

FOLSOM-CORDOVA UNIFIED SCHOOL DISTRICT
Course Outline

GENERAL EARTH SCIENCE

DATE: April, 2008

SCHOOL: Middle Schools

COURSE TITLE: General Science

SUBJECT AREA: Science

PROPOSED GRADE LEVEL(s): Sixth Grade

COURSE LENGTH: One Year

GRADING: A-F

NUMBER OF CREDITS: NA

PREREQUISITES: Sixth Grade Standing

COURSE DESCRIPTION:

The Sixth Grade Middle School Science program emphasizes individual and active learning. This approach focuses on how a learner fits new information into his or her existing bank of knowledge and attitudes so new concepts will be constructed. Students understand the nature of science both as a way of thinking about the world and as a process. An integration of science, technology, and society will be emphasized to extend the study of science into the student's own home and neighborhood. This program reflects the current state science standards for sixth grade. Science can be organized in many ways; those presented here should be regarded as only some of the ways the concepts of science may be integrated into a curriculum that spans scientific disciplines. Each grade level includes investigation and experimentation as it relates each of the subject area/standards covered. The subject areas covered as follows:

- Plate Tectonics
- Shaping the Earth's Surface
- Heat and Thermal Energy
- Energy in the Earth System
- Ecology
- Resources

GENERAL GOALS/PURPOSES:

Science is an active enterprise, made so by our human capacity to think. Scientific knowledge grows as scientists think about the natural world, act on that knowledge in planned ways, and then develop thoughtful explanations of the results. The knowledge of science is its content. There is continual dynamic interaction between the content of science and the thinking processes that characterize the scientific enterprise. The content of science consists of a highly structured, complex set of facts, hypotheses, and theories in a context where many observations have meaning. Theory development is progressive; theory suggests further observations that often make possible further elaboration and testing of the theory.

Scientists use their senses and extensions of their senses to see, touch, and otherwise view the world, observing its characteristics and behaviors as objectively as possible. Scientists describe and picture what they observe in various ways, thus communicating their ideas to others so that they can exchange views and interpretations and pass along information. They test what they know against what they do not yet know, comparing features and behaviors for similarities and differences. Scientists organize their understandings, ordering and categorizing them into broader, more general groupings and classifications. They study the interactions among objects and describe the events, relating factors that reveal deeper insights into causes and effects. Scientists hypothesize

and predict what will happen based on accumulated knowledge and on the events they expect to take place, inferring something that they have not seen because it has not yet happened or because it cannot be observed directly. And as knowledge grows through the use of these scientific thinking processes, scientists develop expertise, applying both knowledge and processes for useful purposes, to make still further extensions of the explanatory power of theory and to perceive fresh possibilities.

STUDENT READING COMPONENT:

The goal of reading in science is to blend scientific knowledge and process with reading strategies to create scientifically literate students. The reading strategies emphasize upcoming key concepts in order to guide and ensure comprehension of the material.

Methods to be used may include, but are not limited to, guided reading, supplemental reading worksheets, vocabulary building activities, oral reading, and periodic comprehension checks.

STUDENT WRITING COMPONENT:

Students will be expected and encouraged to express themselves in complete sentences, with correct capitalization and punctuation, and correct spelling. While students will be expected to meet these standards to the best of their ability, they will be evaluated primarily on the content and quality of their work.

STUDENT ORAL COMPONENT:

Students will be engaged in meaningful science programs that stretch their content of understanding and their abilities to communicate their reasoning and problem solving through various methods such as team reporting and oral presentations.

DETAILED UNITS OF INSTRUCTION:

The following time line for instruction is a guide only. As the students become actively involved in exploring science concepts and processes that are part of each unit, the time line will be adjusted to allow for student-initiated learning activities and projects. In these cases, subsequent units may be shortened. While all standards will be covered, timelines are flexible.

Plate Tectonics and Earth's Structure (6 weeks)

California science standards:

- Plate tectonics explains important features of the Earth's surface and major geologic events. As the basis for understanding this concept, students know:
 - 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.
 - The solid Earth is layered with cold, brittle lithosphere; hot, convecting mantle; and dense, metallic core.
 - Lithospheric plates that are the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.
 - Earthquakes are sudden motions along breaks in the crust called faults, and volcanoes/fissures are locations where magma reaches the surface.
 - Major geologic events, such as earthquakes, volcanic eruptions, and mountain building result from plate motions.
 - How to explain major features of California geology in terms of plate tectonics (including mountains, faults, and volcanoes).
 - 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.

Vocabulary from California science standards: climatic zones, continents, core, earthquake, epicenter, faults, fissures, fossils, geology, lithosphere, lithospheric plates, magma, mid-ocean ridge, volcanoes, plate tectonics.

Correlates to Prentice Hall California Earth Science chapters 4, 5 and 6

Shaping the Earth's Surface (3 weeks)

Shaping the Earth's Surface

- Topography is reshaped by weathering of rock and soil and by the transportation and deposition of sediment. As the basis for understanding this concept, students know:
 - Water running downhill is the dominant process in shaping the landscape, including California's landscape.
 - Rivers and streams are dynamic systems that erode and transport sediment, change course, and flood their banks in natural and recurring patterns.
 - Beaches are dynamic systems in which sand is supplied by rivers and moved along the coast by wave action.
 - Earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.

Vocabulary from California science standards: beaches, deposition, dynamic systems, erode, landscape, landslides, sediment, topography, transport, volcanic eruptions, weathering, wildlife habitats.

Correlates to Prentice Hall California Earth Science chapters 3 and 11

Heat (Thermal Energy) (Physical Science) (2 weeks)

California science standards:

- Heat moves in a predictable flow from warmer objects to cooler objects until all objects are at the same temperature. As a basis for understanding this concept, students know:
 - 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.
 - When fuel is consumed, most of the energy released becomes heat energy.
 - 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).
 - Heat energy is also transferred between objects by radiation; radiation can travel through space.

Vocabulary from California science standards: conduction, convection, energy, fuel, heat, heat flow, heat transfer, light, radiation, sound, waves

Correlates with Prentice Hall California Earth Science chapters 7 and 9

Energy in the Earth System (7 weeks)

California science standards:

- Many phenomena on the Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept, students know:
 - The sun is the major source of energy for phenomena on the Earth's surface, powering winds, ocean currents, and the water cycle.
 - Solar energy reaches Earth through radiation, mostly in the form of visible light.
 - Heat from Earth's interior reaches the surface primarily through convection.
 - Convection currents distribute heat in the atmosphere and oceans.
 - Differences in pressure, heat, air movement, and humidity result in changes of weather.

Vocabulary from California science standards: convection currents, humidity, ocean currents, pressure, solar energy, water cycle, weather, visible light, winds

Correlates with Prentice Hall California Earth Science chapters 7, 8 and 9

Ecology (Life Science) (4 weeks)

California science standards:

- Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept, students know:
 - Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis, and then from organism to organism in food webs.
 - Over time, matter is transferred from one organism to others in the food web, and between organisms and the physical environment.
 - Populations of organisms can be categorized by the functions they serve in an ecosystem.
 - Different kinds of organisms may play similar ecological roles in similar biomes.
 - 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.

Vocabulary from California science standards: abiotic factors, biomes, chemical energy, ecosystems, ecological roles, environment, food webs, matter, nutrients, organisms, photosynthesis, populations, producers, physical environment

Correlates with Prentice Hall California Earth Science chapters 10, 11 and 12

Resources (4 weeks)

California Science Standards:

- 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:
 - 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.
 - Different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.
 - Natural origin of the materials used to make common objects.

Vocabulary from California science standards: air, energy resources, fresh water, material resources, minerals, natural resources, nonrenewable resources, petroleum, renewable resource, rocks, soil.

Correlates with Prentice Hall California Earth Science chapters 2, 7, 11 and 12

Investigation and Experimentation (4 weeks)

California science standards:

- Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations. Students will:
 - Develop a hypothesis.
 - Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
 - Construct appropriate graphs from data and develop qualitative statements about the relationships between variables.
 - Communicate the steps and results from an investigation in written reports and verbal presentations. Recognize whether evidence is consistent with a proposed explanation.
 - Read a topographic map and a geologic map for evidence provided on the maps, construct and interpret a simple scale map.

- Interpret events by sequence and time from natural phenomena (e.g., relative ages of rocks and intrusions).
- Identify changes in natural phenomena over time without manipulating the phenomena (e.g., a tree limb, a grove of trees, a stream, a hill slope).

This standard shall be met by incorporating activities into lessons throughout the sixth grade science program.

Vocabulary from California science standards: hypothesis, evidence, binoculars, variables, topographic map, geologic map, scale map.

Correlates with Prentice Hall California Earth Science chapters 1, 2, 3, 5, 6, 7 and 11

THIS COURSE WILL PREPARE STUDENTS FOR THE CAHSEE AND/OR THE FCUSD EXIT EXAMS:

Science

LAB FEE IF REQUIRED:

None

SUBJECT AREA CONTENT STANDARDS TO BE ADDRESSED:

See Detailed Units for Instruction for Sixth Grade Science Standards.

DISTRICT ESLR's TO BE ADDRESSED:

Students will be:

Self-Directed Learners: This course prepares students to be self-directed learners as they pursue mastering major concepts in investigation and experimentation, cell biology, genetics, evolution, earth sciences, structure, function, and physical principals in living systems.

Effective Communications: This course prepare students to be effective communicators as they complete the writing and oral components of this class.

Quality Producers/Performers: This course prepares students to be quality producers and performers by initiating projects, setting quality standards, and adapting to changing conditions.

Constructive Thinkers: This course prepares students to be constructive thinkers with lab assignments that require them to synthesize, apply, and analyze information, applying the concepts to other situations.

Collaborative Workers: Lab activities and other projects are done in cooperative groups. Students need to be collaborative workers in order to complete these tasks efficiently.

Responsible Citizens: This course will help prepare students to be responsible citizens by using life science knowledge and scientific inquiry skills to make informed decisions about issues related to life science and biotechnology.

APPENDIX I

Assessment Resources in Prentice Hall California Science

1. Progress Monitoring Assessments:
 - Diagnostic tests
 - Reading checkpoints
 - Caption Questions
 - Section Assessments
2. Summative Assessments:
 - Chapter tests
 - Unit Assessments
 - Benchmark tests
 - Midyear exam
 - End-of-year (Outcome) exam
3. Online Self-Assessment Tools for students
 - Chapter review
 - Active Art
 - Success Tracker
4. ExamView® Test Bank