

SCIENCE K-12 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/lessons_topics.php#three	
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.	Identifying controls and variables with Sponge Bob http://sciencespot.net/Media/2009K8Update_SciMethod.pdf 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 IDEA #2 Paper Airplane Science (FUN) Students create questions and form hypotheses then set up and conduct experiments recording data , graphing	

					<p>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>	
		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>	
		B.3			<p>SUGGESTION: Use the experiments above (5.1.B.2) to make a claim based on available qualitative and quantitative evidence</p>	
		B.4			<p>Exploring Baby Weight-math link(advanced) http://www.ipfw.edu/math/lamaster/baby2/babyweqn.htm</p> <p>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</p>	

						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/ https://edunology.wikispaces.com/Interactive_Whiteboards msteacher.org/return_list_science.aspx?id=1365	Teacher Observation, questioning techniques, interactive/hands on 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/ exchange.smarttech.com/search.html?q=analyze+primary	Teacher Observation, questioning techniques, interactive/hands on activities, worksheets' science log.
		C.3				edHelper.com cnx.org exchange.smarttech.com/search.html?q=analyze+primary	Teacher Observation, questioning techniques, 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	
		D.4				Handli usng and treating organisms responsibly http://webcache.googleusercontent.com/search?q=cac he:TMDXXZlxSIQJ:www.nsta.org/pdfs/NCATE-IdeasForSafetyInTheScienceClassroom.doc+Grade+6+science+lessons+%26+use+and+handle+of+organisms+responsibly+and+ethically&cd=1&hl=en&ct=clnk&gl=	
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	Water Displacement activity (1) http://www.fordhamprep.org/gcurran/sho/sho/skills/h2odisskill.htm	

					using water displacement methods.		
		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 (1) http://www.chymist.com/properties.pdf 1. 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 interaction of materials in a closed system?	Compare the properties of reactants with the properties of the products when two or more substances are combined and react chemically.	Comparing physical and chemical changes (1) http://www.eduref.org/cgi-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/SST/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 (1) http://stargazers.gsfc.nasa.gov/pdf/activities/in_a_different_light/lesson2_teacher.pdf (1) http://www.ehow.com/how_6703195_use-prism-middle-school-labs.html (1)	
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 (1+) http://mynasadata.larc.nasa.gov/preview_lesson.php?&passid=50 http://www.bbc.co.uk/weather/features/understanding/hurricane_cycle.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.	<p>See New Jersey Core Curriculum Content Standards, Classroom Applications Document- Science, Physical Science (by the end of grade 6) pgs. 15 &16.</p> http://www.bbc.co.uk/schools/ks2bitesize/science/physical_processes/changing_circuits/play.shtml (1) www.mysciencesite.com/Series_and_Parallel_Circuits_Experiment.doc http://www.tryengineering.org/lessons/serpar.pdf (1)	
5-6	5.2	E.1	Forces and Motion	How can energy be transferred from one material to another?	Changes take place because of the transfer of energy. Model and explain how the	http://dawn.jpl.nasa.gov/DawnClassrooms/2_ion_prop/development/1_tg_development.pdf http://scithon.terc.edu/marbleroll/index.cfm	

				<p>What happens to a material when energy is transferred to it?</p>	<p>description of an object's motion from one observer's view may be different from a different observer's view.</p>	<p>http://www.learner.org/interactives/parkphysics/coaster/</p>	
5-6	5.2	E.2	Forces and Motion	<p>How can energy be transferred from one material to another?</p> <p>What happens to a material when energy is transferred to it?</p>	<p>Energy is transferred to matter through the action of forces.</p> <p>Magnetic, electrical, and gravitational forces can act at a distance.</p>	<p>http://school.discoveryeducation.com/lessonplans/programs/understanding-magnetism/</p> <p>http://www.brainpop.com/technology/energytechnology/electromagnets/preview.weml</p> <p>http://school.discoveryeducation.com/curriculumcenter/magnetism/projectideas.htm</p> <p>http://www.lessonplanet.com/search-a?keywords=activities+on+magnets&media=lesson&rating=4 ****Smartboard activity)</p> <p>http://web.archive.org/web/20040619023533/www.galaxy.net/~k12/electric/poles.shtml</p>	
5-6	5.2	E.3	Forces and Motion	<p>How can energy be transferred from one material to another?</p> <p>What happens to a material when energy is transferred to it?</p>	<p>Changes take place because of the transfer of energy</p> <p>Energy is transferred to matter through the action of forces.</p> <p>Demonstrate and explain the frictional force acting on an object with the use of a physical model.</p>	<p>Friction in our lives: Offers objectives , materials, procedures, adaptations, discussion questions, evaluations, and extensions</p> <p>http://school.discoveryeducation.com/lessonplans/programs/frictioninourlives/</p> <p>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</p> <p>http://library.thinkquest.org/CR0215468/force_and_motion.htm</p> <p>Friction and Force: When Rubber meets the Road: This site offers a review of basic terminology- requires teacher to study information ahead of</p>	

						<p>time and to possibly create own models for explanation; allow advanced 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</p> <p>http://www.learner.org/workshops/force/workshop3/</p>	
5-6	5.2	E.4	Forces and Motion	<p>How can energy be transferred from one material to another?</p> <p>What happens to a material when energy is transferred to it?</p>	<p>Different forces are responsible for the transfer of the different forms of energy.</p> <p>Sinking and floating can be predicted using forces that depend on the relative densities of objects and materials.</p>	<p>STC: Sinking and Floating science Kit http://www.nsrconline.org/curriculum_resources/Flo_overview.html</p> <p>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=curriculum!lessons</p> <p>Resource: Floating and Sinking: Hot Air Balloons http://www.teachersdomain.org/resource/phy03.sci.phys.matter.balloon/</p> <p><u>Can't Stand the Pressure-</u> 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?	<p>Living organisms have a variety of observable features that enable them to obtain food and reproduce.</p> <p>Model the interdependence of the human body's major systems in regulating its internal environment.</p>	<p>http://www.teachersdomain.org/resource/lsp07.sci.life.stru.bodysystems/</p> <p>http://www.teachersdomain.org/resource/tdc02.sci.life.reg.bodycontrol/</p> <p>http://library.thinkquest.org/J001614F/</p> <p>http://www.emints.org/ethemes/resources/S00001013.shtml</p>
5-6	5.3	A.2	Organization and Development	What do all living things have in common?	<p>Living organisms have a variety of observable features that enable them to obtain food and reproduce.</p> <p>Essential functions of plant and animal cells are carried out by organelles.</p>	<p>http://www.teachersdomain.org/resource/tdc02.sci.life.cell.animplant/</p> <p>http://www.sciencenetlinks.com/lessons.php?BenchmarkID=11&DocID=101</p>
5-6	5.3	B.1	Matter and Energy Transformation	How is matter transformed, and energy transferred/transformed in living systems?	<p>All organisms transfer matter and convert energy from one form to another.</p> <p>Describe the sources of the reactants of photosynthesis and trace the pathway to the products.</p>	<p>This lesson covers the process of photosynthesis and the related plant cell functions of transpiration and cellular respiration.</p> <p>http://www.teachengineering.org/view_lesson.php?url=http://www.teachengineering.org/collectio/cub_/lessons/cub_lifescience/cub_lifescience_lesson01.xml</p> <p>The lesson focuses on sequencing the process of photosynthesis.</p> <p>http://www.common sensepress.com/GSA-sample_lesson/lesson_plants.htm#</p>

5-6	5.3	B.2	Matter and Energy Transformation	How is matter transformed, and energy transferred/transformed in living systems?	<p>All organisms transfer matter and convert energy from one form to another.</p> <p>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.</p>	<p>Basic flow charts describing energy through our lives. http://www.uwsp.edu/cnr/wcee/keep/Mod1/Flow/foodchains.htm</p> <p>Games consisting of different food chains. http://www.harcourtschool.com/activity/food/food_menu.html</p> <p>A site including vocabulary worksheets and cloze exercises on food chains and food webs. http://bogglesworldesl.com/foodweb_worksheets.htm</p>	
5-6	5.3	C.1	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>Various human activities have changed the capacity of the environment to support some life forms.</p>	<p>Explain impact of meeting human needs and wants on local and global environments</p> <p>ACTIVITIES: Define biotic and abiotic Smart Board Activity with teacher lessons on biotic and abiotic factors http://exchange.smarttech.com/search.html?q=biotic http://environment.nationalgeographic.com/environment/global-warming/gw-overview-</p>	

				<p>Explain the impact of meeting human needs and wants on local and global environments.</p>	<p>interactive.html</p> <p>Define and understand: Populations: (introduce food chain, food web, review decomposer, carnivore, omnivore, herbivore, consumer, producer) <u>Smart board quiz</u> 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 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-warming/gw-overview-</p>	
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						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>	

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 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 every species.</p> <p>Predict the long-term effect of interference with normal patterns of reproduction.</p>	<p>http://www.uen.org/themepark/cycles/animal.shtml</p> <p>http://www.emints.org/ethemes/resources/S00000759.shtml</p>	

5-6	5.3	D.2	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>Variations exist among organisms of the same generation (e.g. siblings) and of different generations (e.g., parent to offspring)</p> <p>Explain how knowledge of inherited variations within and between generations is applied to farming and animal breeding.</p>	<p>http://www.pbs.org/wnet/nature/lessons/the-loneliest-animals/lesson-overview/4905/</p> <p>http://www.schools.utah.gov/curr/science/sciber00/7th/genetics/sciber/punnett.htm</p>	
5-6	5.3	D.3	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>Traits such as eye color in human beings or fruit/flower color in plants are inherited.</p> <p>Distinguish between inherited and acquired traits/characteristics.</p>	<p>http://seilhanv.wonecks.net/2010/01/28/6th-grade-lesson-plans-heredity-chapter-14/</p> <p>http://mistupid.com/science/heredity.htm</p> <p>Compare and contrast family members from past/present generations using genetic traits such as hair color, eye color, height.</p>	
	5.3	E.1	Evolution	In what ways	Sometimes	In this lesson, students are asked to consider why	

5-6			and Diversity	are organisms of the same kind different from each other? How does this help them reproduce and survive?	<p>differences between organisms of the same kind give advantages in surviving and reproducing in different environments.</p> <p>Changes in environmental conditions can affect the survival of individual organisms and entire species.</p> <p>Describe the impact on the survival of species during specific times in geologic history when environmental conditions changed.</p>	<p>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.</p> <p>http://www.teachengineering.org/view_lesson.php?url=http://www.teachengineering.org/collectio/cub_/lessons/cub_lifescience/cub_lifescience_lesson02.xml</p> <p>This site can be used for both 5th and 6th grade evolution and diversity.</p> <p>http://classroom.jc-schools.net/sci-units/bio.htm</p>	
5-6	5.4	A.1	Objects in the Universe	<p>What predictable, observable patterns occur as a result of the interaction between the Earth, Moon, and Sun? What causes these patterns?</p>	<p>Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun.</p> <p>The height of the path of the Sun in the sky and the length of a shadow change over the course of a year.</p> <p>Generate and analyze evidence (through simulations) that the Sun's apparent motion across the sky</p>	<p>http://www.classzone.com/books/earth_science/terc/content/visualizations/es0408/es0408page01.cfm?chapter_no=04</p> <p>http://www.wsanford.com/~wsanford/exo/sundials/shadows.html</p> <p>http://www.efn.org/~jack_v/AstronomicalCalendar.html#Activity%202</p>	

					changes over the course of a year.		
5-6	5.4	A.2	Objects in the Universe	<p>What predictable, observable patterns occur as a result of the interaction between the Earth, Moon, and Sun? What causes these patterns?</p>	<p>Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun.</p> <p>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 and years.</p> <p>Construct and evaluate models demonstrating the rotation of Earth on its axis and the orbit of Earth around the Sun.</p>	<p>http://www.bbc.co.uk/science/space/solarsystem/earth/solsticescience.shtml</p> <p>http://www.enchantedlearning.com/subjects/astronomy/planets/earth/Seasons.shtml</p> <p>http://www.kidseclipse.com/pages/a1b3c0d0.htm</p>	
5-6	5.4	A.3	Objects in the Universe	<p>What predictable, observable patterns occur as a result of the interaction between the Earth, Moon, and Sun? What causes these patterns?</p>	<p>Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun.</p> <p>The Sun's gravity holds planets and other objects in the solar system in orbit, and planets' gravity holds moons in orbit.</p>	<p>http://www.sciencenetlinks.com/lessons.php?BenchmarkID=4&DocID=405</p> <p>http://science.howstuffworks.com/environmental/earth/geophysics/question232.htm</p> <p>http://www.brainpop.com/science/motionsforcesandtime/gravity/preview.weml</p>	

					Predict what would happen to an orbiting object if gravity were increased, decreased, or taken away.		
5-6	5.4	A.4	Objects in the Universe	<p>What predictable, observable patterns occur as a result of the interaction between the Earth, Moon, and Sun? What causes these patterns?</p>	<p>Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun.</p> <p>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.</p> <p>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>http://www.sciencenetlinks.com/lessons.php?BenchmarkID=12&DocID=33</p> <p>http://school.discoveryeducation.com/lessonplans/programs/classroomplanetarium/</p> <p>spaceunit.wikispaces.com/file/view/planet+distances+activity.doc</p>	
5-6	5.4	B.1	History of Earth	How do geologic events occurring today provide insight Earth's past?	Earth's components form systems? These systems continually interact at different rates of time, affecting the shape of the Earth's surface regionally and	<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</p> <p>http://www.windows2universe.org/teacher_resources/teach_strata.html</p>	

					<p>globally.</p> <p>Successive layers of sedimentary rock and the fossils contained in them tell the factual story of the 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>Quiz on sedimentary rock: use as pre-assessment tool http://www.lnhs.org/hayhurst/geology/ch06/Chapter_6_StudyGuide.pdf Become a Rock Expert: examine metamorphic, igneous and sedimentary rocks- allows students to see samples and how each type of rock is formed http://www.fi.edu/fellows/fellow1/oct98/expert/index.html This site links with the one above and gives students a chance to explore rocks in different ways –also includes an identity quiz http://www.fi.edu/fellows/fellow1/oct98/index2.html The Layered Earth : interactive demo http://www.thelayeredearth.com/Demo.html</p>	
5-6	5.4	B.2	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.</p> <p>Fossils provide evidence of how life and environmental conditions have changed. The principle</p>	<p>Use time frame to realize that mountains, Grand Canyon, Three Gorges, etc were created in time not in human life time The geology of the Grand Canyon http://www.bobspixels.com/kaibab.org/geology/gc_geol.htm</p>	

					<p>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>		
5-6	5.4	B.3	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.</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</p>	<p>Weathering and erosion http://geologyonline.museum.state.il.us/tools/lessons/6.3/lesson.pdf</p> <p>"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/LessonPlanswithVideo/lp/erosion.htm</p> <p>Unit on Erosion (5 lessons including wind, water and ice directed for Gr.4-6 investigation http://www.lessonplanspage.com/ScienceSSMDU/nitOnErosion46.htm</p>	

					landforms were created by processes of erosion (e.g., wind, water, and/or ice based on evidence in pictures, video, and/or maps.		
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 important role in the formatin of soil, but too much erosion can wash away fertile soil from ecosystems, including farms.</p> <p>Describe methods people use to reduce soil erosion.</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</p> <p>Fighting Soil Erosion: Two sessions –one beginner the second intermediate including a slide show on Guinea and investigations on preventing soil erosion http://www.peacecorps.gov/wws/educators/lessonplans/lesson.cfm?lpid=1421</p>	
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.”</p> <p>http://www2.ngdc.wvu.edu/~hferguson/education/education2/lesson_pln/crayon/crayon.htm</p> <p>Activity to compare different types of soil</p>	

						http://www.newhavenscience.org/NewCTStateScience/cmtgr6taskstudent.htm Examine and compare four different types of soil from four different areas. http://www.utdanacenter.org/sciencetoolkit/downloads/activities/4_properties_soil.pdf	
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?		Explore properties of rocks http://www.teachervision.fen.com/tv/printables/cottforesman/sci_3_ARS_C2_exp1.pdf Properties of sedimentary and metamorphic rocks http://www.uwsp.edu/geo/faculty/ritter/geog101/uwsp_lectures/lecture_sedimentary_and_metamorphic_rocks.html Identification of Igneous rocks http://geology.csupomona.edu/alert/igneous/igneousid.htm	
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 geologic events on the surface?		<p>Investigate how mountains are formed</p> <p>http://www.teachengineering.org/view_lesson.php?url=http://www.teachengineering.org/collectio/cub/_lessons/cub_rock/cub_rock_lesson04.xml</p> <p>http://www.dlese.org/library/query.do?q=ring%20of%20fire&s=0</p>	
5-6	5.4	D.2	Tectonics	To what extent does the exchange of energy within the Earth drive geologic events on the surface?		<p>Plate tectonic lessons</p> <p>http://www.teachersdomain.org/resource/ess05.sci.ess.earthsys.lp_platetectonics/</p> <p>http://school.discoveryeducation.com/lessonplans/programs/understanding-magnetism/</p> <p>http://www.brainpop.com/technology/energytechnology/electromagnets/preview.weml</p>	
5-6	5.4	D.3	Tectonics	To what extent does the exchange of energy within the Earth drive geologic events on the surface?		<p>http://school.discoveryeducation.com/curriculumcenter/magnetism/projectideas.htm</p> <p>http://www.lessonplanet.com/search-a?keywords=activities+on+magnets&media=lesson&rating=4 ****Smartboard activity)</p>	

						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	<p>Demonstration: UTube video on convection currents using red and blue food dye http://www.youtube.com/watch?v=7xWWowXtuvA</p> <p>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</p> <p>Gulf Stream: StarLab- here is an example of the cylinder: Stella Danks at Cape May County Building has the whole lab, cylinder and binder lessons to coincide with this picture http://www.starlab.com/starlab_cylinders.html#ocean</p>	
5-6	5.4	F.1	Weather	How do		Roles an engineer can play in the area of weather	

			and Climate	changes in one part of an Earth system affect other parts of the system?		<p>detection: http://www.teachengineering.org/view_activity.php?url=http://www.teachengineering.org/collecton/wpi/_activities/wpi_design_weather_instruments/design_weather_instruments.xml</p> <p>http://education.arm.gov/teacherslounge/lessons/comparingdata.pdf</p>	
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?		<p>Climatographs http://www.nationalgeographic.com/xpeditions/lessons/15/g912/pgafrika4.html</p>	
5-6	5.4	F.3	Weather and Climate	How do changes in one part of an Earth system affect other parts of the		<p>Learn about weather systems http://school.discoveryeducation.com/lessonplans/programs/planetaryweather/</p>	

				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 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>	
5-6	5.4	G.2	Biogeochemical Cycles	How do changes in one part of	Create a Model of ecosystems in two different locations,	Ecosystems: This site explores all ecosystems including abiotic features to allow students to compare and contrast 2 or more ecosystems	

				<p>the Earth system affect other parts of the system and in what ways can Earth processes be explained as interactions among spheres?</p>	<p>AND compare and contrast the living and nonliving components</p>	<p>with each other http://library.thinkquest.org/11353/ecosystems.htm 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	<p>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?</p>	<p>Describe how humans can improve the health of ecosystems around the world</p>	<p>The Environment : Focus on Saskatchewan but lessons can be tweaked for own area http://www.sasked.gov.sk.ca/docs/midlsci/gr9uamsc.html Human Activity and Climate 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_20t.htm 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.technologiselementary.com/userfiles/file/5th%20grade%20water%20ecosystem%20project.pdf</p>	

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