

Wakulla County Schools
ELEMENTARY SCIENCE CURRICULUM
Fourth Grade
Without Access Points

Revised June, 2011

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Fourth Grade Science Curriculum

This curriculum is based upon the Next Generation Sunshine State Standards for Science. Fourth grade science instruction should fully instruct students on the benchmarks contained in this document. A minimum of 100 minutes per week should be spent in science instruction, with an additional 50 minutes per week spent on the Comprehensive Health Curriculum. Where possible, Health standards have been aligned with Science standards in this document.

Documentation:

Teachers should document when instruction is provided on the benchmarks. The date noted should correspond to a specific lesson or unit of instruction as noted in the teacher's lesson plans or to when an assessment was given to determine student mastery of the benchmark.

Major Tool of Instruction:

The major tool of instruction provided to all teachers is the National Geographic Science, 2010 K-5 series. It is critical that teachers require that students access the text in order to build content-area reading skills. Other resources may be incorporated to insure that all students achieve mastery of the required benchmarks.

Key to Acronyms and Markings:

SIWB – Science Inquiry and Writing Book

Bold Print – Vocabulary to be taught to mastery

Marked with * - FCAT Vocabulary

CPALMS – www.floridastandards.org

SCIENCE CURRICULUM – Fourth Grade

Body of Knowledge: Nature of Science

Big Idea 1: The Practice of Science

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	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
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. <p style="text-align: right;">Complexity: High</p>	<p style="text-align: center;">The Nature of Science benchmarks serve as a foundation for all science inquiry. Therefore, they are supported and reinforced throughout the text. The following sections of the textbook are critical to mastery of these benchmarks:</p> <ul style="list-style-type: none"> • Guided Inquiry Activities • Directed Inquiry Activities • Explore Activities • Science Inquiry and Writing Book (SIWB) activities 						
SC.4.N.1.2	Compare the observations made by different groups using multiple tools and seek reasons to explain the differences across groups. <p style="text-align: right;">Complexity: High</p>							
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. <p style="text-align: right;">Complexity: Moderate</p>							
SC.4.N.1.4	Attempt reasonable answers to scientific questions and cite evidence in support. <p style="text-align: right;">Complexity: High</p>							
SC.4.N.1.5	Compare the methods and results of investigations done by other classmates. <p style="text-align: right;">Complexity: Moderate</p>							
SC.4.N.1.6	Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations. <p style="text-align: right;">Complexity: High</p>							

SC.4.N.1.7	Recognize and explain that scientists base their explanations on evidence. Complexity: Moderate							
SC.4.N.1.8	Recognize that science involves creativity in designing experiments. Complexity: Moderate							
Required Activity	Foundational concepts for all inquiry, therefore, the requirement is that science inquiry be supported and encouraged in the classroom through multiple investigations, questioning and hands-on science exploration.							
Associated Vocabulary	Investigation* , inference* , law, scientist, observation* , experiment, valid* , predict* , testable*							
Assessment Information	<p>SC.4.N.1.1 and SC.4.N.1.6 are assessed as SC.5.N.1.1 in 5th grade. Prior knowledge from SC.E.N.1.3 and SC.3.N.1.6 will also be required. Tasks will require students to evaluate written procedure or experimental setup, identify appropriate forms of record keeping, interpret and analyze data to generate appropriate explanations based on that data, and identify examples of or distinguish among observations, predictions, and/or inferences. Students will also explain the difference between an experiment and other types of scientific investigations and identify a control group and/or explain its importance in an experiment.</p> <p>SC.4.N.1.3 and SC.4.N.1.7 are assessed as SC5.N.2.1 in 5th grade. Task will require students to identify and/or explain that science is grounded in verifiable observations (empirical) that are testable, distinguish between personal interpretation and verified observation, distinguish between examples of evidence or observations (empirical) and personal opinion.</p> <p>SC.4.N.1.2 and SC.4.N.1.5 are assessed as SC.5.N.2.2 in 5th Grade. Task will require students to identify and/or explain the need for replication of scientific investigation; explain the reason for differences in data across groups as a result of using different tools and/or procedures; as well as identify and/or explain the need for repeated trials in a scientific investigation.</p>							

Body of Knowledge: Nature of Science

Big Idea 2: The Characteristics of Scientific Knowledge

- 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	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.4.N.2.1	Explain that science focuses solely on the natural world. Complexity: Moderate	Text: Chapter 1 – Lesson 8 Life Science Video (T4A)						
Required Activity	Think Like a Scientist “Math in Science” TE pages T33a-T33d							
Associated Vocabulary	Scale, diagram							
Connection/ Assessment Information								

Body of Knowledge: Nature of Science

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

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	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.4.N.3.1	Explain that models can be three dimensional, two dimensional, an explanation in your mind, or a computer model. Complexity: Moderate	Text: Chapter 5-Lesson 1						
Required Activity	Build Models of Earth and the Moon, Sun and Stars – TE page T328v							
Associated Vocabulary	model							
Connection/ Assessment Information	<p>Math: MA.4.G.5.3 - Identify and build a three-dimensional object from a two-dimensional representation of that object and vice versa. MA.4.A.6.2 – Use models to represent division as:</p> <ul style="list-style-type: none"> ▪ the inverse of multiplication ▪ as partitioning ▪ as successive subtraction <p>Social Studies - a globe is a three-dimensional model of the Earth; a map is a two-dimensional model of the Earth</p>							

Body of Knowledge: Earth/Space Science

Big Idea 5: Earth in Space and Time

Humans continue to explore Earth’s place in space. Gravity and energy influence the formation of galaxies, including our own Milky Way Galaxy, stars, the Solar System and Earth. Humankind’s need to explore continues to lead to the development of knowledge and understanding of our Solar System.

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
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. Complexity: High	Text: Chapter 5						
SC.4.E.5.2	Describe the changes in the observable shape of the moon over the course of about a month. Complexity: Moderate	Text: Chapter 5 – Lessons 2, 6						
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. Complexity: Moderate	Text: Chapter 5 – Lessons 3, 4						
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. Complexity: High	Text: Chapter 5 – Lesson 11						
SC.4.E.5.5	Investigate and report the effects of space research and exploration on the economy and culture of Florida. Complexity: High	Text: Chapter 5 – Lesson 7						
Required Activity	Investigate Moon Phases – TE pages T195a-T195d Use Learning Masters pages 73-77							
Associated Vocabulary	Axis, moon* , motion, sun* , space, season, rotate, revolve, phase, gravity , weight*(a measure of the force of gravity on an object)							
Connection	Social Studies: SS.4.A.8.3 - Describe the effect of the United States space program on Florida's economy and growth. SS.4.E.1.2 - Explain Florida's role in the national and international economy and conditions that attract businesses to the state.							
Assessment Information	<p>SC.4.E.5.4 Reporting Category: Earth & Space Science Benchmark Clarification: Task will require students to describe how the rotation of Earth and apparent movement of the Sun, Moon and/or stars are related; identify that the pattern of stars appears to shift across the sky nightly or that different stars can be seen in different seasons; they will describe the visual changes in the appearance of the Moon; and explain that Earth revolves around the Sun in a year and that the Earth rotates on its axis in a 24-hour day. Content Limits: Items will assess a conceptual understanding of the apparent movements of the Sun, Moon and stars and resulting patterns but will not assess the causes of the moon phases or use vocabulary associated with moon phases such as waning, waxing and gibbous. They will not require the</p>							

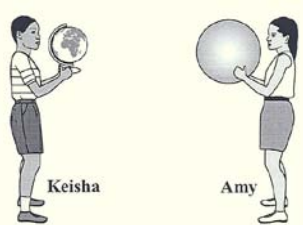
identification of specific constellations or require specific knowledge of quantitative astronomical data and will not assess the causes of seasons, directness of sunlight or Earth's tilt.

Stimulus Attributes: Scenarios referring to patterns of stars in the sky will not use the term constellation.

Prior Knowledge: SC.K.E.5.2, SC.K.E.5.3, SC.K.E.5.4

Sample Item:

Keisha wants to show Amy what happens during one Earth day. Keisha holds a small globe representing Earth and Amy holds a large ball representing the sun.



What should Keisha do to show Amy what happens during one Earth day?

- A. Keisha should move the globe in one complete circle around Amy.
- B. Keisha should move the globe toward Amy and then away from her.
- C. Keisha should slowly lift the globe above her head and then lower it.
- D. Keisha should slowly spin the globe one complete time around its axis. ♦**

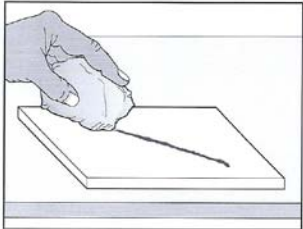
Also assesses: SC.4.E.5.1, SC.4.E.5.2, SC.4.E.5.3

Body of Knowledge: Earth/Space Science

Big Idea 6: Earth Structures

Humans continue to explore the composition and structure of the surface of Earth. 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 water and natural resources.

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
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). Complexity: Low	Text: Chapter 6 – Lessons 5, 7						
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. Complexity: Moderate	Text: Chapter 6 – Lessons 3, 4, 5						
SC.4.E.6.3	Recognize that humans need resources found on Earth and that these are either renewable or non-renewable. Complexity: Moderate	Text: Chapter 7 – Lessons 2-5						
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). Complexity: Moderate	Text: Chapter 8						
SC.4.E.6.5	Investigate how technology and tools help to extend the ability of humans to observe very small things and very large things. Complexity: High	Text: Chapter 5 – Lesson 5						
SC.4.E.6.6	Identify resources available in Florida (water, phosphate, oil, limestone, silicon, wind, and solar energy). Complexity: Low	Text: Chapter 7 – Lesson 2						
Required Activity	Investigate Minerals – TE pages T209i-T209L Learning Masters 83-86							
Associated Vocabulary	Minerals* , Metamorphic* , Igneous* , erosion* , sedimentary* , property, grain, cleavage* , hardness* , natural resources, renewable resources, nonrenewable resources, weathering* , abrasion, streak*							
Connection	Social Studies: SS.4.A.6.1: Describe the economic development of Florida's major industries. SS.4.A.7.1: Describe the causes and effects of the 1920's Florida land boom and bust.							

	<p>SS.4.G.1.1: Identify physical features of Florida. SS.4.G.1.3: Explain how weather impacts Florida.</p>
<p>Assessment Information</p>	<p>SC.4.E.6.4 Reporting Category: Earth & Space Science Benchmark Clarification: Student will identify and/or describe the processes of physical weathering and/or erosion; they will compare and contrast the agents and/or the processes of physical weathering and erosion. Content Limit: Items may address but will not assess specific landforms resulting from physical weathering and erosion. Prior Knowledge: SC.1.E.6.1, SC.1.E.6.3, SC.2.E.6.1 Sample Item: Earth has a great variety of surface features that are caused by weathering and erosion. Which of the following describes a change due to weathering? A. ocean waves washing sand off the beach B. rivers carrying soil and rocks through valleys C. wind blowing sand and pebbles off of a sand dune D. tree roots breaking rocks into smaller pieces of rock ♦</p> <p>SC.4.E.6.2 Reporting Category: Earth & Space Science Benchmark Clarification: Task will require students to identify and/or describe the physical properties of common minerals; to describe and/or explain the role of minerals in the formation of rocks and to identify three categories of rocks and how they were formed. Content Limits: Items will not assess the identification of a specific mineral based on its properties. Items addressing common minerals are limited to quartz, feldspar, mica, calcite, talc, pyrite and graphite. Items will not require the identification of specific mineral composition of any type of rock nor require knowledge of Moh’s hardness scale and will not assess the rock cycle. Prior Knowledge: SC.1.E.6.1, SC.2.E.6.1, SC.2.E.6.2, SC.2.E.6.3, SC.K.P.8.1, SC.1.P.8.1, SC.2.P.8.1 Sample Item: Daunte performs several tests on a mineral to help identify it. The picture below shows one of the tests he performed.</p>  <p>Which property of the mineral will Daunte be able to identify using this test? A. Attraction to magnets B. streak color ♦ C. hardness D. cleavage</p> <p>Also Assesses: SC.4.E.6.1</p>

SC.4.E.6.3

Reporting Category: Earth & Space Science

Benchmark Clarification: Task will require students to identify and/or distinguish between renewable and nonrenewable resources found on Earth and resources naturally found in Florida.

Prior Knowledge: SC.1.E.6.2

Sample Item:

There are many different natural resources found in Florida. Which of the following can be described as a renewable resource?

- A. Limestone B. oil C. phosphate **D. water ♦**

Also Assesses: SC.4.E.6.6

Body of Knowledge: Physical Science

Big Idea 8: Properties of Matter

- A. All objects and substances in the world are made of matter. Matter has two fundamental properties: matter takes up space and matter has mass.
- B. Objects and substances can be classified by their physical and chemical properties. Mass is the amount of matter (or “stuff”) in an object. Weight, on the other hand, is the measure of force of attraction (gravitational force) between an object and Earth.

The concepts of mass and weight are complicated and potentially confusing to elementary students. Hence, the more familiar term of “weight” is recommended for use to stand for both mass and weight in grades K-5. By grades 6-8, students are expected to understand between mass and weight, and use them appropriately.

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
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. Complexity: Moderate	Text: Chapter 9 – Lessons 3-5 Explore on Your Own – Winning Properties – Pioneer/Pathfinder						
SC.4.P.8.2	Identify properties and common uses of water in each of its states. Complexity: Low	Text: Chapter 9 – Lesson 3						
SC.4.P.8.3	Explore the Law of Conservation of Mass by demonstrating that the mass of a whole object is always the same as the sum of the masses of its parts. Complexity: Moderate	Text: Chapter 9 – Lessons 4, 8						
SC.4.P.8.4	Investigate and describe that magnets can attract magnetic materials and attract and repel other magnets. Complexity: High	Text: Chapter 12						
Required Activity	Investigate Mass and Volume – TE pages T355e – T355h Learning Masters pages 132 - 135							
Associated Vocabulary	Matter* , mass* , volume* , conservation of mass, magnet, magnetic, attraction* , repel* , solid, liquid, gas							
Connection	Math: Measurement has been previously introduced and can be practiced in this context. MA.4.G.3.3: Select and use appropriate units, both customary and metric, strategies, and measuring tools to estimate and solve real-world area problems.							
Assessment Information	SC.4.P.8.1 is assessed as SC.5.P.8.1 in 5 th grade. Task will require students to compare and/or contrast the physical properties of solids, liquids and/or gases; and, to describe and/or classify a material as a solid, liquid or gas. SC.4.P.8.4 is assessed as SC.5.P.13.1 in 5 th grade. Task will require students to identify familiar forces that affect how objects move; identify scenarios whereby gravity is overcome and/or describe examples of magnetic attraction and repulsion.							

Body of Knowledge: Physical Science

Big Idea 9: Changes in Matter								
A. Matter can undergo a variety of changes.								
B. Matter can be changed physically or chemically.								
BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
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. Complexity: Low	Text: Chapter 10 – Lesson 4, 5						
Required Activity	Investigate Rusting – TE pages &391a-T391d. This can be done as a demonstration with questioning. Learning Masters pages 142 - 145							
Associated Vocabulary	Chemical properties, physical properties, chemical change* , physical change							
Connection/ Assessment Information	SC.4.P.9.1 is assessed as SC.5.P.9.1 in 5 th grade. Task will require students to describe how physical and/or chemical changes are affected by temperature, to describe the physical changes water undergoes as it is heated and/or cooled, as well as how some familiar changes in materials result in other materials with different characteristics.							

Body of Knowledge: Physical Science

Big Idea 10: Forms of Energy							
A. Energy is involved in all physical processes and is a unifying concept in many areas of science.							
B. Energy exists in many forms and has the ability to do work or cause a change.							
BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE				
			11/12	12/13	13/14	14/15	15/16
SC.4.P.10.1	Observe and describe some basic forms of energy, including light, heat, sound, electrical and the energy of motion. Complexity: Moderate	Text: Chapter 13, Chapter 14 – Lesson 4					
SC.4.P.10.2	Investigate and describe that energy has the ability to cause motion or create change. Complexity: Moderate	Text: Chapter 13 – Lessons 1-6					
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. Complexity: High	Text: Chapter 14 – Lesson 3					
SC.4.P.10.4	Describe how moving water and air are sources of energy and can be used to move things. Complexity: Moderate	Text: Chapter 13 – Lessons 6, 10					
Required Activity	Investigate Chemical Changes – Learning Master pages 186-187 TE –T516m – T516n						
Associated Vocabulary	energy, light, heat, motion, pitch*, vibration, sound						
Connection/Assessment Information	<p>SC.4.P.10.1 & SC.4.P.10.3 are assessed as SC.5.P.10.1 in 5th grade. Task will require students to identify and/or describe some basic forms of energy as well as describe that light travels in a straight line until it strikes an object or travels from one material to another. Students will also explain that heat is produced when two objects are rubbed against each other and that sound is produced by vibrations and/or that pitch depends on how fast or slow the object vibrates.</p> <p>SC.4.P.10.2 & SC.4.P.10.4 are assessed as SC.5.P.10.2 in 5th grade. Task will require students to explain that energy has the ability to cause motion or create change; identify and/or describe examples where energy has caused motion or created changes; and, describe and/or explain how water and/or air are sources of energy.</p>						

Body of Knowledge: Physical Science

Big Idea 11: Energy Transfer and Transformations							
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.							
BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE				
			11/12	12/13	13/14	14/15	15/16
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. Complexity: Low	Text: Chapter 13 – Lesson 5					
SC.4.P.11.2	Identify common materials that conduct heat well or poorly. Complexity: Low	Text: Chapter 13 – Lesson 5					
Required Activity	Investigate Heat Conductors – Learning Masters – pages 169 - 172						
Associated Vocabulary	Heat, energy, conduct* , conductors , insulator*						
Assessment Information	SC.4.P.11.1, SC.4.P.11.2 are tested as SC.5.P.10.4 in 5 th grade. Task will require students to explain that electrical energy can be transformed into heat, light and/or sound energy, as well as the energy of motion; explain that energy from the Sun can be used to heat objects, and that when sunlight is not present, heat may be lost; identify the flow of heat between hot and cold objects and/or that heat may cause objects to change temperature; identify common materials that conduct heat well or poorly; explain that an electrically charged object can attract an uncharged object and/or either attract or repel another charged object without any contact between the objects; determine that the flow of electricity requires a closed circuit; identify and/or classify materials that conduct electricity and materials that do not.						

Body of Knowledge: Physical Science

Big Idea 12: Motion of Objects

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	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.4.P.12.1	Recognize that an object in motion always changes its position and may change its direction. Complexity: Low	Text: Chapter 11 – Lesson 2						
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. Complexity: Moderate	Text: Chapter 11 – Lessons 3-5, 7						
Required Activity	Investigate Speed – TE pages T423a – T423d Learning Masters – pages 152 - 154							
Associated Vocabulary	speed, distance, motion, force *							
Connection/ Assessment Information	SC.4.P.12.1 and SC.4.P.12.2 are assessed as SC.5.P.13.2 in 5 th grade. Task will require students to describe the relationship among mass, force and motion; to identify and/or describe that an object in motion always changes its position and may change its direction; describe that the speed of an object is determined by the distance an object travels and the time it takes the object to travel the distance; as well as describe that objects can move at different speeds.							

Body of Knowledge: Life Science

Big Idea 16: Heredity and Reproduction

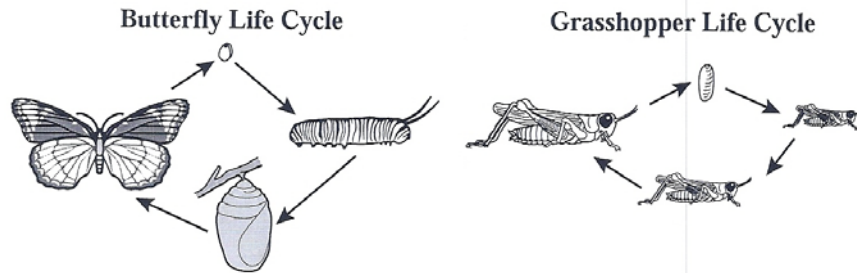
- A. Offspring of plants and animals are similar to, but not exactly like, their parents or each other.**
- B. Life cycles vary among organisms, but reproduction is a major stage in the life cycle of all organisms.**

BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE					
			11/12	12/13	13/14	14/15	15/16	16/17
SC.4.L.16.1	Identify processes of sexual reproduction in flowering plants, including pollination, fertilization (seed production), seed dispersal and germination. Complexity: Moderate	Text: Chapter 1 – How do plants grow: reproduce?						
SC.4.L.16.2	Explain that although characteristics of plants and animals are inherited, some characteristics can be affected by the environment. Complexity: High	Text: Chapter 1 – Lesson 7 Chapter 2 – Lessons 4, 5						
SC.4.L.16.3	Recognize that animal behaviors may be shaped by heredity and learning. Complexity: High	Text: Chapter 2 – Lesson 6 Share and Compare – Learning Master 32 – Classifying Traits						
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 non-flowering seed-bearing plants. Complexity: Moderate	Text: Chapter 1 – Lesson 6						
Required Activity	Investigate Owl Pellets – TE T85e - T85h: Can be done as a demonstration. Have students observe findings and complete chart.							
Associated Vocabulary	Fertilization* , metamorphosis (complete and incomplete)* , pollinate* , pollination, pollen* , reproduction* , life cycle* , heredity, environment* , germination* , seed dispersal, larva* , pupa* , pistil* , spore*							
Connection	Social Studies: SS.4.G.1.3: Explain how weather impacts Florida.							
Assessment Information	<p>SC.4.L.16.1 is assessed as SC.3.L.14.1. Task will require students to identify and/or describe the parts of plants and/or the part’s role; describe how plants respond to stimuli as well as processes of sexual reproduction in flowering plants.</p> <p>SC.4.L.16.4 Reporting Category: Life Science Benchmark Clarification: Tasks will require students to identify, compare, and/or contrast the major life cycles of Florida plants and/or animals. Content Limits: Items will only assess the life cycles of plants and animals commonly found in Florida; items assessing the life cycles of insects are limited to egg, larva, pupa and adult (complete metamorphosis) or egg, nymph and adult (incomplete metamorphosis); items assessing the life cycles of flowering and non-flowering plants are limited to seed, seedling, and other stages of plant development; items assessing the life cycles of animals are limited to egg, embryo, infant, adolescent and adult stages; items will not assess the major stages of the human life cycle. Stimulus Attributes: Plants and animals in scenarios and art must be common in Florida.</p>							

Prior Knowledge: SC.2.L.16.1

Sample Item:

The life cycle of both butterflies and grasshoppers starts at the same stage. The pictures below show the life cycle of both organisms.



Which of the following is the beginning stage of the life cycle for both the butterfly and the grasshopper?

- A. egg ♦ B. larva C. nymph D. pupa

SC.4.L.16.2 and SC.4.L.16.3 are assessed as SC.5.L.17.1 in 5th grade. Task will require students to explain, compare and/or contrast how adaptations displayed by animals or plants enable them to survive in different environments; describe or explain how animals and/or plants respond to changing seasons; distinguish plant or animal characteristics that are inherited from those that are affected by the environment; identify characteristics of animals that are inherited or distinguish inherited characteristics from those that are shaped by learning; compare the seasonal changes in Florida plants and/or animals to those in other regions of the country; identify ways in which plants and/or animals can impact the environment; describe how, when the environment changes, differences between organisms allow some plants and animals to survive and reproduce while others die or move to new locations.

Body of Knowledge: Life Science

Big Idea 17: Interdependence							
A. Plants and animals, including humans, interact with and depend upon each other and their environment to satisfy their basic needs. B. Both human activities and natural events can have major impacts on the environment. C. Energy flows from the sun through producers to consumers.							
BENCHMARK CODE	BENCHMARK	RESOURCES/ACTIVITIES/TEXT CORRELATION	DATE				
			11/12	12/13	13/14	14/15	15/16
SC.4.L.17.1	Compare the seasonal changes in Florida plants and animals to those in other regions of the country. Complexity: Moderate	Text: Chapter 4 – Lesson 3					
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. Complexity: Moderate	Text: Chapter 3 – Lessons 1, 3, 4 Science in a Snap! What’s Your Food Chain? – SE – page 99 Resource: www.justgames.com					
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. Complexity: Moderate	Text: Chapter 3 – Lesson 4					
SC.4.L.17.4	Recognize ways plants and animals, including humans, can impact the environment. Complexity: High	Text: Chapter 4 – Lesson 4-7 Leveled Readers – <u>Wild Ponies</u> “Math in Science” – TE page 141					
Required Activity	Investigating Plants and Water – TE 117e-TE 117h						
Associated Vocabulary	Producer*, consumer*, food chain*, predator*, prey*, recycle, conserve, pollution						
Connection/ Assessment Information	<p>SC.4.L.17.1 and SC.4.L.17.4 are assessed as SC.5.L.17.1 in 5th grade. Task will require students to explain, compare and/or contrast how adaptations displayed by animals or plants enable them to survive in different environments; describe or explain how animals and/or plants respond to changing seasons; distinguish plant or animal characteristics that are inherited from those that are affected by the environment; identify characteristics of animals that are inherited or distinguish inherited characteristics from those that are shaped by learning; compare the seasonal changes in Florida plants and/or animals to those in other regions of the country; identify ways in which plants and/or animals can impact the environment; describe how, when the environment changes, differences between organisms allow some plants and animals to survive and reproduce while others die or move to new locations.</p> <p>SC.4.L.17.3 Reporting Category: Life Science Benchmark Clarification: Task will require students to describe or explain how energy is transferred from the Sun through a food chain; explain that plants make their own food using carbon dioxide, water and energy from the Sun; explain that animals obtain energy from the plants and/or animals they eat.</p>						

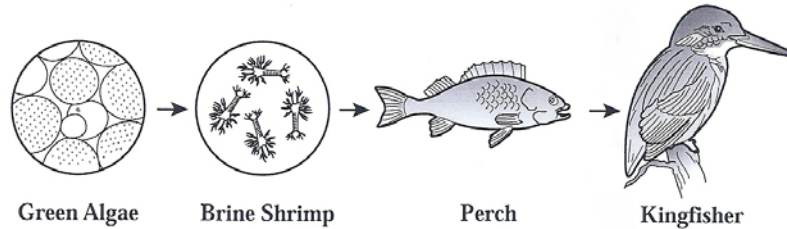
Content Limits: Items assessing the flow of energy from the Sun through a food chain are limited to the direction of energy flow. Items will not address or assess the amounts of energy flowing through the food chain or the efficiency of the energy transfers; items will not address or assess cellular respiration or any other cellular process; items will not address or assess decomposers; items will not address or assess food webs, trophic levels or energy pyramids; items will not assess more than five components (links) in a food chain.

Stimulus Attributes: Scenarios addressing food chains may, but are not required to, include the Sun; Scenarios referring to consumers may use the terms *carnivore*, *herbivore* and *omnivore*.

Prior Knowledge: SC.1.L.17.1

Sample Item:

The Sun provides the energy to be used by the living things in the lagoon food chain shown below.



not to scale

Which of the following describes the transfer of energy from a producer to a consumer?

- A. From Kingfisher to Perch
- B. From Perch to Brine Shrimp
- C. From Green Algae to Sun
- D. From Green Algae to Brine Shrimp ♦**

Also Assesses: SC.3.L.17.3, SC.4.L.17.2

Appendix A

Vocabulary

abrasion
attraction*
axis
chemical change*
chemical properties
cleavage*
conduct*
conductors
conservation of mass
conserve
consumer
energy
environment*
erosion*
experiment
fertilization*
force*
food chain*
germination
grain
gravity
hardness*
heat
heredity
igneous*
inference*
investigation*

insulator*
larva*
law
life cycle*
light
magnet
magnetic
mass*
matter*
metamorphic*
metamorphosis (complete and Incomplete)*
mineral*
model
moon*
motion
natural resources
nonrenewable resources
observation*
physical change
physical properties
pistil*
pitch*
pollinate*
pollination
pollution
predator*

prey*
predict*
producer*
property
pupa*
recycle
renewable resources
repel*
reproduction*
revolve
rotate
scientist
season
sedimentary*
seed dispersal
solid
sound
space
speed
streak*
sun*
valid*
vibration
volume*
weathering*
weight*

Appendix B

4-H Materials

The Wakulla County 4-H Program in conjunction with the University of Florida endorses uses and shares resource materials that can be found at the following websites: <http://www.4-h.org/resource-library/curriculum/>

To utilize the resources available from the 4-H Agent, Sherri Kraeft, please contact her at (850) 926-3931 or sjkraeft@ufl.edu.

Bold indicates curriculum that focuses on Science, Mathematics and Technology skills.

	Project Book Title	Resource
A	Aerospace	http://www.aces.edu/dept/4Haero/
	Agriculture	http://projects.4-hcurriculum.org/curriculum/afterschoolag/
	ATV Safety	http://svia.4-h.org/atvsafety/
B	Beef	http://www.4-h.org/resource-library/curriculum/4-h-beef/
	Bicycle	
	Butterfly	http://www.flmnh.ufl.edu/wings/
C	Cat	
	Child Development	
	Citizenship	
	Communication	
	Computer	
	Consumer Savvy	
D	Dairy Cattle	
	Dairy Goat	
	Dog	
	Down-To-Earth	
E	Electric	
	Entomology	http://new.4-hcurriculum.org/projects/entomology/
	Entrepreneurship	
	Exploring 4-H	
	Exploring Your Environment	http://online.4-hcurriculum.org/curriculum/environment/
F	Financial	
	Fishing	http://4hfishing.org/
	Food, Culture & Reading	http://projects.4-hcurriculum.org/curriculum/fcr/

	Foods	http://www.four-h.purdue.edu/foods/
	Forestry	http://new.4-hcurriculum.org/projects/forestry/
G	Gardening	
	Geospatial	
H	Health and Fitness	http://new.4-hcurriculum.org/projects/health/HealthCurriculum.htm
	Health Rocks!	
	Horse	http://www.4-hcurriculum.org/projects/leadership/
L	Latino Cultural Arts	
	Leadership	http://new.4-hcurriculum.org/projects/leadership
M	Meat Goat	
	Microwave	
O	Outdoor Adventures	http://www.4-h.org/resource-library/curriculum/4-h-outdoor-adventures/project-
P	Pets	
	Photography	http://new.4-hcurriculum.org/projects/photography/
	Poultry	
Q	Quilting (Nebraska)	
R	Rabbit	http://www.4-h.org/resource-library/curriculum/4-h-rabbit/
	Reading/Financial Literacy	http://online.4-hcurriculum.org/curriculum/reading/
	Robotics	http://www.4-h.org/resource-library/curriculum/4-h-robotics/
S	Science Discovery	http://discoverscience.rutgers.edu/curriculum/about.html
	Service Learning	
	Sewing	http://new.4-hcurriculum.org/projects/sewing/
	Sheep	
	Small Engines	http://new.4-hcurriculum.org/projects/smallengines/
	Swine	http://www.4-h.org/resource-library/curriculum/4-h-swine/
T	Theater Arts	
	There's No New Water	http://tnnw.4-hcurriculum.org/curriculum/water/
V	Veterinary Science	http://www.4-h.org/resource-library/curriculum/4-h-veterinary-science/
	Visual Arts	http://new.4-hcurriculum.org/projects/visualarts/
W	The Power of the Wind	http://online.4-hcurriculum.org/curriculum/wind/
	Woodworking	
	Workforce Readiness	

Appendix C

Materials

The following materials are needed for the Required Activities:

Big Idea	Activity	Needed Materials
Big Idea 5	Moon Phases – TE pages T195a-T195d	
Big Idea 6	Investigate Minerals – TE pages T209i-T209L	Streak Plates – one comes in the demo kit, but more are needed per grade level
Big Idea 8	Investigate Mass and volume – TE T355e – T355h	All materials needed should be in previous science kit
Big Idea 9	Investigate Rusting – TE pages 391a-391d	If this is completed as a demonstration, no additional materials will be needed.
Big Idea 10	Investigate Chemical Changes – Learning Masters pages 186 – 187	
Big Idea 11	Investigate Heat Conductors – TE pages T481a-T481d	Strip Thermometers, Metal Rulers
Big Idea 12	Investigate Speed – TE pages T423a-T423d	
Big Idea 16	Investigate Owl Pellets – TE pages T85e-T85h	Bone Sorting Chart – comes in demo kit Owl Pellets – one pack comes in demo kit, but more are needed
Big Idea 17	Investigate Plants and Water – TE pages 1173-117h	