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

Course: 2 Course Code: 5020010 Quarter: 1

Topic of Study: Doing Science

Standards: Nature of Science

Big Ideas: 1: The Practice of Science

Essential Questions: How are questions raised by scientists used in investigations? Why should the results of investigations be the same when scientists use similar methods and tools? Why should proof (evidence) be used to back up scientific explanations? How can empirical observations lead to inferences? In what situations do scientists work collaboratively or alone to solve problems?

Optional Teacher Background: *ScienceSaurus*-Scientific Investigation

RESOURCES **SCIENCE CENTER**

Vocabulary: inquiry skills, science tools, thermometer, investigate, hypothesis, draw conclusions, communicate

Common Labs:

- *Science Fusion* Inquiry Flipchart "Hand in Hand" p.2
- *Science Fusion* Inquiry Flipchart "What do I See." p. 2
- *Science Fusion* Inquiry Flipchart "Hold it" p.3
- *Science Fusion* Inquiry Flipchart "Objects up close" p.3
- *Science Fusion* Inquiry Flipchart "Everything in Balance" p. 5
- *Science Fusion* Inquiry Flipchart "Rule it!" p.5

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

NGSSS	Content	Targets
SC.2.N.1.1 Raise questions about the natural world, investigate them in teams through free exploration and systematic observations, and generate appropriate explanations based on those explorations. SC.2.N.1.2 Compare the observations made by different groups using the same tools. SC.2.N.1.3 Ask "how do you know?" in appropriate situations and attempt reasonable answers when asked the same question by others. SC.2.N.1.4 Explain how particular scientific investigations should yield similar conclusions when repeated. SC.2.N.1.5 Distinguish between empirical observation (what you see, hear, feel, smell, or taste) and ideas or inferences (what you think). SC.2.N.1.6 Explain how scientists alone or in groups are always investigating new ways to solve problems.	I What is science? A. Attempts to explain the world around us B. A scientist is one who studies science II What scientists do A. Observes B. Explores C. Investigates D. Explain III How scientists work A. Alone B. Collaboratively in groups C. Through journals/notebook keeping IV The natural world can be explained through A. Observing B. Investigation C. Explaining V Components of Investigations A. Facts obtained through the use of the five senses (empirical evidence) B. Prediction C. Data collection D. Sharing findings VI Using scientific tools and working safely A. Lab Tools 1. Used by scientists to carry out investigations 2. TEACHER NOTE: show examples of lab equipment and explain their use. B. Lab Safety 1. TEACHER NOTE: download and refer to safety contract on resource page 2. Identify and discuss lab safety equipment in classrooms 3. Lab Safety Plan (refer to objective) VII How to do a science project A. Experimental Design 1. Ask a question 2. Plan investigation a) Identify what is being tested b) Determine how it will be measured c) Identify parts of the investigation that must remain the same d) Ensure that one group remains untouched for comparison 3. Research background information on topic	• Develop questions to investigate the natural world around us and record in a science notebook. (IA) • Develop explanations to questions based on student findings by using a graphic organizer. (IID, IVC) • Justify why the results of a scientific activity should be the same when repeated and record in a science notebook. (III) • Use student findings to back up explanations through research. (IVC) • Identify how careful observations help us learn by using videos, books, or pictures. (IIA, IVA) • Record observations in a science notebook. (IIIC) • Describe situations where scientists would work alone or collaboratively to solve problems by analyzing video or images. (IIIAB) • Compare/contrast empirical observations and inferences

	4. Collect and record data 5. Share findings a) Draw conclusions using data b) Uses repeated trials c) Ask new questions and develop new investigations B. TEACHER NOTE: Refer to ISEF (International Science and Engineering Fair) forms on resource page. **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 rocks, soil and living organisms that are found on Earth's surface.	

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

Course: 2 Course Code: 5020010 Quarter: 1

Topic of Study: How Scientists Work

Standards: Nature of Science

Big Ideas: 6. Earth Structures **7.** Earth Systems and Patterns

Essential Questions: What are rocks? What is soil? How do soils differ? How does weather change? How does the sun heat earth? What is evaporation?

Optional Teacher Background: *ScienceSaurus*- Earth Science Section

Concept Map Resources

Vocabulary: rock, weathering, soil, humus, clay, sand, weather, precipitation, temperature, water cycle, evaporate, condense, tornado, hurricane, lightning, thunderstorm

Common Labs:

- *Science Fusion* Inquiry Flipchart "Rocks Up Close" & "Rock Around the House" p.7
- *Science Fusion* Inquiry Flipchart "Soil Science" & ""How Much Water?" p. 8
- *Science Fusion* Inquiry Flipchart "How Do Soils Differ?" p.9
- *Science Fusion* Inquiry Flipchart "Weather Journal" & "Wind Watching" p.10
- *Science Fusion* Inquiry Flipchart "How Does the Sun Heat Earth" p. 11
- *Science Fusion* Inquiry Flipchart "What is Evaporation?" p.12
- *Science Fusion* Inquiry Flipchart "Make Your Own Tornado" & "Keep It Safe" p.13

NGSSS	Content	Targets
SC.2.E.6.1 Recognize that Earth is made up of rocks. Rocks come in many sizes and shapes. Cognitive Complexity: **Moderate** SC.2.E.6.2 Describe how small pieces of rock and dead plant and animal parts can be the basis of soil and explain the process by which soil is formed. Cognitive Complexity: **High** SC.2.E.6.3 Classify soil types based on color, texture (size of particles), the ability to retain water, and the ability to support the growth of plants. Cognitive Complexity: **High**	What are rocks? ▪ Rock ▪ Weathering What is soil? ▪ Soil ▪ Humus ▪ Clay ▪ Sand How do soils differ? ▪ Size ▪ Shape ▪ Color	▪ Recognize that Earth's surface is made up of rock. ▪ Explain that rocks are made of minerals. ▪ Identify and sort rocks based on physical properties, such as size, shape, and color. ▪ Identify ways that rocks can be used.

SC.2.E.7.1 Compare and describe changing patterns in nature that repeat themselves, such as weather conditions including temperature and precipitation, day to day and season to season. Cognitive Complexity: **Moderate**	How does weather change? ▪ Weather ▪ Precipitation ▪ Temperature ▪ Water cycle ▪ Evaporate ▪ Condense	▪ Explain that air is all around us and that moving air is called wind. ▪ Observe, measure, and describe how weather changes over time. ▪ Identify tools used to measure and predict the weather. ▪ Describe and compare patterns in weather from day to day and from season to season. ▪ Explain the water cycle.
SC.2.E.7.2 Investigate by observing and measuring, that the Sun's energy directly and indirectly warms the water, land, and air. Cognitive Complexity: **High**	How does the sun heat earth? ▪ Water ▪ Land ▪ Air	
SC.2.E.7.3 Investigate, observe and describe how water left in an open container disappear (evaporates), but water in a closed container does not disappear (evaporate). Cognitive Complexity: **High**	What is evaporation? ▪ Water left in an open container evaporates	
SC.2.E.7.4 Investigate that air is all around us and that moving air is wind. Cognitive Complexity: **High**	How can we prepare for severe weather? ▪ Tornado ▪ Hurricane ▪ Lightning ▪ Thunderstorm	
SC.2.E.7.5 State the importance of preparing for severe weather, lightning and other weather related events. Cognitive Complexity: **Low**		