Standard #: SC.4.N.1.7

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Recognize and explain that scientists base their explanations on evidence.

Subject Area: Science

Grade: 4

Body of Knowledge: Nature of Science

Idea: Level 2: Basic Application of Skills & Concepts

Big Idea: 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.

Date Adopted or Revised: 02/08

Content Complexity Rating: Level 2: Basic Application of Skills & Concepts - More Information

Date of Last Rating: 05/08

Status: State Board Approved

Assessed: Yes

Remarks/Examples

** Florida Standards Connections: MAFS.K12.MP.1: Make sense of problems and persevere in solving them.

Related Courses

Course Number	Course Title
5020050:	Science - Grade 4 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
7720050:	Access Science Grade 4 (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 and beyond (current))
5020110:	STEM Lab Grade 4 (Specifically in versions: 2016 and beyond (current))

Related Access Points

Independent

Access Points Number	Access Points Title
SC.4.N.1.In.5:	Recognize that scientists perform experiments, make observations, and gather evidence.

Supported

Access Points Number	Access Points Title
SC.4.N.1.Su.5:	Recognize ways that scientists collect evidence, such as by observations or measuring.

Participatory

Access Points Number	Access Points Title
SC.4.N.1.Pa.4:	Recognize that people share information about science.

Related Resources

Perspectives Video: Expert

Name	Description
Antarctic Core Research:	Charlotte Sjunneskog, curator of the Antarctic Research Facility, discusses the aspects of the cores that are collected and what researchers are looking for in the samples.
Sea Floor Sediment Core Research:	Charlotte Sjunneskog, currator of the Antarctic Reasearch Facility, discusses the ocean sediment cores that are collected and what scientists look for in these samples.

Video/Audio/Animation

Name	Description
Experiment - Which is the best insulator?:	Watch a demonstration of an experiment which tests the effectiveness of two different insulators. The participants will demonstrate their thinking as they run an experiment, identify variables and collect data.

Unit/Lesson Sequence

Name	Description
Measuring Mass:	In this unit, students will first do research and study the Law of Conservation of Mass and learn how to form a hypothesis. After they learn how to form a hypothesis, they will use balance beams to measure clay and crayons.
Pollution:	In this lesson students will learn about pollution and its effects. They will learn in depth about pesticides and see its harmful effects that they might not have realized at first. The students will simulate a landfill and see what objects will decompose and which objects won't. They will create their own solutions to an oil spill and test to see which solution is the most effective. The students will observe the effects oil has on water birds. Through this they will determine the long term damage done by an oil spill.
Rocks and Minerals:	In this unit, students learn the physical properties of rocks and how they are formed.
Weathering and Erosion:	In this unit, students learn about weathering and erosion (and different types of weathering and erosion) through different models and activities. An engineering design competition asks students to synthesize knowledge about erosion to create an erosion-blocking process/product for the Atlantic Coast.

Lesson Plan

Name	Description
Mrs. Thinkwell's Dilemma:	Mrs. Thinkwell is a 4th grade teacher, but she is having a hard time keeping her students engaged during the science lessons. The science lectures are just not working. Of course, there are a few students who seem to be doing well, but there are so many who are underachieving. She could not figure out the problem. Her principal suggested giving the students a multiple intelligence (MI) assessment and possibly utilizing small groups for instruction. She decided to try the MI assessment and received the results; but she still was unsure of what that meant for her classroom. Mrs. Thinkwell wants to utilize small groups in her classroom, but did not know the best way to group the students based primarily on their multiple intelligences. Students will help Mrs. Thinkwell by creating groups of students based on a class data set of MI Assessment results.
Who's to Blame? Me or My Parents?:	This is an integrated science and reading lesson. This lesson is intended as a beginning of year lesson to give students the foundation in some of the practice of science and writing standards. Students will conduct an investigation on inherited traits and use evidence from a research article and their investigation to support their findings.

Teaching Idea

Name	Description
What Is Life?:	Students will investigate different objects and discuss whether they are alive or not alive. Students are challenged to provide evidence for their decision and defend their opinion.

Student Resources

Name	Description
Experiment - Which is the best insulator?:	Watch a demonstration of an experiment which tests the effectiveness of two different insulators. The participants will demonstrate their thinking as they run an experiment, identify variables and collect data.