COBB TEACHING AND LEARNING STANDARDS

Earth Science

COBB COUNTY SCHOOL DISTRICT

ONE TEAM
ONE GOAL
STUDENT SUCCESS

6th Grade Earth Science Teaching & Learning Framework * Clarification statements not provided on framework							
Quarter 1		**Quarter 2**		**Quarter 3**		**Quarter 4**	
Unit 1 **6 weeks**	**Unit 2** **3 weeks**	**Unit 3** **5 weeks**	**Unit 4** **4 weeks**	**Unit 5** **4 weeks**	**Unit 6** **5 weeks**	**Unit 7** **5 weeks**	**Unit 8** **2 weeks**
Rocks and Minerals	**Weathering, Erosion, Soil**	**The Dynamic Earth**	**Water on the Earth**	**Climate and Weather**	**Earth and Moon**	**Solar Sys. & Universe**	**Energy/ Conservation**
S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed. 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.	**S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.** d. Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition. e. Develop a model to demonstrate how natural processes (weathering, erosion, and deposition) and human activity change rocks and the surface 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.	**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. g. Construct an argument using maps and data collected to support a claim of how fossils show evidence of the changing surface and climate. 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.)	**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. 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. b.Plan and carry out an investigation to demonstrate how energy from the sun transfers heat to air, land and water at different rates. 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.	**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 / its effect on seasons.	**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. 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 solarsys. e.Ask questions to compare and contrast the characteristics, composition, and location of comets, asteroids, and meteoroids.	**S6E6. Obtain, evaluate, and communicate information about the uses & conservation of various natural resources and how they impact the Earth.** a.Ask questions to determine the differences between renewable/sustainable energy resources 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.

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.

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.
(*Clarification statement:* 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.
(*Clarification statement:* 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. (*Clarification statement:* 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.)