

6th Grade Science



Quarter 1		arth Science Teaching & Learning Framework * Quarter 2		Quarter 3		Quarter 4	
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
5 weeks	4 weeks	5 weeks	4 weeks	5 weeks	5 weeks	5 weeks	3 weeks
Solar Sys. & Universe	Earth and	Climate and Weather	Water on the Earth	The Dynamic Earth	Rocks and	Weathering,	Energy/
•	Moon				Minerals	Erosion, Soil	Conservation
S6E1. Obtain, evaluate, and	S6E2. Obtain,	S6E4. Obtain, evaluate, and	S6E3. Obtain, evaluate,	S6E5. Obtain, evaluate,	S6E5. Obtain,	S6E5. Obtain,	S6E6. Obtain,
communicate information	evaluate, and	communicate information	and communicate	and communicate	evaluate, and	evaluate, and	evaluate, and
about current scientific	communicate	about how the sun, land, and	information to	information to show how	communicate	communicate	communicate
views of the universe and	information	water affect climate and	recognize the significant	Earth's surface is formed.	information to	information to	information about the
how those views evolved.	about the effects	weather.	role of water in Earth	a. Ask questions to	show how	show how Earth's	uses & conservation
a. Ask questions to	of the relative	a. Analyze and interpret data to	processes. a. Ask guestions to	compare and contrast the Earth's crust, mantle,	Earth's surface is formed.	surface is formed. d. Ask guestions to	of various natural
determine changes in models	positions of the	compare and contrast the	determine where water	inner and outer core,	b. Plan and	identify types of	resources and how
of Earth's position in the	sun, Earth, and	composition of Earth's	is located on Earth's	including temperature,	carry out an	weathering,	they impact the Earth
solar system, and origins of	moon.	atmospheric layers (including	surface (oceans, rivers,	density, thickness, and	investigation	agents of erosion	a. Ask questions to
the universe as evidence that scientific theories change	a. Develop and	the ozone layer) and	lakes, swamps,	composition.	of the	and	determine the
with the addition of new	use a model to	greenhouse gases.	groundwater, aquifers,	g. Construct an argument	characteristics	transportation,	differences between renewable/sustainable
information.	demonstrate the phases of the	b. Plan and carry out an	and ice) and	using maps and data	of minerals	and environments	energy resources
b. Develop a model to	moon by showing	investigation to demonstrate	communicate the	collected to support a	and how	of deposition.	b. Design and evaluate
represent the position of the	the relative	how energy from the sun	relative proportion of water at each location.	claim of how fossils show evidence of the changing	minerals contribute to	e. Develop a model to	solutions for
solar system in the Milky	positions of the	transfers heat to air, land and		surface and climate of the	rock	demonstrate how	sustaining the quality
Way galaxy and in the known	sun, Earth, and	water at different rates.	b. Plan and carry out an	Earth.	composition.	natural processes	and supply of natural
universe. c. Analyze and interpret data	moon.	c. Develop a model	investigation to illustrate the role of the	f. Construct an	c. Construct an	(weathering,	resources such as
to compare and contrast the	b. Construct an	demonstrating the interaction	sun's energy in	explanation of how the	explanation of	erosion, and	water, soil, and air.
planets in our solar system in	explanation of	between unequal heating and	atmospheric conditions	movement of lithospheric	how to classify	deposition) and	c. Construct an argument evaluating
terms of:	the alignment of the sun, Earth,	the rotation of the Earth that	that lead to the cycling	plates, called plate	rocks by their	human activity	contributions to the
size relative to Earth, surface	and moon during	causes local and global wind	of water.	tectonics, can cause	formation and	change rocks and	rise in global
and atmospheric features,	solar and lunar	systems.	c. Ask questions to	major geologic events	how rocks	the surface of the Earth.	temperatures over the
relative distance from the	eclipses.	d. Construct an explanation of	identify and	such as earthquakes and	change		past century.
sun, and ability to support	c. Analyze and	the relationship between air	communicate, using	volcanic eruptions.	through	h. Plan and carry	
life. d. Develop and use a model	interpret data to	pressure, fronts, and air masses	graphs and maps, the	(Clarification statement: Include convergent,	geologic processes in	out an investigation to	
to explain the interaction of	relate the tilt of	and meteorological events such	composition, location,	divergent, and transform	the rock cycle.	provide evidence	
gravity and inertia that	the Earth to the distribution of	as tornados and thunderstorms.	and subsurface topography of the	boundaries.)		that soil is	
governs the motion of	sunlight	e. Analyze and interpret	world's oceans.	·		composed of	
objects in the solar sys.	throughout the	weather data to explain the				layers of	
e. Ask questions to compare	year and its	effects of moisture evaporating	d. Analyze and interpret data to create graphic			weathered rocks	
and contrast the	effect on	from the ocean on weather	representations of the			and decomposed	
characteristics, composition, and location of comets,	seasons.	patterns and weather events	causes and effects of			organic material.	
asteroids, and meteoroids.		such as hurricanes.	waves, currents, and				
asterolas, and meteorolas.			tides in Earth's systems.				
AC Extension:	AC Extension:	AC Extension:	AC Extension:	AC Extension:	AC Extension:	AC Extension:	AC Extension:
Explain the origins of the	Analyze and	Analyze and interpret data to	Plan and carry out	Construct an argument	Apply the	Develop a model	Design and defend a
solar system (SES1a)	interpret data	show how temperature and	investigations of how	using multiple forms of	principles of	of the processes	sustainable energy
	related to short-	precipitation produce pattern of	chemical and physical	evidence that supports	relative age	and geologic	plan based on
	term natural	climate regions (zones) on Earth	properties impact local	the theory of plate	(superposition,	hazards that result	scientific principles for
	cyclic fluctuations of	(SES5d)	aquatic biomes (SEV1e)	tectonics (i.e. fossils,	etc.) to	from both sudden	your location (SEV3d)
	climate (ex: El			paleomagnetism, seafloor	interpret a	and gradual	
	Nino) (SEV2a)			age, etc) (SES2e).	geologic cross-	movements	
	'` ''				section (SES4b)	(SES3b)	1



6th Grade Earth Science Standards

The Cobb Teaching and Learning Standards (CT & LS) for science are designed to provide foundational knowledge and skills for all students to develop proficiency in science. The Project 2061's *Benchmarks for Science Literacy* and the follow up work, *A Framework for K-12 Science Education* were used as the core of the standards to determine appropriate content and process skills for students. The Science Georgia Standards of Excellence focus on a limited number of core disciplinary ideas and crosscutting concepts which build from Kindergarten to high school. The standards are written with the core knowledge to be mastered integrated with the science and engineering practices needed to engage in scientific inquiry and engineering design.

The Cobb Teaching and Learning Standards drive instruction. Hands-on, student-centered, and inquiry-based approaches should be the emphasis of instruction. The standards are a required minimum set of expectations that show proficiency in science. However, instruction can extend beyond these minimum expectations to meet student needs. At the same time, these standards set a maximum expectation on what will be assessed by the Georgia Milestones Assessment System.

Science consists of a way of thinking and investigating, as well a growing body of knowledge about the natural world. To become literate in science, students need to possess sufficient understanding of fundamental science content knowledge, the ability to engage in the science and engineering practices, and to use scientific and technological information correctly. Technology should be infused into the curriculum and the safety of the student should always be foremost in instruction.

Sixth grade students use records they keep and analyze the data they collect, plan and carry out investigations, describe observations, and show information in different forms. They are able to recognize relationships in simple charts and graphs and find more than one way to interpret their findings. They replicate investigations and compare results to find similarities and differences. Sixth graders study weather patterns and systems by observing and explaining how an aspect of weather can affect a weather system. They are able to construct explanations based on evidence of the role of water in Earth processes, recognize how the presence of land and water in combination with the energy from the sun affect the climate and weather of a region. They use different models to represent systems such as the solar system and the sun/moon/Earth system. They study uses and conservation of Earth's natural resources and use what they observe about the Earth's materials to infer the processes and timelines that formed them.

TEACHING AND LEARNING STANDARDS

Earth and Space Science

S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.

- a. Ask questions to determine changes in models of Earth's position in the solar system, and origins of the universe as evidence that scientific theories change with the addition of new information.
 - (<u>Clarification statement:</u> Students should consider Earth's position in geocentric and heliocentric models and the Big Bang as it describes the formation of the universe.)
- b. Develop a model to represent the position of the solar system in the Milky Way galaxy and in the known universe.
- c. Analyze and interpret data to compare and contrast the planets in our solar system in terms of:
 - size relative to Earth,
 - surface and atmospheric features,
 - relative distance from the sun, and
 - ability to support life.
- d. Develop and use a model to explain the interaction of gravity and inertia that governs the motion of objects in the solar system.
- e. Ask questions to compare and contrast the characteristics, composition, and location of comets, asteroids, and meteoroids.

S6E2. Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, Earth, and moon.

- a. Develop and use a model to demonstrate the phases of the moon by showing the relative positions of the sun, Earth, and moon.
- b. Construct an explanation of the alignment of the sun, Earth, and moon during solar and lunar eclipses.
- c. Analyze and interpret data to relate the tilt of the Earth to the distribution of sunlight throughout the year and its effect on seasons.

S6E3. Obtain, evaluate, and communicate information to recognize the significant role of water in Earth processes.

- a. Ask questions to determine where water is located on Earth's surface (oceans, rivers, lakes, swamps, groundwater, aquifers, and ice) and communicate the relative proportion of water at each location.
- b. Plan and carry out an investigation to illustrate the role of the sun's energy in atmospheric conditions that lead to the cycling of water.
 - (<u>Clarification statement:</u> The water cycle should include evaporation, condensation, precipitation, transpiration, infiltration, groundwater, and runoff.)
- c. Ask questions to identify and communicate, using graphs and maps, the composition, location, and subsurface topography of the world's oceans.
- d. Analyze and interpret data to create graphic representations of the causes and effects of waves, currents, and tides in Earth's systems.



S6E4. Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather.

- a. Analyze and interpret data to compare and contrast the composition of Earth's atmospheric layers (including the ozone layer) and greenhouse gases.
 - (*Clarification statement:* Earth's atmospheric layers include the troposphere, stratosphere, mesosphere, and thermosphere.)
- b. Plan and carry out an investigation to demonstrate how energy from the sun transfers heat to air, land and water at different rates. (*Clarification statement:* Heat transfer should include the processes of conduction, convection, and radiation.)
- c. Develop a model demonstrating the interaction between unequal heating and the rotation of the Earth that causes local and global wind systems.
- d. Construct an explanation of the relationship between air pressure, fronts, and air masses and meteorological events such as tornados and thunderstorms.
- e. Analyze and interpret weather data to explain the effects of moisture evaporating from the ocean on weather patterns and weather events such as hurricanes.

S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.

- a. Ask questions to compare and contrast the Earth's crust, mantle, inner and outer core, including temperature, density, thickness, and composition.
- b. Plan and carry out an investigation of the characteristics of minerals and how minerals contribute to rock composition.
- c. Construct an explanation of how to classify rocks by their formation and how rocks change through geologic processes in the rock cycle.
- d. Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition. (*Clarification statement:* Environments of deposition include deltas, barrier islands, beaches, marshes, and rivers.)
- e. Develop a model to demonstrate how natural processes (weathering, erosion, and deposition) and human activity change rocks and the surface of the Earth.
- f. Construct an explanation of how the movement of lithospheric plates, called plate tectonics, can cause major geologic events such as earthquakes and volcanic eruptions.

(Clarification statement: Include convergent, divergent, and transform boundaries.)

- g. Construct an argument using maps and data collected to support a claim of how fossils show evidence of the changing surface and climate of the Earth.
- h. Plan and carry out an investigation to provide evidence that soil is composed of layers of weathered rocks and decomposed organic material.



S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.

- a. Ask questions to determine the differences between renewable/sustainable energy resources (examples: hydro, solar, wind, geothermal, tidal, biomass) and nonrenewable energy resources (examples: nuclear: uranium, fossil fuels: oil, coal, and natural gas), and how they are used in our everyday lives.
- b. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air.
- c. Construct an argument evaluating contributions to the rise in global temperatures over the past century.

 (<u>Clarification statement:</u> Tables, graphs, and maps of global and regional temperatures, and atmospheric levels of greenhouse gases such as carbon dioxide and methane, should be used as sources of evidence.)