OFFICE OF CURRICULUM, INSTRUCTION, & PROFESSIONAL DEVELOPMENT

MIDDLE SCHOOL COURSE OUTLINE

(Revised September 2011)

Department	Science	**Course Code**	4103
Course Title	Science 6 SDAIE / Primary Language Support		
Abbreviation	Sci 6 SDA PLS	**Grade Level**	6
Course Length	1 year	**Co-requisites**	ELD English 0, 1, or 2
Teacher Certification	BCLAD / BCC or CLAD / LDS / AB1969 plus bilingual aide		

COURSE DESCRIPTION:

Sixth grade SDAIE science with primary language support is designed specifically for the needs of English Language Learners (ELLs) who are at the Beginning, Early Intermediate, and Intermediate levels of listening, speaking, reading, and writing proficiency in English. Students in this course cover the essential content and utilize the same basic textbook as their Fluent English Speaker counterparts supplemented with content-parallel English materials at a simplified reading level. Additionally, primary language materials will be provided, when available, to facilitate the preview and review of essential content. The course delivery varies in pacing, instructional methodology, and supplemental materials. It is designed to provide depth versus breadth of the content standards, and provide more comprehensible input, primary language support, and literacy development in the content area.

Sixth grade science is an integrated standards and laboratory based program. Students will spend approximately forty percent (40%) or more of their class time on hands-on activities. Introductory principles of earth, life, and physical sciences will be explored incorporating constructivist methods of teaching. Science activities will be based on benchmark requirements and will utilize the skills and techniques outlined in the Investigation and Experimentation Strand of the Content Standards.

GOALS: (Student needs this course is intended to meet)

- Students will learn all of the California State Standards for 6th Grade Science, which emphasize Earth sciences. The use of well-designed, memorable experiences and the application of scientific knowledge and methodology are essential in helping students achieve appropriate comprehension of the content.
- Students will improve their ability to learn independently by drawing generalizations from science related articles, books, graphs, charts, and diagrams. Regular opportunities are provided for students to clearly communicate their understanding through oral and written explanations of science concepts.
- Students will study the applications of science in everyday life to inspire them to consider pursuing advanced studies in science and explore the wide variety of related career choices available.

Academic Literacy in SDAIE Classes for ELLs at Levels 0, 1, and 2:

The ELD Standards of reading, writing, listening and speaking describe the linguistic pathway that ELLs take to achieve academic literacy in English. SDAIE science classes play an important role in developing and strengthening students' progress towards this goal. Students should be encouraged to expand their English skills, even though grammatical and vocabulary approximations will occur during this process.

When science content and materials have been made comprehensible through instruction in the SDAIE class, ELLs at each level will progress through the following phases of developing academic literacy in English. The students' degrees of literacy in their primary language will significantly affect the pace that students move through these levels.

ELD Level 0

Upon entering ELD Level 0, students have little or no academic English proficiency and have **little or no literacy skills in their first language**. ELLs progressing through this level will:

- participate in modified group/class projects, discussions and oral presentations with non-verbal responses (e.g., gestures, drawings, graphic organizers) and/or single words or phrases with assistance (e.g., word walls, language structure walls)
- begin to participate orally in some content area reading strategies (especially pre-reading, KWL, and anticipation guides presented orally), with single words or phrases to analyze concepts from explicitly taught texts and other course reading materials
- respond to Curriculum Embedded Assessment prompts (read to them and clarified for them) nonverbally (e.g., graphic organizers with drawings) and/or orally with single words or phrases
- begin to use the English alphabet to write in teacher-guided learning logs, selected homework and interactive notebooks, and to organize and record information on pictures, lists, charts and tables using single words or phrases
- understand the need for using modified test-taking strategies (using taught vocabulary) on the required district/state assessments, such as, End of Course Exams (with alternate presentation and response), CST and CAT-6.

ELD Level 1

Upon entering ELD Level 1, students have little or no academic English proficiency and varying levels of academic literacy skills and concepts in their first language. ELLs progressing through this level will:

- participate in group/class projects, discussions and presentations with non-verbal responses (e.g., gestures, drawings, graphic organizers, role-playing) and/or single words, phrases and simple sentences with assistance (e.g., using the academic participation cards)
- participate orally in some content area reading strategies (especially pre-reading, KWL, academic participation cards, anticipation guides) with single words, phrases and/or simple sentences to analyze concepts from taught texts and other course reading materials
- respond to Curriculum Embedded Assessment prompts (read to them and clarified for them) nonverbally (e.g., graphic organizers with drawings) and/or orally with single words, phrases and simple sentences in an outline format
- use writing in a variety of ways such as, but not limited to, guided class note-taking, learning logs, interactive notebooks, representing information on pictures, lists, charts and tables using single words, phrases or simple sentences, and completing student handouts, selected homework, and modified class projects
- understand the need for using test-taking strategies (using taught vocabulary) on the required district/state assessments, such as, End of Course Exams (with alternate presentation and response), CST and CAT-6.

ELD Level 2

Upon entering ELD Level 2, students have some academic English proficiency about topics that have been explicitly taught to them. ELLs progressing through this level will:

- participate in group/class projects, discussions and presentations with simple sentences and many attempts at more complex sentences
- use content area reading strategies (especially pre-reading, KWL, academic participation cards, anticipation guides, Reciprocal Teaching and Question/Answer Relationships) to analyze concepts from taught texts and other course reading materials
- respond to Curriculum Embedded Assessment prompts (read to them and clarified for them) orally and with simple and some complex sentence structures in at least three paragraphs
- use writing in a variety of ways such as, but not limited to, class note-taking, learning logs, interactive notebooks, response logs, and completing student handouts, homework, and class projects
- understand the need for using test-taking strategies (using taught vocabulary) on the required district/state assessments, such as, End of Course Exams (with alternate presentation and response), CST and CAT-6.

CONTEXT: CONTENT SCOPE AND SEQUENCE

6th

Physical Sciences

Density (Qualitative) -------- (CA 8)
Energy
Temperature vs. Heat
Heat Transfer

Earth Sciences

Earth's Layers
Plate Tectonics
Mountain Building
Earthquakes, Faults, and Epicenters
Volcanoes
California Geology
Mechanical & Chemical Weathering
Minerals ---------- (LB)
Rock Cycle (Igneous, Metamorphic, and Sedimentary Rocks) ---------- (LB)
Sun's Effect on Weather
Convections
Solar Energy
Atmospheric Conditions
Natural Resources
Stratigraphy: Fossil Locations Rock (CA 7)
Geol. Timeline of Earth's History -----(CA 7)
Formation of Fossils ----------(CA 7)
Methods of Dating Earth's History ---(CA 7)

Life Sciences

Food Chains / Food Webs
Ecosystems
Human Impacts on Ecosystems --------- (LB)

Six Designated Lessons from Project ALERT Health Curriculum

7th

Life Sciences

Cell Similarities & Differentiation
Function of Cell Structures
Energy at the Cellular Level
Photosynthesis / Respiration
Mitosis
Genetics
DNA → RNA → Protein ---------- (LB)
Sexual / Asexual Reproduction
Meiosis ---------- (LB)
DNA, Genes, & Alleles
Dominant & Recessive Traits
Theory of Evolution
Natural Selection
Body Systems
Taxonomic Keys ---------- (LB)
Kingdoms & Major Phyla ---------- (LB)

8th

Physical Sciences

Observing and Defining Motion
Forces and their Effects
Gravity's Larges Scale Effects
Basic Atomic Theory
Periodic Table as a Tool
Metals, Non-metals, Inert Gases
Electrons beyond the Bohr Model
Ions and Isotopes
Physical & Chemical Properties
Element vs. Compound Properties
Chemical Bonding
Atoms and Ions Forming Solids
Phases and Molecular Motion
Chemical Formulas
Chemical Equations & Conservation of Matter
Exothermic vs. Endothermic
Acids, Bases, and pH
Density & Buoyancy
Sound and Light Energy ------ (CA 7)

Earth Sciences

Galaxies and Stars
Life Cycles of Stars (Nebular Theory, Novas, etc.)
Distances in Astronomy
Light Sources and Reflectors in the Universe
Cosmology (Universe Origin) -------- (LB)
Solar System

Life Sciences

Simple Machines and the Human Body ----------(CA 7)
Blood Pressure and Heart Valves---(CA 7)
Organic Chem. / Biochem.

Three Designated Lessons from Project ALERT Health Curriculum

Notes regarding non-aligned content:

(LB) => Long Beach specific content; not found in CA Science Content Standards

(CA 7) => 7th grade content which has been moved to 6th or 8th grade to accommodate reduced science instruction in 7th grade

(CA 8) => 8th grade content which should be presented qualitatively in 6th grade to help explain convections and other Earth science related content

CONTEXT: SKILLS SCOPE AND SEQUENCE

Investigation and Experimentation:

Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

6th

7a. Develop a hypothesis.
b. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
c. Construct appropriate graphs from data and develop qualitative statements about the relationships between variables.
d. Communicate the steps and results from an investigation in written reports and oral presentations.
e. Recognize whether evidence is consistent with a proposed explanation.
f. Read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map.
g. Interpret events by sequence and time from natural phenomena (e.g., the relative ages of rocks and intrusions).
h. Identify changes in natural phenomena over time without manipulating the phenomena (e.g., a tree limb, a grove of trees, a stream, a hillslope).

7th

7a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
b. Utilize a variety of print and electronic resources (including the World Wide Web) to collect information as evidence as part of a research project.
c. Communicate the logical connection among hypothesis, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.
d. Construct scale models, maps and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).
e. Communicate the steps and results from an investigation in written reports and verbal presentations.

8th

9a. Plan and conduct a scientific investigation to test a hypothesis.
b. Evaluate the accuracy and reproducibility of data.
c. Distinguish between variable and controlled parameters in a test.
d. Recognize the slope of the linear graph as the constant in the relationship y=kx and apply this to interpret graphs constructed from data.
e. Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.
f. Apply simple mathematical relationships to determine one quantity given the other two (including speed = distance/time, density = mass/volume, force = pressure x area, volume=area x height).
g. Distinguish between linear and non-linear relationships on a graph of data.

CA CONTENT STANDARDS

Grade 6 Focus On Earth Science:

Plate Tectonics and Earth's Structure

1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept, students know …

    a. the fit of the continents, location of earthquakes, volcanoes, and midocean ridges, and the distribution of fossils, rock types, and ancient climatic zones provide evidence for plate tectonics.

    b. the solid Earth is layered with cold, brittle lithosphere; hot, convecting mantle; and dense, metallic core.

    c. lithospheric plates that are the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.

    d. earthquakes are sudden motions along breaks in the crust called faults, and volcanoes/fissures are locations where magma reaches the surface.

    e. major geologic events, such as earthquakes, volcanic eruptions, and mountain building result from plate motions.

    f. how to explain major features of California geology in terms of plate tectonics (including mountains, faults, volcanoes).

    g. how to determine the epicenter of an earthquake and that the effects of an earthquake vary with its size, distance from the epicenter, local geology, and the type of construction involved.

Shaping Earth's Surface

2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept, students know …

    a. water running downhill is the dominant process in shaping the landscape, including California's landscape.

    b. rivers and streams are dynamic systems that erode and transport sediment, change course, and flood their banks in natural and recurring patterns.

    c. beaches are dynamic systems in which sand is supplied by rivers and moved along the coast by wave action.

    d. earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.

Heat (Thermal Energy) (Physical Science)

3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature. As a basis for understanding this concept, students know …

    a. energy can be carried from one place to another by heat flow, or by waves including water waves, light and sound, or by moving objects.

    b. when fuel is consumed, most of the energy released becomes heat energy.

    c. heat flows in solids by conduction (which involves no flow of matter) and in fluids by conduction and also by convection (which involves flow of matter).

    d. heat energy is also transferred between objects by radiation; radiation can travel through space.

Energy in the Earth System

4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept, students know …

    a. the sun is the major source of energy for phenomena on the Earth's surface, powering winds, ocean currents, and the water cycle.

    b. solar energy reaches Earth through radiation, mostly in the form of visible light.

    c. heat from Earth's interior reaches the surface primarily through convection.

    d. convection currents distribute heat in the atmosphere and oceans.

    e. differences in pressure, heat, air movement, and humidity result in changes of weather.

Ecology (Life Science)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept, students know …
   a. energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis, and then from organism to organism in food webs.
   b. over time, matter is transferred from one organism to others in the food web, and between organisms and the physical environment. [LS10]
   c. populations of organisms can be categorized by the functions they serve in an ecosystem. [LS10]
   d. different kinds of organisms may play similar ecological roles in similar biomes.
   e. the number and types of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperatures, and soil composition. [LS10]

Resources

6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept, students know …
   a. the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.
   b. different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.
   c. natural origin of the materials used to make common objects.

Earth and Life History (Earth Science) (CA 7th Grade Standards)

7-4. Evidence from rocks allows us to understand the evolution of life on Earth. As the basis for understanding this concept, students know …
   a. Earth processes today are similar to those that occurred in the past and slow geologic processes have large cumulative effects over long periods of time.
   b. the history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids.
   c. that the rock cycle includes the formation of new sediment and rocks and that rocks are often found in layers, with the oldest generally on the bottom.
   d. that evidence from geologic layers and radioactive dating indicates Earth is approximately 4.6 billion years old and that life on this planet has existed for more than 3 billion years.
   e. fossils provide evidence of how life and environmental conditions have changed
   f. how movements of the Earth's continental and oceanic plates through time, with associated changes in climate and geographical connections, have affected the past and present distribution of organisms.
   g. how to explain significant developments and extinctions of plant and animal life on the geologic time scale.

Investigation & Experimentation

7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will …
   a. develop a hypothesis.
   b. select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
   c. construct appropriate graphs from data and develop qualitative statements about the relationships between variables. [LS10]
   d. communicate the steps and results from an investigation in written reports and verbal presentations.
   e. recognize whether evidence is consistent with a proposed explanation. [LS10]
   f. read a topographic map and a geologic map for evidence provided on the maps, and construct and interpret a simple scale map.
   g. interpret events by sequence and time from natural phenomena (e.g., relative ages of rocks and intrusions).
   h. identify changes in natural phenomena over time without manipulating the phenomena (e.g., a tree limb, a grove of trees, a stream, a hillslope).

[CST] – Standards assessed on the California Standards Test
[LS10] – Standards assessed on the 10th grade NCLB Biology/Life Sciences Test

DISTRICT PERFORMANCE STANDARDS:

The Long Beach Unified School District has common assessments and assignments that are required for sixth grade science. The Performance Standard Criteria are shown in the table below. The objective is to have all students achieve at or above the Proficient Level and receive a C or better in the course. Performance level is determined by the average of the assessments or assignments.

Science Performance Standard Criteria

	Not Proficient	**Partial Proficient**	**Proficient**	**Advanced Proficient**
Graded Student Work	Average is a 1 or less than 60%	Average is a 2 or 60% - 69%	Average is a 3 or 70% - 84%	Average is a 4 or 85% - 100%
Standards-Based Classroom Assessments	Less than 60%	60% - 69%	70% - 84%	85% - 100%
Written Response / Lab Report / OES (6 point scale)	1-2	3	4	5-6
Written Response / Lab Report / OES (4 point scale)	1	2	3	4
End-Of-Course Exam	Less than 45%	45% - 59%	60% - 84%	85% - 100%

OUTLINE OF CONTENT AND RECOMMENDED TIME ALLOTMENT:

Time allocations are only suggestions and may be adjusted to suit school site curriculum plans and student needs. Content sequencing is established to align with quarterly district assessments. Adjusting the sequencing can only be done within the established quarters.

SCIENCE 6

Ecology (Life Science)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)

… populations of organisms can be categorized by the functions they serve in an ecosystem. **(5,c)**
[LS10]
 	
DISTRICT ASSESSMENTS:
CR: Food for Thought
 	
MODIFIED ASSESSMENTS:
(Framework, p. 98) Given a random list of 4 or 5 plants and 8 to 10 consumers (primary, secondary, and tertiary), pairs of students organize the organisms according to food web order and ecological function.
 	
Construct an energy pyramid. Outside the pyramid, include 1 or 2 decomposers, and 1 or 2 scavengers. Draw arrows between members of the pyramid to show the predation sequence.
 	
Students are assigned roles as producers, consumers, decomposers, etc. Using string or yarn they connect to one another to form a food web and then a food chain.
	• Identify and define an ecosystem as all the living and nonliving things that interact in a given area.
	• Classify organisms as producers or consumers of chemical energy.
	• Classify consumers as either predators, scavengers, or decomposers.
	• Identify consumers that fall under more than one category:
	  o Omnivores consume both plants and animals.
	  o Opportunistic consumers act as both predators and scavengers.
		Focus on ES: Ch 12:1, 13:1
		
		PH FoES, 19:1
			KEY VOCABULARY:
			ecosystem, producers, consumers, tertiary, herbivore, carnivore, predators, abiotic, photosynthetic microorganisms, scavengers, decomposers, omnivores, opportunistic, food chain, food web, food pyramid, biotic
			
			GRAPHIC ORGANIZERS:
			Venn Diagram: consumers vs. producers
			
			Flow Map: food webs / food chains
			
			Tree Map: Consumers as predators, scavengers, or decomposers
			
			SKILLS FOCUS:
			Observing
			
			Recognize whether evidence is consistent with a proposed explanation. **(I&E 7.e)**
			
			LABS / DEMOS / VISUALS:
			• (Framework, p. 98) Given a random list of 4 or 5 plants and 8 to 10 consumers (primary, secondary, and tertiary), organize the organisms according to food web order and ecological function. Construct an energy pyramid. Outside the pyramid, include 1 or 2 decomposers, and 1 or 2 scavengers. Draw arrows between members of the pyramid to show the predation sequence.
			• Focus on ES: 12:1, Launch Lab, "How tangled is the life web?" p. 513
			• Focus on ES: 12:1, Activity (Abiotic/Biotic), p. 517 TE
			• Focus on ES: 12:1, Activity (Soil Observation), p. 521 TE
			• Focus on ES: 12:1, Demo., "Air is Real", p. 522 TE
			• Focus on ES: 12:1, Nat'l Geog., "Visualizing Biotic Factors", p. 525
			• Focus on ES: 12:1, Data Lab, "Graphing Monthly Abiotic …", p. 530
			• Focus on ES: 13:1, Data Lab, "Can you classify animals by diet?" p. 557
			• Focus on ES: 4-in-1 Lab, "Communities", pp. 87-90
			• Focus on ES: Ch 13 Transparencies
			  "What's for dinner?"
			  "You are what you eat"
			  "A Vital Job"
			• **Teachers Domain:** "Producers, Consumers, Decomposers" http://www.teachersdomain.org/resources/tdc02/sci/life/oate/lp_energyweb/index.html
			• **Enchanted Learning:** "Food Chains and Food Webs" http://www.enchantedlearning.com/subjects/foodchain/
				4 Days

Ecology (Life Science) (cont'd)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)

… energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis, and then from organism to organism through food webs. **(5,a)**
 	
… matter is transferred over time from one organism to others in the food web and between organisms and the physical environment. **(5,b)**
 	
[LS10]
 	
DISTRICT ASSESSMENTS:
CR: Food for Thought
 	
MODIFIED ASSESSMENTS:
Have groups of students do research and create a diagram showing the flow of energy from the Sun through specific photosynthetic microscopic organisms, to larger organisms, and finally to top predators or humans. Include some symbols to show that most of the chemical energy at each level is lost as heat.
	• Describe producers as plants and photosynthetic microorganisms that do not need to consume other organisms, but store chemical energy from basic molecules and light energy.
	• Diagram food chains and food webs, starting with solar energy.
	  o Diagram a food chain where plants are consumed by primary consumers (herbivores), which are consumed by secondary consumers (carnivores), which are consumed by tertiary consumers (top-level predators).
	• Explain how energy and matter are passed from one level to the next in a food chain.
	  o Diagram and explain the carbon cycle.
	  o Diagram and explain the nitrogen cycle.
	• Describe ways that matter and energy are exchanged with the physical environment.
	• Depict the hierarchy of consumers and the transfer and loss of energy from herbivores through secondary consumers to the top carnivores in a food web or energy pyramid.
		Focus on ES:
		Ch 13:1-3
		
		PH FoES, 19:1
			KEY VOCABULARY:
			photosynthetic microorganisms
			hierarchy protist
			water cycle eukaryotic
			carbon cycle **protozoan**
			physical environment
			nitrogen cycle food web
			food chain secondary consumer
			tertiary consumer
			
			GRAPHIC ORGANIZERS:
			Parallel Flow Maps: macroscopic and microscopic food chains
			
			Labeled carbon/oxygen and nitrogen cycles showing the flow of energy as well as matter
			
			SKILLS FOCUS:
			Classifying, predicting, modeling
			
			Construct appropriate graphs from data and develop qualitative statements about the relationships between variables. **(I&E 7.c)**
			
			LABS / DEMOS / VISUALS:
			• Analyze owl pellets
			• Focus on ES: 13:1, Launch Lab, "Can you eat energy?' p. 549
			• Focus on ES: 13:1, Demo., "How plants obtain CO_2", p. 553 TE
			• Focus on ES: 13:2, Demo., "Food Energy", p. 561 TE
			• Focus on ES: 13:2, Mini Lab, "energy through an ecosystem?" p. 567
			• Focus on ES: 13:3, Mini Lab, "Is your soil rich in nitrogen?" p. 569
			• Focus on ES: 13:3, Nat'l Geog., "Visualizing the Carbon Cycle", p. 571
			• Focus on ES: 13:3, Applying Math, Percent of Nitrogen in soil", p. 573
			• Focus on ES: 13:3, Lab, "Is it primary, secondary, or tertiary?" pp. 574-575
			• Focus on ES: 4-in-1 Lab, "Exploring Life in Pond Water", pp. 83-86
			• Focus on ES: Ch 12 Transparency, "The sun's effect on ecosystems"
			• Focus on ES: Ch 13 Transparency, "Nitrogen Cycle"
			• AIMS Educational Foundation: Field Detectives
			• **Iowa St. Univ.:** "Food Chains and Food Webs" http://www.cyfernet.org/integrate/iowa/schain.html
			• **McDougal Littell:** animation showing evidence of the carbon cycle www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES0106
				6 Days

Ecology (Life Science) (cont'd)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… different kinds of organisms may play similar ecological roles in similar biomes. **(5,d)** **DISTRICT ASSESSMENTS:** CR: Home, Home on the Biome **MODIFIED ASSESSMENTS:** Groups of students prepare a poster comparing and contrasting two similar biomes in different hemispheres.	• Describe the various biomes and locate them on a map or globe. • Research biomes around the world, which have similar climate and availability of water. • Define the specific niche of various organisms. • Compare organisms in widely separated geographic locations, but similar biomes, that fulfill the same ecological roles.	**Focus on ES: Ch 12:2, 13:2** *PH FoES, 19:3-4, 18:3*	***KEY VOCABULARY:*** biome role niche ***GRAPHIC ORGANIZERS:*** Tree Map: Biomes Venn Diagram: organisms and their ecological roles in two similar biomes ***SKILLS FOCUS:*** Inferring, observing, researching Develop a hypothesis. **(I&E 7.a)** Communicate the steps and results from an investigation in written reports and oral presentations. **(I&E 7.d)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 12:2, Activity (Biomes), p. 533 TE • Focus on ES: 12:2, Activity (Fox comparison), p. 533 TE • Focus on ES: 12:2, Mini Lab, "How many organisms live here?" p. 534 • Focus on ES: 12:2, Activity (Museum exhibit), p. 535 TE • Focus on ES: 12:2, Demo., "Niches", p. 536 TE • Focus on ES: 13:2, Mini Lab, "What do they eat …?" p. 564 • Focus on ES: Ch 12 Transparency, "Biomes" • **Discovery:** "Unique Plants of the Biomes" (activity), http://school.discovery.com/lessonplans/programs/plantsofthebiomes/ • **Ariz. St. Univ:** "Biomes: Webquest", http://coe.west.asu.edu/students/dmatousek/webquest.htm	8 Days

Ecology (Life Science) (cont'd)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition. **(5,e)** [LS10] **DISTRICT ASSESSMENTS:** CR: Home, Home on the Biome **MODIFIED ASSESSMENTS:** Pairs of students create a collage showing the "Goldilocks" effect in ecosystems: where sunlight and water are found in combinations of large amounts, moderate amounts, and scarce amounts. Students explain how plant growth is affected and how the plant growth affects animal populations.	• Explain how the richness of plant growth (the base of the energy pyramid) controls the diversity of life in an ecosystem. • Describe how abiotic factors control plant growth. • Compare and contrast temperate and tropical environments to deserts and polar tundra for the number of organisms they support. • Show how the number of edible plants in an ecosystem influences the number of plant eating animals. • Analyze the relationship between the number of predators in a system to the number of prey.	**Focus on ES: Ch 12:1** *PH FoES, 18:1-3, 10:3, 13:2-3, 19:4, 20:3*	***KEY VOCABULARY:*** solar radiation — water cycle photosynthesis — humus predator — prey ***GRAPHIC ORGANIZERS:*** Flow Map: interaction of biotic and abiotic factors supporting an ecosystem Cycle Map: food chain showing recycling of organic matter ***SKILLS FOCUS:*** Observing, classifying, measuring, inferring, constructing data tables Identify changes in natural phenomena over time without manipulating the phenomena. **(I&E 7.h)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 12:1, Demo., "Model Ecosystems", p. 516 TE • Focus on ES: 12:1, Demo., "Ecosystems", p. 521 TE • Focus on ES: 12:1, Demo., "Rain Shadow", p. 527 TE • Focus on ES: 12:1, Demo., "Plant Environments", p. 528 TE • Focus on ES: 12:1, Applying Math, "Changing soil pH", p. 531 • Focus on ES: 12:2, Lab, "Counting Species", pp. 538-539 • Focus on ES: 4-in-1 Lab, "Changes in Predator and Prey …", pp. 79-82 • Focus on ES: Ch 12 Transparency, "Interactions of Life" • **PBS:** "The Wolf and the Moose" http://www.pbs.org/edens/denali/mooswolf.htm • **ThinkQuest:** "Biomes—Living Worlds" http://library.thinkquest.org/C0113340/text/biomes/biomes.tundra.plants.growing_period.html	5 Days

Ecology (Life Science) (cont'd)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
* *… that humans are part of and have a responsibility towards ecosystems.* ***(LBUSD)*** **DISTRICT ASSESSMENTS:** OES: **MODIFIED ASSESSMENTS:** Pairs of students research a local environmental problem and the steps which have been taken to address the problem. Issues may include auto emissions, sewage treatment, landfills, farming technology, water resource use, etc.	• *Recognize that human population is an integral part of an ecosystem.* • *Identify imbalances within a variety of ecosystems.* • *Identify both positive and negative ways in which human populations and natural events can affect ecosystems.* • *List ways in which human populations may be affected by imbalances in their environment.* • *Indicate how the actions of individuals may help to solve environmental problems.*	**Focus on ES:** **Ch 12:1-2** *PH FoES, Ch 20*	***KEY VOCABULARY:*** imbalance integral ***GRAPHIC ORGANIZERS:*** Tree Map: human activities and their ecologically harmful and helpful effects. ***SKILLS FOCUS:*** Construct appropriate graphs from data and develop qualitative statements about the relationships between variables. **(I&E 7.c)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 12:1, Launch Lab, "How tangled is the life web?" p. 513 • Focus on ES: 12:1, Content Background, "Real-World Connection (Temp. and Env.)", p. 518 TE • Focus on ES: 12:1, Writing in Science (Pollution), p. 522 TE • Focus on ES: 12:2 , Science & Society, "Recovering Threatened Species", p. 541 • Focus on ES: 4-in-1 Lab, "Human Impact on the Env.", pp. 91-94 • Focus on ES: 4-in-1 Lab, "A survey of your own environment", pp. 117-118 • Focus on ES: 4-in-1 Lab, "A salty situation", pp. 125-128 • GEMS: Environmental Detectives • Focus on ES: Ch 12 Transparencies, "The Dead Zone" "Is there a great happy swamp?" • **Nat'l Geog.:** "Saved by a shark" http://www.nationalgeographic.com/xpeditions/lessons/07/g68/noaashark.html • **Discovery:** "Water, water everywhere?" http://school.discovery.com/lessonplans/activities/watereverywhere/	4 Days

End District Quarter 1 Exam Material

Resources

6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process. **(6,a)** **DISTRICT ASSESSMENTS:** CR: Fueling Around **MODIFIED ASSESSMENTS:** Groups of students prepare a visual of their choosing to show the monetary and environmental costs of an energy resource, and the benefits people receive from the energy source.	• Identify the energy sources which current technologies enable us to use: oil, natural gas, non-fossil fuels (e.g., hydrogen and ethanol), solar, nuclear, wind, and wave. • List the uses for energy in society (i.e., heat, light, and transportation). • Explain why there are different monetary costs involved in harnessing different forms of energy. • Compare the expense and efficiency of various sources of energy for particular uses. • Describe the non-monetary, environmental costs of various energy sources. • Evaluate the usefulness of energy sources by how easily they can be converted to useful forms of energy, their depletion rate, and their monetary and non-monetary costs.	**Focus on ES: 9:1,2,3 14:2,3** *PH FoES, 11: 4, 12:2, 13:4, 14:2, 17:4, 21:1-4*	***KEY VOCABULARY:*** energy source, nuclear, fission, conversion, monetary, non-monetary, environmental, consequence, cost-effective ***GRAPHIC ORGANIZERS:*** Word Web: energy sources Tree Map: energy sources – pros and cons ***SKILLS FOCUS:*** Making models, predicting, applying, evaluating Construct appropriate graphs from data and develop qualitative statements about the relationships between variables. **(I&E 7.c)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 14:2, Demo, "Oil & Natural Gas Deposits", p. 597 TE • Focus on ES: 14:2, Nat'l Geog., "Visualizing Solar Energy", p. 603 • Focus on ES: 14:2, Mini-Lab, "… make the sun work for you?", p. 606 • Focus on ES: 14:3, Demo, "Hybrid Gas Mileage", p. 609 TE • Focus on ES: 14:3, Data Lab, "Do all vehicles … fuels from oil?", p. 614 • Focus on ES: 14:3, Applying Math, "Energy Usage", p. 615 • Focus on ES: 14:3, Design your own lab, "Become an Energy Expert", pp. 616-617 • Focus on ES: 4-in-1 Lab, "Efficiency of Fossil Fuels", pp. 95-97 • Focus on ES: 4-in-1 Lab, "Using Biomass", pp. 99-101 • Focus on ES: 4-in-1 Inquiry Activity, "Lemon Power", pp. 105-106 • Focus on ES: 4-in-1 Inquiry Activity, "The Effects of Acid Precipitation", pp. 111-112 • Focus on ES: Ch 10 Transparency "Oil Disaster" • Focus on ES: Ch 14 Transparencies "Earth's Energy" "Energy Usage" "Conserving Resources" • **PEAK.org:** "Energy Challenge Game" www.peakstudents.org/game/ , • **Dept. of Energy:** Energy Facts www.eia.doe.gov/kids/energyfacts/index.html • **Dept. of Energy:** Energy Labels www.eia.doe.gov/kids/classactivities/energyguidelabels_int.pdf • **NEED.org:** Infobooks www.need.org/energyinfobooks.php	4 Days

Resources (cont'd)

6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and know how to classify them as renewable or nonrenewable. **(6,b)** **DISTRICT ASSESSMENTS:** CR: Fueling Around CR: Oils Well that Ends Well **MODIFIED ASSESSMENTS:** Students identify pictures of energy resources as either renewable or nonrenewable. In groups, students present ideas about how some nonrenewable resources can be conserved or made partially renewable through recycling efforts.	• List material and energy resources. • Categorize resources as renewable or nonrenewable based on the time and process needed to create the resource. • Compare and contrast present and expected future uses of renewable and nonrenewable resources.	**Focus on ES: Ch 3:2,3 9:1, 10:4, 14:1,2,3** *Focus on ES, 4:2, 5:2,3&5, 7:3, 9:1, 11:1-3, 14:2, and 20:1-3*	***KEY VOCABULARY:*** **renewable**, nonrenewable, finite, extraction (mining), processing (smelting), hydroelectric, geothermal, biomass, fusion, **geologic cycle** ***GRAPHIC ORGANIZERS:*** T Chart: renewable and nonrenewable resources ***SKILLS FOCUS:*** Inferring, observing classifying, making models Develop a hypothesis. **(I&E 7.a)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 14:1, Data Lab, "How old is that tree?", p. 590 • Focus on ES: 14:1. Demo, "Wasting Water", p. 593 TE • Focus on ES: 4-in-1 Inquiry Activity, "A Survey of your own Environment", pp. 117-118 • Focus on ES: Ch 14 Transparencies "Water Power" "Earth's Energy and Mineral Resources" • **PEAK.org:** Renewable vs. Nonrenewable www.peakstudents.org/energy_tips_renewable.asp	4 Days

Resources (cont'd)

6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… natural origin of the materials used to make common objects. **(6,c)** **DISTRICT ASSESSMENTS:** CR: Oils Well that Ends Well **MODIFIED ASSESSMENTS:** In pairs, students analyze various food and material items. They then create a visual of their choice to show the final item and its original material sources.	• Make a list of common objects in the classroom or at home. • Analyze these items and determine the materials used to manufacture it. For example, a pencil contains wood, paints, metal, a rubber or plastic eraser, and a "lead" made from a mixture of clay and graphite. • Research the natural origins of each material, for instance, plastics and synthetic materials that are derived from oil. • Classify the materials as renewable or nonrenewable.	**Focus on ES: Ch 2:2, 3:3 and 14:1,2,3** *PH FoES, 4:3, 20:4, and 21:1*	***KEY VOCABULARY:*** natural goods synthetic ***GRAPHIC ORGANIZERS:*** Tree Map: Samples of common items broken into their material components and the sources or those materials. ***SKILLS FOCUS:*** Observing, inferring Communicate the steps and results from an investigation in written reports and oral presentations. **(I&E 7.d)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: Ch 14, Launch Lab, "Where did that come from?", p. 585 • Focus on ES: 14:3, Mini-Lab, "Is it made from plants or plastic?", p. 608 • Focus on ES: Ch 14 Transparency, "For a Big Payoff" • **Mineral Information Institute:** Common Minerals and their Uses www.mii.org/commonminerals.html#Al • **McDougal Littell:** common objects made of minerals www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES0505 • **Geol. Soc. of America:** What Earth Materials are in My Subaru? www.geosociety.org/educate/LessonPlans/Earth_Materials_in_Subaru.pdf • **Geol. Soc. of America:** Toothpaste with a Twist www.geosociety.org/educate/LessonPLans/ToothpasteTwist.pdf	4 Days

Heat (Thermal Energy) (Physical Science)

3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)

… energy can be carried from one place to another by heat flow or by waves, including water, light, and sound, or by moving objects. **(3,a)**
 	
DISTRICT ASSESSMENTS:
CR: A Burning Question
 	
MODIFIED ASSESSMENTS:
In small groups, students create a molecular role-play to model the difference between the concepts of temperature and heat flow.
 	
In pairs, students create illustrations of ways to both enhance and dampen the effects of light, sound, and heat energy in a room. For each idea, they should explain how it affects the waves carrying the energy.
 	
Students use features advertised to enhance car safety and show how they reduce (or prevent) the energy of a crash getting to the passengers.
	• Read thermometers.
	• Distinguish between heat and temperature.
	• Explain that transfer of energy from object to object is the result of difference in temperature.
	• Demonstrate heat flow.
	• Demonstrate how waves are able to carry energy from place to place without net movement of matter.
	  o waves of water
	  o sound waves – vibrating objects cause other objects to vibrate, such as eardrums
	  o light waves (electromagnetic waves), for instance, from the sun to the Earth
	• Show that moving objects also carry energy.
		Focus on ES: 3:1,2,3
		
		PH FoES, 1:2, 2:2, 12:1, and 15:1-2
			KEY VOCABULARY:
			temperature, caloric, thermal energy, infrared, heat, kinetic energy, electromagnetic waves, potential energy, heat flow
			
			GRAPHIC ORGANIZERS:
			Triple Venn Diagram: heat vs. temperature vs. thermal energy
			
			Tree Map: heat transfer
			
			Venn Diagram: Celsius and Fahrenheit temperature scales.
			
			SKILLS FOCUS:
			Select and use appropriate tools and technology to perform tests, collect data, and display data. **(I&E 7.b)**
			
			Recognize whether evidence is consistent with a proposed explanation. **(I&E 7.e)**
			
			LABS / DEMOS / VISUALS:
			• Compare the feel of room temperature wood or plastic to metal. The metal "seems" colder because it conducts heat energy better (heat leaves your hand quicker).
			• Tuning forks: listening to the sound, vibrating in water
			• Focus on ES: Ch 3 Launch Lab, "How cold is it?", p. 121
			• Focus on ES: 3:1, Nat'l Geog., "Visualizing Kinetic Energy", p. 125
			• Focus on ES: 3:1, Demo, "Differences in Kinetic Energy", p. 126 TE
			• Focus on ES: 3:1, Mini-Lab, "How deep is the crater?", p. 127
			• Focus on ES: 3:2, Use Models, p. 132 TE
			• Focus on ES: 3:2, Applying Math, "Thermal Expansion", p. 138
			• Focus on ES: 3:3, Demo, "Particle Movement", p. 139 TE
			• Focus on ES: 3:3, Data Lab, "How are temperature scales related?", p. 144
			• Focus on ES: Ch 3 Transparencies
			  "They've Got Potential"
			  "Nuclear Reactor"
			  "Cosmic Impact"
			  "How a Refrigerator Works"
			  "Full of Hot Air"
			  "Forced Air System"
			• **Caltech:** "Heat vs. Temp", coolcosmos.ipac.Caltech.edu//cosmic_classroom/light_lessons/thermal/differ.html
			• **Discover.com:** Sound Waves school.discovery.com/lessonplans/programs/soundwaves/
			• **AskERIC:** "Understanding Waves" www.reachoutmichigan.org/funexperiments/quick/eric/waves.html
				3 Days

Heat (Thermal Energy) (Physical Science) (cont'd)

3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… that when fuel is consumed, most of the energy released becomes heat energy. **(3,b)** **DISTRICT ASSESSMENTS:** CR: A Burning Question **MODIFIED ASSESSMENTS:** Groups of students role-play fuel molecules (i.e., 8 students to form an eight carbon octane molecule in gasoline, or 6 students to represent a six carbon sugar in food) and show how breaking bonds releases the energy that creates heat, and perhaps light, and is used for work to move things or generate electricity.	• Demonstrate how fuel provides energy. • Explain that fuel is a form of stored energy that is released to provide heat, light, electricity, or motion. • Show by experiment that the energy released when fuel burns comes from the chemical bonds. • Describe how burning fuel is used to do work and how much of that work tends to be transformed into heat.	**Focus on ES, Ch 3:2** *PH FoES, 21:1-4*	***KEY VOCABULARY:*** fuel, consumed, waste products, friction, bonds, work, transformed ***GRAPHIC ORGANIZERS:*** Flow Map: what happens when stored chemical energy is released ***SKILLS FOCUS:*** Observation Develop a hypothesis. **(I&E 7.a)** ***LABS / DEMOS / VISUALS:*** • Strike a large kitchen match as a demonstration. • Light a candle as an analogy to the way a car's fuel combines with oxygen to produce heat and light as byproducts. (Framework, p. 93) • Rub hands together to produce frictional heat to show work. • Focus on ES: 3:2, Demo, "Energy Transformations", p. 135 TE • Focus on ES: 3:2, Mini-Lab, "Heating by Friction", p. 136 • Focus on ES: 4-in-1 LAB, "Using Biomass", pp. 99-107 • **PBS:** "Peanut Calorimetry Lab", www.pbs.org/safarchive/4_class/45_pguides/pguide_502/4552_truth.html#act2	2 Days

Density and Buoyancy (Grade 8 CA Standard)

8. All objects experience a buoyant force when immersed in a fluid.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… density is mass per unit volume. **(8,a)** **DISTRICT ASSESSMENTS:** PT: Density Rocks! **MODIFIED ASSESSMENTS:** Fill a large beaker (1 L or larger) with dry rice. Before class, push a ping-pong ball down into the rice. In class, place a large steel ball bearing on top and shake. In pairs, have students explain why the ball bearing sinks and the ping-pong ball pops up and give an analogy from their experience. Using diagrams, have students predict and explain which will float higher: a ship in warm water, or the same ship in cold water. Also predict whether a warm piece of wood or a cold piece of wood will float higher in the same temperature water. Students need to make the connection that by heating, a given amount of matter will spread out and become less dense.	QUALITATIVE ONLY • Explain that density is the amount of matter (mass) in a given volume. • Show that density of an object can change with temperature. • Define fluids as matter with molecules that are free to move, such as liquids and gases. • Make justified predictions about whether objects or substances will float or sink in a given fluid. Do not take time to make measurements and calculate densities. This will be done in 8th grade.	**Focus on ES, 2:2, 3:4** *PH FoES, 3:3*	***KEY VOCABULARY:*** mass density volume fluid ***GRAPHIC ORGANIZERS:*** Circle Map: density Use two different colors to indicate pre- and post-instruction ideas. Tree Map: density ***SKILLS FOCUS:*** Observing, predicting Recognize whether evidence is consistent with a proposed explanation. **(I&E 7.e)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 2:2, Demo., "Density", p. 91 TE • Focus on ES: 4:3, Science Concepts, "What is density?" p. 187 TE • Focus on ES: 10:2, Mini Lab, "Different densities?" p. 433 • Focus on PS: Launch Lab, "Can you push … under water?" p. 127 • Focus on PS: 3:1, Use Models (Density), p. 132 TE • Focus on PS: 3:2, Activity (Pressure and Buoyancy), p. 141 TE • Focus on PS: 3:3, Demo., "Differences in Densities", p. 151 TE • Focus on PS: 4-in-1 Lab: "Floating in Fresh & Ocean Water", pp. 21-22 • Focus on PS: 4-in-1 Lab: "The Case of the Sabotaged …", pp. 109-112 • Focus on PS: Mini Lab, "Do cold things float?" p. 155 • Focus on PS: 10:2, Mini Lab, "Different Densities", p. 433 • Focus on PS: Ch 3 Transparencies, "Up or Down?" "Density Table" "Buoyancy" • Demonstration: Place an unopened can of coke and diet coke in an aquarium with water to observe density. • Demonstration: Give a variety of objects to students to make predictions about density and then place in a beaker of water to observe. • Demonstration: Place grapes in salt water and fresh water to observe density (ex. Dead Sea vs. swimming pool) • GEMS: Discovering Density • **Virtual Chembook** (Density demonstrations) http://www.elmhurst.edu/~chm/vchembook/124Adensityliq.html • **Nat'l Geog.** (virtual lab), http://www.nationalgeographic.com/xpeditions/lessons/14/g68/trythisoil.html	4 Days

Heat (Thermal Energy) (Physical Science) (cont'd)

3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… heat flows in solids by conduction (which involves no flow of matter) and in fluids by conduction and convection (which involves flow of matter). **(3,c)** **DISTRICT ASSESSMENTS:** CR: A Burning Question **MODIFIED ASSESSMENTS:** Groups of students report on real life examples of convection and conduction. Pairs of students explain how these processes relate to the Earth's interior using a visual or demonstration of their choice.	• Demonstrate conduction and convection as methods of transferring heat. • Explain the difference between conduction and convection.	**Focus on ES, Ch 2:3, 3:4 and 9:2** *PH FoES, 1:2, 15:2*	***KEY VOCABULARY:*** conduction atoms convection molecules kinetic molecular theory ***GRAPHIC ORGANIZERS:*** Venn Diagram: conduction and convection ***SKILLS FOCUS:*** Observation Develop a hypothesis. **(I&E 7.a)** ***LABS / DEMOS / VISUALS:*** • Demonstrate conduction using a metal rod with a paper handle. (Framework, p. 93) • Demonstrate convection using a heat resistant beaker, water, shredded paper, and a heat source. (Framework, p. 94) • Focus on ES: 3:4, Mini-Lab, "Is metal a good conductor?", p. 146 • Focus on ES: 3:4, Mini-Lab, "… convection current", p. 148 • Focus on ES: 3:4, Demo, "Convection in the air", p. 149 TE • Focus on ES: 3:4, Lab, "Create a Thermos", pp. 152-153 • Focus on ES: 4-in-1 Forensics, "Fact or Fraud?", pp. 137-140 • Focus on ES: 4-in-1, Probeware, "Thermal Conductivity", pp. 167-169 • **Exploratorium:** "Convection Current" www.exploratorium.edu/snacks/convection_currents.html • **Cal Tech:** "How does heat travel?" http://coolcosmos.ipac.caltech.edu//cosmic_classroom/light_lessons/thermal/transfer.html • **Cal Tech:** "Measuring Temperature" http://coolcosmos.ipac.caltech.edu//cosmic_classroom/light_lessons/thermal/measure.html	2 Days

Heat (Thermal Energy) (Physical Science) (cont'd)

3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… heat energy is also transferred between objects by radiation (radiation can travel through space). **(3,d)** **DISTRICT ASSESSMENTS:** CR: A Burning Question **MODIFIED ASSESSMENTS:** Students create a Triple Venn Diagram of conduction, convection, and radiation to sum up the three types of heat transfer. Pairs of students design and/or build a solar oven.	• Demonstrate radiation as a method of transferring heat. • Explain how energy is transferred from the Sun to the Earth by radiation.	**Focus on ES:** **Ch 3:1,2,4 & 9:1,2,3** *PH FoES, 1:2, 15:2*	***KEY VOCABULARY:*** radiation, emission, absorption, conductor, insulator ***GRAPHIC ORGANIZERS:*** Tree Map: conduction, convection, and radiation (Include types of energy carried by each.) ***SKILLS FOCUS:*** Develop a hypothesis **(I&E 7.a)** Communicate the steps and results from an investigation in written reports and verbal presentations. **(I&E 7.d)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 9:1, Demo, "Radiant Heat", p. 385 TE • Focus on ES: 4-in-1 LAB, "Observing Radiation", pp. 13-15 • Focus on ES: 4-in-1 LAB, "Venus - The Greenhouse Effect", pp. 17-20 • Focus on ES: 4-in-1 Inquiry Activity, "The Greenhouse Effect on Venus", pp. 113-114 • Focus on ES: Ch 3 Transparencies "The Sun's Radiant Energies" "Conduction, Convection, Radiation" • Focus on ES: Ch 9 Transparency "Energy Transfer" • **Science Rocks! (Meredith Middle School):** "Heat Transfer Demo Lab" http://www.mmscrusaders.com/newscirocks/wethrweb/heat2.htm	2 Days

Energy in the Earth System

4. Many phenomena on the Earth's surface are affected by the transfer of energy through radiation and convection currents.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… the sun is the major source of energy for phenomena on Earth's surface, it powers winds, ocean currents, and the water cycle. **(4,a)** **DISTRICT ASSESSMENTS:** PT: Seasons Have Reasons **MODIFIED ASSESSMENTS:** After observations of how the angle of light hitting the Earth's surface changes at different latitudes (p. 538 activity), have groups of students write paragraphs or create collages of pictures showing how the angle of light affects daily life at different latitudes. Try a combination paragraph/collage if using heterogeneous student groups, or separate the assignments if using homogeneous groups. In pairs, draw a diagram of photosynthesis with labels and explanations of each step of the process. In pairs, students put arrows and labels on a diagram of the water cycle, and then explain their diagram to the class.	• Use evidence to show that solar radiation penetrates the atmosphere to heat the air, oceans, and land. • Draw diagrams showing how sunlight strikes the ground at different angles depending on the season and latitude and explain what effects this has. • Describe how the Sun makes life possible on Earth. • Explain that photosynthesis converts solar energy to stored energy. • Illustrate the H_2O cycle with labels. • Explain how solar energy drives the H_2O cycle.	**Focus on ES: Ch. 9:1, 9:3, 10:2, 11:1, 12:1** *PH FoES, Ch 9:3, 12:4, 15:1,3, 17:1*	***KEY VOCABULARY:*** solar radiation photosynthesis latitude water cycle ***GRAPHIC ORGANIZERS:*** Flow Chart: photosynthesis from solar energy to plants as a food source Flow Chart: water cycle Tree Map: the Sun (energy source) to winds, ocean currents, and the water cycle ***SKILLS FOCUS:*** Inferring, observing Develop a hypothesis. **(I&E 7.a)** Recognize whether evidence is consistent with a proposed explanation. **(I&E 7.e)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 9:1, Demo., "Radiant Heat", p. 385 TE • Focus on ES: 9:1, Demo., "Intensity", p. 386 TE • Focus on ES: 11:1, Launch Lab, "How does water move …?" p. 465 • Focus on ES: 11:1, Demo., "Molecular Movement", p. 469 TE • Focus on ES: 11:1, Activity (Cloud Formation), p. 471 TE • Focus on ES: 11:1, Nat'l Geog., "Visualizing the Water Cycle", p. 473 • Focus on ES: 11:2, Demo., (Tilt of Earth & seasons), p. 479 TE • Focus on ES: 12:1, Demo., "Rain Shadow", pg. 527 TE • Focus on ES: 4-in-1 Lab, "Photosynth. and sunlight", pp. 67-70 • Focus on ES: 4-in-1 Lab, "Carbon Dioxide and Earth Temps", pp. 75-78 • Focus on ES: 4-in-1 Lab, "A Trip Around the World", pp. 115-116 • Focus on ES: Ch 9 Transparencies, "Energy for Life" "The Water Cycle" • Focus on ES: Ch 11 Transparency, "A Lovely Planet" • **NASA:** "Seasons & Angle of sunlight" http://www-spof.gsfc.nasa.gov/stargaze/Sseason.htm • **NOAA:** Water Cycle activity http://www.srh.noaa.gov/srh/jetstream/atmos/ll_sweatin.htm	6 Days

Energy in the Earth System (cont'd)

4. Many phenomena on the Earth's surface are affected by the transfer of energy through radiation and convection currents.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… solar energy reaches Earth through radiation, mostly in the form of visible light. **(4,b)** **DISTRICT ASSESSMENTS:** CR: Why is the Sky Blue? **MODIFIED ASSESSMENTS:** In pairs, draw two examples of solar radiation on construction paper, including explanations. Have the pairs explain their examples to the class before displaying them. In small groups, make up a mnemonic to help memorize all of the colors in visible spectrum in order. Then have students quiz one another. In pairs, draw and label the electromagnetic spectrum. Include explanations of three types of radiation, their effects, and how atmospheric constituents absorb them. In pairs, write and explanation with illustrations to show why the sky is blue and the Sun is yellow.	• Describe solar radiation and demonstrate its energy through observation and experimentation. • Explain and interpret a diagram of the electromagnetic spectrum. • Distinguish long and short wave radiation and how they are absorbed to different amounts by atmospheric constituents. • Explain that the sky appears blue and the Sun yellow because the atmosphere scatters blue light more than yellow. • Describe visible light, infrared light, ultraviolet light and their effects.	**Focus on ES: Ch. 9:1** *PH FoES: 15:1*	***KEY VOCABULARY:*** infrared, ultraviolet, visible, spectrum, electromagnetic, atmospheric constituents, transparent, opaque, scatter, absorb ***GRAPHIC ORGANIZERS:*** Circle Map: radiation Triple Venn Diagram: visible light, infrared radiation, ultraviolet radiation Circle Map: "Why is the sky blue?" using two different colors to show before and after instruction ideas. Be sure to cross out ideas that turned out to be fallacies after instruction. ***SKILLS FOCUS:*** Observing Develop a hypothesis. **(I&E 7.a)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 9:1, Mini Lab, "Why is the sky blue?" p. 391 • Focus on ES: 9, Lab, "Water and Sand Temperatures", pp. 410-411 • Focus on ES: Ch 3 Transparencies, "The Sun's Radiant Energies" "Conduction, Convection and Radiation" • Focus on ES: Ch 9 Transparencies "Heat Transfer" "Energy Transfer" • **SMRC / LBAOP:** "Watershed" Out-of-the-Box Science Kit for checkout • **NASA:** "Why is the sky blue?" http://spaceplace.nasa.gov/en/kids/misrsky/misr_sky.shtml • **Exploratorium:** "Blue Sky" http://www.exploratorium.edu/snacks/blue_sky.html	3 Days

Energy in the Earth System (cont'd)

4. Many phenomena on the Earth's surface are affected by the transfer of energy through radiation and convection currents.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… convection currents distribute heat in the atmosphere and oceans. **(4,d)** **DISTRICT ASSESSMENTS:** PT: California Breeze **MODIFIED ASSESSMENTS:** Using weather web sites, have groups of students research average temperatures in Fargo, North Dakota and Paris, France. (Paris is actually a little farther north than Fargo.) Also, have other student groups compare ocean temperatures of the Pacific off of San Diego to the Atlantic off of Charleston, South Carolina. By looking at maps of global wind and ocean currents, have students explain why the differences exist.	• Diagram the convection currents for air over a coastline caused by unequal heating over land and ocean. • Explain how this unequal heating causes both wind and ocean currents. • Explain how wind and air currents are deflected by the geography of the land and the rotation of the Earth. • Cite evidence proving that these currents carry heat energy from place to place (i.e., coastal cool temperatures, the Gulf Stream warming western Europe.)	**Focus on ES: Ch. 9:2-3, 10:2, 10:4, 11:3-4** *PH FoES: 12:4, 15:2-3, 17:1*	***KEY VOCABULARY:*** current, deflect, distribute, Coriolis Effect, topography, convection current ***GRAPHIC ORGANIZERS:*** Diagram of day and night air currents over coastlines Flow Map: Solar energy to convection currents to air currents to ocean currents ***SKILLS FOCUS:*** Read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map. **(I&E 7.f)** ***LABS / DEMOS / VISUALS:*** • Investigate atmospheric convection currents using smoke chimney or fog chamber. (Framework p. 96) • Observe water droplets (condensing steam) as they exit a boiling teakettle. (Framework p. 96) • Investigate convection currents in liquid. (Framework p. 96) • Focus on ES: 9:1, Launch Lab, "Does temperature affect air density?" p. 379 • Focus on ES: 9:2, Mini Lab, "How do clouds form from convection currents?" pp. 395 • Focus on ES: 9:3, Dem., "Convection Currents", p. 403 TE • Focus on ES: 9:3, Nat'l Geog., "Visualizing Global Winds", p. 407 • Focus on ES: 9:3, Data Lab, "Is it windy here?" p. 408 • Focus on ES:10:1, Launch Lab, "Will hot water sink?" p. 421 • Focus on ES: 10:2, Mini Lab, "Different Densities?" p. 433 • Focus on ES: 10:2, Activity (Coriolis Effect), p. 432 TE • Focus on ES: 10:4, Demo., (California Current), p. 448 TE • Focus on ES: 10:4, Data Lab, "How many whales …?" p. 450 • Focus on ES: 11:3, Mini Lab, "How does latitude affect the angle of sunlight?" p. 485 • Focus on ES: 11:4, Demo., "Differential Heating", p. 493 TE • Focus on ES: Ch 9 Transparency, "Coriolis Effect" • GEMS: Ocean Currents • **NOAA:** National Oceanic & Atmospheric Administration http://www.noaa.gov/	3 Days

End District Quarter 2 Exam Material

Plate Tectonics and Earth's Structure (cont'd)

1. Plate tectonics accounts for important features of Earth's surface and major geologic events.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… the solid Earth is layered with cold, brittle lithosphere; hot, convecting mantle; and dense, metallic core. **(1,b)** **DISTRICT ASSESSMENTS:** CR: A Moving Experience **MODIFIED ASSESSMENTS:** In pairs, students make an appropriately scaled, labeled poster or collage of Earth's interior.	• Describe the Earth's interior structure: o cold, brittle lithosphere o "plastic" upper mantle region called the asthenosphere o hot, convecting mantle o dense, metallic core. • Create an appropriately scaled, cross-section diagram of the Earth with temperature, density, composition, and physical state labeled for each layer. • Explain that scientists have learned about the Earth's structure by studying how earthquake waves move reflect inside the Earth.	**Focus on ES, Ch 2:3, 4:3, and 5:2** *PH FoES, Ch 1:1,2*	***KEY VOCABULARY:*** **crust** **asthenosphere** **mantle** convection currents **core** density **lithosphere** **heat flow** geologist composition ***GRAPHIC ORGANIZERS:*** Tree Map: Earth's interior KWL Chart: What do you know about the Earth? ***SKILLS FOCUS:*** Drawing to scale Communicate the steps and results from an investigation in written reports and oral presentations. **(I&E 7.d)** Recognize whether evidence is consistent with a proposed explanation. **(I&E 7.e)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: Ch 2, Helping You Prepare, Demo., p. 74D TE • Focus on ES: 2:3, Demo., "Structures", p.103 • Focus on ES: 2:3, Mini-Lab, "How can you describe …?", p.103 • Focus on ES: 2:3, Science Concepts, "Activity", p.104 TE • Focus on ES: 2:3, Design Your Own Lab, "Model and Invent: Earth's Layers", p.110-111 • Focus on ES: 4:3, Demo., "Rigid Crust & Molten Mantle", p.187 TE • Focus on ES: 4:3, Applying Math, "Percentage of Minerals and Rocks in the Lithosphere", p.195 • Focus on ES: Ch 3 Transparencies, "Mountain of Ash" "Seismic Wave Speeds" • **UC San Diego:** "Earth Like a Puzzle", http://sio.ucsd.edu/voyager/earth_puzzle/look_beneath.html • **Purdue Univ.:** "Journey to the `Center of the Earth", web.ics.purdue.edu/~braile/edumod/journey/journey.htm • **USGS:** "The Interior of the Earth", pubs.usgs.gov/gip/interior/	4 Days

Plate Tectonics and Earth's Structure (cont'd)

1. Plate tectonics accounts for important features of Earth's surface and major geologic events.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… lithospheric plates that are the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle. **(1,c)** **DISTRICT ASSESSMENTS:** CR: A Moving Experience **MODIFIED ASSESSMENTS:** Given a cross-section diagram of the Earth's crust from North America, across the mid-Atlantic ridge, to Europe, have students draw arrows in the magma showing how convection currents must be moving to cause the (divergent) plate movement above. Do the same for a convergent boundary.	• Explain that the Earth's lithosphere is broken up into oceanic and continental plates. • Describe how hot rising magma and relatively cooler sinking magma in the Earth create convection currents that push the tectonic plates. • Explain that the tectonic plates move at about the same speed that fingernails grow.	**Focus on ES: 4:3, 5:1** *PH FoES, Ch 1:5*	***KEY VOCABULARY:*** lithospheric plates **convection** **oceanic plate** density **continental plate** tectonic plates **continental plate** ***GRAPHIC ORGANIZERS:*** Venn Diagram: continental and oceanic plates ***SKILLS FOCUS:*** Applying prior knowledge Develop a hypothesis. **(I&E 7.a)** Select and use appropriate tools and technology to perform tests, collect data, and display data. **(I&E 7.b)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: Ch 4, Design Your Own Lab: "Use the Internet: Inferring Plate Tectonic Activity", p.196-197 • Focus on ES: 5:1, Applying Math, "Speed of Lithospheric Plates", p.222 • Focus on ES: 5:1, Additional Activity, p.222 TE • Focus on ES: 4-in-1 LAB, "How do Continental Plates move?", p.25-27 • Focus on ES: 4-in-1Lab, "Rena's Folly", pp.133-136 • Focus on ES: Ch 4 Transparency, "Plates of the Lithosphere" • **HartRAO:** Intro to Plate Tectonics www.hartrao.ac.za/geodesy/tectonics.html • **McDougal Littell:** "Animation of plate movement predicted for the future", www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES0807	3 Days

Plate Tectonics and Earth's Structure (cont'd)

1. Plate tectonics accounts for important features of Earth's surface and major geologic events.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… the fit of the continents, location of earthquakes, volcanoes, and midocean ridges, and the distribution of fossils, rock types, and ancient climatic zones provide evidence for plate tectonics. **(1,a)** **DISTRICT ASSESSMENTS:** CR: A Moving Experience **MODIFIED ASSESSMENTS:** In pairs, using a physical map of regions on Earth (showing ocean floor topography when appropriate), students label areas of continental drift showing the direction of movement and listing evidence to look for which would prove continental drift. (These could include plant/animal fossils, landforms, magnetic alignment of rocks, age of rocks, and shapes of landmasses.)	• Describe the theory of continental drift and give evidence from landforms, fossils and climates. • Describe how the existence of midocean ridges provides further evidence for plate tectonics. • Cite general evidence that when plates move, landforms are generated along plate boundaries.	**Focus on ES, Ch 4:1, 2, 5:2, 10:1, 4** *PH FoES, Ch 1:3,4 & Ch 2*	***KEY VOCABULARY:*** Pangaea, continental drift, climate, fossil, mid-ocean ridge, geothermal, plate tectonics, volcano, sea floor spreading, **faults**, **earthquakes**, topography ***GRAPHIC ORGANIZERS:*** Tree Map: Evidences of Plate Tectonics ***SKILLS FOCUS:*** Observing, giving evidence Interpret events by sequence and time from natural phenomena. **(I&E 7.g)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: Ch 2 Launch Lab, "How can you model landscapes?", p. 75 • Focus on ES: Ch 4 Launch Lab, "Can you put it back together?", p. 163 • Focus on ES: 4:1, Demo., "Breakup of Pangaea", p. 167 • Focus on ES: 4:1, Practice Skills, "Reconstruct", p. 168 • Focus on ES: 4:1. Demo., "Similar Organisms found …", p. 169 • Focus on ES: 4:1, Mini-Lab, "Drifting Continents", p. 172 • Focus on ES: 4:2, Nat'l Geog., "Vis'ing Mid-Ocean Ridges", p. 177 • Focus on ES: 4:2, Demo., "Identify", p. 178 • Focus on ES: 4:2, Practice Skills, "Model the Seafloor", p. 179 • Focus on ES: 4:2, Demo., "Drilling for Samples", p. 180 • Focus on ES: 4:2, Data Lab, "How fast does seafloor spread?", p. 182 • Focus on ES: 10:1, Demo., "Model Echo Sounding", p. 426 • Focus on ES: 10:1, Data Lab, "How … read a bathymetric map?", p. 428 • Focus on ES: 10:4, Lab, "Mapping the Ocean Floor", pp. 454-455 • Focus on ES: 4-in-1 Lab, "Charting the Ocean Floor", pp. 5-7 • Focus on ES: 4-in-1 Lab, Concretions", pp. 9-10 • Focus on ES: 4-in-1 Lab, "Paleogeographic Mapping", pp. 29-32 • Focus on ES: 4-in-1 Lab, Earth's Plates", p. 33-37 • Focus on ES: 4:1, Transparency "A Cold Dig" • Focus on ES: Ch 4 Transparencies, "Continental Drift and Fossils" "Let Go of Pressure" "Ocean Basin • **McDougal Littell:** Animation of the breakup of Pangaea www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES3005 • **Moorland School:** "Plate tectonics", www.moorlandschool.co.uk/earth/tectonic.htm • **USGS:** "Historical Perspective" http://pubs.usgs.gov/gip/dynamic/historical.html • **NASA:** "Evidence Supporting Continental Drift" http://kids.earth.nasa.gov/archive/pangaea/evidence.html	10 Days

Plate Tectonics and Earth's Structure (cont'd)

1. Plate tectonics accounts for important features of Earth's surface and major geologic events.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… earthquakes are sudden motions along breaks in the crust called faults, and volcanoes / fissures are locations where magma reaches the surface. **(1,d)** **DISTRICT ASSESSMENTS:** CR: A Moving Experience CR: California on the Move **MODIFIED ASSESSMENTS:** Stay & Stray Activity: In pairs, students create a poster of one of the different types of volcanoes and types of faults. Student (experts) then take turns teaching each other the key facts.	• Describe the type of faults. • Explain why faults form. • Explain the different ways that magma can reach the Earth's surface. • Describe types of volcanoes and how they form.	**Focus on ES: 5:1, 6:1 and 7:1,2,3** *PH FoES, Ch 2:1 & 3:2,3*	***KEY VOCABULARY:*** **fault**, **earthquake**, stress, fissures, volcano, magma, lava, seismic, ring of fire, crater, magma chamber, cone, shield, composite, eruption, molten ***GRAPHIC ORGANIZERS:*** Table: listing Type of Fault, Example, and Cause Multiflow Diagram: Earthquakes ***SKILLS FOCUS:*** Observation Recognize whether evidence is consistent with a proposed explanation. **(I&E 7.e)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: Ch 5 Launch Lab, "How do objects deform?", p. 207 • Focus on ES: 5:1, Demo., "Rock Stretch", p. 211 • Focus on ES: 5:1, Demo, "Normal and Reverse Faults", p. 213 • Focus on ES: 5:1, Mini-Lab, "How can you model movement of a fault?", p. 214 • Focus on ES: Ch 6 Launch Lab, "Rocks Stretch", p. 243 • Focus on ES: 6:1, Demo, "Model Elastic Strain", p. 247 • Focus on ES: Ch 7 Launch Lab, "How did these rocks form?", p. 291 • Focus on ES: 7:1, Demo, "Model Magma Movement", p. 295 • Focus on ES: 7:1, Mini-Lab, "How do volcanoes form?", p. 300 • Focus on ES: 7:2, Demo, "Model", p. 303 • Focus on ES: 7:2, National Geographic, "Visualizing Lava", p. 306 • Focus on ES: 7:2, Data Lab, "Model structures of volcanoes", p. 312 • Focus on ES: 4-in-1 LAB, "Earthquakes", pp. 45-47 • Focus on ES: 4-in-1 LAB, "Volcanic Eruptions", pp. 49-52 • Focus on ES: 4-in-1 LAB, "Volcanic Preservation", pp. 53-54 • **IRIS:** fault motion animations http://www.iris.edu/gifs/animations/faults.htm • **NASA Space Grant:** "Volcano World", http://volcano.und.edu/ • **McDougal Littell:** "Examine animations of fault motion", www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES1103	5 Days

Plate Tectonics and Earth's Structure (cont'd)

1. Plate tectonics accounts for important features of Earth's surface and major geologic events.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… major geologic events, such as earthquakes, volcanic eruptions, and mountain building result from plate motions. **(1,e)** **DISTRICT ASSESSMENTS:** CR: A Moving Experience **MODIFIED ASSESSMENTS:** Identify Pacific Plate boundaries by plotting locations of earthquakes and volcanoes on a world map using iris.edu. Have students note the pattern outlining the Ring of Fire. Explain the causes and surface effects of these.	• Explain how the theory of plate tectonics accounts for the formation, movement, colliding, and subduction of earth's plates. • Describe how various plate movements explain earthquakes, volcanic eruptions, and mountain-building. • Plot the locations of major earthquakes and volcanic eruptions for the last 10 to 100 years on a large map using the internet or various library resources. • Describe that tectonic events form a "ring" that outlines the Pacific plate and that there is a Hawaiian "hot spot". • List landforms likely to be associated with plate boundaries (i.e., mountain ranges, ocean trenches, and volcanic island arcs).	**Focus on ES: Ch 2:1, 5:1,2 6:1 7:1, 3 10:4** *PH FoES, Ch 1:5, 2, 3:1, and 13:1*	***KEY VOCABULARY:*** convergent boundary island arc **subduction** collision hot spot ring of fire volcano trench ***GRAPHIC ORGANIZERS:*** Flow Map: Plate movements to faults to earthquakes, volcanoes, and landforms ***SKILLS FOCUS:*** Mapping, interpreting Recognize whether evidence is consistent with a proposed explanation. **(I&E 7.e)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 2:1, Demo, "Model landforms", p. 79 • Focus on ES: 2:1, Data Lab, "How do mountains vary in shape?", p. 85 • Focus on ES:5:1, National Geographic, "Visualizing Rift Valleys", p. 217 • Focus on ES:5:1, Demo, "Density", p. 219 • Focus on ES: 5:2, Data Lab, "How do landforms define plate boundaries?", p. 227 • Focus on ES: 5:2, Design your own Lab, "Earthquake Depths and Plate Boundaries", pp. 228-229 • Focus on ES: 6:1, Mini-Lab, "Modeling earthquakes and Plate tectonics", p. 250 • Focus on ES:7:3, Applying Math, "Finding Range", p. 319 • Focus on ES:7:3, LAB, "Use the Internet: The Ring of Fire", p. 320-321 • Focus on ES:4-in-1 LAB, "Earth's Plates - PART C", p. 33-37 • Focus on ES: Ch 1 Transparencies, "Valley of Ten Thousand Smokes" "Volcanic Mountain Structure" • Focus on ES: Ch 5 Transparencies, "Plate Movement" "Faults" • Focus on ES: Ch 7 Transparencies, "River Ablaze" "Volcanoes and Hot Spots" "Volcanoes" • Focus on ES: Ch 10 Transparencies, "Water, Water, Everywhere" "The Ocean Floor" "California Coast" • **IRIS:** "Seismic Monitor", http://www.iris.edu/seismon/ • **USGS:** "Plate Motions", http://pubs.usgs.gov/gip/dynamic/understanding.html • **McDougal Littell:** animations of plate boundary processes www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES0804 • **McDougal Littell:** animation of volcanism at a subduction zone www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES0902 • **McDougal Littell:** animation of the Himalayas forming www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES1105	4 Days

Plate Tectonics and Earth's Structure (cont'd)

1. Plate tectonics accounts for important features of Earth's surface and major geologic events.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… how to determine the epicenter of an earthquake and that the effects of an earthquake vary with its size, distance from the epicenter, local geology, and the type of construction involved. **(1,g)** **DISTRICT ASSESSMENTS:** CR: A Moving Experience CR: California on the Move **MODIFIED ASSESSMENTS:** Given P and S wave data for three seismic stations, students are able to triangulate the location of a hypothetical earthquake epicenter. Pairs of students make an illustrated earthquake safety kit checklist. In small groups, students will answer a series of "What if? " earthquake situation questions on index cards. Students rotate the cards until they have answered all the questions. Given a square of jello, 10 toothpicks, and 10 mini-marshmallows, pairs of students create earthquake-proof structures. Compare these to building code regulations.	• Describe how the energy waves of an earthquake travel through Earth. • Identify and describe the different P and S seismic waves. • Model seismic waves through the use of a spring. • Calculate the velocities of P- and S-waves using a spring. • Compare Richter and Mercalli scales used to measure earthquake intensity. • Determine the epicenter of an earthquake through using the method of triangulation. • Describe construction methods that improve the ability of buildings to withstand the effects of earthquakes.	**Focus on ES, Ch 6:2,3,4** *PH FoES, Ch 2:2,3*	***KEY VOCABULARY:*** epicenter, magnitude focus, amplitude seismography, intensity **primary wave (P wave)** **secondary wave (S wave)** vibration, triangulation velocity, rupture Richter scale, liquifaction Mercalli scale, brittle compression, flexible tension, shearing ***GRAPHIC ORGANIZERS:*** T Chart: Earthquake Safety – Safe vs. Unsafe ***SKILLS FOCUS:*** Construct appropriate graphs from data and develop qualitative statements about the relationships between variables. (I&E 7.c) Interpret events by sequence and time from natural phenomena. (I&E 7.g) ***LABS / DEMOS / VISUALS:*** • Focus on ES: 6:2, Mini-Lab, "Modeling P and S waves", p. 256 • Focus on ES: 6:2, Applying Math, "Speeds of seismic waves", p. 259 • Focus on ES: 6:3, Demo, "Seismograph", p. 263 • Focus on ES: 6:3, Data Lab, "… earthquake's epicenter?", pp. 268-269 • Focus on ES: 6:4, Nat'l Geog., "Visualizing Tsunamis", p. 273 • Focus on ES: 6:4, Demo, "Model structures", p. 275 • Focus on ES: 6:4, Demo, "Earthquake safety", p. 277 • Focus on ES: 6:4, Data Lab, "… areas at risk for earthquakes?, p. 279 • Focus on ES: 6:4, Design your own lab, "Preparing for an earthquake", pp. 280-281 • Focus on ES: 4-in 1 Lab, "Using the modified Mercalli scale to locate an epicenter", p. 39-43 • Focus on ES: 4-in 1 Probeware, "Measuring Earthquakes", pp. 159-161 • Focus on ES: Ch 6 Transparencies "Earthquake Activity" "Seismic Waves" "Earthquake Intensity" "Earthquakes"" "Surface Waves" "A Beautiful Detector • **USGS:** Latest Quake Info http://quake.wr.usgs.gov/recent/index.html • **USGS:** "Earthquakes" http://earthquake.usgs.gov/ • **McDougal Littell:** "Observe animations of earthquake waves", www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES1002 • **McDougal Littell:** "Observe P and S waves through Earth's interior", www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES1009	7 Days

End District Quarter 3 Exam Material

Shaping Earth's Surface

2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… water running downhill is the dominant process in shaping the landscape, including California's landscape. **(2,a)** **DISTRICT ASSESSMENTS:** CR: Wasting Away **MODIFIED ASSESSMENTS:** Pairs of students design a way to separate small, medium, and large soil particles using wind or water. Students match appropriate key vocabulary words to cards showing erosion landforms. Students perform GEMS: "River Cutters" assessment after about six guided trials. After observing their stream table, students record the types of erosion and landscape formations over time.	• Explain the concepts of weathering, erosion and deposition and relate them to landscape formations. • Model transportation and deposition of sediment. • Demonstrate that different sizes of sediments settle at different rates. • Describe the effects of moving water. • Describe the effects and cite examples of wind and glacial erosion.	**Focus on ES, Ch 1:1-2 2:1, 8:1-3** *PH FoES, Ch 7:1, 8:1-4 10:1*	***KEY VOCABULARY:*** chemical weathering mechanical weathering erosion deposition glaciers sediment settling landscape topography mass wasting ***GRAPHIC ORGANIZERS:*** Tree Map: wind, water, and glacier erosion ***SKILLS FOCUS:*** Read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map. **(I&E 7.f)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 1:1, Launch Lab, "How might you map …" p. 45 • Focus on ES: 1:1, Demo. (Lat. and Long.), p. 51 TE • Focus on ES: 1:2, Nat'l Geog., Visualizing Topography, p. 57 • Focus on ES: 1:2, Data Lab, "How does a landscape change over time?" p. 62 • Focus on ES: 1:2, Lab, "Mapping a Race Route", pp. 64-65 • Focus on ES: Reference Handbook, "Topographic Map Symbols", p. 673 • Focus on ES: 8:1, Launch Lab, "Set in Stone?", p. 331 • Focus on ES: 8:1, Activity (Weathering), p. 336 TE • Focus on ES: 8:1, Mini Lab, "Water and Weathering", p. 338 • Focus on ES: 8:1, Demo., "Soil Formation", p. 338 TE • Focus on ES: 8:2, Demo., "Beach Deposition", p. 349 TE • Focus on ES: 8:3, Demo., "Glacier Deposition", p. 355 TE • Focus on ES: 8:3, Mini Lab, "Will it slump, or will it creep?" p. 362 • Focus on ES: 8:3, Lab, "Stream Sediment", pp. 364-365 • **Demonstration**: Place varying sizes/types of sediment in a jar, shake the jar, and observe rate of settling. • Focus on ES: 4-in-1 Lab, "Determining Latitude", pp. 1-4 • Focus on ES: 4-in-1 Lab, "Charting the Ocean Floor", pp. 5-8 • Focus on ES: 4-in-1 Lab, "Mass Movements", pp. 55-56 • Focus on ES: 4-in-1 Lab, "Modeling a Glacier", pp. 57-58 • Focus on ES: Ch 1 Transparencies, "Latitude and Longitude" "Map Reading" • Focus on ES: Ch 8 Transparencies, "Going, Going…" "Types of Weathering" "Avalanche" • **Geology Online:** "Weathering and Erosion" http://geologyonline.museum.state.il.us/tools/lessons/6.3/lesson.html • **USGS**: "Glacial Striations" http://education.usgs.gov/schoolyard/glacialstriations.html • **USGS**: "27 ideas for teaching with Topographic Maps" http://education.usgs.gov/common/lessons/teaching_with_topographic_maps.html	7 Days

Shaping Earth's Surface (cont'd)

2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns. **(2,b)** **DISTRICT ASSESSMENTS:** CR: Wasting Away **MODIFIED ASSESSMENTS:** Pairs of students respond to the "Inquiry Challenge" in Focus on ES, p. 245 In small groups, students plan ways to control floods (sand bags, dams, river diversion, etc.).	• Explain how water erosion is the primary factor responsible for shaping Earth's land surface. • Describe some of the land features formed by water erosion. • Explain how sediment enters rivers and streams. • List the factors that effect water's ability to erode and carry sediment. • Explain why a river may change its course over time. • Describe conditions that cause floods and describe how floods can be controlled.	**Focus on ES, Ch. 2:1, 8:2-3** *PH FoES, Ch 8:1,2, 3* *Ch 16: 3*	***KEY VOCABULARY:*** energy, volume, flow, flood, stream bank, oxbow lake, **sediment**, bedrock, slope, valley ***GRAPHIC ORGANIZERS:*** Flow Map: river changes over time and the reasons for the changes Tree Map: three ways streams carry sediment ***SKILLS FOCUS:*** Communicate the steps and results from an investigation in written reports and oral presentations. **(I&E 7.d)** ***LABS / DEMOS:*** • GEMS: River Cutters • Focus on ES: 8:2, Demo., "Levees", p. 347 TE • Focus on ES: 8:2, Activity (Hurricane Katrina), p. 348 TE • Focus on ES: 4-in-1 Lab, "Where is the money?" pp. 121-124 • Focus on ES: 4-in-1 Lab, "What happened to the wild stream?" pp. 129-132 • Focus on ES: Ch 8 Transparencies, "Take the Long Way Home" "Mississippi River Watershed" • **Nat'l Geog.** (virtual lab), "Rain: Friend or Foe?", http://www.nationalgeographic.com/xpeditions/lessons/07/g68/rain.html • **Nat'l Geog.** (activity), "Delving into the Grand Canyon" http://www.nationalgeographic.com/xpeditions/lessons/07/g68/canyon68.html	5 Days

Earth and Life History (Earth Science) (Grade 7 CA Standard)

4. Evidence from rocks allows us to understand the evolution of life on Earth. As the basis for understanding this concept.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… Earth processes today are similar to those that occurred in the past and slow geologic processes have large cumulative effects over long periods of time. **(7-4,a)** **DISTRICT ASSESSMENTS:** CR: Lights Out CR: Sands of Time **MODIFIED ASSESSMENTS:** Students create color-coded posters showing different layers of rocks. Given 10 sample fossils, students glue them into the appropriate layers and use this poster to explain the law of superposition. (Refer to standard 1 to review continental drift and plate tectonics.)	• Define the principle of uniformitarianism. (*According to this principle, the laws of nature do not change over time. Therefore, the same processes that shaped the earth in the past are still at work today*). • Define the principle of superposition. (*The principle of superposition states that younger rock layers are formed on top of older rock layers. This principle is the basis for most relative age dating of fossils*). • Describe continental drift and give evidence for it (model the process). • Explain the theory of plate tectonics. • Describe the relationship between the fossil records and geologic history.	**Focus on LS, Ch 7:1** *PH FoLS, Ch. 6:1, 2, 5* *PH FoES, Ch 1:3, 5*	***KEY VOCABULARY:*** continental drift Pangaea **uniformitarianism** plate tectonics **superposition** fossil record sedimentary rock ***GRAPHIC ORGANIZERS:*** Flow Map: geologic time scale with examples of organisms ***SKILLS FOCUS:*** Inferring, organizing Communicate the logical connection among hypothesis, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence. **(I&E 7.c)** ***LABS / DEMOS / VISUALS:*** • Use hand motions to simulate plate movement. • Focus on LS: 7:1, Launch Lab, "What is Earth's surface like?" p. 281 • Focus on LS: 7:1, Activity (Layering and Superposition), p. 290 TE • Focus on LS: 7:1, Mini Lab, "How does Earth change …?", p. 292 • Focus on LS: 4-in-1 Lab: "Principle of Superposition", pp. 37-39 • Focus on ES: Ch 1 Transparency, "Geologic Mapping" • Focus on LS: Ch 7 Transparencies, "Older than the Hills" "Rock Cycle" • GEMS: Life Through Time • **The Paleontology Portal:** http://www.paleoportal.org/ • **USGS:** Educational Resources for Paleontology, http://geology.er.usgs.gov/paleo/eduinfo.shtml • **Glencoe:** "The Fossils of Antarctica" http://www.glencoe.com/sites/common_assets/science/webquests/fossils.html#task	3 Days

Earth and Life History (Earth Science) (Grade 7 CA Standard) (cont'd)

4. Evidence from rocks allows us to understand the evolution of life on Earth. As the basis for understanding this concept.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… the history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids. **(7-4,b)** **DISTRICT ASSESSMENTS:** CR: Lights Out **MODIFIED ASSESSMENTS:** In groups, students discuss and create a plan for what we might do if there were a major, catastrophic event such as a meteor or major volcanic eruption. They should address the question, "How would life change?"	• Discuss that though rare, catastrophic events have had a significant effect on the shaping of Earth's surface and on the evolutionary development of life. • Describe the immediate effects of catastrophic events such as a large meteor impact or major volcanic eruption (both of which cause the injection of large amounts of fine-grained particle matter into the atmosphere, which may cause immediate regional and global consequences for climate and short and long-term changes in habitat).	**Focus on LS, Ch 8:1-3** *PH FoLS, Ch 6:5*	***KEY VOCABULARY:*** catastrophe, meteor, volcano, consequence, effect, atmosphere, climate, habitat, catastrophic ***GRAPHIC ORGANIZERS:*** Venn Diagram: effects of volcanic eruptions and asteroid impacts ***SKILLS FOCUS:*** Comparing, contrasting, observing Utilize a variety of print and electronic resources (including the World Wide Web) to collect information as evidence as part of a research project. **(I&E 7.b)** ***LABS / DEMOS / VISUALS:*** • Allow students to observe and describe volcanic ash, focusing on its fine particulate nature. • Focus on LS: 8:1, Demo., " Permian Extinction", p. 319 TE • Focus on LS: 8:1, Use Models (Asteroid Impact), p. 322 TE • Focus on LS: 8:1, Data Lab, "Which organisms return first …?", p. 324 • Focus on LS: Ch 8 Transparency, "Bad for Pompeii, Good for Archaeology" • **McDougal Littell:** animation of an asteroid impact … Cretaceous Period www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES3006 • **Enchanted Learning:** "Geologic Time Scale" http://www.enchantedlearning.com/subjects/Geologictime.html • **PBS:** "What killed the dinosaurs?" http://www.pbs.org/wgbh/evolution/extinction/dinosaurs/index.html	3 Days

Earth and Life History (Earth Science) (Grade 7 CA Standard) (cont'd)

4. Evidence from rocks allows us to understand the evolution of life on Earth. As the basis for understanding this concept.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… the rock cycle includes the formation of new sediment and rocks and that rocks are often found in layers, with the oldest generally on the bottom. **(7-4,c)** [Note: This standard extends the introduction of superposition in standard 7-4a and reviews erosion and deposition concepts from standards 2a-d.] **DISTRICT ASSESSMENTS:** CR: Lights Out CR: Sands of Time **MODIFIED ASSESSMENTS:** Teacher creates fossil columns by pouring four different colors of plaster into cups with a different "fossil" in each layer (i.e., peanut, paper clip, eggshell, chicken bone). Students act as paleontologists by excavating the fossils, drawing a diagram of where each fossil was discovered, and drawing conclusions about what events took place and in what sequence.	• Define sediment as a combination of organic and inorganic materials (rock and mineral fragments, various dissolved ions, and biological debris). • Diagram how sediment is transported and deposited to form new sedimentary rock. • Describe the formation of sediment as due to physical processes (abrasion and freezing and thawing cycles) and chemical processes (acid rain and oxygen which results in the formation of new types of minerals). • Determine the relative ages of rock layers using the principle of superposition (include cross-cutting and inclusions). • Describe how the biological portion of accumulated sediment may be fossilized and preserved to provide a partial record of organisms from the source area.	**Focus on LS: Ch. 6:1, 7:1** *Focus on LS: 6.1, 2*	***KEY VOCABULARY:*** sediment, organic, inorganic, minerals, ions, debris, abrasion, relative age, **superposition**, acid rain, erosion, lithification / lithify ***GRAPHIC ORGANIZERS:*** Flow Map: sediment to sedimentary rock Venn Diagram: comparing sediment samples (sand, silt, clay, garden soil) ***SKILLS FOCUS:*** Comparing, contrasting Communicate the logical connection among hypothesis, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence. **(I&E 7.c)** ***LABS / DEMOS / VISUALS:*** • Focus on LS: 7:1, Activity (Clast Shape), p. 286 TE • Focus on LS: 7:1, Activity (Sediment Sorting), p. 287 TE • Focus on LS: 7:1, Demonstration, "Sediment Sorting", p. 289 TE • Focus on LS: 7:2, Lab, "Erosion Stoppers", pp. 302-303 • **USGS:** "Rock Stories" http://education.usgs.gov/schoolyard/RockActivity.html • **Sci. Net Links:** "How Sedimentary Rocks are formed" http://www.sciencenetlinks.com/lessons.cfm?Grade=6-8&BenchmarkID=4&DocID=174	2 Days

Earth and Life History (Earth Science) (Grade 7 CA Standard) (cont'd)

4. Evidence from rocks allows us to understand the evolution of life on Earth. As the basis for understanding this concept.

Standards and Assessments "Students know…"	Task Analysis "Students are able to …"	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
… fossils provide evidence of how life and environmental conditions have changed. **(7-4,e)** **DISTRICT ASSESSMENTS:** CR: Lights Out CR: Sands of Time **MODIFIED ASSESSMENTS:** Pairs of students compare fossils of ancient organisms to similar modern organisms using a Venn diagram. Then, they report to the class on their hypothesis about how differences in environmental conditions might account for the differences in organisms.	• Describe how fossils provide evidence of the environments and types of life that existed in the past (environmental changes are reflected by the classes of organisms that evolved during the period of environmental change). • Describe how geologists use the principle of uniformitarianism to exam fossil evidence, noting changes in organism types over time (ancient animals that exhibit the same shell shape and thickness of modern clams probably lived in the same type of environment).	**Focus on LS: 6:1, and 8:1,2,3** *PH FoLS: 6:1,2,4,5*	***KEY VOCABULARY:*** index fossils environment **uniformitarianism** ***GRAPHIC ORGANIZERS:*** T Chart: environmental conditions today and 100 million years ago ***SKILLS FOCUS:*** Comparing, contrasting, inferring Communicate the logical connection among hypothesis, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence. **(I&E 7.c)** ***LABS / DEMOS / VISUALS:*** • Focus on ES: 4-in-1 LAB, "Index Fossils", pp. 21-23 • Focus on LS: 6:1, Mini Lab, How do Fossils Form?", p. 249 • Focus on LS: 6:1, Demo, "Share Fossils", p. 245 TE • Focus on LS: 6:1, Demo, "Fossilized or Not?", p. 247 TE • Focus on LS: 6:1, Demo, "Env'l Info. from Fossils", p. 249 TE • Focus on LS:8:2, Mini Lab, "What makes the best fossils?", p. 327 • Focus on LS:8:3, Mini Lab, "What happened here?, p. 340 • **McDougal Littell:** "Observe how fossils can form" www.classzone.com/books/earth_science/terc/navigation/home.cfm Enter keycode ES2901	3 Days
… how to explain significant developments and extinctions of plant and animal life on the geologic time scale. **(7-4,g)** **DISTRICT ASSESSMENTS:** CR: Lights Out **MODIFIED ASSESSMENTS:** Create a class geologic timeline using the scale 1 mm = 1 milion years. Students are given pictures of organisms with a time period and glue the pictures to the correct location in time.	• List the gradual changes that life has undergone during the history of Earth (i.e. organisms adapt to slowly changing environments, evolution of new species, and extinction of species). • Provide examples of organisms that support the principle of uniformitarianism (i.e. photosynthetic cyanobacteria, a.k.a. blue-green algae). • Prove whether the principle of uniformitarianism is consistent over the history of the Earth by researching evidence, such as: o Early Earth was very different from today as little oxygen was present in the atmosphere. o There was no ozone layer in the early stratosphere. o Earliest life was anaerobic. o Earth's history has been punctuated by catastrophic events such as mass extinctions and the Cambrian explosion.	**Focus on LS, 8:1,2,3** *PH FoLS, Ch 6:4,5*	***KEY VOCABULARY:*** environment organisms anaerobic ozone layer photosynthetic cyanobacteria (blue-green algae) ***GRAPHIC ORGANIZERS:*** Time Line: Students' life history ***SKILLS FOCUS:*** Interpreting data, making models Construct scale models appropriately labeled diagrams to communicate scientific knowledge **(I&E 7.d)** ***LABS / DEMOS / VISUALS:*** • Focus on LS: 4-in1-Lab, "Modeling Geographic Isolation", pp. 49-50 • Focus on LS: 6:3, Nat'l Geog.: "Vis'ing Geographic Isolation", p. 258 • Focus on LS: 4-in-1 Lab, "Looking at the Geologic Timescale", pp. 45-48 • Focus on LS: 8:3, Demo., "Geologic Timescale", p. 337 TE • Focus on LS: 8:3, Lab, " …CA … Over Geologic Time", pp. 342-343 • **USGS:** "Our changing continent " http://pubs.usgs.gov/gip/continents	7 Days

Health education from Project ALERT lessons 1-6 are optional.
Materials and training are available through the Health Curriculum Office (Ext 2967).

APPLICATION OF COURSE CONTENT: ***Career Connections***

Related Major Skills & Characteristics – objective observation, careful measurement, curiosity, problem solving, organizational skills, numerical reasoning, ability to analyze & interpret data, critical thinking, reading comprehension, concise and accurate communication skills, computer literacy, logical thinking, team skills, testing skills, practical safety awareness, evidence evaluating

Related Careers – Students who continue in the sciences can prepare for the following careers:

Aeronautical Engineer *(Rocket Scientist)*
Agricultural Ecologist
Analytical Chemist
Aquatic Microbial Ecologist
Astronomer
Automotive Engineer
Biochemist
Biologist
Biotechnologist
Botanist
Cell Biologist
Chemical Engineer
Electrical Engineer
Energy
Fire Fighter
Geologist
Geneticist
Immunologist
Marine Biologist
Materials Scientist
Medical Researcher
Meteorologist
Microbiologist
Mining Geologist
National Park Ranger
Neurobiologist
Nuclear Physicist
Nurse
Paleontologist
Pathologist
Pediatrician
Petroleum Geologist
Pharmacist
Physician
Physicist
Physiologist
Professor
Quality Control Specialist
Radiologist
Refrigeration Technician
Science Fiction Writer
Seismologist
Teacher
Technical Editor
Veterinarian
Virologist
Wildlife Ecologist

METHODS:

Lesson Design & Delivery: Teachers will incorporate these components of lesson design during direct instruction and inquiry activities. The order of components is flexible, depending on the teacher's vision for the individual lesson. For instance, the objective and purpose, while present in the teacher's lesson plan, are not made known to the students at the beginning of an inquiry lesson.

Essential **E**lements of **E**ffective **I**nstruction Model for Lesson Design Using Task Analysis	Anticipatory Set Objective Standard Reference Purpose Input Modeling Check for Understanding Guided Practice Closure Independent Practice

Some components may occur once in a lesson, but others will recur many times. Checking for understanding occurs continually; input, modeling, guided practice and closure may occur several times. There may even be more than one anticipatory set when more than one content piece is introduced.

Active Participation: Teachers will incorporate the principles of active participation and specific strategies to ensure consistent, simultaneous involvement of the minds of all learners in the classroom. Teachers should include both covert and overt active participation strategies, incorporating cooperative learning structures and brain research. Some of the possible active participation strategies include:

COVERT	OVERT (Oral)	OVERT (Written)	OVERT (Gestures)
• Recall • Imagine • Observe • Consider	• Pair/Share • Idea Wave • Choral Response • Give One, Get One • Socratic Seminar • Cooperative Discussion Groups (i.e.Talking Chips, Gambit Chips)	• Restate in Journals / Notes • Response Boards • Graphic Organizers • Folded Paper • Ticket Out of Class	• Hand Signals • Model with Manipulatives • Stand up/ Sit down • Point to Examples

Baldridge Quality Tools: Students can become more positively involved in their education through goal setting, self-assessment, and data tracking and analysis by making use of the following strategies:

BALDRIDGE TOOL	PURPOSES
Affinity Diagram	– finding consensus, organizing complex information
Flowchart	– describing a process, planning a project, identifying problem steps in a process
Force Field Diagram	– identifying obstacles, finding causes and solutions to problems
Issues / Ideas Bin	– handling individual questions/requests without stopping a group activity, providing anonymous input, obtaining diverse input in specific areas.
Data Folder	– tracking goals and actual results
Plus / Delta	– tracking improvement efforts, identifying opportunities for change, finding out what's working and what's not working in a process, procedure, activity, etc.
Class Data Graphs	– displaying trends for goal setting

Learning styles and learning challenges of your students may be addressed by implementing combinations of the following:

Reading Strategies in Science
- ❑ Learning Logs
- ❑ Pre-teaching
- ❑ Vocabulary
- ❑ Pre-reading
- ❑ Text Structures
- ❑ Trail Markers
- ❑ Reciprocal Teaching
- ❑ Functional Text

SDAIE Strategies for English Learners
- ❑ Tapping/Building Prior Knowledge (Graphic Organizers, Schema)
- ❑ Grouping Strategies
- ❑ Multiple Intelligences
- ❑ Adapt the Text
- ❑ Interactive Learning (Manipulatives, Visuals)
- ❑ Acquisition Levels
- ❑ Language Sensitivity
- ❑ Lower the Affective Filter (including Processing Time)
- ❑ Home/School Connection (including Cultural Aspects)

Differentiation for Advanced Learners
- ❑ Curriculum Compacting
- ❑ Tiered Assignments
- ❑ Flexible Grouping
- ❑ Acceleration
- ❑ Depth and Complexity
- ❑ Independent Study

Significant, Proven Science Strategies for ALL Science Students
- ❑ Hands-On Labs
- ❑ Inquiry Activities
- ❑ Written/Oral Presentations
- ❑ Short/Long-term projects
- ❑ Essential Questions
- ❑ Summarization
- ❑ Current Events
- ❑ Peer Teaching
- ❑ Guest Speakers

Please note that these strategies often overlap and should not be limited to specifically defined courses or student populations.

MATERIALS:

Basic Textbook and Supplementary Materials: Focus on Earth Science, Glencoe © 2007

eguidance.com web site for exploring careers
safety equipment: goggles, latex gloves, fire extinguisher
glassware: flasks, beakers, test tubes, etc.
measuring devices: triple beam balance, rulers, volumetric containers
chemical reagents
microscopes, microviewers, hand lenses, dissection equipment
appropriate technology

❖ Many items are available through Science/Math Resource Center (SMRC).

SUPPORT FOR ENGLISH LANGUAGE LEARNERS:

Resources Accompanying the Basic Text:

Printed Study Guide (chapter summaries) available in five languages
Student workbooks available in Spanish
Text chapters on audiocassette available in English and Spanish
Unit review videos available in English and Spanish
Suggested alternate/supplemental activities geared for ELL's

- Hands-on activities and projects
- Supplemental audio/visual content materials
- Computer resources available through software and the internet
- Newspapers and magazines
- Guest speakers
- Posters and models
- Graphs and data tables
- Music and songs

RESOURCES:

Documents

- Science Framework: ..... http://www.cde.ca.gov/re/pn/fd/documents/scienceframework.pdf
  [or find it posted in sections at the LBUSD Science Office website]
- CST / NCLB Test Blueprints: ..... http://www.cde.ca.gov/ta/tg/sr/blueprints.asp
- CST Reference Sheets: ..... http://www.cde.ca.gov/ta/tg/sr/cstsciref.asp
- CST Released Test Questions http://www.cde.ca.gov/ta/tg/sr/css05rtq.asp
- National Science Standards: ..... http://www.nap.edu/readingroom/books/nses/html/
- Science Safety Handbook for CA Public Schools (1999)
  can be ordered from the CDE at ..... http://www.cde.ca.gov/re/pn/rc/
- LBUSD Approved Chemicals List, Chemical Hygiene Plan, and Science Fair Resources:
  http://www.lbusd.k12.ca.us/Main_Offices/Curriculum/Areas/Science/teacher_resources.cfm

District Offices

- Science Curriculum Office (562) 997-8000 (ext. 2963)
  - K-12 science standards, curriculum, professional development, science fair
- Science / Math Resource Center (SMRC) (562) 997-8000 (ext. 2964)
  - hands-on materials, consumable material orders, alternative standards-based curriculum packets
- Instructional Materials Workshop (IMW) (562) 997-8000 (ext. 2965)
  - standards-based instructional materials
  - content integrated instructional materials
  - monthly theme-based literacy supplements for science
  - wood shop / lumber room
  - copying, enlarging, and laminating
- Office of Multimedia Services (OMS) (562) 997-8000 (ext. 7145)
  - videos for check out to fit the curriculum (see your librarian for current catalogs)
  - district TV channels programming
- PALMS Office Program Assistance for Language Minority Students (562) 997-8000 (ext. 8031)
  - technical assistance and professional development for English Language Development (ELD) and Specially Designed Academic Instruction In English (SDAIE)
  - assistance in the implementation and maintenance of programs addressing the needs of English Language Learners (ELLs)
- Health Curriculum Office (562) 997-8000 (ext. 2967)
  - curriculum and training for mandated health content

EVALUATION: Student achievement in this course will be measured using multiple assessment tools. Assessments will be used for diagnosing student understanding before instruction, monitoring student learning during instruction, and evaluating student understanding after instruction.

SUGGESTED EVALUATION TOOLS:

Source	Diagnose	Monitor	Evaluate
District Developed Assessments	Grade Level Pretest	Open-Ended Science Performance Task	End of Course Exam Open Ended Science
Glencoe Science: Focus on Earth Science	Reading Essentials: Before You Read Launch Labs New Vocabulary	Reading Check questions Science Notebook, "Summarize It" Lesson Review: Summarize, Using Vocabulary, Understanding Main Ideas, Applying Science Reading Essentials: Think it Over, Reading Check, Picture This Applying Math Foldables Active Folders Mini Lab and Lab Standards Review	Standards Assessment Performance Assessment Sci Activities for Adv. Learners Chapter & Unit Tests Rubric Scored Projects, Labs, and Writings
Teacher Developed Assessments	Accessing Prior Knowledge Activities Pre-quiz Pre-Test Vocab. Knowledge Rating	Warm-Up Quiz Proving Behavior Lab	Open-ended Prompts Chapter / Unit Test Practicum Semester Final Exam

SUGGESTED GRADE WEIGHTING:
(with some possible examples)

1. Assessment ~30%
   - o objective tests including comprehensive finals
   - o performance tasks (rubric scored)
   - o open-ended questions (rubric scored)
   - o portfolios
   - o student self-evaluations
2. Homework not more than 10%
   - o discovery assignments
   - o assignments reinforcing class lesson
   - o essays
   - o organization
   - o research
3. Labs ~20%
   - o lab reports
   - o active participation
4. Projects ~20%
   - o science fair projects
   - o research-based reports and projects
5. Classwork ~20%
   - o note taking skills
   - o organization skills
   - o oral presentations
   - o individual and group projects and assessments

STANDARD GRADING SCALE:		
Advanced Proficient	A	90 – 100%
	B	80 – 89%
Proficient	C	70 – 79%
Partial Proficient	D	60 – 69%
Not Proficient	F	0 – 59%

Submitted by: Eric Brundin (K. Feeley, D. Van Divort)
School: Science Office
Date: 5/27/08
Revised Board Date: 10/4/11