



Standard #: SC.4.N.1.6

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Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations.

Subject Area: Science	Grade: 4
Body of Knowledge: Nature of Science	Idea: Level 3: Strategic Thinking & Complex Reasoning
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 3: Strategic Thinking & Complex Reasoning - More Information	Date of Last Rating: 05/08
Status: State Board Approved	Assessed: Yes

Remarks/Examples

** Florida Standards Connections: [MAFS.K12.MP.5: Use appropriate tools strategically](#); and, [MAFS.K12.MP.6: Attend to precision](#).

Related Courses

Course Number	Course Title
5020050:	Science - Grade 4 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
5010045:	Language Arts - 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))
7710015:	Access Language Arts - 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.4:	Communicate observations and findings through the use of pictures, writing, or charts.

Supported

Access Points Number	Access Points Title
SC.4.N.1.Su.4:	Record observations using drawings, dictation, or pictures.

Participatory

Access Points Number	Access Points Title
SC.4.N.1.Pa.3:	Select an object or picture to represent observed events.

Related Resources

Lesson Plan

Name	Description
"Life's a Breeze!":	In this Engineering Design Challenge, students must design a vessel that will carry passengers safely and quickly across a body of water by harnessing the power of the wind. Students will be given the opportunity to test and improve their vessels as they apply various math and science skills.

Caution! School's a Zoo!	This is a fun science lesson that teaches children about inherited animal behaviors through observation and direct instruction. Students then use their new skills to write a news article explaining what school might be like if teachers or students had different inherited and learned behaviors. This lesson can be integrated into reading and includes an opportunity for writing across the curriculum.
Did It Change?:	Through demonstrations and lab/investigate rotations, students will explore physical and chemical changes.
Dissect It!:	After dissecting a flower(s), the students will be able to identify the parts necessary for pollination, or reproduction of flowering plants. They will also make comparisons and find patterns in nature, leading them to the understanding of the processes of sexual reproduction in flowering plants, including pollination and fertilization (seed production).
Does Soap Float?:	In this science inquiry lesson, students will form hypotheses and carry out an investigation in order to answer a central question: Does soap float? In this lesson, students will address the following real-world problem of sand dune erosion while integrating Engineering Design concepts:
Dune or Doom: The Effects of Wind Erosion on Sand Dunes:	Florida's coastline has been ravaged by winds from hurricanes, resulting in damage to sand dunes and oceanfront properties. Your mission is to design the most effective barrier that would limit the amount of sand displaced from our tall sand dunes and prevent further damage to oceanfront buildings. Your designs can help us save the sand dunes before they are blown away!
Heating Up the Neighborhood:	This Engineering Design Challenge is intended to help students apply the concepts of heat insulators as they build a model house and test different materials to use as insulators, stopping the warm air from escaping and keeping the cool air out. Students will also have an opportunity to use technology in their exploration of heat energy.
Introduction To The Nature Journal:	In the lessons here, students exercise the observation skills that are essential to writing, visual art, and science. First, they try to use evocative language in describing pictures of birds from the Smithsonian's National Zoo. They go on to record observations and to make hypotheses as they follow the behavior of animals on the National Zoo's live webcams. They can watch the giant pandas, the tigers, the cheetahs, the gorillas, or any of a dozen other species.
Just Right Goldilocks' Café: Temperature:	This is lesson 1 of 3 in the Just Right Goldilocks' Café unit. This lesson focuses on systematic investigation on getting a cup of coffee to be the "just right" temperature. Students will use temperature probes and code using ScratchX during their investigation.
Just Right Goldilocks' Café: Temperature & Turbidity:	This is lesson 3 of 3 in the Goldilocks' Café Just Right unit. This lesson focuses on systematic investigation on getting a cup of coffee to be the "just right" temperature and turbidity level. Students will use both the temperature probe and turbidity sensor and code using ScratchX during their investigation.
Just Right Goldilocks' Café: Turbidity:	This is lesson 2 of 3 in the Just Right Goldilocks' Café unit. This lesson focuses on systematic investigation on getting a cup of coffee to be the "just right" level of turbidity. Students will use turbidity sensors and code using ScratchX during their investigation.
Keep it Cool –an Engineering Design Challenge:	This Engineering Design Challenge is intended to help fourth grade students apply the concepts of the flow of heat from a hot object to a cold object and that heat flow may cause objects to change temperature. It is not intended as an initial introduction to this benchmark.
Magnetic Personality:	Through teacher demonstrations and lab type investigations done in rotations, students will explore magnets, magnetic materials, magnetic fields, and electromagnets.
Magnets 2: How Strong is Your Magnet:	This lesson is to experimentally measure the strength of a magnet and to graph how the strength changes as the distance from the magnet increases, and to also observe how a barrier (masking tape), built between the magnet and an iron object, will affect the strength of the magnet.
Observing a Physical Change:	In this lesson, students are shown the difference between physical and chemical changes by dissolving and crushing seltzer tablets. Students learn to recognize that physical changes involved changes in size, shape, or texture, while chemical changes involve the formation of a new substance.
Physical Properties of Matter:	Students will participate in a hands-on lab activity in which they will measure and compare apples based on many of their physical properties.
Set Sail with STEM: Exploring Wind and Water Movement as Energy with Sailboats:	Come sail away with this STEM activity! Students will use hands-on inquiry to find out more about wind and its effect on sails. Through trial and error and based on data collected, students will design, build, and race their own vessel or "sailboat" across the boundless waters of a kiddie pool. Students should gain a better understanding of how moving water and air are sources of energy and can propel objects forward at varying rates of speed.
Stop Heat From Escaping:	In this activity, students act as engineers to determine which type of insulation would conserve the most energy.
The Lunar Cycle:	In this lesson, students learn about the Moon's changing appearance and its pattern of movement. Through class discussion, activities, and multimedia resources, students explore the phases of the Moon and are introduced to the concept of orbital motion. The Moon, Earth's only natural satellite, is easily observed with the naked eye. Over the course of one month, students observe and investigate its full range of appearances and its pattern of movement in the sky. Students then model the sun, earth and moon system in the classroom.
Thumb Wrestling:	Activity: You will measure thumb length, wrist circumference, and thumb circumference to determine which factor plays a bigger part in determining our class thumb-wrestling champion. You will develop a hypothesis based on physical data collected from classmates. You will then test your hypothesis by conducting a thumb wrestling championship. After making observations and analyzing the results, you will form a conclusion to answer the challenge question.
Use Those Tools!:	In this lesson, students will explore with scientific tools often used by scientists to provide them experience with the tools they will be using throughout the year on labs and investigations. They will compare the methods, observations, and results made by different groups using multiple tools and seek reasons to explain the differences across groups. The students will keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations.

Washed Away:	In this Engineering Design Challenge lesson, students will create a model beach and use different materials to find a solution to slow down the erosion process.
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.
Wind at Work: Wind as a Renewable Resource:	This is an Engineering Design Project that follows the CIS: Wind at Work Lesson. This is lesson two of two in the Unit and builds upon the understanding of wind as a natural resource. It is applying content knowledge and is not intended as an initial introduction to the benchmarks.

Teaching Idea

Name	Description
Ball Bounce Experiment:	Students investigate different balls' abilities to bounce and represent the data they collect graphically.
Biomusic:	Students have an opportunity to identify a variety of sounds in the environment, discuss the sounds using appropriate terminology and identify whether they are a product of human production or the natural environment.
Compost Growth Challenge-A SeaWorld Classroom Activity:	Students will compare and contrast the growth rate of plants grown in different soils.
Exploring A Decomposition Community:	In this classroom lab setting, students will construct Decomposition Columns from two-liter plastic bottles. Students will gather organic material and observe activity in the column. Students will record observations and construction steps in their science notebook.
Heat Transfer:	Students will explore how different colors absorb or reflect heat using a black can of water, a white can of water, and a plain can of water.
Investigating Magnetic Force Fields:	In this classroom activity, the students will investigate the magnetic pull of a bar magnet at varying distances with the use of paper clips. Students will hypothesize, conduct the experiment, collect the data, and draw conclusions that support their data. Each student will record the experiment and their findings in their science journals. As a class, students will compare each groups' data and their interpretation of the results.
Looking at Weathering and Erosion:	Students will be divided into small groups to do simple science experiments that illustrate a type of weathering or erosion.
Sound All Around:	Students will have an opportunity to work with sounds and learn about pitch, volume and how sound travels.
Teaching The Scientific Method Through Thumb Wars:	Students will have an opportunity to go through the entire process of the scientific method using the game "Thumb Wars".
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.
What Is Matter?:	During this activity students explore in depth their own understanding of what constitutes "matter" and work together as a group to create a definition for matter.

Formative Assessment

Name	Description
Bounce Back Ball:	Students will be working in teams of four to measure the rebound heights of a tennis ball dropped from four different heights. Students will be investigating with the bouncing balls to measure changes in the type of energy they possess.
Ice Melting:	Students will design investigations to test various materials to prevent heat gain in frozen water.
Packing Materials:	Students will test the solubility of different items used in packing. Based on their observations, the student will explain which of the materials would be least harmful to the environment. The task assesses students' ability to make simple observations and make generalized inferences from their observations
Testing Food:	Students determine the relative amounts of oils in food. They then apply their understanding to an additional situation. The task assesses students' abilities to make simple observations, make generalized inferences from their observations, and apply their understanding to an additional situation.

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
Pollination:	The students will identify the plant parts involved in reproduction, identify the animal (bee) structures involved in pollination, and demonstrate how pollen moves from the male stamen to the female stigma.
Rocks and Minerals:	In this unit, students learn the physical properties of rocks and how they are formed.

Problem-Solving Task

Name	Description
Rising Waters:	Students correlate the weight and water displacement of various balls. They then apply their understanding to an additional situation. The task assesses students' abilities to make simple observations, collect data, make generalized inferences from their observations, and apply their understanding to an additional situation. This task is designed to take students approximately 45 minutes to complete.

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.