Month	Next Generation Science Standards	Learner Targets	Activities
August 10 to Sept 26	**Scientific Inquiry** A) **Asking questions and defining problems.** B) **Planning and carrying out investigations.** C) **Analyzing and interpreting data** D) **Differentiate between the branches of earth science (compare/contrast)** **Resources:** **Holt- Earth Science, ACT practice book,** **Heath-Earth Science** **Current Science Mag.,** **Hot- lab manual** **Geology.com**	1. I can identify & define key terms for scientific inquiry. 2. I can look at models, make observations, & examine data to form questions 3. I can determine if a question is testable (can an experiment be performed; can you make observations/ is there time, technology, & resources) 4. can write hypotheses that specify what happens to a dependent and independent variable. 5. I can plan and conduct an investigation to produce data that is measurable including: a. Independent & dependent variable b. Control variable c. Control group & experimental group d. Data collection (make measurements using SI system, exponential notation, significant figures, make graphs & charts) 6. I can analyze data (looking at observations, charts & data) to identify possible answers & relative success 7. I can differentiate between the branches of earth science (compare/contrast)	Reading; textbook, Current Science topics, scientific journals, origins stories, Easter Island article Writing: Compare/Contrast hypothesis, design an experiment, analyze investigation writing A/H: PL: Learning styles inventory Technology: Frequency Analysis, flash cards Labs: Paper towel lab Assessments: quizzes, worksheets, unit test ACT Prep: Math acitivies from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Qestions

Aug 29 to Oct 7	**HS-ESS-1 Earth's place In the universe** **Resources:** **Holt Earth Science,** **Current Science Mag,** **Allaboutscience.org,** **ACT prep book,** **Video Collection,** **Sciencedaily.com,**	1. I can identify and define vocabulary associated with the formation of the universe. 2. I can summarize the events of the Big Bang Theory. 3. I can cite evidence supporting the Big Bang Theory and critique its validity. 4. I can explain the formation of astronomical structures, (stars, planets, etc.) based on the role of gravity. 5. I can relate Kepler's Laws to the movement of orbital structures in space. 6. I can recall that stars produce energy from nuclear fusion. 7. I can formulate a hypothesis about a star's motion by using the Doppler Effect (red shift/blue shift).	Reading; textbook, Current Science topics, scientific journals Writing: Evidence on the Big bang, open response question A/H: PL: Careers in Astronomy Technology: video clips, flash cards Labs: Model Big Bang with Poppers, Quick lab p 687, Quick lab p 692, Quick lab 757 Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

October 17- Oct 28	**HS-ESS-1 Earth's Place In the Universe** **Resources:** **Holt- Earth Science** **Glenco – Earth Science** **Regentsearth.com** **Wards Science catalog Pbs.org** **Sciencenewsforkids.org**	1. I can identify and define key vocabulary within the history of the Earth unit. 2. I can analyze a cross-section of rock to determine the relative age of rocks and fossils. a.I can define uniformitarianism. b. I can apply the law of superposition to date undisturbed sedimentary rock layers (horizontality). c. I can apply the law of cross-cutting to determine the relative age of rock layers. 3. I can interpret the ages of rocks/fossils using radiometric dating. a. I can calculate the absolute age of rocks/fossils using radioactive decay rates. b.I can analyze radioactive decay rates to determine uses and limitations of specific radioactive elements.	Reading: textbook, Current Science topics, scientific journals Writing: Compare/Contrast relative and absolute dating A/H: Make fossils within rock layers PL: Careers in Geology Technology: Design a Vine Labs: Lab on radioactive decay, relative dating, Lab in gray book p560 Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

Oct 31-Nov 11	**HS-ESS-1 Earth's Place in the Universe** **Resources:** **Holt – Earth Science,** 1.I can identify and define vocabulary within the plate tectonics unit. **Internet – Earth foldable, Oceanleadership.org, Sciencedaily.com**	1.I can identify and define vocabulary within the plate tectonics unit. 2. I can assess the structure. a. I can analyze a scientific diagram of Earth's magnetic field and determine areas of strengths and weaknesses in the magnetic field. of the Earth. b. I can create a model and define the layers and features of the Earth's structure. 3. I can access the evidence supporting continental drift to explain the age of rocks. 4. I can summarize illustrations of sea-floor spreading to identify the ages of rocks a.I can analyze illustrations of sea-floor spreading to identify the ages of rocks. b. I can identify how magnetic symmetry can be used as evidence of sea-floor 5. I can interpret evidence of Earth's interior to describe the cycling of matter by thermal convection. a. I can identify radioactive decay as the source of energy within the Earth as the driving force in mantle convection b.I can summarize the theory of plate tectonics. c.I can identify and compare the three types of plate boundaries. d.I can analyze the mechanisms of plate movements and apply to real world events (earthquakes, volcanoes, climate change, etc.) 6. I can infer how the formation of earthquakes,	Reading: textbook, Current Science topics, scientific journals Writing: How plate movements cause a natural feedback system A/H: Model plate boundaries PL: Careers in Geology Technology: Design a Vine Labs: Quick lab p 253, Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

		trenches, ridges, and seamounts are a result of constructive forces related to mantle convection. (feedback system). 7. I can relate how the movement of seismic waves explain the composition of Earth's interior layers.	
Nov. 14 – Nov. 22	**HS-ESS-2 Earth's Systems** **Holt – Earth Science Earthviewer**	1. I can analyze the events from feedback systems between the biosphere and other Earth Systems which causes continual coevolution of Earth's surface 2. a. I can analyze the geologic and feedback events in the Precambrian Era that lead to development on life. life on it. b. I can analyze geologic events and feedback systems in the Paleozoic Era that lead to continued biological processes. c. I can analyze geologic events and feedback systems in the Mesozoic Era that lead to continued biological processes. d. I can analyze geologic events and feedback systems during the Cenozoic Era that lead to continued biological processes. e. I can infer from historical events the changes of future biological events.	Reading: textbook, Current Science topics, scientific journals Writing: Compare and Contrast earth's feedback systems A/H: PL: Careers in Geology Technology: Youtube -Bozeman Labs: lab page 336 Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

Nov. 28- Dec. 2	**HS-ESS-1 Earth's** **Systems Biogeochemical** **Cycles** **Resources:** **Holt – Earth Science** **Biology Coloring book** **Current Science Mag**	1. I can identify and define key terms in biogeochemical cycles. 2. I can critique a diagram of the carbon cycle to identify the processes involved in biological interactions of cycling. 3. I can summarize the events of the nitrogen and phosphorous cycle. 4. I can interpret a diagram of the water cycle. 5. I can plan and conduct an investigation of the properties of water and its effects on Earth's materials and surface processes. (erosion) 6. I can discuss the process in the Rock cycle 7. I can analyze weather/erosion patterns on earth's surface	Reading: textbook, Current Science topics, scientific journals Writing: Compare/Contrast relative and absolute dating A/H: Biogeochemical cycle coloring sheets PL: Careers in Geology Technology: Interactive web simulations Labs: Stream erosion lab Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

Dec.5– Dec.16	**HS-ESS-2 Earth's Systems** **Resources:** **Holt- Earth Science** **Scienceofdoom.files.com,** **Denniger.com,** **Google docs,** **Sciencebylarson.Weebly.com Heath – Earth Science** **ACT Prep Book**	1. I can identify and define vocabulary in weather/climate. 2. I can list the composition of the atmosphere. 3. I can identify the layers of the atmosphere and recall characteristics. 4. I can interpret a model of the Earth's interaction with solar radiation. 5. I can hypothesize possible results from the interaction of Earth and solar radiation. a. I can summarize the effects of solar radiation on latitude (tilt of the Earth). b. I can infer the effects of solar radiation on the greenhouse effect . c. I can predict effects of solar radiation on formation/effects of pollution. d. I can summarize the effects of solar radiation on wind patterns and ocean currents. 6. I can analyze past climate conditions and describe the predominant details, temperature, and precipitation. 7. I can analyze global climate models to predict future changes, including changes influenced by human and natural factors.	Reading: textbook, Current Science topics, scientific journals Writing: weather poetry A/H: weather music, weather fable, self copy of solar radiation PL: Careers in Meteorology Technology: Interpreting climate data, Video clips, reading weather maps Labs: Brown book 494, 518, Heating land vs water Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

Jan. 2– Jan 13	**HS-ESS-3 Earth and Human Activities** **Holt –Earth Science** **Heath – Earth Science** **Eoearth.org** **Need**	1. I can identify and define vocabulary within natural resources. 2. I can summarize the role of natural resources to the development of human society and illustrate how both positive and negative uses of the resources have affected the course of human history (altering populations, migration) 3. I can analyze renewable/nonrenewable energy sources based on economics, social, environmental, and political cost and risks as well as benefits (tragedy of the commons) 4. I can evaluate and create techniques for developing, managing, utilizing energy, and mineral resources (energy budget, carbon footprint). 5. I can analyze weathering and erosion patterns and predict future outcomes.	Reading: textbook, Current Science topics, scientific journals Writing: Letter to Senator Thompson A/H: Energy Poster PL: Careers in different Energy sources Technology: Research on energy resources Labs: Energy labs Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

Jan. 17-Jan. 27	**HS-ESS-3 Earth and Human Activities** **Resources:** **Holt – Earth Science** **Current Science Mag** **Internet**	1. I can identify ways in which humans have altered and continue to alter our environment. 2. I can define sustainability and describe how sustainability is impacted by environmental worldviews. 3. I can discuss the concept of sustainable resource use and ecological footprint connection with human population growth, technological development, and affluence. 4. I can explain the Tragedy of the Commons and how it applies to resource use. 5. I can explain the role of laws and regulations in attempting to protect our natural and human capital, including differentiation between development, preservation, and conservation ethics. 6. I can describe the accomplishments of major conservationists. 7. I can demonstrate the complexity of environmental problems by using a specific example that involves social, ethical, political, economic, and scientific issues.	Reading: textbook, Current Science topics, scientific journals Writing: Carbon footprint, Tragedy of the Commons A/H: none PL: Spotlight major conservationist Technology: Ecological footprint Labs: tragedy of the commons Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice ODQuestions

Jan 30-Feb10	**HS-ESS-3 Earth and Human Activities** Ecosystems and how they Work	1. I can describe the levels of ecological organization. 2. I can explain the process by which succession occurs in an ecosystem and the characteristics of both pioneer and climax plant species. 3. I can identify and describe the roles an organism can play and the relationships (including competitive and symbiotic) that can exist between organisms. 4. I can use natural laws to describe how matter and energy flow through trophic levels and how that affects organisms within ecosystems. 5. I can identify various exotic species, describe how they were transported, and the effects they have had on their new ecosystems. 6. I can describe how populations evolve over time.	Reading: textbook, Current Science topics, scientific journals Writing: FRQ's, article reviews A/H: Drawing food webs PL: Careers in Ecology Technology: On-line modeling of ecological succession Labs: Energy loss in an ecosystem Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

Feb.13 – March 24	HS-LS2-Interdependent relationships in Ecosystems	1. I can demonstrate how to construct, read, and interpret a climate graph for a given location. 2. I can describe the major characteristics of the world's terrestrial and aquatic biomes. 3. I can describe the major factors that determine the temperature, precipitation, and air pressure in a location and the impact each factor has on determining local climate. 4. I can explain the conditions that have led to natural fluctuations of Earth's climate, including the causes and effects of El Nino and La Nina. 5. I can describe the characteristics that would make an organism more likely to become endangered, including characteristics of r and K strategists. 6. I can explain the factors that can determine the carrying capacity of a population for a given habitat and what can happen if a population exceeds that capacity. 7. I can identify the survivorship curve that best matches different organisms based on their life history characteristics. 8. I can describe the major causes of extinction. 9. I can calculate a biodiversity index and describe how it is used in the field of ecology. 10. I can describe some of the mechanisms that have been used to preserve biodiversity and save endangered species and explain the importance of maintaining biodiversity. 11. I can identify major tenets and impacts of the Endangered Species Act, CITES, the Marine Mammal Protection Act, and the Migratory Bird Conservation Act.	Reading: textbook, Current Science topics, scientific journals Writing: FRQ's, article reviews A/H: Drawing climate graphs PL: Careers in Ecology Technology: Internet-Calculating a Biodiversity Index, Youtube-Bozeman videos Labs: Modeling population fluctuations Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

Feb. 27-March 24	HS-LS4 Natural Selection and Evolution	1. I can demonstrate how to estimate the size of a population using the capture/recapture method. 2. I can predict population changes based on rates of natality, mortality, immigration, and immigration. 3. I can calculate the doubling time of populations using the "Rule of 70" to estimate and determine both crude growth rate and percent growth rate of a population. 4. I can identify replacement level-fertility and explain how this number is determined. 5. I can describe the shape of the human population growth curve and explain the factors that have caused the global human population to grow quickly over the last few centuries. 6. I can demonstrate how to construct and make age-sex diagrams for the populations of various countries. 7. I can explain the demographic transition model and explain, based on the demographic factors within a country, which phase of the model a country might currently be in. 8. I can identify and describe several factors that affect population growth rates in both LDC's and MDC's. 9. I can describe both the environmental and social problems that human population growth can cause. 10. I can explain Thomas Malthus' ideas on the relationship between human population growth and food supply. 11. I can describe human nutritional requirements and the diseases resulting from inadequate diet. 12. I can describe the changes in practice that occurred because of the Green Revolution and the impact those changes have had on food production and the environment. 13. I can describe the practices, benefits and limitations of commercial fishing and aquaculture. 14. I can evaluate the impacts of modern livestock (beef,poultry, hog) feedlots.	Reading: textbook, Current Science topics, scientific journals Writing: FRQ's, article reviews A/H: none PL: Careers in nutrition Technology: Internet-Modeling population demographics Labs: Population graphs Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

March 27- March 31	HS-LS2-Interdependent relationships in Ecosystems	1. I can describe how land use practices affect natural ecosystems. 2. I can describe management practices, including the roadless rule, Healthy Forest Initiative, and traditional fire suppression. 3. I can describe methods of harvesting trees, including clear cutting, selective cutting, and patchwork clear-cutting. 4. I can describe the benefits of forests and how trees are used as resources. 5. I can describe the differences between forests and tree plantations. 6. I can describe the federal laws that regulate land management practices. 7. I can describe the function of the National Parks Service, the US Forest Service, and the Bureau of Land Management. 8. I can describe the similarities between national parks, national forests, and wilderness. 9. I can describe the types and severity of forest fires. 10. I can describe the characteristics of sustainable pasture and rangeland use.	Reading: textbook, Current Science topics, scientific journals Writing: FRQ's, article reviews A/H: Wanted Poster of Invasive Species PL: Careers in Forestry Technology: Internet-Map analysis Labs: none Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions

April 10- May 12	HS-LS2-Interdependent relationships in Ecosystems	1. I can distinguish between domestic, agricultural, industrial, and in-stream water uses and the problems associated with each. 2. I can describe how groundwater flows through the earth and the different layers of the earth that either allow for or impede its flow and how land use and other human activities affect groundwater supplies. 3. I can describe how humans interfere with the natural formation, life cycle, and flood stages of rivers. 4. I can describe the ecological services provided by wetlands. 5. I can describe the human activities that lead to the process of eutrophication and differentiate between oligotrophic and eutrophic lakes. 6. I can define the different ways by which agricultural land may be irrigated and identify benefits and drawbacks of each method. 7. I can describe the main parts of both the Clean Water Act and the Safe Drinking Water Act and explain the impacts both laws have had on our country's water supply. 8. I can demonstrate how to calculate a Water Quality Index (WQI) and the significance of each of the associated water tests. 9. I can describe how drinking water is cleaned and purified at a drinking water treatment facility. 10. I can describe the steps by which wastewater is treated at a sewage treatment facility. 11. I can assess global problems associated with water quality and availability. 12. I can assess my own water use and describe methods of water conservation.	Reading: textbook, Current Science topics, scientific journals Writing: FRQ's, article reviews A/H: none PL: Careers in Oceanography Technology: Internet-analyzing water filtering systems Labs: Water quality test Assessments: quizzes, worksheets, unit test ACT Prep: Math activities from resource book, analysis of charts and graphs, and practice ACT questions. OD: Practice OD Questions