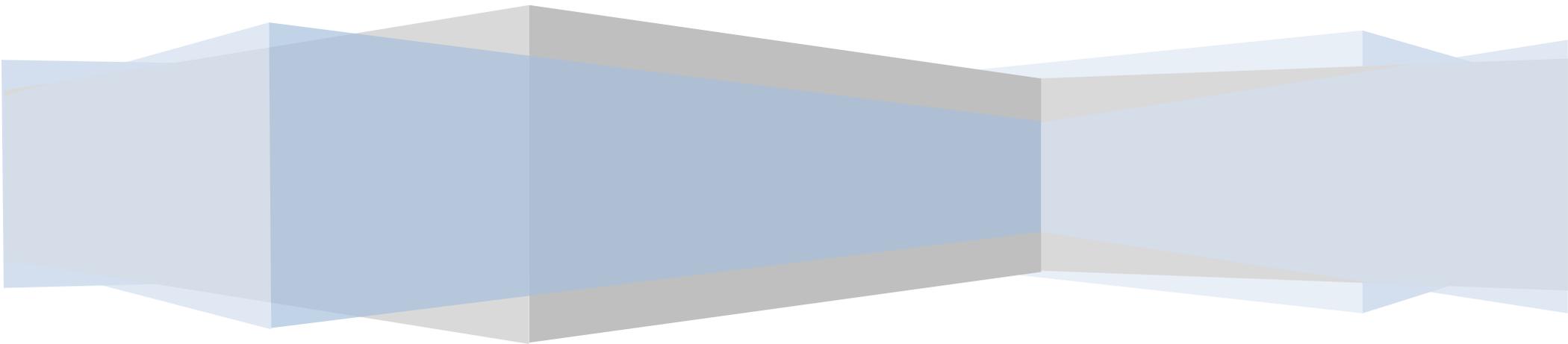


County-wide Curriculum

Science Curriculum 2010

Grades 5-8



Science Grades 5-6

Cape May County, New Jersey (2010)

| OBJECTIVE CODE | | | UNIT CONTENT & PACING | UNIT ESSENTIAL QUESTIONS | UNIT ENDURING UNDERSTANDING WHAT STUDENTS SHOULD KNOW AND BE ABLE TO DO | DIFFERENTIATED ACTIVITIES TIER 1, 2, 3 | BENCHMARK ASSESSMENTS |
|----------------|----------|--------|------------------------------------|---|--|--|-----------------------|
| Grade | Standard | Strand | | | | | |
| 5-6 | 5.1 | A.1 | Understand Scientific Explanations | How do we build and refine models that describe and explain the natural and designed world? | Measurement and observation tools are used to categorize, represent and interpret the natural world. | Learning fundamental concepts, principles, theories, and models http://www.lessonplanspage.com/ScienceSSMars2DevTeamworkSkills56.htm | |
| | | A.2 | | | | Develop evidence-based models to explain the relationships between fundamental concepts and principles http://seplessons.ucsf.edu/taxonomy/term/7 | |
| | | A.3 | | | | Critique scientific arguments by considering the quality of the experimental design and data. http://www.ansp.org/education/visits/lessonstopics.php#three | |

Science Grades 5-6

Cape May County, New Jersey (2010)

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|----------------|----------|--------|--|--|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| 5-6 | 5.1 | B.1 | Generate Scientific Evidence Through Active Investigations | What constitutes useful scientific evidence? | Evidence is used for building, refining, and/or critiquing scientific explanations. | <p>Identifying controls and variables with Sponge Bob http://sciencespot.net/Media/2009K8Update_SciMethod.pdf</p> <p>IDEA #1: Solar Energy Experiment: collect data and graph results, draw a conclusion using white painted bottle, a black painted bottle (add a control=no paint) http://www.col-ed.org/cur/sci/sci106.txt</p> <p>IDEA #2 Paper Airplane Science (FUN) Students create questions and form hypotheses then set up and conduct experiments recording data , graphing results and drawing conclusions http://www.col-ed.org/cur/sci/sci132.txt</p> <p>IDEA #3 Looking at Variables : Sugar cube experiments http://www.col-ed.org/cur/sci/sci186.txt</p> | |

Science Grades 5-6

Cape May County, New Jersey (2010)

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|----------------|----------|--------|-----------------------|--------------------------|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | B.2 | | | | <p>Bouncing Ball Activity: Use two quantifying variables (manipulative, responding and fixed variables) http://www.col-ed.org/cur/sci/sci136.txt</p> <p>Potential and Kinetic Energy: experiments – as a technology tie in allow students to diagram data in a PowerPoint –work in small groups or individually http://www.col-ed.org/cur/sci/sci187.txt</p> <p>Taster or Non-Taster- individual taste challenge to be brought home to find genetic evidence of inherited traits and can be graphed using Excel http://www.col-ed.org/cur/sci/sci83.txt</p> <p>Measuring Calories in Food- use graduated cylinders, balances, thermometers and graphing http://www.seplessons.org/node/349</p> | |

Science Grades 5-6

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|----------------|----------|--------|---------------------------------|--|---|---|---|
| Grade | Standard | Strand | | | | | |
| | | B.3 | | | | SUGGESTION: Use the experiments above (5.1.B.2) to make a claim based on available qualitative and quantitative evidence | |
| | | B.4 | | | | Exploring Baby Weight-math link(advanced) http://www.ipfw.edu/math/lamaster/baby2/babyweqn.htm What percentage of your class (school) is left or right handed: gather data , create a graph , generalize onto total population http://math.rice.edu/~lanius/Algebra/rightleft.html Long Distance Airplanes-gather and graph data: includes objective, materials, student questions, assessment options and extensions http://illuminations.nctm.org/LessonDetail.aspx?ID=L323 | |
| 5-6 | 5.1 | C.1 | Reflect on Scientific Knowledge | How is scientific knowledge constructed? | Scientific knowledge builds upon itself over time. | -Using prior knowledge, for problem solving in investigations http://www.brainpop.com/science/energy/kineticenergy/ | Teacher Observation, questioning techniques, interactive/hands on |

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|----------------|----------|--------|-----------------------|--------------------------|---|--|--|
| Grade | Standard | Strand | | | | | |
| | | | | | | https://edunology.wikispaces.com/Interactive+Whiteboards www.msteacher.org/return_list_science.aspx?id=1365 | activities, worksheets' science log. |
| | | C.2 | | | | Begin to revise and refine explanations on basis of new evidence using new information and models. -Use other tools to complete investigations www.speedofcreativity.org/.../sorry-honey-you-cant-believe-everything-you-read-in-your-printed-science-textbook/ http://www.brainpop.com/science/energy/electromagnets/ www.exchange.smarttech.com/search.html?q=analyze+primary | Teacher Observation, questioning techniques, interactive/hands on activities, worksheets' Science log. |
| | | C.3 | | | | www.edHelper.com www.cnx.org | Teacher Observation, questioning techniques, |

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|----------------|----------|--------|-------------------------------------|---|--|---|---|
| Grade | Standard | Strand | | | | | |
| | | | | | | www.exchange.smarttech.com/search.html?q=analyze+primary | interactive/hands on activities, worksheets' Science log. |
| 5-6 | 5.1 | D.1 | Participate Productively in Science | How does scientific knowledge benefit, deepen, and broaden from scientists sharing and debating ideas and information with peers? | The growth of scientific knowledge involves critique and communication-social practices that are governed by a core set of values and norms. | Small group activity and large group presentation on any of the 5.2-5.4 standards that allow students to discuss, verbalize and communicate ideas Science Fair projects Inventors Fair | |
| | | D.2 | | | | Penpal with another school to communicate ideas Create a class Webblog in which student answer an investigative question and must respond to two or more assigned students as well as answer teacher's inquiry | |
| | | D.3 | | | | Video showing safety use of instruments http://www.wiziq.com/tutorial/39532-Lesson-6-Tools-in-Science | |

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| Grade | Standard | Strand | | | | | |
| | | D.4 | | | | Handling, using, and treating organisms responsibly http://www.nsta.org | |
| 5-6 | 5.2. | A.1 | Properties of Matter | How do the properties of materials determine their use? | The structures of materials determine their properties. Determine the volume of common objects using water displacement methods. | Water Displacement activity (1) http://www.fordhamprep.org/gcurran/sho/sho/skills/h2odisskill.htm | |
| | | A.2 | | | Calculate the density of objects or substances after determining volume and mass. | Density Lab Activity (1) http://www.fordhamprep.org/gcurran/sho/sho/lessons/lesson27.htm | |
| | | A.3 | | | Determine the identity of an unknown substance using data about intrinsic properties. | Identify of an unknown substance http://www.chymist.com/properties.pdf http://www.eduref.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Science/Chemistry/CHM0008.html | |
| 5-6 | 5.2 | B.1 | Changes in Matter | How does conservation of mass apply to the | Compare the properties of reactants with the properties of the products | Comparing physical and chemical changes http://www.eduref.org/cgi- | |

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| Grade | Standard | Strand | | | | | |
| | | | | interaction of materials in a closed system? | when two or more substances are combined and react chemically. | bin/printlessons.cgi/Virtual/Lessons/Science/Chemistry/CHM0008.html http://www.mrseiler.org/cchanges.html http://www.uen.org/Lessonplan/preview.cgi?LPid=2688 | |
| 5-6 | 5.2 | C.1 | Forms of Energy | How do we know that things have energy? | Predict the path of reflected or refracted light using reflecting and refracting telescopes as examples. | http://centerforeducation.rice.edu/ST/resources/Bridging/Module1/Grade_5/1%20Refraction.pdf http://www.micro.magnet.fsu.edu/optics/activities/teachers/prisms.html | |
| | | C.2 | | | Describe how prisms can be used to demonstrate that visible light from the Sun is made up of different colors. | http://www.indianastandardsresources.org/files/sci/sci_6_3_21.pdf http://stargazers.gsfc.nasa.gov/pdf/activities/in_a_different_light/lesson2_teacher.pdf http://www.ehow.com/how_6703195_use-prism-middle-school-labs.html | |

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| Grade | Standard | Strand | | | | | |
| 5-6 | 5.2 | C.3 | Forms of Energy | How do we know that things have energy? | Relate the transfer of heat from oceans and land masses to the evolution of a hurricane. | http://www.indiana.edu/~geol105/1425chap4.htm http://mynasadata.larc.nasa.gov/preview_lesson.php?&passid=50 http://www.bbc.co.uk/weather/features/understanding/hurricanecycle.shtml | |
| 5-6 | 5.2 | D.1 | Energy Transfer and Conservation | How can energy be transferred from one material to another? What happens to a material when energy is transferred to it? | Use simple circuits involving batteries and motors to compare and predict the current flow with different circuit arrangements. | See New Jersey Core Curriculum Content Standards, Classroom Applications Document-Science, Physical Science (by the end of grade 6) pgs. 15 & 16. http://www.bbc.co.uk/schools/ks2bitesize/science/physical_processes/c_hanging_circuits/play.shtml www.mysciencesite.com/Series_and_Parallel_Circuits_Experiment.doc http://www.tryengineering.org/lessons/serpar.pdf | |
| 5-6 | 5.2 | E.1 | Forces and Motion | How can energy be transferred | Changes take place because of the transfer of | http://dawn.jpl.nasa.gov/DawnClassrooms/2_ion_prop/development/1_t | |

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| | | | | from one material to another? What happens to a material when energy is transferred to it? | energy. Model and explain how the description of an object's motion from one observer's view may be different from a different observer's view. | g_development.pdf http://scithon.terc.edu/marbleroll/index.cfm http://www.learner.org/interactives/parkphysics/coaster/ | |
| 5-6 | 5.2 | E.2 | Forces and Motion | How can energy be transferred from one material to another? What happens to a material when energy is transferred to it? | Energy is transferred to matter through the action of forces. Magnetic, electrical, and gravitational forces can act at a distance. | http://school.discoveryeducation.com/lessonplans/programs/understanding-magnetism/ http://www.brainpop.com/technology/energytechnology/electromagnets/preview.weml http://school.discoveryeducation.com/curriculumcenter/magnetism/projectideas.htm http://www.lessonplanet.com/search=?keywords=activities+on+magnets&media=lesson&rating=4 ***Smartboard activity) http://web.archive.org/web/20040619023533/www.galaxy.net/~k12/elec | |

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|----------------|----------|--------|-----------------------|---|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | | tric/poles.shtml | |
| 5-6 | 5.2 | E.3 | Forces and Motion | How can energy be transferred from one material to another? What happens to a material when energy is transferred to it? | Changes take place because of the transfer of energy Energy is transferred to matter through the action of forces. Demonstrate and explain the frictional force acting on an object with the use of a physical model. | Friction in our lives: Offers objectives , materials, procedures, adaptations, discussion questions, evaluations, and extensions http://school.discoveryeducation.com/lessonplans/programs/frictioninourlives/ Friction : Projects by students for students- Read this material and students can then create their own investigation to prove/disprove friction at work; site has a plug-in download to show affect of weight on friction http://library.thinkquest.org/CR0215468/force_and_motion.htm Friction and Force: When Rubber meets the Road: This site offers a review of basic terminology- requires teacher to study information ahead of time and to possibly create own models for explanation; allow advanced | |

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| Grade | Standard | Strand | | | | | |
| | | | | | | students to use models with symbols to explain the force of gravity, neutral force and push or pull on objects using varying lengths and thicknesses of arrows; offers practice questions and answers when you click on available htm. links http://www.learner.org/workshops/force/workshop3/ | |
| 5-6 | 5.2 | E.4 | Forces and Motion | How can energy be transferred from one material to another? What happens to a material when energy is transferred to it? | Different forces are responsible for the transfer of the different forms of energy. Sinking and floating can be predicted using forces that depend on the relative densities of objects and materials. | STC: Sinking and Floating science Kit http://www.nsrconline.org/curriculum_resources/Flo_overview.html Do-It-Yourself Iceberg Science (designed for Grades 6-8, modify for K-5): Scroll to this topic and allow students to investigate different sizes and shapes of icebergs; affect of salinity of water on iceberg- it helps to further the concepts of density and buoyancy http://beyondpenguins.nsd.org/issue/column.php?date=August2009&departmentid=curriculum&columnid | |

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| | | | | | | <p>=curriculum!lessons</p> <p>Resource: Floating and Sinking: Hot Air Balloons http://www.teachersdomain.org/resource/phy03.sci.phys.matter.balloon/</p> <p>Can't Stand the Pressure- students build their own device to test pressure and buoyancy pg 7 of downloaded pdf file http://www.masna.org/PublicArea/PublicEducation/tabid/317/articleType/ArticleView/articleId/270/Lesson-Plans-and-Activities-for-Educators-Grades-6--8.aspx</p> <p>http://www.coralfilm.com/CRAEducatorGuide.pdf</p> | |
| 5-6 | 5.3 | A.1 | Organization and Development | What do all living things have in common? | Living organisms have a variety of observable features that enable them to obtain food and reproduce. Model the | <p>http://www.teachersdomain.org/resource/lsp07.sci.life.stru.bodysystems/</p> <p>http://www.teachersdomain.org/resource/tdc02.sci.life.reg.bodycontrol/</p> | |

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| Grade | Standard | Strand | | | | | |
| | | | | | interdependence of the human body's major systems in regulating its internal environment. | http://library.thinkquest.org/J001614F/ http://www.emints.org/ethemes/resources/S00001013.shtml | |
| 5-6 | 5.3 | A.2 | Organization and Development | What do all living things have in common? | Living organisms have a variety of observable features that enable them to obtain food and reproduce. Essential functions of plant and animal cells are carried out by organelles. | http://www.teachersdomain.org/resource/tdc02.sci.life.cell.animplant/ http://www.sciencenetlinks.com/lessons.php?BenchmarkID=11&DocID=101 | |
| 5-6 | 5.3 | B.1 | Matter and Energy Transformation | How is matter transformed, and energy transferred/transformed in living systems? | All organisms transfer matter and convert energy from one form to another. Describe the sources of the reactants of photosynthesis and trace the pathway to the products. | <p>This lesson covers the process of photosynthesis and the related plant cell functions of transpiration and cellular respiration.</p> http://www.teachengineering.org/view_lesson.php?url=http://www.teachengineering.org/collection/cub/_lessons/cub_lifescience/cub_lifescience_lesson01.xml <p>The lesson focuses on sequencing the process of photosynthesis.</p> | |

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|----------------|----------|--------|----------------------------------|--|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | | http://www.common sensepress.com/GSA-sample_lesson/lesson_plants.htm# | |
| 5-6 | 5.3 | B.2 | Matter and Energy Transformation | How is matter transformed, and energy transferred/transformed in living systems? | All organisms transfer matter and convert energy from one form to another. All animals, including humans, are consumers that meet their energy needs by eating other organisms or their products. Illustrate the flow of energy (food) through a community. | Basic flow charts describing energy through our lives. http://www.uwsp.edu/cnr/wcee/keep/Mod1/Flow/foodchains.htm Games consisting of different food chains. http://www.harcourtschool.com/activity/food/food_menu.html A site including vocabulary worksheets and cloze exercises on food chains and food webs. http://bogglesworldesl.com/foodweb_worksheets.htm | |
| 5-6 | 5.3 | C.1 | Interdependence | In what ways do organisms interact within ecosystems? | All animals and most plants depend on both other organisms and their environments for their basic needs. Various human activities have changed the capacity | Explain impact of meeting human needs and wants on local and global environments ACTIVITIES: Define biotic and abiotic Smart Board Activity with teacher lessons on biotic and abiotic factors http://exchange.smarttech.com/sear | |

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| | | | | | <p>of the environment to support some life forms.</p> <p>Explain the impact of meeting human needs and wants on local and global environments.</p> | <p>ch.html?q=biotic</p> <p>http://environment.nationalgeographic.com/environment/global-warming/gw-overview-interactive.html</p> <p>Define and understand: Populations: (introduce food chain, food web, review decomposer, carnivore, omnivore, herbivore, consumer, producer) Smart board quiz http://exchange.smarttech.com/details.html?id=xaedbf0e087f140449ec4309317c8d457</p> <p>Ecosystems and Human Impact Resource for teachers to read about human interference and repercussions for environment http://regentsprep.org/Regents/global/themes/geography/imp.cfm</p> <p>Ecosystems –STC Kit OR</p> | |

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| | | | | | | <p>Create a terrarium and an aquarium using soda bottles (need soil, grass, clover, alfalfa seed, and debris for terrarium) Record grow of each population #, height- introduce pill bugs and crickets; record changes to ecosystem; then omit the animals and add water mix w/ vinegar (acid rain) record changes; in another add liquid fertilizer and last add salt water. Record observations and discuss changes and impact of human interference</p> <p>Acid Rain experiments http://www.epa.gov/acidrain/education/</p> <p>Bridge Data Series (Watershed Activities) http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive0203.html</p> <p>Global Warming interactive lesson with quiz links http://environment.nationalgeographic.com/environment/global-</p> | |

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| | | | | | | warming/gw-overview-interactive.html | |
| 5-6 | 5.3 | C.2 | Interdependence | In what ways do organisms interact within ecosystems? | <p>All animals and most plants depend on both other organisms and their environments for their basic needs.</p> <p>The number of organisms and populations an ecosystem can support depends on the biotic resources available and on abiotic factors, such as quantities of light and water, range of temperatures, and soil composition.</p> <p>Predict the impact the altering biotic and abiotic factors has on an ecosystem.</p> | <p>Predict the impact that altering biotic and abiotic factors has on an ecosystem</p> <p>Activity: After exploring, investigating and developing understanding from 5.3.C.1, the students create a Venn diagram on impact on organisms in a specific ecosystem</p> <p>The Changing Arctic Ecosystem: A unit containing two lessons with a 3 minute video http://uw.kqed.org/edresources/plans/lesson-2a-the-changing-arctic-ecosystem.pdf?trackurl=true</p> <p>As head of the new National Geographic Climate Observation Post, you need to create a Climate Map to illustrate the world's different climate zones. http://www.nationalgeographic.com/xpeditions/activities/08/climates.html</p> | |

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|----------------|----------|--------|---------------------------|--|---|--|-----------------------|
| Grade | Standard | Strand | | | | | |
| 5-6 | 5.3 | C.3 | Interdependence | In what ways do organisms interact within ecosystems? | <p>All animals and most plants depend on both other organisms and their environments for their basic needs.</p> <p>All organisms cause changes in the ecosystem in which they live. If this change reduces another organism's access to resources, that organism may move to another location or die.</p> <p>Describe how one population of organisms may affect other plants and/or animals in an ecosystem.</p> | <p>Describe how one population of organisms may affect other populations of plants or animals in an ecosystems</p> <p>Classroom Activities : Food Webs- beginning to diversity</p> <p>http://www.riverventure.org/charleston/resources/pdf/food%20web%20game.pdf</p> <p>Food Chains, Habitats and Us – 1 hour distance learning</p> | |
| 5-6 | 5.3 | D.1 | Heredity and Reproduction | How do organisms change as they go through their life cycle? | <p>Organisms reproduce, develop, have predictable life cycles, and pass on some traits to their offspring.</p> <p>Reproduction is essential to the continuation of</p> | <p>http://www.uen.org/themepark/cycles/animal.shtml</p> <p>http://www.emints.org/ethemes/resources/S00000759.shtml</p> | |

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|----------------|----------|--------|---------------------------|--|--|--|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | every species. Predict the long-term effect of interference with normal patterns of reproduction. | | |
| 5-6 | 5.3 | D.2 | Heredity and Reproduction | How do organisms change as they go through their life cycle? | Organisms reproduce, develop, have predictable life cycles, and pass on some traits to their offspring. Variations exist among organisms of the same generation (e.g. siblings) and of different generations (e.g., parent to offspring) Explain how knowledge of inherited variations within and between generations is applied to farming and animal breeding. | http://www.pbs.org/wnet/nature/lessons/the-loneliest-animals/lesson-overview/4905/ http://www.schools.utah.gov/curr/science/sciber00/7th/genetics/sciber/punnett.htm | |
| 5-6 | 5.3 | D.3 | Heredity and Reproduction | How do organisms change as they go through their life cycle? | Organisms reproduce, develop, have predictable life cycles, and pass on some traits to their offspring. | http://seilhanv.wonecks.net/2010/01/28/6th-grade-lesson-plans-heredity-chapter-14/ http://mistupid.com/science/heredit | |

Science Grades 5-6

Cape May County, New Jersey (2010)

| OBJECTIVE CODE | | | UNIT CONTENT & PACING | UNIT ESSENTIAL QUESTIONS | UNIT ENDURING UNDERSTANDING WHAT STUDENTS SHOULD KNOW AND BE ABLE TO DO | DIFFERENTIATED ACTIVITIES TIER 1, 2, 3 | BENCHMARK ASSESSMENTS |
|----------------|----------|--------|-------------------------|---|--|--|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | Traits such as eye color in human beings or fruit/flower color in plants are inherited. Distinguish between inherited and acquired traits/characteristics. | y.htm Compare and contrast family members from past/present generations using genetic traits such as hair color, eye color, and height. | |
| 5-6 | 5.3 | E.1 | Evolution and Diversity | In what ways are organisms of the same kind different from each other? How does this help them reproduce and survive? | Sometimes differences between organisms of the same kind give advantages in surviving and reproducing in different environments. Changes in environmental conditions can affect the survival of individual organisms and entire species. Describe the impact on the survival of species during specific times in geologic history when environmental conditions changed. | In this lesson, students are asked to consider why extinction is a problem that we should concern us. They are taught that destruction of habitat is the main reason many species are threatened. The lesson explores ways that engineers can help save endangered species. http://www.teachengineering.org/view_lesson.php?url=http://www.teachengineering.org/collection/cub/_lessons/cub_lifescience/cub_lifescience_lesson02.xml This site can be used for both 5th and 6th grade evolution and diversity. http://classroom.jc-schools.net/sci-units/bio.htm | |

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|----------------|----------|--------|-------------------------|--|--|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| 5-6 | 5.4 | A.1 | Objects in the Universe | What predictable, observable patterns occur as a result of the interaction between the Earth, Moon, and Sun? What causes these patterns? | Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun. The height of the path of the Sun in the sky and the length of a shadow change over the course of a year. Generate and analyze evidence (through simulations) that the Sun's apparent motion across the sky changes over the course of a year. | http://www.classzone.com/books/earth_science/terc/content/visualizations/es0408/es0408page01.cfm?chapter_no=04 http://www.wsanford.com/~wsanford/exo/sundials/shadows.html http://www.efn.org/~jack_v/AstronomicalCalendar.html#Activity%202 | |
| 5-6 | 5.4 | A.2 | Objects in the Universe | What predictable, observable patterns occur as a result of the interaction between the Earth, Moon, and Sun? What causes these patterns? | Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun. Earth's position relative to the Sun, and the rotation of Earth on its axis, result in patterns and cycles that define time units of days | http://www.bbc.co.uk/science/space/solarsystem/earth/solsticescience.shtml http://www.enchantedlearning.com/subjects/astronomy/planets/earth/Seasons.shtml http://www.kidseclipse.com/pages/a1b3c0d0.htm | |

Science Grades 5-6

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|----------------|----------|--------|-------------------------|--|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | and years. Construct and evaluate models demonstrating the rotation of Earth on its axis and the orbit of Earth around the Sun. | | |
| 5-6 | 5.4 | A.3 | Objects in the Universe | What predictable, observable patterns occur as a result of the interaction between the Earth, Moon, and Sun? What causes these patterns? | Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun. The Sun's gravity holds planets and other objects in the solar system in orbit, and planets' gravity holds moons in orbit. Predict what would happen to an orbiting object if gravity were increased, decreased, or taken away. | http://www.sciencenetlinks.com/lessons.php?BenchmarkID=4&DocID=405 http://science.howstuffworks.com/environmental/earth/geophysics/question232.htm http://www.brainpop.com/science/motionsforcesandtime/gravity/preview.weml | |
| 5-6 | 5.4 | A.4 | Objects in the Universe | What predictable, observable patterns occur as a result of the interaction | Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction | http://www.sciencenetlinks.com/lessons.php?BenchmarkID=12&DocID=33 http://school.discoveryeducation.co | |

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|----------------|----------|--------|-----------------------|---|---|--|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | <p>between the Earth, Moon, and Sun? What causes these patterns?</p> | <p>and energy from the Sun. The Sun is the central and most massive body in our solar system, which includes eight planets and their moons, dwarf planets, asteroids, and comets. Compare and contrast the major physical characteristics (including size and scale) of solar system objects using evidence in the form of data tables and photographs.</p> | <p>m/lessonplans/programs/classroomplanetarium/ spaceunit.wikispaces.com/file/view/planet+distances+activity.doc</p> | |
| 5-6 | 5.4 | B.1 | History of Earth | <p>How do geologic events occurring today provide insight Earth's past?</p> | <p>Earth's components form systems? These systems continually interact at different rates of time, affecting the shape of the Earth's surface regionally and globally. Successive layers of sedimentary rock and the fossils contained in them tell the factual story of the</p> | <p>Windows to the Universe: Rock Layers- activity is two -50 min lessons includes worksheet links to understand sedimentary rock layers and age in superposition of rocks modeled play-doh http://www.windows2universe.org/teacher_resources/teach_strata.html Quiz on sedimentary rock: use as pre-assessment tool</p> | |

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|----------------|----------|--------|-----------------------|--|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | <p>age, history, changing life forms, and geology of Earth.</p> <p>Interpret a representation of a rock layer sequence to establish oldest and youngest layers, geologic events, and changing life forms.</p> | <p>http://www.lnhs.org/hayhurst/geology/ch06/Chapter_6_StudyGuide.pdf</p> <p>Become a Rock Expert: examine metamorphic, igneous and sedimentary rocks- allows students to see samples and how each type of rock is formed</p> <p>http://www.fi.edu/fellows/fellow1/0ct98/expert/index.html</p> <p>This site links with the one above and gives students a chance to explore rocks in different ways – also includes an identity quiz</p> <p>http://www.fi.edu/fellows/fellow1/0ct98/index2.html</p> <p>The Layered Earth : interactive demo</p> <p>http://www.thelayeredearth.com/Demo.html</p> | |
| 5-6 | 5.4 | B.2 | History of Earth | How do geologic events occurring today provide insight Earth's | Earth's components form systems? These systems continually interact at different rates of time, | Use time frame to realize that mountains, Grand Canyon, Three Gorges, etc were created in time not in human life time | |

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|----------------|----------|--------|-----------------------|--------------------------|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | past? | <p>affecting the shape of the Earth's surface regionally and globally.</p> <p>Fossils provide evidence of how life and environmental conditions have changed. The principle of Uniformitarianism makes possible the interpretation of Earth's history. The same Earth processes that occurred in the past occur today.</p> <p>Evaluate the appropriateness of increasing the human population in a region (e.g. barrier islands, Pacific Northwest, Midwest United States) based on the region's history of catastrophic events, such as volcanic eruptions, earthquakes, and floods.</p> | <p>The geology of the Grand Canyon</p> <p>http://www.bobspixels.com/kaibab.org/geology/gc_geol.htm</p> | |

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|----------------|----------|--------|-----------------------|--|---|--|-----------------------|
| Grade | Standard | Strand | | | | | |
| 5-6 | 5.4 | B.3 | History of Earth | How do geologic events occurring today provide insight Earth's past? | <p>Earth's components form systems? These systems continually interact at different rates of time, affecting the shape of the Earth's surface regionally and globally.</p> <p>Moving water, wind, and ice continually shape Earth's surface by eroding rock and soil in some areas and depositing them in other areas.</p> <p>Determine if landforms were created by processes of erosion (e.g., wind, water, and/or ice based on evidence in pictures, video, and/or maps.</p> | <p>Weathering and erosion http://geologyonline.museum.state.il.us/tools/lessons/6.3/lesson.pdf "Canyon" say wind, water, and ice: Grade 4-5 lesson plan focus on sediment , run-off, acid rain, deposition . Implements investigations to answer CPI http://www.kedt.org/Ed/LessonPlanwithVideo/lpeerosion.htm</p> <p>Unit on Erosion (5 lessons including wind, water and ice directed for Gr.4-6 investigation http://www.lessonplanspage.com/ScienceSSMDUnitOnErosion46.htm</p> | |
| 5-6 | 5.4 | B.4 | History of Earth | How do geologic events occurring today provide insight Earth's past? | <p>Earth's components form systems? These systems continually interact at different rates of time, affecting the shape of the Earth's surface regionally and globally.</p> <p>Erosion plays an</p> | <p>Water and soil erosion : Several class or group lessons that examine soil erosion rate with or without grass planted (intended for grade 3-4 but can be adapted for older ages) http://www.eduref.org/Virtual/Lessons/Interdisciplinary/INT0133.html Fighting Soil Erosion: Two sessions</p> | |

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|----------------|----------|--------|-------------------------------|---|--|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | important role in the formatin of soil, but too much erosion can wash away fertile soil from ecosystems, including farms. Describe methods people use to reduce soil erosion. | –one beginner the second intermediate including a slide show on Guinea and investigations on preventing soil erosion http://www.peacecorps.gov/www/educators/lessonplans/lesson.cfm?lpid=1421 | |
| 5-6 | 5.4 | C.1 | Properties of Earth Materials | How do changes in one part of an Earth system affect other parts of the system? | | <p>“To gain a deeper appreciation of soils -- one of our most important natural resources.” http://www2.ngdc.wvu.edu/~hferguson/educationNGDC/education2/lessons_pln/crayon/crayon.htm</p> <p>Activity to compare different types of soil http://www.newhavenscience.org/NewCTStateScience/cmtgr6taskstudent.htm</p> <p>Examine and compare four different types of soil from four different areas. http://www.utdanacenter.org/sciencetoolkit/downloads/activities/4properties_soil.pdf</p> | |

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|----------------|----------|--------|-------------------------------|---|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| 5-6 | 5.4 | C.2 | Properties of Earth Materials | How do changes in one part of an Earth system affect other parts of the system? | | <p>Explore properties of rocks http://www.teachervision.fen.com/tv/printables/scottforesman/sci_3_AR_S_C2_exp1.pdf</p> <p>Properties of sedimentary and metamorphic rocks http://www.uwsp.edu/geo/faculty/ritter/geog101/uwsp_lectures/lecture_sedimentary_and_metamorphic_rocks.html</p> <p>Identification of Igneous rocks http://geology.csupomona.edu/alert/igneous/igneousid.htm</p> | |
| 5-6 | 5.4 | C.3 | Properties of Earth Materials | How do changes in one part of an Earth system affect other parts of the system? | | Shows how three different types of rocks are formed. http://www.fi.edu/fellows/fellow1/oct98/create/ | |
| 5-6 | 5.4 | D.1 | Tectonics | To what extent does the exchange of energy within the Earth drive | | Investigate how mountains are formed http://www.teachengineering.org/view_lesson.php?url=http://www.teac | |

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|----------------|----------|--------|-----------------------|---|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | geologic events on the surface? | | http://engineering.org/collection/cub_lessons/cub_rock/cub_rock_lesson04.xml http://www.dlese.org/library/query.do?q=ring%20of%20fire&s=0 | |
| 5-6 | 5.4 | D.2 | Tectonics | To what extent does the exchange of energy within the Earth drive geologic events on the surface? | | Plate tectonic lessons http://www.teachersdomain.org/resource/ess05.sci.ess.earthsys.lp_plate_tectonics/ http://school.discoveryeducation.com/lessonplans/programs/understanding-magnetism/ http://www.brainpop.com/technology/energytechnology/electromagnets/preview.weml | |
| 5-6 | 5.4 | D.3 | Tectonics | To what extent does the exchange of energy within the Earth drive geologic events on the surface? | | http://school.discoveryeducation.com/curriculumcenter/magnetism/projectideas.htm http://www.lessonplanet.com/search=a?keywords=activities+on+magnets | |

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|----------------|----------|--------|-------------------------|---|--|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | | &media=lesson&rating=4 ****Smartboard activity) http://web.archive.org/web/20040619023533/www.galaxy.net/~k12/electric/poles.shtml | |
| 5-6 | 5.4 | E.1 | Energy in Earth Systems | What is the role of the sun in energy transfer in the atmosphere and in the oceans? | Generate a conclusion about energy transfer and circulation by observing a model of convection currents | Demonstration: UTube video on convection currents using red and blue food dye http://www.youtube.com/watch?v=7xWWowXtuvA Around and Around We Go: prerequisite-density (Standard 5.2 ...but this site offers 3 lessons to help); need hot plates and beakers. Includes 3 experiments , questions , apply what you learned and assessment http://teachertech.rice.edu/Participants/louviere/Lessons/les7.html Gulf Stream: StarLab- here is an example of the cylinder: Stella Danks at Cape May County | |

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|----------------|----------|--------|-----------------------|---|---|--|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | | | Building has the whole lab, cylinder and binder lessons to coincide with this picture http://www.starlab.com/starlab_cylinders.html#ocean | |
| 5-6 | 5.4 | F.1 | Weather and Climate | How do changes in one part of an Earth system affect other parts of the system? | | Roles an engineer can play in the area of weather detection: http://www.teachengineering.org/view_activity.php?url=http://www.teachengineering.org/collection/wpi/_activities/wpi_design_weather_instruments/design_weather_instruments.xml http://education.arm.gov/teacherslonge/lessons/comparingdata.pdf | |
| 5-6 | 5.4 | F.2 | Weather and Climate | How do changes in one part of an Earth system affect other parts of the system? | | Climatographs http://www.nationalgeographic.com/expeditions/lessons/15/g912/pgafrika4.html | |
| 5-6 | 5.4 | F.3 | Weather and Climate | How do changes in one part of an Earth system affect other parts | | Learn about weather systems http://school.discoveryeducation.com/lessonplans/programs/planetaryweather/ | |

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|----------------|----------|--------|-----------------------|--|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | of the system? | | | |
| 5-6 | 5.4 | G.1 | Biogeochemical Cycles | How do changes in one part of the Earth system affect other parts of the system and in what ways can Earth processes be explained as interactions among spheres? | Illustrate global winds and surface currents through the creation of a world map of global winds and currents that explains the relationship between the two factors | <p>Global Winds: interactive Smart lesson: trade winds , polar easterlies and prevailing westerlies http://exchange.smarttech.com/details.html?id=xd1f671893d7f41b3a3a92c62f79ce44e</p> <p>and Wind Belts http://exchange.smarttech.com/details.html?id=xc673f2af20194c37abea7c45c006f491</p> <p>Science from the Poles: Understanding The Gulf Stream, Part 2 (Webcast) http://www.exploratorium.edu/webcasts/archive.php?keywordtext=convection%20currents&cmd=keyword</p> <p>Temperature and Water Density: Develop understanding of the convection of liquids and how this applies to ocean currents http://www.col-ed.org/cur/sci/sci212.txt</p> | |

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|----------------|----------|--------|-----------------------|--|--|--|-----------------------|
| Grade | Standard | Strand | | | | | |
| 5-6 | 5.4 | G.2 | Biogeochemical Cycles | How do changes in one part of the Earth system affect other parts of the system and in what ways can Earth processes be explained as interactions among spheres? | Create a Model of ecosystems in two different locations, AND compare and contrast the living and nonliving components | <p>Ecosystems: This site explores all ecosystems including abiotic features to allow students to compare and contrast 2 or more ecosystems with each other http://library.thinkquest.org/11353/ecosystems.htm</p> <p>Earth Observatory : Scroll down to GREAT GRAPH MATCH- students match temperatures to biomes and test their ecological knowledge of living/non-living things and TO PLANT or NOT TO PLANT http://earthobservatory.nasa.gov/Experiments/</p> | |
| 5-6 | 5.4 | G.3 | Biogeochemical Cycles | How do changes in one part of the Earth system affect other parts of the system and in what ways can Earth processes be | Describe how humans can improve the health of ecosystems around the world | <p>The Environment : Focus on Saskatchewan but lessons can be tweaked for own area http://www.sasked.gov.sk.ca/docs/midlsci/gr9uamsc.html</p> <p>Human Activity and Climate</p> | |

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|----------------|----------|--------|-----------------------|--|---|---|-----------------------|
| Grade | Standard | Strand | | | | | |
| | | | | explained as interactions among spheres? | | <p>Change (Gr.6-9) Lists goals, materials, use graphs to determine cause and effect, procedures, assessment and modifications http://www.ucar.edu/learn/1_4_2_2_0t.htm</p> <p>Water Ecosystem Project Gr.5: includes standards, benchmarks, technology and Social Studies connections, procedures, 5 lessons , extensions, graphic organizers, and a rubric for assessment http://www.technologyiselementary.com/userfiles/file/5th%20grade%20water%20ecosystem%20project.pdf</p> | |

Science Grades 7 – 8

Cape May County, NJ (2010)

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|----------------|-----------------------------------|----------|---|---|--|---|---|
| Grade | Standard | Strand | | | | | |
| 7-8 | 5.1 Vocabulary | A1 A2 | Understanding Scientific Explanation <i>(all year)</i> | What are the core scientific principles that represent the conceptual basis of model-building and facilitate the generation of new and productive questions? How results of observations and measurements can be used to build conceptual-based | Demonstrate understanding and use of interrelationships among central scientific concepts to revise explanations and to consider alternative explanations. Use mathematical, physical and computational tools to build conceptual-based models and to pose theories. | View 5.1 A1 Differentiated Activity Make observations about a box containing an unknown object(s). Use your observations to infer what is inside the box. Discuss your theories with other students. | Science Fair/ Experimental Design Project Performance tasks and scoring rubrics listed by grade level and subject http://pals.sri.com/tasks/tasks5-8.html |

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|----------------|----------|--------|--|---|--|---|---|
| Grade | Standard | Strand | | | | | |
| | | | | models and to search for core explanations ? | | | |
| 7-8 | 5.1 | A3 | Understanding Scientific Explanation (<i>all year</i>) | How can predictions and explanations be revised based on systematic observations, accurate measurements and structured data/evidence? | Use scientific principles and models to frame and synthesize scientific arguments and pose theories. | Measure the height of a burning birthday candle every two minutes. Use the data to create a line plot. Use line plot to predict the height of a candle after burning for 5 minutes. Test the prediction. Predict the number of drops of water that will fit on a penny. Test your prediction with a medicine dropper. | Science Fair/ Experimental Design Project Performance tasks and scoring rubrics listed by grade level and subject http://pals.sri.com/tasks/tasks5-8.html |



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|----------------|----------|----------|--|--|--|--|---|
| Grade | Standard | Strand | | | | | |
| | | | | | | Find the mean for the class data. Come up with question that can be tested about drops of water on a penny (which holds more heads or tails, new or old penny, etc.) Collect data to answer your question. | |
| 7-8 | 5.1 | B1 B2 | Generate Scientific Evidence through Active Investigations (<i>all year</i>) | How is evidence generated and evaluated? How can mathematics and technology be used to gather, analyze, and | Design investigations and use scientific instrumentation to collect, analyze, and evaluate evidence as part of building and revising models and explanations. Gather, evaluate, and represent | Equipment Survey-applications Various Labs Make a boat out of a piece of aluminum foil. Test how many pennies the boat can hold before sinking. Modify your design so it can hold more pennies. Test your | Science Fair/ Experimental Design Project Performance tasks and scoring rubrics listed by grade level and subject http://pals.sri.com/tasks/tasks5-8.html |



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|----------------|----------|----------|--|--|--|--|---|
| Grade | Standard | Strand | | | | | |
| | | | | communicate results? | evidence using scientific tools, technologies, and computational strategies. | design against those made by other students. | |
| 7-8 | 5.1 | B3 B4 | Generate Scientific Evidence through Active Investigations (<i>all year</i>) | How is collected evidence used to construct and defend arguments? How is scientific reasoning used to support scientific conclusions? | Use qualitative and quantitative evidence to develop observation based arguments. Use quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations. | Various Lab Activities & Lab Reports Construct tables and graphs | Science Fair/ Experimental Design Project Performance tasks and scoring rubrics listed by grade level and subject http://pals.sri.com/tasks/tas_ks5-8.html |
| 7-8 | 5.1 | C1 C2 | Reflect on Scientific Knowledge (<i>all year</i>) | How can scientific models and understandings of | Monitor one's own thinking and understandings of scientific concepts. Revise predictions | Pre-tests & post-tests Warm-ups Paired Discussions Closure activities | Science Fair/ Experimental Design Project Performance tasks and scoring rubrics listed by grade level and subject |



Science Grades 7 – 8

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| OBJECTIVE CODE | | | UNIT CONTENT & PACING | UNIT ESSENTIAL QUESTIONS | UNIT ENDURING UNDERSTANDING WHAT STUDENTS SHOULD KNOW AND BE ABLE TO DO | DIFFERENTIATED ACTIVITIES TIER 1, 2, 3 | BENCHMARK ASSESSMENTS |
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| Grade | Standard | Strand | | | | | |
| | | | | fundamental concepts and principles be refined as new evidence is gathered? How are predictions and explanations revised to account more completely for available evidence? | or explanations on the basis of discovery, new evidence, or using models. | Create a timeline outlining the experiments and corresponding conclusions that led to the evolution in our understanding of the structure of the atom. | http://pals.sri.com/tasks/tasks5-8.html |
| 7-8 | 5.1 | C3 | Reflect on Scientific Knowledge <i>(all year)</i> | What is Science? | Generate new and productive questions to evaluate and refine core explanations. | After finishing an experiment come up with a new idea for a follow up experiment. Carry out your experiment and | Science Fair/ Experimental Design Project Performance tasks and scoring rubrics listed by grade level and subject http://pals.sri.com/tasks/tasks5-8.html |



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| | | | | | | report your results to the class KWLS Graphic Organizers Labs | |
| 7-8 | 5.1 | D1 D2 | Participate Productively in Science <i>(all year)</i> | What are the social interactions that should occur in the science classroom? How can students collaborate in a science classroom? | Engage in multiple forms of discussion in order to process, make sense of, and learn from others ideas, observations and experiences. Engage in productive scientific discussion processes during conversations with peers, both face-to-face and virtually, in the context of scientific investigations and model-building. | Paired discussions, group work, debates, role plays, Presentations Participate in an on-line collaborative project CIESE On-Line Collaborative Projects Students work in teams to find a way to save a gummy worm from “drowning.” Save Fred Activity Review another student’s science | Science Fair/ Experimental Design Project Performance tasks and scoring rubrics listed by grade level and subject http://pals.sri.com/tasks/tasks5-8.html |



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| | | | | | | project or lab report. Question the student and give constructive criticism. Use the constructive criticism of your own work to improve it. | |
| 7-8 | 5.1 | D3 D4 | Participate Productively in Science <i>(all year)</i> | What are the instruments of measurement that can be used to safely gather accurate information for making scientific comparisons of objects and events? How can | Demonstrate how to safely use tools, instruments and supplies. Handle and treat organisms humanely, responsibly and ethically. | Lab Activities using tools Online- virtual dissections Care for a living organism: plant, terrarium, aquarium, etc. | Science Fair/ Experimental Design Project Performance tasks and scoring rubrics listed by grade level and subject http://pals.sri.com/tasks/tasks5-8.html |



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| | | | | organisms be treated humanely, responsibly and ethically? | | | |
| 7-8 | 5.2 (Vocabulary) | A1 A2 A3 A4 A5 A6 A7 | Properties of Matter | <p>What are the parts that make up matter?</p> <p>What are all substances made of?</p> <p>How can energy alter the behavior of molecules in the different phases of matter?</p> <p>What do scientists consider</p> | <p>Explain that all matter is made up of atoms, and give examples of common elements. Analyze and explain the implications of the statement, “all substances are composed of elements.”</p> <p>Use the kinetic molecular model to predict how solids, liquids and gases would behave under various</p> | <p>Write a “Wanted” poster for an element describing its properties</p> <p>Use indicators to measure pH, measure pH or acid base combo</p> <p>Separate a mixture using the properties of the substances</p> <p>Organize a periodic table of elements by arranging the elements into groups based on their properties</p> <p>View 5.2 A4</p> | <p>Create Atomic Cookies</p> <p>Separate Mixtures & Explain</p> <p>Building/ drawing molecules</p> <p>Determine the pH for common household liquids</p> <p>http://pals.sri.com/tasks/tasks5-8.html</p> |



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| | | | | <p>when organizing the elements on the periodic table?</p> <p>How do the physical and chemical properties of products in a chemical reaction, differ from the reactants involved?</p> <p>What properties do scientists consider when classifying a substance as a metal or</p> | <p>physical circumstances such as heating and cooling.</p> <p>Predict the physical and chemical properties of elements based on their position on the periodic table.</p> <p>Identify unknown substances based on data regarding their physical and chemical properties.</p> <p>Determine whether a substance is a metal or non metal through student designed investigations.</p> <p>Determine the relative acidity and</p> | <p>Differentiated Activity</p> <p>http://chemcool.com/</p> <p>Rader's Chem4kids</p> <p>ProtonDon</p> <p>Science Education at Jefferson Labs</p> <p>Build Atoms Yourself</p> <p>Interactive Periodic Table</p> | |



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| | | | | non-metal? What indicators can be used to identify an unknown compound as an acid? | relativity of common acids, such as vinegar or cream of tartar, through a variety of student designed investigations | | |
| 7-8 | 5.2 | B1 B2 | Changes in Matter | What is the law of mass conservation ? In a chemical reaction, how and why are the products different than the reactants? | Explain, using an understanding of the concept of chemical changes, why the mass of reactants and the mass of products remain the same. Compare and contrast the physical properties of reactants with products after a chemical reaction such as those that occur during | View 5.2 B Differentiated Activity Balance Chemical Equations using manipulatives Describe a chemical reaction, measure the mass of products and reactants Design an experiment to test if a variable (temp, size, etc.) affects the rate at which an | Make homemade ice cream and explain how it was formed scientifically Potato and hydrogen peroxide explanations Identification of various scenarios as chemical or physical reactions http://pals.sri.com/tasks/tasks5-8.html |



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| | | | | | photosynthesis and cellular respiration. | effervescent tablet dissolves Classic Chembalancer | |
| 7-8 | 5.2 | C1 C2 | Forms of Energy | What is Earth's primary source of energy and what does it provide? What are the ways light and thermal energy travel from place to place? | Structure evidence to explain the relatively high frequency of tornadoes in "Tornado Alley." Model a current technology used to capture solar energy for the purpose of converting it to electrical energy. | Put wax on rods of different at different , melt drops of wax of rods, wax at different distances | Design and build a solar cooker Illustrate energy chains for various activities http://pals.sri.com/tasks/tasks5-8.html |
| 7-8 | 5.2 | D1 D2 | Energy Transfer & Conservation | How is energy transferred from one system to another while the | Relate the kinetic and potential energies of a roller coaster at various points of its path. Describe the flow of energy from the | Test pendulum, determine which variables (length, mass, etc) affect the period of swing Draw and describe an energy chain | Build ,test & explain a functional roller coaster or amusement park ride Draw and describe an energy chain http://pals.sri.com/tasks/tasks5-8.html |



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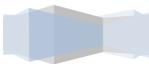
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| | | | | quantity of energy before transfer equals the quantity of energy after the transfer? How do the nuclear reactions from the sun affect the energy flow on Earth? | sun to the fuel tank of an automobile. | (pole vaulter, flashlight, toaster, etc.) Build and test levers using a meter stick and a fulcrum, measure the mechanical advantage EdHeads Compound Machine Amusement Park Physics Simulation – Energy Skate Park Power Play EdHeads Simple Machines | |
| 7-8 | 5.2 | E1 E2 | Forces & Motion | How is the speed of an object calculated and how | Calculate the speed of an object when given distance and time. Compare the | Describe an example of Newton’s Laws in your own life Bowling using | Apply Newton’s Three Laws to real-life situations Read and interpret distance vs. time graphs Tell a story illustrating |



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| | | | | <p>does it affect the motion of an object? What are Newton's Three Laws of Motion?</p> | <p>motion of an object acted on by balanced forces with the motion of an object acted on by unbalanced forces in given specific scenario.</p> | <p>ramp, golf ball Drop different nails down tube into Styrofoam, measure how deep they penetrate Read and interpret distance vs. time graphs Egg drop survive drop Make a boat out of aluminum foil, test how much weight it can hold Build and test paper airplanes Use toy cars, measure time, distance, calculate speed, test varying slopes and cars Exploratorium – Sports Physics</p> | <p>Newton's Three Laws http://pals.sri.com/tasks/tasks5-8.html</p> |



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| | | | | | | EdHeads Crash Scene Investigation | |
| 7-8 | 5.3 (Vocabulary) | A1 A2 | Organization and Development | What are the functions of cells in a multicellular organism? How do cells reproduce? | Compare the benefits and limitations of existing as a single-celled organism and as a multicellular organism. Explain how single-celled organism and multicellular organisms reproduce. | View 5.3 A1/A2 Differentiated Activity Describe the parts and functions of a cell, write an analogy of the cell compared to a city or factory Use a microscope to view and draw prepared slides Create a wet mount slide WWW Virtual Library: Microscopy Image Libraries Molecular Expressions Virtual Microscopy Discovery | Edible Cell/ Clay models Performance assessment to act out the cell parts & functions Flip books/ Comic strips for Mitosis Using virtual images identify the parts of cells http://pals.sri.com/tasks/tas_ks5-8.html |



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| | | | | | | Education Virtual Electron Microscope Beyond Books Cell: Down to Basics Cells Alive Website Online Onion Root Tip Mitosis Lab | |
| 7-8 | 5.3 | B1 B2 | Matter & Energy Transformations | Where do cells get food to function? How do animals, including humans meet their energy needs? | Relate the energy and nutritional needs of organisms in a variety of life stages and situations, including stages of development and periods of maintenance. Analyze the components of a consumer's diet and trace them | View 5.3 B Differentiated Activity Measure the calories in food (marshmallow, cereal, etc.) by burning the food, heating water, and calculating the calories of energy released | Verbally use the vocabulary to explain processes Construct and use the calorimeter http://pals.sri.com/tasks/tasks5-8.html |



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| | | | | | back to plants and plant products. | | |
| 7-8 | 5.3 | C1 | Interdependence | How can a change on one species impact the rest of the ecosystem? | Model the effect of positive and negative changes in population size on symbiotic pairing such as: producer/consumer, predator/prey, parasite/host, scavenger prey, decomposer/prey. | Use a simulation or role play to demonstrate how limiting factors (food, shelter, etc) and interactions (predator/prey) affect an ecosystem Investigate how camouflage can help a species by coloring paper butterflies, hiding them around the room, and testing which can be found. Write a report about white tailed deer overpopulation in New Jersey. Describe what | Create a graphic organizer to demonstrate the interrelationships of species/ impact of removing a species Horseshoe Crab and shorebird projects Introduced vs. Indigenous Species reports http://pals.sri.com/tasks/tasks5-8.html |



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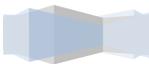
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| | | | | | | caused the problem, the consequences, and suggest a solution. Complete a research project on invasive species National Invasive Species Information Center Nowhere to Hide Camouflage Simulation | |
| 7-8 | 5.3 | D1 D2 D3 | Heredity and Reproduction | What evidence do you have that proves genetic traits are inherited from your parents? a) How can the recombining | Defend the principle that, through reproduction, genetic traits are passed from one generation to the next, using evidence collected from observations of inherited traits. | Use coin flips to determine the inherited traits of a simulated organism Draw Punnett squares showing the possible outcomes of a cross Build a model of DNA 23 and Me Genetics | Analyze Karyotype Mr. Potato head projects Analyze personal phenotypes vs. genotypes Dragon Genetics http://pals.sri.com/tasks/tasks5-8.html |



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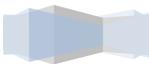
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| | | | | <p>of parental genes result in variation of traits among offspring?</p> <p>b) How is it possible for siblings from the same parents to have different genetic traits? What factors can influence an organism's characteristics?</p> | <p>Explain the source of variation among siblings. Describe the environmental conditions or factors that may lead to a change in a cell's genetic information or to an organism's development, and how these changes are passed on.</p> | <p>Testing for Health Nova Online Create a DNA Fingerprint Virtual Fruit Fly Genetics Lab</p> | |
| 7-8 | 5.3 | E1 E2 | Evolution & Diversity | a) What factors play a role in a | Organize and present evidence to show how the | Research an endangered species IUCN Red List of | Adaptations vs. Mutations Activities (ie. Forks, Starburst |



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| | | | | species chance of survival? b) How can an environmental change lead to changes in characteristics amongst a species of organisms? What anatomical evidence supports the theory evolution? | extinction of a species is related to an inability to adapt to changing environmental conditions using quantitative and qualitative data. Compare the anatomical structures of a species with fossil records to derive a line of descent. | Threatened Species PBS Evolution in Action Simulation Interactive Tree of Life Bio-Alive | Survivor, bird beaks) Behavioral or structural adaptations- identifications Create their own animal with special adaptations for an environment http://pals.sri.com/tasks/tasks5-8.html |
| 7-8 | 5.4 (Vocabulary) | A1 A2 A3 A4 | Objects in the Universe | How do the relative position of sun, Earth and moon | Analyze moon phases, eclipses and tidal data to construct models that explain how | View 5.4 A1 Differentiated Activity Create a Moon phase calendar | Using moon data & tide data, predict the moon & tide calendar for the next month Tide Hoola Hoop Activity |



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| | | | | <p>result in natural phenomena such as moon phases, eclipses and tides? What is responsible for the number of daylight hours and changing temperatures on Earth's surface? What two factors contribute to the amount of gravitational</p> | <p>the relative positions and motions of the sun, Earth and moon cause these three phenomena. Use evidence of global variations in day length, temperature, and the amount of solar radiation striking Earth's surface to create models that explain this phenomenon and seasons. Predict how gravitational forces between two bodies would differ for bodies of different masses or bodies that are</p> | <p>Create a tide chart showing the high and low tide levels for a month, and the moon phase Make a sun dial, draw and measure the shadow at different times during the day Model the motion of the sun, earth, and moon using a flashlight and some volunteers Make a scale model of the solar system that accurately models both the sizes and distances of the planets Astronomy Picture of the Day Space Mysteries</p> | <p>& Identifications Determine the differences in their mass and weight on different planets Scale models of the solar system http://pals.sri.com/tasks/tas_ks5-8.html</p> |



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| | | | | pull one object exerts on another? How does the predictable motion of objects such as comets, planets and moons allow scientists to predict their position in the solar system? | different distances apart. Analyze data regarding the motion of comets, planets and moons to find general patterns of orbital motion. | | |
| 7-8 | 5.4 | B1 B2 | History of Earth | How has life on Earth changed over time? How do fossils show the evidence of how life | Correlate the evolution of organisms and the environmental conditions on Earth as they changed throughout geologic time. | Create a timeline of important geologic events on a long strip of adding machine paper | Identify characteristics of general time period Chronologically place important developments of geologic time http://pals.sri.com/tasks/tasks5-8.html |



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| | | | | and environmental conditions have changed? | Evaluate the appropriateness of increasing the human population in a region based on catastrophic events. | | |
| 7-8 | 5.4 | C1 C2 | Properties of Earth Materials | What is the composition of soil and how does it change through each layer? What are the physical and chemical changes that take place on Earth's materials through weathering and erosion? | Determine the chemical properties of soil. Explain how the chemical and physical mechanisms are responsible for creating a variety of landforms. | Compare topsoil and subsoil, measure their composition Make a model river Model wave erosion Identify the properties of rocks and minerals (hardness, density, etc.) | What is the problem in the garden? Activity Stations & identifications for the types of weathering http://pals.sri.com/tasks/tasks5-8.html |



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| 7-8 | 5.4 | C3 | Properties of Earth's Materials | What is the content of Earth's atmosphere at different levels? | Model the vertical structure of the atmosphere using information from active and passive remote-sensing (e.g., satellites, balloons, and/or ground-based sensors) in the analysis. | Identify the levels of Earth's Atmosphere and provide a characteristic for each layer | Match the layers of the atmosphere with characteristics |
| 7-8 | 5.4 | D1 D2 | Tectonics | What are the Earth's layers? What are the major geological events that result from the motion of the plates? | Model the interactions between the layers of Earth. Present evidence to support the arguments for the theory of plate motion. | Compare the structure of the Earth to a model (egg, apple, etc.) Build and test a structure that can withstand an earthquake Triangulate an earthquake epicenter using the arrival times of seismic waves | Diagram or construct the layers of Earth Assess a model to determine if it is realistic with the Earth's model Spaghetti Earthquake web quest http://pals.sri.com/tasks/tasks5-8.html |



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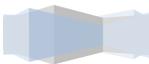
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| | | | | | | Model seismic waves with a slinky Use clay to model geologic forces and faults IRIS Seismic Monitor National Geographic Forces of Nature | |
| 7-8 | 5.4 | D3 | Tectonics | How can scientists use Earth's magnetic fields for navigation? | Explain why geomagnetic north and geographic north are at different locations. | Construct a model of the sea floor and the geomagnetic north and south | Model and explain magnetic reversals |
| 7-8 | 5.4 | E1 | Energy in Earth Systems | How is the sun's energy responsible for: plant growth, ocean currents, wind | Explain how energy from the sun is transformed and transferred in global wind circulation, and the water cycle. | Model ocean temperature and density currents using water and food coloring Demonstrate the water cycle | Interpretation of the water cycle Use appropriate vocabulary |



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| | | | | circulation, and the water cycle? | | | |
| 7-8 | 5.4 | F1 F2 F3 | Climate & Weather | How do patterns of movement in the atmosphere influence our local weather? What role do oceans and landmasses have on local and global climate? How does the water cycle influence weather and climate? | Determine the origin of local weather by exploring national and international maps. Explain the mechanisms that cause varying daily temperature ranges in a coastal community and in a community located in the interior of the country. Create a model of the hydrologic cycle that focuses on the transfer of water in and out of | Track a hurricane Research and present a weekly weather forecast, test its accuracy Smog City 2 Interactive Weather Maker Edheads Weather National Geographic Forces of Nature | Model heating of land vs. water and explain results Locate global winds Weather map and predictions http://pals.sri.com/tasks/tasks5-8.html |



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| | | | | | the atmosphere. Apply the model to different climates throughout the world. | | |
| 7-8 | 5.4 | G1 G2 | Biochemical Cycles | How does the energy in Earth's oceans affect global climate systems? a) What positive and negative effects can humans have on their immediate environment? b) What is the scientific cause and | Represent and explain, using sea surface temperature and maps, how ocean currents impact the climate of coastal communities. Investigate a local or global environmental issue by defining the problem, researching possible causative factors, understanding the underlying science, and evaluating the | Make a colored map of ocean temperatures around the world, determine their effects on global climate Measure the temperature changes of water and soil as they are heated and cooled. Investigate local environmental issues. Discuss with a guest speaker from the local, county, or state level. For example: | Identify and address an environmental concern Community Clean-ups http://pals.sri.com/tasks/tasks5-8.html |



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| Grade | Standard | Strand | | | | | |
| | | | | effect of an environmental issue in your community? c) What is the scientific cause and effect of a global environmental issue? | benefits and risks of alternative solutions. | Watershed Ambassadors, local environmental commission, Steve Serwatka New Jersey Nature, Americorps, etc. Write a report about a controversial environmental issue, make the case for both sides, then give your own opinion. | |

