**THE NATURE OF SCIENCE NGSSS 2008**

**17% of FCAT 2.0**

Big Idea 1: The Practice of Science

Big Idea 2: The Characteristics of Scientific Knowledge

* **SC.5.N.1.1 Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identification of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions. (H)**
* SC.3.N.1.1 Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate appropriate explanations based on those explorations. (H)
* SC.4.N.1.1 Raise questions about the natural world, use appropriate reference materials that support understanding to obtain information (identifying the source), conduct both individual and team investigations through free exploration and systematic investigations, and generate appropriate explanations based on those explorations. (H)
* SC.4.N.1.6 Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations. (H)
* SC.5.N.1.2 Explain the difference between an experiment and other types of scientific investigation. (M)
* SC.5.N.1.4 Identify a control group and explain its importance in an experiment. (M)
* **SC.5.N.2.1 Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence. (M)**
* SC.3.N.1.7 Explain that empirical evidence is information, such as observations or measurements, that is used to help validate explanations of natural phenomena. (H)
* SC.4.N.1.3 Explain that science does not always follow a rigidly defined method (“the scientific method”) but that science does involve the use of observations and empirical evidence. (M)
* SC.4.N.1.7 Recognize and explain that scientists base their explanations on evidence. (M)
* SC.5.N.1.5 Recognize and explain that authentic scientific investigation frequently does not parallel the steps of “the scientific method.” (M)
* SC.5.N.1.6 Recognize and explain the difference between personal opinion/interpretation and verified observation. (M)
* **SC.5.N.2.2 Recognize and explain that when scientific investigations are carried out, the evidence produced by those investigations should be replicable by others. (M)**
* SC.3.N.1.2 Compare the observations made by different groups using the same tools and seek reasons to explain the differences across groups. (H)
* SC.3.N.1.5 Recognize that scientists question, discuss, and check each others’ evidence and explanations. (M)
* SC.4.N.1.2 Compare the observations made by different groups using multiple tools and seek reasons to explain the differences across groups. (H)
* SC.4.N.1.5 Compare the methods and results of investigations done by other classmates. (M)
* SC.5.N.1.3 Recognize and explain the need for repeated experimental trials. (M)

**EARTH/SPACE SCIENCE GRADES 3-5 NGSSS 2008**

**29% of FCAT 2.0**

Big Idea 5: Earth in Space and Time

Big Idea 6: Earth Structures

Big Idea 7: Earth Systems and Patterns

* **SC.5.E.5.1 Recognize that a galaxy consists of gas, dust, and many stars, including any objects orbiting the stars. Identify our home galaxy as the Milky Way. (L)**
* SC.3.E.5.1 Explain that stars can be different; some are smaller, some are larger, and some appear brighter than others; all except the Sun are so far away that they look like points of light. (H)
* SC.3.E.5.2 Identify the Sun as a star that emits energy; some of it in the form of light. (M)
* SC.3.E.5.3 Recognize that the Sun appears large and bright because it is the closest star to Earth. (H)
* **SC.5.E.5.3 Distinguish among the following objects of the Solar System -- Sun, planets, moons, asteroids, comets -- and identify Earth's position in it. (H)**
* SC.5.E.5.2 Recognize the major common characteristics of all planets and compare/contrast the properties of inner and outer planets. (M)
* **SC.4.E.5.4 Relate that the rotation of Earth (day and night) and apparent movements of the Sun, Moon, and stars are connected. (H)**
* **SC.4.E.5.1** Observe that the patterns of stars in the sky stay the same although they appear to shift across the sky nightly, and different stars can be seen in different seasons. (H)
* **SC.4.E.5.2** Describe the changes in the observable shape of the moon over the course of about a month. (M)
* **SC.4.E.5.3** Recognize that Earth revolves around the Sun in a year and rotates on its axis in a 24-hour day. (M)
* **SC.4.E.6.2 Identify the physical properties of common earth-forming minerals, including hardness, color, luster, cleavage, and streak color, and recognize the role of minerals in the formation of rocks. (M)**
* SC.4.E.6.1 Identify the three categories of rocks: igneous, (formed from molten rock); sedimentary (pieces of other rocks and fossilized organisms); and metamorphic (formed from heat and pressure). (L)
* **SC.4.E.6.3 Recognize that humans need resources found on Earth and that these are either renewable or nonrenewable. (M)**
* SC.4.E.6.6 Identify resources available in Florida (water, phosphate, oil, limestone, silicon, wind, and solar energy). (L)
* **SC.4.E.6.4 Describe the basic differences between physical weathering (breaking down of rock by wind, water, ice, temperature change, and plants) and erosion (movement of rock by gravity, wind, water, and ice). (M)**
* **SC.5.E.7.1 Create a model to explain the parts of the water cycle. Water can be a gas, a liquid, or a solid and can go back and forth from one state to another. (H)**
* SC.5.E.7.2 Recognize that the ocean is an integral part of the water cycle and is connected to all of Earth's water reservoirs via evaporation and precipitation processes. (M)
* **SC.5.E.7.3 Recognize how air temperature, barometric pressure, humidity, wind speed and direction, and precipitation determine the weather in a particular place and time. (M)**
* SC.5.E.7.4 Distinguish among the various forms of precipitation (rain, snow, sleet, and hail), making connections to the weather in a particular place and time. (H)
* SC.5.E.7.5 Recognize that some of the weather-related differences, such as temperature and humidity, are found among different environments, such as swamps, deserts, and mountains. (M)
* SC.5.E.7.6 Describe characteristics (temperature and precipitation) of different climate zones as they relate to latitude, elevation, and proximity to bodies of water. (H)

**PHYSICAL SCIENCE GRADES 3-5 NGSSS 2008**

**29% of FCAT 2.0**

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

* **SC.5.P.8.1 Compare and contrast the basic properties of solids, liquids, and gases, such as mass, volume, color, texture, and temperature. (M)**
* SC.3.P.8.1 Measure and compare temperatures of various samples of solids and liquids. (M)
* SC.3.P.8.2 Measure and compare the mass and volume of solids and liquids. (M)
* SC.3.P.8.3 Compare materials and objects according to properties such as size, shape, color, texture, and hardness. (M)
* SC.4.P.8.1 Measure and compare objects and materials based on their physical properties including: mass, shape, volume, color, hardness, texture, odor, taste, attraction to magnets. (M)
* **SC.5.P.8.3 Demonstrate and explain that mixtures of solids can be separated based on observable properties of their parts such as particle size, shape, color, and magnetic attraction. (M)**
* SC.5.P.8.2 Investigate and identify materials that will dissolve in water and those that will not and identify the conditions that will speed up or slow down the dissolving process. (H)
* **SC.5.P.9.1 Investigate and describe that many physical and chemical changes are affected by temperature. (H)**
* SC.3.P.9.1 Describe the changes water undergoes when it changes state through heating and cooling by using familiar scientific terms such as melting, freezing, boiling, evaporation, and condensation. (M)
* SC.4.P.9 1 Identify some familiar changes in materials that result in other materials with different characteristics, such as decaying animal or plant matter, burning, rusting, and cooking. (L)
* **SC.5.P.10.1 Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical. (M)**
* SC.3.P.10.1 Identify some basic forms of energy such as light, heat, sound, electrical, and mechanical. (L)
* SC.3.P.10.3 Demonstrate that light travels in a straight line until it strikes an object or travels from one medium to another. (M)
* SC.3.P.10.4 Demonstrate that light can be reflected, refracted, and absorbed. (M)
* SC.3.P.11.1 Investigate, observe, and explain that things that give off light often also give off heat. (H)
* SC.3.P.11.2 Investigate, observe, and explain that heat is produced when one object rubs against another, such as rubbing one's hands together. (H)
* SC.4.P.10.1 Observe and describe some basic forms of energy, including light, heat, sound, electrical, and the energy of motion. (M)
* SC.4.P.10.3 Investigate and explain that sound is produced by vibrating objects and that pitch depends on how fast or slow the object vibrates. (H)
* **SC.5.P.10.2 Investigate and explain that energy has the ability to cause motion or create change. (H)**
* SC.3.P.10.2 Recognize that energy has the ability to cause motion or create change. (L)
* SC.4.P.10.2 Investigate and describe that energy has the ability to cause motion or create change. (M)
* SC.4.P.10.4 Describe how moving water and air are sources of energy and can be used to move things. (M)

**PHYSICAL SCIENCE GRADES 3-5 NGSSS 2008**

**29% of FCAT 2.0**

* **SC.5.P.10.4 Investigate and explain that electrical energy can be transformed into heat, light, and sound energy, as well as the energy of motion. (H)**
* SC.3.E.6.1 Demonstrate that radiant energy from the Sun can heat objects and when the Sun is not present, heat may be lost. (H)
* SC.4.P.11.1 Recognize that heat flows from a hot object to a cold object and that heat flow may cause materials to change temperature. (L)
* SC.4.P.11.2 Identify common materials that conduct heat well or poorly. (L)
* SC.5.P.10.3 Investigate and explain that an electrically-charged object can attract an uncharged object and can either attract or repel another charged object without any contact between the objects. (H)
* SC.5.P.11.1 Investigate and illustrate the fact that the flow of electricity requires a closed circuit (a complete loop). (M)
* SC.5.P.11.2 Identify and classify materials that conduct electricity and materials that do not. (M)
* **SC.5.P.13.1 Identify familiar forces that cause objects to move, such as pushes or pulls, including gravity acting on falling objects. (L)**
* SC.3.E.5.4 Explore the Law of Gravity by demonstrating that gravity is a force that can be overcome. (H)
* SC.4.P.8.4 Investigate and describe that magnets can attract magnetic materials and attract and repel other magnets. (H)
* **SC.5.P.13.2 Investigate and describe that the greater the force applied to it, the greater the change in motion of a given object. (M)**
* SC.4.P.12.1 Recognize that an object in motion always changes its position and may change its direction. (L)
* SC.4.P.12.2 Investigate and describe that the speed of an object is determined by the distance it travels in a unit of time and that objects can move at different speeds. (M)
* SC.5.P.13.3 Investigate and describe that the more mass an object has, the less effect a given force will have on the object's motion. (M)
* SC.5.P.13.4 Investigate and explain that when a force is applied to an object but it does not move, it is because another opposing force is being applied by something in the environment so that the forces are balanced. (H)

**LIFE SCIENCE GRADES 3-5 NGSSS 2008**

**25% of FCAT 2.0**

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

* **SC.3.L.14.1 Describe structures in plants and their roles in food production, support, water and nutrient transport, and reproduction. (M)**
* SC.3.L.14.2 Investigate and describe how plants respond to stimuli (heat, light, gravity), such as the way plant stems grow toward light and their roots grow downward in response to gravity. (H)
* SC.4.L.16.1 Identify processes of sexual reproduction in flowering plants, including pollination, fertilization (seed production), seed dispersal, and germination. (M)
* **SC.5.L.14.1 Identify the organs in the human body and describe their functions, including the skin, brain, heart, lungs, stomach, liver, intestines, pancreas, muscles and skeleton, reproductive organs, kidneys, bladder, and sensory organs. (M)**
* **SC.5.L.14.2 Compare and contrast the function of organs and other physical structures of plants and animals, including humans, for example: some animals have skeletons for support -- some with internal skeletons others with exoskeletons -- while some plants have stems for support. (M)**
* SC.3.L.15.1 Classify animals into major groups (mammals, birds, reptiles, amphibians, fish, arthropods, vertebrates and invertebrates, those having live births and those which lay eggs) according to their physical characteristics and behaviors. (M)
* SC.3.L.15.2 Classify flowering and nonflowering plants into major groups such as those that produce seeds, or those like ferns and mosses that produce spores, according to their physical characteristics. (M)
* **SC.4.L.16.4 Compare and contrast the major stages in the life cycles of Florida plants and animals, such as those that undergo incomplete and complete metamorphosis, and flowering and nonflowering seed-bearing plants**. (M)
* **SC.5.L.17.1 Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics. (M)**
* SC.3.L.17.1 Describe how animals and plants respond to changing seasons. (M)
* SC.4.L.16.2 Explain that although characteristics of plants and animals are inherited, some characteristics can be affected by the environment. (H)
* SC.4.L.16.3 Recognize that animal behaviors may be shaped by heredity and learning. (H)
* SC.4.L.17.1 Compare the seasonal changes in Florida plants and animals to those in other regions of the country. (M)
* SC.4.L.17.4 Recognize ways plants and animals, including humans, can impact the environment. (H)
* SC.5.L.15.1 Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations. (H)
* **SC.4.L.17.3 Trace the flow of energy from the Sun as it is transferred along the food chain through the producers to the consumers. (M)**
* SC.3.L.17.2 Recognize that plants use energy from the Sun, air, and water to make their own food. (L)
* SC.4.L.17.2 Explain that animals, including humans, cannot make their own food and that when animals eat plants or other animals, the energy stored in the food source is passed to them. (M)