

## LINKS TO CALIFORNIA SCIENCE CONTENT STANDARDS

### **Grade Four**

#### **Life Sciences**

- 2.a. Students know plants are the primary source of matter and energy entering most food chains.
- 2.b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.
- 2.c. Students know decomposers recycle matter from dead plants and animals.
- 3.a. Students know ecosystems can be characterized by their living and nonliving components.
- 3.b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
- 3.c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.

#### **Earth Sciences**

- 4.a. Students know how to differentiate among igneous, sedimentary, and metamorphic rocks by referring to their properties and method of formation (the rock cycle).
- 4.b. Student know how to identify common rock-forming minerals (including quartz, calcite, feldspar, mica, and hornblende) and ore minerals by using a table of diagnostic properties.
- 5.a. Students know some changes in the Earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.
- 5.b. Students know natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces.
- 5.c. Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

#### **Investigation and Experimentation**

- 6.a. Students will differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.
- 6.c. Students will formulate and justify predictions based on cause-and-effect relationships.
- 6.d. Students will conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.
- 6.e. Students will construct and interpret graphs from measurements.
- 6.f. Students will follow a set of written instructions for a scientific investigation.

### **Grade Five**

#### **Life Sciences**

- 2.a. Students know many multicellular organisms have specialized structures to support the transport of materials.

#### **Earth Sciences**

- 4.a. Students know uneven heating of Earth causes air movements.
- 4.b. Students know the influence that the ocean has on the weather and the roles that the water cycle plays in weather patterns.
- 4.c. Students know the causes and effects of different types of severe weather.
- 4.d. Students know how to use weather maps and data to predict local weather and know that weather forecasts depend on many variables.

#### **Investigation and Experimentation**

- 6.a. Students will classify objects in accordance with appropriate criteria.
- 6.f. Students will select appropriate tools and make quantitative observations.
- 6.g. Students will record data by using appropriate graphic representations and make inferences based on those data.

- 6.h. Students will draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion

### **Grade Six**

#### **Plate Tectonics and Earth's Structure**

- 1.a. Students know evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and midocean ridges; the distribution of fossils, rock types, and ancient climate zones.
- 1.c. Students know lithospheric plates the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.
- 1.d. Students know that earthquakes are sudden motions along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface.
- 1.e. Students know major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.
- 1.f. Students know how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics.

#### **Shaping Earth's Surface**

- 2.a. Students know water running downhill is the dominant process in shaping the landscape, including California's landscape.
- 2.c. Students know beaches are dynamic systems in which the sand is supplied by rivers and moved long the coast by the action of waves.
- 2.d. Students know earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.

#### **Ecology (Life Sciences)**

- 5.a. Student know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.
- 5.b. Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.
- 5.c. Students know populations of organisms can be characterized by the functions they serve in an ecosystem.
- 5.d. Students know different kinds of organisms may play similar ecological roles in similar biomes.
- 5.e. Students know 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.

#### **Investigation and Experimentation**

- 7.a. Students will develop a hypothesis.
- 7.b. Students will select and use appropriate tools and technology to perform tests, collect data, and display data.
- 7.c. Students will construct appropriate graphs from data and develop qualitative statements about the relationships between variables.
- 7.e. Students will recognize whether evidence is consistent with a proposed explanation.
- 7.f. Students will read a topographic map and a geologic map for evidence provided on maps and construct and interpret a simple scale map.
- 7.g. Students will interpret events by sequence and time from natural phenomena.
- 7.h. Students will identify changes in natural phenomena over time without manipulating the phenomena.

### **Grade Seven**

#### **Evolution**

- 3.a. Students know both genetic variation and environmental factors are causes of evolution and diversity of organisms.
- 3.e. Students know that extinction of a species occurs when the environment changes and that the adaptive characteristics of a species are insufficient for its survival.

#### **Earth and Life History (Earth Science)**

- 4.a. Students know 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.
- 4.b. Students know the history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids.
  - 4.c. Students know 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.
  - 4.e. Students know fossils provide evidence of how life and environmental conditions have changed.
  - 4.f. Students know how movements of Earth's continental and oceanic plates through time, with associated changes in climate and geographic connections, have affected the past and present distribution of organisms.

**Investigation and Experimentation**

- 7.a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
- 7.c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.

**Grade Eight****Investigation and Experimentation**

- 9.a. Plan and conduct a scientific investigation to test a hypothesis.

