

Publisher: CPO Science

Program Title: *CPO Focus on Earth Science*

Components used in Standards Map, with abbreviations: Student Edition (**SE: page #**), Investigation Manual (**INV: page #**), Teacher's Guide (**TE: page #**), Skill and Practice Worksheets (**SP: section # and "First word of title..."**), Teaching Illustrations (**TI: section # and "First word of title..."**)

Other program components: Equipment Kit, Black-line Answer Sheets, Pre-Assessment Questions, ELL Strategies, ExamView CD and booklet, Electronic Book (includes SE and INV)

Grade Level: Six

**Standards Map – Basic Comprehensive Program
Science
Grade – Six
Focus on Earth Science**

Grade	Standard #	Text of Standard	PUBLISHER CITATIONS		IMAP/CRP USE ONLY		
			Primary Citations	Supporting Citations	Meets Standard		IMAP/CRP Notes
					Y	N	
PLATE TECTONICS AND EARTH'S STRUCTURE							
6	1	<u>Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:</u>					
6	1.a	<i>Students know</i> 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.	SE: 16, 17, 147, 158-180, 184-188, 198, 210-214 INV: 46-50, 61, 66	TE: 141-145, 197, 201 SP: 3.1 "Relative..." SP: 8.3 "Earth's..." TI: 3.1 "Fossil..." TI: 8.2 "Sea-Floor..." TI: 8.3 "Plate..."			

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				TI: 8.3 “Divergent...” TI: 8.3 “Convergent...” TI: 8.3 “Collision...”			
6	1.b	<i>Students know</i> Earth is composed of several layers: a cold, brittle lithosphere; a hot, convecting mantle; and a dense, metallic core.	SE: 138-155 INV: 44, 45	TE: 132-143 SP: 7.2 “Earth’s...” TI: 7.2 “Earth’s...”			
6	1.c	<i>Students know</i> lithospheric plates the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.	SE: 143-149, 186 INV: 44, 45	TE: 140-145 SP: 5.1 “Density...” SP: 5.2 “Buoyancy...” SP: 8.3 “Earth’s...” TI: 1.3 “Locations...” TI: 7.3 “Mantle...” TI: 8.1 “Evidence...” TI: 8.3 “Earth’s...”			
6	1.d	<i>Students know</i> that earthquakes are sudden motions along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface.	SE: 151, 152, 182-199, 204-225, 279-284 INV: 47-49, 56-67	TE: 174-207 SP: 9.2 “Finding...” TI: 9.1 “Plate...” TI: 9.1 “Parts...”			
6	1.e	<i>Students know</i> major geologic events, such as earthquakes,	SE: 164-172, 182-187, 196,	TE: 175-177, 200-201			

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		volcanic eruptions, and mountain building, result from plate motions.	209-213, 224, 225, 279 INV: 49, 56-61, 66, 67,	SP: 10.1 “Volcano...” TI: 8.3 “Formation...” TI: 9.3 “Earthquakes...” TI: 10.2 “Ring...” TI: 10.2 “Volcanoes...” TI: 10.2 “Volcanic...” TI: 10.2 “Forming...” TI: 10.3 “Types...” TI: 10.3 “Geysers...”			
6	1.f	<i>Students know</i> how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics.	SE: 171, 176, 184-199, 222, 224, 225, 228, 229 INV: 46-50	TE: 175, 177, 180, 181, 204 SP: 8.4 “California...” SP: 10.1 “Volcano...” TI: 9.1 “Cross-section...” TI: 10.1 “Parts...”			
6	1.g	<i>Students know</i> 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	SE: 189-199, 279, 280 INV: 62-64	TE: 180-187, 268 SP: 9.2 “Speed...” TI: 9.2 “Finding...”			

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		earthquake, the distance of the region from the epicenter, the local geology, and the type of construction in the region.					
SHAPING EARTH'S SURFACE							
6	2	<u>Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment.</u> As a basis for understanding this concept:					
6	2.a	<i>Students know</i> water running downhill is the dominant process in shaping the landscape, including California's landscape.	SE: 238-242, 248 INV: 72-76	TE: 218-223 TI: 11.2 "Graded..." TI: 11.2 "Diagram..." TI: 11.2 "River..."			
6	2.b	<i>Students know</i> rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns.	SE: 238-242, 248, 275 INV: 72-76, 84-86	TE: 218-223 TI: 11.2 "Graded..." TI: 11.2 "Diagram..." TI: 11.2 "River..."			
6	2.c	<i>Students know</i> beaches are dynamic systems in which the sand is supplied by rivers and moved along the coast by the action of waves.	SE: 254-268 INV: 80-83	TE: 238-253 SP: 12.1 "Shallow..." TI: 12.2 "Longshore..."			

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6	2.d	<i>Students know</i> earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.	SE: 270-291, 358, 359 INV: 84-89	TE: 256-269			
HEAT (THERMAL ENERGY) (PHYSICAL SCIENCE)							
6	3	<u>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:</u>					
6	3.a	<i>Students know</i> 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.	SE: 37, 76-90, 139-141, 256-259, 264, 265, 297, 320, 323 INV: 62-64, 80-83	TE: 72, 73, 246, 300 SP: 4.2 “Heat...” TI: 7.1 “S-Waves...”			
6	3.b	<i>Students know</i> that when fuel is consumed, most of the energy released becomes heat energy.	SE: 80, 297, 302 INV: 93-95	TE: 86, 285, 286, 291			
6	3.c	<i>Students know</i> 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).	SE: 82, 83, 88-90, 120-122, 125-128, 148 INV: 26-31	TE: 74, 78, 80, 147 SP: 4.2 “Heat...” TI: 4.2 “Convection...”			

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6	3.d	<i>Students know</i> heat energy is also transferred between objects by radiation (radiation can travel through space).	SE: 84-87, 300, 308, 317, 319	TE: 84, 85, 290 SP: 4.2 “Heat...” TI: 4.3 “The Sun’s...”			
ENERGY IN THE EARTH SYSTEM							
6	4	<u>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:</u>					
6	4.a	<i>Students know</i> the sun is the major source of energy for phenomena on Earth’s surface; it powers winds, ocean currents, and the water cycle.	SE: 90, 106, 113, 115, 119-136, 219 INV: 42, 43	TE: 78-82, 118, 119, 127, 154, 309 SP: 6.3 “Weather...”			
6	4.b	<i>Students know</i> solar energy reaches Earth through radiation, mostly in the form of visible light.	SE: 86-92, 113, 133, 344 INV: 42, 43	TE: 113, 299 TI: 4.3 “The Sun’s...”			
6	4.c	<i>Students know</i> heat from Earth’s interior reaches the surface primarily through convection.	SE: 148, 164 INV: 44-55	TE: 139, 147, 195 SP: 5.1 “Density...” SP: 5.2 “Buoyant...” SP: 7.2 “Earth’s...” TI: 7.3 “Mantle...”			

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6	4.d	<i>Students know</i> convection currents distribute heat in the atmosphere and oceans.	SE: 114-132 INV: 37-43	TE: 78-82, 118, 119, 127, 154 SP: 4.2 “Heat...” SP: 5.1 “Density...” SP: 5.2 “Buoyancy...” TI: 6.2 “Expansion...” TI: 6.2 “North...” TI: 6.3 “Convection...”			
6	4.e	<i>Students know</i> differences in pressure, heat, air movement, and humidity result in changes of weather.	SE: 124-132, 272-274 INV: 37-44	TE: 113, 114, 120-123			
ECOLOGY (LIFE SCIENCE)							
6	5	<u>Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:</u>					
6	5.a	<i>Students know</i> energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.	SE: 316-333 INV: 96, 97	TE: 72, 298-309 SP: 15.1 “Ecosystem...” TI: 15.1 “Photosynthesis...” TI: 15.2 “Simple...” TI: 15.2 “Food...”			

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6	5.b	<i>Students know</i> matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.	SE: 316-325 INV: 96, 97	TE: 298-301 SP: 15.1 “Ecosystem...”			
6	5.c	<i>Students know</i> populations of organisms can be categorized by the functions they serve in an ecosystem.	SE: 318-321, 326-328 INV: 96, 97	TE: 300, 301, 307 SP: 15.3 “Ecosystem...”			
6	5.d	<i>Students know</i> different kinds of organisms may play similar ecological roles in similar biomes.	SE: 334, 338-360 INV: 100-106	TE: 316-329 SP: 15.3 “Ecosystem...” TI: 16.1 “Earth’s...” TI: 16.2 “Desert...” TI: 16.2 “Grassland...” TI: 16.3 “Temperate...” TI: 16.3 “Tropical...” TI: 16.4 “Taiga...” TI: 16.4 “Arctic...”			
6	5.e	<i>Students know</i> 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.	SE: 326, 328-333, 342-363 INV: 100-106	TE: 300, 301, 306-309, 316-329 SP: 15.1 “Ecosystem...” SP: 15.3 “Ecosystem...” TI: “15.1 “Living...”			

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RESOURCES							
6	6	<u>Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:</u>					
6	6.a	<i>Students know</i> 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.	SE: 295-304, INV: 90-95	TE: 284-287			
6	6.b	<i>Students know</i> 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.	SE: 294-304 INV: 90-95	TE: 278-287 TI: 14.1 "Transportation..." TI: 14.2 "U.S..." TI: 14.2 "U.S.Renewable..." TI: 14.3 "Earth's..." TI: 14.3 "Composition..."			
6	6.c	<i>Students know</i> the natural origin of the materials used to make common objects.	SE: 295, 305-309	TE: 289, 290			

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INVESTIGATION AND EXPERIMENTATION							
6	7	<u>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:</u>					
6	7.a	Develop a hypothesis.	SE: 4, 5, 9, 14, 15, 21, 36, 52 INV: 2-10, 16, 37, 82, 90, 91	TE: 10, 11, 14, 19 SP: 1.1 “What’s...”			
6	7.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.	SE: 24-34, 48, 49, 51, 73, 241, 266, 282 INV: 11-22, 37, 56, 70, 77, 117-134	TE: 19, 20, 33, 93, 218, 219, 226 SP: 1.3 “Stopwatch...”, SP: 2.1 “Internet...”, SP: 1.3 “Scientific...”, TI: 2.2 “Celsius...”			
6	7.c	Construct appropriate graphs from data and develop qualitative statements about the relationships between variables.	SE: 41-45, 51, 52, 87, 90 INV: 9, 16, 21, 27, 43, 83, 88, 91, 116, 133	TE: 40, 41, 265 SP: 1.3 “Drawing...”, SP: 2.4 “Types...”, SP: 2.4 “What’s...”, SP: 2.4			

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				“Reading...” TI: 2.4 “Graphs” TI: 2.4 “Parts...”			
6	7.d	Communicate the steps and results from an investigation in written reports and oral presentations.	SE: 12-15, 19, 22, 202, 360 INV: 114-116, 17, 106, 132, 134	TE: 19, 21, 43, 48, 49, 81 SP: 1.2 “Lab...” SP: 1.3 “Scientific...” SP: 2.1 “Internet...” SP: 2.2 “Bibliographies” TI: 1.3 “Example...”			
6	7.e	Recognize whether evidence is consistent with a proposed explanation.	SE: 10-20 INV: 31, 37, 61, 64, 66, 71, 83, 85	TE: 12-21, 140-143 SP: 1.2 “Observation...”			
6	7.f	Read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map.	SE: 63-73, 198, 211, 214, 224, 225 INV: 23-25, 64	TE: 60-64 SP: 2.4 “Map...” SP: 3.3 “Topographic...” SP: 3.3 “Bathymetric...” SP: 3.3 “Latitude...” TI: 3.3 “Topographic...” TI: 3.3 “Making...” TI: 3.3 “Latitude...”			

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6	7.g	Interpret events by sequence and time from natural phenomena (e.g., the relative ages of rocks and intrusions).	SE: 54-62, 71, 149, 243-248 INV: 18-22	TE: 52-57, 225 TI: 3.1 “Original...” TI: 3.1 “Lateral...” TI: 3.1 “Cross-cutting...” TI: 3.2 “Earth’s...” TI: 3.2 “A Cross-Section...”			
6	7.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).	SE: 61, 68, 232, 235, 241 INV: 18-22	TE: 56, 57, 204, 225 TI: 3.2 “A Cross-section...”			
Appendix							