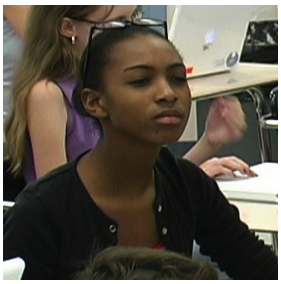
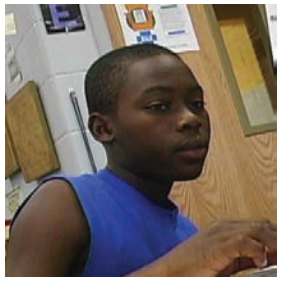
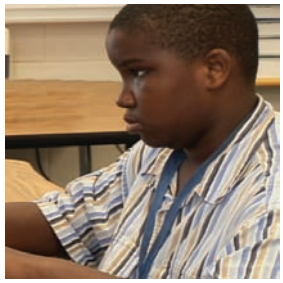
SCIENCE

FLORIDA

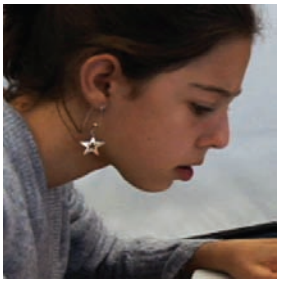
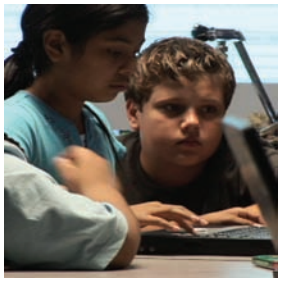







Sunshine State Standards


Math & Science
Solutions for Florida's Future

FLORIDA SCIENCE STANDARDS

K-8 GRADE-LEVEL STANDARDS

Big Ideas

The revised science standards include big ideas that flow throughout all grade levels and build in rigor as students move to higher grade levels. The eighteen big ideas used throughout this document are organized as follows:

Body of Knowledge: The Nature of Science

Big Idea 1: The Practice of Science

Big Idea 2: The Characteristics of Scientific Knowledge

Big Idea 3: The Role of Theories, Laws, Hypotheses, and Models

Big Idea 4: Science and Society

Body of Knowledge: Earth and Space Science

Big Idea 5: Earth in Space in Time

Big Idea 6: Earth Structures

Big Idea 7: Earth Systems and Patterns

Body of Knowledge: Physical Science

Big Idea 8: Properties of Matter

Big Idea 9: Changes in Matter

Big Idea 10: Forms of Energy

Big Idea 11: Energy Transfer and Transformations

Big Idea 12: Motion of Objects

Big Idea 13: Forces and Changes in Motion

Body of Knowledge: Life Science

Big Idea 14: Organization and Development of Living Organisms

Big Idea 15: Diversity and Evolution of Living Organisms

Big Idea 16: Heredity and Reproduction

Big Idea 17: Interdependence

Big Idea 18: Matter and Energy Transformations

The numbering for the big ideas is consistent throughout the document. Not all big ideas are addressed at each grade level, so the numbering scheme is not consecutive for each grade level.

Benchmark Coding Scheme

SC.	5.	N.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea	Benchmark

Body of Knowledge Key:

N ~ Nature of Science

E ~ Earth and Space Science

P ~ Physical Science

L ~ Life Science

GRADE: 6

Big Idea 1:

A: Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation.

B: The processes of science frequently do not correspond to the traditional portrayal of "the scientific method."

C: Scientific argumentation is a necessary part of scientific inquiry and plays an important role in the generation and validation of scientific knowledge.

D: Scientific knowledge is based on observation and inference; it is important to recognize that these are very different things. Not only does science require creativity in its methods and processes, but also in its questions and explanations.

BENCHMARK CODE	BENCHMARK
SC.6.N.1.1	Define a problem from the sixth grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.N.1.2	Explain why scientific investigations should be replicable. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.N.1.3	Explain the difference between an experiment and other types of scientific investigation, and explain the relative benefits and limitations of each. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.N.1.4	Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.N.1.5	Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate

Big Idea 2:

A: Scientific knowledge is based on empirical evidence, and is appropriate for understanding the natural world, but it provides only a limited understanding of the supernatural, aesthetic, or other ways of knowing, such as art, philosophy, or religion.

B: Scientific knowledge is durable and robust, but open to change.

C: Because science is based on empirical evidence it strives for objectivity, but as it is a human endeavor the processes, methods, and knowledge of science include subjectivity, as well as creativity and discovery.

BENCHMARK CODE	BENCHMARK
SC.6.N.2.1	Distinguish science from other activities involving thought. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.N.2.2	Explain that scientific knowledge is durable because it is open to change as new evidence or interpretations are encountered. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.N.2.3	Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goals. *Cognitive Complexity/Depth of Knowledge Rating:* Low

Big Idea 3: The terms that describe examples of scientific knowledge, for example; "theory," "law," "hypothesis," and "model" have very specific meanings and functions within science.	
BENCHMARK CODE	**BENCHMARK**
SC.6.N.3.1	Recognize and explain that a scientific theory is a well-supported and widely accepted explanation of nature and is not simply a claim posed by an individual. Thus, the use of the term theory in science is very different than how it is used in everyday life. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.N.3.2	Recognize and explain that a scientific law is a description of a specific relationship under given conditions in the natural world. Thus, scientific laws are different from societal laws. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.N.3.3	Give several examples of scientific laws. *Cognitive Complexity/Depth of Knowledge Rating:* Low
SC.6.N.3.4	Identify the role of models in the context of the sixth grade science benchmarks. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
Big Idea 6: Over geologic time, internal and external sources of energy have continuously altered the features of Earth by means of both constructive and destructive forces. All life, including human civilization, is dependent on Earth's internal and external energy and material resources.	
BENCHMARK CODE	**BENCHMARK**
SC.6.E.6.1	Describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion, and deposition. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.E.6.2	Recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas, and lakes and relate these landforms as they apply to Florida. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
Big Idea 7: The scientific theory of the evolution of Earth states that changes in our planet are driven by the flow of energy and the cycling of matter through dynamic interactions among the atmosphere, hydrosphere, cryosphere, geosphere, and biosphere, and the resources used to sustain human civilization on Earth.	
BENCHMARK CODE	**BENCHMARK**
SC.6.E.7.1	Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through Earth's system. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.E.7.2	Investigate and apply how the cycling of water between the atmosphere and hydrosphere has an effect on weather patterns and climate. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.E.7.3	Describe how global patterns such as the jet stream and ocean currents influence local weather in measurable terms such as temperature, air pressure, wind direction and speed, and humidity and precipitation. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.E.7.4	Differentiate and show interactions among the geosphere, hydrosphere, cryosphere, atmosphere, and biosphere. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.E.7.5	Explain how energy provided by the sun influences global patterns of atmospheric movement and the temperature differences between air, water, and land. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.E.7.6	Differentiate between weather and climate. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.E.7.7	Investigate how natural disasters have affected human life in Florida. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.E.7.8	Describe ways human beings protect themselves from hazardous weather and sun exposure. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate

SC.6.E.7.9	Describe how the composition and structure of the atmosphere protects life and insulates the planet. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate

Big Idea 11:

A. Waves involve a transfer of energy without a transfer of matter.

B. Water and sound waves transfer energy through a material.

C. Light waves can travel through a vacuum and through matter.

D. The Law of Conservation of Energy: Energy is conserved as it transfers from one object to another and from one form to another.

BENCHMARK CODE	BENCHMARK
SC.6.P.11.1	Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate

Big Idea 12:

A. Motion is a key characteristic of all matter that can be observed, described, and measured.

B. The motion of objects can be changed by forces.

BENCHMARK CODE	BENCHMARK
SC.6.P.12.1	Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship. *Cognitive Complexity/Depth of Knowledge Rating:* High

Big Idea 13:

A. It takes energy to change the motion of objects.

B. Energy change is understood in terms of forces--pushes or pulls.

C. Some forces act through physical contact, while others act at a distance.

BENCHMARK CODE	BENCHMARK
SC.6.P.13.1	Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.P.13.2	Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are. *Cognitive Complexity/Depth of Knowledge Rating:* Low
SC.6.P.13.3	Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate

Big Idea 14:

A. All living things share certain characteristics.

B. The scientific theory of cells, also called cell theory, is a fundamental organizing principle of life on Earth.

C. Life can be organized in a functional and structural hierarchy.

D. Life is maintained by various physiological functions essential for growth, reproduction, and homeostasis.

BENCHMARK CODE	BENCHMARK
SC.6.L.14.1	Describe and identify patterns in the hierarchical organization of organisms from atoms to molecules and cells to tissues to organs to organ systems to organisms. *Cognitive Complexity/Depth of Knowledge Rating:* Low

SC.6.L.14.2	Investigate and explain the components of the scientific theory of cells (cell theory): all organisms are composed of cells (single-celled or multi-cellular), all cells come from pre-existing cells, and cells are the basic unit of life. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.L.14.3	Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.L.14.4	Compare and contrast the structure and function of major organelles of plant and animal cells, including cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
SC.6.L.14.5	Identify and investigate the general functions of the major systems of the human body (digestive, respiratory, circulatory, reproductive, excretory, immune, nervous, and musculoskeletal) and describe ways these systems interact with each other to maintain homeostasis. *Cognitive Complexity/Depth of Knowledge Rating:* High
SC.6.L.14.6	Compare and contrast types of infectious agents that may infect the human body, including viruses, bacteria, fungi, and parasites. *Cognitive Complexity/Depth of Knowledge Rating:* Moderate
Big Idea 15: **A. The scientific theory of evolution is the organizing principle of life science.** **B. The scientific theory of evolution is supported by multiple forms of evidence.** **C. Natural Selection is a primary mechanism leading to change over time in organisms.**	
BENCHMARK CODE	**BENCHMARK**
SC.6.L.15.1	Analyze and describe how and why organisms are classified according to shared characteristics with emphasis on the Linnaean system combined with the concept of Domains. *Cognitive Complexity/Depth of Knowledge Rating:* High