**Science Pacing Guide**

**Time Frame: On Going Seventh Grade**

**Unit On Going**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **S.IA.M.1 Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.**  **S.IA.07.11** Analyze information from data tables and graphs to answer scientific questions.  **S.IA.07.12** Evaluate data, claims, and personal knowledge through collaborative science discourse.  **S.IA.17.13** Communicate and defend findings of observations and investigations.  **S.IA.07.14** Draw conclusions from sets of data from multiple trials of a scientific investigation to draw conclusions.  **S.IA.07.15** Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.  **S.RS.07.17** Describe the effect humans and other organisms have on the balance of the natural world.  **S.RS.07.18** Describe what science and technology can and cannot reasonably contribute to society.  **S.RS.07.19** Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures  **S.RS.07.11** Evaluate the strengths and weaknesses of claims, arguments, and data.  **S.RS.07.12** Describe limitations in personal and scientific knowledge.  **S.RS.07.13** Identify the need for evidence in making scientific decisions.  **S.RS.07.14** Evaluate scientific explanations based on current evidence and scientific principles.  **S.RS.07.15** Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.  **S.RS.07.16** Design solutions to problems using technology. | How has the Scientific Method shaped the way we understand the world around us?  What are the steps in the Scientific Method and why is each step important?  Why is it necessary to control variables in an experiment?  What is the importance of performing multiple trials?  Why is the metric system the preferred measuring system of scientists?  In your own words, why is Science based more on theory than fact? | Science Fair Project  Science Experiments throughout other units. | conclusion  conflicting interpretations  data  ethics in science  experimental control  fact  hypothesis  intellectual honesty  research question  scientific interpretation  scientific method  social implications  theory | Science Fair websites  <http://school.discoveryeducation.com/sciencefaircentral/scifairstudio/teachers.html>    **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3> |

**Time Frame: September 8- October 1 (3 weeks)**

**Unit 1: Scientific Method**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **S.IP.07.11** Generate scientific questions based on observations, investigations, and research.  **S.IP.07.12** Design and conduct scientific investigations.  **S.IP.07.13** Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens, thermometer, models, sieves, microscopes, hot plates, pH meters) appropriate to scientific investigations.  **S.IP.07.14** Use metric measurement devices in an investigation.  **S.IP.07.15** Construct charts and graphs from data and observations.  **S.IP.07.16** Identify patterns in data. | How has the Scientific Method shaped the way we understand the world around us?  What are the steps in the Scientific Method and why is each step important?  Why is it necessary to control variables in an experiment?  What is the importance of performing multiple trials?  Why is the metric system the preferred measuring system of scientists?  In your own words, why is Science based more on theory than fact? | Science Fair Project  Science Experiments throughout other units.  Write a scientific explanation: Does an element’s position on the Periodic Table of the Elements give us important information? (Must include claim, and at least three pieces of evidence.) | Analysis  conclusion  conflicting interpretations  data  ethics in science  Experiment  experimental control  fact  hypothesis  intellectual honesty  Purpose  Research  research question  scientific interpretation  scientific method  social implications  theory | Science Fair websites  <http://school.discoveryeducation.com/sciencefaircentral/scifairstudio/teachers.html>    **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Prentice Hall Physical Science book  State GLCEs |

**Time Frame: October 2-23 (4 week)**

**Unit 2: Solar Energy/Atmosphere**

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| Processes, Content Statements & Expectations (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **E.FE.07.11** Describe the atmosphere as a mixture of gases. (taken out of unit 10)  **E.FE.07.12** Compare and contrast the composition of the atmosphere at different elevations. (taken out of unit 10)  **E.ES.07.12** Describe the relationship between the warming of the atmosphere of the Earth by the sun and convection within the atmosphere and oceans.  **E.ES.07.13** Describe how the warming of the Earth by the sun produces winds and ocean currents.  **P.EN.07.61** Identify that nuclear reactions take place in the sun, producing heat and light.  **P.EN.07.62** Explain how only a tiny fraction of light energy from the sun is transformed to heat energy on Earth. | What is the atmosphere composed of?  How does the composition of the atmosphere change at different elevations?  How do these changes affect the properties and temperature of the air?  What is convection? How does it affect the water cycle?  What is wind?  What is ocean current?  How are winds and ocean currents produced? | Explain that the sun’s warming of the atmosphere also causes movement or currents in the air similar to the currents in the ocean. | atmosphere  convection  ocean currents  wind  radiation  conduction  energy  sun  oxygen  nitrogen  trace gases  altitude  solar energy  atmospheric composition  atmospheric layers | **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Online experiment testing for acids and bases.  <http://pbskids.org/zoom/games/kitchenchemistry/virtual-start.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Prentice Hall: Physical Science  -p. 184 |

**Time Frame: October 27-Novebmer 26 (3 weeks)**

**Unit 3: Weather and Climate**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **E.ES.07.71** Compare and contrast the difference and relationship between climate and weather.  **E.ES.07.72** Describe how different weather occurs due to the constant motion of the atmosphere from the energy of the sun reaching the surface of the Earth.  **E.ES.07.73** Explain how the temperature of the oceans affects the different climates on Earth because water in the oceans holds a large amount of heat.  **E.ES.07.74** Describe weather conditions associated with frontal boundaries (cold, warm, stationary, and occluded) and the movement of major air masses and the jet stream across North America using a weather map.  **E.ES.07.12** Describe the relationship between the warming of the atmosphere of the Earth by the sun and convection within the atmosphere and oceans. (moved from unit 10)  **E.ES.07.13** Describe how the warming of the Earth by the sun produces winds and ocean currents. (moved from unit 10) | What is weather?  What is climate?  What are some similarities and differences between climate and weather?  Where does weather occur in the atmosphere and what causes it?  What do temperature changes in air masses cause?  How do oceans affect temperature and climate?  What is a frontal boundary?  How do warm and cold air masses affect each other?  What is a cold front? Warm front? Stationary front? Occluded front? Jet stream? | Compare weather and climate and explain how movement of water in the oceans and atmosphere affect weather and climate. Explain that weather is the daily conditions of temperature, precipitation, wind and humidity and climate is the long term, year-to-year conditions of temperature, precipitation, wind, and humidity. | convection  ocean currents  wind  weather  climate  frontal boundaries  cold front  warm front  stationary front  occluded front  air mass  jet stream  cloud formation | **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Climate information for the United States by region, quiz, and activities.  <http://weathereye.kgan.com/cadet/climate/>  Website about weather put together by 6th grade students.  <http://library.thinkquest.org/3805/index.html>  Great activities for climate and Weather, fun and educational games.  <http://www.epa.gov/climatechange/kids/games/index.html>  A lot of information and activities available for multiple weather events  <http://www.fi.edu/weather/> |

**Time Frame: December 1-17 (2 weeks)**

**Unit 4: Physical Properties and Changes**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **P.PM.07.24** Describe examples of physical and chemical properties of elements and compounds (boiling point, density, color, conductivity, reactivity).  **P.PM.07.21** Identify the smallest component that makes up an element. | What are examples of physical and chemical properties of elements and compounds?  How can you classify substances by their chemical properties?  What are the physical properties of a metal?  What are the properties of a nonmetal?  What is the smallest component that makes up an element?  What is the difference between an atom, molecule, and an element?  How are elements within the periodic table organized by similar properties into families? | Describe the physical properties and chemical properties of the products and reactants in a chemical change.  Distinguish between physical properties (color, size, shape, texture, state of matter, density, boiling point, conductivity) and chemical properties (flammability, pH, reactivity). | Physical Properties  Matter  Boiling Point  Density  Color  Conductivity  Reactivity  Flammability  pH  Proton  Nucleus  Electron  Atomic number  Atomic mass  Chemical symbol  Periodic table  Period  Malleable  Ductile  Mixture  Element  Atom  Mass number  Neutron | **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Online experiment testing for acids and bases.  <http://pbskids.org/zoom/games/kitchenchemistry/virtual-start.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Prentice Hall: Physical Science  -p. 184 |

**Time Frame: January 12-February 12 (5 weeks)**

**Unit 5: Chemical Properties and Changes (was Unit 7)**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **P.CM.07.21** Identify evidence of chemical change through color, gas formation, solid formation, and temperature change.  **P.CM.07.23** Describe the physical properties and chemical properties of the products and reactants in a chemical change.  **P.CM.07.22** Compare and contrast the chemical properties of a new substance with the original after a chemical change.  **P.PM.07.11** Classify substances by their chemical properties (flammability, pH, and reactivity).  **P.PM.07.23** Illustrate the structure of molecules using models or drawings (water, carbon dioxide, table salt  **P.PM.07.22** Describe how the elements within the Periodic Table are organized by similar properties into families (highly reactive metals, less reactive metals, highly reactive nonmetals, and some almost completely non-reactive gases). | What are examples of physical and chemical properties of elements and compounds?  What are chemical properties?  What is the difference between physical and chemical properties?  What are some indicators that prove a chemical change has taken place?  Illustrate the structure of molecules using models or drawings.  What is the law of conservation of mass?  How are the chemical properties of the new substance similar to and different from the chemical properties of the original substance?  What are the chemical and physical properties of the products and the reactants in a chemical change?  How do chemical changes occur? | Describe the physical properties and chemical properties of the products and reactants in a chemical change.  Distinguish between physical properties (color, size, shape, texture, state of matter, density, boiling point, conductivity) and chemical properties (flammability, pH, reactivity).  Perform various mini-experiments demonstrating chemical and physical reactions and have students label each accordingly. Have each student justify why they determined that a chemical or physical reaction took place. | Chemical Properties  Chemical Reaction  Endothermic  Exothermic  Water (H20)  Carbon dioxide (CO2)  Table salt (NaCl)  Molecule  Compound  Reactivity  Flammability  pH  Reactivity  Formula | **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Online experiment testing for acids and bases.  <http://pbskids.org/zoom/games/kitchenchemistry/virtual-start.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Prentice Hall: Physical Science  -p. 184 |

**Time Frame: February 23 –March 4 (2 weeks)**

**Unit 6: Photosynthesis (used to be unit 8)**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **L.OL.07.61** Recognize the need for light to provide energy for the production of carbohydrates, proteins and fats.  **L.OL.07.62** Explain that carbon dioxide and water are used to produce carbohydrates, proteins, and fats.  **L.OL.07.63** Describe evidence that plants make, use and store food.  **P.EN.07.43** Explain how light energy is transferred to chemical energy through the process of photosynthesis. | What is the detailed process in which a plant produces its own food?  What would happen if plants did not produce their own food?  Why isn’t your stomach lining made up of urine cells? Would this be a problem? If so, explain?  How and why do cells divide?  Why do you have the traits that you have and where did they come from?  What is photosynthesis?  Where does the energy for plants to combine materials from air, water, and soil to produce carbohydrates, proteins, and fats come from?  What are the sources of carbon, hydrogen and oxygen found in carbohydrates, proteins and fats produced by plants?  What evidence is available that plants make, use and store food?  Where does the energy that plants use to combine materials from air, water, and soil to produce carbohydrates, proteins, and fats come from? | Student groups test the ability of an Elodea plant to photosynthesize with and without light. This familiar activity requires students to seal part of an Elodea plant in a test tube filed with a weak bromthymol blue solution that has been acidified with CO2 from a student’s breath and observe color changes in plants exposed to light and those shielded from light as CO2 is consumed in the process of photosynthesis.  Design investigations that block light from different parts of the plant (leaves and stems)  Relate all investigation results to the simplified equation of photosynthesis.  Discuss how plants take in carbon dioxide. Use the underside of a variety of leaves under the microscope to identify the stomata cells of the plant where carbon dioxide enters the plant and oxygen exits the plant.  Students design and perform plant growth investigations that use light as a variable.  Have students explore station to discover where sugar and starch are stored in different parts of different plants (use glucose test strips and iodine for indicators).  Have students read about the experiment of scientist Van Helmont and how he discovered that plants do not use soil the same way people use food.  Students design investigations into food storage in plants and how plants survive through the winter and overnight. Students recognize that plants make, use, and store their own food. | photosynthesis  carbon dioxide  water  carbohydrate  protein  fat  chemical building blocks | Build an Eco-column  <http://www.learner.org/channel/courses/essential/life/bottlebio/ecocol/build.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3> |

**Time Frame: March 5-27 (3 weeks)**

**Unit 7: Cells**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **L.OL.07.21** Recognize that all organisms are composed of cells (single cell organisms, multicellular organisms).  **L.OL.07.22** Explain how cells make up different body tissues, organs, and organ systems.  **L.OL.07.23** Describe how cells in all multicellular organisms are specialized to take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or organism needs.  **L.OL.07.24** Recognize that cells function in a similar way in all organisms.  **L.OL.07.32** Examine how through cell division, cells can become specialized for specific functions. | Why isn’t your stomach lining made up of urine cells? Would this be a problem? If so, explain?  Why do you have the traits that you have and where did they come from?  What are all living organisms composed of?  What do specialized cells within multi-cellular organisms form?  What are the functions of different cells in a multicellular organism?  What are basic life functions performed by cells?  How do nutrients pass through cell membranes by diffusion and how are nutrients used to provide energy for work in the cell and materials that the cell needs?  How do cells function similarly in all organisms? | Student groups test the ability of an Elodea plant to photosynthesize with and without light. This familiar activity requires students to seal part of an Elodea plant in a test tube filed with a weak bromthymol blue solution that has been acidified with CO2 from a student’s breath and observe color changes in plants exposed to light and those shielded from light as CO2 is consumed in the process of photosynthesis.  Design investigations that block light from different parts of the plant (leaves and stems)  Relate all investigation results to the simplified equation of photosynthesis.  Discuss how plants take in carbon dioxide. Use the underside of a variety of leaves under the microscope to identify the stomata cells of the plant where carbon dioxide enters the plant and oxygen exits the plant.  Students design and perform plant growth investigations that use light as a variable.  Prepare multiple slides at microscope stations of different cells for students to observe. Slides may include, onion skin, cheek cells, pond water with amoeba or paramecia, and aquatic plants such as elodea. Make a list of student questions based on their initial observations of the cell slides.  Use multiple reference sources for students to evaluate their initial ideas about cells and cell functions.  List criteria for distinguishing one-celled from multicellular organisms.  Describe how one-celled and multicellular organisms increase in size.  Explain how multicellular organisms can develop more specialized parts and functions than one-celled organisms.  Have students compare and contrast cells of different body tissues, organs, and organ systems.  Observe tissues from different parts of a plant comparing the structure of cells from roots, stems, and leaves and/or compare the structure of cells from different regions of a leaf of a flowering plant.  Explain and define the terms growth and development, and differentiation and specialization. Have student apply the key terms to cells and the specialized cells in their research. | cell  specialized cell  tissues  organs  organ systems  unicellular organism  multicellular organism  specialized tissue  cell membrane  cell function | Build an Eco-column  <http://www.learner.org/channel/courses/essential/life/bottlebio/ecocol/build.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3> |

**Time Frame: March 30-April 24 (2 weeks)**

**Unit 8: Reproduction (was unit 6)**

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| **L.OL.07.31** Describe growth and development in terms of increase of cell number and/or cell size.  **L.OL.07.32** Examine how through cell division, cells can become specialized for specific functions.  **L.HE.07.21** Compare how characteristics of living things are passed on through generations, both asexually and sexually.  **L.HE.07.22** Compare and contrast the advantages and disadvantages of sexual vs. asexual reproduction. | How and why do cells divide?  How does division of cells lead to an increase in cell number and an increase in the size of multicellular organisms?  How does growth occur in one-celled organisms?  How does continued cell division in multicellular organisms lead to the development of specialized tissues, organs and organ systems?  What are two types of reproduction?  How are the characteristics of young produced sexually and asexually similar?  How do the sources of genetic material of young differ in sexual and asexual reproduction?  What are the advantages and disadvantages of sexual and asexual reproduction? | Explain and asexual and sexual reproductions. Include the advantages and disadvantages of each.  Ask students if they know how humans and other animals pass on their traits to their offspring. The point of the discussion is to make sure that students understand that in animals, traits are inherited from both parents.  Have the class discuss and explain the different traits of organisms that are influenced by genetics (reproduction) and environmental influence. Have students identify traits that are passed on through reproduction that enhance the organism’s chances to survive.  Create a Venn diagram of sexual versus asexual reproduction that displays similarities and differences in the types of reproduction, characteristics of offspring compared to parent and advantages and disadvantages of each type of reproduction.  Visit a greenhouse or research facility that is using asexual reproduction in plants to increase food supply and genetically engineer superior plants. Have students conduct research into current science and technology that is being used to alter food crops. | cell division  sexual reproduction  asexual reproduction  unicellular organism  multicellular organism  fertilization  genetic material | Build an Eco-column  <http://www.learner.org/channel/courses/essential/life/bottlebio/ecocol/build.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3> |

**Time Frame: April 27-May 15 (3 weeks)**

**Unit 9 : Waves**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **P.EN.07.31** Identify examples of waves, including sound waves, seismic waves, and waves on water.  **P.EN.07.32** Describe how waves are produced by vibrations in matter.  **P.EN.07.33** Demonstrate how waves transfer energy when they interact with matter (for example: tuning fork in water, waves hitting a beach, earthquake knocking over buildings). | What do Nuclear reactions in the sun produce?  How is the heating of the Earth at any location determined?  Why is only a fraction of light energy from the sun transformed to heat energy on Earth?  What is a wave?  How is sound created?  What are seismic waves?  How are waves produced?  What is energy?  What is an energy transfer? | Go outside and make observations of the effects of the sun’s warming on different materials and areas of the schoolyard. Ask students to describe the effects of the sun on different surfaces, living things, and nonliving things, in direct sunlight and in the shade.  Visit a greenhouse. Why is glass or plastic used to retain the heat from the sun?  The atmosphere of the Earth traps heat energy from the sun. Without the greenhouse effect, the Earth would be too cold to support life.  Have students research the properties of the sun and gather information regarding the nuclear reactions that occur on the sun that produces heat and light. Ask students to share their information from their research.  Student research the problems of leaving young children in a car on a hot summer’s day. What happens to these children? What could then happen to the parents? Students report their findings to the class.  Have the students demonstrate a “stadium wave.” Explain that ht “stadium wave” is a model of how sound waves, seismic waves, and waves on water are produced.  Brainstorm ideas of how sounds produced. Construct a simple banjo and use it to find out how sound is produced.  Have students make observations of the vibrations of tuning forks through their sense of tough, sight, and hearing. Use a shallow pan of water to demonstrate the transfer of sound waves in the air to waves in water.  Use a slinky model to demonstrate how seismic waves travel through the earth. Seismic waves occur in earthquakes and volcanoes.  Explain how sound is created when something vibrates. Sound wave spread away from a vibrating object. | wavelength  sun’s radiation  seismic wave  water wave  light energy  sound wave  energy  vibration  matter  waves  energy transfer  nuclear reactions  solar energy  transform waves  transverse waves  transfer  crest  trough  amplitude  frequency  erosion  greenhouse effect  medium  nuclear fusion | Information about the sun and its properties and how it affects the solar system  <http://www.nineplanets.org/sol.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3>  Volcano: The Eruption and Healing of Mount  St. Helens, Patricia Lauber, 1993.  ISBN-13: [9780689716799](http://product.half.ebay.com/Volcano_W0QQtgZinfoQQprZ12199) |

**Time Frame: May 18- 29(2 weeks)**

**Unit 10: Water Cycle**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **E.ES.07.81** Explain the water cycle and describe how evaporation, transpiration, condensation, cloud formation, precipitation, infiltration, surface runoff, ground water, and absorption occur within the cycle.  **E.ES.07.82** Analyze the flow of water between the components of a watershed, including surface features (lakes, streams, rivers, wetlands) and groundwater.  **E.FE.07.11** Describe the atmosphere as a mixture of gases.  **E.ES.07.11** Demonstrate, using a model or drawing, the relationship between the warming by the sun of the Earth and the water cycle as it applies to the atmosphere (evaporation, water vapor, warm air rising, cooling, condensation, clouds). | What is the water cycle?  What processes move water through the water cycle?  What is a watershed?  How does water flow between the different components of watersheds?  What is the atmosphere composed of?  Why is this combination important to living things?  How does the composition of the atmosphere change at different elevations?  How do these changes affect the properties and temperature of the air?  What role does the sun play in the water cycle?  How does rain form?  What is convection? How does it affect the water cycle?  What is wind?  What is ocean current?  How are winds and ocean currents produced? | The movement of water in the water cycle can be elaborated on by following the flow of water after it falls to the ground. Students investigate and make models of groundwater and the movement of water in local watersheds. Have students identify different habitats that exist in the watersheds and how pollution and human activity has affected populations and quality of life.  As a class determine a working definition of the water cycle and then introduce the terms evaporation, condensation, precipitation, and transpiration. Only after students have determined a meaning on their own, have them refer to a resource that helps to explain the definition of the terms.  Provide posters or other resources that illustrate the water cycle for students to use to compare their observations of the model of the water cycle and solar stills. Ask students to describe how the model demonstrates what happens in the atmosphere.  Investigate the role of evaporation on pure water and salt water. Have students make a solar still by placing a small cup of water into a closable bag and place in the sunlight. Have students make one still with salt water and one till with pure water and make observations over a period of time.  Relate the model of the solar still to the water cycle where evaporation is key. Explain the role of the sun’s warming of the Earth in the water cycle.  Explain that the sun’s warming of the atmosphere also causes movement or currents in the air similar to the currents in the ocean. | water cycle  atmosphere  evaporation  water vapor  condensation  clouds  convection  ocean currents  wind  transpiration  cloud formation  precipitation  infiltration  surface runoff  groundwater  absorption  radiation  conduction  energy  sun  oxygen  nitrogen  trace gases  altitude  solar energy  non-potable  atmospheric composition  atmospheric layers | Water Cycle video lesson and global impact video lesson from the NOAA.  <http://www.learningdemo.com/noaa/lesson07.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3> |

**Time Frame: June 1-5 (1 week)**

**Unit 11: Human Interactions**

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| **Processes, Content Statements & Expectations** (Disciplinary Knowledge) | **Essential Questions** | **Assessment** | **Vocabulary** | **Resources** |
| **E.ES.07.41** Explain how human activities (surface mining, deforestation, overpopulation, construction and urban development, farming, dams, landfills, and restoring natural areas) change the surface of the Earth and affect the survival of organisms.  **E.ES.07.42** Describe the origins of pollution in the atmosphere, geosphere, and hydrosphere, (car exhaust, industrial emissions, acid rain, and natural sources), and how pollution impacts habitats, climatic change, threatens or endangers species. | What are ways that humans impact the Earth?  What risks and benefits does the sun have on the Earth?  What is the Earth’s major source of energy?  How do human activities change animal habitat?  How does change in animal habitat affect the survival rate of organisms?  How do human activities destroy animal habitats?  What is the atmosphere? Geosphere? Hydrosphere?  What causes air pollution? | Give students a list of environmental topics (global warming, abandoned gas stations, improper disposal of hazardous materials, overpopulation, overdevelopment, etc.). Have each student choose a topic, then research and write an article. Articles could then be assembled in a class newspaper and distributed to the school and community.  Make real world connections to students’ lives by relating the effect of human activity on the environment and how it affects plant and animal life. Have students do research on green house gases and global warming. Make connections to pollution in the atmosphere, hydrosphere, and geosphere.  Challenge the class to design and carry out a procedure that would clean polluted water. Encourage students to use what they have learned about the water cycle and evaporation through the solar still to clean the polluted water sample. | atmospheric motion  climate change  climatic pattern  geosphere  hydrosphere  surface mining  deforestation  overpopulation  dams  landfills  urban development  acid rain  industrial emissions  habitat | Great game/quiz. Asks students to make decisions and then rank them based on how their decision would affect the environment.  <http://www.bellmuseum.org/distancelearning/watershed/watershed2.html>  **State Companion document for ideas on inquiry/instructional strategies for each unit.** <http://tinyurl.com/dkd7y3> |