

Topic of Study: Studying Science

Standards: Nature of Science

Big Ideas: 1.The Practice of Science, 2.Characteristics of Scientific Knowledge, 3.The Role of Theories, Laws, Hypotheses, and Models

Essential Questions: What Do Scientists Do? What Skills Do Scientists Use? How Do Scientists Collect and Use Data? Why Do Scientists Compare Results? What Kinds of Models Do Scientists Use?

Optional Teacher Background: *ScienceSaurus*- Scientific Investigation Section

[Resources](#)

[Science Center](#)

Vocabulary: *scientist, observation, hypothesis, science, investigation, inference, data, microscope, pan balance, spring scale, model, two-dimensional model, three-dimensional model, computer model*

Common Inquiry Labs:

- *Science Fusion Inquiry Flipchart "Spin a Copter"& "Design Your Own" p.2*
- *Science Fusion Inquiry Flipchart "Pendulum Swing" & "Pantry Investigation" p.3*
- *Science Fusion Inquiry Flipchart "Rain, Rain, Come Again" & "Who's Wet? Who's Dry?" p.4*
- *Science Fusion Inquiry Flipchart "Why Do Scientists Compare Results?" p.5*
- *Science Fusion Inquiry Flipchart "Bridge Building" & "Stress Test" p.6*
- *Science Fusion Inquiry Flipchart "How can you Model A School?" p.7*

	Technology Links:	
<p><u>Lab Assistance:</u></p> <p><u>Daily Inquiries</u></p> <p><u>Logs and Mini Lessons</u></p> <p><u>Health Activities</u></p>	<p><u>Science Links:</u></p> <p><u>www.Thinkcentral.com</u></p> <p><u>Fusion Teacher Resources</u></p> <p><u>Graphic Organizers</u></p>	<p><u>Online Guides:</u></p> <p><u>Above Level</u></p> <p><u>On Level</u></p> <p><u>Below Level</u></p>

St. Lucie County Public Schools Scope and Sequence 2012-2013

NGSSS	Content	Targets
<p>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. Cognitive Complexity: High</p> <p>SC.4.N.1.2 Compare the observations made by different groups using multiple tools and seek reasons to explain the differences across groups. Cognitive Complexity: High</p> <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. Cognitive Complexity: Moderate</p> <p>SC.4.N.1.4 Attempt reasonable answers to scientific questions and cite evidence in support. Cognitive Complexity: High</p> <p>SC.4.N.1.5 Compare the methods and results of investigations done by other classmates. Cognitive Complexity: Moderate</p> <p>SC.4.N.1.6 Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations. Cognitive Complexity: High</p> <p>SC.4.N.1.7 Recognize and explain that scientists base their explanations on evidence. Cognitive Complexity: Moderate</p> <p>SC.4.N.1.8 Recognize that science involves creativity in designing experiments. Cognitive Complexity: Moderate</p> <p>SC.4.N.2.1 Explain that science focuses solely on the natural world. Cognitive Complexity: Moderate</p>	<p>What Do Scientists Do?</p> <ul style="list-style-type: none"> ▪ The Role of Scientists ▪ Making Observations and Asking Questions ▪ Investigations ▪ Experiments ▪ Hypothesis ▪ Other kinds of Investigations ▪ Scientists share their Results as Evidence ▪ Conclusions <p>What Skills Do Scientists Use?</p> <ul style="list-style-type: none"> ▪ Observation ▪ Inferences ▪ Communication ▪ Prediction ▪ Use Variables ▪ Plan and Conduct Investigations ▪ Hypothesize ▪ Draw Conclusions <p>Math and Science Skills</p> <ul style="list-style-type: none"> ▪ Classify and Order ▪ Measure ▪ Use Numbers ▪ Use Time and Space Relationships ▪ Record and Display Data <p>How Do Scientists Collect and Use Data?</p> <ul style="list-style-type: none"> ▪ Research ▪ Science Tools ▪ Measurement Tools ▪ Recording and Displaying Data ▪ Using Data 	<ul style="list-style-type: none"> ▪ Explain that scientists make observations, ask questions, conduct investigations, and produce evidence that guides scientific thought and theory. ▪ Communicate that scientists conduct multiple types of investigations (traditional experiments involving fair testing, inventing, documenting, trial and error, etc.). ▪ Recognize that scientific knowledge requires evidence. ▪ Explain that inquiry skills are used in daily life. ▪ Identify examples of skills used to carry out common tasks. ▪ Describe the role of scientists. ▪ Describe that scientists come from all backgrounds. ▪ Determine the role of technology in the work of scientists. ▪ Determine that scientists often conduct research as part of an investigation. ▪ Identify different tools that scientists use to study objects and properties. ▪ Communicate that data gathered are based on measurement and observation, not inferences. ▪ Record data in appropriate tables and charts based on the purpose of the data. ▪ Describe that measurements and recording methods need to be accurate because data are used as evidence for scientific explanation. ▪ Measure an object using several different types of tools and compare the results with other groups of students. ▪ Communicate the importance of accuracy in measurements and reasons why differences may occur. ▪ Describe that science focuses on the natural world only.

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<p>SC.4.N.3.1 Explain that models can be three dimensional, two dimensional, an explanation in your mind, or a computer model. Cognitive Complexity: Moderate</p>	<p>What Kinds of Models Do Scientists Use?</p> <ul style="list-style-type: none">▪ Two-dimensional Models▪ Three-dimensional Models▪ Computer Models <p>TEACHER TRANSITION INTO NEXT TOPIC OF STUDY Now that we know that we can study the natural world through observations, investigations and explanations, let's use these skills to help us understand the patterns in the sky and the relationship between the Sun, Earth, and Moon.</p>	<ul style="list-style-type: none">▪ Communicate that scientists use different types of models depending on the subject they are studying.▪ Identify differences between examples of models, such as a picture, replica, and animation.▪ Determine that technology has helped scientists make more accurate models.
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St. Lucie County Public Schools Scope and Sequence 2012-2013

Course: 4th Grade

Course Code: 5020010

Quarter: 1

<p>Topic of Study: Earth's Place in Space</p> <p>Standards: Earth and Space Science</p> <p>Big Ideas: 5. Earth in Space and Time</p> <p>Essential Questions: How Does Earth Rotate and Revolve in Space? How Does Earth Move in Space? What are Moon Phases? How Does Technology Help Us Learn About Space?</p> <p>Optional Teacher Background: <i>ScienceSaurus</i>- Earth Science Section</p>
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Vocabulary: rotates, axis, orbit, constellation, moon phases, telescope, space probe

<p>Common Inquiry Labs:</p> <ul style="list-style-type: none"> • <i>Science Fusion</i> Inquiry Flipchart "Spin and Model" & "Constellation Patterns" p. 8 • <i>Science Fusion</i> Inquiry Flipchart "How Does Earth Move in Space?" p. 9 (SE p.77) • <i>Science Fusion</i> Inquiry Flipchart "From Full to New and Back Again" & "On the Moon" p. 10 • <i>Science Fusion</i> Inquiry Flipchart "Working In Space" & "Space Technology" p. 11

NGSSS	Content	Targets
<p>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. Cognitive Complexity: High</p> <p>SC.4.E.5.2 Describe the changes in the observable shape of the moon over the course of about a month. Cognitive Complexity: Moderate</p> <p>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. Cognitive Complexity: Moderate</p> <p>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. Cognitive Complexity: High</p> <p>SC.4.E.5.5 Investigate and report the effects of space research and exploration on the economy and culture of Florida. Cognitive Complexity: High</p>	<p>How Does Earth Rotate and Revolve in Space?</p> <ul style="list-style-type: none"> ▪ Day and Night ▪ Seasons ▪ Patterns in the Sky <p>How Does Earth Move in Space?</p> <ul style="list-style-type: none"> ▪ Rotation ▪ Revolution ▪ Axis ▪ Orbit <p>What are Moon Phases?</p> <ul style="list-style-type: none"> ▪ Change throughout the month ▪ Repeat these same changes every 28 days <p>How Does Technology Help Us Learn About Space?</p> <ul style="list-style-type: none"> ▪ Early Astronomers ▪ Telescope ▪ Human Exploration of Space ▪ Space Probes <ul style="list-style-type: none"> ○ Hubble Telescope ○ International Space Station ▪ Florida's Role in Space ▪ Space Technology at Home <p>TEACHER TRANSITION INTO NEXT TOPIC OF STUDY</p> <p>Now that we know about the patterns in the sky and the relationship between the Sun, the Earth, and the Moon let's learn about the patterns and cycles we have on Earth- the rock cycle and weathering and erosion.</p>	<ul style="list-style-type: none"> ▪ Explain how Earth's rotation causes day and night. ▪ Describe the apparent motion of objects in the sky. ▪ Explain that different constellations are visible in different seasons as a result of Earth's revolution. ▪ Recognize that the seasons result from Earth's tilt and orbit around the sun. ▪ Form a model to represent the observable motion of the sun and moon across the sky. ▪ Communicate how Earth's rotation on its axis explains the apparent motion of the sun and moon. ▪ Identify and predict changes in the appearance of the moon. ▪ Identify tools and technology used to explore the universe. ▪ Explain why Florida is one of the nation's centers for space exploration. ▪ Explain how Florida benefits from the space exploration industry. ▪ Describe technologies that have developed as a result of the space program.

Topic of Study: Earth's Surface and Resources

Standards: Earth and Space Science

Big Ideas: 6. Earth Structures

Essential Questions: How Do Weathering and Erosion Shape Earth's Surface? What are Minerals? What are Properties of Minerals? How can rocks be classified? Which Resources Are Found In Florida?

Vocabulary: weathering, erosion, deposition, sediment, mineral, rock, igneous rock, sedimentary rock, metamorphic rock, rock cycle, fossil, resource, renewable resource, nonrenewable resource

Common Inquiry Labs: *Science Fusion* Inquiry Flipchart "Grooving with Glaciers" & "Which will Weather Faster?" p.12

- *Science Fusion* Inquiry Flipchart "Mineral Match-Up" & "Growing Crystals" p.13
- *Science Fusion* Inquiry Flipchart "What are Properties of Minerals?" p.14
- *Science Fusion* Inquiry Flipchart "Getting Stones to Stick" & "Modeling the Rock Cycle" p.15
- *Science Fusion* Inquiry Flipchart "Recycle Resources Yourself" & "Map It" p.16

NGSSS	Content	Targets
<p>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). Cognitive Complexity: Low</p> <p>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. Cognitive Complexity: Moderate</p> <p>SC.4.E.6.3 Recognize that humans need resources found on Earth and that these are either renewable or nonrenewable. Cognitive Complexity: Moderate</p> <p>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). Cognitive Complexity: Moderate</p> <p>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. Cognitive Complexity: High</p> <p>SC.4.E.6.6 Identify resources available in Florida (water, phosphate, oil, limestone, silicon, wind, and solar energy). Cognitive Complexity: Low</p>	<p>How Do Weathering and Erosion Shape Earth's Surface?</p> <ul style="list-style-type: none"> ▪ What can break a Boulder? ▪ Weathering ▪ Rocks on the Move ▪ Erosion ▪ Deposition ▪ Sediment ▪ Wind ▪ Ice ▪ Gravity ▪ Water <p>What are Minerals?</p> <ul style="list-style-type: none"> ▪ What are Minerals? ▪ Which Mineral is which? ▪ Hardness ▪ Luster ▪ Cleavage ▪ Fracture ▪ Color ▪ Streak <p>How Can Rocks be Classified?</p> <ul style="list-style-type: none"> ▪ Igneous Rock ▪ Sedimentary Rock ▪ Metamorphic Rock ▪ The Rock Cycle <p>Which Resources Are Found In Florida?</p> <ul style="list-style-type: none"> ▪ Renewable Resources ▪ Nonrenewable Resources ▪ Resources in Florida ▪ Recycling <p>TEACHER TRANSITION INTO NEXT TOPIC OF STUDY</p> <p>Now that we know about the patterns and cycles we have on Earth-the rock cycle and weathering and erosion let's learn about patterns and life cycles of plants and animals.</p>	<ul style="list-style-type: none"> ▪ Explain what weathering is and how it can change rock. ▪ Explain how erosion and deposition change Earth's surface. ▪ Describe how landforms can change over time. ▪ Contrast physical weathering and erosion. ▪ Explain what minerals are and how they form. ▪ Identify the physical properties of minerals. ▪ Sort minerals into groups based on their physical properties. ▪ Recognize that Earth's surface is made up of rocks. ▪ Recognize the physical characteristics of rock. ▪ Identify the three types of rock, and explain how each forms. ▪ Compare and contrast renewable and nonrenewable resources. ▪ Identify some of the resources found in Florida.