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

**Course: 5th Grade** **Course Code: 5020010** **Quarter: 1**

**Topic(s) of Study:** Thinking Like a Scientist

**Bodies of Knowledge:** Nature of Science

**Big Idea(s): 1.** The Practice of Science, **2.** The Characteristics of Scientific Knowledge

**Essential Questions:** Why should evidence be used and cited to support scientific explanations? How does a scientific question determine the method of study? How does replicable work support the findings of the original investigation?

**Optional Teacher Background***: ScienceSaurus*- Scientific Investigation Section

**RESOURCES** **SCIENCE CENTER**

**Vocabulary: investigation, science, evidence, opinion, scientific methods, experiment, variable, control, microscopic, balance, spring scale, accurate**

**Common Inquiry Labs:**

- *Science Fusion* Inquiry Flipchart "How do scientists learn about the natural world?" p. 3
- *Science Fusion* Inquiry Flipchart "How do you perform a controlled experiment?" p. 5
- *Science Fusion* Inquiry Flipchart "How can scientists learn from observations?" p. 7

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

| NGSSS | CONTENT | TARGETS |
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| 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.<br>Cognitive Complexity: **High**<br><br>SC.5.N.1.2 Explain the difference between an experiment and other types of scientific investigation. Cognitive Complexity: **Moderate**<br><br>SC.5.N.1.3 Recognize and explain the need for repeated experimental trials.<br>Cognitive Complexity: **Moderate**<br><br>SC.5.N.1.4 Identify a control group and explain its importance in an experiment.<br>Cognitive Complexity: **Moderate**<br><br>SC.5.N.1.5 Recognize and explain that authentic scientific investigation frequently does not parallel the steps of "the scientific method".<br>Cognitive Complexity: **Moderate**<br>SC.5.N.1.6 Recognize and explain the difference between personal opinion/interpretation and verified observation.<br>Cognitive Complexity: **Moderate** | What is science?<br>▪ The study of the natural world through:<br>o Observation<br>o Systematic Investigation<br>o Appropriate explanation<br><br>How do scientists work?<br>▪ Alone<br>▪ Collaboratively in groups<br>o Groups using the same tools can have different outcomes based on:<br>- Interpretation<br>- Human error<br><br>What is the difference between evidence and opinion?<br>▪ Empirical observations<br>▪ Predictions<br>▪ Inferences<br>▪ Data collection<br>▪ Results<br><br>How do scientists keep records?<br>▪ Pictures<br>▪ Graphic organizers<br>▪ Graphs<br>▪ Charts<br>▪ Written explanations<br><br>How do scientists communicate?<br>▪ Share findings<br>▪ Check the accuracy of one another's work<br>▪ Debate explanations<br>▪ Share inferences based on observations<br>▪<br>How do you use models?<br>▪ Visual representations<br>▪ Types of models – 1 dimensional, 2 and 3 dimensional | ▪ Describe the relationship between evidence and opinion in scientific explanations.<br>▪ Demonstrate the ability to observe, infer, investigate, compare, communicate, classify, order, draw conclusions, and use time/space relationships.<br>▪ Identify elements of well-designed investigations and valid conclusions.<br>▪ Explain how communication and collaboration among scientists can lead to constructive debate and changes in scientific thinking.<br>▪ Describe how scientific knowledge differs from information gathered in other ways.<br>▪ Explain the relationship between evidence and explanations in science.<br>▪ Explain that there are many methods to investigate phenomena, and compare various forms of investigations.<br>▪ Observe the natural world.<br>▪ Record observations.<br>▪ Explain why some investigations can only be conducted by observation. |
| 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.<br>Cognitive Complexity: **Moderate**<br><br>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.<br>Cognitive Complexity: **Moderate** | How do you use lab tools safely?<br>▪ Lab Tools<br>o Used by scientists to carry out investigations<br>o TEACHER NOTE: show examples of lab equipment and explain their use.<br>▪ Lab Safety<br>o Identify and discuss lab safety equipment in classrooms<br>o Lab Safety Plan (refer to objective) | ▪ Design controlled experiments and explain the importance of a control.<br>▪ Demonstrate the ability to predict; hypothesize; identify and control variables; experiment; formulate and use models; and collect, record, and interpret data.<br>▪ Record data from repeated trials.<br>▪ Manipulate two types of variables.<br>▪ Demonstrate proper and safe use of science tools.<br>▪ Explain the importance of accuracy in measurements.<br>▪ Demonstrate the ability to use numbers and measure. |

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| | How do you design a science experiment?<br>▪ Experimental Design<br>o Ask a question<br>o Plan investigation<br>- Identify independent variable<br>- Determine the dependent variable<br>- Identify constants<br>- Ensure you have a control group<br>o Research background information on topic<br>- Address appropriate research materials<br>- Address how to cite sources accurately<br>- Address plagiarism<br>o Collect and record data<br>- Graphs<br>- Charts<br>- Visual representations<br>o Share findings<br>- Draw conclusions using data<br>- Uses repeated trials<br>- Ask new questions and develop new investigations | |

**Course: 5th Grade** **Course Code: 5020010** **Quarter: 1**

**Topic(s) of Study:** Weather
**Bodies of Knowledge:** Earth Science
**Big Idea(s): 7.** Earth Systems and Patterns

**Essential Questions:** How does water change as it travels through the water cycle? What role does the ocean play in the water cycle? How does heating and cooling impact weather? How do different types of environments affect weather characteristics? How are temperature and precipitation related to different climate zones? How would you prepare for a natural disaster? How are scientific inquiry and knowledge useful in solving problems?

**Optional Teacher Background:** *ScienceSaurus*- Earth Science Section

**Vocabulary: water cycle, atmosphere, evaporation, condensation, precipitation, runoff, weather, anemometer, barometer, humidity, wind, air mass, front, weather map, air pressure, climate, climate zone, equator, latitude**

**Common Inquiry Labs:**

- *Science Fusion* Inquiry Flipchart "Watching the Water Cycle" & "An Icy Observation" p. 11
- *Science Fusion* Inquiry Flipchart "What happens during the water cycle?" p. 12
- *Science Fusion* Inquiry Flipchart "I can read the sky" & "When the wind blows" p. 13
- *Science Fusion* Inquiry Flipchart "Make a Model Tornado" & "Be prepared" p. 14
- *Science Fusion* Inquiry Flipchart "How can we observe weather patterns?" p. 15
- *Science Fusion* Inquiry Flipchart "Nature's weather logs" and "Road Trip!" p. 16

| NGSSS | CONTENT | TARGETS |
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| 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.<br>Cognitive Complexity: **High**<br><br>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.<br>Cognitive Complexity: **Moderate**<br><br>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.<br>Cognitive Complexity: **Moderate**<br><br>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.<br>Cognitive Complexity: **High** | What is the water cycle?<br>▪ Evaporation<br>▪ Condensation<br>▪ Precipitation<br>▪ Runoff<br>(all happening simultaneously)<br><br>What factors influence weather?<br>▪ Barometric pressure – the pressure exerted on objects by the atmosphere<br>▪ Humidity – the amount of water in the atmosphere<br>▪ Wind speed – the average speed the wind blows<br>▪ Precipitation – water falling to the Earth in one form or another (rain, sleet, snow, hail)<br>▪ Presence of large bodies of water<br><br>What are climate zones?<br>▪ Rain forests – high precipitation and humidity<br>▪ Deserts – low precipitation and humidity | ▪ Describe the water cycle and the role that evaporation, condensation, and precipitation play in it.<br>▪ Explain how the sun provides the energy that powers the water cycle.<br>▪ Explain how oceans and other bodies of water interact through the water cycle.<br>▪ Describe the path of precipitation from clouds to ground to runoff and groundwater.<br>▪ Use models to investigate how water moves between oceans, the atmosphere, and land.<br>▪ Draw conclusions about the role of the oceans in the water cycle.<br>▪ Explain how modeling can help scientists answer questions.<br>▪ Define weather and describe some weather conditions.<br>▪ Describe tools that meteorologists use and explain what the tools measure.<br>▪ Compare and contrast different types of clouds and describe how they form.<br>▪ Describe several forms of precipitation and when and where they occur. |

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| 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.<br>Cognitive Complexity: **Moderate**<br><br>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.<br>Cognitive Complexity: **High**<br><br>SC.5.E.7.7 Design a family preparedness plan for natural disasters and identify the reasons for having such a plan.<br>Cognitive Complexity : **Moderate** | What is the weather like at certain times of year?<br>▪ Summer – higher humidity and precipitation<br>▪ Winter – lower humidity in the south, higher precipitation in the form of snow in the north.<br><br>How are climate and location related?<br>▪ Swamp/Marsh – warm and humid<br>▪ Mountains – cool and dry<br><br>What should disaster plans include?<br>▪ Water<br>▪ Food<br>▪ Shelter<br>▪ Medical care/medicines<br>▪ Batteries<br>▪ Flashlights<br>▪ Evacuation | ▪ Describe the factors that enable meteorologists to predict weather.<br>▪ Describe how oceans and mountains affect weather.<br>▪ Describe some examples of severe weather and disasters they can cause.<br>▪ Design a family preparedness plan for natural disasters.<br>▪ Measure and record weather conditions using weather tools.<br>▪ Use evidence from weather observations to make predictions.<br>▪ Analyze weather data.<br>▪ Verify observations made by others.<br>▪ Explain the difference between climate and weather.<br>▪ Compare and contrast tropical, temperate, and polar climate zones.<br>▪ Explain how factors such as latitude, elevation, and proximity to bodies of water affect climate.<br>▪ Describe how climate affects the environment. |