |

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| | | They are homologous structures which mean they have similar structure due to common ancestry even though they serve different functions. In other words, they have been remodeled or modified not created anew. Evolution is a remodeling process – structures change as they take on new functions.<br>The presence of vestigial structures, structures with no apparent function, is evidence of common ancestry. Whales have hip bones but no legs. Current theory shows whales evolving from a wolf-like ancestor. Here are some of the vestigial structures in humans:<br>• Muscles for wiggling the ears: Many mammals have the ability to turn their large ears toward the source of a sound. Three small muscles that surround each ear provide this motion. Some humans can wiggle their ears!<br>• The appendix: The cecum is the T-shaped sac formed at the junction of the small and large intestines which is important for digestion of grass by animals in the horse family. Our appendix is reduced, shriveled cecum.<br>• Wisdom teeth: These are molars that are usually removed. |
| SC.2.4.2 Explain how natural selection influences the changes in species over time. | Develop a cause and effect model for the process of natural selection:<br>• Species have the potential to increase in numbers exponentially.<br>• Populations are genetically variable due to mutations and genetic recombination.<br>• There is a finite supply of resources required for life.<br>• Changing environments select for specific genetic phenotypes.<br>• Those organisms with favorable adaptations survive, reproduce and pass on their alleles.<br>• The accumulation and change in favored alleles leads to changes in species over time.<br>Illustrate the role of geographic isolation in speciation. | Populations are groups of interbreeding individuals that live in the same place at the same time and compete with each other for food, water, shelter, and mates. Populations produce more offspring than the environment can support. Organisms with certain genetic variations will be favored to survive and pass their variations on to the next generation. The unequal ability of individuals to survive and reproduce leads to the gradual change in a population, generation after generation over many generations. Depending on the selective pressure, these changes can be rapid over few generations (i.e., antibiotic resistance).<br>Genetic mutations and variety produced by sexual reproduction allow for diversity within a given population. Many factors can cause a change in a gene over time. Mutations are important in how populations change over time because they result in changes to the gene pool.<br>Through his observations, including those made in the Galapagos Islands, Charles Darwin formulated a theory of how species change over time, called natural selection. Natural selection is a process by which organisms with traits well suited to an environment survive and reproduce at a greater rate than organisms less suited to that environment, and is governed by the principles of genetics. The change in frequency of a gene in a given population leads to a change favoring maintenance of that gene within a population and if so, may result in the emergence of a new species. Natural selection operates on populations over many generations.<br>Depending on the rate of adaptation, the rate of reproduction, and the environmental factors present, structural adaptations may take millions of years to develop.<br>Stephen Jay Gould's idea of punctuated equilibrium proposes that organisms may undergo rapid (in geologic time) bursts of speciation followed by long periods of time unchanged. This view is in contrast to the traditional evolutionary view of gradual and continuous change.<br>Biogeography is the geographical distribution of species. It shows how organisms move from place to place. Island biogeography is especially instrumental in evolutionary theory. Islands often have species found nowhere else on earth. The closest relatives to island species are on the nearest mainland. Individuals colonized the new land, encountered new habitats, and quickly spread to fill new niches. |
| SC.3.4.3 Explain how various disease agents (bacteria, viruses, chemicals) can influence | Develop a cause and effect model for the role of disease agents in natural selection including evolutionary selection of resistance to antibiotics and | Adaptations sometimes arise abruptly in response to strong environmental selective pressures, for example, the development of antibiotic resistance in bacterial populations, morphological changes in the peppered moth population, and the development of pesticide resistance in insect populations. Examples include: |

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| natural selection. | pesticides in various species, passive/active immunity, antivirals and vaccines. | • Antibiotic resistance: The resistance of many disease causing bacteria is direct evidence of evolution. This happens as the result of misuse and overuse of antibiotics. If someone takes an antibiotic and does not follow directions, all of the bacteria may not be killed. The bacteria that live were somehow able to escape the effects of the drug. These are, of course, the ones that will live and pass on their resistance capabilities to future generations.<br>• Pesticide resistance: The same effect occurs when powerful chemicals are used to kill agricultural pests. Some are just naturally resistant -- and will live to pass on their resistance genes. |

| **SC.2.5 Evolution and Genetics: Analyze how classification systems are developed upon speciation.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.2.5.1 Explain the historical development and changing nature of classification systems. | Generalize the changing nature of classification based on new knowledge generated by research on evolutionary relationships and the history of classification system. | Information about relationships among living organisms and those that inhabited Earth in the past is gained by comparing biochemistry and developmental stages of organisms and by examining and interpreting the fossil record. This information is continually being gathered and used to modify and clarify existing classification systems. |
| SC.2.5.2 Analyze the classification of organisms according to their evolutionary relationships (including dichotomous keys and phylogenetic trees). | • Classify organisms using a dichotomous key.<br>• Compare organisms on a phylogenetic tree in terms of relatedness and time of appearance in geologic history. | Binomial nomenclature is a standard way of identifying a species with a scientific two-word name. The first word is the genus name and the second the species name. Species is the basic unit of classification. A species is defined as a group of organisms that has the ability to interbreed and produce fertile offspring in nature.<br>A dichotomous key is a classification tool used to identify and organize organisms using defining characteristics.<br>Evolutionary relationships can be represented using a branching diagram called a cladogram or phylogenetic tree; these are organized by shared, derived characteristics. |

| **SC.2.6 Molecular Biology: Understand how biological molecules are essential to the survival of living organisms.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.2.6.1 Compare the structures and functions of the major biological molecules (carbohydrates, proteins, lipids, and nucleic acids) as related to the survival of living organisms. | Compare the structure and function of each of the listed organic molecules in organisms:<br>• Carbohydrates (glucose, cellulose, starch, glycogen)<br>• Proteins (insulin, enzymes, hemoglobin)<br>• Lipids (phospholipids, steroids)<br>• Nucleic Acids (DNA, RNA) | The primary functions of carbohydrate macromolecules are to provide and store energy.<br>The primary functions of lipid macromolecules are to insulate, store energy, and make up cell membranes.<br>Nucleic acids (DNA and RNA) control cell activities by directing protein synthesis.<br>Proteins are polymers made by linking together amino acid monomers. Protein molecules that are assembled in cells carry out most of the cells' work. The function of each protein molecule depends on its specific conformation. The sequence of amino acids and the shape of the chain are a consequence of attractions between the chain's parts. Some proteins are structural (hair, nails). Others function in transport (hemoglobin), movement (muscle fibers and cytoskeletal elements), defense (antibodies), and regulation of cell functions (hormones and enzymes). |
| SC.2.6.2 Summarize the relationship among DNA, proteins and amino acids in carrying out the work of cells and how this is | • Recall that the sequence of nucleotides in DNA codes for specific amino acids which link to form proteins.<br>• Identify the five nitrogenous bases (A, T, C, G and U) found in nucleic acids as the same | DNA stores the information for directing the construction of proteins within a cell. These proteins determine the phenotype of an organism. The genetic information encoded in DNA molecules provides instructions for assembling protein molecules. The code is virtually the same for all life forms.<br>During DNA replication, enzymes unwind and unzip the double helix and each strand serves as a template for building a new DNA molecule. Free |

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| similar in all organisms. | for all organisms.<br>Summarize the process of protein synthesis.<br>**Note:** *Students are not expected to memorize the names and/or structures or characteristics of the 20 amino acids. The focus should be on the fact that side chains are what make each of the amino acids different and determine how they bond and fold in proteins.* | nucleotides bond to the template (A-T and C-G) forming a complementary strand. The final product of replication is two identical DNA molecules.<br>DNA is a polymer consisting of nucleotides. A DNA nucleotide is identified by the base it contains: adenine (A), guanine (G), cytosine (C) or thymine (T). DNA is a double-stranded molecule. The strands are composed of covalently bonded sugar and phosphate molecules and are connected by complementary nucleotide pairs (A-T and C-G) like rungs on a ladder. The ladder twists to form a double helix.<br>In terms of the DNA molecule, a gene is a specific sequence of DNA that carries the information for producing one protein strand. Transcription is when the information coded for by DNA is copied to RNA. Translation is when RNA is read and used to arrange the order of amino acids for the protein. In transcription, only one of the two strands of the DNA molecule is used as a template for the production of a molecule of RNA. In this process, the sequence of nucleotides in the DNA molecule is rewritten as a sequence of complementary nucleotides in the molecule of messenger RNA (Remember that RNA does not contain thymine. Instead, the complementary nucleotide for adenine in the DNA molecule becomes uracil in RNA). The two strands of DNA separate, RNA polymerase clips to the template strand, and messenger RNA is formed as RNA polymerase slides along the template. At the appropriate point, the RNA polymerase drops off the template and the new messenger RNA is released. The two strands of DNA then move back together. In eukaryotic cells, transcription takes place within the nucleus, while translation happens in the cytoplasm; as a result, the new molecule of messenger RNA must move into the cytoplasm.<br>Translation converts the information stored in messenger RNA to the sequence of amino acids found in a specific protein. Messenger RNA, transfer RNA and ribosomes come together to accomplish this process. Transfer RNA has a site for the attachment of a specific amino acid at one end and an unpaired triplet, the anticodon, at the other end. A ribosome is formed from a large and a small subunit, both of which contain proteins and ribosomal RNA. The complete ribosome has binding sites for messenger RNA and for two transfer RNAs. The binding sites for the transfer RNAs are the A site and the P site. |
| SC.2.6.3 Explain how enzymes act as catalysts for biological reactions. | Develop a cause and effect model for specificity of enzymes - the folding produces a 3-D shape that is linked to the protein function, enzymes are proteins that speed up chemical reactions (catalysts) by lowering the activation energy, are re-usable and specific, and are affected by such factors as pH and temperature. | Most life processes are a series of chemical reactions influenced by environmental and genetic factors. The chemical reactions that occur inside cells are directly controlled by a large set of protein molecules called enzymes, whose functions depend on their specific shapes. Each enzyme has a definite three-dimensional shape that allows it to recognize and bind with its substrate. In living cells, enzymes control the rate of metabolic reaction by acting as catalysts.<br>**Note***: Students should understand that enzymes are necessary for all biochemical reactions and have a general understanding of how enzymes work in terms of the connection between shape and function.* |

| **SC.2.7 Molecular Biology: Analyze the relationships between biochemical processes and energy use in the cell.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.2.7.1 Analyze photosynthesis and cellular respiration in terms of how energy is stored, released, and transferred within and between these | • Analyze overall reactions including reactants and products for photosynthesis and cellular respiration and factors which affect their rates (amounts of reactants, temperature, pH, light, etc.).<br>• Compare these processes | Plant cells and many microorganisms use solar energy to combine molecules of carbon dioxide and water into complex, energy-rich organic compounds and release oxygen into the environment.<br>The process of photosynthesis provides a vital connection between the sun and the energy needs of living systems. During photosynthesis, cells trap energy from sunlight with chlorophyll, found in chloroplasts, and use the energy, carbon dioxide, and water to produce energy-rich organic molecules (glucose) and oxygen. Photosynthesis involves an energy |

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| systems. | with regard to efficiency of ATP formation, the types of organisms using these processes, and the organelles involved. (Anaerobic respiration should include lactic acid and alcoholic fermentation.) | conversion in which light energy is converted to chemical energy in specialized cells. These cells are found in autotrophs such as plants and some protists.<br>During cell respiration, eukaryotic cells "burn" organic molecules with oxygen in the mitochondria, which releases energy, carbon dioxide, and water. Some of that energy is captured and stored in the chemical ATP in living cells.<br>Cells release the chemical energy stored in the products of photosynthesis. This energy is transported within the cell in the form of ATP. When cells need energy to do work, certain enzymes release the energy stored in the chemical bonds in ATP.<br>**Note:** (1) Instruction should include the comparison of anaerobic and aerobic organisms. (2) Glycolysis, Kreb's Cycle, and Electron Transport Chain are not addressed. |
| SC.2.7.2 Explain ways that organisms use released energy for maintaining homeostasis (active transport). | Conclude that energy production by organisms is vital for maintaining homeostasis and that maintenance of homeostasis is necessary for life. Examples: Active transport of needed molecules or to rid the cell of toxins; movement to avoid danger or to find food, water, and or mates; synthesizing needed molecules. | As cells increase in size, surface area to volume ratios decrease, making cells unable to obtain nutrients or remove wastes. To reduce the effects of this, cells divide to stay small or change shape to increase surface area or reduce volume. The energy released from food taken in by active transport is used to power active transport and other cell physiology processes. |

| **SC.3.1 Forces and Motion: Understand motion in terms of speed, velocity, acceleration, and momentum.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.3.1.1 Explain motion in terms of frame of reference, distance, and displacement. | • Interpret all motion as relative to a selected reference point. Identify distance and displacement as a scalar-vector pair.<br>• Describe motion qualitatively and quantitatively in terms of an object's change of position, distance traveled, and displacement. | **Video - Force and Motion: Newton's Three Laws video clip**<br>http://www.teachertube.com/viewVideo.php?video_id=143432<br><br>**Distance and Displacement Activity**<br>http://msclantonsphysicalsciencepage.weebly.com/distance-and-displacement-lab-activity-page-one.html<br><br>**Explanation of Distance and Displacement**<br>http://www.physicsclassroom.com/class/1dkin/u1l1c.cfm<br><br>**Vectors**<br>http://galileoandeinstein.physics.virginia.edu/lectures/vectors.htm |
| SC.3.1.2 Compare speed, velocity, acceleration, and momentum using investigations, graphing, scalar quantities, and vector quantities. | • Compare speed and velocity as a scalar-vector pair. Velocity is a relationship between displacement and time: $\bar{v} = \frac{\Delta d}{\Delta t}$<br>• Apply concepts of average speed and average velocity to solve conceptual and quantitative problems.<br>• Explain acceleration as a relationship between velocity and time: $\bar{a} = \frac{\Delta v}{\Delta t}$<br>• Using graphical analysis, solve for displacement, time, and average velocity. Analyze conceptual trends in the displacement vs. time graphs such as constant velocity and acceleration.<br>• Using graphical analysis, solve for velocity, time, and average acceleration. Analyze conceptual trends in the velocity vs. time graphs such as constant velocity and acceleration.<br>• Infer how momentum is a relationship between mass and velocity of an object p=mv . The focus should be on the conceptual understanding that the same momentum could be associated with a slow-moving massive object and an object moving at high velocity with a very small mass (e.g.- 100 kg object moving 1 m/s has the same momentum as a 1-kg object moving 100m/s)<br>• Explain change in momentum in terms of the magnitude of the applied force and the time | **Speed/Velocity Definition**<br>http://examples.yourdictionary.com/examples-vector-scalar-quantity-physics.html<br><br>**Speed/Velocity Education Video**<br>http://www.youtube.com/watch?v=6U-cOWW1z4o<br><br>**Speed/Velocity Comparison Video**<br>http://www.youtube.com/watch?v=c-iBy1-nt0M<br><br>**Velocity Problems**<br>http://www.khanacademy.org/science/physics/one-dimensional-motion/displacement-velocity-time/v/calculating-average-velocity-or-speed<br><br>**Khan Academy Definition Video for Acceleration**<br>http://www.khanacademy.org/science/mcat/physical-processes/acceleration-mcat/v/acceleration<br><br>**Acceleration Video**<br>http://www.physicsclassroom.com/mmedia/kinema/acceln.cfm<br><br>**Khan Academy Definition Video Graphs**<br>http://www.khanacademy.org/science/physics/one-dimensional-motion/kinematic_formulas/v/deriving-displacement-as-a-function-of-time--acceleration-and-initial-velocity<br><br>**Khan Academy Definition Video Graphs**<br>http://www.khanacademy.org/science/physics/one-dimensional-motion/kinematic_formulas/v/plotting-projectile-displacement--acceleration--and-velocity<br><br>**Khan Academy Momentum**<br>http://www.khanacademy.org/science/physics/linear-momentum/momentum-tutorial/v/introduction-to- |

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| | interval that the force is applied to the object. Everyday examples of the impulse/momentum relationship include: the use of airbags in cars; time of contact and "follow-through" in throwing, catching, kicking, and hitting objects in sports; bending your knees when you jump from a height to the ground to prevent injury. | momentum<br>http://www.khanacademy.org/science/physics/linear-momentum/momentum-tutorial/v/momentum--ice-skater-throws-a-ball<br><br>**Youtube Momentum Video**<br>http://www.youtube.com/watch?v=2FwhjUuzUDg<br>http://www.youtube.com/watch?v=h5uceO/r/3g |

| **SC.3.2 Forces and Motion: Understand the relationship between forces and motion.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.3.2.1 Explain how gravitational force affects the weight of an object and the velocity of an object in free fall. | • Recognize that the weight of an object is a measure of the force of gravity and is the product of its mass and the acceleration due to gravity: $F_g = mg$<br>• With negligible air resistance, explain acceleration due to gravity as an example of uniformly changing velocity: g= 9.8 $m/s^2$<br>• Relate the presence of air resistance to the concept of terminal velocity of an object in free fall. | **Introduction to Gravity**<br>http://www.khanacademy.org/science/physics/newton-gravitation/gravity-newtonian/v/introduction-to-gravity<br><br>**Easy Weight Comparison Activity**<br>http://www.spacegrant.hawaii.edu/class_acts/Weight.html<br><br>**Comparison Between Mass and Weight**<br>http://www.khanacademy.org/science/physics/newton-gravitation/gravity-newtonian/v/mass-and-weight-clarification<br><br>**Simulator**<br>http://phet.colorado.edu/en/simulation/mass-spring-lab<br><br>**Acceleration Due to Gravity**<br>http://www.khanacademy.org/science/physics/newton-gravitation/gravity-newtonian/v/acceleration-due-to-gravity-at-the-space-station<br><br>**Air Resistance Example**<br>http://www.khanacademy.org/science/physics/forces-newtons-laws/balanced-unbalanced-forces/v/balanced-and-unbalanced-forces<br><br>**Program/Video of Air Resistance Explanation**<br>http://www.khanacademy.org/cs/modeling-air-resistance/966875281 |
| SC.3.2.2 Classify frictional forces into one of four types: static, sliding, rolling, and fluid. | • Identify friction as a force that opposes motion of an object. (Review from middle school.)<br>• Classify the frictional forces present in a situation such as a book resting on a table (static), a box pushed across the floor (sliding), a ball rolling across the floor (rolling), a boat moving through a river (fluid), or an object in free-fall (air resistance). | **Friction Lesson Plan with Simulation**<br>http://phet.colorado.edu/en/contributions/view/2846<br><br>**Friction Lab**<br>http://www.ccmr.cornell.edu/ret/modules/documents/Friction.pdf<br><br>**Friction Wiki:** http://en.wikipedia.org/wiki/Friction<br><br>**Rolling Friction**<br>http://en.wikipedia.org/wiki/Rolling_resistance |

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| | | **Sliding Friction Lab**<br>http://www.pa.uky.edu/~phy211/Friction_book.html<br><br>**Friction Lab**<br>http://www.physicsclassroom.com/lab/newtlaws/NL8tg.pdf |
| SC.3.2.3 Explain forces using Newton's three laws of motion. | • Explain the property of inertia as related to mass - the motion of an object will remain the same (either at rest or moving at a constant speed in a straight line) in the absence of unbalanced forces; if a *change in motion* of an object is observed, there must have been a net force on the object.<br>• Explain balanced and unbalanced forces mathematically and graphically with respect to acceleration to establish the relationship between net force, acceleration, and mass: a $\alpha$ F and a $\alpha$ 1/m (no trigonometry). Note: $\alpha$ is symbol for angular acceleration.<br>• Explain qualitatively and quantitatively the relationship between force, mass and acceleration– the greater the force on an object, the greater its change in motion; however, the same amount of force applied to an object with less mass results in a greater acceleration.<br>• While the second law describes a single object, forces always come in equal and opposite pairs due to interaction between objects. Give examples of interaction between objects describing Newton's third law – whenever one object exerts a force on another, an equal and opposite force is exerted by the second on the first. The third law can be written mathematically as $F_{A\rightarrow B} = -F_{B\rightarrow A}$. Students should explain why these forces do not "cancel each other out". | **Introduction to Newton's Laws of Motion**<br>http://www.khanacademy.org/science/physics/forces-newtons-laws/newtons-laws-of-motion/v/newton-s-1st-law-of-motion<br>http://csep10.phys.utk.edu/astr161/lect/history/newton3laws.html<br><br>**First Law Explanation Video**<br>http://www.khanacademy.org/science/physics/forces-newtons-laws/newtons-laws-of-motion/v/newton-s-first-law-of-motion-concepts<br><br>**Balanced and Unbalanced Forces**<br>http://www.khanacademy.org/science/physics/forces-newtons-laws/balanced-unbalanced-forces/v/balanced-and-unbalanced-forces<br><br>**NFL Learning:** https://www.nbclearn.com/nfl/cuecard/50974<br><br>**Second Law of Motion Video**<br>http://www.khanacademy.org/science/physics/forces-newtons-laws/newtons-laws-of-motion/v/newton-s-second-law-of-motion<br><br>**Physics Classroom**<br>http://www.physicsclassroom.com/class/newtlaws/u2l3a.cfm<br><br>**Motion Simulation**<br>http://phet.colorado.edu/en/simulation/forces-and-motion-basics<br><br>**Third Law of Motion**<br>http://www.khanacademy.org/science/physics/forces-newtons-laws/newtons-laws-of-motion/v/newton-s-third-law-of-motion<br><br>**Newton's Laws Summary**<br>http://www.physicsclassroom.com/class/newtlaws/u2l3a.cfm |

| **SC.3.3 Matter: Understand types, properties, and structure of matter.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.3.3.1 Classify matter as: homogeneous or heterogeneous; pure substance or mixture; element or compound; metals, nonmetals, or | • Classify a sample of matter as homogeneous or heterogeneous based on uniformity of the material.<br>• Classify a sample of matter as a pure substance or mixture based | **Homo/Hetero Exercise**<br>http://ebookbrowsee.net/classifying-mixtures-heterogeneous-or-homogeneous-student-ws-pdf-d298914691<br><br>**Foundations of Chemistry** |

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| metalloids; solution, colloid, or suspension. | on the number of elements or compounds in the sample.<br>• Classify an element as a metal, nonmetal, or metalloid based on its location on the periodic table.<br>• Classify a substance as an element or compound using its chemical formula.<br>• Classify samples and sets of matter as a solution, colloid or suspension based on the application of characteristic properties: particle size, "settling out" of one or more components, and interaction with light (Tyndall Effect). | http://www.chem.memphis.edu/bridson/FundChem/T05a1100.htm<br><br>**Slide Show for Mixtures**<br>http://wiki.answers.com/Q/What_is_a_heterogeneous_and_a_homogeneous_mixture? - slide=1<br><br>**Mixtures versus Pure Substances Explanation**<br>http://www.dummies.com/how-to/content/how-to-distinguish-pure-substances-and-mixtures.html<br><br>**Periodic Table Explanation**<br>http://www.dummies.com/how-to/content/the-periodic-table-metals-nonmetals-and-metalloids.html<br><br>**Metals/Nonmetals/Metalloids**<br>http://galileo.phys.virginia.edu/outreach/8thgradesol/Metals.htm<br><br>**Element Vs. Compound Explanation**<br>http://www.diffen.com/difference/Compound_vs_Element<br><br>**Solution, Colloid or Suspension Video**<br>http://www.youtube.com/watch?v=b3HS_woWaJQ<br><br>**Tyndall Effect Video**<br>http://www.youtube.com/watch?v=E2ULbn7Uxsk<br><br>**States of Matter: Suspensions, Colloids, and Solutions**<br>http://www.khanacademy.org/science/chemistry/states-of-matter/v/suspensions--colloids-and-solutions |
| SC.3.3.2 Explain the phases of matter and the physical changes that matter undergoes. | • Develop a conceptual cause-and-effect model for the phase change process that shows the relationship among particle attraction, particle motion, and gain or loss of heat - when a solid melts it has absorbed heat that increased the potential energy of its particles (space between particles) thus reducing the attraction between particles so that they can flow in a liquid phase. (Consider conditions of normal atmospheric pressure as well as the qualitative affects of changes in pressure involving gases.)<br>• The focus should be on the following phase changes: solid to liquid (melting), liquid to gas (vaporization), gas to liquid (condensation), and liquid to solid (freezing).<br>• Compare the process of evaporation to vaporization – materials that evaporate versus | **Explanation**<br>http://crescentok.com/staff/jaskew/isr/chemistry/class16.htm<br><br>**Simulation**<br>http://phet.colorado.edu/en/simulation/states-of-matter<br><br>**States of Matter**<br>http://www.khanacademy.org/science/chemistry/states-of-matter/v/states-of-matter<br><br>**Phase Change Video**<br>http://www.youtube.com/watch?v=0-ZWS9Wq-uc<br><br>**Evaporation/Vapor Video**<br>http://www.showme.com/sh/?h=xn2pJkq<br><br>**Solution Activity**<br>http://atlantis.coe.uh.edu/texasipc/units/solution/sunit.pdf<br><br>**Solubility**<br>http://www.khanacademy.org/science/chemistry/states-of-matter/v/solubility |

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| | those which do not; attraction between surface particles and colliding air molecules.<br>• Recognize that the formation of solutions is a physical change forming a homogenous mixture. (Review from middle school).<br>• Develop a conceptual model for the solution process with a cause and effect relationship involving forces of attraction between solute and solvent particles. A material is insoluble due to a lack of attraction between particles.<br>• Interpret solubility curves to determine the amount of solute that can dissolve in a given amount of solvent (typically water) at a given temperature.<br>• Qualitatively explain concentration of solutions as saturated, unsaturated or supersaturated; dilute or concentrated. | **Solution Explanation**<br>http://webs.anokaramsey.edu/pieper/Chem1020/Chapter13.pdf<br><br>**Solution Simulation**<br>http://phet.colorado.edu/en/simulation/sugar-and-salt-solutions<br><br>**Solubility Curve Video**<br>http://www.youtube.com/watch?v=D2NAw-A0V1s<br>http://www.youtube.com/watch?v=y616V7Vo2tA<br><br>**Understanding Solubility Curves**<br>http://chemwiki.ucdavis.edu/Physical_Chemistry/Physical_Properties_of_Matter/Solutions/Solubilty/Types_of_Saturation<br><br>**Different Saturations Presentation**<br>http://www.youtube.com/watch?v=0hfd6KwZLPM<br><br>**Dilute versus Concentrated Pre**<br>http://prezi.com/1gx0vjv3cxed/solubility-and-dilute-vs-concentrated-solutions/ |
| SC.3.3.3 Compare physical and chemical properties of various types of matter. | • Calculate the density of different substances using the relationship. D=M/V<br>• Compare physical properties of a mixture that could be used to separate its components such as solubility, density, boiling point, magnetic property, etc.<br>• Compare various physical and chemical properties of metals, nonmetals and metalloids such as state of matter at a given temperature, density, melting point, boiling point, luster, conductivity, ductility, malleability, color, reactivity, etc.<br>• Compare physical and chemical properties of various everyday materials such as salt, sugar, baking soda, corn starch, rubbing alcohol, water, etc. | **Density Simulation:**<br>http://phet.colorado.edu/en/simulation/density<br><br>**Density Explanation Video**<br>http://www.youtube.com/watch?v=VDSYXmvjg6M<br><br>**Density Clarification – Physical Property**<br>http://everydaylife.globalpost.com/density-considered-physical-property-rather-chemical-property-matter-31179.html<br><br>**Solubility Clarification - Physical Property**<br>http://www.slideshare.net/MMoiraWhitehouse/solubility-a-physical-property<br><br>**Boiling Point Clarification – Physical Property**<br>http://www.elmhurst.edu/~chm/vchembook/104Aphysprop.html<br><br>**Magnetic Properties – Physical Property**<br>http://www.science.uwaterloo.ca/~cchieh/cact/applychem/propertyp.html<br><br>**Physical and Chemical Properties of METALS flash cards**<br>http://quizlet.com/14213452/chemicalphysical-properties-of-metals-flash-cards/<br><br>**Cornstarch Labs**<br>http://www.physics.uoguelph.ca/outreach/resources/grade5/goop_5_teachersguide.pdf<br>http://ice.chem.wisc.edu/KitComponents/Samples/FwCSample_CornStarchPutty.pdf |

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| SC.3.3.4 Interpret the data presented in the Bohr model diagrams and dot diagrams for atoms and ions of elements 1 through 18. | • Describe the charge, relative mass, and the location of protons, electrons, and neutrons within an atom.<br>• Calculate the number of protons, neutrons, electrons, and mass number in neutral atoms and ions.<br>• Explain how the different mass numbers of isotopes contributes to the average atomic mass for a given element (conceptual, no calculations).<br>• Use isotopic notation to write symbols for various isotopes (ex. Carbon-12, C-12, $^{12}C$, etc.)<br>• Explain Bohr's model of the atom.<br>• Draw Bohr models from hydrogen to argon including common isotopes and ions.<br>• Construct dot diagrams, a shorthand notation for Bohr models, using the element symbol and dots to represent electrons in the outermost energy level. | **Periodic Table**<br>http://www.cnet.com.au/how-to-learn-the-periodic-table-in-three-minutes-339344400.htm<br><br>**Atom Intro Video**<br>http://www.youtube.com/watch?v=Vi91qyjuknM<br><br>**Khan Atom Video**<br>http://www.khanacademy.org/science/chemistry/introduction-to-the-atom/v/introduction-to-the-atom<br><br>**Calculation Protons, Neutrons, Electrons**<br>http://misterguch.brinkster.net/PRA007.pdf<br><br>**Definition of Atomic Mass**<br>http://chemwiki.ucdavis.edu/Physical_Chemistry/Atomic_Theory/Atomic_Mass<br><br>**Isotopes Definition**<br>http://www.chem4kids.com/files/atom_isotopes.html<br><br>**Bohr's Model Explained**<br>http://www.pcs.k12.va.us/tms/periodictable/<br>http://abyss.uoregon.edu/~js/glossary/bohr_atom.html<br>http://science.sbcc.edu/physics/solar/sciencesegment/bohratom.swf<br><br>**Lewis Dot Structures Explanation**<br>http://www.roymech.co.uk/Related/Chemistry/Lewis_dot_structure.html<br>http://www.kentchemistry.com/links/AtomicStructure/lewisDots.htm<br><br>**Lewis Dot structures Practice**<br>http://www.chem.ufl.edu/~itl/4411/lectures/lewis_ramyess/pjb_ramyess.html<br>http://www.chem.purdue.edu/vsepr/practice.html |

| **SC.3.4 Matter: Understand chemical bonding and chemical interactions.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.3.4.1 Infer valence electrons, oxidation number, and reactivity of an element based on it location in the periodic table. | • Predict the number of valence electrons of representative elements (A Groups or 1, 2, 13-18) based on its location in the periodic table.<br>• Predict an element's oxidation number based on its position in the periodic table and valence electrons. (Representative groups including multiple oxidation states for tin and lead).<br>• Predict reactivity of metals and nonmetals from general periodic trends. | **Valence Video**<br>http://www.youtube.com/watch?v=3b8XSs73-9w<br><br>**Oxidation Cheat Sheet**<br>http://www.faculty.sfasu.edu/langleyricha/Chem133/OxNos.pdf<br><br>**Oxidation Explanation**<br>http://www.youtube.com/watch?v=8_CvNPuuhiM<br><br>**Tool For Trends**<br>http://dl.clackamas.cc.or.us/ch104bk/lesson7/periodic.htm |

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| SC.3.4.2 Infer the type of chemical bond that occurs, whether covalent, ionic or metallic, in a given substance. | Describe how ionic, covalent, and metallic bonds form and provide examples of substances that exhibit each type of bonding.<br>Predict the type of bond between two elements in a compound based on their positions in the periodic table. | **Types of Bonds**<br>http://www.khanacademy.org/science/chemistry/periodic-table-trends-bonding/v/ionic--covalent--and-metallic-bonds<br><br>**Bond Explanation**<br>https://www.etap.org/demo/Chemistry/chem3/instruction1tutor.html |
| SC.3.4.3 Predict chemical formulas and names for simple compounds based on knowledge of bond formation and naming conventions. | • Name and write formulas for simple binary compounds containing a metal and nonmetal using representative elements (A Groups or 1, 2, 13-18) and compounds involving common polyatomic ions: ammonium ($NH_4^+$), acetate ($C_2H_3O_2^-$), nitrate ($NO_3^-$), hydroxide ($OH^-$), carbonate ($CO_3^{2-}$), sulfate ($SO_4^{2-}$), phosphate ($PO_4^{3-}$).<br>• Name and write formulas for binary compounds of two nonmetals using Greek prefixes (mono-, di-, tri-, tetra-, etc.). | **Khan Video Demonstration for Balancing**<br>http://www.khanacademy.org/science/chemistry/chemical-reactions-stoichiometry/v/balancing-chemical-equations<br><br>**Balancing Equations**<br>http://www.youtube.com/watch?v+RnGu3xO2h74 |
| SC.3.4.4 Exemplify the law of conservation of mass by balancing chemical equations. | • Use coefficients to balance simple chemical equations involving elements and/or binary compounds.<br>• Conclude that chemical equations must be balanced because of the law of conservation of matter. | **Demonstration Empirical Formula**<br>http://www.khanacademy.org/science/chemistry/chemical-reactions-stoichiometry/v/molecular-and-empirical-formulas<br><br>**Demonstration Mass Composition**<br>http://www.khanacademy.org/science/chemistry/chemical-reactions-stoichiometry/v/formula-from-mass-composition<br><br>**Explanation**<br>http://www.ck12.org/book/CK-12-Physical-Science-Concepts-For-Middle-School/r11/section/3.18/ |
| SC.3.4.5 Classify types of reactions such as synthesis, decomposition, single replacement or double replacement. | • Classify chemical reaction as one of four types: single replacement, double replacement, decomposition and synthesis. (Neutralization reaction is a type of double replacement reaction.)<br>• Summarize reactions involving combustion of hydrocarbons as not fitting into one of these four types. Hydrocarbon + oxygen → carbon dioxide + water. | **Types of Chemical Reactions**<br>http://misterguch.brinkster.net/6typesofchemicalrxn.html<br><br>**Stoichiometry Understanding**<br>http://www.khanacademy.org/science/chemistry/chemical-reactions-stoichiometry/v/stoichiometry<br><br>**Combustion Reaction Explanation**<br>http://www.iun.edu/~cpanhd/C101webnotes/chemical reactions/combustion.html<br><br>**Combustion Reaction Live Video**<br>http://www.youtube.com/watch?v=UygUcMkRy_c |
| SC.3.4.6 Summarize the characteristics and interactions of acids and bases. | • Recognize common inorganic acids including hydrochloric (muriatic) acid, sulfuric acid, acetic acid, nitric acid and citric acid.<br>• Recognize common bases including sodium bicarbonate, and hydroxides of sodium, potassium, calcium, magnesium, | **Khan Section of Videos (All Acid and Base Videos)**<br>http://www.khanacademy.org/science/chemistry/acids-and-bases<br><br>**Base – Comparison**<br>http://www.chemtutor.com/acid.htm - pbase |

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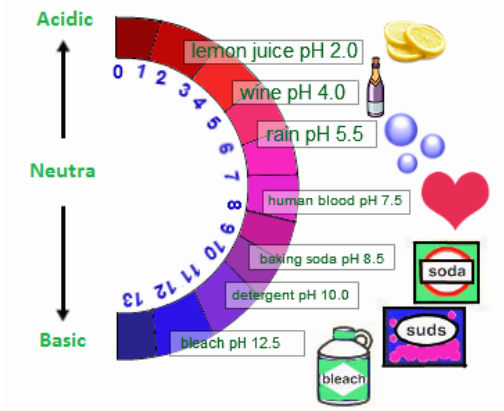
| | barium and ammonium.<br>• Define acids and bases according to the Arrhenius theory.<br>• Develop an understanding of the pH scale and the classification of substances therein.<br>• Generalize common characteristics of acids and bases—pH range, reactivity with metals and carbonates (acids) or fats/oils (bases), conductivity.<br>• Relate general household uses of acids and bases with their characteristic properties.<br>• Explain what happens in a neutralization reaction, identifying each component substance. | **In Depth Acid and Base Explanation**<br>http://chemistry.tutorvista.com/inorganic-chemistry/acids-bases-and-salts.html<br><br>**Theory**<br>http://www.chemguide.co.uk/physical/acidbaseeqia/theories.html<br>  <br>**Explanation**<br>http://chemistry.tutorvista.com/inorganic-chemistry/acids-bases-and-salts.html<br>https://www.sciencenter.org/chemistry/d/activity_guide_acids_bases.pdf<br>http://www.chem.memphis.edu/bridson/FundChem/T16a1100.htm<br><br>**Neutralization Video**<br>http://www.youtube.com/watch?v=64_HqEFZ_TI |

| **SC.3.5 Matter: Understand the role of the nucleus in radiation and radioactivity.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.3.5.1 Compare nuclear reactions including alpha decay, beta decay, and gamma decay; nuclear fusion and nuclear fission. | • Compare the characteristics of alpha and beta particles and gamma rays – composition, mass, penetrability.<br>• Compare alpha, beta, and gamma decay processes –alpha decay reduces the mass of an atom by 4 and the atomic number by 2; beta decay increases the atomic number by 1 (a neutron decays into a proton and electron); gamma rays are electromagnetic waves released from the nucleus along with either an alpha or beta particle.<br>• Compare the processes of fission (splitting of a very large atom) and fusion (joining of atoms) in terms of conditions required for occurrence, energy released, and the nature of products. | **Khan Video Types of Decay**<br>http://www.khanacademy.org/science/chemistry/radioactive-decay/v/types-of-decay<br><br>**Particle Explanation**<br>http://www.nrc.gov/about-nrc/radiation/health-effects/radiation-basics.html<br>http://library.thinkquest.org/3471/radiation_types_body.html<br><br>**Decay Process Essay**<br>http://www.rsc.org/images/essay3_tcm18-17765.pdf<br><br>**Nuclear Fission versus Nuclear Fusion:**<br>http://chemwiki.ucdavis.edu/Physical_Chemistry/Nuclear_Chemistry/Fission_and_Fusion/Nuclear_Fission_vs_Nuclear_Fusion |

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| SC.3.5.2 Exemplify the radioactive decay of unstable nuclei using the concept of half-life. | • Conceptually explain half-life using models.<br>• Perform simple half-life calculations based on an isotope's half-life value, time of decay, and/or amount of substance. | **Half-Life Lab & Demonstration**<br>http://serc.carleton.edu/sp/library/demonstrations/examples/26461.html<br><br>**Khan Video Half-Life**<br>http://www.khanacademy.org/science/chemistry/radioactive-decay/v/half-life<br><br>**Half-Life Problems**<br>http://www.mdc.edu/kendall/chmphy/nuclear/halflive.htm<br>http://go.hrw.com/resources/go_sc/ssp/HK1MSW35.PDF |

| **SC.3.6 Energy Conservation and Transfer: Understand types of energy, conservation of energy and energy transfer.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.3.6.1 Explain thermal energy and its transfer. | • Infer the ability of various materials to absorb or release thermal energy in order to conceptually relate mass, specific heat capacity, and temperature of materials to the amount of heat transferred. (Calculations with $q = mC_p \Delta T$ should be used to aid in conceptual development through laboratory investigation and analysis, not as problem-solving exercises.)<br>• Compare thermal energy, heat, and temperature.<br>• Relate phase changes to latent heat that changes the potential energy of particles while the average kinetic energy of particles (temperature) remains the same.<br>• Compare conduction, convection, and radiation as methods of energy transfer. | **Thermal Energy Explanation**<br>http://chemwiki.ucdavis.edu/Physical_Chemistry/Thermodynamics/State_Functions/THERMAL_ENERGY<br><br>**Specific Heat Virtual Lab**<br>http://www.sciencegeek.net/VirtualLabs/SpecificHeatLab.html<br><br>**Comparison PDF**<br>http://teacherweb.com/MA/ChocksettMiddleSchool/Petit/Chapter14section1.pdf<br><br>**Latent Heat Explanation**<br>https://www.boundless.com/physics/heat-and-heat-transfer/phase-change-and-latent-heat/latent-heat/<br><br>**Heat Module**<br>http://www.nc-climate.ncsu.edu/edu/k12/.lsheat |
| SC.3.6.2 Explain the law of conservation of energy in a mechanical system in terms of kinetic energy, potential energy and heat. | • Exemplify the relationship between kinetic energy, potential energy, and heat to illustrate that total energy is conserved in mechanical systems such as a pendulum, roller coaster, cars/balls on ramps, etc.<br>• Relate types of friction in a system to the transformation of mechanical energy to heat. | **Explanation**<br>http://www.dbooth.net/mhs/chem/heatandenergy01.html<br>http://resources.saylor.org/CHEM/CHEM101/Unit6/CHEM101-6.1.1-EnergyHeatAndWork-BY-SA_files/CHEM101-6.1.1-EnergyHeatAndWork-BY-SA.html<br><br>**Pendulum Understanding**<br>http://www.clarkson.edu/highschool/k12/project/documents/Lesson3_-Understanding Energy.pdf<br><br>**Conservation of Energy**<br>http://www.khanacademy.org/science/physics/work-and-energy/work-and-energy-tutorial/v/conservation-of-energy<br><br>**Friction**<br>http://www.khanacademy.org/science/physics/work-and-energy/work-and-energy-tutorial/v/work-energy-problem-with-friction |

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| SC.3.6.3 Explain work in terms of the relationship among the applied force to an object, the resulting displacement of the object, and the energy transferred to an object. | • Explain scenarios, in which work is done, identifying the force, displacement, and energy transfer- work requires energy; when work is done on an object, the result is an increase in its energy and is accompanied by a decrease in energy somewhere else.<br>• Compare scenarios in which work is done and conceptually explain the differences in magnitude of work done using the relationship W= FΔd. | **Work Explanation**<br>http://www.physicsclassroom.com/class/energy/u5l1a.cfm<br>http://hyperphysics.phy-astr.gsu.edu/hbase/work2.html |
| SC.3.6.4 Explain the relationship among work, power and simple machines both qualitatively and quantitatively. | • Infer the work and power relationship:<br>• $p = \frac{W}{\Delta t} = \frac{F\Delta d}{\Delta t} = F\bar{v}$<br>• Determine the component simple machines present in complex machines – categorize a wedge and screw as variations of an inclined plane; a pulley and wheel & axle as variations of a lever.<br>• Explain the relationship between work input and work output for simple machines using the law of conservation of energy.<br>• Define and determine ideal and actual mechanical advantage: $IMA = \frac{d_E}{d_R}, AMA = \frac{f_r}{f_e}$<br>• Define and determine efficiency of machines: $Efficiency = \frac{W_{out}}{W_{in}} x\ 100$<br>• Explain why no machine can be 100% efficient. | **Explanation**<br>http://hyperphysics.phy-astr.gsu.edu/hbase/work.html<br><br>**Simulation**<br>http://phet.colorado.edu/en/simulation/ramp-forces-and-motion<br><br>**Explanation**<br>http://facstaff.gpc.edu/~pgore/PhysicalScience/work-energy-power.html<br><br>http://www.jnoodle.com/ps_2/psb6.htm<br><br>**Introduction to Mechanical Advantage**<br>http://www.khanacademy.org/science/physics/work-and-energy/mechanical-advantage/v/introduction-to-mechanical-advantage<br><br>**Explanation**<br>http://formulas.tutorvista.com/physics/efficiency-formula.html |

| **SC.3.7 Energy Conservation and Transfer: Understand the nature of waves.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.3.7.1 Explain the relationships among wave frequency, wave period, wave velocity, amplitude, and wavelength through calculation and investigation. | • Identify the basic characteristics of a longitudinal (compressional) wave: amplitude, rarefaction, and compression.<br>• Recognize the relationship between period and frequency (focus on conceptual understanding).<br>• Explain the relationship among velocity, frequency, and wavelength and use it to solve wave problems: $v_w = f\lambda$<br>• Exemplify wave energy as related to its amplitude and independent of velocity, frequency or wavelength. | **Introduction to Waves**<br>http://www.khanacademy.org/science/physics/waves-and-optics/v/introduction-to-waves<br><br>**Waves and Optics**<br>http://www.khanacademy.org/science/physics/waves-and-optics/v/amplitude--period--frequency-and-wavelength-of-periodic-waves<br><br>**Measures of Waves Explanation**<br>http://www.light-measurement.com/measures-of-wave/<br><br>**Wave Energy Explanation**<br>http://www.physicsclassroom.com/class/waves/u10l2c.cfm |

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| SC.3.7.2 Compare waves (mechanical, electromagnetic, and surface) using their characteristics. | • Classify waves as one of three types: mechanical, electromagnetic or surface waves based on their characteristics.<br>• Compare different wave types based on how they are produced, wave speed, type of material (medium) required, and motion of particles. | **Waves Explanation**<br>http://www.physicsclassroom.com/class/waves/u10l1c.cfm |
| SC.3.7.3 Classify waves as transverse or compressional (longitudinal). | • Compare compressional (longitudinal) and transverse waves in terms of particle motion relative to wave direction. | **Categories of Waves Explanation**<br>http://www.physicsclassroom.com/class/waves/u10l1c.cfm |
| SC.3.7.4 Illustrate the wave interactions of reflection, refraction, diffraction, and interference. | • Illustrate reflection and refraction of waves at boundaries: reflection of a transverse pulse at the fixed-end of a spring or rope; reflection of sound (SONAR) and radio waves (RADAR); reflection of water (surface) waves; refraction of water waves as the depth of the water changes; sounds as it changes media; refraction of light as it passes from air into water, glass, oil, etc.<br>• Illustrate the effects of wave interference (superposition)-constructive and destructive interference of surface waves, mechanical waves (sound, pulses in springs/ropes, etc.) light (soap bubbles/thin films, diffraction gratings). Emphasis on conceptual understanding-not mathematical relationships. | **Reflection and Refraction Explanation**<br>http://www.physicsclassroom.com/class/waves/Lesson-3/Reflection,-Refraction,-and-Diffraction<br><br>http://www.physicsclassroom.com/class/sound/Lesson-3/Reflection,-Refraction,-and-Diffraction |

| **SC.3.8 Energy Conservation and Transfer: Understand electricity and magnetism and their relationship.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.3.8.1 Summarize static and current electricity. | • Identify interactions between charged objects - opposite charges attract and like charges repel.<br>• Compare the three methods of charging objects: conduction, friction, and induction – explain the re-distribution or transfer of electrons for each method for both positively and negatively charged objects.<br>• Compare static and current electricity related to conservation of charge and movement of charge (without calculations). | **Interactions between Charges Explanation**<br>http://www.physicsclassroom.com/class/estatics/Lesson-1/Charge-Interactions<br><br>**Introduction to Charge and Coulomb's Law**<br>http://www.khanacademy.org/science/physics/electricity-and-magnetism/v/electrostatics--part-1---introduction-to-charge-and-coulomb-s-law<br><br>**Friction Explanation**<br>http://www.physicsclassroom.com/class/estatics/Lesson-2/Charging-by-Friction<br><br>**Induction Explanation**<br>http://www.physicsclassroom.com/class/estatics/Lesson-2/Charging-by-Induction |

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| | | **Conduction Explanation**<br>http://www.physicsclassroom.com/class/estatics/Lesson-2/Charging-by-Conduction<br><br>**Comparison**<br>https://learn.sparkfun.com/tutorials/what-is-electricity/static-or-current-electricity |
| SC.3.8.2 Explain simple series and parallel DC circuits in terms of Ohm's law. | • Interpret simple circuit diagrams using symbols.<br>• Explain open and closed circuits.<br>• Apply Ohm's law and the power equation to simple DC circuits: V=IR and P=VI<br>• Compare series and parallel circuits. Conceptually explore the flow of electricity in series and parallel circuits. (Calculations may be used to develop conceptual understanding or as enrichment.)<br>• Explain how the flow of electricity through series and parallel circuits is affected by voltage and resistance. | **Circuit Explanation**<br>http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa/electricity/circuitsrev1.shtml<br>http://198.185.178.104/iss/electricity/pages/a12.xml<br>http://www.electronics-tutorials.ws/dccircuits/dcp_2.html<br>http://physics.bu.edu/py106/notes/Circuits.html<br><br>**Khan Academy Circuits Video**<br>http://www.khanacademy.org/science/physics/electricity-and-magnetism/v/circuits--part-1<br><br>**Explanation**<br>http://hyperphysics.phy-astr.gsu.edu/hbase/class/phscilab/electric.html |
| SC.3.8.3 Explain how current is affected by changes in composition, length, temperature, and diameter of wire. | • Explain how the wire in a circuit can affect the current present – for a set voltage, the current in a wire is inversely proportional to its resistance (more current exists where resistance is low); the resistance of a material is an intensive property called resistivity; increasing the length of a wire increases the resistance; increasing the temperature increases the resistance; increasing the diameter of a wire decreases its resistance.<br>• Explain using a cause-and-effect model how changes in composition, length, temperature, and diameter of a wire would affect the current in a circuit. | **Simulation**<br>https://phet.colorado.edu/en/simulation/resistance-in-a-wire<br><br>**Circuits Explanation**<br>http://www.physicsclassroom.com/class/circuits/u9l3b<br><br>**What Factors Affect the Current Flowing**<br>http://www.studymode.com/essays/What-Factors-Affect-The-Current-Flowing-65942.html |
| SC.3.8.4 Explain magnetism in terms of domains, interactions of poles, and magnetic fields. | • Describe the characteristics and behaviors of magnetic domains.<br>• Explain the attractions of unlike poles and the repulsion of like poles in terms of magnetic fields.<br>• Explain magnetic fields produced around a current-carrying wire and wire coil (solenoid).<br>• Explain the relationship between strength of an electromagnet and the variance of number of coils, voltage, and core material. | **Magnetism Explanation**<br>http://www.ndt-ed.org/EducationResources/HighSchool/Magnetism/magneticdomain.htm<br>http://armymedical.tpub.com/md0950/md09500047.htm<br><br>**Magnet Simulation**<br>http://phet.colorado.edu/en/simulation/magnet-and-compass<br><br>**Explanation**<br>http://www2.rps205.com/Parents/Academics/Learning/Science/Documents/PhysicsFirstTextbook/Chapter17.pdf<br>http://abyss.uoregon.edu/~js/21st_century_science/lectures/lec04.html |

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| SC.3.8.5 Explain the practical application of magnetism. | • Explain the relationship between electricity and magnetism in practical applications such as generators and motors – the process of electromagnetic induction in electric generators that converts mechanical energy to electrical energy; transformation of electric energy to mechanical energy in motors.<br>• Extrapolate other practical applications such as security cards (ATM, credit or access cards), speakers, automatic sprinklers, traffic signal triggers, seismometers, battery chargers, transformers, AC-DC adapters. | **Electromagnetism Explanation**<br>http://www.nuffieldfoundation.org/practical-physics/electromagnetism<br><br>**Magnets and Electromagnets Simulations**<br>http://phet.colorado.edu/en/simulation/magnets-and-electromagnets<br><br>**How Magnets Work Explanation**<br>http://www.howmagnetswork.com/uses.html<br>http://science.howstuffworks.com/magnet4.htm |

| **SC.4.1 Earth in the Universe: Explain the Earth's role as a body in space.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.1.1 Describe interactions between earth's systems and living things. | • Discuss structures in the universe (e.g., galaxies, stars, constellations, solar systems), the age and development of the universe, and the age and development of Stars (e.g., main sequence, stellar development, deaths of stars [black hole, white dwarf]).<br>• Identify Sun, planets, and moons (e.g., types of planets, comets, asteroids), the motion of the Earth and the interactions within the Earth's solar system (e.g., tides, eclipses).<br>• Discuss determination of the age of the Earth, including radiometrics, fossils, and landforms. | The most widely acepted model for formation of the universe is that a "Big Bang" occurred approximately 13.8 bya (billion years ago) and caused rapid expansion of extremely hot and dense material of unknown origin. Scientists have not agreed on why this created a universe that is almost flat. As the universe expanded, the first chemical elements formed and over billions of years gathered into masses of sufficient size and density to form stars. There are billions of galaxies of stars with each galaxy consisting of billions of stars. The universe is still expanding so the galaxies are rapidly getting farther apart. From Earth, stars appear to be grouped in constellations (Gemini, Virgo, Libra, Sagittarius, etc.) but the stars we see as a constellation are not relatively close in space, just in the same direction from Earth. Almost all stars are orbited by planets or some other non-stellar structures so they have an *extrasolar system* similar to the *solar system* formed by our Sun and its planets.<br>A *protostar* form as gravitational contraction of a thin gaseous cloud (nebula) creates a core that heats much more intensely than the surrounding material. When the pressure becomes great enough, nuclear fusion of hydrogen (H) atoms into helium (He) atoms begins. This fusion reaction releases huge amounts of energy and the radiated heat causes an increase in motion of stellar gases so that outward pressure balances gravitational forces and "a star is born".<br>The evolution and lifespan of stars is summarized by the Hertzsprung-Russell Diagram, although some stars known as *red giants* are an exception to this diagram. Stars live about 10 bya and smaller stars end their lives as *white dwarfs*.<br><br>**Life Cycle of a Star**<br>http://www.cartage.org.lb/en/themes/sciences/astronomy/thestars/evolutionstars/evolutionstars.html<br><br>Our Sun is one of billions of stars in the *Milky Way Galaxy*. It is orbited by 8 planets. Instructors and some students may have learned that there were 9 planets, but in 2006 astronomers adopted a definition of a planet as an object large enough to become round from the force of its own gravity. Now Pluto and more than 40 other objects orbiting the Sun are categorized as *Dwarf Planets*. At least one dwarf planet (Ceres) is larger than Pluto. Dwarf planets may be called asteroids. Some dwarf planets may still be referred to as asteroids in the literature. More than 40 asteroids and dwarf planets have been identified, and it is assumed there are many smaller ones. To be classed as an asteroid, the body must not have comet-like features, including glowing when it travels near the Sun. Comets often have a tail and their nuclei consist of ice, rocks and dust. Comets and asteroids were thought to have originated in different regions of the solar system, but new discoveries have blurred that distinction. About 5000 objects in our solar system have been identified as comets.<br>Some chemical elements, including lead, zircon, and carbon, have radioisotopes that decay over long periods of time. Knowing their rates of decay allows the age of minerals, rocks and fossils to be determined by *radiometric dating*.<br><br>**Radiometric Dating**<br>http://www.pbs.org/wgbh/evolution/library/03/3/l_033_01.html |

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| SC.4.1.2 Explain the Earth's motion through space, including precession, nutation, the barycenter, and its path about the galaxy. | • Explain the origin of the Earth's motion based on the origin of the galaxy and its solar system.<br>• Recall Earth's role in the hierarchy of organization within the universe and in the developmental continuum. (Universe is made of galaxies that consist of many stars. Some stars have planetary systems similar to our solar system. Earth is a satellite planet of one particular star.)<br>• Explain planetary orbits, especially that of the Earth, using Kepler's laws.<br>• Explain relative motion of the Earth in the solar system, the solar system in the galaxy, and the galaxy in the universe – including the expanding nature of the universe; Orbital motion (Earth around the Sun – once/year, seasons depend upon an approximate 23.5 degree tilt); Rotation around our axis (day/night).<br>• Explain Precession – change in direction of the axis, but without any change in tilt – this changes the stars near (or not near) the Pole, but does not affect the seasons (as long as the angle of 23.5 degrees stays the same).<br>• Explain nutation – wobbling around the precessional axis (This is a change in the angle – ½ degree one way or the other. This occurs over an 18 year period and is due to the Moon exclusively. This would very slightly increase or decrease the amount of seasonal effects.)<br>• Explain barycenter – the point between two objects where they balance each other. For example, it is the center of mass where two or more celestial bodies orbit each other. When a moon orbits a planet, or a planet orbits a star, both bodies are actually orbiting around a point that lies outside the center of the | Objects that do not have an orbital speed sufficient to balance the gravitational attraction a star would be pulled into that star. Hence Earth and the other planets of our solar system orbit around the Sun. Likewise the billions of stars that make up the *Milky Way Galaxy* orbit around the center of the galaxy, which is on the other side of the constellation *Sagittarius.* This rotation was created when the stars of the Milky Way were formed by gravitational attraction and started rotating around the galaxy's center of mass. As the rotation rate increased, the galaxy flattened, especially at the edges, like a hand-tossed pizza crust. The Milky Way is now rotating at approximately 600,000 miles per hour and makes a complete rotation every 225 million years. The same principles created the rotation of our solar system. Read more at http://www.universetoday.com/23870/the-milky-ways-rotation/#ixzz2e1PBF9DT<br><br>Earth is the 3rd of 8 or 9 planets (depending on whether Pluto is considered a planet) plus many other objects including those in the Kepler Belt beyond Pluto that orbit our Sun. Our Sun is one of trillions of stars in the Milky Way Galaxy. The Milky Way is one of billions of galaxies in the universe. Many stars have planets just as many planets have moons (Earth has one moon).<br><br>**Images of Our Universe**<br>http://scaleofuniverse.com/<br>http://csep10.phys.utk.edu/astr161/lect/history/kepler.html<br><br>Day & night result from a point on Earth rotating from Sun-facing to other side of Earth as Earth rotates on its axis. Because Earth's axis is tilted 23.4 degrees, the northern hemisphere gets more direct sunlight in summer while sunlight is mostly glancing off the southern hemisphere. Earth orbits the Sun once every 365.25 days (so calendar corrected each Leap Year).<br>Our solar system is part of the Milky Way Galaxy, which is approximately 100,000 light-years wide and 10,000 light-years thick at the center. The Milky Way is described as a *barred spiral galaxy* with 3 arms. Our solar system is about 2/3rds of the way out *The Orion Arm.* At that distance our solar system orbits around the center of the Milky Way Galaxy at a speed of approximately 600km/sec<br>The universe is expanding so rapidly that travel to another galaxy is essentially impossible. One way to illustrate universe expansion is using raisin bread dough as illustrated on the PowerPoint handout.<br>As the spinning Earth makes an orbit around the Sun, the orientation of the North Pole makes a circle rather than maintaining direction of tilt. This causes the "North Star" to switch from Polaris to Vega and back to Polaris during a 28,000-year cycle. As long as the Earth's "tilt" remains constant, precession does not affect seasons significantly. Precession can be illustrated by spinning a top and watching the top of the top make a circle.<br>As the top of a spinning top appears to make a circle, it is actually not a circle because of a sideways wobble. So that circle looks more like the edge of a small-tooth circular saw. Our Earth tilts about half a degree more or less during each 18-year cycle. There is a small effect on seasons, but it is not generally recognized because weather patterns cause seasons to vary so much from year to year (for example, the effects of El Nino on seasons).<br>It is not Earth that orbits the Sun; rather the center of mass (barycenter) of the Earth-Moon system orbits the Sun. For systems with more equal mass or more than two bodies, the barycenter is not likely to be inside the larger object. However, the barycenter for the Earth-Moon system is in the Earth, but not in the center of the Earth. Instead it is 1062 miles below the Earth's surface on the side facing the Moon, and as the Moon orbits the Earth the barycenter circles the Earth to remain on the moon side. This is the point where masses of the Earth and moon balance, and the point about which the Earth and Moon orbit as they travel around the Sun. Our solar system has a |

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| | primary (the larger body).<br>• Summarize that the Sun is not stationary in our solar system. It actually moves as the planets tug on it, causing it to orbit the solar system's barycenter. The Sun never strays too far from the solar system barycenter. | barycenter that orbits within the Milky Way Galaxy, and the Milky Way also has a barycenter.<br><br>**Barycenter for the Earth-Moon System**<br>http://library.thinkquest.org/29033/begin/earthsunmoon.htm<br><br>The solar system is not stationary in the Milky Way galaxy, but there is a point in the solar system that is stationary with respect to the rest of the solar system. That point is the *barycenter*, which is sometimes located within the Sun's mass but sometimes drifts above the surface of the Sun.<br>**The Solar System Barycenter Video**<br>http://www.youtube.com/watch?v=_IHXj8k2jqc |
| SC.4.1.3 Explain how the Earth's rotation and revolution about the Sun affect its shape and is related to seasons and tides. | • Describe daily changes due to rotation, seasonal changes due to the tilt and revolution of the Earth, and tidal impact due to the gravitational interaction between the Earth and Moon.<br>• Develop a cause and effect model for the shape of the Earth explaining why the circumference around the equator is larger than that around the poles. | Day & night result from a point on Earth rotating from Sun-facing to other side of Earth as Earth rotates on its axis. The northern hemisphere gets more direct sunlight in summer because it is tilted toward the Sun and sunlight is hitting the Earth from directly overhead during part of the day. Conversely the southern hemisphere is tilted away from the Sun so much of the sunlight hits from a low angle from the horizon and glances off the Earth into space. Earth orbits the Sun once every 365.25 days. Regardless of the Sun's angle, it exerts a gravitational pull on water. However the gravitational pull of the moon is greater because the moon is so much closer to the Earth. This gravitational pull lifts water causing high tides on the sides facing and opposite the moon, and low tides on the other 2 sides of the Earth.<br>As the Earth spins on its axis, the centrifugal force generated at the spinning equator causes a bulge as the molten material of the inner Earth moves outward. This pulls the North and South poles closer together, so the shape of the Earth becomes an "oblate spheroid" or "ellipsoid". The bulge at the equator is about 26.5 miles so the diameter measured in an equatorial plane is 26.5 miles greater than the diameter in a polar plane. |
| SC.4.1.4 Explain how the Sun produces energy that is transferred to the Earth by radiation. | • Compare combustion and nuclear reactions (fusion and fission) on a conceptual level. Identify fusion as the process that produces radiant energy of stars.<br>• Identify the forms of energy (electromagnetic waves) produced by the Sun and how some are filtered by the atmosphere (X-rays, cosmic rays, etc.).<br>• Summarize how energy flows from the sun to the Earth through space. | *Atomic number* is the number of protons in each atom of a given chemical element. *Fission* is the splitting of the nucleus of an atom to form at least 2 atomic nuclei with smaller atomic numbers. Conversely, *fusion* is the joining of 2 or more atoms to form an atom of an element with a higher atomic number. Whereas fission can release an amount of energy we associate with an atomic bomb, the fusion of heavy isotopes (more neutrons) of hydrogen (H) to form the element helium (He) releases vastly more energy because the mass of the He atom is less than the combined masses of the H atoms that fused. The extra matter is converted to energy following Einstein's $E = mc^2$. This reaction powers the Sun and all stars.<br>Nuclear fusion produces gamma rays, but during the thousands of years it takes that energy to travel from Sun's interior to its surface it is converted to lower energy forms. That is important for life on Earth. Solar radiation is in the form of X-rays, ultraviolet light (UV), visible light, infrared light (IR) and radio waves. Most of what reaches the Earth's atmosphere is UV, IR and visible light. Fortunately the *ozone layer* of the atmosphere filters out much of the UV, which can be very damaging to living cells. There is still enough UV reaching the Earth surface for prolonged exposure to sunlight to cause genetic mutations and skin damage including wrinkles and skin cancer. Cosmic rays, which are actually high-energy particles rather than part of the light spectrum and may or may not originate from the Sun, are also filtered out by the atmosphere.<br>Energy is transmitted through space from Sun to Earth in the form of electromagnetic waves, which are a combination of electric waves and magnetic waves that are in phase, but perpendicular to each other.<br><br>**Different Wave Lengths**<br>http://www.colorado.edu/physics/2000/waves_particles/ |

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| SC.4.1.5 Explain how incoming solar energy makes life possible on Earth. | • Explain how the tilt of the Earth's axis results in seasons due to the amount of solar energy impacting the Earth's surface.<br>• Explain differential heating of the Earth's surface (water temperature vs. land temperature).<br>• Explain how solar energy is transformed into chemical energy through photosynthesis.<br>• Explain how the Earth's magnetic field protects the planet from the harmful effects of radiation. | In summer the Earth's northern hemisphere is tilted toward the Sun, and the southern hemisphere is tilted away from the Sun. Therefore the angle of incoming radiation is much less in the southern hemisphere so more radiation is reflected into space and the southern hemisphere retains less heat and energy than the northern hemisphere where solar radiation strikes Earth at closer to a $90^{o}$ angle.<br>Water has a much higher specific heat than almost all of the things on the surface of land, so it is slow to heat and slow to cool. Therefore, the ocean, Great Lakes, and other large bodies of water will retain heat longer and cool more slowly in winter. Likewise, it takes more heat to warm these bodies of water as summer begins. Many other materials, especially metals, will heat and cool much more rapidly. However, heating over ice and snow is very different because of the *Albedo Effect*. Hence there is much less heating over polar ice and during northern winters.<br>Photosynthesis combines carbon dioxide, water and energy from light in a chemical reaction that produces oxygen and glucose. The equation is $6CO_2 + 6H_2O$ + energy → $C_6H_{12}O_6 + 6O_2$. The six C atoms in the glucose molecule are held together by covalent bonds that store a lot of energy.<br>The Earth's rotation on its axis causes the liquid iron in the outer core to swirl. This is thought to be the origin of the Earth's magnetic field, which surrounds Earth and deflects the solar wind. Solar wind refers to a stream of energetic particles originating from the Sun that would be devastating to living things. |

| **SC.4.2 Earth Systems, Structures and Processes: Explain how processes and forces affect the lithosphere.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.2.1 Describe Earth and its System Components and Interactions. | • Discuss characteristics of the atmosphere, including its layers and its gases and their effects on the Earth and its organisms (include climate change).<br>• Describe characteristics of the oceans (e.g., salt water, currents, coral reefs) and their effects on Earth and organisms.<br>• Explain interactions between Earth's systems (e.g., weathering caused by wind or water on rock, wind caused by high/low pressure and Earth rotation, etc.).<br>• Describe the interior structure of the Earth (e.g., core, mantle, crust, tectonic plates) and its effects (e.g., volcanoes, earthquakes, etc.) and major landforms of the Earth (e.g., mountains, ocean basins, continental shelves, etc.). | Other than water vapor, Earth's atmosphere is 78% nitrogen and 21% oxygen. The other 1% is a mixture of several gases. Most of these gases are in the troposphere, which extends about 5 miles above Earth at the poles and about 10 miles at the equator. Above the troposphere is the stratosphere, which extends to about 28 miles above Earth's surface and is warmer because it absorbs most of the UV light from the Sun. The mesosphere and thermosphere are above the stratosphere, with the thermosphere extending more than 60 miles above the surface of the Earth. Some of the gases in the atmosphere keep light energy from being reflected back into space, which allows Earth to be warm enough for life. These "greenhouse gases" include carbon dioxide ($CO_2$), water vapor, and methane. Throughout Earth's history, atmosphere $CO_2$ levels have fluctuated enough to cause major climate changes including ice ages and ice melting leading to much higher ocean levels than exist today.<br>**Atmospheric Composition and Recent Changes in $CO_2$ Levels**<br>http://www4.uwsp.edu/geo/faculty/ritter/geog101/textbook/atmosphere/atmospheric_composition.html<br>Oceans and seas cover 2/3rds of the Earth. If the surface of the Earth was smooth without mountains, valleys, etc. the entire Earth would be covered with water to a depth of 8200 feet. There is significant variation in salt content of seawater, but the average salinity is 35 part per thousand (ppt). The most important dissolved ions are sodium, chloride, magnesium and sulfate. Light does not penetrate very far into ocean water so rooted plants only grow in very shallow areas. Coral reefs are found in shallow water for the same reason as the coral animal is dependent on algae making food by photosynthesis. Sound travels faster and further in seawater than in air. Surface currents are primarily driven by winds and by the *Coriolis effect* which results from Earth's rotation. Large scale ocean water flow patterns result from warmer water moving away from the equator (such as in the Gulf Stream along the eastern U.S. coast) and cooler water moving toward it; the resultant large circulation patterns are called *gyre*. Gyre have major effects on climate and weather thus impacting the location and distribution of |

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| | | biomes and ecosystems. Coastal upwelling brings nutrient rich water up from the deep ocean and creates a very productive area for sea life.<br>**National Oceanic and Atmosphere Administration (NOAA)**<br>http://oceanservice.noaa.gov/education/kits/currents/05currents1.html<br>Earth's rotation sustains 3 prevailing wind patterns on a global scale, with the divisions between these patterns at approximately $30^{o}$ of latitude. At both poles there are polar easterlies from 0 to $30^{o}$. Then there are westerlies from $30^{o}$ to $60^{o}$ latitude and easterlies (aka "trade winds") from $60^{o}$ to the equator. These prevailing wind patterns contribute to beach erosion, both from wind and from water as waves are blown ashore during storms. Wind is also a significant cause of inland soil erosion in dry areas such as the Great Plains when the soil is not protected by vegetation. Water is a more significant cause of erosion in wetter climates, particularly those with greater slopes. Rock weathering occurs when rocks are blasted by smaller wind-blown particles and when rocks are tumbled by moving water or water seeps into rocks and exerts pressure on outer rock layers when it freezes.<br>The central core of the Earth (inner core) is solid iron and nickel with a temperature greater than $7200^{o}$F. It is surrounded by an outer core of the same material that is molten and has a temperature of 6300 to $7200^{o}$F. Its depth is 3200 miles; the inner core begins at 3960 miles. Outside the outer core is the lower and upper mantle. The upper mantle begins at a depth of between 3 and 45 miles depending on the topography of the Earth crust. The lower mantle begins at about 1860 miles. The uppermost layers of the mantle are fused to the crust, and together they form the *lithosphere*.<br>**MIT Video**<br>http://video.mit.edu/watch/layers-of-the-earth-12670/ |
| SC.4.2.2 Explain how the rock cycle, plate tectonics, volcanoes, and earthquakes impact the lithosphere. | • Explain the rock cycle in enough detail to relate the cycling of materials – formation and destruction of the three major rock types to the forces responsible: physical and chemical weathering, heat and pressure, deposition, foliation and bedding. The forms of energy that drive the rock cycle include heat and mechanical (gravitational potential) energy.<br>• Explain how various mechanisms (mantle convection, ridge push, gravity pull) drive movement of the lithospheric plates.<br>• Infer the relationship between the type of plate boundary and the locations of various features such as ocean trenches, mountain ranges and mid-ocean ridges. (Relate to the development of the theory of plate tectonics and geologic time.)<br>• Compare magma and lava. Locate volcanoes and relate back to plate boundaries. | The basic rock cycle is molten magma to igneous rock to sedimentary rock to metamorphic rock, which will become magma if exposed to high temperature and pressure. Sedimentary rock is formed by compaction and cementation of sediment, regardless of which type of rock was weathered to create the sediment (so there can be diversions across and even backward in the cycle). Sedimentary rock becomes metamorphic rock when it is exposed to sufficient heat and pressure, but heat and pressure can also change igneous rock directly into metamorphic rock. Rocks often weather by shedding layers (similar to layers of an onion); this is called "sheeting" or "foliation". Exfoliation may be triggered by heat. Chemical weathering occurs when rocks are exposed to corrosive chemicals, most commonly carbonic acid ($H_2CO_3$), which is formed by a reaction between water and carbon dioxide, or organic acids secreted from plant roots.<br>A relatively long-standing theory of tectonic plate movement is convection currents in the asthenosphere (molten material underlying the lithosphere), but recent seismic tomography has failed to detect convention cells so that theory is currently being modified. The term "ridge push" is a misnomer because the only pushing force would be gravity as a plate slides downward during subduction or away from a "mantle dome. Another theory relates movements to Earth rotation.<br>**Discussion and Animations of Tectonic Plate Movement**<br>http://serc.carleton.edu/NAGTWorkshops/geophysics/visualizations/PTMovements.html<br>Three types of boundaries between tectonic plates are *divergent*, *convergent* and *transform* boundaries. Plates spread apart at divergent boundaries where they create features such as the mid-Atlantic trench and the Rift Valley of East Africa. Where plates are moving together one plate slides under the other and has pushed out major mountain ridges including the Appalachian Mountains, Andes, Alps, etc. Many volcanoes are at the Continental-Oceanic Convergences around the Pacific Plate, and this area is called the *Ring of Fire*. There is sideways sliding against each other at transform boundaries such as the San Andreas Fault in California; that sliding can cause major earthquakes.<br>Both magma and lava are molten rock. Magma identifies underground molten rock (usually fairly deep in the Earth but sometimes in chambers |

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| | Explain volcanic effects on the lithosphere and relate back to plate boundaries (convergent, divergent, transform) including lahar (mud) flows and ash in the atmosphere.<br>• Describe the anatomy of an earthquake. Locate earthquakes – epicenter and focal point – and related to different types of plate boundaries. Explain how the release of energy of various types of earthquakes relates to magnitude, and P and S waves.<br>• Summarize the major events in the geologic history of North Carolina and the southeastern United States. Explain how current geologic landforms developed such as Appalachian Mountains, fall zone, shorelines, barrier islands, valleys, river basins, etc. using the geologic time scale.<br>• Explain how processes change sea-level over time – long- and short-term. Infer the effects on landforms such as shorelines and barrier islands. | below a volcano). Lava is the name for the molten rock after it is ejected from a volcano. Sometimes lava is so thick it builds in the volcano and causes a massive explosion that throws a lot of dust and ash into the atmosphere. Sometimes a volcano flow is in the form of *lahar*, which is a hot or cold mixture of water and small rock fragments so it looks like wet concrete and may be referred to as a mudflow. Sometimes the rocks that are carried in a lahar are huge boulders. Discussion and videos can be found at http://www.geo.mtu.edu/volcanoes/hazards/primer/lahar.html<br>Earthquakes are the *elastic rebound* of rocks that have actually been stretched as Earth plates slide past each other. In the 1906 San Francisco earthquake, the Pacific plate lurched about 15 feet north along the North American plate. The underground point where the earthquake originates is called the *focus*; the depth of the focus significantly impacts the amount of shaking at ground level. The term *epicenter* refers to the Earth surface point that is directly above the focus. The violent shaking of an earthquake radiates from the focus like waves generated when an object drops into still water. The 2 kinds of waves generated are S waves (sideways shaking) and P waves (push-pull); they travel at different speeds and seismology uses the difference in time of their arrivals at a given point to locate the earthquake focus and epicenter.<br>**Measuring Earthquake Size**<br>http://eqseis.geosc.psu.edu/~cammon/HTML/Classes/IntroQuakes/Notes/earthquake_size.html<br>Convergent plates formed the Appalachian mountain 260 mya. When the Permian Extinction of more than 95% of species occurred 252 mya, North Carolina was part of a supercontinent near the equator. North America separated from Africa about 200 mya and as it drifted northwest the Atlantic Ocean formed. The eastern coast of NC has fluctuated dramatically through world climate changes caused by ice ages and periods of warm climates. The coast has moved from the Piedmont to its present location over the past 50 mya. More detail can be found at www.learnnc.org/lp/editions/nchist-twoworlds/1671<br>During a period when polar ice caps and glaciers melted, the sea level rose more than 300 feet higher than today leaving an *escarpment* than runs through Scotland, Hoke and Cumberland counties. Approximately 1.7 mya sea level dropped and the present coastal plain was exposed. About 18,000 years ago the sea level dropped so much the Pamlico Sound was exposed. Geologists do not agree on when the outer banks formed but perhaps between 3500 and 5000 years ago; they have moved eastward or westward with sea level changes. |
| SC.4.2.3 Predict the locations of volcanoes, earthquakes, and faults based on information contained in a variety of maps. | • Infer the locations of volcanoes, earthquakes and faults (strike-slip, reverse and normal) from soil, geologic and topographic map studies. (Relate fault locations/types to plate boundaries.)<br>• Make predictions based on data gathered over time in conjunction with various maps. | Three types of boundaries between tectonic plates are *divergent*, *convergent* and *transform* boundaries. Where plates are moving together one plate slides under the other and has pushed up major mountain ridges including the Appalachian mountains. At the Continental-Oceanic Convergences around the Pacific Plate is a volcanic area called the *Ring of Fire*. Sideways sliding against each other at transform boundaries can cause major earthquakes.<br>**Types of Faults**<br>http://www.livescience.com/37052-types-of-faults.html<br>**Predicting Weather**<br>http://www.ussartf.org/predicting_weather.htm |
| SC.4.2.4 Explain how natural actions such as weathering, erosion (wind, water and gravity), and soil formation | • Recall that soil is the result of weathering of rocks and includes weathered particles: sand, silt and clay.<br>• Explain differences in chemical and physical weathering and how | Air and water in pore spaces is very important for a soil to be good place for plants to root and grow. Humus (decaying organic material) contributes significantly to soil productivity. The matrix for these materials as well as biotic components of the soil is formed by a mixture of sand, silt, and/or clay. Sand, silt and clay are created by the weathering of rocks.<br>Many rocks were formed underground where conditions are much different than they encounter when they come to the surface. Physical forces that |

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| affect Earth's surface. | weathering rates are affected by a variety of factors including climate, topography and rock composition.<br>• Compare erosion by water, wind, ice, and gravity and the effect on various landforms. | cause rock weathering include wind and water, possibly including objects that they force against the rocks rather violently. Temperature variations cause rocks to expand and contract, which may cause exfoliation of outer layers or create cracks that fill with water. Water expands as it freezes and that can exert tremendous force on a rock. Water can combine with $CO_2$ to form carbonic acid or plant roots can release organic acids, thus causing chemical weathering. Other sources of chemical weathering include acid rain, sea salt, and various chemicals in the soil such as silicates. Some rocks weather more rapidly than others, and climatic conditions such as precipitation, wind and temperature fluctuations affect weathering rate. Topography affects wind exposure, speed of water flow, and susceptibility to mass wasting (such as landslides) which contribute to rock weathering.<br>Erosion by flowing water has destroyed much agriculturally productive soil but has also created some of America's wonders such as the Grand Canyon. The power of wind erosion is illustrated by the dust bowl conditions of the 1930s in the U.S. and Canadian prairies, and by sandstorms. Glacial erosion is a very powerful force; one of the ice sheets of the last ice age changed the course of the Mississippi River and another created Great Lakes and Niagara Falls. |
| SC.4.2.5 Explain the probability of and preparation for geohazards such as landslides, avalanches, earthquakes and volcanoes in a particular area based on available data. | • Conclude the best location for various types of development to reduce impacts by geohazards and protect property.<br>• Explain precautions that can be made to protect life from various geohazards and include meteorological hazards. Some examples include landslides, earthquakes, tsunamis, sinkholes, groundwater pollution, and flooding. | Much of the U.S. is susceptible to one or more types of geohazards. The potential for property damage is significant in earthquake, tornado, and hurricane-prone areas. Hillsides are susceptible to mass wasting (landslides and mudslides) and construction in forested areas exposures houses and other structures to the risk of forest fire damage. With the projected rise in sea level, coastal areas become increasingly susceptible to storms and flooding, but 40% of Americans live in coastal counties.<br>Location and quality of dwelling structures is important in areas subject to landslides, earthquakes and tsunamis. Levees can protect some flood-prone areas but warning systems for those areas, as well as coastal areas, are also important. People who get their water from private wells need to be informed of any incident of possible groundwater contamination. Some potential damage from sinkholes can be reduced with road and home construction techniques, and maps that show areas where sinkholes are more likely can be made available to potential real estate buyers. |

| **SC.4.3 Earth Systems, Structures and Processes: Understand how human influences impact the lithosphere.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.3.1 Explain the consequences of human activities on the lithosphere (such as mining, deforestation, agriculture, overgrazing, urbanization, and land use) past and present. | • Explain the need for and consequences of various types of land use such as urbanization, deforestation and agriculture.<br>• Explain ways to mitigate detrimental human impacts on the lithosphere and maximize sustainable use of natural resources.<br>• Explain the effects of human activity on shorelines, especially in development and artificial stabilization efforts | Deforestation is the result of a growing population, which increases the need for home sites, roads, shopping centers and food production. However there are major environmental consequences of urbanization including heat islands, air and water pollution, waste management issues, etc.<br>The loss of species habitats and effects on ecosystems are major concerns, as is the loss of productive farmland, so land use planning has increasing importance. The tidal areas of our coastline need protection because they serve as a nursery for many marine species that are important sources of food and recreation, or part of their food chains and ecosystem balance. However, land use planning often conflicts with desires and rights of property owners.<br><br>**Significant Issues – Beach Nourishment**<br>http://www.csc.noaa.gov/archived/beachnourishment/html/human/dialog/series1a.htm |

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| SC.4.3.2 Compare the various methods humans use to acquire traditional energy sources (such as peat, coal, oil, natural gas, nuclear fission, and wood). | Compare the methods of obtaining energy resources: Harvesting (peat and wood), mining (coal and uranium/plutonium), drilling (oil and natural gas) and the effect of these activities on the environment. | Coal mining helped build the American economy, but at significant cost to human life, human health, and the environment. Exploration and drilling for oil and natural gas has helped our state, national and world economy and helped produce relatively cheap electrical power as well as fuel for motor vehicles, home heating, etc. The potential for environmental disasters with significant consequences for the lives of a large number of people is illustrated by the 2010 BP Gulf oil spill. A discussion of the hidden environmental costs of the use of fossil fuels can be found at http://www.ucsusa.org/clean_energy/our-energy-choices/coal-and-other-fossil-fuels/the-hidden-cost-of-fossil.html |

| **SC.4.4 Earth Systems, Structures and Processes: Explain the structure and processes within the hydrosphere.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.4.1 Explain how water is an energy agent (currents and heat transfer). | • Explain how the density of ocean water is affected by temperature and how this results in major ocean currents distributing heat away from the equator toward the poles.<br>• Explain how coastal climates are moderated by water (due to its high specific heat capacity) in comparison to inland climates. | As seawater cools it becomes more dense and sinks. Water with higher salinity also sinks. Deep water currents are set in motion by the *downwelling* of dense, cold, salty water in polar and subpolar regions until it reaches a level of equal density where it spreads out, often over long distances. In warmer areas upwelling of less dense water lets it mix with warmer water and be warmed by the Sun as it is transported by surface currents to replace the water that sank in colder areas.<br><br>**Discussion Video and Activity**<br>http://oceanexplorer.noaa.gov/edu/learning/8_ocean_currents/activities/currents.html<br>Water has a higher specific heat than most other materials so it takes a long time for it to warm in spring and cool in fall. Ocean currents and the amount of water in the ocean contribute to the slowness of temperature change of seawater in comparison to the atmosphere. The result is slower temperature changes and more moderate temperatures in coastal areas. |
| SC.4.4.2 Explain how ground water and surface water interact. | • Illustrate the water cycle to explain the connection between groundwater and surface water, detailing how groundwater moves through the lithosphere. (Emphasize the processes of evaporation and infiltration in the conceptual diagram of the hydrologic cycle.)<br>• Explain river systems including North Carolina river basins, aquifer, and watersheds.<br>• Explain how flood events might be affected by groundwater levels. | Underground rock areas that collect and conduct water are *aquifers*. Several large aquifers are the source of drinking water for large regions of the U.S., so it is important that they do not become polluted with dangerous chemicals. The amount of water in an aquifer varies with replenishment from precipitation as water percolates downward through porous soil. A spring is a place where an aquifer intersects with the surface. Groundwater moves upward through soil capillaries as water evaporates from the soil surface and as plant roots provide plants with water for physiological processes. Hence surface water is cycled into groundwater, which is later cycled to surface water.<br>**NC Watersheds:** http://nc.water.usgs.gov/<br>When rainfall is unusually high, as in the summer of 2013, percolation of surface water into the soil may be sufficient to saturate the soil so that most of the pores and air spaces are full. Then additional precipitation must simply run off into streams, lakes, etc. Since an inch of rain is more than 17,370,000 gallons per square mile, and since many rivers drain hundreds of square miles, substantial flooding can result from rainfall when groundwater levels are high. |

| **SC.4.5 Earth Systems, Structures and Processes: Evaluate how humans use water.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.5.1 Evaluate human influences on freshwater availability. | • Explain various water uses by humans and evaluate for benefits and consequences of use (ex. wells, aquifer | People use water for transportation, recreation, industry, agriculture and various home uses including drinking, cooking, bathing, flushing toilets, watering plants, car washing, etc. Meeting each person's food needs for one day requires up to 700 gallons of water and almost 70% of worldwide |

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| | depletion, dams and dam removal, agriculture, recreation).<br>• Explain consequences of aquifer depletion including subsidence and salt-water intrusion on the coast.<br>• Evaluate the effects of population growth on potable water resources. Infer future effects.<br>• Explain how pollutants might flow through a watershed and affect inhabitants that share the same watershed. | water use is for irrigation. Another 22% goes for industrial uses and about 8% for household uses.<br>**Per Capita Water Use and Water Resource for NC Counties**<br>http://nc.water.usgs.gov/infodata/wateruse.html<br>Saltwater intrusion into aquifers contaminates supply wells, and has forced many coastal areas to discontinue use of some of their supply wells over the last 75 years. The major cause of saltwater intrusion into aquifers is groundwater depletion so that saltwater moves underground into the depleted aquifer. Saltwater contamination can also result from hurricane storm surges as well as rising sea levels.<br>**Causes and Consequences of Groundwater Depletion**<br>http://ga.water.usgs.gov/edu/gwdepletion.html<br>Per capita water consumption of North Carolinians averages about 1300 gallons per day, so a population growth of 1000 people increases this state's water needs by 1,300,000 gallons per day even if we do use more water to achieve a higher standard of living.<br>Storm water runoff is the most common cause of water pollution in NC. When polluted water enters an aquifer, it can spread for miles in all directions. When it enters a stream, large areas downstream and downriver can be subject to contamination by percolation of polluted water into stream and river beds.<br>**Causes and Prevention of North Carolina Watershed Contamination**<br>http://srwqis.tamu.edu/north-carolina/program-information/north-carolina-target-themes/pollution-assessment-prevention/<br>**Watershed Activity**<br>http://www.calacademy.org/teachers/resources/lessons/pollution-in-our-watershed/ |
| SC.4.5.2 Evaluate human influences on water quality in North Carolina's river basins, wetlands and tidal environments. | • Evaluate issues of ground and surface water pollution, wetland and estuary degradation, and saltwater intrusion.<br>• Analyze how drinking water and wastewater treatment systems impact quantity and quality of potable water.<br>• Evaluate water quality of North Carolina streams (chemical, physical properties, biotic index).<br>• Analyze non-point source pollution and effects on water quality (sedimentation, storm water runoff, naturally and human induced occurrences of arsenic in groundwater.).<br>• Evaluate conservation measures to maximize quality and quantity of available freshwater resources. | **Estuary and Wetland Degradation**<br>http://water.epa.gov/type/oceb/nep/challenges.cfm<br>Wastewater treatment plants are designed to remove physical, chemical and biological contaminants. Where plants use advanced technology, it is now possible to reuse sewage effluent as drinking water, and that is done in one country (Singapore). Failure to treat wastewater can lead to algae blooms that kill a lot of marine life. Although the website is designed for children.<br>**Treatment of Drinking Water**<br>http://water.epa.gov/learn/kids/drinkingwater/watertreatmentplant_index.cfm<br>In its 2010 report, the Environmental Protection Agency (EPA) identified over 1500 miles of NC rivers and streams with biotic "impairment". Almost 1000 miles were identified with turbidity, and over 900 miles had fish with mercury contamination. Since mercury is such a dangerous chemical, especially for pregnant women, information on mercury contamination of fish from various bodies of water is maintained by the NC Fish and Game Commission. The EPA report on water quality assessment is at http://ofmpub.epa.gov/waters10/attains_state.control?p_state=NC<br>Non-point source water pollutants include materials from home gardens, lawns and farms such as sediments, fertilizer, pesticides and animal wastes. Since 1942 the U.S. standard for drinking water has been less than 50 ppb of arsenic. Some forms of arsenic are natural to soils everywhere and greater in some areas of the world, but arsenic contamination has been enhanced by coal burning, use of arsenic in gold and lead mining, and the use of arsenic based pesticides as well as industrial chemicals. Discussion and a map of groundwater arsenic pollution in the U.S. can be found at http://nationalatlas.gov/articles/water/a_arsenic.html<br>**Discussion Topics:** http://water.epa.gov/polwaste/nps/chap3.cfm |

| SC.4.6 Earth Systems, Structures and Processes: Understand the structure of and processes within our atmosphere. | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.6.1 Summarize the structure and composition of our atmosphere. | Summarize information from charts and graphs regarding layers of the atmosphere, temperature, chemical composition, and interaction with radiant energy. | From Earth to space, the atmospheric layers are troposphere (first 11 miles), stratosphere (11 to 47 miles), mesosphere (47 to 80 miles) and thermosphere (80 to over 100 miles). More than 50% of the air molecules of our atmosphere are in the first 6 miles of the troposphere as the air gets progressively thinner with distance above Earth. The air "turns over" in the troposphere and its thickness actually varies by latitude and by seasons. The air gets colder with height in the troposphere, but starts to get warmer again in the stratosphere. Ozone forms in the stratosphere. Because ozone absorbs UV light the temperature increases with height in the stratosphere. UV light absorption is what makes the ozone layer so important to life on earth. Clouds do not go higher than its boundary with the troposphere. Temperatures decline again in the mesosphere and the temperature at the top of the mesosphere is about -90°C (-130°F). Although the temperature in the thermosphere would be measured as hot by many devices, that is an artifact of rapid movement of air molecules because they are spaced so far apart.<br><br>**Diagram with Animation**<br>http://earthguide.ucsd.edu/earthguide/diagrams/atmosphere/ |
| SC.4.6.2 Explain the formation of typical air masses and the weather systems that result from air mass interactions. | • Explain how air masses move (pressure differentials).<br>• Explain how interactions of air masses form frontal boundaries, clouds, and affect wind patterns.<br><br>*Note: Also address precautions for severe cyclonic storms to preserve life and property.* | **Air Pressure Discussion**<br>http://ww2010.atmos.uiuc.edu/%28Gh%29/guides/mtr/fw/prs/def.rxml<br>Air flows away from the center of a high pressure system and toward the center of a low pressure system. In the northern hemisphere, Earth rotation causes clockwise winds around a high-pressure system and counterclockwise around a low-pressure system (such as a tropical depression).<br><br>**NC Barometric Pressure Readings**<br>http://www.usairnet.com/weather/maps/current/north-carolina/barometric-pressure/<br>Precipitation often develops near frontal boundaries where warmer air rises above colder air. This is illustrated at http://ww2010.atmos.uiuc.edu/%28Gh%29/guides/mtr/cld/dvlp/frnt.rxml<br>When a cold front advances against a retreating warm front, there may be a possibility of severe thunderstorms. Precautions during thunderstorms and other types of storms are discussed at http://www.ready.gov/thunderstorms-lightning |
| SC.4.6.3 Explain how cyclonic storms form based on the interaction of air masses. | • Explain factors that affect air density and understand their influence on winds, air masses, fronts and storm systems.<br>• Use data to substantiate explanations and provide evidence of various air mass interactions. *Note: Also address precautions for severe cyclonic storms to preserve life and property.* | Temperature, barometric pressure and relative humidity influence air density, which is the mass of air per unit volume. Other factors being equal, air has a lower density when relative humidity is higher because the molecular mass of water is lower than the molecular mass of dry air.<br>Hurricanes and other cyclonic storms only form over ocean water that is at least 80°F to a depth of at least 50 meters. Hence their early stage is called a tropical storm. They also need wind, which is provided to hurricanes in the Atlantic Ocean by the prevailing easterly wind at latitudes within 30° of the equator.<br>**Storms**<br>http://www.learnnc.org/lp/editions/nchist-recent/6248 |
| SC.4.6.4 Predict the weather using available weather maps and data (including surface, upper atmospheric | • Observe, analyze and predict weather using technological resources.<br>• Interpret and analyze weather maps and relative humidity charts. | You might want to consult a local meteorologist or invite on to speak to the class. However, there is a 6-minute video discussing tools for weather prediction at http://www.youtube.com/watch?v=dqpFU5SRPgY<br>http://www.intellicast.com/National/Surface/Current.aspx<br>Given a constant barometric pressure, the temperature at which the rate of condensation into liquid water equals the rate of evaporation of liquid |

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| winds, and satellite imagery). | • Explain the importance of water vapor and its influence on weather (clouds, relative humidity, dew point, precipitation).<br><br>*Note: Use predictions to develop plans for safety precautions related to severe weather events.* | water is the *dew point*. When relative humidity is high, the dew point is fairly close to current temperature, but not so close when relative humidity is low. Relative humidity is the ratio of partial pressure of the water vapor in the air to the saturated vapor pressure at a given temperature. Relative humidity affects evaporation rate of human perspiration so we get uncomfortable when relative humidity is high. As air rises and cools the relative humidity increases and clouds form. If humid air cools at ground level, fog forms. For explanation ideas see http://www.youtube.com/watch?v=S8W-xl4mcJ8 |
| SC.4.6.5 Explain how human activities affect air quality. | • Explain how acid rain is formed and how human activities can alter the pH of rain.<br>• Infer other human activities that impact the quality of atmospheric composition. (e.g. aerosols, chlorofluorocarbons, burning, industrial byproducts, over farming, etc.)<br>• Exemplify methods to mitigate human impacts on the atmosphere. | Water combines with sulfur dioxide to form sulfuric acid, which is a very strong acid. Water reacts with nitrogen oxide to form nitric acid. Two sources of sulfur dioxide are volcanic eruptions and burning of coal and oil. The sulfur content of coal and oil varies considerably, and the burning of high sulfur coal or oil is regulated in the U.S. (so they are sold at lower prices). Acid rain damages vegetation, paint and some building materials, especially limestone. it can also make ponds and lakes acidic harming fish and other aquatic life. See http://www.epa.gov/acidrain/<br>Chlorofluorocarbons (CFCs) have been widely used in aerosol cans, refrigerants (including Freon) and solvents. As CFCs accumulate in the stratosphere, they destroy the ozone layer. Burning of any carbon-based material, including all fossil fuels, releases $CO_2$ and contributes to global warming, Many industrial processes release a multitude of atmospheric pollutants as well as a lot of $CO_2$. Crop and animal production are major contributors to nitrogen oxide and methane in the atmosphere (methane is a greenhouse gas). Vegetation absorbs more heat and takes $CO_2$ out of the air for photosynthesis, so farming practices that reduce vegetative cover contribute to global warming.<br>The most obvious way to help our atmosphere, and the one with potentially the greatest impact, would be to drive less. Reducing your consumption of electrical energy is another big one since much our electricity is from coal-power electrical plants (burning coal releases $CO_2$ and sulfur dioxide). For other ideas see http://www.moretonbay.qld.gov.au/general.aspx?id=2220 |

| **SC.4.7 Earth Systems, Structures and Processes: Analyze patterns of global climate change over time.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.7.1 Differentiate between weather and climate. | • Explain major climate categories (Köppen climate classification system – temperate, tropical, and polar).<br>• Compare weather and climate. | The Köppen Climate Classification System (aka Köppen -Geiger) divides the world's climatic regions into 5 categories: Tropical/megathermal, Dry, Mild Termperate/mesothermal, Continental/microthermal, and Polar. Each of these is subdivided into different types and many of those types have subtypes, so a 2- to 4-letter identification scheme is used on most maps. An example of a Koppen climate map can be found at http://koeppen-geiger.vu-wien.ac.at/<br>Weather is relatively short-term, whereas climate refers to longer periods of time.<br>**Weather and Climate**<br>http://www.nasa.gov/mission_pages/noaa-n/climate/climate_weather.html |
| SC.4.7.2 Explain changes in global climate due to natural processes. | • Summarize natural processes that can and have affected global climate (particularly El Niño/La Niña, volcanic eruptions, sunspots, shifts in Earth's orbit, and carbon dioxide fluctuations).<br>• Explain the concept of the greenhouse effect including a | Polar ice core samples show major long-term variations in atmospheric $CO_2$ level, and those fluctuations probably caused ice ages and very hot periods. Sunspots can reduce global temperature dramatically. See http://www-das.uwyo.edu/~geerts/cwx/notes/chap02/sunspots.html<br>A significant shift in Earth's orbit could dramatically affect global climate. Multiple massive volcanic eruptions may have led to at least one ice age as dust, etc. reduce penetration of sunlight. The El Nino-Southern Oscillation affects the surface temperature of the Pacific Ocean and can have major effects on weather in the U.S., the western coast of South America, |

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| | list of specific greenhouse gases and why $CO_2$ is most often the focus of public discussion. | Australia and New Zealand and can also affect hurricane formation in the Atlantic Ocean. See video at http://www.teachersdomain.org/resource/ess05.sci.ess.watcyc.eselnino/<br>A "greenhouse gas" is any atmospheric gas that traps heat and solar radiation by keeping it from being emitted back into space after it is reflected from the Earth's surface. The most important greenhouse gases and the percentages of each in 2011 greenhouse gas emissions are carbon dioxide (84%), methane (9%), and nitrous oxide (5%). Although only 2% of the 2011 greenhouse gas emissions were fluorinated gases, those gases are sometimes referred to as "High global warming potential (GWP) gases." http://www.epa.gov/climatechange/ghgemissions/gases.html |
| SC.4.7.3 Analyze the impacts that human activities have on global climate change (such as burning hydrocarbons, greenhouse effect, and deforestation). | • Outline how deforestation and the burning of fossil fuels (linked to increased industrialization) contribute to global climate change.<br>• Explain how large-scale development contributes to regional changes in climate (i.e. heat islands in large cities like NY, Chicago, Beijing, etc).<br>• Analyze actions that can be taken by humans on a local level, as well as on a larger scale, to mitigate global climate change. | Plants remove carbon dioxide from the air during photosynthesis, so forests have the potential to maintain lower atmospheric $CO_2$ levels. Deforestation can increase atmospheric $CO_2$ when trees are burned because $CO_2$ is a combustion product as well as by reducing the total biomass doing photosynthesis. Fossil fuels (coal, oil, natural gas) were formed over millions of years as plant material partially decayed to form hydrocarbons. Thus the burning of fossil fuels returns large amounts of $CO_2$ to the atmosphere. The result is global warming.<br>Homes, industries, etc. in large cities release a lot of heat from heating, cooking, manufacturing, power generation, air conditioner operation, etc. However, the biggest cause of "urban heat islands (UHI)" is pavement and other reflectors of sunlight. UHIs exist is both summer and winter and may raise the local temperature as much as $7^{o}$F at night in the New York City area. Three things that might be good research or discussion topics are reducing automobile use, reducing the use of electrical power, and generating power using alternate energy sources. Since global climate change is a world-wide issue, inspiring changes in all parts of the world should be considered. |
| SC.4.7.4 Attribute changes to Earth's systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc.). | • Analyze how changes in global temperatures affect the biosphere (ex. agriculture, species diversity, ecosystem balance).<br>• Explain how changes in atmospheric composition contribute to ocean acidification. Analyze its effect on ocean life and its connection to global climate change.<br>• Explain how changes in global temperature have and will impact sea level.<br>• Analyze how sea level has been affected by other Earth processes such as glaciations and tectonic movements. Consider long- and short-term changes. | Ecosystems with the most obvious risk from global warming are coral reefs and the tundra. The melting of polar ice and glaciers is having dramatic effects on many species, with polar bears getting a lot of media coverage. Since coral reefs are among the world's most productive biomes, their damage from rising sea levels and increasing ocean temperatures would have significant impacts on other ocean ecosystems. Rising sea levels may also damage estuaries, which are another very productive ecosystem. Less certain, but alarming, are potential effects on amount of precipitation over large areas as habitats may change dramatically with climate changes.<br>As atmospheric $CO_2$ increases, more carbonic acid is formed in ocean water and the water becomes more acidic. This increases the rate of chemical reactions that decrease levels of calcium available to marine life, significantly affecting the formation of calcium-based shells of shellfish. Since shellfish are an important part of many marine food chains, entire ecosystems may be affected. See http://www.pmel.noaa.gov/co2/story/What+is+Ocean+Acidification%3F<br>Global temperature has increased dramatically since 1850 when records were first kept. Evaluation of ice core samples, tree rings, and other natural phenomena show a longer term warming trend. Recently there has been significant melting of polar ice and glaciers (Glacier National Park no longer has glaciers). Since the reflection of solar radiation is so much greater by ice and snow than by earth and water, the reduction of ice and snow coverage leads to more rapid warming, causing more ice melting. Figures are available that show how the *Albedo Effect* differs for ice, water, forest, soil, pavement, etc. and can be used to supplement this discussion at http://nsidc.org/cryosphere/seaice/processes/albedo.html<br><br>**Global Warming**<br>http://www.climatecentral.org/blogs/131-years-of-global-warming-in-26-seconds/ |

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| | | Historically, the most dramatic effects on sea level resulted from ice ages and from very warm periods in Earth's history when most of the polar and glacial ice melted. Tectonic plate movements have raised volcanic and other islands and opened deep trenches in the ocean, thus having significant effects on sea level. See http://www.cmar.csiro.au/sealevel/sl_hist_intro.html |

| **SC.4.8 Earth Systems, Structures and Processes: Explain how the lithosphere, hydrosphere, and atmosphere individually and collectively affect the biosphere.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.8.1 Describe Interactions between Earth's Systems and living things. | • Discuss interactions of matter between living and nonliving things (e.g., cycles of matter) and the locations, uses and dangers of fossil fuels.<br>• Evaluate natural hazards (e.g., earthquakes, hurricanes, etc.) their effects (e.g., frequency, severity, and short- and long-term effects), and mitigation thereof (e.g., dikes, storm shelters, building practices).<br>• Discuss extraction and use of natural resources, renewable versus nonrenewable resources and sustainability. | Carbon, nitrogen, and some other chemical elements are cycled into and back out of the biochemicals of living things. Carbon, and to a lesser extent sulfur, are part of organic chemicals formed from the decay of biochemicals. The formation of fossil fuels from arrested decay of a large quantity of biomass removed a lot of carbon from an ancient hot climate. As humans seek new sources of oil and gas from increasingly inaccessible locations, they not only increase the rate of return of this carbon bank back into the carbon cycle, thus increasing atmospheric $CO_2$, but they increase the risks of accidents that damage large ecosystems.<br><br>**The Carbon Cycle**<br>http://www.cotf.edu/ete/modules/carbon/efcarbon.html<br>Earthquakes cause more damage if the soil is wet and stronger earthquakes cause major damage when *liquification* occurs. Severe shaking can cause the earth to "liquefy" so that above ground structures sink and buried objects float to the surface (including underground gas storage tanks). Hurricane damage along coastal areas is greater when landfall coincides with high tides and potentially will become more severe as sea levels rise. Coastal construction can be designed to withstand wind damage but construction to mitigate damage by a surge of water is more difficult and more expensive. Most students have recently observed the power of a tsunami on TV coverage of the recent tsunami in Japan.<br>How sustainable are various energy sources? The fossil fuels of coal, oil and natural gas on which we currently rely are nonrenewable, and progress in development and adoption of alternative energy sources has been agonizingly slow. The mining of coal from underground mines has been repeatedly proven to be quite dangerous, and strip-mining of coal is very controversial due to its effects on the landscape and environment. Deep-water oil drilling has recently led to a major disaster, as has transportation of crude oil (Exxon Valdese). Current controversies include offshore drilling along the NC coast and the construction of an oil pipeline. It should be noted that the Alaska pipeline that was so controversial several years ago has not been the ecological disaster than many predicted. |
| SC.4.8.2 Explain how abiotic and biotic factors interact to create the various biomes in North Carolina. | • Explain how biotic and abiotic factors determine biome classification (temperature, rainfall, altitude, type of plant, latitude, type of animals).<br>• Compare impacts of biotic and abiotic factors on biodiversity.<br>• Match landforms and soils (and their change over time) to biomes. | Some biomes (e.g. *grasslands*) are identified only by predominant type of vegetation, but an important abiotic factor in determining its location is rainfall. Latitude is recognized as a determining factor for biomes in the designation of *temperate rainforest* and *tropical rainforest*. *Desert* is a biome primarily determined by climatic factors and the existence of a permafrost layer is the major determinate of the *tundra* biome, whether the low temperature results from elevation or latitude. Coral is an animal the builds coral reefs of that biome. Grazing animals interact with climatic factors to determine where the *grassland* and *savanna* biomes are located. Students can observe the distribution of biomes on a world map, such as the one shown at http://www.blueplanetbiomes.org/world_biomes.htm to consider possible determining factors.<br>Encyclopedia of Earth describes a very broad definition of biodiversity that includes genetic diversity within species, variety of species, and variety of habitats at http://www.eoearth.org/view/article/150560/ Biodiversity is |

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| | | limited by both biotic and abiotic factors. Water and temperature variations are major determinants of biodiversity in terrestrial environments. Biotic factors include species interactions and the development of sustainable food webs. In any ecosystem food chains begin with the producers (usually plants) that may be limited by the amount of energy available from sunlight for photosynthesis. Hence energy input can be a major limiting factor for biodiversity. A changing environment would have a huge impact.<br>Mountains, marshes, and deep water obviously limit the types of biomes that can exist at those locations. The predominant vegetation of a biome is limited by soil characteristics, but it also is a major builder of that soil. For example, prairie soil is very rich in organic matter that is the result of centuries of grass growth and decay. Desert soil is very fragile and results from the interaction of biotic factors with abiotic limitations, primarily limited rainfall. The biomes of a mountain may vary with elevation. |
| SC.4.8.3 Explain why biodiversity is important to the biosphere. | • Define the biosphere as all life on Earth.<br>• Explain biodiversity as including genetic variation within populations and variation of populations within ecosystems that makeup the biosphere.<br>• Infer the relationship between environmental conditions and plants and animals that live within various biomes that comprise the biosphere.<br>• Explain the global impact of loss of biodiversity. | All living things and their environments. Alternatively, that portion of the Earth's outer crust, atmosphere and hydrosphere that contains living things, both aquatic and terrestrial.<br>Every ecosystem consists of a multitude of microorganisms, plants, animals and fungi. This diversity of life forms is necessary for stable food webs, recycling of organic matter via decay, and replenishment of nutrients and food sources. For the species that compose an ecosystem to maintain viable populations, each must be able to adapt to environmental changes. Adaptation and evolution are not possible unless a species has adequate genetic diversity to produce more adapted genotypes.<br>A temperate forest biome includes deciduous trees and animals that are adapted to the winter climate. A desert biome includes plants and animals that are able to locate and/or maintain adequate water levels. An ocean biome has photosynthetic plankton and consumers that are adapted to harvesting phytoplankton or species in a plankton-based food chain. The producers in these and other biomes are dependent on nutrients from the waste and decay of consumers.<br>A wide variety of plant species serve as food sources for animals and have been utilized as medications or to meet other human needs. Loss of some species can have devastating effects on an ecosystem by upsetting its ecological balance or can mean the loss of potential life-saving medications.<br><br>**Biodiversity Report**<br>http://www.biodiv.be/biodiversity/about_biodiv/importance-biodiv/ |
| SC.4.8.4 Explain how human activities impact the biosphere. | • Explain effects of human population growth, habitat alteration, introduction of invasive species, pollution and overharvesting on various plant and animal species in North Carolina.<br>• Explain effects of invasive nonnative species (plant or animal) on a North Carolina ecosystem.<br>• Summarize ways to mitigate human impact on the biosphere. | More people require more homes, roads, shopping centers, recreational facilities, and food. American agriculture has done a great job of producing more food on less farmland, but where is the limit to that efficiency? Here, and especially in developing countries where the population is growing more rapidly, meeting the needs of more people requires more deforestation, thus reducing the habitat for many species (especially in the rainforest). Trees are a buffer against the Greenhouse Effect (and some geohazards such as flooding) so uncontrolled population growth is part of a vicious cycle. More people means more cars and greater electrical power needs, thus increasing carbon dioxide emissions.<br>Meeting the food needs of an increasing population is generally accompanied by more agricultural chemical pollution, as well as more soil erosion (but construction is also a principal cause of soil erosion). Greater food needs encourage mismanagement problems such as overgrazing. Attempts to find new agricultural products have frequently resulted in invasive species, such as kudzu. However, many invasive animal species are the result of importation of exotic animals as pets.<br>An invasive plant may grow and reproduce so well that it becomes a noxious weed, out-competes native plant species, and even kills them. When an introduced animal species out-competes a native species, it may simply replace that species in food chains and food webs, or it may destroy the |

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| | | predator-prey and/or producer-primary consumer balance of an ecosystem. In NC, the grey squirrel has largely replaced the fox squirrel. In south Florida and south Texas, crazy ants are replacing other ant species, and "killer bees" are replacing other bee species.<br>http://www.ramsar.org/cda/fr/ramsar-activities-partnershipindex-private-biosphere-ramsar-related-21189/main/ramsar/1-63-506-98-400%5E21189_4000_1__ |

| **SC.4.9 Earth Systems, Structures and Processes: Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth.** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Resources |
| SC.4.9.1 Evaluate alternative energy technologies for use in North Carolina. | Critique the benefits, costs and environmental impact of various alternative sources of energy for North Carolina (solar, wind, biofuels, nuclear fusion, fuel cells, wave power, geothermal).<br>Evaluate which sources of alternative energy may work best in different parts of the state and why.<br>**Extension:** Examine for region, country, continent, hemisphere, and world. | Alternate energy sources are renewable and most have fewer pollution problems. Nuclear power plants remain controversial and little progress has been made in the development of nuclear fusion as an energy source. Harvesting of solar and wind power has expensive start-up costs and people do not consider wind farms to be attractive scenery. Ethanol is a renewable energy source and it reduces the amount of carcinogens, such as benzene, released by 80%. In 2006, the inclusion of ethanol in some gasoline reduced $CO_2$ emissions by 8,000,000 tons. Controversy includes using corn for ethanol rather than food, but new cellulosic technology may make it possible for ethanol to be made from stalks and leaves. Scientists are working to overcome the engineering problems that have been experienced with attempts to harvest energy from ocean waves, which would be a good energy source for North Carolina.<br>**Energy Sources**<br>http://nationalatlas.gov/articles/people/a_energy.html<br>Wind power has the most potential in the NC mountains and along the coast. Obviously, wave power is limited to the coast. It may be counterintuitive, but solar power may be more efficient in colder areas because high temperatures can damage photovoltaic panels. Tidal energy as well as wave energy is most suited to coastal areas of Europe. There are more wind farms in the Great Plains than elsewhere in the U.S. Historically, extensive use of geothermal energy has been limited to areas near tectonic plates. Hydroelectric power requires construction of dams and has been employed more extensively in the mountainous regions of U.S. and other countries. |
| SC.4.9.2 Critique conventional and sustainable agriculture and aquaculture practices in terms of their environmental impacts. | • Critique the advantages and disadvantages of traditional agriculture/aquaculture techniques and compare with sustainable agriculture/aquaculture techniques. Include the economics and environmental impacts in this comparison.<br>• Judge potential impact of sustainable techniques on environmental quality (include magnitude, duration, frequency). | Sustainable agriculture focuses on preserving productive soil and maintaining its ability to hold the right amount of water. It is guided by principles of ecology and environmental protection. Soil fertility is preserved and enhanced by recycling crop waste and using manure rather than chemical fertilizers. Using a crop rotation that includes legumes such as soybeans, alfalfa, clovers and peanuts allows replenishment of soil nitrogen content, as the roots of legumes form a symbiotic relationship with bacteria that convert nitrogen to a form that can be used by all plants (these are called nitrogen-fixing bacteria). Researchers are attempting to genetically engineer non-legume plants that will also form this symbiotic relationship, but the genetic engineering of crop plants is controversial. Adding organic matter (humus) to the soil improves its water holding capability. Practices that reduce water runoff both help preserve water, thus reducing irrigation needs, and reduce soil erosion. Maintaining cover crops to reduce time of exposure of bare soil reduces wind as well as water erosion.<br>http://www.ucsusa.org/food_and_agriculture/solutions/advance-sustainable-agriculture/ |
| SC.4.9.3 Explain the effects of uncontrolled population growth on the Earth's | • Explain carrying capacity.<br>• Infer limiting factors to human population growth.<br>• Summarize the impacts of a growing population on the | In biology, the carrying capacity of the environment refers to how many members of a species population can be provided with adequate food and habitat.<br>Can technology overcome these limitations for the human population? See<br>http://www-formal.stanford.edu/jmc/progress/population.html |

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| resources. | natural resources in North Carolina. | Obviously more people require more building materials for more homes, stores, etc. They also require more food production, more vehicles, more roadways, and more electrical energy. All of these speed the depletion of non-renewable resources. See http://www.ces.ncsu.edu/nreos/ncnatres/ |
| SC.4.9.4 Evaluate the concept of "reduce, reuse, recycle" in terms of impact on natural resources. | • Explain how ecological footprints exist at the personal level and extend to larger scales.<br>• Evaluate personal choices in terms of impacts on availability of natural resources and environmental quality; relate this to ecological footprints on various scales.<br>• Evaluate the impact of implementing change that adheres to the "reduce, reuse, recycle" philosophy (e.g. through case studies, data collection/analysis, model development, etc.). | http://www.footprintnetwork.org/en/index.php/gfn/page/footprint_basics_overview/<br>Recycling, using public transportation, and carpooling are just a few of many activities that people can employ to reduce their ecological footprints. Students can learn about their own ecological footprint by taking a quiz at http://www.myfootprint.org/ and those who complete this quiz could make valuable contributions to class discussion of this topic.<br>Responsibility, recovery or re-thinking are sometimes added to the R3 list of reduce, reuse, and recycle. Many people thought this initiative was a good idea for others; fewer people made much effort to apply it to themselves. However, improved recycling practices are evolving in many communities and particularly on many college campuses. Data to evaluate effectiveness of these efforts might be collected from recycling reports, but it is harder to analyze how much reduction and reuse has taken place. One source is http://www.bls.gov/opub/btn/volume-2/reduce-reuse-recycle-green-technologies-and-practices-at-work.htm |

**ASE SC 1: Living Organisms and Ecosystems – Instructor Checklist**

| **SC.1.1 Structures and Functions of Living Organisms: Understand the relationship between the structures and functions of cells and their organelles.** | | |
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| Objectives | Curriculum – Materials Used | Notes |
| SC.1.1.1 Summarize the structure and function of organelles in eukaryotic cells (including the nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and ways that these organelles interact with each other to perform the function of the cell. | | |
| SC.1.1.2 Compare prokaryotic and eukaryotic cells in terms of their general structures degree of complexity. | | |
| SC.1.1.3 Explain how instructions in DNA lead to cell differentiation and result in cells specialized to perform specific functions in multicellular organisms. | | |

| **SC.1.2 Structures and Functions of Living Organisms: Analyze the cell as a living system.** | | |
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| Objectives | Curriculum – Materials Used | Notes |
| SC.1.2.1 Explain how homeostasis is maintained in a cell and within an organism in various environments. | | |
| SC.1.2.2 Analyze how cells grow and reproduce in terms of interphase, mitosis and cytokinesis. | | |
| SC.1.2.3 Explain how specific cell adaptations help cells survive in particular environments (focus on unicellular organisms). | | |

| **SC.1.3 Ecosystems: Analyze the interdependence of living organisms within their environment.** | | |
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| Objectives | Curriculum – Materials Used | Notes |
| SC.1.3.1 Analyze the flow of energy and cycling of matter (such as water, carbon, nitrogen and oxygen) through ecosystems relating the significance of each to maintaining the health and sustainability of an ecosystem. | | |
| SC.1.3.2 Analyze the survival and reproductive success of organisms in terms of behavioral, structural, and reproductive adaptations. | | |
| SC 1.3.3 Explain various ways organisms interact with each other and with their environments resulting in stability within ecosystems. | | |
| SC.1.3.4 Explain why ecosystems can be relatively stable over hundreds or thousands of years, even though populations may fluctuate. | | |

| **SC.1.4 Ecosystems: Understand the impact of human activities on the environment (one generation affects the next).** | | |
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| Objectives | Curriculum – Materials Used | Notes |
| SC.1.4.1 Infer how human activities (including population growth, pollution, global warming, burning of fossil fuels, habitat destruction and introduction of nonnative species) may impact the environment. | | |
| SC.1.4.2 Explain how the use, protection and conservation of natural resources by humans impact the environment from one generation to the next. | | |

**ASE SC 2: Evolution, Genetics and Molecular Biology – Instructor Checklist**

| **SC.2.1 Evolution and Genetics: Explain how traits are determined by the structure and function of DNA.** | | |
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| Objectives | Curriculum – Materials Used | Notes |
| SC.2.1.1 Explain the double-stranded, complementary nature of DNA as related to its function in the cell. | | |
| SC.2.1.2 Explain how DNA and RNA code for proteins and determine traits. | | |
| SC.2.1.3 Explain how mutations in DNA that result from interactions with the environment or new combinations in existing genes lead to changes in function and phenotype. | | |

| **SC.2.2 Evolution and Genetics: Understand how the environment, and/or the interaction of alleles, influences the expression of genetic traits.** | | |
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| Objectives | Curriculum – Materials Used | Notes |
| SC.2.2.1 Explain the role of meiosis in sexual reproduction and genetic variation. | | |
| SC.2.2.2 Predict offspring ratios based on a variety of inheritance patterns. | | |
| SC.2.2.3 Explain how the environment can influence the expression of genetic traits. | | |

| **SC.2.3 Evolution and Genetics: Understand the application of DNA technology.** | | |
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| Objectives | Curriculum – Materials Used | Notes |
| SC.2.3.1 Interpret how DNA is used for comparison and identification of organisms. | | |
| SC.2.3.2 Summarize how transgenic organisms are engineered to benefit society. | | |
| SC.2.3.3 Evaluate some of the ethical issues surrounding the use of DNA technology. | | |

| **SC.2.4 Evolution and Genetics: Explain the theory of evolution by natural selection as a mechanism for how species change over time.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.2.4.1 Explain how fossil, biochemical, and anatomical evidence support the theory of evolution. | | |
| SC.2.4.2 Explain how natural selection influences the changes in species over time. | | |
| Bio.3.4.3 Explain how various disease agents can influence natural selection. | | |

| **SC.2.5 Evolution and Genetics: Analyze how classification systems are developed upon speciation.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.2.5.1 Explain the historical development and changing nature of classification systems. | | |
| SC.2.5.2 Analyze the classification of organisms according to their evolutionary relationships. | | |

| **SC.2.6 Molecular Biology: Understand how biological molecules are essential to the survival of living organisms.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.2.6.1 Compare the structures and functions of the major biological molecules as related to the survival of living organisms. | | |
| SC.2.6.2 Summarize the relationship among DNA, proteins and amino acids in carrying out the work of cells and how this is similar in all organisms. | | |
| SC.2.6.3 Explain how enzymes act as catalysts for biological reactions. | | |

| **SC.2.7 Molecular Biology: Analyze the relationships between biochemical processes and energy use in the cell.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.2.7.1 Analyze photosynthesis and cellular respiration in terms of how energy is stored, released, and transferred within and between these systems. | | |
| SC.2.7.2 Explain ways that organisms use released energy for maintaining homeostasis. | | |

**ASE SC 3: Physical Science – Instructor Checklist**

| SC.3.1 Forces and Motion: Understand motion in terms of speed, velocity, acceleration, and momentum. | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.3.1.1 Explain motion in terms of frame of reference, distance, and displacement. | | |
| SC.3.1.2 Compare speed, velocity, acceleration, and momentum using investigations, graphing, scalar quantities, and vector quantities. | | |

| SC.3.2 Forces and Motion: Understand the relationship between forces and motion. | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.3.2.1 Explain how gravitational force affects the weight of an object and the velocity of an object in free fall. | | |
| SC.3.2.2 Classify frictional forces into one of four types: static, sliding, rolling, and fluid. | | |
| SC.3.2.3 Explain forces using Newton's three laws of motion. | | |

| SC.3.3 Matter: Understand types, properties, and structure of matter. | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.3.3.1 Classify matter as: homogeneous or heterogeneous; pure substance or mixture; element or compound; metals, nonmetals, or metalloids; solution, colloid, or suspension. | | |
| SC.3.3.2 Explain the phases of matter and the physical changes that matter undergoes. | | |
| SC.3.3.3 Compare physical and chemical properties of various types of matter. | | |
| SC.3.3.4 Interpret the data presented in the Bohr model diagrams and dot diagrams for atoms and ions of elements 1 through 18. | | |

| SC.3.4 Matter: Understand chemical bonding and chemical interactions. | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.3.4.1 Infer valence electrons, oxidation number, and reactivity of an element based on it location in the periodic table. | | |
| SC.3.5.2 Infer the type of chemical bond that occurs, whether covalent, ionic or metallic, in a given substance. | | |
| PSc.2.2.3 Predict chemical formulas and names for simple compounds based on knowledge of bond formation and naming conventions. | | |
| SC.3.4.4 Exemplify the law of conservation of mass by balancing chemical equations. | | |
| SC.3.4.5 Classify types of reactions such as synthesis, decomposition, single replacement or double replacement. | | |
| SC.3.4.6 Summarize the characteristics and interactions of acids and bases. | | |

**ASE SC 3: Physical Science – Instructor Checklist – Page 2**

| SC.3.5 Matter: Understand the role of the nucleus in radiation and radioactivity. | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.3.5.1 Compare nuclear reactions including alpha decay, beta decay, and gamma decay; nuclear fusion and nuclear fission. | | |
| SC.3.5.2 Exemplify the radioactive decay of unstable nuclei using the concept of half-life. | | |

| SC.3.6 Energy Conservation and Transfer: Understand types of energy, conservation of energy and energy transfer. | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.3.6 .1 Explain thermal energy and its transfer. | | |
| SC.3.6 .2 Explain the law of conservation of energy in a mechanical system in terms of kinetic energy, potential energy and heat. | | |
| SC.3.6.3 Explain work in terms of the relationship among the applied force to an object, the resulting displacement of the object, and the energy transferred to an object. | | |
| SC.3.6.4 Explain the relationship among work, power and simple machines both qualitatively and quantitatively. | | |

| SC.3.7 Energy Conservation and Transfer: Understand the nature of waves. | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.3.7.1 Explain the relationships among wave frequency, wave period, wave velocity, amplitude, and wavelength through calculation and investigation. | | |
| SC.3.7.2 Compare waves (mechanical, electromagnetic, and surface) using their characteristics. | | |
| SC.3.7.3 Classify waves as transverse or compressional (longitudinal). | | |
| SC.3.7.4 Illustrate the wave interactions of reflection, refraction, diffraction, and interference. | | |

| SC.3.8 Energy Conservation and Transfer: Understand electricity and magnetism and their relationship. | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.3.8.1 Summarize static and current electricity. | | |
| SC.3.8.2 Explain simple series and parallel DC circuits in terms of Ohm's law. | | |
| SC.3.8.3 Explain how current is affected by changes in composition, length, temperature, and diameter of wire. | | |
| SC.3.8.4 Explain magnetism in terms of domains, interactions of poles, and magnetic fields. | | |
| SC.3.8.5 Explain the practical application of magnetism. | | |

**ASE SC 4: Environmental, Earth and Space Science – Instructor Checklist**

| **SC.4.1 Earth in the Universe: Explain the Earth's role as a body in space.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.1.1 Describe interactions between earth's systems and living things. | | |
| SC.4.1.2 Explain the Earth's motion through space, including precession, nutation, the barycenter, and its path about the galaxy. | | |
| SC.4.1.3 Explain how the Earth's rotation and revolution about the Sun affect its shape and is related to seasons and tides. | | |
| SC.4.1.4 Explain how the Sun produces energy that is transferred to the Earth by radiation. | | |
| SC.4.1.5 Explain how incoming solar energy makes life possible on Earth. | | |

| **SC.4.2 Earth Systems, Structures and Processes: Explain how processes and forces affect the lithosphere.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.2.1 Describe Earth and its System Components and Interactions. | | |
| SC.4.2.2 Explain how the rock cycle, plate tectonics, volcanoes, and earthquakes impact the lithosphere. | | |
| SC.4.2.3 Predict the locations of volcanoes, earthquakes, and faults based on information contained in a variety of maps. | | |
| SC.4.2.4 Explain how natural actions such as weathering, erosion (wind, water and gravity), and soil formation affect Earth's surface. | | |
| SC.4.2.5 Explain the probability of and preparation for geohazards such as landslides, avalanches, earthquakes and volcanoes in a particular area based on available data. | | |

| **SC.4.3 Earth Systems, Structures and Processes: Understand how human influences impact the lithosphere.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.3.1 Explain the consequences of human activities on the lithosphere (such as mining, deforestation, agriculture, overgrazing, urbanization, and land use) past and present. | | |
| SC.4.3.2 Compare the various methods humans use to acquire traditional energy sources (such as peat, coal, oil, natural gas, nuclear fission, and wood). | | |

| **SC.4.4 Earth Systems, Structures and Processes: Explain the structure and processes within the hydrosphere.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.4.1 Explain how water is an energy agent (currents and heat transfer). | | |
| SC.4.4.2 Explain how ground water and surface water interact. | | |

| **SC.4.5 Earth Systems, Structures and Processes: Evaluate how humans use water.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.5.1 Evaluate human influences on freshwater availability. | | |
| SC.4.5.2 Evaluate human influences on water quality in North Carolina's river basins, wetlands and tidal environments. | | |

**ASE SC 4: Environmental, Earth and Space Science – Instructor Checklist – Page 2**

| **SC.4.6 Earth Systems, Structures and Processes: Understand the structure of and processes within our atmosphere.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.6.1 Summarize the structure and composition of our atmosphere. | | |
| SC.4.6.2 Explain the formation of typical air masses and the weather systems that result from air mass interactions. | | |
| SC.4.6.3 Explain how cyclonic storms form based on the interaction of air masses. | | |
| SC.4.6.4 Predict the weather using available weather maps and data (including surface, upper atmospheric winds, and satellite imagery). | | |
| SC.4.6.5 Explain how human activities affect air quality. | | |

| **SC.4.7 Earth Systems, Structures and Processes: Analyze patterns of global climate change over time.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.7.1 Differentiate between weather and climate. | | |
| SC.4.7.2 Explain changes in global climate due to natural processes. | | |
| SC.4.7.3 Analyze the impacts that human activities have on global climate change (such as burning hydrocarbons, greenhouse effect, and deforestation). | | |
| SC.4.7.4 Attribute changes to Earth's systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc.). | | |

| **SC.4.8 Earth Systems, Structures and Processes: Explain how the lithosphere, hydrosphere, and atmosphere individually and collectively affect the biosphere.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.8.1 Describe Interactions between Earth's Systems and living things. | | |
| SC.4.8.2 Explain how abiotic and biotic factors interact to create the various biomes in North Carolina. | | |
| SC.4.8.3 Explain why biodiversity is important to the biosphere. | | |
| SC.4.8.4 Explain how human activities impact the biosphere. | | |

| **SC.4.9 Earth Systems, Structures and Processes: Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth.** | | |
|---|---|---|
| Objectives | Curriculum – Materials Used | Notes |
| SC.4.9.1 Evaluate alternative energy technologies for use in North Carolina. | | |
| SC.4.9.2 Critique conventional and sustainable agriculture and aquaculture practices in terms of their environmental impacts. | | |
| SC.4.9.3 Explain the effects of uncontrolled population growth on the Earth's resources. | | |
| SC.4.9.4 Evaluate the concept of "reduce, reuse, recycle" in terms of impact on natural resources. | | |

**ASE SC 1: Living Organisms and Ecosystems – Student Checklist**

| **SC.1.1 Structures and Functions of Living Organisms: Understand the relationship between the structures and functions of cells and their organelles.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can correctly label a plant cell. | | |
| I can correctly label an animal cell. | | |
| I can explain the function of each organelle. | | |
| I can use a Venn diagram to compare/contract plant and animal cells. | | |
| I can draw conclusions about the relationship between structure and function by analyzing diagrams of cell organelles. | | |
| I can properly use a light microscope. | | |
| I can calculate for total power magnification when using a light microscope. | | |
| I can categorize cells based on the presence of a nucleus when using a microscope to determine if the cell is prokaryotic or eukaryotic. | | |
| I can distinguish between a plant and animal cell when using a microscope. | | |
| I can explain why a scanning and electron transmission microscope reveals greater detail about eukaryotic and prokaryotic cells. | | |
| I can predict that prokaryotic cells are less complex than eukaryotic cells. | | |
| I can construct a Venn diagram comparing and contrasting prokaryotic and eukaryotic cells. | | |
| I can recognize a specialized cell and determine its function. | | |
| I can define a stem cell. | | |
| I can define a specialized cell. | | |
| I can explain the process of differentiation. | | |
| I understand the role of hormones and receptors. | | |
| I understand the process of nerve cell conduction. | | |
| I can discuss how stem cells are used in the body | | |

| **SC.1.2 Structures and Functions of Living Organisms: Analyze the cell as a living system.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can recognize homeostatic principles in action. | | |
| I can recognize diffusion, facilitated diffusion and osmosis as types of passive transport. | | |
| I can predict movement of particles based on concentration gradient. | | |
| I can recognize that osmosis is the diffusion of water across a semipermeable membrane. | | |
| I can recognize the sodium-potassium pump, endocytosis and exocytosis as types of active transport. | | |
| I can explain that active transport can move particles from a low to high concentration. | | |
| I can explain that active transport uses energy in the form of ATP. | | |
| I can explain the role of the plasma membrane in maintaining homeostasis in the cell. | | |
| I can evaluate the role of the phospholipids and proteins in facilitating cell transport. | | |
| I can determine the direction of water movement in varying concentrations of solutions. | | |
| I can outline the cell cycle. | | |
| I can organize diagrams of the cell cycle. | | |
| I can explain how contractile vacuoles, cilia, flagella, pseudopods and eyespots increase survival for unicellular organisms. | | |
| I can summarize the survival benefits of adaptive behaviors, including chemotaxis and phototaxis. | | |

**ASE SC 1: Living Organisms and Ecosystems – Student Checklist, Page 2**

| **SC.1.3 Ecosystems: Analyze the interdependence of living organisms within their environment.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can recognize the carbon cycle and how it relates to photosynthesis, cellular respiration, decomposition and climate change. | | |
| I can complete a chart of the nitrogen cycle. | | |
| I can conclude from the chart the nitrogen cycle's importance to synthesis of proteins and DNA. | | |
| I can explain the role of nitrogen-fixing bacteria in the nitrogen cycle. | | |
| I can explain how the greenhouse effect and natural environmental processes influence the environment. | | |
| I can debate the human impact on the greenhouse effect. | | |
| I can explain the processes that breakdown matter within an ecosystem. | | |
| I can analyze energy pyramids for direction and efficiency of energy transfer. | | |
| I can explain how organisms adapt to their specifics environments in order to carry out life functions. | | |
| I can compare and contrast using a Venn diagram, autotrophs and heterotrophs and how they breakdown and absorb foods. | | |
| I can analyze behavioral adaptations that help accomplish basic life functions. | | |
| I can identify and describe the different symbiotic relationships. | | |
| I can define pheromones, courtship dances, and territorial defenses. | | |
| I can give examples of organisms that use pheromones, courtship dances, and territorial defenses. | | |
| I can interpret a food web and food chain. | | |
| I can predict the influence of changes to a food web. | | |
| I can compare and contrast exponential growth and logistic growth. | | |
| I can evaluate the limiting factors that can create specific carrying capacities. | | |
| I can interpret human population growth demonstrating birth and death rates and how it influences population size. | | |
| I can explain how diseases disrupt the balance in an ecosystem. | | |

| **SC.1.4 Ecosystems: Understand the impact of human activities on the environment (one generation affects the next).** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can interpret the effect of human activities and how they impact the environment. | | |
| I can evaluate the historical data to determine human effect on global climate. | | |
| I can predict the impact humans have on ecosystems and global climate through current and projected data. | | |
| I can explain the effect that acid rain has on mountain ecosystems. | | |
| I can explain the impact of beach erosion. | | |
| I can explain the impact of urban development of the NC piedmont as it effects habitat destruction and water runoff. | | |
| I can interpret the impact of invasive species. | | |
| I can infer the effects of resource depletion, deforestation, and pesticide use. | | |
| I can trace the path of bioaccumulation. | | |
| I can explore and share ways to contribute to conservation efforts. | | |
| I can propose solutions to environmental problems with emphasis on good stewardship. | | |

**ASE SC 2: Molecular Biology and Genetics – Student Checklist**

| **SC.2.1 Evolution and Genetics: Explain how traits are determined by the structure and function of DNA.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain why the structure of DNA is important to processes such as replication, transcription and translation. | | |
| I can label or develop a model of DNA/phosphate-sugar groups, bases and hydrogen bonds. | | |
| I can explain the base pairing rules (A to T, C to G). | | |
| I can explain how the sequence of DNA bases is important in creating a functional protein. | | |
| I can relate overproduction, underproduction, and production of proteins at incorrect times may be beneficial or detrimental. | | |
| I can define transcription as a process that produces an RNA copy of DNA. | | |
| I can differentiate between the three types of RNA (mRNA, rRNA, tRNA). | | |
| I can diagram and explain the process of translation, including the role of tRNA. | | |
| I can interpret a codon chart to determine an amino acid sequence from a strand of mRNA. | | |
| I can explain that amino acids link to form a polypeptide chain that folds to become a protein and the protein leads to a phenotypic characteristic of the organism. | | |
| I understand that a mutation is a change in DNA. | | |
| I can determine the sequence of effects of mutations. | | |
| I can classify mutations into deletions, additions, and substitutions. | | |
| I can recognize that a change in the amino acid sequence may result in loss of protein function and change in phenotype. | | |

| **SC.2.2 Evolution and Genetics: Understand how the environment, and/or the interaction of alleles, influences the expression of genetic traits.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can recall the process of meiosis and identify the processes occurring in phase diagrams. | | |
| I can illustrate how genes being on separate chromosomes contribute to making unique gametes | | |
| I can explain how the process of meiosis includes independent assortment that allows for greater genetic diversity. | | |
| I can determine sources of genetic variation in sexually reproducing organisms. | | |
| I can evaluate the potential outcome of gene mutations and nondisjunction. | | |
| I can recognize the impact of random fertilization events to allow for unique genetic combinations | | |
| I can distinguish between dominant and recessive traits. | | |
| I can practice genetic problems to determine if a genotype will express the dominant or recessive phenotype. | | |
| I can use a Punnett square to determine genotypic and phenotypic ratios. | | |
| I can use data to determine parental genotypes based on offspring ratios. | | |
| I can examine a karyotype to determine gender and any chromosomal abnormalities. | | |
| I can interpret a variety of intermediate patterns of inheritance. | | |
| I can recognize that some traits are controlled by polygenic inheritance patterns and are identified by the presence of a wide range of phenotypes. | | |

**ASE SC 2: Molecular Biology and Genetics – Student Checklist, Page 2**

| | | |
|---|---|---|
| I can identify the pattern of inheritance of sickle cell anemia, cystic fibrosis, and Huntington's disease. | | |
| I can solve Punnett square problems related to sickle cell anemia, cystic fibrosis and Huntington's disease inheritance patterns. | | |
| I can establish a link between inheritance of Sickle cell anemia and malaria. | | |
| I can solve and interpret codominant crosses involving multiple alleles including blood typing problems. | | |
| I can solve problems involving sex-linked traits (color-blindness and hemophilia). | | |
| I can articulate why males are more likely to express a sex-linked trait. | | |
| I can analyze a pedigree of phenotypes. | | |
| I can construct/interpret pedigrees with appropriate nomenclature. | | |
| I can identify possible cause/effect relationships between environmental factors and gene expression. | | |
| I know that tobacco use can trigger the expression of cancer genes. | | |
| I know that sun exposure can cause genetic mutations that lead to skin cancer. | | |

| **SC.2.3 Evolution and Genetics: Understand the application of DNA technology.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can summarize the process of gel electrophoresis. | | |
| I can compare DNA bands to find similarities between 2 samples. | | |
| I can identify applications of DNA fingerprinting. | | |
| I can identify sources and importance of transgenic organisms in agriculture and medicine.<br>I can explain the process of making insulin using bacteria. | | |
| I can summarize the steps in the process of bacterial transformation. | | |
| I can identify the reasons for establishing the Human Genome Project and list the goals. | | |
| I can explain how the Human Genome Project helps to identify individuals who carry or are affected by disease. | | |
| I can explain treatments (ex. Gene therapy) have been developed because of the efforts of the Human Genome Project. | | |
| I can explain the use of gene therapy in treating genetic diseases. | | |
| I can discuss and debate the benefits and controversies of stem cell research. | | |
| I can discuss and debate the benefits and controversies of genetically modified organisms. | | |
| I can discuss and debate the ethical issues of stem cell research and genetically modified organisms. | | |

| **SC.2.4 Evolution and Genetics: Explain the theory of evolution by natural selection as a mechanism for how species change over time.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can summarize how early conditions affected our first cell development. | | |
| I can discuss the Miller/Urey experiment and its importance in explaining evolutionary condition on early Earth. | | |
| I can summarize how fossil evidence enhances our understanding the evolution of species. | | |
| I can determine the relative age of a fossil based on the strata (rock layers). | | |

**ASE SC 2: Molecular Biology and Genetics – Student Checklist, Page 3**

| | | |
|---|---|---|
| I can interpret what the fossil evidence means in relation to modern day flora and fauna. | | |
| I can infer the biochemical (molecular) evolutionary similarities among present day animals. | | |
| I can create a Venn diagram showing the biochemical similarities of 2 or 3 organisms. | | |
| I can compare DNA similarities between organisms to determine evolutionary relationship. | | |
| I can define homologous structures and discuss their implications in evolutionary relationships. | | |
| I can relate vestigial structures to evolutionary progression. | | |
| I can determine the causes and effects of natural selection. | | |
| I can complete an activity modeling the process of natural selection. | | |
| I can explain mutations and genetic recombination as they relate to natural selection. | | |
| I can predict the role of geographic isolation in speciation. | | |
| I can explain the role of diseases in the various types of natural selection. | | |
| I can discuss the creation of species that are resistant to antibiotics and pesticides. | | |
| I can distinguish between passive and active immunity. | | |
| I can define antivirals and vaccines and discuss their roles in preventing or diminishing outbreaks. | | |

| **SC.2.5 Evolution and Genetics: Analyze how classification systems are developed upon speciation.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can define binomial nomenclature. | | |
| I can properly state scientific names. | | |
| I can recite the hierarchy of classification (using human and other examples). | | |
| I can classify organisms using a dichotomous key. | | |
| I can compare organisms using a phylogenetic tree. | | |

| **SC.2.6 Molecular Biology: Understand how biological molecules are essential to the survival of living organisms.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can compare structure and function of the major biological molecules (carbohydrates, proteins, lipids, and nucleic acids). | | |
| I can recall the sequence of bases in DNA codes for specific amino acids that link to form proteins. | | |
| I can identify the 5 nitrogen bases (A, T, C, G, U). | | |
| I can use the genetic code chart. | | |
| I can summarize the process of protein synthesis. | | |
| I can explain why enzymes and enzyme shape are important. | | |
| I can explain how enzymes speed up chemical reactions by lowering activation energy. | | |
| I can identify properties of enzymes and understand that enzymes are reusable and substrate specific. | | |
| I can determine that factors such as pH and temperature affect an enzyme's shape. | | |

**ASE SC 2: Molecular Biology and Genetics – Student Checklist, Page 4**

| **SC.2.7 Molecular Biology: Analyze the relationships between biochemical processes and energy use in the cell.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how the photosynthesis reaction is $6CO_2 + 6H_20 \rightarrow C_6H_{12}O_6 + 6O_2$. | | |
| I can recognize factors that affect rate of reaction. | | |
| I can explain how the cellular respiration reaction is $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_20$. | | |
| I can differentiate between aerobic and anaerobic respiration. | | |
| I can summarize the way the cell uses energy to maintain homeostasis. | | |

**ASE SC 3: Physical Science – Student Checklist**

| SC.3.1 Forces and Motion: Understand motion in terms of speed, velocity, acceleration, and momentum. | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how frame of reference is important when discussing the speed or velocity of something. | | |
| I can identify distance and displacement as a scalar-vector pair. | | |
| I can use vector and scalar drawings to show that velocity has a direction. | | |
| I can analyze vector/scalar drawings and use the equation v=d/t to find the velocity of an object. | | |
| I can mathematically determine the velocity of a moving object. | | |
| I can solve word problems using the velocity equation v=d/t. | | |
| I can mathematically determine the rate of acceleration of an object. | | |
| I can solve word problems using the acceleration equation a= Δv/t. | | |
| I can analyze a graph and use the information presented to determine the displacement, velocity, or acceleration of an object. | | |
| I can analyze and interpret graph trends relating to velocity and acceleration. | | |
| I can explain how momentum is affected if I change the mass or speed of an object. | | |
| I can explain the relationship between momentum and force and give everyday examples of how force and momentum are related. | | |
| I can properly identify and place the correct units of measure for acceleration and velocity. | | |

| SC.3.2 Forces and Motion: Understand the relationship between forces and motion. | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how weight and mass are different. | | |
| I can calculate the weights of different objects using the weight equation Fg=mg. | | |
| I can explain how with no air resistance the velocity of an object due to gravity is 9.8 $m/s^2$. | | |
| I can explain that terminal velocity is the result of air resistance on an object in free fall. | | |
| I can explain that friction is a force that opposes motion of an object. | | |
| I can demonstrate the different types of friction that may affect the motion of an object. | | |
| I can explore real world examples that demonstrate the relationship between mass and inertia (Newton's 1st Law). | | |
| I can mathematically solve problems showing balanced and unbalanced forces. | | |
| I can illustrate graphically balanced and unbalanced forces. | | |
| I can demonstrate and mathematically show the relationship between mass, force, and acceleration. (Newton's 2nd Law). | | |
| I can solve word problems with F=m x a. | | |
| I can explain that forces always occur in pairs. (Newton's 3rd law). | | |
| I can explain that for every action there is an equal and opposite reaction. | | |
| I can apply real world examples to Newton's 3rd Law. | | |

| SC.3.3 Matter: Understand types, properties, and structure of matter. | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can investigate and classify different samples of matter. | | |
| I can examine a sample of matter and determine whether it is homogenous or heterogeneous. | | |
| I can examine a sample of matter and determine whether it is pure substance or a mixture. | | |
| I can identify the characteristics of a solution, colloid, or suspension by particle size, "settling out"" of one or more components, or interaction of light (Tyndall Effect). | | |

**ASE SC 3: Physical Science – Student Checklist, Page 2**

| | | |
|---|---|---|
| I will identify where metals, nonmetals, and metalloids are located on the periodic table. | | |
| I can look at a chemical formula and identify whether it is an element or a compound. | | |
| I can model or demonstrate the different relationships of particle attraction in solids, liquids, and gases. | | |
| I model or demonstrate the different relationships of particle motion in solids, liquids, and gases. | | |
| I can model or illustrate melting, freezing, vaporization, and condensation. | | |
| I can explain the difference between evaporation and vaporization. | | |
| I can explain why solutions are classified as homogenous mixtures. | | |
| I can explain why a formation of a solution is a physical change. | | |
| I can explain the parts of a solution and determine the solubility. | | |
| I can use a solubility graph to determine the concentration of a solution (saturated, unsaturated, supersaturated). | | |
| I can identify if a solution is diluted or concentrated and classify the solution as saturated, unsaturated, or supersaturated. | | |
| I can calculate density using D=m/V. | | |
| I can analyze and interpret density graphs. | | |
| I can investigate the physical properties of mixtures. | | |
| I can compare the physical and chemical properties of the elements of the periodic table | | |
| I can investigate the physical and chemical properties of common everyday materials. | | |
| I can illustrate the location of protons, electrons, and neutrons. | | |
| I can describe the charge and relative mass of protons, electrons, and neutrons. | | |
| I can calculate the number of protons, electrons, neutrons, and mass for a given atom or ion. | | |
| I can identify and write symbols and isotopic notations for various isotopes, (Carbon-12, C-12, 12C. etc.). | | |
| I can analyze a Bohr model. | | |
| I can illustrate Bohr models of elements 1 to 18 on the Periodic Table. | | |
| I can create and model Lewis-dot diagrams. | | |

| **SC.3.4 Matter: Understand chemical bonding and chemical interactions.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can identify valence electrons, based on their location in Groups 1, 2, and 13-18. | | |
| I can identify oxidation numbers, based on their location in Groups 1, 2, and 13-18, including the elements tin and lead (transition metals). | | |
| I can generalize periodic trends. | | |
| I can compare and contrast ionic, covalent, and metallic bonding. | | |
| I can illustrate different types of bonds using Lewis-dot diagrams. | | |
| I can identify the type of bond shown between elements of a compound. | | |
| I can demonstrate how to name formulas for elements found in Group 1, 2, and 13-18. | | |
| I can name and write formulas for simple compounds containing polyatomic ions. | | |
| I can apply Greek prefixes (mono, di, tri, tetra, etc.), to properly name covalent compounds. | | |
| I can demonstrate how to balance chemical equations. | | |
| I can identify and illustrate the four types of reactions including, synthesis, decomposition, single replacement, and double replacement. | | |
| I can identify combustion reactions. | | |
| I can discuss the properties of several inorganic acids, including hydrochloric (muriatic) acid, sulfuric acid, acetic acid, nitric acid and citric acid. | | |

| | | |
|---|---|---|
| I can recognize common bases. | | |
| I can explain the criteria for a compound to be classified as an Arrhenius acid or base. | | |
| I can identify and classify substances on the pH scale and their characteristics. | | |
| I can illustrate the pH range and scale. | | |
| I can give examples of substance that are acids and bases. | | |
| I can give examples of acids and bases found in household use. | | |
| I can identify the acid, base, and salt in a neutralization reaction. | | |

| **SC.3.5 Matter: Understand the role of the nucleus in radiation and radioactivity.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can identify alpha particles, beta particles, and gamma rays. | | |
| I can compare nuclear decay processes. | | |
| I can compare and contrast fission and fusion. | | |
| I can explain the concept of half-lives. | | |
| I can model half-life. | | |
| I can mathematically perform half-life calculations. | | |

| **SC.3.6 Energy Conservation and Transfer: Understand types of energy, conservation of energy and energy transfer.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how various materials absorb or release thermal energy. | | |
| I can relate phase changes to changes in energy. | | |
| I can explain and diagram real world examples of conduction, convection, and radiation. | | |
| I can demonstrate the law of conservation of energy. | | |
| I can solve word problems identifying W=Fd. | | |
| I can be able to identify the correct displacement from a word problem to solve for work. | | |
| I can analyze work including force, displacement, and energy transfer. | | |
| I can explain the relationship between work and power and the relationship with their associated formulas. | | |
| I can categorize simple machines into 2 categories (lever or inclined plane). | | |
| I can illustrate examples of simple machines and their parts. | | |
| I can identify simple machines in a complex machine. | | |
| I can calculate ideal and actual mechanical advantage using formulas. | | |
| I can explain why no machine has ideal mechanical advantage. | | |
| I can calculate the efficiency of a machine using the efficiency equation. | | |
| I can explain why no machine is 100% efficient. | | |

| **SC.3.7 Energy Conservation and Transfer: Understand the nature of waves.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can illustrate and label parts of the longitudinal wave including: amplitude, rarefaction, and compression. | | |
| I can demonstrate the characteristics of a longitudinal wave through the slinky lab. | | |
| I can explain and demonstrate the concept of the inverse relationship between period and frequency. | | |
| I can explain how velocity, wavelength, and frequency are related. | | |
| I can calculate the velocity of a wave (using the wave velocity equation $V_w=\lambda f$). | | |

| | | |
|---|---|---|
| I can compare and contrast the characteristics of the three main types of waves: mechanical, electromagnetic, and surface waves. | | |
| I can investigate the effect of wave speed, material used, and motion of particles in the production of different wave types. | | |
| I can compare and contrast compressional (longitudinal) and transverse waves. | | |
| I can illustrate reflections and refraction of waves. | | |
| I can compare and contrast wave interference. | | |

| **SC.3.8 Energy Conservation and Transfer: Understand electricity and magnetism and their relationship.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can demonstrate examples of how opposite charges attract and like charges repel. | | |
| I can compare and contrast static electricity and current electricity. | | |
| I can identify simple circuit diagrams. | | |
| I can compare and contrast open and closed circuits. | | |
| I can calculate current, potential difference, and resistance of a circuit using Ohms law. | | |
| I can compare and contrast series and parallel circuits. | | |
| I can explain how properties of the conductor affect the circuit. | | |
| I can describe the behaviors and characteristics of magnetic domains. | | |
| I can explain the attraction of unlike poles and repulsion of like poles. | | |
| I can investigate the properties of a solenoid. | | |
| I can investigate the relationship between the strength of an electromagnet and the variance in number of coils, voltage, and core material. | | |
| I can compare, contrast, and apply the relationship between electricity and magnetism. | | |
| I can explain how generators and motors convert energy. | | |

**ASE SC 4: Environmental, Earth and Space Science – Student Checklist**

| SC.4.1 Earth in the Universe: Explain the Earth's role as a body in space. | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can describe the Big Bang Theory. | | |
| I can describe how the Universe developed after the Big Bang Theory. | | |
| I can identify galaxies, stars, constellations, and solar systems. | | |
| I can describe the stages of the life span of a star. | | |
| I can explain the formation of protostars, their transition to stars, their developmental sequence, and their demise. | | |
| I can explain radiometric dating of rocks and fossils. | | |
| I can explain how the formation of the solar system created the sequence of bodies and the relative motion that defines our solar system. | | |
| I can describe the motions of precession and nutation and their effect on Earth's orbit around the sun. | | |
| I can describe Earth's primary motions relative to those of the solar system and galaxy. | | |
| I can demonstrate how bodies in space both create and are affected by the gravitational attraction of adjacent bodies, resulting in elliptical orbits (motion). | | |
| I can explain barycenter. | | |
| I can explain how the relative motions of the earth, sun, and moon cause ocean tides. | | |
| I can explain the reason that earth has four seasons based on the tilt of the earth's axis of rotation and earth's motion relative to the sun. | | |
| I can relate earth's initial formation to its present day spherical shape. | | |
| I can explain how the sun produces energy which is transferred to the Earth by radiation. | | |
| I can compare and contrast nuclear fusion and fission. | | |
| I can explain the process of energy transference in a star. | | |
| I can explain the equilibrium between gravity and particle motion in the core of a star. | | |
| I can navigate the electromagnetic spectrum and identify features of associated wave energy. | | |
| I can explain how incoming solar energy makes life possible on Earth. | | |

| SC.4.2 Earth Systems, Structures, and Processes: Explain how processes and forces affect the lithosphere. | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can identify atmospheric layers and gases. | | |
| I can discuss effect of atmospheric gases on climate change. | | |
| I can describe characteristics of the ocean and the effects on living things. | | |
| I can explain ocean currents. | | |
| I can explain causes of rock weathering. | | |
| I can identify the Earth's core, mantle, and crust. | | |
| I can relate tectonic plates to volcanoes, earthquakes and the formation of land features. | | |
| I can explain how the rock cycle, plate tectonics, volcanoes, and earthquakes impact the lithosphere. | | |
| I can explain the forces and materials in the rock cycle. | | |
| I can explain how different mechanisms influence plate motion. | | |
| I can demonstrate the locations of volcanoes, earthquakes, and faults based on information contained in a variety of maps. | | |
| I can locate volcanoes in what is known as the "ring of fire" from the world wide web. | | |
| I can describe how the processes of weathering and erosion contribute to the formation of soils. | | |

| | | |
|---|---|---|
| I can describe the differences in physical and chemical weathering. | | |
| I can explain effects of climate on rates of weathering. | | |
| I can describe the common types of mass wasting and the hazards associated with volcanoes, earthquakes, floods, etc. | | |
| I can identify potential geohazards based on text and map data. | | |

| **SC.4.3 Earth Systems, Structures, and Processes: Understand how human influences impact the lithosphere.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can describe the consequences of human activities on the lithosphere focusing on mining, deforestation, agriculture, overgrazing, urbanization, and land use. | | |
| I can identify the sources of energy and their uses, and environmental impacts. | | |

| **SC.4.4 Earth Systems, Structures, Processes: Explain the Structure and Processes within the Hydrosphere.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain the role of water in weather and atmospheric change. | | |
| I can use concepts of fluid density to describe global water movement and ocean currents and their effect in disturbing heat around the globe. | | |
| I can make connections between surface water and groundwater and be able to use the water cycle to illustrate and model those connections. | | |
| I can explain the concepts and dynamics of river systems with examples drawn from North Carolina river systems. | | |
| I can list and describe common methods used to conserve both water quantity and quality. | | |

| **SC.4.5 Earth Systems, Structures, Processes: Evaluate how humans use water.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can list and describe how humans use water, what the effects of overuse are, and the consequences for present and future populations. | | |
| I can understand the role of saltwater and wetlands in aquatic systems. | | |
| I can understand that water is described in terms of both quantity and quality. | | |
| I can describe common sources and types of water pollutants and their impact on surface and groundwater resources. | | |

| **SC.4.6 Earth Systems, Structures, Processes: Understand the structure of and processes within our atmosphere** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can describe Earth's atmosphere and the way it changes as altitude increases. | | |
| I can apply the basic concepts of atmospheric heating, air pressure, and relative humidity to the formation of air masses and movement and interaction of fronts. | | |
| I can describe the main types of severe weather and identify actions to be taken to remain safe during them. | | |
| I can explain how circular storms form based on the interaction of air masses. | | |
| I can interpret simple weather maps and predict future changes in local weather based on weather maps | | |
| I can explain how acid rain is formed and how human activities can alter the pH of rain. | | |
| I can discuss other human activities that impact the quality of atmospheric composition (e.g. aerosols, chlorofluorocarbons, burning, industrial byproducts, over farming, etc.). | | |
| I can illustrate methods to mitigate human impacts on the atmosphere. | | |

**ASE SC 4: Environmental, Earth and Space Science – Student Checklist, Page 3**

| **SC.4.7 Earth Systems, Structures, and Processes: Analyze patterns of global climate change over time.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain the difference between weather and climate. | | |
| I can summarize natural processes that can and have affected global climate (particularly El Nino/La Nina, volcanic eruptions, sunspots, shifts in Earth's orbit, and carbon dioxide fluctuations). | | |
| I can explain how deforestation and the burning of fossil fuels contribute to global climate change. | | |
| I can correlate actions such as deforestation and fossil fuel use to increases in atmospheric greenhouse gas concentration and the impacts of these increases on global temperature and accelerated environmental change in both terrestrial and aquatic systems. | | |

| **SC.4.8 Earth Systems, Structures, and Processes: Explain how the lithosphere, hydrosphere, and atmosphere individually and collectively affect the biosphere.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can describe cycles of matter in living and nonliving things. | | |
| I can discuss renewable versus nonrenewable natural resources. | | |
| I can explain how biotic and abiotic factors determine biome classification. | | |
| I can define the biosphere as all life on Earth. | | |
| I can explain biodiversity including genetic variation within populations and variation of populations within ecosystems that makeup the biosphere. | | |
| I can explain the global impact of loss of biodiversity. | | |
| I can explain effects of human population growth, habitat alteration, introduction of invasive species, pollution and overharvesting on various plant and animal species in NC. | | |
| I can explain effects of invasive nonnative species (plant or animal) on an NC ecosystem. | | |
| I can summarize ways to mitigate human impact on the biosphere. | | |

| **SC.4.9 Earth Systems, Structures, and Processes: Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth.** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can critique the benefits, costs and environmental impact of various alternative sources of energy for North Carolina (solar, wind, biofuels, nuclear fusion, fuel cells, wave power, geothermal). | | |
| I can evaluate which sources of alternative energy may work best in different parts of the state and why. | | |
| I can critique the advantages and disadvantages of traditional agriculture/aquaculture techniques and compare with sustainable agriculture/aquaculture techniques including the economics and environmental impacts in this comparison. | | |
| I can judge potential impact of sustainable techniques on environmental quality (include magnitude, duration, frequency). | | |
| I can define carrying capacity by inferring limiting factors to human population growth and summarizing the impacts of a growing population on the natural resources in North Carolina. | | |
| I can propose the reasons citizens should reduce, recycle, and reuse to reduce the impact on natural resources. | | |

## North Carolina Community College System

## College and Career Readiness

## Adult Secondary Education Content Standards

## Level 5, Grade Levels 9.0 – 12.9

# Social Studies

**ASE SS 1: US History to 1877**

| **SS.1.1 Apply the four interconnected dimensions of historical thinking to the United States History Essential Standards in order to understand the creation and development of the United States over time. AH1.H1** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.1.1.1 Use Chronological Thinking to:<br><br>1. Identify the structure of a historical narrative or story: (its beginning, middle and end)<br>2. Interpret data presented in time lines and create time lines | **The student will know:**<br>• Chronological thinking is the foundation of historical reasoning—the ability to examine relationships among historical events and to explain historical causality.<br>**The student will be able to:**<br>• Deconstruct the temporal structure (its beginning, middle, and end) of various types of historical narratives or stories. Thus, students will be able to think forward from the beginning of an event, problem, or issue through its development, and anticipate some outcome; or to work backward from some issue, problem, or event in order to explain its origins or development over time.<br>• Interpret data presented in time lines and create time lines in order to identify patterns of historical succession (change and historical duration (continuity). | **Chronological Thinking**<br>http://worldhistoryforusall.sdsu.edu/foundations/standard1.php<br><br>http://www.edmondschools.net/Portals/0/docs/SocialStudies/ChronologicalThinking.pdf<br><br>https://www.youtube.com/watch?v=PZbkgWdHlz4 |
| SS.1.1.2 Use Historical Comprehension to:<br><br>1. Reconstruct the literal meaning of a historical passage<br>2. Differentiate between historical facts and historical interpretations<br>3. Analyze data in historical maps<br>4. Analyze visual, literary and musical sources | **The student will know:**<br>• Historical passages are primary sources that provide firsthand testimony or direct evidence concerning a topic under investigation.<br>• Historical narratives are research based stories or accounts that describe or interpret historical events.<br>• Comprehending a historical passage requires that it be read to reveal the humanity of the individuals and groups who lived in the past. What, for example, were their motives and intentions, their values and ideas, their hopes, doubts, fears, strengths, and weaknesses?<br>• Comprehending a historical passage or narrative requires the appreciation for and the development of historical perspective—judging the past in consideration of the historical context in which the events unfolded and not solely in terms of personal and/or contemporary norms and values. How then did the social, political, cultural, or economic world of certain individuals and groups possibly influence their motives and intentions, their values and ideas, their hopes, doubts, fears, strengths, and weaknesses?<br>**The student will be able to:**<br>• Reconstruct the literal meaning of a historical passage by identifying who was involved, what happened, where it happened, what events led to these developments, and what consequences or outcomes followed.<br>• Differentiate between historical facts and historical interpretations but acknowledge that the two are related; that the facts the historian reports are selected and reflect the historian's judgment of what is most significant about the past.<br>• Analyze historical data and sources beyond written passages or narratives in order to clarify, illustrate or elaborate on data presented in historical passages or narratives. This data includes, but is not limited to, historical maps, visual, mathematical, and quantitative data presented in a variety of graphic organizers, photographs, political cartoons, paintings, music and architecture. | **Historical Comprehension**<br>http://worldhistoryforusall.sdsu.edu/foundations/standard2.php<br><br>https://www.youtube.com/watch?v=qvTv8CzfaQ4<br><br>**Mayflower Compact**<br>http://www.ushistory.org/documents/mayflower.htm<br><br>http://www.history.com/topics/mayflower-compact<br><br>**Declaration of Independence**<br>http://www.archives.gov/exhibits/charters/declaration_transcript.html<br><br>http://www.history.com/topics/american-revolution/declaration-of-independence<br><br>**US Constitution**<br>http://www.archives.gov/exhibits/charters/constitution_transcript.html<br><br>http://www.history.com/topics/constitution |

| | | |
|---|---|---|
| | • Analyze excerpts or portions of writings, documents and records that reflect the history of the United States including but not limited to the preamble to the North Carolina Constitution, the Declaration of independence, the United States Constitution, the Mayflower Compact, the national motto, the National Anthem, the Pledge of Allegiance, the writings, speeches, documents, and proclamations of the founding fathers and Presidents of the United States, decisions of the Supreme Court of the United States, and acts of the Congress of the United States, including the published text of the Congressional Record. | |
| SS.1.1.3 Use Historical Analysis and Interpretation to:<br><br>1. Identify issues and problems in the past 2. Consider multiple perspectives of various peoples in the past.<br>2. Analyze cause-and-effect relationships and multiple causation.<br>3. Evaluate competing historical narratives and debates among historians.<br>4. Evaluate the influence of the past on contemporary issues. | **The student will know:**<br>• Historical analysis involves more than a single source. Such an analysis would involve a rich variety of historical documents and artifacts that present alternative voices, accounts, and interpretations or perspectives on the past.<br>• The study of history is subject to an individual's interpretation of past events, issues, and problems. There is usually no one right answer, one essential fact, or one authoritative interpretation that can be used to explain the past.<br>• Historians may differ on the facts they incorporate in the development of their narratives and disagree on how those facts are to be interpreted. Thus, written history is a "dialogue" among historians, not only about what happened but about the historical interpretation of why and how events unfolded.<br>• Historical issues are frequently value-laden and subsequently create opportunities to consider the moral convictions that possibly contributed to those actions taken by individuals and groups in the past.<br>• The past inevitably has a degree of relevance to one's own times.<br>**The student will be able to:**<br>• Identify issues and problems in the past and analyze the interests, values, perspectives, and points of view of those involved in the situation. Consequently, the student will be able to use criteria to judge the past in consideration of the historical context in which the events unfolded and not solely in terms of personal and/or contemporary norms and values.<br>• Consider multiple perspectives of various peoples in the past by demonstrating their differing motives, beliefs, interests, hopes, and fears.<br>• Analyze past events in terms of cause and effect relationships. The student will be able to consider multiple causes of past events by demonstrating the importance of the individual in history; the influence of ideas, human interests, and beliefs; and the role of chance, the accidental and the irrational.<br>• Use specific criteria to critique competing historical interpretations of past events in order to differentiate between expressions of opinion and informed hypotheses grounded in historical evidence.<br>• Use specific criteria to judge the relevance of the past to contemporary events and their own lives through a variety of classroom settings such as debates, simulations, and seminars.<br>• Analyze past events in terms of cause and effect | **Historical Analysis and Interpretation**<br>http://worldhistoryforusall.sdsu.edu/foundations/standard3.php<br><br>https://www.youtube.com/watch?v=HEj8MjQd1K4 |

| | | |
|---|---|---|
| | relationships by using excerpts or portions of writings, documents and records that reflect the history of the United States including but not limited to the preamble to the North Carolina Constitution, the Declaration of independence, the United States Constitution, the Mayflower Compact, the national motto, the National Anthem, the Pledge of Allegiance, the writings, speeches, documents, and proclamations of the founding fathers and Presidents of the United States, decisions of the Supreme Court of the United States, and acts of the Congress of the United States, including the published text of the Congressional Record. | |
| SS.1.1.4 Use Historical Research to:<br><br>1. Formulate historical questions<br>2. Obtain historical data from a variety of sources<br>3. Support interpretations with historical evidence<br>4. Construct analytical essays using historical evidence to support arguments. | **The student will know:**<br>• *Historical inquiry*, the research or investigation of past events, often begins with a historical question. Historical questions typically address "how" and/or "why" past decisions were made, past actions were taken, or past events occurred.<br>• *Historical inquiry*, the research or investigation of past events, requires the acquisition and analysis of historical data and documents beyond the classroom textbook.<br>• *Historical inquiry*, the research or investigation of past events, will allow them to analyze preexisting interpretations, to raise new questions about an historical event, to investigate the perspectives of those whose voices do not appear in the textbook accounts, or to investigate an issue that the textbook largely or in part bypassed.<br>**The student will be able to:**<br>• Formulate historical questions by deconstructing a variety of sources, such as historical narratives and passages, including eyewitness accounts, letters, diaries, artifacts, photos, historical sites, architecture, and other records from the past.<br>• Collect historical data from a variety of sources, to help answer historical questions. These sources include library and museum collections, historic sites, historical photos, journals, diaries, eyewitness accounts, newspapers, and the like: documentary films, oral testimony from living witnesses, censuses, tax records, city directories, statistical compilations, and economic indicators.<br>• Interpret historical data, reconstruct reasoned arguments and draw conclusions using historical evidence collected from a variety of sources.<br>• Create analytical essays that demonstrate historical interpretations, analysis, conclusions, and supporting evidence from a variety of sources. | **Historical Research**<br>http://worldhistoryforusall.sdsu.edu/foundations/standard4.php |

| **SS.1.2 Analyze key political, economic and social turning points in United States History using historical thinking. AH1.H.2** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.1.2.1 Analyze key political, economic, and social turning points from colonization through Reconstruction in terms of causes and effects (e.g., conflicts, legislation, elections, innovations, leadership, movements, | **The student will understand:**<br>• The chronological narrative of a nation can be examined as a series of interconnected historical turning points.<br>• Historical turning points typically have multiple causes and effects within that chronological narrative.<br>• Historical turning points can be considered political, economic and/or social and can derive from a variety of sources such as conflict, legislation, political elections, | **Cause and Effect in American History**<br>http://prezi.com/qsumnmllntmi/cause-and-effect-in-american-history |

| | | |
|---|---|---|
| Supreme Court decisions, etc.). | technological innovations, leadership decisions, social movements or court decisions.<br>**The student will know:**<br>• Historical turning points are key moments from the past which typically occur for multiple reasons and ultimately produce a significant amount of change. | |

| **SS.1.3 Understand the factors that led to exploration, settlement, movement, and expansion and their impact on United States development over time. AH1.H.3** | | |
|---|---|---|
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.1.3.1 Analyze how economic, political, social, military and religious factors influenced European exploration and American colonial settlement (e.g., Reformation, mercantilism, improvements in navigation technology, colonization, defeat of Spanish Armada, Great Awakening, etc.). | **The student will understand:**<br>• Nations and individuals motivated by power, wealth, and adventure may experience exploration and settlement differently.<br>• Individuals and groups are sometimes motivated to relocate and take risks in order to improve their quality of life.<br>• A nation may choose to colonize other regions of the world to expand its economic and political power.<br>**The student will know:**<br>• How the Protestant Reformation impacted European exploration and settlement of North America.<br>• How the global imperial conflict between Britain, France and Spain impacted European exploration and settlement of North America. | **Francis Drake: Defeat of the Spanish Armada**<br>http://en.wikipedia.org/wiki/Francis_Drake#Defeat_of_the_Spanish_Armada<br><br>**Early American Settlements**<br>http://civics.sites.unc.edu/files/2012/05/EarlyAmericanSettlements11.pdf<br><br>**European Exploration of the New World**<br>http://www.history.com/topics/exploration/exploration-of-north-america<br><br>**The Great Awakening**<br>http://en.wikipedia.org/wiki/Great_awakening |
| SS.1.3.2 Explain how environmental, cultural and economic factors influenced the patterns of migration and settlement within the U.S. before the Civil War (e.g., economic diversity of regions, mercantilism, cash crops, triangular trade, ethnic diversity, American Indian beliefs about land ownership, Lewis & Clark expedition, farming, Industrial Revolution, etc.). | **The student will understand:**<br>• Diverse individuals and groups that settle into a particular region shape the cultural identity of that region.<br>• Geographic factors can shape the migration, settlement and cultural development within a region.<br>• Government policy can promote and direct the migration and settlement of people.<br>**The student will know:**<br>• How economic factors influenced the settlement and development of the thirteen English colonies in North America (e.g., enclosure movement, joint-stock companies, head right system, "Triangular" trade and the growth of cash crops, Navigation Acts).<br>• How environmental factors, such as topography, climate variations and disease, influenced the settlement and development of the thirteen English colonies in North America.<br>• How government policies and action influenced the patterns of migration and settlement along the Western frontier (e.g., Land Ordinance of 1785, Northwest Ordinance of 1787, Louisiana Purchase/Lewis and Clark Expedition, Mexican War, Gadsden Purchase, Kansas-Nebraska Act, Homestead Act).<br>• How and to what extent the westward movement and settlement of European colonists and United States citizens impacted the culture and movement of American Indians.<br>• How and to what extent the westward expansion of the United States influenced the spread of slavery.<br>• How and to what extent the Underground Railroad | **Lewis and Clark Expedition Lesson plan**<br>http://civics.sites.unc.edu/files/2012/04/ManifestDestinyLewisClarkExpedition.pdf<br><br>http://www.smithsonianeducation.org/educators/lesson_plans/lewis_clark/index.html<br><br>**Lewis and Clark Expedition PowerPoint**<br>http://civics.sites.unc.edu/files/2012/05/ManifestDestinyLewisClarkPPT.pdf<br><br>**Lewis and Clark Expedition Interactive Lesson**<br>http://www.mnh.si.edu/lewisandclark/index.html?loc=/lewisandclark/home.html |

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| | influenced the migration of slaves to free communities in the North before the Civil War. | |
| SS.1.3.3 Analyze voluntary and involuntary immigration trends through Reconstruction in terms of causes, regions of origin and destination, cultural contributions, and public and governmental response (e.g., Puritans, Pilgrims, American Indians, Quakers, Scotch-Irish, Chinese, Africans, indentured servants, slavery, Middle Passage, farming, ideas of the Enlightenment, etc.). | **The student will understand:**<br>• The development of technology and industry encourages immigration, urban development, and ethnic diversity.<br>• Immigrants are often challenged with economic hardship, poor living conditions and discrimination.<br>• Forces that push or pull various groups of people to move to a particular place or region may factor into the cultural development of that place or region.<br>• Public responses to immigration may influence government policies.<br>**The student will know:**<br>• How and why various religious and/or ethnic groups immigrated to the colonies and the United States (e.g., Puritans, Pilgrims, Quakers, Jews, African slaves, Germans and Irish Catholics).<br>• How indentured servitude worked and the extent to which it impacted the economic, social and political development of various places and regions.<br>• How and why the "triangular trade" promoted the enslavement of 1619 - 1700West Africans in the New World. | **African Slave Trade**<br>http://africanhistory.about.com/od/slavery/tp/TransAtlantic001.htm<br><br>**Indentured Servants**<br>http://www.ushistory.org/us/5b.asp |

| **SS.1.4 Analyze how conflict and compromise have shaped politics, economics and culture in the United States. AH1.H.4** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.1.4.1 Analyze the political issues and conflicts that impacted the United States through Reconstruction and the compromises that resulted (e.g., American Revolution, Constitutional Convention, Bill of Rights, development of political parties, nullification, slavery, states' rights, Civil War). | **The student will understand:**<br>• Political relationships can change and impact the domestic and foreign affairs between people and/or nations.<br>• A government founded on the division of power and authority may endure internal and external debates that can lead to conflict and/or compromise.<br>• A leader's response to contemporary issues can result in political conflict or compromise.<br>• Governmental policies and actions that promote national growth and expansion can create sectional tension and political debate.<br><br>**The student will know:**<br>• To what extent self-government and English colonial policy led to conflict and a desire for independence by the colonists.<br>• How the structure, powers, and authority of a new federal government under the *Articles of Confederation* led to political conflict and their eventual replacement by the *U.S. Constitution.* (Structure of government)<br>• How and to what extent the failure of political compromises over the expansion of slavery contributed to the onset of the Civil War. (Inalienable rights, Equal justice under the law, private property rights, federalism)<br>• How and why Reconstruction ended and how it impacted various groups politically and economically (e.g., scalawags, carpetbaggers and free African Americans). (Free elections in a representative government, inalienable rights, equal justice under the law, private property rights, federalism, due process, individual rights, individual responsibility) | **Declaration of Independence**<br>http://www.apstudynotes.org/us-history/topics/declaration-of-independence/<br><br>**The Revolutionary War**<br>http://www.history.com/topics/american-revolution<br><br>**Articles of Confederation**<br>http://www.ushistory.org/us/14b.asp<br><br>http://www.history.com/topics/articles-of-confederation |

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| SS.1.4.2 Analyze the cultural conflicts that impacted the United States through Reconstruction and the compromises that resulted (e.g., displacement of American Indians, manifest destiny, slavery, assimilation, nativism). | **The student will understand:**<br>• Cultural diffusion may come at the expense of cultural traditions.<br>• Shared experiences among diverse groups may shape national identity.<br>• As nations expand and become more diverse, conflict may arise over cultural differences.<br>**The student will know:**<br>• How British, Spanish and French attempts at empire in North America led to cultural diffusion and conflict between various groups leading up to the American Revolution.<br>• How the institution of slavery impacted the antebellum lives and cultures of those who were enslaved (e.g., the slave trade, plantation division of labor, effects on enslaved women, slave religion and folklore, family life and slave rebellions) and free (e.g. free blacks, plantation owners, southern farmers, northern laborers and western settlers). (Inalienable rights, equal justice under the law, private property rights, due process) | **Indian Removal**<br>http://www.history.com/topics/native-american-history/trail-of-tears<br><br>**Slavery Controversy**<br>http://www.history.com/topics/black-history/slavery<br><br>*Note: This standard clarifies a distinction between social and cultural issues, conflict and compromise. This clarifying objective demonstrates how cultural conflict resulted from the struggle of different individuals and groups to identify with and freely express themselves in a diverse democratic nation.* |

| **SS.1.5 Understand how tensions between freedom, equality and power have shaped the political, economic and social development of the United States. AH1.H.5** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.1.5.1 Summarize how the philosophical, ideological and/or religious views on freedom and equality contributed to the development of American political and economic systems through Reconstruction (e.g., natural rights, First Great Awakening, Declaration of Independence, transcendentalism, suffrage, abolition, "slavery as a peculiar institution", etc.). | **The student will understand:**<br>• Diverse groups of people may have to agree upon shared values and principles in order to form and maintain a viable political and economic system.<br>• A nation may agree on values and principles philosophically, but disagree on the practical political and economic application of those same values and principles.<br>• Governments can be structured in order to address the needs and desires of the governed. (Structure of government)<br>• Leadership can affect societal, economic and political change in order to promote freedom and equality. (Due process)<br>• **The student will know:**<br>• How and to what extent colonial rights and privileges as Englishmen, established in England, influenced the development of colonial political institutions (e.g., the Magna Carta, English Common Law, and the English Bill of Rights). (Inalienable rights)<br>• How, why and to what extent British colonies encouraged religious freedom and tolerance (e.g., Massachusetts Bay, Rhode Island, Virginia, Maryland, and Pennsylvania). (Connections can be made to the eventual creation of the Bill of Rights which recognized basic individual rights)<br>• How British colonists began to express and share ideas about liberty and independence leading up to the American Revolution (e.g., John Dickinson, Samuel Adams, Paul Revere, and Committees of Correspondence). (Inalienable rights)<br>• How and why the northern emancipation of slaves and the southern "peculiar institution" of slavery affected the political and economic systems of the United States. (Federalism, equal justice under the law, rule of law, private property rights, individual rights as set forth in the Bill of Rights, individual responsibility, due process)<br>• How and to what extent the adoption of the 13th, 14th | **Bill of Rights Powerpoint & Lesson Plan**<br>http://civics.sites.unc.edu/files/2012/05/BillofRightsACTIVITY1.pdf<br><br>http://civics.sites.unc.edu/files/2012/10/BillofRights10-11.pdf<br>**Magna Carta**<br>http://www.archives.gov/exhibits/featured_documents/magna_carta/translation.html<br><br>http://www.history.com/topics/british-history/magna-carta<br><br>**Bill of Rights**<br>http://www.history.com/topics/bill-of-rights<br><br>**Reconstruction Amendments: 13th, 14th, and 15th Amendments**<br>http://www.pbs.org/tpt/slavery-by-another-name/themes/reconstruction-amendments/<br><br>http://www.fasttrackteaching.com/burns/Unit_1_Reconstruction/U1_Reconstruction_Amendments.html |

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| | and 15th Amendments to the United States Constitution impacted the freedom and equality of African Americans. (Federalism, equal justice under the law, rule of law, private property rights, individual rights as set forth in the Bill of Rights, individual responsibility, due process, inalienable rights, free elections in a representative government)<br>• How and why the Bill of Rights was added to the United States Constitution. (Federalism, private property rights, individual rights as set forth in the Bill of Rights) | |
| SS.1.5.2 Explain how judicial, legislative and executive actions have affected the distribution of power between levels of government from colonization through Reconstruction (e.g., the Marshall Court, Jacksonian era, nullification, secession, etc.). | **The student will understand:**<br>• Perceptions of power and authority can lead to actual tension and conflict.<br>• The power to govern in a democratic system is divided among different groups which, at times, are at odds with each other over how to best govern.<br>• Leaders can modify the institutions of government in response to the challenges of their time.<br>• The distribution of power and authority may change during times of tension and conflict. (Structure of government, separation of powers with checks and balances)<br>**The student will know:**<br>• How the actions and legislation of the British monarch and Parliament after the French and Indian War led to the American Revolution and independence.<br>• How, why and to what extent the leadership and presidency of George Washington established a stronger national government. (Structure of government, separation of powers with checks and balances)<br>• How, why, and to what extent executive, judicial and legislative decisions may have increased sectional tension within the United States (e.g., the Three-Fifths Compromise, the Alien and Sedition Acts of 1798, the Missouri Compromise, the Tariff of 1828, the Mexican War, the Compromise of 1850, the Fugitive Slave Act, the Kansas-Nebraska Act and the Dred Scott decision). (Structure of government, separation of powers with checks and balances, federalism)<br>• How, why and to what extent the wartime leadership of Abraham Lincoln secured the authority of the national government and increased the power of the U.S. Presidency. (Structure of government, separation of powers with checks and balances, federalism, due process) | **George Washington**<br>http://www.history.com/topics/us-presidents/george-washington<br><br>http://civics.sites.unc.edu/files/2012/05/LeadershipGeorgeDidIt.pdf<br><br>**Abraham Lincoln**<br>http://www.history.com/topics/us-presidents/abraham-lincoln<br><br>**Abraham Lincoln and The Civil War Lesson Plan**<br>http://civics.sites.unc.edu/files/2012/05/AbrahamLincoln.pdf |

| **SS.1.6 Understand how and why the role of the United States in the world has changed over time. AH1.H.6** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.1.6.1 Explain how national economic and political interests helped set the direction of United States foreign policy from independence through Reconstruction (e.g., treaties, embargo, tariffs, Proclamation of Neutrality, Monroe Doctrine, etc.). | **What the student will understand:**<br>• Economic and political interests will guide a nation's foreign policy.<br>• Foreign policy guidelines and international agreements may encourage domestic economic development and enable political security.<br>• Foreign policy decisions may be a source of national pride or sectional tension.<br>**The student will know:**<br>• How, why and to what extent the early republic adhered to a foreign policy of isolationism, and neutrality | **Louisiana Purchase**<br>http://www.history.com/topics/louisiana-purchase<br><br>**Monroe Doctrine**<br>http://www.history.com/topics/monroe-doctrine |

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| | especially in the wake of the French Revolution.<br>• To what extent the Monroe Doctrine secured the nation's dominant economic and political role in the Western Hemisphere.<br>• How various diplomatic treaties/agreements enabled political security and nationalism (e.g., Louisiana Purchase). | |
| SS.1.6.2 Explain the reasons for involvement in wars prior to Reconstruction and the influence each involvement had on international affairs (e.g., French and Indian War, War of 1812, Mexican War, Civil War) | **The student will understand:**<br>• When a nation's economic and/or political interests are threatened it can lead to some degree of participation in war.<br>• Wars and their outcomes are often unsettling and have enduring international consequences for nations and civilians.<br>• Political and popular opinion on war can shift between government policies or thoughts of isolationism, neutrality and interventionism.<br>**The student will know:**<br>• How and why the competition between empirical powers led to colonial involvement in the French and Indian War.<br>• How and why more strict colonial policies by the British government led to colonial discontent, opposition, protest and the American Revolution.<br>• How, why and the extent to which maritime rights and/or territorial expansion led to the War of 1812.<br>• How and why expansionism and a national belief in Manifest Destiny led to the Mexican War.<br>• How, why and the extent to which the United States Civil War was an "irrepressible conflict." (Federalism) | **The French and Indian War**<br>http://www.history.com/topics/french-and-indian-war<br><br>**War of 1812**<br>http://www.history.com/topics/war-of-1812<br><br>**Mexican War**<br>http://www.history.com/topics/mexican-american-war |

| **SS.1.7 Understand the impact of war on American politics, economics, society, and culture. AH1.H.7** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.1.7.1 Explain the impact of wars on American politics through Reconstruction (e.g., Issues of taxation without representation, Proclamation of 1763, Proclamation of Neutrality, XYZ Affair, Alien & Sedition Acts, War Hawks, Hartford Convention, slavery Compromises, scalawags, carpetbaggers, etc.). | **The student will understand:**<br>• War can influence the political decisions and development of participant and neutral nations, and their leaders.<br>• Politicians who support or refute a nation's participation in war can politically benefit or suffer from their stance.<br>• A nation's government and its political leaders often assume more authority during periods of conflict, rebellion or warfare.<br>**The student will know:**<br>• How and to what extent imperial wars between England, Spain and France impacted the development and expectation of self-government in the British North American colonies.<br>• How and why British attempts to exert control over its colonies after the French and Indian War led to violent, organized and successful resistance.<br>• How empirical conflict between Great Britain and France tested the neutrality of the United States.<br>• How and why political leaders crafted sectional compromises following the Mexican War.<br>• How and to what extent the secession of southern states impacted congress and the development of federal policies during the Civil War and Reconstruction. (Federalism) | **Taxation Without Representation**<br>http://www.history.com/this-day-in-history/patrick-henry-voices-american-opposition-to-british-policy<br><br>**Sectionalism**<br>http://www.schooltube.com/video/a5a4b9c865fde8c4787b/Sectionalism-and-Compromise<br><br>See Sectionalism Activities under http://abspd.appstate.edu/teaching-resources US History (Colonial Period to 1877) |

| SS.1.8 Analyze the relationship between progress, crisis and the "American Dream" within the United States. AH1.H.8 | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.1.8.1 Analyze the relationship between innovation, economic development, progress and various perceptions of the "American Dream" through Reconstruction (e.g., inventions, Industrial Revolution, American System, etc.). | **The student will understand:**<br>• Individual risks, aspirations and ingenuity often lead to innovation, economic development and progress.<br>• Governments may create policies that encourage economic growth and development.<br>• Different groups of people may be affected in different ways by economic growth.<br>• Innovation designed to solve problems may result in the creation of new problems.<br>**The student will know:**<br>• How the 17th and early 18th century growth of cash crops, colonial land policies and indentured or enslaved labor led to the economic development of the plantation system and a landed gentry in the South.<br>• How the 17th and early 18th century growth of commerce shipbuilding and commercial agriculture encouraged materialism and economic development in New England.<br>• How the invention of the cotton gin impacted the institution of slavery, as well as the economic development of southern states and the nation.<br>• How, why and to what extent American innovations immediately after the Civil War led to economic development and settlement of the frontier (e.g., barbed wire, farm implements, air brakes and steam turbines). | **Cotton Gin**<br>http://www.history.com/topics/inventions/cotton-gin-and-eli-whitney<br><br>**Industrial Revolution**<br>http://www.history.com/topics/industrial-revolution |
| SS.1.8.2 Explain how opportunity and mobility impacted various groups within American society through Reconstruction (e.g., Lowell and other "mill towns", Manifest Destiny, immigrants/migrants, Gold Rush, Homestead Act, Morrill Act, Exodusters, women, various ethnic groups, etc.). | **The student will understand:**<br>• Opportunity and mobility on behalf of survival, perseverance and self-improvement can have both positive and negative impacts for various groups and their communities.<br>• People often move, despite barriers, when given an opportunity.<br>**The student will know:**<br>• How British colonists persevered in the face of harsh conditions to colonize North America.<br>• How American Indians were impacted by European colonization and the nation's westward expansion. (Private property rights)<br>• How the late 18th century Industrial Revolution and emergence of new technologies in the New England textile industry impacted women and their roles in society (e.g., Lowell Mill Girls and families within the Rhode Island system). (Private property rights, individual rights, equal justice under the law, inalienable rights)<br>• How and to what extent government legislation encouraged westward movement and economic opportunity along the western frontier (e.g., Northwest Ordinance, Louisiana Purchase, American System, Homestead Act, Morrill Act and Indian Removal). (Private property rights, individual rights, equal justice under the law, inalienable rights, frequent and free elections in a representative government)<br>• How and to what extent Republican "scalawags" and "carpetbaggers" benefited from Reconstruction. (Private property rights, individual rights, equal justice under the law, inalienable rights, frequent and free elections in a representative government) | **Manifest Destiny**<br>http://www.history.com/topics/manifest-destiny<br><br>http://www.ushistory.org/us/29.asp<br><br>**Lowell Mills**<br>http://www.youtube.com/watch?v=pkJwOYagvuI<br><br>**Homestead Act**<br>http://www.history.com/topics/homestead-act |

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| SS.1.8.3 Analyze multiple perceptions of the "American Dream" in times of prosperity and crisis through Reconstruction (e.g., Hamilton's Financial Plan, Bank of the United States, Embargo of 1807, Manifest Destiny, phases of Reconstruction, etc.). | **The student will understand:**<br>• An individual or group's perceptions of themselves, their country, and their place within a society may be influenced by times of prosperity and crisis.<br>**The student will know:**<br>• How explorers and colonists justified their risks and perseverance in exploring and settling the "New World" (e.g., John Smith's The Generall Historie of Virginia, John Winthrop's "City upon a Hill", Roger Williams, Anne Hutchinson and William Penn).<br>• How American Indians fought, appealed and made concessions at times of colonial encroachment and national expansion (e.g., Pequot War, Seneca Chief Cornplanter's address to George Washington, Elias Boudinot and the Trail of Tears). (Private property rights)<br>• How and why colonists declared and gained independence from Great Britain (e.g., James Otis and The Rights of the British Colonists Asserted, John Dickinson and Letters of a Pennsylvania Farmer, Thomas Paine and Common Sense, Thomas Jefferson and The Declaration of Independence). (Inalienable rights)<br>• How politicians, opportunists and/or activists either defended or protested expansionism and Manifest Destiny (e.g., James K. Polk, John L. O'Sullivan and Henry David Thoreau.) (Inalienable rights, property rights, individual responsibility) How southerners and politicians defended state's rights, slavery, and the idea of nullification at times of sectional tension and political debate (e.g., Virginia and Kentucky Resolutions, John C. Calhoun, George Fitzhugh and South Carolina Exposition and Protest). (Inalienable rights, property rights, federalism, individual responsibility)<br>• How slaves and freedmen reacted to the proposition that "all men are created equal" during the era of African American slavery (e.g., Narrative of the Life of Frederick Douglass, "Ain't I a Woman", Phyllis Wheatley, Harriet Jacobs and Nat Turner). (Inalienable rights)<br>• How women reacted to the promise that "all men are created equal" in the absence of gender rights (e.g., Abigail Adams correspondence to John Adams, The Declaration of Sentiments, Sarah and Angelina Grimke). (Inalienable rights)<br>• How American leaders, reformers and activists struggled to give greater meaning to the proposition that "all men are created equal" (e.g., Henry David Thoreau and "Civil Disobedience", Frederick Douglass and "What to a Slave is the Fourth of July?" and Abraham Lincoln and the Gettysburg Address). (Inalienable rights, property rights, equal justice under the law, individual responsibility) | **Thomas Jefferson**<br>http://www.history.com/topics/us-presidents/thomas-jefferson<br><br>**The Indian Removals**<br>http://www.ushistory.org/us/24f.asp<br><br>**What to a Slave is the Fourth of July?**<br>https://brainmass.com/file/1385559/Douglass_July_4_1852.pdf<br><br>**Gettysburg Address**<br>http://www.history.com/topics/american-civil-war/gettysburg-address |

| **SS.2.1 Apply the four interconnected dimensions of historical thinking to the American History Essential Standards in order to understand the creation and development of the US over time. Concept(s): Historical Thinking. USH2.H.1** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.2.1.1 Use Chronological Thinking to:<br>1. Identify the structure of a historical narrative or story: (its beginning, middle and end)<br>2. Interpret data presented in time lines and create time lines | **The student will know:**<br>• Chronological thinking is the foundation of historical reasoning—the ability to examine relationships among historical events and to explain historical causality.<br>**The student will be able to do:**<br>• Deconstruct the temporal structure (its beginning, middle, and end) of various types of historical narratives or stories. Thus, students will be able to think forward from the beginning of an event, problem, or issue through its development, and anticipate some outcome; or to work backward from some issue, problem, or event in order to explain its origins or development over time.<br>• Interpret data presented in time lines in order to identify patterns of historical succession (change) and historical duration (continuity).<br>• Create time lines to record events according to the temporal order in which they occurred and to reconstruct patterns of historical succession and duration. | **Chronological Thinking**<br>http://worldhistoryforusall.sdsu.edu/foundations/standard1.php<br><br>http://www.edmondschools.net/Portals/0/docs/SocialStudies/ChronologicalThinking.pdf<br><br>https://www.youtube.com/watch?v=PZbkgWdHlz4 |
| SS.2.1.2 Use Historical Comprehension to:<br>1. Reconstruct the literal meaning of a historical passage<br>2. Differentiate between historical facts and historical interpretations<br>3. Analyze data in historical maps<br>4. Analyze visual, literary and musical sources | **The student will know:**<br>• Historical passages are primary sources that provide firsthand testimony or direct evidence concerning a topic under investigation.<br>• Historical narratives are research based stories or accounts that describe or interpret historical events.<br>• Comprehending a historical passage requires that it be read to reveal the humanity of the individuals and groups who lived in the past. What, for example, were their motives and intentions, their values and ideas, their hopes, doubts, fears, strengths, and weaknesses?<br>• Comprehending a historical passage or narrative requires the appreciation for and the development of historical perspective—judging the past in consideration of the historical context in which the events unfolded and not solely in terms of personal and/or contemporary norms and values. How then did the social, political, cultural, or economic world of certain individuals and groups possibly influence their motives and intentions, their values and ideas, their hopes, doubts, fears, strengths, and weaknesses?<br>**The student will be able to do:**<br>• Reconstruct the literal meaning of a historical passage by identifying who was involved, what happened, where it happened, what events led to these developments, and what consequences or outcomes followed.<br>• Differentiate between historical facts and historical interpretations but acknowledge that the two are related; that the facts the historian reports are selected and reflect the historian's judgment of what is most significant about the past.<br>• Analyze historical data and sources beyond written passages or narratives in order to clarify, illustrate or elaborate on data presented in historical passages or narratives. This data includes historical maps.<br>• Analyze historical data and sources beyond written passages or narratives in order to clarify, illustrate or | **Historical Comprehension**<br>http://worldhistoryforusall.sdsu.edu/foundations/standard2.php<br><br>https://www.youtube.com/watch?v=qvTv8CzfaQ4 |

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| | elaborate on data presented in historical passages or narratives. This data includes, but is not limited to, visual, mathematical, and quantitative data presented in a variety of graphic organizers, photographs, political cartoons, paintings, music and architecture. | |
| SS.2.1.3 Use Historical Analysis and Interpretation to:<br>1. Identify issues and problems in the past Consider multiple perspectives of various peoples in the past.<br>2. Analyze cause-and-effect relationships and multiple causation.<br>3. Evaluate competing historical narratives and debates among historians.<br>4. Evaluate the influence of the past on contemporary issues. | **The student will know:**<br>• Historical analysis involves more than a single source. Such an analysis would involve a rich variety of historical documents and artifacts that present alternative voices, accounts, and interpretations or perspectives on the past.<br>• The study of history is subject to an individual's interpretation of past events, issues, and problems. There is usually no one right answer, one essential fact, or one authoritative interpretation that can be used to explain the past.<br>• Historians may differ on the facts they incorporate in the development of their narratives and disagree on how those facts are to be interpreted. Thus, written history is a "dialogue" among historians, not only about what happened but about the historical interpretation of why and how events unfolded.<br>• Historical issues are frequently value-laden and subsequently create opportunities to consider the moral convictions that possibly contributed to those actions taken by individuals and groups in the past.<br>• The past inevitably has a degree of relevance to one's own times.<br>**The student will be able to do:**<br>• Identify issues and problems in the past and analyze the interests, values, perspectives, and points of view of those involved in the situation. Consequently, the student will be able to use criteria to judge the past in consideration of the historical context in which the events unfolded and not solely in terms of personal and/or contemporary norms and values.<br>• Consider multiple perspectives of various peoples in the past by demonstrating their differing motives, beliefs, interests, hopes, and fears.<br>• Analyze past events in terms of cause and effect relationships. The student will be able to consider multiple causes of past events by demonstrating the importance of the individual in history; the influence of ideas, human interests, and beliefs; and the role of chance, the accidental and the irrational.<br>• Use specific criteria to critique competing historical interpretations of past events in order to differentiate between expressions of opinion and informed hypotheses grounded in historical evidence.<br>• Use specific criteria to judge the relevance of the past to contemporary events and their own lives through a variety of classroom settings such as debates, simulations, and seminars. | **Historical Analysis and Interpretation**<br>http://worldhistoryforusall.sdsu.edu/foundations/standard3.php<br><br>https://www.youtube.com/watch?v=HEj8MjQd1K4 |
| SS.2.1.4 Use Historical Research to:<br>1. Formulate historical questions<br>2. Obtain historical data from a variety of sources<br>3. Support | **The student will know:**<br>• Historical inquiry, the research or investigation of past events, often begins with a historical question. Historical questions typically address "how" and/or "why" past decisions were made, past actions were taken, or past events occurred.<br>• Historical inquiry, the research or investigation of past events, requires the acquisition and analysis of historical | **Historical Research**<br>http://worldhistoryforusall.sdsu.edu/foundations/standard4.php |

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| interpretations with historical evidence<br>4. Construct analytical essays using historical evidence to support arguments. | data and documents beyond the classroom textbook.<br>• Historical inquiry, the research or investigation of past events, will allow them to analyze preexisting interpretations, to raise new questions about an historical event, to investigate the perspectives of those whose voices do not appear in the textbook accounts, or to investigate an issue that the textbook largely or in part bypassed.<br>**The student will be able to do:**<br>• Formulate historical questions by deconstructing a variety of sources, such as historical narratives and passages, including eyewitness accounts, letters, diaries, artifacts, photos, historical sites, art, architecture, and other records from the past.<br>• Collect historical data from a variety of sources, to help answer historical questions.<br>• These sources include library and museum collections, historic sites, historical photos, journals, diaries, eyewitness accounts, newspapers, and the like; documentary films, oral testimony from living witnesses, censuses, tax records, city directories, statistical compilations, and economic indicators.<br>• Interpret historical data, construct reasoned arguments and draw conclusions using historical evidence collected from a variety of sources.<br>• Create analytical essays that demonstrate historical interpretations, analysis, conclusions, and supporting evidence from a variety of sources. | |

| **SS.2.2 Analyze key political, economic and social turning points in American History using historical thinking. Concept(s): Turning Points, Historical Thinking. USH2.H.2** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.2.2.1 Analyze key political, economic, and social turning points since the end of Reconstruction in terms of causes and effects (e.g., conflicts, legislation, elections, innovations, leadership, movements, Supreme Court decisions, etc.). | **The student will understand:**<br>• The chronological narrative of a nation can be examined as a series of interconnected historical turning points.<br>• Historical turning points typically have multiple causes and effects within that chronological narrative.<br>• Historical turning points can be considered political, economic, and or/social and can derive from a variety of sources such as conflict, legislation, political elections, technological innovations, leadership decisions, social movements or court decisions.<br>**The student will know:**<br>• Historical turning points are key moments from the past which typically occur for multiple reasons and ultimately produce a significant amount of change. | **Turning Points in US History**<br>http://delasalle.mpsedu.org/uploads/turning_points_in_us_history.ppt |
| SS.2.2.2 Evaluate key turning points since the end of Reconstruction in terms of their lasting impact (e.g., conflicts, legislation, elections, innovations, leadership, movements, Supreme Court decisions, etc.). | **The student will understand:**<br>• The chronological narrative of a nation can be examined as a series of interconnected historical turning points.<br>• Turning points may have impacts over large periods of time and relevance to contemporary events, problems and issues.<br>• The interpretation of historical turning points and their impacts are subject to the criteria by which they are judged.<br>**The student will know:**<br>• Historical turning points are key moments from the past which typically occur for multiple reasons and ultimately produce a significant amount of change. | |

| **SS.2.3 Understand the factors that led to exploration, settlement, movement, and expansion and their impact on US development over time. Concept(s): Exploration, Settlement, Movement, Expansion. USH2.H.3** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.2.3.1 Analyze how economic, political, social, military and religious factors influenced US imperialism (e.g., passing of the western frontier, new markets, Spanish-American War, Open Door Policy, Monroe Doctrine, Roosevelt Corollary, canal route, etc.). | **The student will understand:**<br>• Industrialization and technological innovations in some countries and not others can change the global distribution of power and authority.<br>• International competition for political and military control over limited resources, such as land and water, can lead to open conflict.<br>• Cultural differences often lead to misguided beliefs about the inferiority and/or superiority of certain groups.<br>• A powerful nation founded on democratic principles, such as freedom and equality, can sometimes infringe on the principles of other people and nations in order to improve its own status.<br>• Successful displays of national power typically create a more patriotic populace.<br>• Strong leaders can change the direction of a nation's foreign policy.<br>**The student will know:**<br>• How the desire for new trade markets by industrialized countries like England, Germany, Russia, Japan and the US impacted the distribution of global power and authority at the onset of the 20th Century.<br>• How and why the US became involved in the Spanish-American War and the implications of that war on American foreign policy.<br>• How US Presidents and their administrations developed and implemented imperial foreign policy strategies.<br>• How the leaders and citizens of other nations reacted to the expansion of US power and influence within their countries and others (e.g., Cubans, Puerto Ricans, Hawaiians and Filipinos). | **US Imperialism: Crash Course**<br>https://www.youtube.com/watch?v=QfsfoFqsFk4<br><br>**US Imperialism: Lesson Plans**<br>http://sheg.stanford.edu/?q=node/33 |
| SS.2.3.2 Explain how environmental, cultural and economic factors influenced the patterns of migration and settlement within the US since the end of Reconstruction (e.g., gold rush, destruction of the buffalo, reservations, ethnic neighborhoods, etc.). | **The student will understand:**<br>• Individuals and groups are sometimes motivated to relocate and take risks in order to improve their quality of life.<br>• Diverse individuals and groups who settle into a particular region shape the cultural identity of that region.<br>• Geographic factors can shape the migration, settlement and cultural development within a region.<br>• Government policy can promote and direct the migration and settlement of people.<br>**The student will know:**<br>• How and why the birth of the cattle industry led to the era of the American cowboy and new patterns of migration and settlement in the southwestern US.<br>• How and why aridity, availability of land and new land laws influenced the westward migration and settlement of various groups, such as homesteaders and "sodbusters".<br>• How American Indians were pushed to the Great Plains and forced to settle on reservations. | **The Wild West**<br>http://www.pbs.org/wgbh/americanexperience/features/timeline/wild-west/ |
| SS.2.3.3 Explain the roles of various racial and ethnic groups in settlement and expansion since Reconstruction and the consequences for | **The student will understand:**<br>• Individuals and groups willing to take risks can influence the settlement and expansion of a nation.<br>• While expansion and settlement may offer opportunities for various groups, it may also limit opportunities due to discrimination and racism | **Westward Expansion Impact on Native Americans**<br>http://www.fallriverschools.org/Westward_Expansion_Impact_on_American_Indians.pdf |

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| those groups (e.g., American Indians, African Americans, Chinese, Irish, Hispanics and Latino Americans, Asian Americans, etc.). | **The student will know:**<br>• How westward settlement and expansion impacted various ethnic groups during the 19th Century (e.g., African American, Asians, Hispanics and American Indians).<br>• How westward settlement and expansion impacted the roles of women, their contributions and relationships. | |
| SS.2.3.4 Analyze voluntary and involuntary immigration trends since Reconstruction in terms of causes, regions of origin and destination, cultural contributions, and public and governmental response (e.g., new immigrants, ports of entry, ethnic neighborhoods, settlement houses, immigration restrictions, etc.). | **The student will understand:**<br>• The development of technology and industry encourages immigration, urban development, and ethnic diversity.<br>• Immigrants are often challenged with economic hardship, poor living conditions and discrimination.<br>• Diverse groups of immigrants can contribute to the cultural, social, economic and political development of a nation.<br>**The student will know:**<br>• Why and how various national, cultural, and/or ethnic groups decided to immigrate to the US at specific times since Reconstruction (e.g. Eastern and Southern Europeans from 1900-1920, Asians and Latin Americans from 1970-2010).<br>• How the "huddled masses" of "new" immigrants were processed at ports of entry such as Ellis Island and Angel Island, and how that process impacted the lives and cultural contributions of immigrants to the US.<br>• How traditional nativist attitudes impacted various groups of immigrants and the cultural development of the US (e.g., Italians, Roman Catholics, Chinese, Mexican and Muslim)<br>• How various federal immigration laws affected specific groups of immigrants since Reconstruction (e.g., Chinese Exclusion Act of 1882, Immigration Quota Act of 1924 and Immigration Act of 1965). | **Chinese Exclusion Act**<br>https://www.slideshare.net/MrsHeller/chinese-exclusion-act-5829709<br><br>**Encyclopedia of North American Immigration**<br>http://www.slideshare.net/wanville/encyclopedia-of-north-american-immigration<br><br>**Immigration to US Ellis Island**<br>http://www.slideshare.net/jredeker/immigration-to-us-ellis-island |

| **SS.2.4 Analyze how conflict and compromise have shaped politics, economics and culture in the US. Concept(s): Conflict, Compromise. USH2.H.4** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.2.4.1 Analyze the political issues and conflicts that impacted the US since Reconstruction and the compromises that resulted (e.g., Populism, Progressivism, working conditions and labor unrest, New Deal, Wilmington Race Riots, Eugenics, Civil Rights Movement, Anti-War protests, Watergate, etc.). | **The student will understand:**<br>• Political relationships can change and impact the domestic and foreign affairs between people and/or nations.<br>• A government founded on the division of power and authority may endure internal and external debates that can lead to conflict and/or compromise.<br>• A leader's response to contemporary issues can result in political conflict or compromise.<br>• Governmental policies and actions that promote national growth and expansion can create sectional tension and political debate.<br>**The student will know:**<br>• How African Americans were disenfranchised after Reconstruction and subjected to "Jim Crow" segregation laws.<br>• How late 19th Century civil service reform and regulatory laws of the national government impacted American politics and industry (e.g., Pendleton Civil Service Act of 1883, Interstate Commerce Act of 1887 and Sherman Anti-Trust Act of 1890)<br>• How and why progressivism emerged in American politics | **Jim Crow**<br>http://www.pbs.org/wnet/jimcrow/<br><br>**Plessy v. Ferguson**<br>http://www.pbs.org/wnet/jimcrow/stories_events_plessy.html<br><br>**FDR and the New Deal: Lesson Plans and Powerpoint**<br>http://civics.sites.unc.edu/files/2012/05/NewDeal11.pdf<br><br>**Brown v Board of Education**<br>http://www.pbs.org/wnet/supremecourt/rights/landmark_brown.html<br><br>**The Vietnam War**<br>http://www.ushistory.org/us/55.asp<br><br>**The Anti-War Movement**<br>http://www.ushistory.org/us/55d.asp |

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| | at the beginning of the 20th Century and in what ways governments at all levels became more democratic, efficient, and regulatory, as well as, greater advocates for social justice.<br>• How Franklin D. Roosevelt delivered a "New Deal" to the American people that aimed to ease the effects of the depression through government programs and agencies that provided direct government relief, recovery and reform.<br>• How and why the New Deal and some of its agencies and programs were opposed by a variety of individuals and groups (e.g., U.S. Supreme Court, Huey Long, Francis Townshend and Charles Coughlin)<br>• How executive, legislative and judicial decisions of the federal government impacted the direction and outcome of the African American civil rights movement (e.g. *Plessy v. Ferguson, Brown v. Board of Education*, Executive Order 9981, the Civil Rights Act of 1964, the Voting Rights Act of 1965 and the Civil Rights Act of 1968.<br>• How and why the Watergate burglary led to a cover up by President Richard Nixon and his staff, a Congressional investigation, and the first resignation of a US president. | **Watergate**<br>http://www.history.com/topics/watergate |
| SS.2.4.2 Analyze the economic issues and conflicts that impacted the US since Reconstruction and the compromises that resulted (e.g., currency policy, industrialization, urbanization, laissez-faire, labor unrest, New Deal, Great Society, supply-side economics, etc.). | **The student will understand:**<br>• Relationships between individuals, groups and nations may change as economic circumstances change.<br>• A nation's economic development often varies by region which often leads to sectional interests.<br>• While a nation's economic policies may encourage national growth, these policies may also lead to sectional tensions.<br>• As a nation prospers and grows, economic opportunities may increase for some individuals and groups, while decreasing for others.<br>• An economy's cyclical nature may challenge individuals, groups and a nation.<br>**The student will know:**<br>• How and why southern tenant farming and sharecropping developed and how both led to cultural and economic stagnation in much of the South.<br>• How and why the US became more industrial and urban during the 19th Century and to what extent rapid urban and industrial development produced widespread poverty and poor working conditions (e.g., poor sanitation, threat of fires and conditions of tenements, Triangle Shirtwaist Fire).<br>• How and why "robber barons" or "captains of industry" took risks and to what extent their enterprise impacted the distribution of wealth in American society.<br>• How and why the Great Depression occurred in the US and the extent to which it affected the livelihood and fortunes of various Americans. | **The Great Depression**<br>http://www.ushistory.org/us/48.asp<br><br>http://civics.sites.unc.edu/files/2012/04/GreatDepression.pdf<br><br>http://civics.sites.unc.edu/files/2012/04/GreatDepressionPPT.pdf<br><br>**Sharecropping**<br>http://civics.sites.unc.edu/files/2012/05/SharecroppingPPT.pdf |
| SS.2.4.3 Analyze the social and religious conflicts, movements and reforms that impacted the US since Reconstruction in terms of participants, strategies, opposition, and results (e.g., Prohibition, Social Darwinism, Eugenics, anti- | **The student will understand:**<br>• The desire for self-improvement and the common good can influence people to reform themselves and society.<br>• Movements for change and reform often become necessary when the relationship between a nation and its ideals are conflicting.<br>• Reform movements require the leadership and participation of various individuals and groups.<br>• The strategies used to achieve reform produce varying | **Civil Rights Movement**<br>http://www.ushistory.org/us/54.asp<br><br>**Rosa Parks**<br>http://www.ushistory.org/us/54b.asp<br><br>**Freedom Rides of 1961: Lesson Plans and Power Points**<br>http://civics.sites.unc.edu/files/2012/ |

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| war protest, etc.). | degrees of success and opposition.<br>**The student will know:**<br>• How and why labor unions formed during the 19th Century and to what extent their leadership bred opposition and results (e.g., Knights of Labor and Terrence Powderly, AFL and Samuel Gompers, American Railway Union and Eugene V. Debs, United Mine Workers and "Mother" Jones).<br>• How and why prohibition became "the law of the land" and why it was later repealed.<br>• How and why progressivism emerged in American societies at the beginning of the 20th Century and how leaders of the movement advocated for social justice.<br>• How and to what extent various civil rights events and movements successfully tested segregation and gained greater equality for different groups of Americans (e.g., the Greensboro Sit-Ins, the Montgomery Bus-Boycotts, and Freedom Rides). | 05/FreedomRides1.pdf<br><br>http://civics.sites.unc.edu/files/2012/05/FreedomRidesPPT1.pdf<br><br>**Greensboro Sit-in Lesson Plans and Powerpoints**<br>https://database.civics.unc.edu/files/2012/04/GreensboroSitInsCounterRevolution1.pdf<br><br>http://civics.sites.unc.edu/files/2012/04/GreensboroSitInsCounterRevolutionPPT.pdf |
| SS.2.4.4 Analyze the cultural conflicts that impacted the US since Reconstruction and the compromises that resulted (e.g., nativism, Back to Africa movement, modernism, fundamentalism, black power movement, women's movement, counterculture, Wilmington Race Riots, etc.). | **The student will understand:**<br>• Cultural diffusion may come at the expense of cultural traditions.<br>• Cultural diversity derived from religious, ethnic, geographic and class difference may create conflict.<br>• Shared experiences among diverse groups may shape national identity.<br>• Art, literature and music often reflect a region or nation's interests, values and conflicts.<br>• As nations expand and become more diverse, conflict may arise over cultural differences.<br>• Cultural development and differences sometimes lead to open rebellion and/or war.<br>**The student will know:**<br>• How and to what extent African Americans were disenfranchised after Reconstruction and subjected to "Jim Crow" segregation laws.<br>• How women's rights activists and organizations used various approaches to overcome internal division within the movement and secure universal suffrage for women with the Nineteenth Amendment.<br>• How and in what ways defenders of tradition reacted to modern thought and rapid change in American society of the 1920s (e.g., nativism and the Sacco and Vanzetti case, rise in fundamentalism and the Scopes Monkey Trial, Ku Klux Klan, Prohibition, eugenics).<br>• How, why and to what extent American culture was "conforming" during the 1950s and how conformity helped produce an American counterculture (e.g., corporate life, a cult of domesticity, consumerism, Levittowns and beatniks).<br>• How and why a youth culture driven by consumerism, delinquency, and rock-n-roll music emerged after World War II and impacted American society. | **Women's Suffrage**<br>http://www.history.com/topics/womens-history/the-fight-for-womens-suffrage<br><br>**The Roaring 20s: Websites, Lesson Plans, Teacher Guides.**<br>http://www.besthistorysites.net/index.php/american-history/1900/roaring-20s#lesson<br><br>**Wilmington Race Riots: Lesson Plans and Powerpoint**<br>http://civics.sites.unc.edu/files/2013/05/1898Crow.pdf<br>http://civics.sites.unc.edu/files/2013/05/1898CROWppt.pdf |

| **SS.2.5 Understand how tensions between freedom, equality and power have shaped the political, economic and social development of the US. Concept(s): Freedom, Equality, Power. USH2.H.5** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.2.5.1 Summarize how the philosophical, ideological and/or religious views on freedom | **The student will understand:**<br>• Diverse groups of people may have to agree upon shared values and principles in order to form and maintain a | **The Gilded Age: Websites, Lesson Plans, Teacher Guides.**<br>https://www.besthistorysites.net/ind |

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| and equality contributed to the development of American political and economic systems since Reconstruction (e.g., "separate but equal", Social Darwinism, social gospel, civil service system, suffrage, Harlem Renaissance, the Warren Court, Great Society programs, American Indian Movement, etc.). | viable political and economic system.<br>• A nation may agree on values and principles philosophically, but disagree on the practical political and economic application of those same values and principles.<br>• Governments can be structured in order to address the needs and desires of the governed.<br>• Leadership can affect societal, economic and political change in order to promote freedom and equality.<br>**The student will know:**<br>• How and why the adoption of the 14th Amendment to the US Constitution and its interpretation impacted the equality of various groups during the 20th Century.<br>• How and why the philosophy of Social Darwinism emerged and how the notion of "the survival of the fittest" impacted the development of American industry, government policies and social customs during the Gilded Age.<br>• How the fight for universal women's suffrage culminated with the adoption of the 19th Amendment and how the vote of women impacted the 20th Century American government and economics.<br>• How the Harlem Renaissance raised awareness of issues affecting the lives of African Americans in the 1920s through various forms of expression such as literature, art, music and drama.<br>• How and why President Lyndon Johnson addressed issues of social and racial injustice through direct government intervention and the programs of the Great Society; and the effects of such intervention on American politics and economics. | ex.php/american-history/1800/gilded-age<br><br>**Harlem Renaissance**<br>http://www.biography.com/people/groups/movement-harlem-renaissance#image-harlem-renaissance-figures-8-raw<br><br>**Lyndon Johnson's Great Society**<br>http://www.ushistory.org/us/56e.asp<br><br>**Warren Court Decisions**<br>http://www.socialstudieshelp.com/lesson_106_notes.htm |
| SS.2.5.2 Explain how judicial, legislative and executive actions have affected the distribution of power between levels of government since Reconstruction (e.g., New Deal, Great Society, Civil Rights, etc.). | **The student will understand:**<br>• Perceptions of power and authority can lead to actual tension and conflict.<br>• The power to govern in a democratic system is divided among different groups which at times are at odds with each other over how to best govern.<br>• Leaders can modify the institutions of government in response to the challenges of their time.<br>• The distribution of power and authority may change during times of tension and conflict.<br>**The student will know:**<br>• How and why President Franklin Roosevelt attempted to "pack" the US Supreme Court and how the attempt affected the New Deal and the balance of power between the executive and judicial branches of government.<br>• How and why US involvement in the Vietnam War influenced the presidency of Lyndon Johnson and his relationship with the US Congress. | **Franklin Roosevelt: Court Packing**<br>http://www.pbs.org/wgbh/amexperience/features/general-article/fdr-presidential<br><br>**Franklin Roosevelt: Separation of Powers**<br>http://www.archives.gov/education/lessons/separation-powers<br><br>**Lyndon Johnson and the Vietnam War**<br>http://www.historylearningsite.co.uk/johnson_vietnam.htm |

| **SS.2.6 Understand how and why the role of the US in the world has changed over time. Concept(s): International Affairs, Foreign Policy** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.2.6.1 Explain how national economic and political interests helped set the direction of US foreign policy since Reconstruction (e.g., new markets, isolationism, neutrality, containment, | **The student will understand:**<br>• Economic and political interests will guide a nation's foreign policy<br>• Foreign policy guidelines and international agreements may encourage domestic economic development and enable political security.<br>• Foreign policy decisions may be a source of national pride | **US Becomes a World Power**<br>http://www.loc.gov/teachers/classroommaterials/primarysourcesets/spanish-american-war/pdf/teacher_guide.pdf<br><br>**Woodrow Wilson** |

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| homeland security, etc.). | or tension.<br>**The student will know:**<br>• How and to what extent international trade policies and tariffs of the 20th Century shaped the economic development and foreign policy of the US (e.g., McKinley Tariff, Hawley-Smoot Tariff, GATT, and NAFTA).<br>• How westward settlement and expansion led to the Indian Wars of the Great Plains that culminated at the Battle of Wounded Knee.<br>• How the desire of industrialized countries, such as England, Germany, Russia, Japan and the US, to open new trade markets impacted US foreign policy at the turn of the 19th Century.<br>• How and to what extent economic and political interests in Latin America and the Caribbean guided the foreign policies of Theodore Roosevelt, William Howard Taft and Woodrow Wilson.<br>• How and why American foreign policy shifted from neutrality to interventionism at the beginning of World War I.<br>• How and why American foreign policy shifted to isolationism after World War I.<br>• How and why American foreign policy shifted from neutrality to interventionism at the beginning of World War II.<br>• How President Truman and his administration rationalized using the atomic bomb to end World War II and how that decision affected US foreign policy.<br>• How the American foreign policy of isolationism ended with US membership in post World War II alliances and how that involvement influenced American foreign policy during the 20th Century.<br>• How and why the administration of George W. Bush initiated preemptive military action in place of containment and deterrence. | http://www.history.com/topics/us-presidents/woodrow-wilson<br><br>**Treaty of Versailles**<br>http://www.history.com/topics/world-war-i/treaty-of-versailles<br><br>**Treaty of Versailles/League of Nations**<br>http://www.ushistory.org/us/45d.asp<br><br>**Neutrality Acts**<br>https://history.state.gov/milestones/1921-1936/neutrality-acts<br><br>**Isolationism & Interventionism**<br>http://unctv.pbslearningmedia.org/resource/arct14.soc.pclosttg/lost-peace-teachers-guide<br><br>**President Truman and The Atomic Bomb**<br>http://unctv.pbslearningmedia.org/resource/pres10.socst.ush.dww.atomicbomb/truman-and-the-atomic-bomb-world-war-ii/<br><br>**Communism and Capitalism**<br>http://www.ushistory.org/gov/13b.asp<br><br>**Fall of Communism – Eastern Europe**<br>https://history.state.gov/milestones/1989-1992/fall-of-communism |
| SS.2.6.2 Explain the reasons for US involvement in global wars and the influence each involvement had on international affairs (e.g., Spanish-American War, WWI, WWII, Cold War, Korea, Vietnam, Gulf War, Iraqi War, etc.). | **The student will understand:**<br>• When a nation's economic and/or political interests are threatened it can lead to some degree of participation in war.<br>• Wars and their outcomes are often unsettling and have enduring international consequences for nations and civilians.<br>• Political and popular opinion for war can shift between government policies or thoughts of isolationism, neutrality and interventionism.<br>**The student will know:**<br>• How and why the US joined with the Allied Powers to end World War I.<br>• How and why economic and political conditions in Europe after World War I led to the rise of authoritarian rulers and the onset of World War II.<br>• How and why World War II ended and how a series of Allied conferences would help initiate the Cold War.<br>• How, why and to what extent the Cold War and the policy of containment influenced the Truman administration's involvement in international affairs (e.g., Truman Doctrine, Berlin Blockade and the Marshall Plan).<br>• How and why a failed policy of containment in China would help lead to United States involvement in the Korean War. | **Alliance System – World War 1**<br>http://www.youtube.com/watch?v=KMMAL3v0lA0<br><br>**Imperialism, Nationalism, Militarism**<br>http://www.spiritsd.ca/teachers/dave.herron/H20/Causes%20of%20War.htm<br><br>**Russian Revolution**<br>http://www.history.com/topics/russian-revolution<br><br>**Fascism, Nazism, and Totalitarianism**<br>http://cla.calpoly.edu/~lcall/fascism.html<br><br>**Axis Alliance – World War II**<br>http://www.ushmm.org/wlc/en/article.php?ModuleId=10005177<br><br>**Allied Powers – World War II**<br>http://www.worldwar2history.info/war/Allies.html |

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| | • How and why the Korean War ended in "stalemate" and how the war's outcome affected international relations during and since the Cold War.<br>• How, why and to what extent the Cold War and the policy of flexible response influenced the Kennedy administration's involvement in international affairs (e.g., Bay of Pigs Invasion, Cuban Missile Crisis, Berlin Wall).<br>• How, why and to what extent the US became diplomatically and militarily involved in French Indochina/Vietnam.<br>• How and to what extent the Reagan administration's escalation of defense spending and use of anti-communist rhetoric ended the Cold War.<br>• How and why the US led a United Nations coalition of forces in the Persian Gulf War and how the war's outcome affected American foreign policy in the Middle East. | **Holocaust**<br>http://www.ushmm.org/wlc/en/article.php?ModuleId=10005143<br><br>**Marshall Plan**<br>http://www.history.com/topics/world-war-ii/marshall-plan<br><br>**The Cold War: Lesson Plan**<br>http://civics.sites.unc.edu/files/2012/05/ColdWar1.pdf<br><br>**Berlin Blockade**<br>http://www.pbs.org/wgbh/amex/bomb/peopleevents/pandeAMEX49.html<br><br>**Berlin Airlift**<br>http://www.history.com/topics/cold-war/berlin-airlift<br><br>**Decolonization**<br>http://www.youtube.com/watch?v=T_sGTspaF4Y |

| **SS.2.7 Understand the impact of war on American politics, economics, society and culture. Concept(s): War, Impacts. USH2.H.7** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.2.7.1 Explain the impact of wars on American politics since Reconstruction (e.g., spheres of influence, isolationist practices, containment policies, first and second Red Scare movements, patriotism, terrorist policies, etc.). | **The student will understand:**<br>• War can influence the political decisions and development of participant and neutral nations, and their leaders.<br>• Politicians who support or refute a nation's participation in war can politically benefit or suffer from their stance.<br>• A nation's government and its political leaders often assume more authority during periods of conflict, rebellion or warfare.<br>• Unconventional wars of terrorism have no conventional boundaries.<br>**The student will know:**<br>• How American political leaders used foreign aggression as opportunities to prepare for and request war (e.g., U.S.S. Maine, Lusitania, Four Freedoms, Pearl Harbor, 9/11).<br>• How the US government used propaganda to appeal to American patriotism and sell the nation's war efforts (e.g., Committee on Public Information, Four-Minute Men, "Meatless Tuesdays").<br>• How, why and to what extent the federal government restricted the civil liberties of various groups of Americans during times of war (e.g., the Espionage and Sedition Acts, Schenck v. US, Japanese-American internment camps and the Patriot Act).<br>• How and why the American policy of isolationism ended with US participation in post World War II alliances and how that involvement influenced the nation's foreign policy.<br>• How US Presidents from Harry Truman to Ronald Reagan practiced varying degrees of "containment."<br>• How and why the War on Terrorism in the wake of the 9/11 attacks led to a doctrine of preemptive military action and the Second Gulf War.<br>• | **Truman Doctrine**<br>https://history.state.gov/milestones/1945-1952/truman-doctrine<br><br>**American Foreign Policy Since 9/11: Bush Doctrine**<br>http://www.pbs.org/wgbh/pages/frontline/video/flv/generic.html?s=frol02s11efq416&continuous=1<br><br>http://www.pbs.org/wgbh/pages/frontline/shows/iraq/etc/cron.html |

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| SS.2.7.2 Explain the impact of wars on American society and culture since Reconstruction (e.g., relocation of Japanese Americans, American propaganda, first and second Red Scare movement, McCarthyism, baby boom, Civil Rights Movement, protest movements, ethnic patriotism, etc.). | **The student will understand:**<br>• Wars between countries of competing ideologies and influence can create societal suspension, anxiety, fear and discrimination.<br>• The perception of wars and their purpose may help determine the degree of mobilization and participation of a democratic nation and its citizens.<br>**The student will know:**<br>• How and why US involvement in world wars and the contributions of women during times of war impacted the perceptions and roles of women in American society. (e.g., 19th Amendment, WAVES, "Rosie the Riveter").<br>• How, why and to what extent US participation in world wars restricted the civil liberties of various groups of Americans. (e.g., German Americans, Japanese Americans, Muslim Americans)<br>• How various ethnic groups within the US contributed to American war efforts (e.g., Tuskegee Airmen, bracero program and American Indian "code talkers").<br>• How and why US entry into World War I and World War II created a "Great Migration" of African Americans to northern cities and how that migration culturally impacted the nation.<br>• How the post World War II baby boom generation affected the culture, economy and politics of the US through the 20th Century.<br>• How the Soviet launching of Sputnik fostered a space race and impacted the development of American education and culture through the 20th Century.<br>• How and why the counterculture movement started in the 1950s and 1960s and the extent to which their anti-war protests affected the Vietnam War and American society. | **Japanese American Internment Camps**<br>http://www.ushistory.org/us/51e.asp<br><br>**GI Bill**<br>http://www.benefits.va.gov/gibill/history.asp<br><br>**McCarthyism**<br>http://www.slideshare.net/mmartin13/mccarthyism<br><br>http://www.slideshare.net/ierajomar7/joseph-mccarthy<br><br>**Great Migration**<br>http://unctv.pbslearningmedia.org/resource/mr13.socst.us.greatmig/great-migration/<br><br>**The Sixties**<br>http://unctv.pbslearningmedia.org/resource/b409cfea-661b-46ad-a803-e7c35009a37f/the-sixties/ |

| **SS.2.8 Analyze the relationship between progress, crisis and the "American Dream" within the US. Concept(s): Progress, Crisis, "the American Dream." USH2.H.8** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.2.8.1 Analyze the relationship between innovation, economic development, progress and various perceptions of the "American Dream" since Reconstruction (e.g., Gilded Age, assembly line, transcontinental railroad, highway system, credit, etc.). | **The student will understand:**<br>• Individual risks, aspirations and ingenuity often lead to innovation, economic development and progress.<br>• Governments may create policies that encourage economic growth and development.<br>• Different groups of people may be affected in different ways by economic growth.<br>• Innovation designed to solve problems may result in the creation of new problems.<br>**The student will know:**<br>• How and why so many inventions occurred within the US during the mid-19th Century.<br>• How Gilded Age entrepreneurs took risks to develop and monopolize industries and how their efforts impacted the economic development and cultural progress of the US (e.g., John D. Rockefeller, Andrew Carnegie, J.P. Morgan).<br>• How the race to outer space and space age technologies impacted American culture. | **The Gilded Age: Websites, Lesson Plans, Teacher Guides.**<br>https://www.besthistorysites.net/index.php/american-history/1800/gilded-age<br><br>http://unctv.pbslearningmedia.org/resource/arct14.soc.amexroctea/the-rockefellers-teachers-resources-teachers-guide/<br><br>**The Space Race**<br>http://unctv.pbslearningmedia.org/resource/arct14.sci.nvsputnika/sputniks-impact-on-america/<br><br>http://www.pbs.org/wgbh/nova/military/space-race-history.html |
| SS.2.8.2 Explain how opportunity and mobility impacted various groups within American society since Reconstruction | **The student will understand:**<br>• That opportunity and mobility on behalf of survival, perseverance and self- improvement can have both positive and negative impacts for various groups and their communities. | **The Dust Bowl Migration**<br>http://unctv.pbslearningmedia.org/resource/5dac042c-e0c4-4cf4-9368-680db34b4eb1/5dac042c-e0c4-4cf4-9368-680db34b4eb1/ |

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| (e.g., Americanization movement, settlement house movement, Dust Bowl, the Great Migration, suburbia,etc.). | • That people often move, despite barriers, when given an opportunity.<br>**The student will know:**<br>• How and to what extent westward migration and the "Americanization" of the American Indian led to the break up of reservations and the disintegration of American Indian culture at the dawn of the 20th Century.<br>• How and why the federal government encouraged the westward growth of the railroad industry and how the industry's growth and movement impacted the settlement, daily lives and fortunes of various groups. | **Life in the Dust Bowl: Media and Teacher Resources**<br>http://unctv.pbslearningmedia.org/resource/eb8bf007-3e70-405b-a4c4-6b3f87334326/eb8bf007-3e70-405b-a4c4-6b3f87334326/<br><br>**Suburbia**<br>http://www.ushistory.org/us/53b.asp |
| SS.2.8.3 Evaluate the extent to which a variety of groups and individuals have had opportunity to attain their perception of the "American Dream" since Reconstruction (e.g., immigrants, Flappers, Rosie the Riveter, GIs, blue collar worker, white collar worker, etc.). | **The student will understand:**<br>• National ideals often influence an individual or group's perceptions of themselves, their country, and their place within society.<br>• National ideals may not always be attainable or equitable for everyone.<br>**The student will know:**<br>• To what extent American entrepreneurs and inventors improved their personal fortunes and the daily lives of Americans.<br>• To what extent American immigrants or migrants have endured passage to or within the US to better themselves, their families and their communities.<br>• To what extent the American woman has successfully gained expanded roles in American society and gender equality. | **Civil Rights and Women's Movement**<br>http://unctv.pbslearningmedia.org/resource/976708ae-6ec4-444c-91e1-48cd2ccea7f1/civil-rights-and-the-womens-movement/ |
| SS.2.8.4 Analyze multiple perceptions of the "American Dream" in times of prosperity and crisis since Reconstruction (e.g., Great Depression, Dust Bowl, New Deal, oil crisis, savings and loan crisis, dot.com bubble, mortgage foreclosure crisis, etc.). | **The student will understand:**<br>• An individual or group's perceptions of themselves, their country, and their place within a society may be influenced by times of prosperity and crisis.<br>**The student will know:**<br>• How westward migration and Manifest Destiny impacted perceptions of the frontier and the "American Dream" (e.g., Frederick Jackson Turner and "The Significance of the Frontier in American History", Helen Hunt Jackson and A Century of Dishonor, Frank Norris and The Octopus).<br>• How African American civil rights leaders of the late 19th Century differed in how to best achieve greater freedom and equality (Ida B. Wells, Booker T. Washington and "The Atlanta Compromise", W.E.B. Du Bois and "The Talented Tenth").<br>• How the Harlem Renaissance raised American awareness of issues affecting the lives of African Americans in the 1920s through various forms of expression such as literature, art, music and drama (e.g., Alain Locke, Langston Hughes, Zora Neale Hurston and James Weldon Johnson).<br>• How national political leaders have expressed their perceptions of the "American Dream" during times of prosperity or crisis (e.g., John Kennedy's Inaugural Address, Franklin Roosevelt's First Inaugural Address, Ronald Reagan's "Tear Down This Wall" speech, George W. Bush "Congressional Speech on 9/11" and Barack Obama's "A More Perfect Union" speech). | **Booker T Washington vs W.E.B. DuBois**<br>http://unctv.pbslearningmedia.org/resource/bf10.socst.us.indust.bookert/<br><br>**John F Kennedy Inaugural Address**<br>http://www.bartleby.com/124/pres56.html<br><br>**Ronald Reagan "Tear Down this Wall"**<br>http://www.historyplace.com/speeches/reagan-tear-down.htm<br><br>**Barack Obama " A More Perfect Union"**<br>http://en.wikipedia.org/wiki/A_More_Perfect_Union_(speech) |

**ASE SS 3: Civics and Economics**

| **SS.3.1 Analyze the foundations and development of American government in terms of principles and values. CE.C&G.1** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.1.1 Explain how the tensions over power and authority led America's founding fathers to develop a constitutional democracy (e.g., mercantilism, salutary neglect, taxation and representation, boycott and protest, independence, American Revolution, Articles of Confederation, Ben Franklin, George Washington, John Adams, Son of Liberty, etc.). | **Students will understand:**<br>• "Salutary neglect" between a nation and its colonies may impact their political and economic relationship and lead to the creation of a new nation.<br>• The desire for representative government can lead to conflict within and among nations. (Frequent and free elections in a representative government)<br>• Civil disobedience can lead to changes in government. (Frequent and free elections in a representative government, rule of law, federalism, due process, Structure of government, separation of powers with checks and balances)<br>**Students will know:**<br>• A constitutional democracy is a form of representative democracy that depends on the participation of its citizens. (Frequent and free elections in a representative government, rule of law, federalism, due process, Structure of government, separation of powers with checks and balances)<br>• A constitutional democracy is a system of government based on popular sovereignty in which the structures, powers, and limits of government are set forth in a constitution. (Frequent and free elections in a representative government, rule of law, federalism, due process, Structure of government, separation of powers with checks and balances, equal justice under the law, private property rights)<br>• Reasons for colonial rebellion, such as British control and taxation, and how this lead to the Revolutionary War and American independence. (Inalienable rights, rule of law, equal justice under the law, due process)<br>• The connection between colonial conflicts and the major principles the framers placed in the United States Constitution. (Structure of government, separation of powers with checks and balances, rule of law, equal justice under the law, federalism, individual rights set forth in the Bill of Rights) | **Mercantilism**<br>http://www.youtube.com/watch?v=9W4e_rN15xA&feature=related<br><br>**Taxation without Representation**<br>http://www.glencoe.com/video_library/index_with_mods.php?CHAPTER=5&PROGRAM=9780078777158&VIDEO=3042<br><br>http://www.uen.org/Lessonplan/preview.cgi?LPid=23822<br><br>http://www.econedlink.org/lessons/index.php?lid=356&type=educator<br><br>**Tea, Taxes, and the American Revolution**<br>http://wn.com/american_revolutionary_period<br><br>**Articles of Confederation**<br>http://www.youtube.com/watch?v=QQtJNK5_8Uk<br><br>http://www.youtube.com/watch?v=bO7FQsCcbD8<br><br>**Sons of Liberty**<br>http://education-portal.com/academy/lesson/sons-of-liberty-resistance-to-the-stamp-act-and-british-rule.html#transcript<br><br>http://civics.sites.unc.edu/files/2012/04/CausesofAmericanRevolution10-111.pdf |
| SS.3.1.2 Explain how the Enlightenment and other contributing theories impacted the writing of the Declaration of Independence, the US Constitution and the Bill of Rights to help promote liberty, justice and equality (e.g., natural rights, classical theories of government, Magna Carta, Montesquieu, Locke, English Bill of Rights, etc.). | **Students will understand:**<br>• A nation's political documents are often influenced by philosophical theories. (U.S. Constitution, N.C. Constitution, Declaration of Independence, Supreme Court Decisions, Congressional Acts)<br>• New ideas or ways of thinking are often integrated into a nation's founding and development. (Inalienable rights, structure of government, separation of powers with checks and balances, rule of law, equal justice under the law, federalism, individual rights set forth in the Bill of Rights)<br>• Constitutional governments are often founded upon ideas such as freedom, equality and the rights of individuals. (Inalienable rights, structure of government, separation of powers with checks and balances, rule of law, equal justice under the law, federalism, individual rights set forth in the Bill of Rights, individual responsibility). | **Magna Carta, John Locke**<br>http://americanrevolutionurness.webs.com/teacherlessonplans.htm<br><br>**Enlightenment**<br>http://civics.sites.unc.edu/files/2014/03/Enlightenment.pdf<br><br>**NC Civic Education Consortium**<br>http://database.civics.unc.edu/lesson/?s=&course=civics-and-economics<br><br>**English Bill of Rights**<br>http://teachingamericanhistory.org/library/document/the-english-bill-of-rights-1689/<br><br>http://web.international.ucla.edu/euro/article/29425 |

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| | **Students will know:**<br>• Philosophical theories of the Enlightenment and the 18th century (Locke, Rousseau, Hobbes, and Montesquieu). (Inalienable rights, structure of government, separation of powers with checks and balances, rule of law, equal justice under the law)<br>• American colonists brought with them the knowledge of Enlightenment theories and those theories impacted the development of United States government. (Inalienable rights, structure of government, separation of powers with checks and balances, rule of law, equal justice under the law, federalism, individual rights set forth in the Bill of Rights, individual responsibility)<br>• The fundamental principles of the Declaration of Independence. (Inalienable rights, rule of law, equal justice under the law)<br>• The fundamental principles of the United States Constitution. (Separation of powers with checks and balances, rule of law, federalism)<br>• The freedoms established in the Bill of Rights. (Inalienable rights, structure of government, equal justice under the law, due process, federalism, individual rights set forth in the Bill of Rights, individual responsibility) | **Magna Carta, English Bill of Rights**<br>http://mrsmartinklein.weebly.com/uploads/8/5/1/5/8515231/msmagnacarta.doc |
| SS.3.1.3 Evaluate how debates on power and authority between Federalists and Anti-Federalists have helped shape government in the United States over time (e.g., Hamilton, Jefferson, Madison, Federalist Papers, strong central government, protection of individual rights, Elastic Clause, Bill of Rights, etc.). | **Students will understand:**<br>• Multiple perspectives on power and authority often influence the direction in which a nation's government develops.<br>• Groups and individuals pursuing their own goals may influence the priorities, decisions and actions of a government.<br>• Debates over the power and authority of national government are present in contemporary political debates. (Structure of government, separation of powers with checks and balances, rule of law, equal justice under the law, federalism, individual rights set forth in the Bill of Rights)<br>**Students will know:**<br>• Major arguments for and against ratifying the United States Constitution. (Rule of law, federalism, individual rights set forth in the Bill of Rights)<br>• Differences between Federalist and Anti-Federalist thoughts and writings. (Structure of government, separation of powers with checks and balances, federalism, individual rights set forth in the Bill of Rights)<br>• Key Federalists and Anti-Federalists in the debate over ratifying the United States Constitution. (Federalism, Individual rights set forth in the Bill of Rights) | **Thomas Jefferson**<br>http://www.biography.com/people/thomas-jefferson-9353715#drafting-the-declaration-of-independence<br>http://youtu.be/_3Ox6vGteek?list=PL8dPuuaLjXtMwmepBjTSG593eG7ObzO7s<br>**James Madison**<br>http://edsitement.neh.gov/lesson-plan/james-madison-madison-was-there<br>**Federalist Papers**<br>http://edsitement.neh.gov/lesson-plan/james-madison-madison-was-there<br>**Bill of Rights**<br>http://civics.sites.unc.edu/files/2012/10/BillofRights10-111.pdf<br>**Bill of Rights Jeopardy**<br>Scroll down and click on Bill of Rights PPT<br>http://database.civics.unc.edu/lesson/<br>**Federalist vs. Antifederalist**<br>http://civics.sites.unc.edu/files/2012/04/FederalistsAntifederalists.pdf |
| SS.3.1.4 Analyze the principles and ideals underlying American democracy in terms of how they promote freedom (i.e. separation of powers, rule of law, limited government, democracy, consent of the governed / individual rights –life, liberty, pursuit of happiness, | **Students will understand:**<br>• Shared values and principles may be necessary for a group of people to progress and form a political system.<br>• Principles and ideals underlying democracy are designed to promote the freedom of the people in a nation.<br>• A nation may agree on values and principles philosophically, but disagree on the practical application of those same values and principles.<br>• Democratic freedom requires the active participation of a nation's citizens.<br>**Students will know:** | **Seperation of Powers**<br>http://www.youtube.com/watch?v=AvyDpGSSKDQ<br>**Democracy**<br>http://civics.sites.unc.edu/files/2012/05/DoingDemocracy.pdf<br>**Limited Government**<br>http://www.youtube.com/watch?v=rPrZsrSmrAc<br>**Life, Liberty and the Pursuit of Happiness** |

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| self-government, representative democracy, equal opportunity, equal protection under the law, diversity, patriotism, etc.). | • Ideals that are considered fundamental to American public life (individual rights, self-government, justice, equality, diversity, patriotism, the common/public good, etc.).<br>• Principles that are considered fundamental to American constitutional democracy (rule of law, representative government, shared powers, checks and balances, federalism, individual rights, etc.). | https://www.khanacademy.org/partner-content/aspeninstitute/aspen-founding-docs/aspen-declaration-independence/v/life--liberty-and-the-pursuit-of-happiness<br><br>**Representative Democracy**<br>http://www.princeton.edu/~achaney/tmve/wiki100k/docs/Representative_democracy.html |
| SS.3.1.5 Evaluate the fundamental principles of American politics in terms of the extent to which they have been used effectively to maintain constitutional democracy in the United States (e.g., rule of law, limited government, democracy, consent of the governed, etc.). | **Students will understand:**<br>• A government system in which the structures, powers and limits of government are set forth in a constitution relies on its founding principles to maintain order. (Inalienable rights, structure of government, separation of powers with checks and balances, frequent and free elections in a representative government, rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• A constitutional democracy allows competing ideas, values, and principles to compete in a peaceful manner. (Inalienable rights, structure of government, separation of powers with checks and balances, frequent and free elections in a representative government, rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>**Students will know:**<br>• Basic principles of United States government and their purpose. (Structure of government, separation of powers with checks and balances, rule of law, equal justice under the law)<br>• The concept of the social contract. (Inalienable rights) | **Rule of Law**<br>http://civics.sites.unc.edu/files/2012/05/RuleofLaw1.pdf<br><br>http://www.youtube.com/watch?v=IZDd2v18vfw<br><br>**Limited Government**<br>http://billofrightsinstitute.org/resources/educator-resources/americapedia/americapedia-constitution/limited-government/<br><br>**Consent of the Governed**<br>http://www.youtube.com/watch?v=UWRum3cQgRE<br><br>http://www.democracyweb.org/consent/principles.php |

| **SS.3.2 Analyze government systems within the United States in terms of their structure, function and relationships. CE.C&G.2** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.2.1 Analyze the structures of national, state and local governments in terms of ways they are organized to maintain order, security, welfare of the public and the protection of citizens (e.g., federalism, the three branches, court system, jurisdictions, judicial process, agencies, etc.). | **Students will understand:**<br>• Governments are structured to address the basic needs of the people (Inalienable rights, structure of government, separation of powers with checks and balances, frequent and free elections in a representative government, rule of law, equal justice under the law, private property rights, federalism, individual rights as set forth in the Bill of Rights)<br>• A system of government established by a constitution may result in the complex dispersal of powers, as a result people may live under the jurisdiction of national, state and local governments. (Inalienable rights, structure of government, separation of powers with checks and balances, frequent and free elections in a representative government, rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• A complex system of multi-levels and divisions of government may reflect the principle of popular sovereignty, enable citizens to hold their governments accountable and help to insure protection for the rights of the people. (Structure of government, separation of | **Checks and Balances**<br>http://civics.sites.unc.edu/files/2012/05/SeperationofPowersChecksBalances1.pdf<br><br>http://www.youtube.com/watch?v=ZCB8EOY5d48<br><br>**Federalism**<br>http://www.historylearningsite.co.uk/fed.htm<br><br>**Jurisdiction**<br>http://www.law.cornell.edu/wex/Jurisdiction<br><br>**Judicial Process**<br>http://www.cengagebrain.com.mx/content/9781133980605.pdf |

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| | powers with checks and balances, frequent and free elections in a representative government, rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Functions of government involve a complex relationship among the branches of government at all levels. (Structure of government, separation of powers with checks and balances)<br>**Students will know:**<br>• Reasons for America's implementation of a federalist system of government. (Structure of government, separation of powers with checks and balances, federalism)<br>• Powers that are shared and held individually by state and federal governments with in a federalist system. (Structure of government, separation of powers with checks and balances, federalism)<br>• The structure of government at national, state and local levels. (Structure of government, separation of powers with checks and balances, federalism) | |
| SS.3.2.2 Summarize the functions of North Carolina state and local governments within the federal system of government (e.g., local charters, maintain a militia, pass ordinances and laws, collect taxes, supervise elections, maintain highways, types of local governments, etc.). | **Students will understand:**<br>• Constitutions are "higher laws" that authorize an effective government with limited powers. (Structure of government, separation of powers with checks and balances, federalism)<br>• Government can have a significant impact on how people are governed. (Structure of government, separation of powers with checks and balances, federalism)<br>**Students will know:**<br>• The functions of state and local governments. (Structure of government, separation of powers with checks and balances, federalism)<br>• The responsibilities and duties of the state and local government. (Structure of government, separation of powers with checks and balances, federalism)<br>• How and why government responds to social and economic changes. | **NC Government**<br>http://civics.sites.unc.edu/files/2012/05/NCGovtEnvironmentLorax1.pdf<br><br>**Militia**<br>http://www.find-laws.com/statutes/north-carolina/Chapter_127A/GS_127A-80<br><br>**Local Governments**<br>http://sogpubs.unc.edu//cmg/cmg01.pdf? |
| SS.3.2.3 Evaluate the U.S. Constitution as a "living Constitution" in terms of how the words in the Constitution and Bill of Rights have been interpreted and applied throughout their existence (e.g., precedents, rule of law, Stare decisis judicial review, supremacy, equal protections, "establishment clause", symbolic speech, due process, right to privacy, etc.). | **Students will understand:**<br>• A written constitution sets forth the terms and limits of a government's power. (Structure of government, separation of powers with checks and balances, frequent and free elections in a representative government, rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights)<br>• A nation's founding documents reflect and preserve its basic principles. (U.S. Constitution, N.C. Constitution, Declaration of Independence)<br>**Students will know:**<br>• The purposes for the United States Constitution as outlined in the Preamble.<br>• The meaning of a "living Constitution"(U.S. Constitution, N.C. Constitution)<br>• The processes for amending the United States Constitution. ". (U.S. Constitution, N.C. Constitution)<br>• The purpose of the first 10 amendments, the freedoms each grants, and their relevance to each citizen. | **Establishment Clause, Living Constitution**<br>http://civics.sites.unc.edu/files/2012/05/MarshvChambers.pdf<br><br>**Precedent**<br>http://www.pbslearningmedia.org/resource/bf09.socst.us.const.lprecedent/the-importance-of-precedent-in-the-decisons-of-the-supreme-court/<br><br>**Stare Decisis**<br>http://education-portal.com/academy/lesson/stare-decisis-doctrine-definition-example-cases.html#lesson<br><br>**Supremacy**<br>http://billofrightsinstitute.org/resources/educator-resources/americapedia/americapedia-constitution-text/supremacy-clause/ |

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| | (Federalism, due process, individual rights as set forth in the Bill of Rights) | **Establishment Clause**<br>http://www.law.cornell.edu/wex/establishment_clause<br><br>**Due Process**<br>http://www.law.cornell.edu/wex/due_process |
| SS.3.2.4 Evaluate the authority federal, state and local governments have over individuals' rights and privileges (e.g., Bill of Rights, Delegated Powers, Reserved Powers, Concurrent Powers, Pardons, Writ of habeas corpus, Judicial Process, states' rights, Patriot Act, etc.). | **Students will understand:**<br>• Governments balance preserving the rights of individuals with protecting the common good. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Constitutional democracy often develops from both the need for authority and the need to limit authority. (Structure of government, rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>**Students will know:**<br>• The types of authority government can exercise over the people. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• The rights and privileges citizens have in the United States and the differences between the two. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility) | **Bill of Rights**<br>http://www.youtube.com/watch?v=tlt6R1KD4E0<br><br>**Delegated, Concurrent, Reserved Powers**<br>http://go.hrw.com/venus_images/C06E01c.gif<br><br>**Pardons**<br>http://www.pardonpower.com/<br><br>**Writ of Habeas Corpus**<br>http://www.nolo.com/legal-encyclopedia/appeals-writ-habeas-corpus-faq-29096-5.html<br><br>**Judicial Process**<br>http://www.crimeandjustice.org/somali/911.gif<br><br>**States' Rights**<br>http://www.civilwar.org/education/history/civil-war-overview/statesrights.html<br><br>**Patriot Act**<br>http://www.justice.gov/archive/ll/highlights.htm |
| SS.3.2.5 Analyze contemporary issues and governmental responses at the local, state, and national levels in terms of how they promote the public interest and/or general welfare (e.g., taxes, immigration, naturalization, civil rights, economic development, annexation, redistricting, zoning, national security, health care, etc.). | **Students will understand:**<br>• One level of government can have a significant impact on how policy is established and people are governed. (Structure of government, separation of powers with checks and balances)<br>• Controversies often exist regarding government response to contemporary issues.<br>• Individuals and institutions are affected by government actions.<br>**Students will know:**<br>• Definition and various examples of public interests in the United States.<br>• The definition of general welfare in the United States and how the government attempts to preserve it.<br>• Contemporary issues affecting the United States and how government and citizens respond. | **Immigration**<br>http://civics.sites.unc.edu/files/2012/05/ImmigrationWritingPrompt.pdf<br><br>**Naturalization**<br>http://www.uscis.gov/us-citizenship/citizenship-through-naturalization<br><br>http://www.uscis.gov/citizenship/teachers/naturalization-information<br><br>**Economic Development**<br>http://www.mildredwarner.org/econdev/strategies<br><br>**National Security**<br>http://www.nsa.gov/about/mission/index.shtml<br><br>http://www.discoveryeducation.com/teachers/free-lesson-plans/national-security.cfm |
| SS.3.2.6 Analyze America's two-party system in terms of the political and economic views that led to its emergence and the role that political parties play in American politics (e.g., | **Students will understand:**<br>• A nation's political systems are often comprised of adversarial groups which must find ways to resolve conflict and balance competing interests.<br>• Third parties play an important role in politics. (Frequent and free elections in a representative government, individual responsibility)<br>For example: | **Comparing Political Parties**<br>http://blog.flocabulary.com/compare-political-parties-a-worksheet-and-lesson-plan/<br><br>http://www.diffen.com/difference/Democrat_vs_Republican<br><br>**Civic Responsibility** |

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| Democrat, Republican, promotion of civic responsibility, Federalists, Anti-Federalists, Influence of third parties, precincts, "the political spectrum", straight ticket, canvass, planks, platform, etc.). | • Third parties bring up new ideas or press for action on certain issues. (Frequent and free elections in a representative government, individual responsibility)<br>• Third parties can change the outcome of elections by drawing votes away from one of the main parties. (Frequent and free elections in a representative government, individual responsibility)<br><br>**Students will know:**<br>• History and characteristics of the two-party system. (Frequent and free elections in a representative government)<br>• Advantages and disadvantages of a two-party system. (Frequent and free elections in a representative government)<br>• The dominant political parties and platforms in the United States and their distinguishing characteristics.<br>• How political parties allow citizens to participate in government. (Frequent and free elections in a representative government, individual responsibility)<br>• The importance of civic responsibility to a political system. (Frequent and free elections in a representative government, individual responsibility) | http://learningtogive.org/papers/paper11.html<br><br>**Federalists & Antifederalists**<br>http://www.youtube.com/watch?v=YAmZdp1cH0g<br><br>http://faculty.polytechnic.org/gfeldmeth/chart.fed.pdf<br><br>http://www.apstudynotes.org/us-history/topics/federalists-versus-antifederalists-/<br><br>**Political Spectrum**<br>http://www.gotoquiz.com/politics/political-spectrum-quiz.html<br><br>**Straight Ticket**<br>http://www.ncsl.org/research/elections-and-campaigns/straight-ticket-voting.aspx<br><br>**Parties, Planks, and Platforms**<br>https://www.sos.ca.gov/elections/mock-election/teachers-guide/2008/pdfs/parties-planks-platforms.pdf |

| **SS.3.3 Analyze the legal system within the United States in terms of the development, execution and protection of citizenship rights at all levels of government. CE.C&G.3** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS3.3.1 Analyze how the rule of law establishes limits on both the governed and those who govern while holding true to the ideal of equal protection under the law (e.g., the Fourteenth Amendments, Americans with Disabilities Act, equal opportunity legislation). | **Students will understand:**<br>• A democratic government works with its citizens to make, follow, and enforce laws. (Structure of government, rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• In a democracy, rule of law influences the behavior of citizens, establishes procedures for making policies, and limits the power of government. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Equal protection of the law promotes equal treatment as an element of fundamental fairness and prohibits discrimination by government institutions. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>**Students will know:**<br>• How to define rule of law and recognize why it is an important concept for democratic governance. (Rule of law)<br>• How to define the concept of "equal protection under the law." (Rule of law, equal justice under the law)<br>• Specific constitutional and legal protections that provide equal protection to all citizens. (Rule of law, equal justice under the law)<br>• The concept of limited government. (Structure of government, rule of law, equal justice under the law, private property rights, federalism) | **Fourteenth Amendment**<br>http://www.youtube.com/watch?v=KWG8AcCty_I<br><br>**Americans with Disabilities Act**<br>http://www.ada.gov/cguide.htm<br><br>**Equal Opportunity**<br>http://www.eeoc.gov/facts/qanda.html |

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| SS.3.3.2 Compare lawmaking processes of federal, state and local governments (e.g., committee system, legislative process, bills, laws, veto, Filibuster, Cloture, Proposition, etc.). | **Students will understand:**<br>• Legislatures are bound to follow a particular process in lawmaking. (Federalism)<br>• Political parties play a major role in shaping public and national policies as well as laws. (Equal justice under the law, private property rights, due process, individual responsibility)<br>**Students will know:**<br>• The formal process for how a bill becomes a law. (Structure of government, rule of law, frequent and free elections in a representative government)<br>• The role of the executive, legislative, and judicial branches in the federal law making process. (Structure of government, rule of law, frequent and free elections in a representative government)<br>• Similarities in the lawmaking processes on the national, state and local levels. (Structure of government, rule of law, frequent and free elections in a representative government)<br>• Explain procedural techniques for blocking legislation (vetoes, filibusters).<br>• How party politics play a role in the law making process. | **Bills**<br>http://www.youtube.com/watch?v=H-eYBZFEzf8<br><br>**How a Bill becomes a Law**<br>http://civics.sites.unc.edu/files/2012/05/CongressandtheLegislativeProcessMADDSimulation.pdf<br><br>**Veto**<br>http://www.senate.gov/reference/glossary_term/veto.htm<br><br>**Filibuster**<br>http://www.senate.gov/artandhistory/history/common/briefing/Filibuster_Cloture.htm |
| SS.3.3.3 Explain how individual rights are protected by varieties of law (e.g., Bill of Rights, Supreme Court Decisions, constitutional law, criminal law, civil law, Tort, Administrative law, Statutory law and International law, etc.). | **The student will understand:**<br>• Citizens look to the principle varieties of law for protection of individual rights. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights)<br>• Constitutions may limit government in order to protect individual rights. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights)<br>• Citizens often depend on legal systems to manage conflicts, disputes and protection of rights. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights)<br>**The student will know:**<br>• The differences between civil rights and individual rights. (Individual rights as set forth in the Bill of Rights)<br>• Why and how laws protect the rights and freedoms of individuals. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights)<br>• The relationship between the various types of law and how those affect individual rights (e.g., Constitutional, civil, and criminal).<br>• How court decisions have protected various minority groups. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights)<br>• The procedures involved in a criminal case.<br>• The procedures involved in a civil case.<br>• The constitutional issues of Supreme Court cases - to include but not exclusive of landmark cases | **Constitutional issues of Supreme Court Cases**<br>Instead of memorizing court cases students will be expected to recognize the Constitutional issues the Supreme Court considers in reviewing a case (Due Process, Establishment Clause, Symbolic Speech, Supremacy, Equal Protection, Judicial Review, Federalism, etc.).<br><br>**Bill of Rights**<br>http://www.law.cornell.edu/constitution/billofrights<br><br>**Constitutional Law**<br>http://law2.umkc.edu/faculty/projects/ftrials/conlaw/home.html<br><br>**Tort**<br>http://www.videojug.com/interview/tort-law-terms-2<br><br>**Administrative & Statutory Law**<br>http://libguides.law.gsu.edu/content.php?pid=154797&sid=1312330<br><br>http://www.hg.org/adm.html<br><br>http://www.hg.org/statutory-law.html |
| SS.3.3.4 Explain ways laws have been influenced by political parties, constituents, interest groups, | **Students will understand:**<br>• Building constituencies plays an important role when trying to influence laws and policies.<br>**Students will know:**<br>• Students will know how individuals and interest groups | **Labor Unions**<br>http://www.econlib.org/library/Enc/LaborUnions.html |

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| lobbyists, the media and public opinion (e.g., extension of suffrage, labor legislation, civil rights legislation, military policy, environmental legislation, business regulation and educational policy). | influence public policy. (Individual responsibility)<br>• Ways the media plays an important role in public opinion. (Individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Public opinion may influence the creation of laws. | **Civil Rights Legislations**<br>http://americanhistory.about.com/od/civilrights/a/civilrights1.htm<br><br>**Extension of Suffrage**<br>http://teachers.henrico.k12.va.us/tucker/strusky_m/webquests/GOVT6f_suffrage/suffrageextension.htm<br><br>**Business Regulation**<br>http://smallbusiness.chron.com/five-areas-government-regulation-business-701.html |
| SS.3.3.5 Summarize the importance of the right to due process of law for individuals accused of crimes (e.g., habeas corpus, presumption of innocence, impartial tribunal, trial by jury, right to counsel, right against self-incrimination, protection against double jeopardy, right of appeal.) | **Students will understand:**<br>• Individuals have the responsibility to be aware of their rights. (Rule of law, equal justice under the law, private property rights, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Government must not subject individuals to unreasonable, unfair or arbitrary treatment under the law. (Rule of law, equal justice under the law, private property rights, due process, individual rights as set forth in the Bill of Rights)<br>**Students will know:**<br>• The constitutional and legal protections against the abuse of power by the government (such as the 8th Amendment and the War Powers Resolution).<br>• The legal rights and responsibilities that citizens process.<br>• The adversarial nature of the judicial process protects individuals' rights and freedoms. | **Presumption of innocence**<br>http://www.youtube.com/watch?v=Mjj7W3iEW70<br><br>**Habeas Corpus**<br>http://www.lectlaw.com/def/h001.htm<br><br>**Tribunal**<br>http://www.humanrights.is/the-human-rights-project/humanrightscasesandmaterials/comparativeanalysis/therighttodueprocess/imperial/<br><br>**Double Jeopardy**<br>http://www.annenbergclassroom.org/term/protection-against-double-jeopardy<br><br>http://sunnylandsclassroom.org/Downloads/ACBooks/Our%20Rights/Chapters/Chapter%2016-%20Our%20Rights.pdf |
| SS.3.3.6 Evaluate the rights of individuals in terms of how well those rights have been upheld by democratic government in the United States. | **Students will understand:**<br>• The nature of citizenship and the rights associated with it have changed over time. (Individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Certain groups are sometimes excluded from membership in a democratic society.<br>• Individuals have the responsibility to be aware of their rights. (Rule of law, equal justice under the law, private property rights, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>**Students will know:**<br>• The relationship between the ideals of individual rights and freedoms and the realities of America's history. (Rule of law, equal justice under the law, private property rights, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Ways in which the rights of individuals have been protected and violated in the United States. (Rule of law, equal justice under the law, private property rights, due process, individual rights as set forth in the Bill of Rights, individual responsibility) | Citizenship rights have changed over time. For example, in early United States history, only white, male property holders could vote. Over time the right to vote expanded to include all white males over 21. After the Civil War, black males over 21 could vote too. In 1920, women over 21 could vote. In 1971, 18 year olds gained the right to vote/ |

| **SS.3.4 Understand how democracy depends upon the active participation of citizens. CE.C&G.4** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.4.1 Compare citizenship in the American constitutional democracy to | **Students will understand:**<br>• The political, religious, and economic freedoms provided to citizens are often accompanied by the responsibility of | **Citizen Responsibilities**<br>http://betterlesson.com/community/lesson/21259/lesson-4-citizen-responsibilities |

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| membership in other types of governments (e.g., right to privacy, civil rights, responsibilities, political rights, right to due process, equal protection under the law, participation, freedom, etc.). | active civic participation at the individual, community, state, and national levels. (Individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Stable governments need a citizenry who understand their roles and responsibilities and abide by those understandings. (Individual responsibility)<br>**Students will know:**<br>• Criteria which defines citizenship in the United States.<br>• The criteria that have defined citizenship in the United States during various periods of its history (the Constitutional era, pre and post Civil War, early 1900s, post WWI, post WWII, present-day, etc.).<br>• Different types of American citizenship | **Civil Rights**<br>http://www.discoveryeducation.com/teachers/free-lesson-plans/civil-rights-an-investigation.cfm<br><br>**Equal Protection Under the Law**<br>http://www.annenbergclassroom.org/files/documents/lessonplans/equaljusticeunderlawlessonplan.pdf |
| SS.3.4.2 Analyze the roles of citizens of North Carolina and the United States in terms of responsibilities, participation, civic life and criteria for membership or admission (e.g., voting, jury duty, lobbying, interacting successfully with government agencies, organizing and working in civic groups, volunteering, petitioning, picketing, running for political office, residency, etc.). | **Students will understand:**<br>• Citizenship involves recognition of individual rights and responsibilities for political participation and encourages personal, social, economic, and political choice. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• Political, religious, and economic freedoms provided to citizens are often accompanied by the responsibility of active civic participation at the individual, community, state, and national levels. (Rule of law, equal justice under the law, private property rights, federalism, due process, individual rights as set forth in the Bill of Rights, individual responsibility)<br>• An increased level of citizen participation results in a more representative government. (Individual responsibility)<br>**Students will know:**<br>• Various ways individuals participate in civic life. (Individual responsibility)<br>• The criteria for becoming a United States citizen.<br>• The role citizens play in influencing government policies and actions. (Individual responsibility) ƒ<br>• Effective methods of influencing government. (Individual responsibility) | **Duties and Responsibilities of a Citizen**<br>http://www.mnliteracy.org/sites/default/files/curriculum/social_studies_week_27_final_2.pdf<br><br>**Lobbying**<br>http://www.youtube.com/watch?v=Q46kxNc5BLE<br><br>**Right to Picket**<br>http://www.lc.org/media/9980/attachments/resource_picket_parade_demonstrate_witness_chptr_14.pdf |

| **SS.3.5 Analyze how political and legal systems within and outside of the United States provide a means to balance competing interests and resolve conflicts. CE.C&G.5** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.5.1 Analyze the election process at the national, state and local levels in terms of the checks and balances provided by qualifications and procedures for voting (e.g., civic participation, public hearings, forums, at large voting, petition, local initiatives, local referendums, voting amendments, types of elections, etc.). | **Students will understand:**<br>• Elected leaders are expected to represent the interests of the electorate. (Frequent and free elections in a representative government, rule of law, individual rights as set forth in the Bill of Rights, individual responsibility)<br>**Students will know:**<br>• The qualification for voting in federal, state, and local elections. (Frequent and free elections in a representative government)<br>• How citizens can implement laws and influence government policy through voting. (Frequent and free elections in a representative government, rule of law, individual responsibility)<br>• How citizens make informed choices in elections. (Frequent and free elections in a representative government, individual responsibility) The role media | **Civic Participation**<br>http://cce.wsu.edu/about/civic-engagement<br><br>**NC Voter Qualifications**<br>http://www.ncsbe.gov/ncsbe/registering-to-vote<br><br>**Forums**<br>http://www.firstamendmentschools.org/freedoms/faq.aspx?id=13012<br><br>**Voting Amendments**<br>http://www.in.gov/judiciary/citc/museum/voting/index.html |

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| | plays in elections. (Frequent and free elections in a representative government, individual responsibility)<br>• Constitutional amendments and laws related to voting rights.<br>• The reason for qualifications for elected government officials.<br>• Progression of the election process at national, state, and local levels. (Frequent and free elections in a representative government) | |
| SS.3.5.2 Analyze state and federal courts by outlining their jurisdictions and the adversarial nature of the judicial process (e.g., Appellate, Exclusive, Concurrent, Original, types of federal courts, types of state courts, oral argument, courtroom rules, Supreme Court, opinions, Court Docket, Prosecutor/Prosecution, Complaint, Defendant, Plaintiff, hearing, bail, indictment, sentencing, appeal, etc.). | **Students will understand:**<br>• Legal systems can be structured to allow courts the authority to hear and decide cases. (Structure of government, separation of powers with checks and balances)<br>• Separation of powers and checks and balances slow down the process of enforcing and interpreting laws which insures better outcomes. (Structure of government, separation of powers with checks and balances) Judicial review reflects the idea of a constitutional government.<br>• (Rule of law, due process, ( "…excerpts or portions of decisions of the Supreme Court of the United States)<br>**Students will know:**<br>• The structure of the court system (federal, state and local). (Structure of government, separation of powers with checks and balances, federalism)<br>• The types of jurisdictions among the courts.<br>• The types of law.<br>• The judicial process (federal and state).(Federalism)<br>• How conflicts are resolved through the judicial process. | **North Carolina Court System**<br>http://www.nccourts.org<br><br>**Original Jurisdiction**<br>http://www.law.cornell.edu/wex/Original_jurisdiction<br><br>**Concurrent Jurisdiction**<br>http://www.law.cornell.edu/wex/concurrent_jurisdiction<br><br>**Appellate Jurisdiction**<br>http://www.law.cornell.edu/wex/appellate_jurisdiction<br><br>**Executive Jurisdiction**<br>http://definitions.uslegal.com/e/exclusive-jurisdiction/ |
| SS.3.5.3 Analyze national, state and local government agencies in terms of how they balance interests and resolve conflicts (e.g., FBI, SBI, DEA, CIA, National Guard Reserves, magistrates, Better Business Bureau, IRS, Immigration and Naturalization, FEMA, Homeland Security, ATF, etc.) | **Students will understand:**<br>• Government agencies affect national, state and local interests in a variety of ways.<br>• Laws may be enforced by many different agencies in order to ensure domestic tranquility.<br>• Government agencies set regulations to meet the requirements of laws passed by legislatures.<br>**Students will know:**<br>• The three types of independent agencies (executive, regulatory, and government corporations).<br>• The roles and responsibilities of key national, state and local government agencies. | **FBI**<br>http://www.fbi.gov<br><br>**CIA Overview**<br>https://www.youtube.com/watch?v=3UpC2IMg65k<br><br>**ATF**<br>https://www.atf.gov |
| SS.3.5.4 Analyze the developments and implementation of domestic and foreign policy by outlining opposing arguments on major issues and their efforts toward resolutions (e.g., health care, education, immigration, regulation of business and industry, foreign aid, intervention abroad, etc.). | **Students will understand:**<br>• Contemporary political developments across the globe have significant political, demographic and environmental implications on domestic policy.<br>• Being informed about global developments and a government's policies toward them helps citizens make better decisions on domestic and foreign policy. (Individual responsibility)<br>• Nation-states interact using diplomacy, formal agreements and sanctions which may be peaceful or involve the use of force.<br>**Students will know:**<br>• The most important powers the United States Constitution gives to the Congress, president, and federal judiciary in foreign affairs. (Structure of government, separation of powers with checks and | **How the US achieves its domestic and foreign policy goals:**<br>Diplomacy; trade agreements; incentives; sanctions; military intervention; treaties; humanitarian aid, economic aid, etc.<br><br>**Healthcare Opposing Viewpoints**<br>http://ic.galegroup.com/ic/ovic/ReferenceDetailsPage/DocumentToolsPortletWindow?displayGroupName=Reference&jsid=e232dd98cd0be091fc524dbb557a11f1&action=2&catId=GALE%7C00000000LVZR&documentId=GALE%7CPC3010999106&u=cant48040&zid=8e7b513163108871764fb872979b25cd |

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| | balances, federalism)<br>• Strategies the United States uses to achieve domestic and foreign policy. (Structure of government, separation of powers with checks and balances)<br>• The impact and relevance of policy decisions on laws, governments, communities, and individuals. (Due process) | http://www.pbslearningmedia.org/search/?q=health+care<br><br>**Foreign Aid**<br>http://ic.galegroup.com/ic/ovic/ViewpointsDetailsPage/ViewpointsDetailsWindow?query=&prodId=OVIC&displayGroupName=Viewpoints&limiter=&disableHighlighting=true&displayGroups=&sortBy=&zid=&search_within_results=&action=2&catId=&activityType=&documentId=GALE%7CEJ3010159416&source=Bookmark&u=oak30216&jsid=d5a2092f28809ee88a83d9c9855f7959<br><br>**US Intervention Abroad**<br>http://www.au.af.mil/au/ssq/2009/Winter/wolf.pdf |

| **SS.3.6 Analyze the concepts and factors that enable individuals to make informed financial decisions for effective resource planning. CE.PFL.1** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.6.1 Explain how education, income, career, and life choices impact an individual's financial plan and goals (e.g., job, wage, salary, college/university, community college, military, workforce, skill development, social security, entrepreneur, rent, mortgage, etc.) | **Students will understand:**<br>• The choices that people make have benefits, costs, risks, and future consequences.<br>• An individual's actions affect them through intended and unintended consequences.<br>• Attitudes and values affect financial decisions.<br>**Students will know:**<br>• What tradeoffs are and that a person's choices involve trade-offs.<br>• That a person's income and wealth is mostly dependent on the kind of human capital that they possess (e.g., knowledge, habits, and skills). | **Entrepreneur**<br>http://www.youtube.com/watch?v=lZKhZmvJuZY<br><br>**Effects of Education on Income**<br>http://www.educationcounts.govt.nz/indicators/main/education-and-learning-outcomes/1919<br><br>http://www.businessinsider.com/see-what-effect-your-education-has-on-income-2012-7 |
| SS.3.6.2 Explain how fiscally responsible individuals create and manage a personal budget that is inclusive of income, taxes, gross and net pay, giving, fixed and variable expenses and retirement (e.g., budget, financial plan, money management, saving and investing plan, etc.). | **Students will understand:**<br>• People perform basic financial tasks to manage income, expenses and saving.<br>**Students will know:**<br>• How to create a budget that balances their income with their expenses.<br>• The definition of "disposable income" and "discretionary income."<br>• What it means to "pay yourself first." | **US Financial System**<br>http://civics.sites.unc.edu/files/2012/04/BattleBehindthePumps.pdf<br><br>**Budget Calculator**<br>http://cgi.money.cnn.com/tools/budget101/budget_101.jsp<br><br>**Save & Invest**<br>http://www.mymoney.gov/save-invest/Pages/saveandinvest.aspx<br><br>http://civics.sites.unc.edu/files/2012/05/SavingsandInvesting.pdf |
| SS.3.6.3 Analyze how managing a checking and savings account contributes to financial well being (e.g., deposits, withdrawals, transfers, automated transactions, fees, etc.). | **Students will understand:**<br>• Wealth increases with regular investment, time and frequent compounding.<br>**Students will know:**<br>• The characteristics of checking accounts and savings accounts.<br>• How to make basic transactions with bank accounts and the consequences of overdrafts. | **Managing a Savings Account**<br>http://www.gcflearnfree.org/moneybasics/7<br><br>**How to Use a Checking Account**<br>https://www.dcu.org/streetwise/howto/checking.html |
| SS.3.6.4 Summarize how debt management and creditworthiness impact | **Students will understand:**<br>• Credit is a basic financial tool.<br>**Students will know:** | **Credit Lesson Plan**<br>http://www.moneymanagement.org/Budgeting-Tools/Credit-Lesson-Plans.aspx |

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| an individual's ability to become responsible consumers and borrowers (e.g., credit card management, monitoring interest rates and personal credit reports, analyzing loan details, keeping and maintaining records, etc.). | • That failing to pay off a credit card balance quickly can lead to a decrease in one's standard of living.<br>• How a good credit score can help one get a good rate on a mortgage.<br>• That the Annual Percentage Rate (APR) is the best indicator of the cost of a loan.<br>• The nature of compound interest as it relates to debt. The costs and benefits of using debt to make purchases in various situations. | **Practical Money Skills for Life**<br>https://www.practicalmoneyskills.com/foreducators/lesson_plans/college.php |
| SS.3.6.5 Analyze how fiscally responsible individuals save and invest to meet financial goals (e.g., investment, stock market, bonds, mutual funds, etc.). | **Students will understand:**<br>• Saving and investing are basic ways of preparing for one's future financial goals and financial security.<br>• There are risks and benefits to various investments.<br>**Students will know:**<br>• How to develop habits of saving every month.<br>• The distinction between stocks, bonds, mutual funds, CDs and money market accounts.<br>• The relationship between risk and return when investing. | **Difference Between Stocks, Bonds, and Mutual Funds**<br>https://www.youtube.com/watch?v=ZfkmYfQe318 |
| SS.3.6.6 Compare various investing strategies and tax implications for their potential to build wealth (e.g., individual stocks and bonds with investing in stock, giving, bonds, mutual funds, retirement plans, etc.). | **Students will understand:**<br>• Investment strategies differ in their potential rate of return, liquidity and level of risk.<br>• Fees, tax deferrals and exemptions may significantly affect an investor's total return over time.<br>**Students will know:**<br>• Where to find information on various investments.<br>• The relationship between risk and return when investing an investor's total return over time.<br>• There are risks and benefits to various investments. | **Individual Stocks and Bonds**<br>https://www.americancentury.com/investment_education/comparing_investment_types.jsp<br><br>**Retirement**<br>http://ok.gov/sde/sites/ok.gov.sde/files/PFLModule_6.1.pdf |

| **SS.3.7 Understand how risk management strategies empower and protect consumers. CE.PFL.2** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.7.1 Explain how consumer protection laws and government regulation contribute to the empowerment of the individual (e.g., consumer credit laws, regulation, FTC-Federal Trade Commission, protection agencies, etc.). | **Students will understand:**<br>• Laws and regulations exist to protect consumers from seller and lender abuses.<br>**Students will know:**<br>• Examples of basic consumer protections offered to them by state and federal government. | **Federal Trade Commission**<br>http://www.ftc.gov/<br><br>**Consumer Credit**<br>http://www.law.cornell.edu/wex/consumer_credit<br><br>**Protection Agencies**<br>http://www.sourcewatch.org/index.php?title=Consumer_Financial_Protection_Agency |
| SS.3.7.2 Summarize various types of fraudulent solicitation and business practices (e.g., identity theft, personal information disclosure, online scams, Ponzi schemes, investment scams, internet fraud, etc.). | **Students will understand:**<br>• Automated financial transactions can make consumers vulnerable to privacy infringement and identity theft.<br>• An investment opportunity that looks too good to be true probably is.<br>**Students will know:**<br>• Types of fraudulent business practices such as Ponzi schemes and Pyramid Schemes (or Multi-Level Marketing) work | **Identity Theft**<br>http://www.youtube.com/watch?v=zBheC5afBfc<br><br>**Personal Information Disclosure**<br>http://www.privacy.org.nz/the-privacy-act-and-codes/privacy-principles/limits-on-disclosure-of-personal-information-principle-eleven/<br><br>**Ponzi Scheme**<br>http://www.brighthubeducation.com/history-lessons-grades-9-12/29745-a-lesson-on-teaching-ponzi-scheme-to-high-school-students/ |

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| | | **Top 10 Online Scams**<br>http://www.uen.org/Lessonplan/preview.cgi?LPid=28967 |
| SS.3.7.3 Summarize ways consumers can protect themselves from fraudulent and deceptive practices (e.g., do not call lists, reading the fine print, terms and conditions, personal information disclosure, investment protection laws, fees, etc.) | **Students will understand:**<br>• An informed investor understands the importance of research and uses this information in their investing decisions.<br>• Dealing with non-reputable parties can have undesirable consequences when investing.<br>**Students will know:**<br>• To contact the state securities regulator (or securities commission) to make sure the investment is legitimate before investing. | **Internet Crime Complaint Center**<br>http://www.ic3.gov/crimeschemes.aspx<br><br>**Do Not Call Lists**<br>https://www.donotcall.gov/<br><br>**Reading the fine print**<br>http://www.tv411.org/reading/understanding-what-you-read/reading-fine-print |
| SS.3.7.4 Classify the various types of insurance and estate planning including the benefits and consequences (e.g., car, health, renters, life, liability, travel, disability, long-term care, natural disaster, etc.). | **Students will understand:**<br>• People purchase insurance to mitigate the risk of financial loss.<br>**Students will know:**<br>• What kinds of insurance are available, and if they are appropriate for a person at a given stage of life. | **Types of Insurance**<br>http://www.moneyinstructor.com/insurancelessons.asp<br><br>**Insurance: Your Protection**<br>http://www.uen.org/Lessonplan/preview?LPid=8782 |
| SS.3.7.5 Summarize strategies individuals use for resolving consumer conflict (e.g., contacting Attorney General, filing claims, Better Business Bureau, Secretary of State, etc.). | **Students will understand:**<br>• People resolve conflicts through legal procedures or compromise.<br>**Students will know:**<br>• Steps in filing a claim with the Better Business Bureau.<br>• Strategies for resolving consumer conflict. | **Attorney General**<br>http://www.ncdoj.gov/complaint.aspx<br><br>**Filing Complaint Claims**<br>http://www.usa.gov/topics/consumer/complaint.shtml |

| **SS.3.8 Understand economies, markets and the role economic factors play in making economic decisions. CE.E.1** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.8.1 Compare how individuals and governments utilize scarce resources (human, natural and capital) in traditional, command, market and mixed economies. | **Students will understand:**<br>• There are not enough resources to satisfy all wants.<br>• Scarcity forces people to make choices.<br>• All choices have opportunity costs.<br>• Economic systems influence peoples' incentives.<br>• People and governments make choices with limited resources.<br>• The need for resources and markets promotes expansion and may lead to some degree of conflict.<br>• Relative scarcity may lead to trade and economic interdependence or to conflict.<br>**Students will know:**<br>• The definition of scarcity and examples of scarce resources<br>• How to predict how someone will act based on the incentives they are given.<br>• The different kinds of economic systems (traditional, market, command, mixed)<br>• How to place the economic systems on a continuum showing level of economic freedom (traditional is not usually placed on this continuum).<br>• Productive resources, also called "factors of production." | **Factors of Production**<br>Natural, human and capital resources, also called "land, labor, entrepreneurship and capital."<br><br>**The Battle Behind the Pumps**<br>http://civics.sites.unc.edu/files/2012/04/BattleBehindthePumps.pdf |

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| SS.3.8.2 Analyze a market economy in terms of economic characteristics, the roles they play in decision making and the importance of each role (e.g., private property, free enterprise, circular flow, competition and profit motive, and allocation of resources via the price system). | **Students will understand:**<br>• Profit often acts as an incentive in a market economy.<br>• Government has limited yet important functions in a market economy<br>• Investment in capital and human resources can affect production and influence the economic choices of groups and individuals.<br>**Students will know:**<br>• The definition of a Market Economy and synonyms: free enterprise, price system, laissez-faire, capitalism.<br>• The basic parts of the Circular Flow Model.<br>• In a market economy, profit acts as a motivator, competition acts as a regulator, and prices act as a coordinator.<br>• Private property is an essential part of a market economy, since market exchange cannot occur without clearly established ownership.<br>• The role of competition in regulating quality and price.<br>• The role of prices as coordinators of a market economy. | Government functions in a market economy:<br>Preserve competition, enforce contracts, and to protect life, liberty, and property.<br><br>**Free Enterprise**<br>http://freeenterprisealliance.org/<br><br>**Private Property**<br>http://www.iep.utm.edu/property/<br><br>**Profit Motive**<br>http://businessethicsblog.com/2011/03/29/ethics-of-profit-part-3-the-profit-motive/ |
| SS.3.8.3 Explain how supply and demand determine equilibrium price and quantity produced (e.g., any market example –apples, tires, etc.). | **Students will understand:**<br>• Scarcity and the necessity of balancing scarcity and unlimited wants may influence production, consumption and economic choices.<br>• In a free market economy, price and quantity are determined by the interaction of supply and demand.<br>• Increases or decreases in demand and/or supply will impact price and quantity.<br>**Students will know:**<br>• How to create a demand schedule and supply schedule.<br>• How to find the "market clearing price" or "equilibrium price and quantity."<br>• The difference between "demand" (the curve) and "quantity demanded" (the x-axis).<br>• What occurrences will move supply and demand curves. | **Things that Move Supply and Demand Curves**<br>An improvement in technology will cause an industry's supply curve to slide to the right. Advertisement for a product will cause the demand curve to slide to the right.<br><br>https://www.khanacademy.org/economics-finance-domain/microeconomics/supply-demand-equilibrium |
| SS.3.8.4 Analyze the ways in which incentives and profits influence what is produced and distributed in a market system (e.g., supply, demand, What to Produce?, How to Produce It?, How Much to Produce?, For Whom To Produce It?, free enterprise, etc.). | **Students will understand:**<br>• When nations face the problem of scarcity, their citizens must often decide how allocate scarce resources.<br>• Investment in capital and human resources can affect production and influence the economic choices of groups and individuals.<br>• Goods and services are supplied by many people in many ways.<br>**Students will know:**<br>• Prices are like traffic signals for the economy: they organize the flow of economic resources and channel them to their most efficient use.<br>• In a command economy (by way of contrast), it is government planners, not prices, that decide how resources are used.<br>• While profits often act as incentives, people might also be motivated by other factors, like a feeling of fulfillment in their work or any number of other things.<br>• A method for allocating scarce resources is an economic system. An economic system is a set of rules that people must consider when making decisions. | **Supply and Demand**<br>http://www.youtube.com/watch?v=QgUkjqMIaD8<br><br>**What to Produce**<br>http://faculty.winthrop.edu/stonebrakerr/book/what_to_produce.htm<br><br>**How to Produce It**<br>http://faculty.winthrop.edu/stonebrakerr/book/How_to_produce.htm |
| SS.3.8.5 Compare how various market structures affect | **Students will understand:**<br>• Markets with more competition tend to create better outcomes for consumers. | **Examples of Market Types**<br>**Perfect Competition**: wheat and many other farm products |

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| decisions made in a market economy (e.g., monopoly, oligopoly, monopolistic competition, pure competition, etc.). | • Location, government regulation or the uniqueness of a product are factors that may cause markets to be more or less competitive.<br>**Students will know:**<br>• How to create a continuum showing the differences between different market structures in terms of the level of competition (e.g., a monopolistically competitive market includes more competition than an oligopolistic market, which in turn has more competition than a monopolistic market).<br>• The role of competition in regulating quality and price.<br>• Why people in a particular industry might have an interest in creating barriers for others' entry into the market.<br>• Factors that cause markets to be competitive. | **Oligopoly**: cell-phone networks, hospitals, soft drinks<br>**Monopoly**: utilities<br><br>**Definitions**<br>http://www.investopedia.com/university/economics/economics6.asp#axzz1xX1Tkrbg |

| **SS.3.9 Understand factors of economic interdependence and their impact on nations. CE.E.2** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.9.1 Explain the basic concepts of trade (e.g., including absolute and comparative advantage, exchange rates, balance of trade, gains from trade, etc.). | **Students will understand:**<br>• Trade can cause economies to change.<br>• Trade allows a nation to specialize in the production of products than it can produce most efficiently.<br>• Producers who do not have a comparative advantage may be driven out of business.<br>**Students will know:**<br>• A voluntary trade benefits both parties.<br>The definition of comparative advantage: the ability of a party (e.g. person, business, or nation) to produce a good or service at a lower opportunity cost than others. | A **comparative advantage** gives people an incentive to specialize and trade. For example: Specialization allows people to pursue their comparative advantage, which causes goods and services to be produced at a lower cost. Trade allows overall global production and consumption to increase.<br>**Barter and Money**<br>http://civics.sites.unc.edu/files/2012/05/Money10.pdf<br>**Gains from Trade**<br>http://www.econedlink.org/lessons/index.php?lid=855&type=educator |
| SS.3.9.2 Summarize how nations specialize and become interdependent through trade (e.g., trade restrictions and government policy). | **Students will understand:**<br>• Nations with strong economic infrastructure wield greater power in international relations.<br>• Different economic systems develop and change as societies respond to three essential questions; what to produce, how to produce and for whom to produce.<br>**Students will know:**<br>• The definition of interdependence.<br>• The definition of globalization.<br>Nations decide what, why and with whom to trade. | **International Trade**<br>http://civics.sites.unc.edu/files/2012/05/InternationalTrade10.pdf<br>**Barriers to Trade**<br>http://www.econedlink.org/lessons/index.php?lid=68&type=afterschool<br>**Issues of International Trade**<br>http://www.fte.org/teacher-resources/lesson-plans/tradelessons/ |
| SS.3.9.3 Explain the impact of government policies on international trade (e.g., tariffs, quotas, sanctions, subsidies, banking, embargos, etc.) | **Students will understand:**<br>• Protectionism usually benefits a narrow industry while increasing costs for consumers.<br>• Voters tend to support protectionism when its benefits are concentrated and its costs are dispersed.<br>• Political action may impact a nation's economy and result in changing government regulations.<br>• Economic decisions of one country can affect the economies of other nations.<br>**Students will know:**<br>• Governments often attempt to shield certain sectors of the economy from the changes brought about by trade. Definition of "protectionism." Various forms of protectionism: subsidies, tariffs, sanction, embargos, and quotas. | **Tariffs, Quotas, Embargos, Sanctions**<br>http://www.econmentor.com/international-economics/ssein2/define-trade-barriers-as-tariffs-quotas-embargoes-standards-and-subsidies/text/1699.html - Define the different types of trade barriers |

| SS.3.10 Analyze the role of government and economic institutions in developing and implementing economic stabilization policies in the U.S. CE.E.3 | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.3.10.1 Explain how fiscal policy and monetary policy influence overall levels of employment, interest rates, production, price level and economic growth (e.g., business cycle, standard of living, recession, depression, Consumer Price Index, etc.). | **Students will understand:**<br>• Changes in the money supply can lead to changes in interest rates which, in turn, affect the availability of credit, the average level of prices and national levels of spending and output.<br>• National, state and local levels of government often use tax cuts and spending increases in times of economic weakness to stimulate the economy. (Structure of government, federalism)<br>• Fiscal policy can provide stimulus during economic recession. Monetary policy decisions can prevent inflation.<br>**Students will know:**<br>• The definitions of fiscal policy and monetary policy.<br>• Monetary policy is used by the national government and fiscal policy is used by all levels of government.<br>• What exactly the Federal Reserve system is and its function.<br>• Banks create money when they make loans.<br>• The term "fiat" money.<br>• How and why fiscal and monetary policy are used | **Fiat money**<br>Money that has value only because of government regulation or law. Money that has no gold or silver backing. Today, most national currencies are fiat currencies, including the US dollar and the euro.<br><br>**Federal Reserve**<br>The Federal Reserve can affect the amount of money that banks can lend. The Federal Reserve can influence interest rates.<br><br>http://www.federalreserve.gov |
| SS.3.10.2 Analyze organizations in terms of their roles and functions in the United States economy (e.g., banks, labor unions, federal reserve, nonprofit organizations and cooperatives, Wall Street, etc.). | **Students will understand:**<br>• A central bank has a monopoly on creating the currency of a nation and functions to provide a nation's money supply.<br>• National governments can control the supply of money in an economy by encouraging or discouraging bank loans with the changes in discount rate and the buying or selling of government bonds. (Structure of government)<br>• Nonprofit organizations serve the public or a mutual benefit other than the accumulation of profits and as a result are a valuable part of a nation's economy.<br>• Financial institutions facilitate allocation of financial resources from its source to potential users.<br>**For example:**<br>• Some financial institutions collect funds from investors and make them available to users.<br>• Some financial institutions manage funds as agents for their clients.<br>**Students will know:**<br>• That the financial system (banks, the stock market, etc.) connects savers to borrowers.<br>• Entrepreneurs get money for new businesses by borrowing money through banks.<br>• The definition and characteristics of a recession. | **How Wall Street Works**<br>https://www.youtube.com/watch?v=VYPeMq0rxpM<br><br>**Nonprofit**<br>http://learningtogive.org/lessons/unit64/lesson3.html |

**ASE SS 4: World History and Geography**

| **SS.4.1 Apply the four interconnected dimensions of historical thinking to the United States History Essential Standards in order to understand the creation and development of the United States over time. WH.H.1** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.4.1.1 Use Chronological Thinking to:<br>• Identify the structure of a historical narrative or story: (its beginning, middle and end)<br>• Interpret data presented in time lines and create time lines | **The student will know:**<br>• Chronological thinking is the foundation of historical reasoning—the ability to examine relationships among historical events and to explain historical causality.<br>**The student will be able to:**<br>• Deconstruct the temporal structure (its beginning, middle, and end) of various types of historical narratives or stories. Thus, students will be able to think forward from the beginning of an event, problem, or issue through its development, and anticipate some outcome; or to work backward from some issue, problem, or event in order to explain its origins or development over time.<br>• Interpret data presented in time lines in order to identify patterns of historical succession (change) and historical duration (continuity).<br>• Create time lines to record events according to the temporal order in which they occurred and to reconstruct patterns of historical succession and duration. | **Interpreting Timelines with Worksheets**<br>http://teachersites.ladue.k12.mo.us/lhwhs/kantonelli/Mrs_Antonelli_Bio_Chem/Biology_Classes_files/Chapter%2012%20Science%20Skills%20Worksheet.pdf<br><br>**Make Your Own Timelines**<br>http://www.readwritethink.org/files/resources/interactives/timeline_2/<br><br>**Pearson's World History Home Page**<br>http://phschool.com/webcodes10/index.cfm?area=view&wcprefix=nbk&wcsuffix=8888 |
| SS.4.1.2 Use Historical Comprehension to:<br>• Reconstruct the literal meaning of a historical passage<br>• Differentiate between historical facts and historical interpretations<br>• Analyze data in historical maps<br>• Analyze visual, literary and musical sources | **The student will know:**<br>• Historical passages are primary sources that provide first-hand testimony or direct evidence concerning a topic under investigation.<br>• Historical narratives are researched stories or accounts that describe or interpret historical events.<br>• Comprehending a historical passage requires that it be read to reveal the humanity of the individuals and groups who lived in the past. What, for example, were their motives and intentions, their values and ideas, their hopes, doubts, fears, strengths, and weaknesses?<br>• Comprehending a historical passage or narrative requires the appreciation for and the development of historical perspective—judging the past in consideration of the historical context in which the events unfolded and not solely in terms of personal and/or contemporary norms and values. How then did the social, political, cultural, or economic world of certain individuals and groups possibly influence their motives and intentions, their values and ideas, their hopes, doubts, fears, strengths, and weaknesses?<br>**The student will be able to:**<br>• Reconstruct the literal meaning of a historical passage by identifying who was involved, what happened, where it happened, what events led to these developments, and what consequences or outcomes followed.<br>• Differentiate between historical facts and historical interpretations but acknowledge that the two are related; that the facts the historian reports are selected and reflect therefore the historian's judgment of what is most significant about the past.<br>• Analyze historical data and sources beyond written passages or narratives in order to clarify, illustrate or elaborate on data presented in historical passages or | **World History for US All**<br>http://worldhistoryforusall.sdsu.edu/<br><br>**Analyzing Historical Maps of North Carolina**<br>http://www.learnnc.org/lp/pages/5254 |

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| | narratives. This data includes historical maps.<br>• Analyze historical data and sources beyond written passages or narratives in order to clarify, illustrate or elaborate on data presented in historical passages or narratives. This data includes, but is not limited to, visual, mathematical, and quantitative data presented in a variety of graphic organizers, photographs, political cartoons, paintings, music and architecture. | |
| SS.4.1.3 Use Historical Research to:<br>• Formulate historical questions<br>• Obtain historical data from a variety of sources<br>• Support interpretations with historical evidence<br>• Construct analytical essays using historical evidence to support arguments. | **The student will know:**<br>• Historical inquiry, the research or investigation of past events, often begins with a historical question. Historical questions typically address "how" and/or "why" past decisions were made, past actions were taken, or past events occurred.<br>• Historical inquiry, the research or investigation of past events, requires the acquisition and analysis of historical data and documents beyond the classroom textbook.<br>• Historical inquiry, the research or investigation of past events, will allow them to analyze preexisting interpretations, to raise new questions about an historical event, to investigate the perspectives of those whose voices do not appear in the textbook accounts, or to investigate an issue that the textbook largely or in part bypassed.<br>**The student will be able to:**<br>• Formulate historical questions by deconstructing a variety of sources, such as historical narratives and passages, including eyewitness accounts, letters, diaries, artifacts, photos, historical sites, art, architecture, and other records from the past.<br>• Collect historical data from a variety of sources, to help answer historical questions.<br>• These sources include library and museum collections, historic sites, historical photos, journals, diaries, eyewitness accounts, newspapers, and the like; documentary films, oral testimony from living witnesses, censuses, tax records, city directories, statistical compilations, and economic indicators.<br>• Interpret historical data, construct reasoned arguments and draw conclusions using historical evidence collected from a variety of sources.<br>• Create analytical essays that demonstrate historical interpretations, analysis, conclusions, and supporting evidence from a variety of sources. | **The Research Paper: Developing Historical Questions**<br>http://teachinghistory.org/teaching-materials/teaching-guides/25516<br><br>**Teaching Sophisticated Historical Reasoning**<br>http://www.historicalthinker.com/ |

| **SS.4.2 Analyze ancient civilizations and empires in terms of their development, growth and lasting impact. WH.H.2** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.4.2.1 Compare how different geographic issues of the ancient period influenced settlement, trading networks and the sustainability of various ancient civilizations (e.g., flooding, fertile crescent, confluence, limited fertile lands, etc.). | **Students will understand:**<br>• Topography, climate and natural resources of a region influence the culture, economy and life-style of its inhabitants.<br>• Location affects a society's economic development.<br>• Geographic issues can lead to the migration of people and result in the spread and adaptation of ideas, customs and technologies from one group of people to another.<br>• Human response to the physical environment comes with consequences for both the environment and human interdependence. | **Ancient Civilizations PDF:**<br>http://www.wsfcs.k12.nc.us/cms/lib/NC01001395/Centricity/Domain/648/_Files/WORLD%20HISTORY/Unit%202_The%20Rise%20of%20Civilizations/wh_unit_2s_geographic_issues_of_ancient_period_with_area2.pdf<br><br>**More example questions:**<br>• Why did the ancient civilizations of the Fertile Crescent, India, |

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| | **Students will know:**<br>• How and why geographic issues such as flooding, natural barriers, drought, famine and limited fertile land influenced the settlement, trade interactions and sustainability of ancient civilizations<br>• Various settlement patterns that result in the rise of early river valley civilizations.<br>**For example**: Knowing how a particular group used available resources in its region to help develop a settlement.<br>• How and why the physical geography of a region helps shape the development of trade and the flow of migration in early and ancient civilizations<br>• People controlled the rivers in various manners in an attempt to channel water to the fields and build dikes to hold back flood waters.<br>• People used the rivers to form a communication chain while also using them as trade routes that formed extensive trading networks.<br>• The differences between nomadic and settled peoples.<br>• How and why trade networks expanded as groups crisscrossed the Mediterranean exporting and importing goods.<br>**For example**: Phoenician and Greek traders traveled back and forth across the Mediterranean trading goods and technology. As a result people migrated throughout the Mediterranean and trade networks connected to each other and stretched deep into northern Europe, Africa, and Asia. | Egypt, and China develop along rivers?<br>• Match the following ancient civilizations with their associated rivers or river valleys and place them in chronological order; [Sumer, India, Egypt, and China]<br>• What geographic features protected ancient Egypt from invasion and resulted in long-lasting civilizations?<br>• What geographic features protected ancient China from invasion and resulted in long-lasting civilizations?<br>• What geographic feature of the Mesopotamia or land between the 2 rivers ***encouraged*** invasions by outside groups?<br>• Describe the transition from the Paleolithic Era to the Neolithic Era? How did their lives change?<br>• Why did people of Sumer have to create the irrigation system? |
| SS.4.2.2 Analyze the governments of ancient civilizations in terms of their development, structure and function within various societies (e.g., theocracy, democracy, oligarchy, tyranny, aristocracy, etc.). | **Students will understand:**<br>• As a society increases in complexity and interacts with other societies, the complexity of government increases.<br>• Distribution of power in government is often the result of how it is organized combined with contemporary values and beliefs.<br>• Culture and society shape and change how a government is organized and carries out responsibilities.<br>**Students will know:**<br>• The role that religion played in unifying and centrally governing expanding territories with diverse populations.<br>• How ancient civilizations developed and expanded into empires of unprecedented size and diversity by creating centralized governments and by promoting commerce and a common culture.<br>**For example**: Greece, Rome, India and China<br>• Various types of governments that existed within ancient civilizations<br>• The structure of government in major ancient civilizations around the globe.<br>• How and why the function of government in major ancient civilizations around the globe differed depending on the type of government system that was in place. | |
| SS.4.2.3 Explain how codifying laws met the needs of ancient societies (e.g., Hammurabi, Draco, Justinian, Theodosius, etc.). | **Students will understand:**<br>• Written codes of law establish legal rules and regulations that govern a society as well as informs those in the society of acceptable and unacceptable behavior.<br>• Unifying laws into a written "code" can be a unifying factor for a society while reflecting also duties and obligations of those in the society.<br>• Both effective distribution of power in government and order | **Code of Hammurabi (portions only):**<br>http://www.commonlaw.com/Hammurabi.html<br><br>**The Codex Theodosianus:**<br>http://www.fordham.edu/halsall/source/codex-theod1.asp |

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| | within a society can result from the creation of a written code of laws.<br>**Students will know:**<br>• The meaning of codify and what it means when used in context with laws or legal systems<br>**For example**: -To organize into a code or system, such as body of law; "Hammurabi codified the laws:"<br>• How written law such as Hammurabi and Justinian Law Codes reinforced the belief that government had a responsibility for what behaviors were acceptable in a society and the consequences of unacceptable behaviors.<br>• How and why codifying laws centralized power for ancient rulers.<br>• How and why Draco's laws lead to the development of democracy in Ancient Greece. | **More example questions:**<br>• Why was **codifying** or creating a system of laws and **displaying** those laws to the public important?<br>• Why was Hammurabi's Code or system of laws not considered fair to all Babylonians?<br>• " If he puts out the eye of a man's slave, or break the bones of a man's slave, he shall pay ½ of a man's value". What does this say about Hammurabi society? |
| SS.4.2.4 Analyze the development and growth of major Eastern and Western religions (e.g., Including but not limited to Buddhism, Christianity, Confucianism, Hinduism, Islam, Judaism, and Shintoism, etc.). | **Students will understand:**<br>• Connections between and among empires may not only lead to geopolitical expansion or decline but also to the rise and spread of religious practices.<br>• Toleration of religious practices and beliefs often encourages the growth of religion within an empire and may help guarantee its success or lead to conflict and eventual decline.<br>**Students will know:**<br>• Differences between monotheistic and polytheistic belief systems and how they impact the political, economic and cultural development and/or expansion of major empires.<br>• The meaning of the term medieval.<br>• How and why the introduction of various religions impacted the values and beliefs of both Eastern and Western civilizations.<br>**For example**:<br>• The wide spread of Christianity in the Roman empire.<br>• The casual connections between the breakup of the unified. Roman and Han empires and the spread of Christianity and Buddhism<br>• Major beliefs and practices of Brahmanism in India and how they evolved into early Hinduism<br>• Christianity and Buddhism winning converts among culturally diverse peoples across wide area of Afro-Eurasia<br>• Islam winning converts among culturally diverse peoples across wide area of Afro-Eurasia<br>• The emergence of a center of Islamic civilization in Iberia and its economic and cultural influence<br>• Contributing factors that led to the expansion of religious influences and practices in and across Europe, Asia and Africa.<br>• The similarities between the tenets of various world religions that developed in the medieval period (e.g., Buddhism, Christianity, Confucianism, Islam, Judaism, Sikhism, and Taoism) and their patterns of expansion.<br>• Why the location, economic and religious importance of Constantinople was a source of conflict between civilizations but also enabled the spread of Christianity.<br>• The extent to which the Byzantine Empire influenced the Islamic world and Western Europe. | **A Brief Contrast between Eastern and Western Religions**<br>http://thenaturalsystemsinstitute.org/IX%20World%20Religions%20and%20Cultural%20Control%20and%20Conflict/a_brief_contrast_between_eastern_and_western_religions.htm<br>**DifferenceBetween.net**<br>http://www.differencebetween.net/miscellaneous/religion-miscellaneous/difference-between-eastern-religions-and-western-religions/ |

| SS.4.3 Understand how conflict and innovation influenced political, religious, economic and social changes in medieval civilizations. WH.H.3 | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.4.3.1 Explain how religion influenced political power and cultural unity in various regions of the Europe, Asia and Africa (e.g., Carolingian Dynasty, Holy Roman Empire, Ottoman Empire, Mughal Empire, Safavid Empire). | **Students will understand:**<br>• Religious beliefs and practices allow for the development of cultural institutions that often unite people and groups.<br>• Religious decisions and actions may result in both intended and unintended consequences that can impact a group or nation's power in a region.<br>• Religion can be a unifying force both politically and culturally.<br>• Absolute power can evolve when leaders have complete authority in religious and political matters.<br>**Students will know:**<br>• The meaning of the term Medieval.<br>• The characteristics of the Early Middle Ages, Middle Ages, and High Middle Ages.<br>• The political significance of Europe being largely cut off from advanced civilizations in the Middle East, China and India.<br>• How and why a new European civilization emerged that blended Greco-Roman, Germanic and Christian traditions.<br>• The reasons why Holy Roman emperors failed to build a unified state in Germany.<br>• The reasons for the emergence of "feudalism" and the development of the manor economy and political system.<br>• Christianity was a unifying force culturally, politically and militarily in the European empires.<br>• That medieval popes enjoyed powerful positions of absolute authority during the middle ages.<br>• How the role of religion was used to unify and centrally govern expanding territories with diverse populations of Europe.<br>• The causes and outcomes of the Crusades.<br>• Religion played an integral role in the expansion of empires.<br>• The powers the church had at its height. | **World Geography Religion**<br>http://world-geography.org/563-religion.html<br><br>**Mesopotamian Religion**<br>http://www.ancient.eu.com/Mesopotamian_Religion/<br><br>**Three Monotheistic Religions: Judaism, Christianity, Islam**<br>http://orias.berkeley.edu/slideshow/Slide.htm |
| SS.4.3.2 Analyze how innovations in agriculture, trade and business impacted the economic and social development of various medieval societies (e.g., Feudalism, Agricultural Revolutions, Commercial Revolution and development of a banking system, manorial system, growth of towns, etc.). | **Students will understand:**<br>• Innovation and technology leads to economic, cultural and social change.<br>• Technological innovation and expanding economic activity and markets can lead to population shifts, urbanization, and the development of complex economic systems.<br>**Students will know:**<br>• The connection between peasants adapting new farming technologies that made their fields more productive and the agricultural revolution.<br>• How and why the fact that Europe's growing population created a need for goods not available on the manor led to the revival of trade across Europe.<br>• How and why new business practices such as banking houses, partnerships and bill of exchange transformed medieval economies in the commercial revolution.<br>• The evolution of medieval towns and cities due to rapid growth.<br>• Increased trade and the growth of towns create the need for a banking system.<br>• That the decline of feudalism occurs due to the Agricultural Revolution and Commercial Revolution.<br>• How the feudal and manorial systems provided a foundation for political, economic and social relations in Europe. | **Agriculture - Hundred Years' War**<br>http://www.hyw.com/books/history/agricult.htm<br><br>http://wiki.answers.com/Q/What_were_the_agricultural_changes_in_the_Middle_Ages<br><br>**Technology in the Medieval Age - San Jose State University**<br>http://www.engr.sjsu.edu/pabacker/history/middle.htm |

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| | • The importance of the rise of the middle-class in Europe.<br>• Why the introduction of a new class (the bourgeoisie) had no place within the medieval system of lord, church and peasant. Also, know that this bourgeoisie class included master artisans and merchants. | |
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| **SS.4.4 Analyze the political, economic, social and cultural factors that lead to the development of the first age of global interaction. WH.H.4** | | |
| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.4.4.1 Explain how interest in classical learning and religious reform contributed to increased global interaction (e.g., Renaissance, Protestant Reformation, Catholic Reformation, Printing revolution, etc.). | **Students will understand:**<br>• An increase in the quest for knowledge can lead to global interactions.<br>• Intellectual and religious movements can transform societies and influence relationships among nations.<br>**Students will know:**<br>• How and why innovations from Asian and Islamic civilizations, as well as from ancient Greek and Roman culture, laid the foundation for the Renaissance.<br>• How and why increased availability of print material increased literacy and resulted in the spread of ideas that both supported and challenged authority.<br>• The factors that led to the Renaissance and the impact it had on the arts.<br>• The factors that led to the Reformation and the impact it had on European politics.<br>• The reasons why classical knowledge becomes the foundation for cultural growth.<br>• That the geographic location of Italian city-states played a significant role in the fact that Italy was the center of the Renaissance.<br>• How and why the Reformation led to religious reforms.<br>• That the printing revolution is a catalyst for the Reformation.<br>• How the Protestant Reformation affected the development of Northern and Southern European society. | **Khan Academy-Introduction to the Protestant Reformation**<br>https://www.khanacademy.org/humanities/history/1500-1600-Renaissance-Reformation/protestant-reformation/a/an-introduction-to-the-protestant-reformation<br><br>**The importance of the printing press**<br>http://www.reformation21.org/articles/the-importance-of-the-printing-press-for-the-protestant-reformation-part-two.php<br><br>**Gutenberg and the Printing Revolution in Europe**<br>http://www.crf-usa.org/bill-of-rights-in-action/bria-24-3-b-gutenberg-and-the-printing-revolution-in-europe |
| SS.4.4.2 Explain how agricultural and technological improvements transformed daily life socially and economically (e.g., growth of towns, creation of guilds, feudalism and the manorial system, commercialization, etc.). | **Students will understand:**<br>• Economies progress with improvements in agriculture and technology.<br>• A consequence of technological innovation is expanding economic activity and new markets which can result in massive population increases, urbanization, and the development of new economic systems.<br>• Agricultural advances promote growth in populations, urbanization and industrialization.<br>• The quality of life may be changed as a result of a shift in economic stability.<br>**Students will know:**<br>• That there are significant relationships between the "agricultural revolution," population growth, industrialization, specialization of labor, and patterns of land-holding that encourage growth of towns, creation of guilds and unions and changes in the feudal and manorial systems.<br>• Better diets increased the average life span of people as a result of agricultural advancements.<br>• Technological improvements made agricultural advancements possible.<br>• How and why the impact of the printing press and other technologies helped to disseminate beliefs and ideas as well as improve communication. | **The Manorial System**<br>http://www.historyworld.net/wrldhis/PlainTextHistories.asp?historyid=ac80<br><br>**Medieval Economies:**<br>http://www.castlehs.com/users/gbennett/Basics/Medieval%20Economies.pdf<br><br>**Learn NC**<br>http://www.learnnc.org/?standards=Social_Studies--World_History--All_Standards<br><br>**Europe in the Middle Ages 1000 – 1500**<br>http://holceyhistory.weebly.com/uploads/2/2/5/0/22509738/ch10flat.pdf |

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| | • How and why scientific and technological changes, transportation and new forms of energy brought about social, economic and cultural changes across Europe. | |

| **SS.4.5 Analyze exploration and expansion in terms of its motivations and impact. WH.H.5** | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.4.5.1 Explain how and why the motivations for exploration and conquest resulted in increased global interactions, differing patterns of trade, colonization, and conflict among nations (e.g., religious and political motives, adventure, economic investment, Columbian exchange, commercial revolution, conquistador destruction of Aztec and Incan civilizations, Triangular Trade, Middle Passage, trading outposts, plantation colonies, rise of capitalism, etc.). | **Students will understand:**<br>• The methods of and motivations for exploration and conquest can result in increased global interactions, differing patterns of trade, colonization, and conflict among nations.<br>• The desire for resources and markets can be catalysts for exploration and may lead to increased global interaction, economic competition and additional colonial possessions.<br>• Movement and interaction of people and ideas affects all societies involved.<br>• Imperialism and colonization prompts political, military and economic conflict among and between people and groups while initiating global interactions that can result in the development of new systems.<br>• The desire for economic advantage and the migration of people causes drastic changes in how, why and where people settle.<br>**Students will know:**<br>• How and why the recovery of the late Middle Ages set the stage for changes during the Age of Discovery.<br>• The major technological innovations that were made by the Portuguese and Spanish in shipbuilding, navigation and naval warfare and that those innovations had a direct affect on the confidence explorers had in expanding their travel beyond traditional routes.<br>• The economic and geopolitical causes that lead groups and nations to seek expansion<br>• That the voyages for exploration marked the beginning of European domination of the globe and these voyages helped Europe emerged as a powerful new force in the world in the 16th and 17th centuries.<br>• Factors such as the Scientific Revolution, the search for a sea route to Asia, the arrival of Columbus and other Europeans to the Americas helped create the Columbian Exchange.<br>• The migration of Europeans to the Americas and the exchange of ideas and culture between the Europeans and the Native Americans as well as the death of millions of Native Americans and the trans-Atlantic slave trade are effects of the Columbian Exchange.<br>• How and why colonization prompted conflict between Europeans and Native Americans. How and why the movement of people (ingenious Americans, European, African) into, from and within the Americas and Africa resulted in conflict between the New World and European nations.<br>• The African slave trade and resulting migration caused a shift in societal settlement patterns in Africa, European societies and the Americas. | **Khan Academy-Mesoamerica and Central America**<br>https://www.khanacademy.org/partner-content/british-museum/the-americas-bm/meso-central-america-bm/a/olmec-stone-mask<br><br>**The Impact of the Crusades**<br>https://www.khanacademy.org/humanities/art-history/art-history-400-1300-medieval---byzantine-eras/the-crusades/a/the-impact-of-the-crusades-4-of-4 |

| SS.4.6 Understand the Age of Revolutions and Rebellions. WH.H.6 | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.4.6.1 Explain how new ideas and theories of the universe altered political thought and affected economic and social conditions (e.g., Scientific Revolution, Enlightenment, rationalism, secularism, humanism, tolerance, empiricism, natural rights, contractual government, laissez-faire economics, Bacon, Descartes, Galileo, Newton, inductive and deductive reasoning, heliocentric, inquisition, works of Locke, Montesquieu, Rousseau, Bolivar, Jefferson, Paine, Adam Smith, etc.). | **Students will understand:**<br>• New ideas, theories and political thought help engineer foundations for changes in government, economies and societies.<br>• Discontent with prevailing economic, political, and social conditions is often the impetus for change which can result in revolution or reform.<br>**Students will know:**<br>• How and why the recovery of the late Middle Ages set the stage for changes during the Renaissance and Reformation.<br>• Meanings of key terminology as it relates to the Age of Revolutions (e.g., rationalism, reason, humanism, empiricism, heliocentric, geocentric).<br>• The impact of humanism on the growth of the Renaissance and the spread of new ideas.<br>• Enlightenment theories initiated the questioning of current government practices and prompted the desire for self-rule.<br>• How and why various ideals became driving forces for reforms and revolutions (e.g., liberty, popular sovereignty, natural rights, democracy and nationalism).<br>• That new intellectual, philosophical, and scientific ideas caused people to reevaluate how they viewed themselves and how they viewed their physical and spiritual worlds.<br>• The Inquisition was a direct result of the spread of ideas of the Enlightenment that were in conflict with the doctrines of the Roman Catholic Church.<br>• How economic conditions were impacted by Enlightenment thinkers.<br>• How and why the printing press and other technologies where a catalyst to better communication and more rapid dissemination of ideas across Europe. | **Khan Academy-Video on the Alphabet:**<br>https://www.khanacademy.org/computing/computer-science/informationtheory/info-theory/v/history-of-the-alphabet--language-of-coins--3-9<br><br>**Khan Academy-Video, "What is information theory?"**<br>https://www.khanacademy.org/computing/computer-science/informationtheory/info-theory/v/intro-information-theory |
| SS.4.6.2 Analyze political revolutions in terms of their causes and impact on independence, governing bodies and church-state relations. (e.g., Glorious Revolution, American Revolution, French<br>Revolution, Russian Revolution, Haitian, Mexican, Chinese, etc.) | **Students will understand:**<br>• When there is conflict between or within societies, change is a result.<br>• Conflict occurs when government and colonial leaders are not able to compromise on important issues.<br>• Changes in leadership due to revolution can lead to the establishment of new types of government.<br>**Students will know:**<br>• How changes in political thought resulted in revolution around the globe.<br>• The American Revolution was a catalyst for revolutions around the globe.<br>• The need for independence created revolutions in the Americas.<br>• New ideas developed during the Enlightenment became the motivation behind the American & French Revolutions.<br>• The Russian and Chinese Revolutions were a result of weak leadership, global conflict and revolutionary ideas.<br>• Ways in which the American, French, and Haitian revolutions influenced independence movements in Latin America.<br>• That the Haitian and Mexican Revolutions occurred because of a quest for independence. | **Khan Academy-1700-1800 Age of Enlightenment**<br>https://www.khanacademy.org/humanities/art-history/art-history-1700-1800-age-of-enlightenment |

| SS.4.7 Understand how national, regional, and ethnic interests have contributed to conflict among groups and nations in the modern era. WH.H.7 | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.4.7.1 Evaluate key turning points of the modern era in terms of their lasting impact (e.g., conflicts, documents, policies, movements, etc.). | **Students will understand:**<br>• When there is conflict between or within societies, change is a result.<br>• Key events in history can signal turning points that drastically alter the social, economic and political directions of a society.<br>• Effective leadership is necessary to accomplish the goals of a society, nation or group.<br>**Students will know:**<br>• The meaning of "turning point" and "watershed".<br>• How geography impacted major turning points during major wars during the modern era.<br>• How and why major political, military and economic campaigns or decisions have forever changed the course of history.<br>• The role leadership has played in key events throughout history. | **Timeline of Key Turning Points:**<br>1455—Gutenberg's Print Revolution<br>1492—The Columbian Exchange<br>1600—The British East India Company<br>1648—The Treaty of Westphalia<br>1676—Van Leeuwenhoek's Microscope<br>1751—Diderot's Enlightenment Encyclopedia<br>1787—The American Experiment<br>1789—The French Revolution<br>1838—The British Slavery Abolition Act<br>1839—The Opium War in China<br>1859—Darwin and the Origin of Species<br>1869—Binding Continents<br>1893—First Women Voters in New Zealand<br>1896—The Invention of Motion Pictures<br>1903—Kitty Hawk and Powered Flight<br>1904—The Russo-Japanese War<br>1928—The Discovery of Penicillin<br>1942—The Dawn of the Atom<br>1969—Walking on the Moon<br>1972—China Enters the World Balance<br>1989—The Fall of the Berlin Wall<br>2004—The Rise of Social Media |
| SS.4.7.2 Explain how economic crisis contributed to the growth of various political and economic movements (e.g., Great Depression, nationalistic movements of colonial Africa and Asia, socialist and communist movements, effect on capitalist economic theory, etc.). | **Students will understand:**<br>• Economic depression in one country can substantially affect the economies of other nations.<br>• In an attempt to avoid the chaos of an economic crisis, political and economic changes are initiated.<br>• Unequal distribution of wealth may lead to economic crisis and the implementation of economic and political reform.<br>• Changes in leadership prompted by the political action of citizens can be a direct result of economic problems.<br>**Students will know:**<br>• The factors that contributed to the Great Depression. For example: One of the contributing factors of the Great Depression was the unequal distribution of wealth.<br>• How and why the methods used by Mao Zedong and Chiang Kai-Shek were prompted by the economic crisis within China.<br>• That both the Korean and Vietnam conflicts began because of the desire to bring equality among social classes. | **Khan Academy - Overview of Chinese history 1911-1949**<br>https://www.khanacademy.org/humanities/history/euro-hist/China-early-1900s/v/overview-of-chinese-history-1911---1949<br><br>**Khan Academy - Communism**<br>https://www.khanacademy.org/humanities/history/euro-hist/cold-war/v/communism<br><br>**Timelines of the Great Depression**<br>http://www.hyperhistory.com/online_n2/connections_n2/great_depression.html |

| SS.4.8 Analyze global interdependence and shifts in power in terms of political, economic, social and environmental changes and conflicts since the last half of the twentieth century. WH.H.8 | | |
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| Objectives | What Learner Should Know, Understand, and Be Able to Do | Teaching Notes and Examples |
| SS.4.8.1 Evaluate global wars in terms of how they challenged political and economic power structures and gave rise to new balances of power (e.g., Spanish American War, WWI, WWII, Vietnam War, Colonial Wars in Africa, Persian Gulf War, etc.). | **Students will understand:**<br>• The collapse of a government or nation causes changes in the balance of power within a region and between nations.<br>• Changes in political and economic power can be a direct result of global conflict.<br>• Global economic interdependence is an effect of changing political power structures.<br>• Political instability and chaos serve as catalysts for changes to the balance of power and can led to war.<br>**Students will know:**<br>• How and why the rise of totalitarian governments contributed to World War II.<br>• Nationalism, imperialism, industrialization, and militarism contributed to an increase in economic and military competition among European nations, the Ottoman Empire, and Japan, and led to World War I.<br>• The failure of the Treaty of Versailles, the impact of the global depression, and the expansionist policies and actions of Axis nations are viewed as major factors that resulted in World War II.<br>• World Wars I and II were "total wars" in which nations mobilized entire populations and economies and employed new military tactics that resulted in unprecedented death and destruction, as well as drastic changes in political boundaries.<br>• The intended and unintended consequences of new national boundaries established by the treaties that ended World War II.<br>• World Wars I and II challenged economic and political power structures and gave rise to a new balance of power in the world.<br>• The causes and consequences of the genocides of Armenians, Roma (gypsies), and Jews, as well as the mass exterminations of Ukrainians and Chinese.<br>• How and why American isolationism contributed to both World War I and II.<br>• How and why the United States emerges as a world power after the Spanish-American War.<br>• The reasons that political instability within Vietnam caused political and military changes as well as chaos globally. | **Khan Academy-Empires before WWI**<br>https://www.khanacademy.org/humanities/history/euro-hist/world-war-I-tutorial/v/empires-before-world-war-i<br><br>**WWI Begins**<br>https://www.khanacademy.org/humanities/history/euro-hist/world-war-I-tutorial/v/the-great-war-begins |
| SS.4.8.2 Explain how international crisis has impacted international politics (e.g., Berlin Blockade, Korean War, Hungarian Revolt, Cuban Missile Crisis, OPEC oil crisis, Iranian Revolt, "911", terrorism, etc.). | **Students will understand:**<br>• International conflicts challenge political power structures and gave rise to new balances of power throughout the world.<br>• For examples: Partitioning of India, Berlin Blockade, Hungarian Revolt, Cuban Missile Crisis, Iranian Revolt, etc.<br>• When there is conflict between or within societies, change is a result.<br>• International relationships change in response to global and regional issues and events.<br>• The inability to compromise and the lack of cooperation can lead to increased tension and crisis.<br>• The continued threat of terrorist acts upon a nation leads to changes in a nation's political and foreign policy decisions.<br>• A change in the balance of power can serve as a means to increase political leverage among nations.<br>**Students will know:** | **Khan Academy Pattern of US cold war intervention**<br>https://www.khanacademy.org/humanities/history/euro-hist/cold-war/v/pattern-of-us-cold-war-interventions<br><br>**Perestroika and Glasnost**<br>http://www.history.com/topics/cold-war/perestroika-and-glasnost<br><br>**Foreign Policy Example**<br>For example: The Brezhnev Doctrine derived from the basic tenant that "When forces that are hostile to socialism try to turn the |

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| | • The reasons for and impact of various foreign policies of the U.S. as well as those of other nations.<br>• For examples: Containment, Eisenhower's policy of Brinkmanship, Kennedy's Flexible Response, Kruschev's Peaceful Coexistence, the Brezhnev Doctrine, Glasnost, Perestroika, etc.<br>• How and why post-independence struggles in South Asia, including the struggle over the partitioning of the subcontinent into India and Pakistan, as well as later tensions over Kashmir contributed to ongoing religious and regional divisions.<br>• Cold War conflicts in Eastern Europe and Asia led to increased tensions and prompted the US policy of containment.<br>• Reason why the Cuban Missile Crisis was a result of the hesitation of the Soviet Union and the United States to compromise on the positioning of weapons.<br>• That the Iranian Revolt was one of the first acts of international terrorism against the US and the reasons behind the capture of the 52 American hostages.<br>• The basic tenants of major foreign policy programs of the U.S. and other superpower nations during the Cold War.<br>• "9-11" prompted political changes that were designed to give government extended powers into the private lives of US citizens in an attempt to protect US borders from terrorist attacks.<br>• Post "9-11" issues that have changed the way nations interact. | development of some socialist country towards capitalism, it becomes not only a problem of the country concerned, but a common problem and concern of all socialist countries." This doctrine was announced to retroactively justify the Soviet invasion of Czechoslovakia in August 1968 along with earlier Soviet military interventions, such as the invasion of Hungary in 1956. These interventions were meant to put an end to democratic liberalization efforts and uprisings that had the potential to compromise Soviet influence inside the Eastern bloc, which was considered by the Soviets to be an essential defensive and strategic buffer in case hostilities with NATO were to break out. |
| SS.4.8.3 Analyze scientific, technological and medical innovations of postwar decades in terms of their impact on systems of production, global trade and standards of living (e.g., satellites, computers, social networks, information highway). | **Students will understand:**<br>• Advances in technology lead to the development of new products and materials which can strengthen the economic infrastructure of a society.<br>• New technologies and scientific breakthroughs can improve the quality of life—but may also present ethical dilemmas.<br>• Scientific and technological innovation transforms global economies, societies and military systems.<br>• Technological power and bureaucracies has been used by nations to deliberately and systematically destroy economies of other nations as well as ethnic/racial, political, and cultural groups and their quality of life.<br>• Global trade may become unbalanced as some countries become more technologically advanced than others.<br>• Social networking allows for faster, immediate communication and greater interconnectivity among people globally.<br>• Nations support free trade or trade barriers at different times for different reasons.<br>• Students will know:<br>• How and why scientific and technological improvements in the second half of the 20th century have resulted in an increasingly global economy and societies that face challenges of limited natural resources.<br>• How medical discoveries such as the polio vaccine and antiretroviral (ARV) therapy for HIV/AIDS patients have increased the life span of people.<br>• How and why Sputnik initiated the race to explore outer space.<br>• The significance of the shift in education among developed nations to focus on an emphasis to teach science, math, and foreign language education after the 1957 launch of Sputnik.<br>• How and why the internet has allowed for the exchange of ideas to take place at such a rapid pace. | **Video-The Discoveries: The Great Breakthroughs in 20th-Century Science**<br>http://www.uctv.tv/shows/The-Discoveries-The-Great-Breakthroughs-in-20th-Century-Science-11372<br><br>**Declaration on Science and the Use of Scientific Knowledge:**<br>http://www.unesco.org/science/wcs/eng/declaration_e.htm<br><br>**The 20th century: 100 Years of Scientific Creativity**<br>http://www.unesco.org/bpi/science/content/press/anglo/6.htm |

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| | • Both positive and negative global effects of the information highway and 21stcentury technologies. For example: The Three Gorges Dam (The TVA on the Yangte River) | |
| SS.4.8.4 Explain why terrorist groups and movements have proliferated and the extent of their impact on politics and society in various countries (e.g., Basque, PLO, IRA, Tamil Tigers, Al Qaeda, Hamas, Hezbollah, Palestinian Islamic Jihad, etc.). | **Students will understand:**<br>• Struggle for power and political leverage are often the basis of terrorism. Terrorist acts gain global attention and prompt changes in politics, economies and geographic boundaries.<br>• Acts of terrorism can occur as a result of political and economic factors such as nationalism, religion, economic disadvantage or globalization.<br>• Radical movements that espouse violence can arise from broad political conflicts centered on the demands of disadvantaged groups.<br>• Terrorism can be a reaction to alien cultural values and influences.<br>• Government is responsible for trying to prevent terrorist attack as well as relieving the hardships caused by terrorism. For example: The Indonesian government's pressure to relieve the economic hardships faced by the people in Bali after the 2002 attack and the tightening of airport security in order to prevent terrorism.<br>• Government measures to secure a nation and prevent terrorism may infringe on individual freedom and personal privacy.<br>• The desire for change in existing political order or geopolitical boundaries can lead to terrorist acts and altar societies. For example: The creation of a new state from an existing state or replacement of the existing state with another form (PLO and Islamic Jihad in Israel, the Chechnyans in Russia, the IRA in the UK, who want to change the existing political order and replace it with their own.)<br>• Terrorist acts can have a significant impact on a nation's tourist industry. Terrorist acts in one country can substantially affect the economies of other nations. For example: May impact global supply chains and cause things such as higher transportation costs that which often have a negative effect on emerging economies.<br>**Students will know:**<br>• The United Nations definition of terrorism.<br>• Definition of "fundamentalism" and how the modern connotation differs from its historical use.<br>• Meaning of jihad and the Islamic principles and laws that are relevant to military activity.<br>• Factors that influence terrorist acts and the pressing problems facing nations that have faced a breakdown of authority in the last two decades of the 20th century and the first decades of the 21st century.<br>• Various methods nations use to protect their citizens from terrorist acts.<br>• The importance of international cooperation and multinational organizations in attempting to solve global issues. | **The History of Terrorism**<br>http://terrorism.about.com/od/whatisterroris1/p/Terrorism.htm<br><br>**A Guide to Different Types of Terrorism**<br>http://terrorism.about.com/od/whatisterroris1/tp/DefiningTerrorism.htm<br><br>**Economic Impact of Terrorism and the September 11 Attacks**<br>http://terrorism.about.com/od/issuestrends/a/EconomicImpact.htm<br><br>**American Psychological Association-The Impact of Terrorism and Disasters on Children**<br>http://www.apa.org/about/gr/issues/cyf/disaster.aspx<br><br>**Forbidden Faces: Effects of Taliban Rule on Women in Afghanistan**<br>http://civics.sites.unc.edu/files/2012/05/ForbiddenFacesEffectsofTalibanRuleonWomeninAfghanistan.pdf<br><br>**Economic effects of terrorism**<br>http://securipedia.eu/mediawiki/index.php/Economic_effects_of_terrorism<br><br>**Terrorism: Cause and Effect**<br>http://dissidentvoice.org/2010/05/terrorism-cause-and-effect/ |

**ASE SS 1: US History to 1877 – Instructor Checklist**

| **SS.1.1 Apply the four interconnected dimensions of historical thinking to the United States History Essential Standards in order to understand the creation and development of the United States over time. AH1.H1** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.1.1 Use Chronological Thinking to:<br>1. Identify the structure of a historical narrative or story: (its beginning, middle and end)<br>2. Interpret data presented in time lines and create time lines | | |
| SS.1.2 Use Historical Comprehension to:<br>1. Reconstruct the literal meaning of a historical passage<br>2. Differentiate between historical facts and historical interpretations<br>3. Analyze data in historical maps<br>4. Analyze visual, literary and musical sources | | |
| SS.1.3 Use Historical Analysis and Interpretation to:<br>1. Identify issues and problems in the past<br>2. Consider multiple perspectives of various peoples in the past.<br>3. Analyze cause-and-effect relationships and multiple causation.<br>4. Evaluate competing historical narratives and debates among historians.<br>5. Evaluate the influence of the past on contemporary issues. | | |
| SS.1.4 Use Historical Research to:<br>1. Formulate historical questions<br>2. Obtain historical data from a variety of sources<br>3. Support interpretations with historical evidence<br>4. Construct analytical essays using historical evidence to support arguments. | | |

| **SS.1.2 Analyze key political, economic and social turning points in United States History using historical thinking. AH1.H.2** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.1.2.1 Analyze key political, economic, and social turning points from colonization through Reconstruction in terms of causes and effects (e.g., conflicts, legislation, elections, innovations, leadership, movements, Supreme Court decisions, etc.). | | |

| **SS.1.3 Understand the factors that led to exploration, settlement, movement, and expansion and their impact on United States development over time. AH1.H.3** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.1.3.1 Analyze how economic, political, social, military and religious factors influenced European exploration and American colonial settlement (e.g., Reformation, mercantilism, improvements in navigation technology, colonization, defeat of Spanish Armada, Great Awakening, etc.). | | |
| SS.1.3.2 Explain how environmental, cultural and economic factors influenced the patterns of migration and settlement within the U.S. before the Civil War (e.g., economic diversity of regions, mercantilism, cash crops, triangular trade, ethnic diversity, American Indian beliefs about land ownership, Lewis & Clark expedition, farming, Industrial Revolution, etc.). | | |
| SS.1.3.3 Analyze voluntary and involuntary immigration trends through Reconstruction in terms of causes, regions of origin and destination, cultural contributions, and public and governmental response (e.g., Puritans, Pilgrims, American Indians, Quakers, Scotch-Irish, Chinese, Africans, indentured servants, slavery, Middle Passage, farming, ideas of the Enlightenment, etc.). | | |

| **SS.1.4 Analyze how conflict and compromise have shaped politics, economics and culture in the United States. AH1.H.4** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.1.4.1 Analyze the political issues and conflicts that impacted the United States through Reconstruction and the compromises that resulted (e.g., American Revolution, Constitutional Convention, Bill of Rights, development of political parties, nullification, slavery, states' rights, Civil War). | | |

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| SS.1.4.2 Analyze the cultural conflicts that impacted the United States through Reconstruction and the compromises that resulted (e.g., displacement of American Indians, manifest destiny, slavery, assimilation, nativism). | | |

| **SS.1.5 Understand how tensions between freedom, equality and power have shaped the political, economic and social development of the United States. AH1.H.5** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.1.5.1 Summarize how the philosophical, ideological and/or religious views on freedom and equality contributed to the development of American political and economic systems through Reconstruction (e.g., natural rights, First Great Awakening, Declaration of Independence, transcendentalism, suffrage, abolition, "slavery as a peculiar institution", etc.). | | |
| SS.1.5.2 Explain how judicial, legislative and executive actions have affected the distribution of power between levels of government from colonization through Reconstruction (e.g., the Marshall Court, Jacksonian era, nullification, secession, etc.). | | |

| **SS.1.6 Understand how and why the role of the United States in the world has changed over time. AH1.H.6** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.1.6.1 Explain how national economic and political interests helped set the direction of United States foreign policy from independence through Reconstruction (e.g., treaties, embargo, tariffs, Proclamation of Neutrality, Monroe Doctrine, etc.). | | |
| SS.1.6.2 Explain the reasons for involvement in wars prior to Reconstruction and the influence each involvement had on international affairs (e.g., French and Indian War, War of 1812, Mexican War, Civil War) | | |

| **SS.1.7 Understand the impact of war on American politics, economics, society, and culture. AH1.H.7** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.1.7.1 Explain the impact of wars on American politics through Reconstruction (e.g., Issues of taxation without representation, Proclamation of 1763, Proclamation of Neutrality, XYZ Affair, Alien & Sedition Acts, War Hawks, Hartford Convention, slavery Compromises, scalawags, carpetbaggers, etc.). | | |

| **SS.1.8 Analyze the relationship between progress, crisis and the "American Dream" within the United States. AH1.H.8** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.1.8.1 Analyze the relationship between innovation, economic development, progress and various perceptions of the "American Dream" through Reconstruction (e.g., inventions, Industrial Revolution, American System, etc.). | | |
| SS.1.8.2 Explain how opportunity and mobility impacted various groups within American society through Reconstruction (e.g., Lowell and other "mill towns", Manifest Destiny, immigrants/migrants, Gold Rush, Homestead Act, Morrill Act, Exodusters, women, various ethnic groups, etc.). | | |
| SS.1.8.3 Analyze multiple perceptions of the "American Dream" in times of prosperity and crisis through Reconstruction (e.g., Hamilton's Financial Plan, Bank of the United States, Embargo of 1807, Manifest Destiny, phases of Reconstruction, etc.). | | |

**SS 2: Modern US History – Instructor Checklist**

| **SS.2.1 Apply the four interconnected dimensions of historical thinking to the American History Essential Standards in order to understand the creation and development of the US over time. Concept(s): Historical Thinking. USH2.H.1** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.2.1.1 Use Chronological Thinking to:<br>1. Identify the structure of a historical narrative or story: (its beginning, middle and end)<br>2. Interpret data presented in time lines and create time lines | | |
| SS.2.1.2 Use Historical Comprehension to:<br>1. Reconstruct the literal meaning of a historical passage<br>2. Differentiate between historical facts and historical interpretations<br>3. Analyze data in historical maps<br>4. Analyze visual, literary and musical sources | | |
| SS.2.1.3 Use Historical Analysis and Interpretation to:<br>1. Identify issues and problems in the past.<br>2. Consider multiple perspectives of various peoples in the past.<br>3. Analyze cause-and-effect relationships and multiple causation.<br>4. Evaluate competing historical narratives and debates among historians.<br>5. Evaluate the influence of the past on contemporary issues. | | |
| SS.2.1.4 Use Historical Research to:<br>1. Formulate historical questions<br>2. Obtain historical data from a variety of sources<br>3. Support interpretations with historical evidence<br>4. Construct analytical essays using historical evidence to support arguments. | | |

| **SS.2.2 Analyze key political, economic and social turning points in American History using historical thinking. Concept(s): Turning Points, Historical Thinking. USH2.H.2** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.2.2.1 Analyze key political, economic, and social turning points **since the end of Reconstruction** in terms of causes and effects (e.g., conflicts, legislation, elections, innovations, leadership, movements, Supreme Court decisions, etc.). | | |
| SS.2.2.2 Evaluate key turning points **since the end of Reconstruction** in terms of their lasting impact (e.g., conflicts, legislation, elections, innovations, leadership, movements, Supreme Court decisions, etc.). | | |

| **SS.2.3 Understand the factors that led to exploration, settlement, movement, and expansion and their impact on US development over time. Concept(s): Exploration, Settlement, Movement, Expansion. USH2.H.3** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.2.3.1 Analyze how economic, political, social, military and religious factors influenced US imperialism (e.g., passing of the western frontier, new markets, Spanish-American War, Open Door Policy, Monroe Doctrine, Roosevelt Corollary, canal route, etc.). | | |

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| SS.2.3.2 Explain how environmental, cultural and economic factors influenced the patterns of migration and settlement within the US since the end of Reconstruction (e.g., gold rush, destruction of the buffalo, reservations, ethnic neighborhoods, etc.). | | |
| SS.2.3.3 Explain the roles of various racial and ethnic groups in settlement and expansion since Reconstruction and the consequences for those groups (e.g., American Indians, African Americans, Chinese, Irish, Hispanics and Latino Americans, Asian Americans, etc.). | | |
| SS.2.3.4 Analyze voluntary and involuntary immigration trends since Reconstruction in terms of causes, regions of origin and destination, cultural contributions, and public and governmental response (e.g., new immigrants, ports of entry, ethnic neighborhoods, settlement houses, immigration restrictions, etc.). | | |

| **SS.2.4 Analyze how conflict and compromise have shaped politics, economics and culture in the US. Concept(s): Conflict, Compromise. USH2.H.4** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.2.4.1 Analyze the political issues and conflicts that impacted the US since Reconstruction and the compromises that resulted (e.g., Populism, Progressivism, working conditions and labor unrest, New Deal, Wilmington Race Riots, Eugenics, Civil Rights Movement, Anti-War protests, Watergate, etc.). | | |
| SS.2.4.2 Analyze the economic issues and conflicts that impacted the US since Reconstruction and the compromises that resulted (e.g., currency policy, industrialization, urbanization, laissez-faire, labor unrest, New Deal, Great Society, supply-side economics, etc.). | | |
| SS.2.4.3 Analyze the social and religious conflicts, movements and reforms that impacted the US since Reconstruction in terms of participants, strategies, opposition, and results (e.g., Prohibition, Social Darwinism, Eugenics, , anti-war protest, etc.). | | |
| SS.2.4.4 Analyze the cultural conflicts that impacted the US since Reconstruction and the compromises that resulted (e.g., nativism, Back to Africa movement, modernism, fundamentalism, black power movement, women's movement, counterculture, Wilmington Race Riots, etc.). | | |

| **SS.2.5 Understand how tensions between freedom, equality and power have shaped the political, economic and social development of the US. Concept(s): Freedom, Equality, Power. USH2.H.5** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.2.5.1 Summarize how the philosophical, ideological and/or religious views on freedom and equality contributed to the development of American political and economic systems since Reconstruction (e.g., "separate but equal", Social Darwinism, social gospel, civil service system, suffrage, Harlem Renaissance, the Warren Court, Great Society programs, American Indian Movement, etc.). | | |

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| SS.2.5.2 Explain how judicial, legislative and executive actions have affected the distribution of power between levels of government since Reconstruction (e.g., New Deal, Great Society, Civil Rights, etc.). | | |

| **SS.2.6 Understand how and why the role of the US in the world has changed over time. Concept(s): International Affairs, Foreign Policy** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.2.6.1 Explain how national economic and political interests helped set the direction of US foreign policy since Reconstruction (e.g., new markets, isolationism, neutrality, containment, homeland security, etc.). | | |
| SS.2.6.2 Explain the reasons for US involvement in global wars and the influence each involvement had on international affairs (e.g., Spanish-American War, WWI, WWII, Cold War, Korea, Vietnam, Gulf War, Iraqi War, etc.). | | |

| **SS.2.7 Understand the impact of war on American politics, economics, society and culture. Concept(s): War, Impacts. USH2.H.7** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.2.7.1 Explain the impact of wars on American politics since Reconstruction (e.g., spheres of influence, isolationist practices, containment policies, first and second Red Scare movements, patriotism, terrorist policies, etc.). | | |
| SS.2.7.2 Explain the impact of wars on American society and culture since Reconstruction (e.g., relocation of Japanese Americans, American propaganda, first and second Red Scare movement, McCarthyism, baby boom, Civil Rights Movement, protest movements, ethnic patriotism, etc.). | | |

| **SS.2.8 Analyze the relationship between progress, crisis and the "American Dream" within the US. Concept(s): Progress, Crisis, "the American Dream." USH2.H.8** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.2.8.1 Analyze the relationship between innovation, economic development, progress and various perceptions of the "American Dream" since Reconstruction (e.g., Gilded Age, assembly line, transcontinental railroad, highway system, credit, etc.). | | |
| SS.2.8.2 Explain how opportunity and mobility impacted various groups within American society since Reconstruction (e.g., Americanization movement, settlement house movement, Dust Bowl, the Great Migration, suburbia,etc.). | | |
| SS.2.8.3 Evaluate the extent to which a variety of groups and individuals have had opportunity to attain their perception of the "American Dream" since Reconstruction (e.g., immigrants, Flappers, Rosie the Riveter, GIs, blue collar worker, white collar worker, etc.). | | |
| SS.2.8.4 Analyze multiple perceptions of the "American Dream" in times of prosperity and crisis since Reconstruction (e.g., Great Depression, Dust Bowl, New Deal, oil crisis, savings and loan crisis, dot.com bubble, mortgage foreclosure crisis, etc.). | | |

**ASE SS 3: Civics and Economics – Instructor Checklist**

| **SS.3.1 Analyze the foundations and development of American government in terms of principles and values. CE.C&G.1** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.1.1 Explain how the tensions over power and authority led America's founding fathers to develop a constitutional democracy (e.g., mercantilism, salutary neglect, taxation and representation, boycott and protest, independence, American Revolution, Articles of Confederation, Ben Franklin, George Washington, John Adams, Son of Liberty, etc.). | | |
| SS.3.1.2 Explain how the Enlightenment and other contributing theories impacted the writing of the Declaration of Independence, the US Constitution and the Bill of Rights to help promote liberty, justice and equality (e.g., natural rights, classical theories of government, Magna Carta, Montesquieu, Locke, English Bill of Rights, etc.). | | |
| SS.3.1.3 Evaluate how debates on power and authority between Federalists and Anti-Federalists have helped shape government in the United States over time (e.g., Hamilton, Jefferson, Madison, Federalist Papers, strong central government, protection of individual rights, Elastic Clause, Bill of Rights, etc.). | | |
| SS.3.1.4 Analyze the principles and ideals underlying American democracy in terms of how they promote freedom (i.e. separation of powers, rule of law, limited government, democracy, consent of the governed / individual rights – life, liberty, pursuit of happiness, self-government, representative democracy, equal opportunity, equal protection under the law, diversity, patriotism, etc.). | | |
| SS.3.1.5 Evaluate the fundamental principles of American politics in terms of the extent to which they have been used effectively to maintain constitutional democracy in the United States (e.g., rule of law, limited government, democracy, consent of the governed, etc.). | | |

| **SS.3.2 Analyze government systems within the United States in terms of their structure, function and relationships. CE.C&G.2** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.2.1 Analyze the structures of national, state and local governments in terms of ways they are organized to maintain order, security, welfare of the public and the protection of citizens (e.g., federalism, the three branches, court system, judicial process, jurisdictions, agencies, etc.). | | |
| SS.3.2.2 Summarize the functions of North Carolina state and local governments within the federal system of government (e.g., local charters, maintain a militia, pass ordinances and laws, collect taxes, supervise elections, maintain highways, types of local governments, etc.). | | |
| SS.3.2.3 Evaluate the U.S. Constitution as a "living Constitution" in terms of how the words in the Constitution and Bill of Rights have been interpreted and applied throughout their existence (e.g., precedents, rule of law, Stare decisis judicial review, supremacy, equal protections, "establishment clause", symbolic speech, due process, right to privacy, etc.). | | |
| SS.3.2.4 Evaluate the authority federal, state and local governments have over individuals' rights and privileges (e.g., Bill of Rights, Delegated Powers, Reserved Powers, Concurrent Powers, Pardons, Writ of habeas corpus, Judicial Process, states' rights, Patriot Act, etc.). | | |
| SS.3.2.5 Analyze contemporary issues and governmental responses at the local, state, and national levels in terms of how they promote the public interest and/or general welfare (e.g., taxes, immigration, naturalization, civil rights, economic development, annexation, redistricting, zoning, national security, health care, etc.). | | |
| SS.3.2.6 Analyze America's two-party system in terms of the political and economic views that led to its emergence and the role that political parties play in American politics (e.g., Democrat, Republican, promotion of civic responsibility, Federalists, Anti-Federalists, Influence of third parties, precincts, "the political spectrum", straight ticket, canvass, planks, platform, etc.). | | |

**ASE SS 3: Civics and Economics – Instructor Checklist, Page 2**

| **SS.3.3 Analyze the legal system within the United States in terms of the development, execution and protection of citizenship rights at all levels of government. CE.C&G.3** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS3.3.1 Analyze how the rule of law establishes limits on both the governed and those who govern while holding true to the ideal of equal protection under the law (e.g., the Fourteenth Amendments, Americans with Disabilities Act, equal opportunity legislation). | | |
| SS.3.3.2 Compare lawmaking processes of federal, state and local governments (e.g., committee system, legislative process, bills, laws, veto, Filibuster, Cloture, Proposition, etc.). | | |
| SS.3.3.3 Explain how individual rights are protected by varieties of law (e.g., Bill of Rights, Supreme Court Decisions, constitutional law, criminal law, civil law, Tort, Administrative law, Statutory law and International law, etc.). | | |
| SS.3.3.4 Explain ways laws have been influenced by political parties, constituents, interest groups, lobbyists, the media and public opinion (e.g., extension of suffrage, labor legislation, civil rights legislation, military policy, environmental legislation, business regulation and educational policy). | | |
| SS.3.3.5 Summarize the importance of the right to due process of law for individuals accused of crimes (e.g., habeas corpus, presumption of innocence, impartial tribunal, trial by jury, right to counsel, right against self-incrimination, protection against double jeopardy, right of appeal.) | | |
| SS.3.3.6 Evaluate the rights of individuals in terms of how well those rights have been upheld by democratic government in the United States. | | |

| **SS.3.4 Understand how democracy depends upon the active participation of citizens. CE.C&G.4** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.4.1 Compare citizenship in the American constitutional democracy to membership in other types of governments (e.g., right to privacy, civil rights, responsibilities, political rights, right to due process, equal protection under the law, participation, freedom, etc.). | | |
| SS.3.4.2 Analyze the roles of citizens of North Carolina and the United States in terms of responsibilities, participation, civic life and criteria for membership or admission (e.g., voting, jury duty, lobbying, interacting successfully with government agencies, organizing and working in civic groups, etc.). | | |

| **SS.3.5 Analyze how political and legal systems within and outside of the United States provide a means to balance competing interests and resolve conflicts. CE.C&G.5** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.5.1 Analyze the election process at the national, state and local levels in terms of the checks and balances provided by qualifications and procedures for voting (e.g., civic participation, public hearings, forums, at large voting, petition, local initiatives, local referendums, voting amendments, types of elections, etc.). | | |
| SS.3.5.2 Analyze state and federal courts by outlining their jurisdictions and the adversarial nature of the judicial process (e.g., Appellate, Exclusive, Concurrent, Original, types of federal courts, types of state courts, oral argument, courtroom rules, Supreme Court, opinions, Court Docket, Prosecutor/Prosecution, Complaint, Defendant, Plaintiff, hearing, bail, indictment, sentencing, appeal, etc.). | | |
| SS.3.5.3 Analyze national, state and local govern-ment agencies in terms of how they balance interests and resolve conflicts (e.g., FBI, SBI, DEA, CIA, National Guard Reserves, magistrates, Better Business Bureau, IRS, Immigration and Naturalization, FEMA, Homeland Security, ATF, etc.) | | |
| SS.3.5.4 Analyze the developments and implementation of domestic and foreign policy by outlining opposing arguments on major issues and their efforts toward resolutions (e.g., health care, education, immigration, etc.). | | |

| **SS.3.6 Analyze the concepts and factors that enable individuals to make informed financial decisions for effective resource planning. CE.PFL.1** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.6.1 Explain how education, income, career, and life choices impact an individual's financial plan and goals (e.g., job, wage, salary, college/university, community college, military, workforce, skill development, social security, entrepreneur, rent, mortgage, etc.) | | |
| SS.3.6.2 Explain how fiscally responsible individuals create and manage a personal budget that is inclusive of income, taxes, gross and net pay, giving, fixed and variable expenses and retirement (e.g., budget, financial plan, money management, saving and investing plan, etc.). | | |
| SS.3.6.3 Analyze how managing a checking and savings account contributes to financial well being (e.g., deposits, withdrawals, transfers, automated transactions, fees, etc.). | | |
| SS.3.6.4 Summarize how debt management and creditworthiness impact an individual's ability to become responsible consumers and borrowers (e.g., credit card management, monitoring interest rates and personal credit reports, analyzing loan details, keeping and maintaining records, etc.). | | |
| SS.3.6.5 Analyze how fiscally responsible individuals save and invest to meet financial goals (e.g., investment, stock market, bonds, mutual funds, etc.). | | |
| SS.3.6.6 Compare various investing strategies and tax implications for their potential to build wealth (e.g., individual stocks and bonds with investing in stock, giving, bonds, mutual funds, retirement plans, etc.). | | |

| **SS.3.7 Understand how risk management strategies empower and protect consumers. CE.PFL.2** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.7.1 Explain how consumer protection laws and government regulation contribute to the empowerment of the individual (e.g., consumer credit laws, regulation, FTC-Federal Trade Commission, protection agencies, etc.). | | |
| SS.3.7.2 Summarize various types of fraudulent solicitation and business practices (e.g., identity theft, personal information disclosure, online scams, Ponzi schemes, investment scams, internet fraud, etc.). | | |
| SS.3.7.3 Summarize ways consumers can protect themselves from fraudulent and deceptive practices (e.g., do not call lists, reading the fine print, terms and conditions, personal information disclosure, investment protection laws, fees, etc.) | | |
| SS.3.7.4 Classify the various types of insurance and estate planning including the benefits and consequences (e.g., car, health, renters, life, liability, travel, disability, long-term care, natural disaster, etc.). | | |
| SS.3.7.5 Summarize strategies individuals use for resolving consumer conflict (e.g., contacting Attorney General, filing claims, Better Business Bureau, Secretary of State, etc.). | | |

| **SS.3.8 Understand economies, markets and the role economic factors play in making economic decisions. CE.E.1** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.8.1 Compare how individuals and governments utilize scarce resources (human, natural and capital) in traditional, command, market and mixed economies. | | |
| SS.3.8.2 Analyze a market economy in terms of economic characteristics, the roles they play in decision making and the importance of each role (e.g., private property, free enterprise, circular flow, competition and profit motive, and allocation of resources via the price system). | | |
| SS.3.8.3 Explain how supply and demand determine equilibrium price and quantity produced (e.g., any market example –apples, tires, etc.). | | |

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| SS.3.8.4 Analyze the ways in which incentives and profits influence what is produced and distributed in a market system (e.g., supply, demand, What to Produce?, How to Produce It?, How Much to Produce?, For Whom To Produce It?, free enterprise, etc.). | | |
| SS.3.8.5 Compare how various market structures affect decisions made in a market economy (e.g., monopoly, oligopoly, monopolistic competition, pure competition, etc.). | | |

| **SS.3.9 Understand factors of economic interdependence and their impact on nations. CE.E.2** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.9.1 Explain the basic concepts of trade (e.g., including absolute and comparative advantage, exchange rates, balance of trade, gains from trade, etc.). | | |
| SS.3.9.2 Summarize how nations specialize and become interdependent through trade (e.g., trade restrictions and government policy). | | |
| SS.3.9.3 Explain the impact of government policies on international trade (e.g., tariffs, quotas, sanctions, subsidies, banking, embargos, etc.) | | |

| **SS.3.10 Analyze the role of government and economic institutions in developing and implementing economic stabilization policies in the U.S. CE.E.3** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.3.10.1 Explain how fiscal policy and monetary policy influence overall levels of employment, interest rates, production, price level and economic growth (e.g., business cycle, standard of living, recession, depression, Consumer Price Index, etc.). | | |
| SS.3.10.2 Analyze organizations in terms of their roles and functions in the United States economy (e.g., banks, labor unions, federal reserve, nonprofit organizations and cooperatives, Wall Street, etc.). | | |

**ASE SS 4: World History and Geography – Instructor Checklist**

| **SS.4.1 Apply the four interconnected dimensions of historical thinking to the United States History Essential Standards in order to understand the creation and development of the United States over time. WH.H.1** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.4.1.1 Use Chronological Thinking to:<br>• Identify the structure of a historical narrative or story: (its beginning, middle and end)<br>• Interpret data presented in time lines and create time lines | | |
| SS.4.1.2 Use Historical Comprehension to:<br>• Reconstruct the literal meaning of a historical passage<br>• Differentiate between historical facts and historical interpretations<br>• Analyze data in historical maps<br>• Analyze visual, literary and musical sources | | |
| SS.4.1.3 Use Historical Research to:<br>• Formulate historical questions<br>• Obtain historical data from a variety of sources<br>• Support interpretations with historical evidence<br>• Construct analytical essays using historical evidence to support arguments. | | |

| **SS.4.2 Analyze ancient civilizations and empires in terms of their development, growth and lasting impact. WH.H.2** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.4.2.1 Compare how different geographic issues of the ancient period influenced settlement, trading networks and the sustainability of various ancient civilizations (e.g., flooding, fertile crescent, confluence, limited fertile lands, etc.). | | |
| SS.4.2.2 Analyze the governments of ancient civilizations in terms of their development, structure and function within various societies (e.g., theocracy, democracy, oligarchy, tyranny, aristocracy, etc.). | | |
| SS.4.2.3 Explain how codifying laws met the needs of ancient societies (e.g., Hammurabi, Draco, Justinian, Theodosius, etc.). | | |
| SS.4.2.4 Analyze the development and growth of major Eastern and Western religions (e.g., Including but not limited to Buddhism, Christianity, Confucianism, Hinduism, Islam, Judaism, and Shintoism, etc.). | | |

| **SS.4.3 Understand how conflict and innovation influenced political, religious, economic and social changes in medieval civilizations. WH.H.3** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.4.3.1 Explain how religion influenced political power and cultural unity in various regions of the Europe, Asia and Africa (e.g., Carolingian Dynasty, Holy Roman Empire, Ottoman Empire, Mughal Empire, Safavid Empire). | | |
| SS.4.3.2 Analyze how innovations in agriculture, trade and business impacted the economic and social development of various medieval societies (e.g., Feudalism, Agricultural Revolutions, Commercial Revolution and development of a banking system, manorial system, growth of towns, etc.). | | |

| **SS.4.4 Analyze the political, economic, social and cultural factors that lead to the development of the first age of global interaction. WH.H.4** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.4.4.1 Explain how interest in classical learning and religious reform contributed to increased global interaction (e.g., Renaissance, Protestant Reformation, Catholic Reformation, Printing revolution, etc.). | | |
| SS.4.4.2 Explain how agricultural and technological improvements transformed daily life socially and economically (e.g., growth of towns, creation of guilds, feudalism and the manorial system, commercialization, etc.). | | |

| **SS.4.5 Analyze exploration and expansion in terms of its motivations and impact. WH.H.5** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.4.5.1 Explain how and why the motivations for exploration and conquest resulted in increased global interactions, differing patterns of trade, colonization, and conflict among nations. | | |

| **SS.4.6 Understand the Age of Revolutions and Rebellions. WH.H.6** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.4.6.1 Explain how new ideas and theories of the universe altered political thought and affected economic and social conditions. | | |
| SS.4.6.2 Analyze political revolutions in terms of their causes and impact on independence, governing bodies and church-state relations (e.g., Glorious Revolution, American Revolution, French Revolution, Russian Revolution, Haitian, Mexican, Chinese, etc.) | | |

| **SS.4.7 Understand how national, regional, and ethnic interests have contributed to conflict among groups and nations in the modern era. WH.H.7** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.4.7.1 Evaluate key turning points of the modern era in terms of their lasting impact (e.g., conflicts, documents, policies, movements, etc.). | | |
| SS.4.7.2 Explain how economic crisis contributed to the growth of various political and economic movements (e.g., Great Depression, nationalistic movements of colonial Africa and Asia, socialist and communist movements, effect on capitalist economic theory, etc.). | | |

| **SS.4.8 Analyze global interdependence and shifts in power in terms of political, economic, social and environmental changes and conflicts since the last half of the twentieth century. WH.H.8** | | |
|---|---|---|
| Objectives | Curriculum Used | Notes |
| SS.4.8.1 Evaluate global wars in terms of how they challenged political and economic power structures and gave rise to new balances of power (e.g., Spanish American War, WWI, WWII, Vietnam War, Colonial Wars in Africa, Persian Gulf War, etc.). | | |
| SS.4.8.2 Explain how international crisis has impacted international politics (e.g., Berlin Blockade, Korean War, Hungarian Revolt, Cuban Missile Crisis, OPEC oil crisis, Iranian Revolt, "911", terrorism, etc.). | | |
| SS.4.8.3 Analyze scientific, technological and medical innovations of postwar decades in terms of their impact on systems of production, global trade and standards of living (e.g., satellites, computers, social networks, etc.) | | |
| SS.4.8.4 Explain why terrorist groups and movements have proliferated and the extent of their impact on politics and society in various countries (e.g., Basque, PLO, IRA, Tamil Tigers, Al Qaeda, Hamas, Hezbollah, Palestinian Islamic Jihad, etc.). | | |

**ASE SS 1: US History to 1877 – Student Checklist**

| **SS.1.1 Apply the four interconnected dimensions of historical thinking to the United States History Essential Standards in order to understand the creation and development of the United States over time. AH1.H1** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can use chronological thinking to identify the beginning, middle, and end of an historical narrative. | | |
| I can use chronological thinking to Interpret data presented in time lines. | | |
| I can use chronological thinking to create time lines. | | |
| I can use historical comprehension to reconstruct the literal meaning of a historical passage. | | |
| I can use historical comprehension to understand the difference between historical facts and historical interpretations. | | |
| I can use historical comprehension to analyze data in historical maps. | | |
| I can use historical comprehension to analyze visual, literary, and musical sources. | | |
| I can use historical analysis and interpretation to identify issues and problems in the past. | | |
| I can use historical analysis and interpretation to consider multiple perspectives of various peoples in the past. | | |
| I can use historical analysis and interpretation to analyze cause-and-effect relationships. | | |
| I can use historical analysis and interpretation to analyze effects that have more than one cause. | | |
| I can use historical analysis and interpretation to evaluate competing historical narratives and debates among historians. | | |
| I can use historical analysis and interpretation to evaluate the influence of the past on contemporary issues. | | |
| I can use historical research to create historical questions. | | |
| I can use historical research to obtain historical data from more than one source. | | |
| I can use historical research to support my interpretations with historical evidence. | | |
| I can use historical research to create essays with historical evidence to back my arguments. | | |

| **SS.1.2 Analyze key political, economic and social turning points in United States History using historical thinking. AH1.H.2** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze key political turning points from colonization through Reconstruction in terms of their causes and effects. | | |
| I can analyze key economic turning points from colonization through Reconstruction in terms of their causes and effects. | | |
| I can analyze key social turning points from colonization through Reconstruction in terms of their causes and effects. | | |

| **SS.1.3 Understand the factors that led to exploration, settlement, movement, and expansion and their impact on United States development over time. AH1.H.3** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze how economic factors influenced European exploration and American colonial settlement. | | |
| I can analyze how political factors influenced European exploration and American colonial settlement. | | |
| I can analyze how social factors influenced European exploration and American colonial settlement. | | |

**ASE SS 1: US History to 1877 – Student Checklist, Page 2**

| | | |
|---|---|---|
| I can analyze how military factors influenced European exploration and American colonial settlement. | | |
| I can analyze how religious factors influenced European exploration and American colonial settlement. | | |
| I can explain how environmental factors influenced the patterns of migration and settlement within the U.S. before the Civil War. | | |
| I can explain how cultural factors influenced the patterns of migration and settlement within the U.S. before the Civil War. | | |
| I can explain how economic factors influenced the patterns of migration and settlement within the U.S. before the Civil War. | | |
| I can analyze voluntary and involuntary immigration trends through Reconstruction in terms of causes. | | |
| I can analyze voluntary and involuntary immigration trends through Reconstruction in terms of regions of origin and destination. | | |
| I can analyze voluntary and involuntary immigration trends through Reconstruction in terms of cultural contributions. | | |
| I can analyze voluntary and involuntary immigration trends through Reconstruction in terms of governmental response. | | |

| **SS.1.4 Analyze how conflict and compromise have shaped politics, economics and culture in the United States. AH1.H.4** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze the political issues and conflicts that impacted the United States through Reconstruction, | | |
| I can analyze the compromises that resulted from the political issues and conflicts that impacted the United States through Reconstruction. | | |
| I can analyze the cultural conflicts that impacted the United States through Reconstruction and the compromises that resulted. | | |
| I can analyze the compromises that resulted from the cultural conflicts that impacted the United States through Reconstruction. | | |

| **SS.1.5 Understand how tensions between freedom, equality and power have shaped the political, economic and social development of the United States. AH1.H.5** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can summarize how the philosophical, ideological and/or religious views on freedom and equality contributed to the development of American political and economic systems through Reconstruction. | | |
| I can explain how judicial actions have affected the distribution of power between levels of government from colonization through Reconstruction. | | |
| I can explain how legislative actions have affected the distribution of power between levels of government from colonization through Reconstruction. | | |
| I can explain how executive actions have affected the distribution of power between levels of government from colonization through Reconstruction. | | |

| **SS.1.6 Understand how and why the role of the United States in the world has changed over time. AH1.H.6** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how national economic interests helped set the direction of United States foreign policy from independence through Reconstruction. | | |
| I can explain how national political interests helped set the direction of United States foreign policy from independence through Reconstruction | | |
| I can explain the reasons for involvement in wars prior to Reconstruction. | | |
| I can explain the influence each war prior to Reconstruction had on international affairs. | | |

| **SS.1.7 Understand the impact of war on American politics, economics, society, and culture. AH1.H.7** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain the impact of wars on American politics through Reconstruction. | | |

| | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze the relationship between innovation, economic development, progress and various perceptions of the “American Dream” through Reconstruction. | | |
| I can explain how opportunity and mobility impacted various groups within American society through Reconstruction. | | |
| I can analyze multiple perceptions of the “American Dream” in times of prosperity and crisis through Reconstruction. | | |

**SS 2: Modern US History – Student Checklist**

| **SS.2.1 Apply the four interconnected dimensions of historical thinking to the American History Essential Standards in order to understand the creation and development of the US over time. Concept(s): Historical Thinking. USH2.H.1** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can use chronological thinking to identify the beginning, middle, and end of an historical narrative. | | |
| I can use chronological thinking to Interpret data presented in time lines. | | |
| I can use chronological thinking to create time lines. | | |
| I can use historical comprehension to reconstruct the literal meaning of a historical passage. | | |
| I can use historical comprehension to understand the difference between historical facts and historical interpretations. | | |
| I can use historical comprehension to analyze data in historical maps. | | |
| I can use historical comprehension to analyze visual, literary, and musical sources. | | |
| I can use historical analysis and interpretation to identify issues and problems in the past. | | |
| I can use historical analysis and interpretation to consider multiple perspectives of various peoples in the past. | | |
| I can use historical analysis and interpretation to analyze cause-and-effect relationships. | | |
| I can use historical analysis and interpretation to analyze effects that have more than one cause. | | |
| I can use historical analysis and interpretation to evaluate competing historical narratives and debates among historians. | | |
| I can use historical analysis and interpretation to evaluate the influence of the past on contemporary issues. | | |
| I can use historical research to create historical questions. | | |
| I can use historical research to obtain historical data from more than one source. | | |
| I can use historical research to support my interpretations with historical evidence. | | |
| I can use historical research to create essays with historical evidence to back my arguments. | | |

| **SS.2.2 Analyze key political, economic and social turning points in American History using historical thinking. Concept(s): Turning Points, Historical Thinking. USH2.H.2** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze key political turning points since Reconstruction in terms of their causes and effects. | | |
| I can analyze key economic turning points since Reconstruction in terms of their causes and effects. | | |
| I can analyze key social turning points since Reconstruction in terms of their causes and effects. | | |
| I can evaluate key turning points since the end of Reconstruction in terms of their lasting impact. | | |

| **SS.2.3 Understand the factors that led to exploration, settlement, movement, and expansion and their impact on US development over time. Concept(s): Exploration, Settlement, Movement, Expansion. USH2.H.3** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze how economic factors influenced US imperialism. | | |
| I can analyze how political factors influenced US imperialism. | | |
| I can analyze how social factors influenced US imperialism. | | |
| I can analyze how religious factors influenced US imperialism. | | |
| I can explain how environmental factors influenced the patterns of migration and settlement within the US since the end of Reconstruction. | | |
| I can explain how cultural factors influenced the patterns of migration and settlement within the US since the end of Reconstruction. | | |
| I can explain how economic factors influenced the patterns of migration and settlement within the US since the end of Reconstruction. | | |

**SS 2: Modern US History – Student Checklist, Page 2**

| | | |
|---|---|---|
| I can explain the consequences various racial and ethnic groups experienced in settlement and expansion since Reconstruction. | | |
| I can analyze voluntary and involuntary immigration trends since Reconstruction in terms of causes. | | |
| I can analyze voluntary and involuntary immigration trends since Reconstruction in terms of regions of origin and destination. | | |
| I can analyze voluntary and involuntary immigration trends since Reconstruction in terms of cultural contributions. | | |
| I can analyze voluntary and involuntary immigration trends since Reconstruction in terms of public and governmental response. | | |

| **SS.2.4 Analyze how conflict and compromise have shaped politics, economics and culture in the US. Concept(s): Conflict, Compromise. USH2.H.4** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze the political issues and conflicts that impacted the US since Reconstruction. | | |
| I can analyze the compromises that resulted from the political issues and conflicts that impacted the US since Reconstruction. | | |
| I can analyze the economic issues and conflicts that impacted the US since Reconstruction. | | |
| I can analyze the compromises that resulted from economic issues and conflicts that impacted the US since Reconstruction. | | |
| I can analyze the social and religious conflicts, movements and reforms that impacted the US since Reconstruction in terms of participants. | | |
| I can analyze the social and religious conflicts, movements and reforms that impacted the US since Reconstruction in terms of strategies. | | |
| I can analyze the social and religious conflicts, movements and reforms that impacted the US since Reconstruction in terms of opposition. | | |
| I can analyze the social and religious conflicts, movements and reforms that impacted the US since Reconstruction in terms of results. | | |
| I can analyze the cultural conflicts that impacted the US since Reconstruction. | | |
| I can analyze the compromises that resulted from the cultural conflicts that impacted the US since Reconstruction. | | |

| **SS.2.5 Understand how tensions between freedom, equality and power have shaped the political, economic and social development of the US. Concept(s): Freedom, Equality, Power. USH2.H.5** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can summarize how the philosophical, ideological and/or religious views on freedom and equality contributed to the development of American political systems since Reconstruction. | | |
| I can summarize how the philosophical, ideological and/or religious views on freedom and equality contributed to the development of American economic systems since Reconstruction. | | |
| I can explain how judicial actions have affected the distribution of power between levels of government since Reconstruction. | | |
| I can explain how legislative actions have affected the distribution of power between levels of government since Reconstruction. | | |
| I can explain how executive actions have affected the distribution of power between levels of government since Reconstruction. | | |

**SS 2: Modern US History – Student Checklist, Page 3**

| **SS.2.6 Understand how and why the role of the US in the world has changed over time. Concept(s): International Affairs, Foreign Policy** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how national economic interests helped set the direction of US foreign policy since Reconstruction. | | |
| I can explain how national political interests helped set the direction of US foreign policy since Reconstruction. | | |
| I can explain the reasons for US involvement in global wars. | | |
| I can explain the influence US involvement in global wars had on international affairs. | | |

| **SS.2.7 Understand the impact of war on American politics, economics, society and culture. Concept(s): War, Impacts. USH2.H.7** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain the impact of wars on American politics since Reconstruction. | | |
| I can explain the impact of wars on American society and culture since Reconstruction. | | |

| **SS.2.8 Analyze the relationship between progress, crisis and the "American Dream" within the US. Concept(s): Progress, Crisis, "the American Dream." USH2.H.8** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze the relationship between innovation, economic development, progress and various perceptions of the "American Dream" since Reconstruction. | | |
| I can explain how opportunity impacted various groups within American society since Reconstruction.<br>I can explain how mobility impacted various groups within American society since Reconstruction. | | |
| I can evaluate the extent to which a variety of groups and individuals have had opportunity to attain their perception of the "American Dream" since Reconstruction. | | |
| I can analyze multiple perceptions of the "American Dream" in times of prosperity and crisis since Reconstruction. | | |

**ASE SS 3: Civics and Economics – Student Checklist**

| **SS.3.1 Analyze the foundations and development of American government in terms of principles and values. CE.C&G.1** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how the tensions over power and authority led America's founding fathers to develop a constitutional democracy. | | |
| I can explain how the Enlightenment and other contributing theories impacted the writing of the Declaration of Independence, the US Constitution and the Bill of Rights to help promote liberty, justice and equality. | | |
| I can evaluate how debates on power and authority between Federalists and Anti-Federalists have helped shape government in the United States over time. | | |
| I can analyze the principles and ideals underlying American democracy in terms of how they promote freedom. | | |
| I can evaluate the fundamental principles of American politics in terms of the extent to which they have been used effectively to maintain constitutional democracy in the United States. | | |

| **SS.3.2 Analyze government systems within the United States in terms of their structure, function and relationships. CE.C&G.2** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze the structures of the national government in terms of ways they are organized to maintain order, security, and welfare of the public and the protection of citizens. | | |
| I can analyze the structures of state governments in terms of ways they are organized to maintain order, security, and welfare of the public and the protection of citizens. | | |
| I can analyze the structures of local governments in terms of ways they are organized to maintain order, security, and welfare of the public and the protection of citizens. | | |
| I can summarize the functions of the North Carolina state government within the federal system of government. | | |
| I can summarize the functions of North Carolina local governments within the federal system of government. | | |
| I can evaluate the U.S. Constitution as a "living document" in terms of how the words in the Constitution and Bill of Rights have been interpreted and applied throughout their existence. | | |
| I can evaluate the authority the federal government has over individuals' rights and privileges. | | |
| I can evaluate the authority state governments have over individuals' rights and privileges. | | |
| I can evaluate the authority local governments have over individuals' rights and privileges. | | |
| I can analyze contemporary issues in terms of how they promote the public interest and/or general welfare. | | |
| I can analyze governmental responses at the local, state, and national levels in terms of how they promote the public interest and/or general welfare. | | |
| I can analyze America's two-party system in terms of the political and/or economic views that led to its emergence. | | |
| I can analyze America's two-party system in terms of the role that political parties play in American politics. | | |

| **SS.3.3 Analyze the legal system within the United States in terms of the development, execution and protection of citizenship rights at all levels of government. CE.C&G.3** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze how the rule of law establishes limits on the governed while holding true to the ideal of equal protection under the law. | | |
| I can analyze how the rule of law establishes limits on those who govern while holding true to the ideal of equal protection under the law. | | |
| I can compare the lawmaking processes of federal, state and local governments. | | |
| I can explain how individual rights are protected by varieties of law. | | |
| I can explain ways laws have been influenced by political parties. | | |
| I can explain ways laws have been influenced by constituents. | | |
| I can explain ways laws have been influenced by interest groups. | | |
| I can explain ways laws have been influenced by lobbyists. | | |

| | | |
|---|---|---|
| I can explain ways laws have been influenced by public opinion. | | |
| I can summarize the importance of the right to due process of law for individuals accused of crimes. | | |
| I can evaluate the rights of individuals in terms of how well those rights have been upheld by democratic government in the United States. | | |

| **SS.3.4 Understand how democracy depends upon the active participation of citizens. CE.C&G.4** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can compare citizenship in the American constitutional democracy to membership in other types of governments. | | |
| I can analyze the roles of citizens of North Carolina in terms of responsibilities, participation, civic life and criteria for membership or admission. | | |
| I can analyze the roles of citizens of the United States in terms of responsibilities, participation, civic life and criteria for membership or admission. | | |

| **SS.3.5 Analyze how political and legal systems within and outside of the United States provide a means to balance competing interests and resolve conflicts. CE.C&G.5** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can analyze the election process at the national level in terms of the checks and balances provided by qualifications and procedures for voting. | | |
| I can analyze the election process at the state level in terms of the checks and balances provided by qualifications and procedures for voting. | | |
| I can analyze the election process at the local level in terms of the checks and balances provided by qualifications and procedures for voting. | | |
| I can analyze state courts by outlining their jurisdictions and the adversarial nature of the judicial process. | | |
| I can analyze federal courts by outlining their jurisdictions and the adversarial nature of the judicial process. | | |
| I can analyze national government agencies in terms of how they balance interests and resolve conflicts. | | |
| I can analyze state government agencies in terms of how they balance interests and resolve conflicts. | | |
| I can analyze local government agencies in terms of how they balance interests and resolve conflicts. | | |
| I can analyze the developments and implementation of domestic policy by outlining opposing arguments on major issues and their efforts toward resolutions. | | |
| I can analyze the developments and implementation of foreign policy by outlining opposing arguments on major issues and their efforts toward resolutions. | | |

| **SS.3.6 Analyze the concepts and factors that enable individuals to make informed financial decisions for effective resource planning. CE.PFL.1** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how education impacts an individual's financial plan and goals. | | |
| I can explain how income impacts an individual's financial plan and goals. | | |
| I can explain how career choices impact an individual's financial plan and goals. | | |
| I can explain how life choices impact an individual's financial plan and goals. | | |
| I can explain how fiscally responsible individuals create and manage a personal budget that includes income, taxes, gross and net pay, giving, fixed and variable expenses and retirement. | | |
| I can analyze how managing a checking and savings account contributes to financial well being. | | |
| I can summarize how debt management and creditworthiness impact an individual's ability to become responsible consumers and borrowers. | | |
| I can analyze how fiscally responsible individuals save and invest to meet financial goals. | | |
| I can compare various investing strategies and their tax implications for their potential to build wealth. | | |

**ASE SS 3: Civics and Economics – Student Checklist, Page 3**

| **SS.3.7 Understand how risk management strategies empower and protect consumers. CE.PFL.2** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how consumer protection laws contribute to the empowerment of the individual. | | |
| I can explain how government regulation contributes to the empowerment of the individual. | | |
| I can summarize various types of fraudulent solicitation and business practices. | | |
| I can summarize ways consumers can protect themselves from fraudulent and deceptive practices. | | |
| I can classify the various types of insurance and estate planning including the benefits and consequences. | | |
| I can summarize strategies individuals use for resolving consumer conflict. | | |

| **SS.3.8 Understand economies, markets and the role economic factors play in making economic decisions. CE.E.1** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can compare how individuals and governments use scarce resources. | | |
| I can analyze a market economy in terms of its economic characteristics. | | |
| I can analyze a market economy in terms of the roles economic characteristics play in decision making. | | |
| I can analyze a market economy in terms of how important the role of each economic characteristic is. | | |
| I can explain how supply and demand determine equilibrium price and quantity produced. | | |
| I can analyze the ways in which incentives influence what is produced and distributed in a market system. | | |
| I can analyze the ways in which profits influence what is produced and distributed in a market system. | | |
| I can compare how various market structures affect decisions made in a market economy. | | |

| **SS.3.9 Understand factors of economic interdependence and their impact on nations. CE.E.2** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain the basic concepts of trade. | | |
| I can summarize how nations specialize through trade. | | |
| I can summarize how nations become interdependent through trade. | | |
| I can explain the impact of government policies on international trade. | | |

| **SS.3.10 Analyze the role of government and economic institutions in developing and implementing economic stabilization policies in the U.S. CE.E.3** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how fiscal policy influences overall levels of employment, interest rates, production, price level and economic growth. | | |
| I can explain how monetary policy influence overall levels of employment, interest rates, production, price level and economic growth. | | |
| I can analyze organizations in terms of their roles and functions in the United States economy. | | |

**ASE SS 4: World History and Geography – Instructor Checklist**

| **SS.4.1 Apply the four interconnected dimensions of historical thinking to the United States History Essential Standards in order to understand the creation and development of the United States over time. WH.H.1** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can use chronological thinking to identify the beginning, middle, and end of an historical narrative. | | |
| I can use chronological thinking to Interpret data presented in time lines. | | |
| I can use chronological thinking to create time lines. | | |
| I can use historical comprehension to reconstruct the literal meaning of a historical passage. | | |
| I can use historical comprehension to understand the difference between historical facts and historical interpretations. | | |
| I can use historical comprehension to analyze data in historical maps. | | |
| I can use historical comprehension to analyze visual, literary, and musical sources. | | |
| I can use historical analysis and interpretation to identify issues and problems in the past. | | |
| I can use historical analysis and interpretation to consider multiple perspectives of various peoples in the past. | | |
| I can use historical analysis and interpretation to analyze cause-and-effect relationships. | | |
| I can use historical analysis and interpretation to analyze effects that have more than one cause. | | |
| I can use historical analysis and interpretation to evaluate competing historical narratives and debates among historians. | | |
| I can use historical analysis and interpretation to evaluate the influence of the past on contemporary issues. | | |

| **SS.4.2 Analyze ancient civilizations and empires in terms of their development, growth and lasting impact. WH.H.2** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can compare how different geographic issues of the ancient period influenced settlement. | | |
| I can compare how different geographic issues of the ancient period influenced trading networks. | | |
| I can compare how different geographic issues of the ancient period influenced the sustainability of various ancient civilizations. | | |
| I can analyze the governments of ancient civilizations in terms of their development within various societies. | | |
| I can analyze the governments of ancient civilizations in terms of their structure within various societies. | | |
| I can analyze the governments of ancient civilizations in terms of their function within various societies. | | |
| I can explain how codifying laws met the needs of ancient societies. | | |
| I can analyze the development and growth of major Eastern religions. | | |
| I can analyze the development and growth of major Western religions. | | |

| **SS.4.3 Understand how conflict and innovation influenced political, religious, economic and social changes in medieval civilizations. WH.H.3** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how religion influenced political power and cultural unity in various regions of Europe. | | |
| I can explain how religion influenced political power and cultural unity in various regions of Asia. | | |
| I can explain how religion influenced political power and cultural unity in various regions of Africa. | | |
| I can analyze how innovations in agriculture, trade and business impacted the economic development of various medieval societies. | | |
| I can analyze how innovations in agriculture, trade and business impacted the social development of various medieval societies. | | |

| **SS.4.4 Analyze the political, economic, social and cultural factors that lead to the development of the first age of global interaction. WH.H.4** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how interest in classical learning contributed to increased global interaction. | | |
| I can explain how interest in religious reform contributed to increased global interaction. | | |
| I can explain how agricultural improvements transformed daily life socially and economically. | | |
| I can explain how technological improvements transformed daily life socially and economically. | | |

| **SS.4.5 Analyze exploration and expansion in terms of its motivations and impact. WH.H.5** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how the motivations for exploration and conquest resulted in increased global interactions, differing patterns of trade, colonization, and conflict among nations. | | |
| I can explain why the motivations for exploration and conquest resulted in increased global interactions, differing patterns of trade, colonization, and conflict among nations. | | |

| **SS.4.6 Understand the Age of Revolutions and Rebellions. WH.H.6** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can explain how new ideas and theories of the universe altered political thought. | | |
| I can explain how new ideas and theories of the universe affected economic and social conditions. | | |
| I can analyze political revolutions in terms of their causes. | | |
| I can analyze political revolutions in terms of their impact on independence. | | |
| I can analyze political revolutions in terms of their impact on governing bodies. | | |
| I can analyze political revolutions in terms of their impact on church-state relations. | | |

| **SS.4.7 Understand how national, regional, and ethnic interests have contributed to conflict among groups and nations in the modern era. WH.H.7** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can evaluate key turning points of the modern era in terms of their lasting impact. | | |
| I can explain how economic crisis contributed to the growth of various political movements. | | |
| I can explain how economic crisis contributed to the growth of various economic movements. | | |

| **SS.4.8 Analyze global interdependence and shifts in power in terms of political, economic, social and environmental changes and conflicts since the last half of the twentieth century. WH.H.8** | | |
|---|---|---|
| Learning Targets | Mastery Level % | Date |
| I can evaluate global wars in terms of how they challenged political and economic power structures. | | |
| I can evaluate global wars in terms of how they gave rise to new balances of power. | | |
| I can explain how international crisis has impacted international politics. | | |
| I can analyze scientific innovations of postwar decades in terms of their impact on systems of production, global trade and standards of living. | | |
| I can analyze technological innovations of postwar decades in terms of their impact on systems of production, global trade and standards of living. | | |
| I can analyze medical innovations of postwar decades in terms of their impact on systems of production, global trade and standards of living. | | |
| I can explain why terrorist groups and movements have proliferated. | | |
| I can explain terrorist groups' impact on politics and society in various countries. | | |