

Curriculum Map: Science First Grade Next Generation 2020

Course: Science Grade 1 Sub-topic: Uncategorized

Grade(s): 1

Course Description: The performance expectations in first grade help students formulate answers to questions such as: "What happens when materials vibrate? What happens when there is no light? What are some ways plants and animals meet their needs so that they can survive and grow? How are parents and their children similar and different? What objects are in the sky and how do they seem to move?" First grade performance expectations include PS4, LS1, LS3, and ESS1 Disciplinary Core Ideas from the NRC Framework. Students are expected to develop understanding of the relationship between sound and vibrating materials as well as between the availability of light and ability to see objects. The idea that light travels from place to place can be understood by students at this level through determining the effect of placing objects made with different materials in the path of a beam of light. Students are also expected to develop understanding of how plants and animals use their external parts to help them survive, grow, and meet their needs as well as how behaviors of parents and offspring help the offspring survive. The understanding is developed that young plants and animals are like, but not exactly the same as, their parents. Students are able to observe, describe, and predict some patterns of the movement of objects in the sky. The crosscutting concepts of patterns; cause and effect; structure and function; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. In the first grade performance expectations, students are expected to demonstrate grade-appropriate proficiency in planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

**Course Description adapted from the Next Generation Science Standard Grade Level Storyline.

Course Textbooks, Workbooks, Materials Citations: **Next Generation Science K-2 Science Bundles purchased by the Science Curriculum Writing Team**

Supplemental Resources:

Bookroom Science Resources

Pearson-Science Concept Readers

Foss Kit Class Sets

Pacing Calendar: **Waves: Light and Sound**

Unit 1-Light and Solar Patterns-8 Weeks

Space Systems: Patterns and Cycle

Unit 2-Light, Sound, Space and Communication-12 Weeks

Structure, Function, and Information Processing

Unit 3-Structures and Behaviors in Organisms-12 Weeks

Course Interdisciplinary Connections: **Engineering Design**

Common Core Standards Connections in ELA/Literacy:

RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1)

W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1),(K-2-ETS1-3)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1),(K-2-ETS1-3)

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)

Common Core Standards Connections in Mathematics

MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3)

MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3)

MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3)

2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1),(K-2-ETS1-3)

1. Structure, Function, and Information Processing

Common Core Standards Connections in ELA/Literacy

RI.1.1 Ask and answer questions about key details in a text. (1-LS1-2),(1-LS3-1)

RI.1.2 Identify the main topic and retell key details of a text. (1-LS1-2)

RI.1.10 With prompting and support, read informational texts appropriately complex for grade. (1-LS1-2)

W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). (1-LS1-1),(1-LS3-1) W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-LS3-1)

Common Core Standards Connections in Mathematics

MP.2 Reason abstractly and quantitatively. (1-LS3-1)

MP.5 Use appropriate tools strategically. (1-LS3-1)

1.NBT.B.3 Compare two two-digit numbers based on the meanings of the tens and one digits, recording the results of comparisons with the symbols $>$, $=$, and $<$. (1-LS1-2)

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning uses. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. (1-LS1-2)

1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. (1-LS1-2)

1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. (1-LS1-2)

1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-LS3-1)

1. Waves: Light and Sound

Common Core Standards Connections in ELA/Literacy

W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure. (1-PS4-2)

W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). (1-PS4-1),(1-PS4-2),(1-PS4-3),(1-PS4-4)

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-PS4-1),(1-PS4-2),(1-PS4-3)

SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. (1-PS4-1),(1-PS4-2),(1-PS4-3)

Common Core Standards Connections in Mathematics

MP.5 Use appropriate tools strategically. (1-PS4-4) 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-PS4-4)

1.MD.A.2 Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (1-PS4-4)

1.Space Systems: Patterns and Cycles

Common Core Standards Connections in ELA/Literacy

W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). (1-ESS1-1),(1-ESS1-2)

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1),(1-ESS1-2)

Common Core Standards Connections in Mathematics

MP.2 Reason abstractly and quantitatively. (1-ESS1-2)

MP.4 Model with mathematics. (1-ESS1-2)

MP.5 Use appropriate tools strategically. (1-ESS1-2)

1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)

1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (1-ESS1-2)

Course Notes:

Unit: Waves: Light and Sound

Timeline: 8 Weeks

Description: October/November

Skills:

- The students will plan and carry out investigations.
- The students will construct explanations.
- The students will design solutions.

Essential Questions: Why are we able to see objects?

Content: **Content will cover the following components of light and sound:**

- Sources of Light
- Kinds of Light
- Necessities for Light
- Materials that Affect Light
- How Shadows are Formed
- How Materials Absorb Light
- Light Refraction/Reflection
- Comparisons of Light before and after electricity

Lessons: **Lessons 1-15 Light**

- Lesson 1: Identify Light
- Lesson 2: Natural and Unnatural Light
- Lesson 3: Describing Light
- Lesson 4: STEM: Pinhole Boxes
- Lesson 5: Seeing in the Dark
- Lesson 6: Light Stations- Students use a flashlight and various materials to determine how materials affect light.
- Lesson 7: Shadow experience - AM vs. PM
- Lesson 8: Transparent, Translucent, Opaque Materials
- Lesson 9: Light Can Bend - Pencil in cup of water demonstration

Lesson 10: Light Can Reflect - Using various materials, students will determine which materials create a reflection.

Lesson 11: Then and Now - Teacher shares various pictures of light then and now. Students will converse about the difference in which light was used in the past and in present time.

Lesson 12 (optional): Fireflies - Teacher reads article about fireflies and students create firefly craft.

Lesson 13 (optional): Lighthouses - Teacher Reads The Little Red Lighthouse and the Great Gray Bridge

Lesson 14 (Optional): Seeing Color - Watch Bill Nye episode concerning light and how it can disperse.

Lesson 15 (Optional): Catch a Rainbow - Review the concept of light "dispersing" from lesson 14. Encourage children to "Catch a Rainbow"

Lessons 16 - 30 Sound

Lesson 16: Identifying Sounds

Lesson 17: Sound Walk

Lesson 18: Sound Stations

Lesson 19: Sound Shared Research

Lesson 20: Sound Pitch Sort

Lesson 21: Hearing Sound

Lesson 22: Telephone Cups

Lesson 23: Sound Travel Video

Lesson 24: Find Your Partner - Vocabulary exercise review- Students will hold either a vocabulary word or definition and need to find his/her partner.

Lesson 25 (Optional): Partner Oobleck

Lesson 26: Sound Recordings

Lesson 27: Sounds we make

Lesson 28 (Optional): Sound Stations

Lesson 29: Helen Keller

Lesson 30: Communicate without Sound - Part 2 from Helen Keller

Vocabulary: Light Vocabulary:

light - how we see

transparent- material that lets light in

illuminate- light something up

ray- path light takes from the source

energy- strength for an activity

translucent- material that lets some light through

reflect- send light back in opposite direction

opaque- material that does not let light through

rainbow- arch of colors produced by light

shadow- dark area made by an object blocking light

refract- bend light

absorb- take light energy and transform to heat energy

disperse- separate light into colors

Sound Vocabulary:

sound- what we hear

vibrate- what an object does to make a sound

volume- how loud or soft a sound is

waves- made when something vibrates

pitch- how high or low a sound is

ear- what we use to hear

matter- what sound waves travel through

decibel- measures the level of sound

vocal cords- what we use to make vibrations and speak

absorb- what sound does when it hits something soft

bounce- what sound does when it hits something hard

frequency- how close sound waves are to each other

Resources: Next Generation Unit on Light and Sound purchased by Michelle Jarrett
FOSS Kit resources to support the above curriculum

Topic: Light and Solar Patterns-Bundle 1

Core Lesson Description: Summary The bundle organizes performance expectations around the theme of seeing objects. Instruction developed from this bundle should always maintain the three-dimensional nature of the standards, but recognize that instruction is not limited to the practices and concepts directly linked with any of the bundle performance expectations.

Core Lesson Student Learning Objectives: Students will plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

Students will make observations to construct an evidence-based account that objects can be seen only when illuminated.

Students will plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.

Students will use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

Core Lesson Essential Questions: Light-Why do we need light?

What materials affect light?

How can we use light?

What color is light?

Sound-What is sound?

How do we hear sounds?

How do we make sounds?

How can we use sound?

Core Lesson Big Ideas: Light is useful.

Sound is made up of vibrations.

Core Lesson Materials:

Teachers will utilize the resources directly related to the Next Generation Science Standards purchased by Michelle Jarrett and resources from the Primary FOSS Kits.

Core Lesson Key Terminology & Definitions:

Light Vocabulary:

light - how we see
transparent- material that lets light in
illuminate- light something up
ray- path light takes from the source
energy- strength for an activity
translucent- material that lets some light through
reflect- send light back in opposite direction
opaque- material that does not let light through
rainbow- arch of colors produced by light
shadow- dark area made by an object blocking light
refract- bend light
absorb- take light energy and transform to heat energy
disperse- separate light into colors

Sound Vocabulary:

sound- what we hear
vibrate- what an object does to make a sound
volume- how loud or soft a sound is
waves- made when something vibrates
pitch- how high or low a sound is
ear- what we use to hear
matter- what sound waves travel through
decibel- measures the level of sound
vocal cords- what we use to make vibrations and speak
absorb- what sound does when it hits something soft
bounce- what sound does when it hits something hard
frequency- how close sound waves are to each other

Unit: Space Systems: Patterns and Cycles

Timeline: 12 Weeks

Description: December/January/February

Skills: Students will obtain the necessary skills to plan and carry out investigations.
Students will analyze and interpret data.

Essential Questions:

What patterns do we observe during the day and night?

Content: **Content Includes:**

- Earth Rotation Patterns
- Daylight Length Changes
- Compare and Contrast Day and Night
- Moon Changes and Phases
- Constellations
- Patterns of the Sun, Moon and Stars

Lessons:

- Lesson 1 - The Sun
- Lesson 2 - Shadow Experiment
- Lesson 3 - Length of Daylight
- Lesson 4 - Daytime - students brainstorm things done during the day.
- Lesson 5 - Night time - students brainstorm and chart things done at night time.
- Lesson 6 - The Moon
- Lesson 7 - Moon Phases
- Lesson 8 - Stars and Constellations
- Lesson 9 - STEM - Students create their own constellation
- Lesson 10 - Compare and Contrast the sun, moon, and stars

Vocabulary: Vocabulary:

- sun- the big star Earth revolves around
- crescent- shape the moon takes when most of the moon cannot be seen
- eclipse- when one object blocks us from seeing another
- gibbous- more than half of the moon can be seen
- new moon- moon can not be seen
- season- part of the year with a distinct weather
- waxing- amount of the moon that can be seen is increasing
- waning- amount of the moon that can be seen is decreasing
- star- bright ball of gas in space
- phase- part of a cycle or pattern
- half moon- half of the moon can be seen
- Earth- planet we live on
- full moon- all of the moon can be seen
- orbit- to go around something in the same pattern each time

Resources: Materials will include the Next Generation First Grade Curriculum purchased by Michelle Jarrett and other various resources and materials from the primary FOSS kits.

Topic: Observing Objects with Sight and Hearing-Bundle 2

Core Lesson Description: The bundle organizes performance expectations with a focus on the theme of observing objects with sight and hearing. Instruction developed from this bundle should always maintain the three-dimensional nature of the standards, but recognize that instruction is not limited to the practices and concepts directly linked with any of the bundle performance expectations.

Core Lesson Student Learning Objectives: TSWBAT use observations of the sun, moon, and stars to describe patterns that can be predicted.
TSWBAT make observations at different times of year to relate the amount of daylight to the time of year.

Core Lesson Essential Questions: What patterns do we observe during the day?
What patterns do we observe at night?

Core Lesson Big Ideas: We can observe patterns in the sky?

Core Lesson Materials: Materials will include the Next Generation First Grade Curriculum purchased by Michelle Jarrett and other various resources and materials from the primary FOSS kits.

Core Lesson Key Terminology & Definitions:

- sun- the big star Earth revolves around
- crescent- shape the moon takes when most of the moon cannot be seen
- eclipse- when one object blocks us from seeing another
- gibbous- more than half of the moon can be seen
- new moon- moon can not be seen
- season- part of the year with a distinct weather
- waxing- amount of the moon that can be seen is increasing
- waning- amount of the moon that can be seen is decreasing
- star- bright ball of gas in space
- phase- part of a cycle or pattern
- half moon- half of the moon can be seen
- Earth- planet we live on
- full moon- all of the moon can be seen
- orbit- to go around something in the same pattern each time

Unit: Structure, Function, and Information Processing

Timeline: 12 Weeks

Description: March, April, May

Skills: Students will gain the skills to construct explanations and design solutions.
Students will obtain, evaluate, and communicate information.

Essential Questions: What structures and behaviors help plants and animals survive?

Content: Content Includes:

- Distinguishing Living and NonLiving Things
- Compare and Contrast Animals and Plants
- Observing Offspring similarities to Parents
- Graphing Traits of Classmates
- Observing Inherited Traits
- Matching Offspring to Parents
- Living Things Have Characteristics to Support Survival
- Living Things Adapt to Survive

Lessons:

- Lesson 1 - Living of Non Living
- Lesson 2 - Living/Non Living Sort and Application
- Lesson 3 - Animals - "What are animals?"
- Lesson 4 - Plants - "What are plants?"
- Lesson 5 - Plants vs Animals (compare and contrast)
- Lesson 6 - Animal Babies - discuss baby names, parent names and how they are alike and different

Lesson 7 - Heredity - What is a trait?

Lesson 8 - Our Class Traits - students collect and analyze data based on student traits

Lesson 9 - Staying Safe - How do parents keep young safe? Animal parents and Human parents

Lesson 10 - Family Lessons - How do parents of animals and humans teach babies to survive?

Lesson 11 - Plant Parts

Lesson 12 - Animal Characteristics

Lesson 13 (Optional) - Adaptation Stations

Vocabulary: Vocabulary

organisms- a living thing

need- something you have to have to live

parent- father or mother

predator- an animal hunts and eats another animal

offspring- an animal's young

external- on the outside

trait- a characteristic we get from our parents

survive- to keep on living

habitat- an organism's home

prey- an animal that is hunted for food

protect- to keep safe

mimic- to copy

internal- on the inside

Resources: Teachers will utilize the resources directly related to the Next Generation Science Standards purchased by Michelle Jarrett and resources from the Primary FOSS Kits.

Topic: Structures and Behaviors in Organisms-Bundle 3

Core Lesson Description: The bundle organizes performance expectations with a focus on the theme of structures and behaviors in organisms. Instruction developed from this bundle should always maintain the three-dimensional nature of the standards, but recognize that instruction is not limited to the practices and concepts directly linked with any of the bundle performance expectations.

Core Lesson Student Learning Objectives: TSWBAT use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

TSWBAT read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

TSWBAT make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Core Lesson Essential Questions: What are organisms?
How are offspring like their parents?
What do organisms do to survive?

Core Lesson Big Ideas: Organisms have tools for survival.

Core Lesson Materials: Materials will include the Next Generation First Grade Curriculum purchased by Michelle Jarrett and other various resources and materials from the primary FOSS kits.

Core Lesson Key Terminology & Definitions:

Vocabulary

organisms- a living thing

need- something you have to have to live

parent- father or mother

predator- an animal hunts and eats another animal

offspring- an animal's young

external- on the outside

trait- a characteristic we get from our parents

survive- to keep on living

habitat- an organism's home

prey- an animal that is hunted for food

protect- to keep safe

mimic- to copy

internal- on the inside

Unit: K-2 Engineering Design (STEAM)

Timeline: 3 Weeks

Description: 1 day per Trimester

Essential Questions: How can I apply learned engineering and design skills to solve a problem during a STEAM challenge?

Topic: Interactive STEAM Challenge

Core Lesson Description: One day per trimester, the student will be presented with a STEAM challenge in which they are able to apply learned engineering and design skills to solve a problem.

Core Lesson Student Learning Objectives: TSWBAT ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

TSWBAT develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

TSWBAT analyze data from tests of two objects designed to solve the same problem to compare strengths and weaknesses of how each performs.

Unit:

This Curriculum Map Unit has no Topics to display