

GRADE 6
Overview of the Science Standards
FOCUS: EARTH SCIENCES

I. PLATE TECTONICS AND EARTH'S STRUCTURE

- *Plate tectonics accounts for important features of Earth's surface and major geologic events.*
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II. SHAPING EARTH'S SURFACE

- *Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment.*
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III. HEAT (Thermal Energy) (Physical Science)

- *Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature.*
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IV. ENERGY IN THE EARTH SYSTEM

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

V. ECOLOGY (Life Science)

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

VI. ECOLOGY (Life Science)

- *Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation.*
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VII. INVESTIGATION AND EXPERIMENTATION

- *Scientific progress is made by asking meaningful questions and conducting careful investigations.*
-

Aligning the Instructional Program with the Grade Level Standards and Benchmarks

In order to align the instructional program with the prescribed content standards for the grade, it is critical that the standards and their affiliated benchmarks are reviewed regularly so as to become very familiar with them. At the outset of each quarter/trimester an initial decision must be made as to which standards and benchmark proficiencies will be included in the instructional program. At the end of each quarter/trimester the teacher should fill out the **response section next to each benchmark**. This activity will serve as a checkpoint and will help gauge what still needs to be taught or what should be re-taught.

Complete the Response Section

ST/B = Standard and Benchmark **P**: Priority benchmark **Q**: Quarter 1 or 2 or 3 or 4

At the start of the quarter/trimester, select the benchmarks you consider to be your “priority benchmarks.” Mark the box under the “P” code.

At the end of each quarter/trimester complete the response section of the **standard/benchmark listings, indicating to what extent students have mastered the benchmark.**

A: Fewer than 20% of the students are proficient

B: About *half* (50%) of the students are proficient

C: 80% or more of the students are proficient

Sample Recording of the Response Form GRADE 2

I. PHYSICAL SCIENCE

The motion of objects can be observed and measured. As a basis for understanding this concept, students in the SECOND GRADE will ...

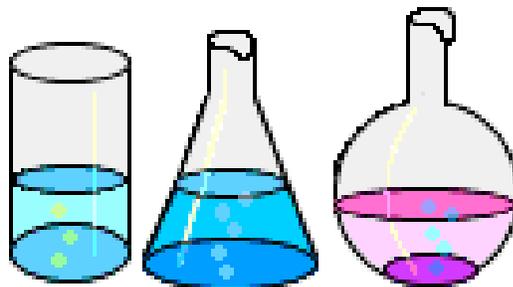
ST/B	P	ST/B: Standard/Benchmark P: Priority Benchmark Degree of Mastery: % of students at end of each Q: Quarter A= 75% or more B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
ST1.A	P	<i>know</i> that the position of an object can be described by locating it in relation to another object or to the background.	A	B	B	C
ST1.B		<i>know</i> that an object's motion can be described by recording the change in position of the object over time.	A	A	B	B

GRADE 6
Science Standards and Benchmark Proficiencies
FOCUS: EARTH SCIENCES

I. PLATE TECTONICS AND EARTH'S STRUCTURE

Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept, students in the SIXTH GRADE will ...

ST/B	P	ST/B: Standard/Benchmark P: Priority Benchmark Degree of Mastery: % of students at end of each Q: Quarter A= 75% or more B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
ST1.A		<i>know</i> that evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and mid-ocean ridges; and the distribution of fossils, rock types, and ancient climatic zones.				
ST1.B		<i>know</i> that Earth is composed of several layers: a cold, brittle lithosphere; a hot, convecting mantle; and a dense, metallic core.				
ST1.C		<i>know</i> that lithospheric plates, the size of continents and oceans, move at rates of centimeters per year in response to movements in the mantle.				
ST1.D		<i>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.				
ST1.E		<i>know</i> that major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.				
ST1.F		<i>know</i> how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics.				
ST1.G		<i>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 earthquake, the distance of the region from the epicenter, the local geology, and the type of construction in the region.				



II. SHAPING 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, students in the SIXTH GRADE will ...

ST/B.	P	ST/B: Standard/Benchmark P: Priority Benchmark Degree of Mastery: % of students at end of each Q: Quarter A= 75% or more B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
ST2.A		<i>know</i> that water running downhill is the dominant process in shaping the landscape, including California's landscape.				
ST2.B		<i>know</i> that rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns.				
ST2.C		<i>know</i> that beaches are dynamic systems in which the sand is supplied by rivers and moved along the coast by the action of waves.				
ST2.D		<i>know</i> that earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.				

III. HEAT (Thermal Energy) (Physical Science)

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 in the SIXTH GRADE will ...

ST/B	P	ST/B: Standard/Benchmark P: Priority Benchmark Degree of Mastery: % of students at end of each Q: Quarter A= 75% or more B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
ST3.A		<i>know</i> that 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.				
ST3.B		<i>know</i> that when fuel is consumed, most of the energy released becomes heat energy.				
ST3.C		<i>know</i> that 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).				
ST3.D		<i>know</i> that heat energy is also transferred between objects by radiation (radiation can travel through space).				

IV. ENERGY IN THE EARTH 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, students in the SIXTH GRADE will...

ST/B.	P	ST/B: Standard/Benchmark P: Priority Benchmark Degree of Mastery: % of students at end of each Q: Quarter A= 75% or more B=about half C=fewer than 25%	Q 1	Q 2	Q 4	Q 4
ST4.A		<i>know</i> that the Sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.				
ST4.B		<i>know</i> that solar energy reaches Earth through radiation, mostly in the form of visible light.				
ST4.C		<i>know</i> that heat from Earth's interior reaches the surface primarily through convection.				
ST4.D		<i>know</i> that convection currents distribute heat in the atmosphere and oceans.				
ST4.E		<i>know</i> that differences in pressure, heat, air movement, and humidity result in changes of weather.				

V. ECOLOGY (LIFE SCIENCE)

Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept, students in the SIXTH GRADE will ...

ST/B.	P	ST/B: Standard/Benchmark P: Priority Benchmark Degree of Mastery: % of students at end of each Q: Quarter A= 75% or more B=about half C=fewer than 25%	Q 1	Q 2	Q 4	Q 4
ST5.A		<i>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.				
ST5.B		<i>know</i> matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.				
ST5.C		<i>know</i> populations of organisms can be categorized by the functions they serve in an ecosystem.				
ST5.D		<i>know</i> different kinds of organisms may play similar ecological roles in similar biomes.				
ST5.E		<i>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.				

VI. ECOLOGY (LIFE SCIENCE)

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 in the SIXTH GRADE students will...

ST/B.	P	ST/B: Standard/Benchmark P: Priority Benchmark Degree of Mastery: % of students at end of each Q: Quarter A= 75% or more B=about half C=fewer than 25%	Q 1	Q 2	Q 4	Q 4
ST6.A		<i>know</i> that 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.				
ST6.B		<i>know</i> the 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.				
ST6.C		<i>know</i> the natural origin of the materials used to make common objects.				

VII. 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. SIXTH GRADE students will ...

ST/B	P	ST/B: Standard/Benchmark P: Priority Benchmark Degree of Mastery: % of students at end of each Q: Quarter A= 75% or more B=about half C=fewer than 25%	Q 1	Q 2	Q 3	Q 4
ST7.A		<i>develop</i> a hypothesis.				
ST7.B		<i>select</i> and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.				
ST7.C		<i>construct</i> appropriate graphs from data and develop qualitative statements about the relationships between variables.				
ST7.D		<i>communicate</i> the steps and results from an investigation in written reports and oral presentations.				
ST7.E		<i>recognize</i> whether evidence is consistent with a proposed explanation.				
ST7.F		<i>read</i> a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map.				
ST7.G		<i>interpret</i> events by sequence and time from natural phenomena (e.g., the relative ages of rocks and intrusions).				
ST7.H		<i>identify</i> changes in natural phenomena over time without manipulating the phenomena (e.g., a tree limb, a grove of trees, a stream, a hill slope).				

GRADE SIX

Standards Based Vocabulary for Science

Focus on Earth Science

composition	major geologic features; mountain ranges, plateaus, volcanoes, faults, trenches, ocean ridges, etc.	continental drift
plate boundary interactions	convection	plate boundary interactions
converging & diverging boundaries	crust	difference between focus and epicenter
position	earthquakes	rates of movement
fit of continents	seismic shadow	lithosphere, mantle, inner and outer core
seismic waves; S-waves, P-waves	location of earthquakes, volcanoes, mid-ocean ridges	structure of the earth
tectonic plates	types of faults; transform, thrust (reverse), normal	

Shaping Earth's Surface

deposition	topography	geologic map
transportation	thematic map	water cycle
topographic map	weathering	topographic maps: scale, symbols, contour interval, how to construct a topographic map, methods of location

Heat (Thermal Energy)

conduction	convection	radiation
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Energy in the Earth System

climate changes	pressure	climate zones	pressure in the earth's interior	conduction
radiation	convection	radioactive decay	Coriolis effect	weather
global warming	wind currents	humidity	water currents	microclimate

Ecology (Life Science)

abiotic	habitat	biotic	herbivore	carnivore
natural resources	chlorophyll	non-renewable resources	consumer	omnivore
decomposer	photosynthesis	ecosystem	population	food chain
producer	food pyramid	renewable resources	food web	scavenger

Resources

chemical energy	formation of planets	fossil fuels
hydroelectric energy	non-renewable resources	solar energy
solar energy	wave energy	wind energy

