COBB

TEACHING AND LEARNING STANDARDS

4th Grade Science

COBB COUNTY SCHOOL DISTRICT

ONE TEAM
ONE GOAL
STUDENT SUCCESS

4th Grade Science Teaching & Learning Framework

Quarter 1		Quarter 2		Quarter 3		Quarter 4	
Unit 1 **4 weeks**	**Unit 2** **5 weeks**	**Unit 3** **4 weeks**	**Unit 4** **5 weeks**	**Unit 5** **5 weeks**	**Unit 6** **4 weeks**	**Unit 7** **3 weeks**	**Unit 8** **6 weeks**
Earth & Moon	**Stars & Planets**	**Ecosystems**	**Water**	**Weather**	**Light**	**Sound**	**Forces and Motion**
S4E2. Obtain, evaluate & communicate information to model the effects of the position & motion of the Earth & the moon in relation to the sun as observed from the Earth. a. Develop a model to support an explanation of why the length of a day & night change throughout the year. b Develop a model based on observations to describe the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous & full) c. Construct an explanation of how the Earth's orbit, with its consistent tilt, affects seasonal change.	**S4E1. Obtain, evaluate, & communicate information to compare & contrast the physical attributes of stars & planets.** a. Compare & contrast technological advances that have changed the amount & type of information on distant objects in the sky. b. Construct an argument on why some stars appear to be larger or brighter than other stars c. Construct an explanation of the differences between stars & planets in the sky**.** d. Evaluate strengths & limitations of models of our solar system in describing relative size, order, appearance, & composition of planets & the sun.	**S4L1. Obtain, evaluate, & communicate information about the roles of organisms & the flow of energy within an ecosystem.** a. Develop a model to describe the roles of producers, consumers, & decomposers in a community. b. Develop simple models to illustrate the flow of energy through a food web/food chain beginning with sunlight & including producers, consumers & decomposers. c. Design a scenario to demonstrate the effect of a change on an ecosystem. d. Use printed & digital data to develop a model illustrating & describing changes to the flow of energy in an ecosystem when plants or animals become scarce, extinct, or over-abundant.	**S4E3. Obtain, evaluate, and communicate information to demonstrate the water cycle.** a. Plan and carry out investigations to observe the flow of energy in water as it changes states from solid (ice) to liquid (water) to gas (water vapor) and changes from gas to liquid to solid. b. Develop models to illustrate multiple pathways water may take during the water cycle (evaporation, condensation, and precipitation).	**S4E4. Obtain, evaluate, and communicate information to predict weather events and infer weather patterns using weather charts/maps and collected weather data.** a. Construct an explanation of how weather instruments (thermometer, rain gauge, barometer, wind vane, and anemometer) are used in gathering weather data and making forecasts. b. Interpret data from weather maps, including fronts (warm, cold, and stationary), temperature, pressure, and precipitation to make an informed prediction about tomorrow's weather. c. Ask questions and use observations of cloud types (cirrus, stratus, and cumulus) and data of weather conditions to predict weather events. d. Construct an explanation based on research to communicate the difference between weather and climate.	**S4P1. Obtain, evaluate, & communicate information about the nature of light & how light interacts with objects.** a. Plan & carry out investigations to observe & record how light interacts with various material to classify them as opaque, transparent or translucent. b. Plan & carry out investigations on the path light travels from a light source to a mirror & how it is reflected by the mirror using different angles. c. Plan & carry out an investigation utilizing everyday materials to explore examples of refraction. **S4P2. Obtain, evaluate & communicate information about how sound is produced & changed & how sound &/or light can be used to communicate.** b. Design & construct a device to communicate across a distance using light &/or sound.	**S4P2. Obtain, evaluate & communicate information about how sound is produced & changed & how sound &/or light can be used to communicate.** a. Plan & carry out an investigation utilizing everyday objects to produce sound & predict the effects of changing the strength or speed of vibrations. b. Design & construct a device to communicate across a distance using light &/or sound.	**S4P3. Obtain, evaluate & communicate information about the relationship between balanced & unbalanced forces.** a. Plan & carry out an investigation on the effects of balanced & unbalanced forces on an object & communicate the results. b. Construct an argument to support the claim that gravitational force affects the motion of an object. c. Ask questions to identify & explain the uses of simple machines & how forces are changed when simple machines are used to complete tasks.

Fourth Grade 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 focus on a limited number of core disciplinary ideas and crosscutting concepts which build from Kindergarten to high school. The Cobb Teaching and Learning 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. Crosscutting concepts are used to make connections across different science disciplines.

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.

The Fourth Grade, Cobb Teaching and Learning Standards for science engage students in constructing meaningful models that allow them to gain understanding of the natural world. They speculate about observations they make. Fourth graders add, subtract, multiply and divide whole numbers mentally, on paper, and with a calculators. They list common materials for making simple mechanical constructions and for repairing things. They gather and interpret data and use records, tables, or graphs to identify patterns of change. They write instructions & make sketches that allow others to carry out a scientific investigation. They determine whether or not a comparison is fair if conditions are different for each each thing being compared. They question claims or statements made by people outside their field of expertise. The students will use this information to compare & contrast the physical attributes of stars & planets, model the effects of the relative motion of the Earth & moon around the sun, use weather charts/maps to predict weather events, conduct investigations about the water cycle & understand their relationship with heat energy, communicate information about the nature of light & sound, study the effects of balanced & unbalanced forces on an object, & describe the flow of energy in an ecosystem & the roles organisms play in a community.

Earth Science

S4E1. Obtain, evaluate, and communicate information to compare and contrast the physical attributes of stars and planets.

a. Ask questions to compare & contrast technological advances that have changed the amount & type of information on distant objects in the sky.
b. Construct an argument on why some stars (including the Earth's sun) appear to be larger or brighter than other stars.
c. Construct an explanation of the differences between stars & planets in the sky.
d. Evaluate strengths & limitations of models of our solar system in describing relative size, order, appearance, & composition of planets an & the sun.
(*Clarification statement:* Composition of planets is limited to rocky vs. gaseous)

S4E2. Obtain, evaluate, and communicate information to model the effects of the position & motion of the Earth and the moon in relation to the sun as observed from Earth.

a. Develop a model to support an explanation of why the length of day & night change throughout the year.
b. Develop a model based on observations to describe the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous, and full).
c. Construct an explanation of how the Earth's orbit, with its consistent tilt, affects seasonal changes.

S4E3. Obtain, evaluate, and communicate information to demonstrate the water cycle.

a. Plan and carry out investigations to observe the flow of energy in water as it changes states from solid (ice) to liquid (water) to gas (water vapor) & changes from gas to liquid to solid.
b. Develop models to illustrate multiple pathways water may take during the water cycle (evaporation, condensation, & precipitation).
(*Clarification statement:* Students should understand that the water cycle does not follow a single pathway.

Earth Science (continued)

S4E4. Obtain, evaluate, and communicate information to predict weather events and infer weather patterns using weather charts/maps and collected weather data.

a. Ask questions to explain how weather instruments (thermometer, rain gauge, barometer, wind vane, and anemometer) are used in gathering weather data & making forecasts.
b. Interpret data from weather maps to identify fronts (warm, cold & stationary), temperature & precipitation to make an informed prediction about tomorrow's weather
c. Ask questions and use observations of cloud types (cirrus, stratus, & cumulus) & data of weather events & patterns throughout the year
d. Construct an explanation based on research to communicate the differences between weather & climate.

Physical Science

S4P1. Obtain, evaluate, and communicate information about the nature of light & how light interacts with objects.

a. Plan & carry out investigations to observe & record how light interacts with various materials to classify them as opaque, transparent, or translucent.
b. Plan & carry out investigations on the path light travels from a light source to a mirror using different angles.
c. Plan & carry out an investigation utilizing everyday materials to explore examples of when light is refracted. (*Clarification statement:* Everyday materials could include prisms, eyeglasses, & a glass of water.)

S4P2. Obtain, evaluate & communicate information about how sound is produced & changed & how sound &/or light can be used to Communicate.

a. Plan & carry out an investigation utilizing everyday objects to produce sound & predict the effects of changing the strength or speed of vibrations.
b. Design & construct a device to communicate across a distance using light &/or sound.

Physical Science (continued)

S4P3. Obtain, evaluate & communicate information about the relationship between balanced and unbalanced forces.

a. Plan & carry out an investigation on the effects of balanced & unbalanced forces on an object & communicate the results.
b. Construct an argument to support the claim that gravitational force affects the motion of an object.
c. Ask questions to identify & explain the uses of simple machines (lever, pulley, wedge, inclined plane, wheel & axle, and screw) & how forces are changed when simple machines are used to complete tasks.
(*Clarification statement:* The use of mathematical formulas is not expected.)

Life Science

S4L1. Obtain, evaluate & communicate information about the roles of organisms & the flow of energy within an ecosystem.

a. Develop a model to describe the roles of producers, consumers, and decomposers in a community.
(*Clarification statement:* Students are not expected to identify the different types of consumers-herbivores, carnivores, omnivores, & scavengers.)
b. Develop simple models to illustrate the flow of energy through a food web/food chain beginning with sunlight & including producers, consumers, & decomposers.
c. Communicate a scenario to demonstrate the effect of a change on an ecosystem.
(*Clarification statement:* Include living & non-living factors in the scenario)
d. Use printed & digital data to develop a model illustrating & describing changes to the flow of energy in an ecosystem when plants or animals become scarce, extinct, or over-abundant.

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