

## Curriculum Map: Science Second Grade Next Generation 2020

Course: Science Grade 2 Sub-topic: Uncategorized

Grade(s): 2

### Course

#### Description:

The performance expectations in second grade help students formulate answers to questions such as: "How does land change and what are some things that cause it to change? What are the different kinds of land and bodies of water? How are materials similar and different from one another, and how do the properties of the materials relate to their use? What do plants need to grow? How many types of living things live in a place?" Students are expected to develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students are also expected to compare the diversity of life in different habitats. An understanding of observable properties of materials is developed by students at this level through analysis and classification of different materials. Students are able to apply their understanding of the idea that wind and water can change the shape of the land to compare design solutions to slow or prevent such change. Students are able to use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. The crosscutting concepts of patterns; cause and effect; energy and matter; structure and function; stability and change; 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 second grade performance expectations, students are expected to demonstrate grade appropriate proficiency in developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, 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

Supplemental Resources:

- Bookroom Science Resources
- Pearson Science Concept Readers
- FOSS Kit Book Sets

### Pacing Calendar:

#### Structure and Properties of Matter

- Unit 1 - 12 Weeks - Water

#### Earth's Systems: Processes that Shape the Earth

- Unit 2 - 12 Weeks - Changes to Land

#### Interdependent Relationships in Ecosystems

- Unit 3 - 8 Weeks - The Needs of Plants

### Course Interdisciplinary Connections:

#### Common Core State Standard Connections

Engineering and Design

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)

### **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)

## **Interdependent Relationships in Ecosystems**

### **ELA/Literacy –**

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS2-1),(2-LS4-1)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1),(2-LS4-1)

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. (2-LS2-2)

### **Mathematics –**

MP.2 Reason abstractly and quantitatively. (2-LS2-1),(2-LS4-1)

MP.4 Model with mathematics. (2-LS2-1),(2-LS2-2),(2-LS4-1)

MP.5 Use appropriate tools strategically. (2-LS2-1)

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. (2-LS2-2),(2-LS4-1)

## **Structure and Properties of Matter**

### **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. (2-PS1-4)

RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)

RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-2), (2-PS1-4)

W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4)

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1),(2-PS1- 2),(2-PS1-3)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1),(2-PS1-2),(2-PS1-3)

### **Mathematics –**

MP.2 Reason abstractly and quantitatively. (2-PS1-2)

MP.4 Model with mathematics. (2-PS1-1),(2-PS1-2)

MP.5 Use appropriate tools strategically. (2-PS1-2)

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. (2-PS1-1),(2-PS1-2)

### **Earth's Systems: Processes that Shape the Earth**

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. (2-ESS1-1)

RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1),(2-ESS2-1)

RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)

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. (2-ESS1-1),(2-ESS2-3)

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1),(2-ESS2-3) SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)

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. (2-ESS2-2)

### **Mathematics –**

MP.2 Reason abstractly and quantitatively. (2-ESS2-1),(2-ESS2-1),(2-ESS2-2)

MP.4 Model with mathematics. (2-ESS1-1),(2-ESS2-1),(2-ESS2-2) MP.5 Use appropriate tools strategically. (2-ESS2-1)

2.NBT.A Understand place value. (2-ESS1-1)

2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)

2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1)

**Course Notes:** Students in kindergarten through fifth grade begin to develop an understanding of the four disciplinary core ideas: physical sciences; life sciences; earth and space sciences; and engineering, technology, and applications of science. In the earlier grades, students begin by

recognizing patterns and formulating answers to questions about the world around them. By the end of fifth grade, students are able to demonstrate grade-appropriate proficiency in gathering, describing, and using information about the natural and designed world(s). The performance expectations in elementary school grade bands develop ideas and skills that will allow students to explain more complex phenomena in the four disciplines as they progress to middle school and high school. While the performance expectations shown in kindergarten through fifth grade couple particular practices with specific disciplinary core ideas, instructional decisions should include use of many practices that lead to the performance expectations.

## **Unit: Structure and Properties of Matter**

Timeline: 12 Weeks

**Description:** October

Week One: Lesson 1 States of Matter

Week Two: Lesson 2 Sorting Matter

Week Three: Lesson 3 Atoms Matter

Week Four: Lesson 4 Observing Properties

November

Week One: Lesson 5 Oobleck

Week Two: Lesson 6 Property Research

Week Three: Lesson 7 Property Research

Week Four: Lesson 8 Sink or Float

December

Week One: Lesson 9 Build it, Break it

Week Two: Lesson 10 Rearrange it

Week Three: Lesson 11 Changing Phases

Week Four: Lesson 12 Reversible and Irreversible Changes

**Skills:** Students will be able to:

- plan and carry out investigations
- analyze and interpret data
- construct explanations and design solutions
- engage in argument from evidence

**Essential Questions:** How can matter change?

**Content:** Content will include:

- description of the states of matter
- sorting matter into categories
- atom arrangement in different types of matter
- properties of matter

- testing buoyancy of materials
- changing states of matter
- determination if matter changes can be reversed

**Lessons:**

- Lesson 1 States of Matter
- Lesson 2 Sorting Matter
- Lesson 3 Atoms Matter
- Lesson 4 Observing Properties
- Lesson 5 Oobleck
- Lesson 6 Property Research
- Lesson 7 Property Research
- Lesson 8 Sink or Float
- Lesson 9 Build it, Break it
- Lesson 10 Rearrange it
- Lesson 11 Changing Phases
- Lesson 12 Reversible and Irreversible Changes

**Vocabulary:**

- matter- anything that takes up space
- property- quality that describes a material
- observe - look for something specific
- classify- sort
- texture- how a material feels
- irreversible- something that can't go back to original state
- reversible- something that can go back to it's original state
- elasticity- ability of a material to be stretched
- solid- something that has its own shape
- liquid- a wet substance that takes the shape of whatever holds it
- gas- fill any space that holds it
- buoyancy- ability of objects to float in water or air
- hardness- quality of being hard
- atom- basic building blocks of all matter
- material- parts of which something is made

**Resources:** This unit was developed using the Next Generation Science Standards. Teachers will utilize the Next Gen Curriculum purchased by the Primary Center Science Curriculum Writing Team.

Teachers will also supplement the curriculum with FOSS kit resources and Pearson Concept Readers.

**STANDARDS: STANDARDS**

NGSS Arranged by Disciplinary Core Idea (DCI) - Science (2013)

2-PS1-1 (Advanced) Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

2-PS1-2 (Advanced) Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

2-PS1-3 (Advanced) Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.

2-PS1-4 (Advanced) Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

**Topic: Unit 1 - Matter Can Change**

**Core Lesson Description:** This unit organizes performance expectations with a focus on helping students build understanding of how matter can change.

**Core Lesson Student Learning Objectives:** The students will be able to plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

The students will be able to analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

The students will be able to make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.

The students will be able to construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

**Core Lesson Essential Questions:** How are materials alike and different?

How do properties of materials determine their use?

How does matter change?

**Core Lesson Big Ideas:** Matter can change.

**Core Lesson Key Terminology & Definitions:** matter- anything that takes up space

property- quality that describes a material

observe - look for something specific

classify- sort

texture- how a material feels

irreversible- something that can't go back to original state

reversible- something that can go back to it's original state

elasticity- ability of a material to be stretched

solid- something that has its own shape

liquid- a wet substance that takes the shape of whatever holds it

gas- fill any space that holds it

buoyancy- ability of objects to float in water or air

hardness- quality of being hard

atom- basic building blocks of all matter

material- parts of which something is made

## **Unit: Earth's Systems: Processes that Shape the Earth**

Timeline: 12 Weeks

**Description:** January

Week One: Lesson 1 Land or Water

Week Two: Lesson 2 What is a landform?

Week Three: Lesson 3 Types of Landforms

Week Four: Lesson 4 Comparing Landscapes

February

Week One: Lesson 5 Mapping Landforms

Week Two: Lesson 6 Water

Week Three: Lesson 7 Bodies of Water

Week Four: Lesson 8 Mapping Landforms

March

Week One: Lesson 9 Presenting Landforms

Week Two: Lesson 10 Observing Changes

Week Three: Lesson 11 Earthquakes, Volcanoes, Landslides

Week Four: Lesson 12 Weathering and Erosion

**Skills:** Students will be able to:

- develop and use models
- construct explanations and design solutions
- obtain, evaluate, and communicate information

**Essential Questions:** How do the Earth's surfaces change?

**Content:** Content will include:

- sources of water found on Earth
- bodies of water found on a map

- deciphering between land and water on a map
- comparing different landscapes
- describing various landforms
- ability for students to find a landform on a map
- ability for students to represent landforms and bodies of water
- ways that landforms change
- events that change Earth's surface quickly
- events that change Earth's surface slowly
- solutions to prevent changes to Earth's surface

**Lessons:**

- Lesson 1 Land or Water
- Lesson 2 What is a landform?
- Lesson 3 Types of Landforms
- Lesson 4 Comparing Landscapes
- Lesson 5 Mapping Landforms
- Lesson 6 Water
- Lesson 7 Bodies of Water
- Lesson 8 Mapping Landforms
- Lesson 9 Presenting Landforms
- Lesson 10 Observing Changes
- Lesson 11 Earthquakes, Volcanoes, Landslides
- Lesson 12 Weathering and Erosion

**Vocabulary:**

- mountain- landform that rises above the surrounding area
- ocean- huge body of salt water
- valley- long ditch in the Earth's surface
- river- a flowing, moving stream of water
- glacier- large area of thick ice that remains frozen
- cave- natural hollow space under the ground
- plain- a large of area of thick ice that remains frozen
- canyon- large, deep valley cut by a river through rock
- landform- solid, natural structure made of soil and dirt
- plateau- an area of raised land that is flat on top
- wind- air in motion

lake- large body of water surrounded by land

erosion- process of rock being moved to another place

earthquake- shaking, rolling, or sudden shock of Earth's surface

volcano- mountain that opens to a pool of hot rock

**Resources:** This unit was developed using the Next Generation Science Standards. Teachers will utilize the Next Gen Curriculum purchased by the Primary Center Science Curriculum Writing Team. Teachers will also supplement the curriculum with FOSS kit resources and Pearson Concept Readers.

**STANDARDS: STANDARDS**

NGSS Arranged by Disciplinary Core Idea (DCI) - Science (2013)

[2-ESS2-1 \(Advanced\)](#) Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

[2-ESS2-2 \(Advanced\)](#) Develop a model to represent the shapes and kinds of land and bodies of water in an area.

[2-ESS2-3 \(Advanced\)](#) Obtain information to identify where water is found on Earth and that it can be solid or liquid.

**Topic: Unit 2 - Earth's Surfaces Change**

**Core Lesson Description:** Unit 2 organizes performance expectations with a focus on helping students understand changes that occur on and to land.

**Core Lesson Student Learning Objectives:** The students will be able to use information from several sources to provide evidence that Earth events can occur quickly or slowly.

The students will be able to compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

The students will be able to develop a model to represent the shapes and kinds of land and bodies of water in an area.

The students will be able to obtain information to identify where water is found on Earth and that it can be solid or liquid.

**Core Lesson Essential Questions:** What kinds of landforms are found on Earth?

Where is water found on Earth?

Why do landforms change?

STEM Challenge: Windbreakers

**Core Lesson Big Ideas:** Earth's Surfaces Change

**Core Lesson Key Terminology & Definitions:** mountain- landform that rises above the surrounding area

ocean- huge body of salt water

valley- long ditch in the Earth's surface

river- a flowing, moving stream of water

glacier- large area of thick ice that remains frozen

cave- natural hollow space under the ground  
plain- a large of area of thick ice that remains frozen  
canyon- large, deep valley cut by a river through rock  
landform- solid, natural structure made of soil and dirt  
plateau- an area of raised land that is flat on top  
wind- air in motion  
lake- large body of water surrounded by land  
erosion- process of rock being moved to another place  
earthquake- shaking, rolling, or sudden shock of Earth's surface  
volcano- mountain that opens to a pool of hot rock

### **Unit: Interdependent Relationships in Ecosystems**

Timeline: 8 Weeks

**Description:** April

Lesson 1 Ecosystems

Lesson 2 Types of Ecosystems

Lesson 3 Diversity in Ecosystems

Lesson 4 Ecosystems Around Me

May

Lesson 5 Types of Seeds

Lesson 6 Seeds on the Move

Lesson 7 Seed Dispersal Sort

Lesson 8 Cactus Hotel

**Skills:** The students will be able to:

- develop and use models
- plan and carry out investigations

**Essential Questions:** How do organisms depend on each other?

**Content:** Content will include:

- parts of an ecosystem
- organisms characteristics
- comparing ecosystems
- different seed characteristics

- survival necessities for plants
- seed disbursement
- explanation of how organisms are interdependent
- model of pollinator and effectiveness

**Lessons:**

- Lesson 1 Ecosystems
- Lesson 2 Types of Ecosystems
- Lesson 3 Diversity in Ecosystems
- Lesson 4 Ecosystems Around Me
- Lesson 5 Design Plant Experiment
- Lesson 6 Types of Seeds
- Lesson 7 Seeds on the Move
- Lesson 8 Seed Dispersal Sort
- Lesson 9 Sock Walk
- Lesson 10 Cactus Hotel
- Lesson 11 My Interdependence
- Lesson 12 STEM: Pollinators
- Lesson 13 Plant Experiment Results

**Vocabulary:**

- ecosystem- large community of living and non-living things
- community- a group of living things in one place
- population- amount of one species living in one place
- biotic- living
- abiotic- non-living
- dependent- an organism that needs another organism
- pollinate- to transfer pollen from one flower to another
- pollen- a substance that causes plants to form seeds
- disperse- process of spreading organisms from one place to another
- diverse- group of organisms that are very different from each other
- seed- small part of a flowering plant that grows into a new plant

**Resources:** This unit was developed using the Next Generation Science Standards. Teachers will utilize the Next Gen Curriculum purchased by the Primary Center Science Curriculum Writing Team. Teachers will also supplement the curriculum with FOSS kit resources and Pearson Concept Readers.

**STANDARDS: STANDARDS**

NGSS Arranged by Disciplinary Core Idea (DCI) - Science (2013)

2-LS2-1 (Advanced) Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-2 (Advanced) Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

**Topic: Unit 3 - The Needs of Organisms**

**Core Lesson Description:** Unit 3 organizes performance expectations with a focus on helping students understand the needs of organisms.

**Core Lesson Student Learning Objectives:** The students will be able to plan and conduct an investigation to determine if plants need sunlight and water to grow.

The students will be able to develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

The students will be able to make observations of plants and animals to compare the diversity of life in different habitats.

**Core Lesson Essential Questions:** How are ecosystems diverse?

How do organisms depend on their environment and each other to grow?

STEM CHALLENGE: Pollination

**Core Lesson Big Ideas:** Organisms depend on each other.

**Core Lesson Key Terminology & Definitions:** ecosystem- large community of living and non-living things

community- a group of living things in one place

population- amount of one species living in one place

biotic- living

abiotic- non-living

dependent- an organism that needs another organism

pollinate- to transfer pollen from one flower to another

pollen- a substance that causes plants to form seeds

disperse- process of spreading organisms from one place to another

diverse- group of organisms that are very different from each other

seed- small part of a flowering plant that grows into a new plant

**Unit: K-2 Engineering Design (STEAM)**

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

**Skills:** Students will be able to ask questions and define problems, develop and use models, and analyze and interpret data.

**Essential Questions:** How can I ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through development of a new or improved object or tool?

How can I develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a problem?

How can I analyze data from test of two objects designed to solve the same problem to compare strengths and weaknesses of how each performs?

**Vocabulary:** ask - ask questions about your design or task

imagine - what will the end result look like

plan - plan out the process and steps you will take

create - create your design or task using your plan

improve - improve the design if needed

**STANDARDS: STANDARDS**

NGSS Arranged by Disciplinary Core Idea (DCI) - Science (2013)

[K-2-ETS1-1](#)  
(Advanced)

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.

[K-2-ETS1-2](#)  
(Advanced)

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.

[K-2-ETS1-3](#)  
(Advanced)

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

**Topic: Interactive STEAM Challenge**

**Core Lesson Description:** One day per trimester, students 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:** The students will be able to 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.

The students will be able to 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.

The students will be able to analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

**Core Lesson Essential** How can I ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through development of a new or improved object or tool?

**Questions:**

How can I develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a problem?

How can I analyze data from test of two objects designed to solve the same problem to compare strengths and weaknesses of how each performs?

**Core Lesson Big Ideas:**

Collaborative Problem Solving

**Core Lesson Key Terminology & Definitions:**

ask - ask questions about your design or task

imagine - what will the end result look like

plan - plan out the process and steps you will take

create - create your design or task using your plan

improve - improve the design if needed