California Science

Earth Science

Plate Tectonics and Earth Structure: Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept: 1.PT.0

- **A** Students know evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and midocean ridges; and the distribution of fossils, rock types, and ancient climatic zones. 1.PT.1
- **B** Students know Earth is composed of several layers: a cold, brittle lithosphere; a hot, convecting mantle; and a dense, metallic core. 1.PT.2
- **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.PT.3
- **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.PT.4
- **E** Students know major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions. 1.PT.5
- **F** Students know how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics. 1.PT.6
- **G** Students know how to determine the epicenter of an earthquake and know that the effects of an earthquake on any region vary, depending on the size of the earthquake, the distance of the region from the epicenter, the local geology, and the type of construction in the region. 1.PT.7

Shaping the Earth's Surface: 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: 2.SES.0

- **A** Students know water running downhill is the dominant process in shaping the landscape, including California's landscape. 2.SES.1
- **B** Students know rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns. 2.SES.2
- **C** Students know beaches are dynamic systems in which the sand is supplied by rivers and moved along the coast by the action of waves. 2.SES.3
- **D** Students know earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats. 2.SES.4

He Ph Skip to main content **tudents know energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.** 3.H.1

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: 3.H.0	**B** Students know that when fuel is consumed, most of the energy released becomes heat energy. 3.H.2
	C Students know heat flows in solids by conduction (which involves no flow of matter) and in fluids by conduction and by convection (which involves flow of matter). 3.H.3
	D Students know heat energy is also transferred between objects by radiation (radiation can travel through space). 3.H.4
Energy in the Earth's System: 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: 4.EES.0	**A** Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle. 4.EES.1
	B Students know solar energy reaches Earth through radiation, mostly in the form of visible light. 4.EES.2
	C Students know heat from Earth's interior reaches the surface primarily through convection. 4.EES.3
	D Students know convection currents distribute heat in the atmosphere and oceans. 4.EES.4
	E Students know differences in pressure, heat, air movement, and humidity result in changes of weather. 4.EES.5
Ecology: Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept: 5.E.0	**A** Students 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.E.1
	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.E.2
	C Students know populations of organisms can be categorized by the functions they serve in an ecosystem. 5.E.3
	D Students know different kinds of organisms may play similar ecological roles in similar biomes. 5.E.4
	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. 5.E.5
Resources: Sources of energy and materials differ in amounts, distribution, usefulness, an for	**A** 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. 6.R.1.

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basis for understanding this concept: 6.R.0	**B** Students know 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.R.2
	C Students know the natural origin of the materials used to make common objects. 6.R.3
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: 7.IE.0	**A** Develop a hypothesis. 7.IE.0
	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. 7.IE.1
	C Construct appropriate graphs from data and develop qualitative statements about the relationships between variables. 7.IE.2
	D Communicate the steps and results from an investigation in written reports and oral presentations. 7.IE.3
	E Recognize whether evidence is consistent with a proposed explanation. 7.IE.4
	F Read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map. 7.IE.5
	G Interpret events by sequence and time from natural phenomena (e.g., the relative ages of rocks and intrusions). 7.IE.6
	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). 7.IE.7