

## Curriculum Map: Science Kindergarten Next Generation 2020

Course: Science Grade K Sub-topic: Uncategorized

Grade(s): Kindergarten

### Course Description:

#### Kindergarten

The performance expectations in kindergarten help students formulate answers to questions such as: "What happens if you push or pull an object harder? Where do animals live and why do they live there? What is the weather like today and how is it different from yesterday?" Students are expected to develop understanding of patterns and variations in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather. Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students are also expected to develop understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live. The crosscutting concepts of patterns; cause and effect; systems and system models; interdependence of science, engineering, and technology; 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 kindergarten performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, 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 Standards grade level story line.

### 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

### Pacing Calendar:

Forces and Interactions: Pushes and Pulls

Unit 1- 8 weeks

Weather and Climate

Unit 2- 10 weeks

Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

Unit 3- 18 weeks

### Course Interdisciplinary Connections:

#### Engineering and Design

Common Core State Standards Connections for Language Arts and Mathematics:

**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: Animals, Plants, and Their Environment**

Common Core State Standards Connections for Language Arts and Mathematics:

**ELA/Literacy** – RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS2-2)

W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2)

W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS2-2),(K-ESS3-3)

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1)

SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1)

**Mathematics** – MP.2 Reason abstractly and quantitatively. (K-ESS3-1)

MP.4 Model with mathematics. (K-ESS3-1)

K.CC Counting and Cardinality (K-ESS3-1)

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (K-LS1-1)

### **Forces and Interactions: Push and Pulls**

Common Core State Standards Connections for Language Arts and Mathematics:

**ELA/Literacy** – RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS2-2)

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS2-1)

SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2)

**Mathematics** – MP.2 Reason abstractly and quantitatively. (K-PS2-1)

K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1)

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (K-PS2-1)

### **Weather and Climate**

Common Core State Standards Connections for Language Arts and Mathematics:

**ELA/Literacy** –

RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS3-2)

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1),(K-PS3-2),(K-ESS2-1)

SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2)

**Mathematics** –

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

MP.4 Model with mathematics. (K-ESS2-1),(K-ESS3-2)

K.CC Counting and Cardinality (K-ESS3-2) K.CC.A Know number names and the count sequence. (K-ESS2-1)

K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (K-PS3-1),(KPS3-2)

**Course Notes: Elementary**

Unit:

This Curriculum Map Unit has no Topics to display

**Unit: Forces and Interactions: Pushes and Pulls**

Timeline: 8 Weeks

**Description:** September

- Lesson 1 Make It Move
- Lesson 2 Force
- Lesson 3 Push or Pull
- Lesson 4 Gravity
- Lesson 5 Force Exploration Stations

October

- Lesson 6 Motions I Make
- Lesson 7 Directions
- Lesson 8 Object Size
- Lesson 9 Strength of the Force
- Lesson 10 Stopping Motion

**Skills:** TSWBAT

- plan and carry out investigations
- analyze and interpret data

**Essential Questions:** How can forces cause objects to move in different ways?

**Content:** Content will include:

- what causes objects to move
- ways things move
- objects that can be pushed and pulled
- gravity
- motions someone can make
- movement in different directions
- how the size and strength of force affects motion
- stopping motion

**Lessons:** Lesson 1 Make It Move

Lesson 2 Force  
Lesson 3 Push or Pull  
Lesson 4 Gravity  
Lesson 5 Force Exploration Stations  
Lesson 6 Motions I Make  
Lesson 7 Directions  
Lesson 8 Object Size  
Lesson 9 Strength of the Force  
Lesson 10 Stopping Motion

**Vocabulary:** invention  
force  
motion  
push  
pull  
stop  
size  
strength  
roll  
slide

**Resources:** This unit was developed using the Next Generation Science standards. Teachers will use the Next Generation Science Resources purchased by the Primary Science Curriculum Writing Team along with FOSS kit resources and Pearson Science Concept Readers.

**STANDARDS: STANDARDS**

[NGSS Arranged by Topic - Science \(2013\)](#)

[K-PS2-1 \(Advanced\)](#) Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

[K-PS2-2 \(Advanced\)](#) Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

**Topic: Unit 1 Pushes and Pulls**

**Core Lesson Description:** The unit organizes performance expectations around the topic of pushes and pulls. 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 plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

TSWBAT analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

TSWBAT use and share observations of local weather conditions to describe patterns over time.

TSWBAT 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 Questions:** What causes an object to move?  
What can change or affect motion?  
STEM Challenge: Rollercoasters!

**Core Lesson Big Ideas:** Force can cause objects to move in different ways.

**Core Lesson Key Terminology & Definitions:**

- invention- something new that has a purpose
- force- the push or pull on an object
- motion- the change in position next to an object that is not moving
- push- the force that moves an object away
- pull- the force of bringing an object closer
- stop- not moving
- size- how big or small something else
- strength- the amount of power to stop force
- roll- to move turning over and over
- slide- to move smoothly over a surface

### **Unit: Weather and Climate**

Timeline: 10 Weeks

**Description:** November, December, January

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

- ask questions and define problems
- plan and carry out investigations
- analyze and interpret data
- construct explanations and design solutions
- obtain, evaluate, and communicate information

**Essential Questions:** How do weather patterns cause changes that affect us?

**Content:** Content will include:

- weather facts
- collecting data on weather
- facts about clouds
- facts about rain
- facts about lightning
- facts about snow
- facts about the wind
- effects of the wind
- facts about rainbows
- recreating rainbows
- who a meteorologist is and what they do

- what decisions need to be made based on weather
- facts about the sun
- how to stay safe in the sun

**Lessons:**

- Lesson 1 Weather Words
- Lesson 2 Wind
- Lesson 3 Rainbows
- Lesson 4 Meteorologists
- Lesson 5 Weather Decisions
- Lesson 6 Tornadoes
- Lesson 7 Severe Weather
- Lesson 8 The Sun
- Lesson 9 Stem Challenge Sunlight Protection

**Vocabulary:**

- weather
- sun
- rain
- clouds
- rain
- lightning
- snow
- wind
- rainbow
- forecast
- tornado
- flood
- temperature
- storm

**Resources:** This unit was developed using the Next Generation Science standards. Teachers will use the Next Generation Science Resources purchased by the Primary Science Curriculum Writing Team along with FOSS kit resources and Pearson Science Concept Readers.

**STANDARDS: STANDARDS**

NGSS Arranged by Topic - Science (2013)

- [K-PS3-1 \(Advanced\)](#) Make observations to determine the effect of sunlight on Earth's surface.
- [K-PS3-2 \(Advanced\)](#) Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.
- [K-ESS2-1 \(Advanced\)](#) Use and share observations of local weather conditions to describe patterns over time.
- [K-ESS3-2 \(Advanced\)](#) Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.

**Topic: Unit 2 Patterns and Effects of Sunlight**

**Core Lesson Description:** The unit organizes performance expectations around observations of patterns and effects of sunlight. 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 make observations to determine the effect of sunlight on Earth's surface.  
TSWBAT use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth's surface.  
TSWBAT use and share observations of local weather conditions to describe patterns over time.  
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.

**Core Lesson Essential Questions:** How can we describe the weather?  
Why do we predict the weather?  
How does sunlight affect our world?

**Core Lesson Big Ideas:** Weather patterns cause changes that affect us.

**Core Lesson Materials:** Teachers will use the Next Generation Science Resources purchased by the Primary Science Curriculum Writing Team along with FOSS kit resources and Pearson Science Supplemental Readers.

**Core Lesson Key Terminology & Definitions:** weather- daily state of the air in a given place, it affects people in their comfort, food supply, and even safely  
sun- the star at the center of the solar system, hot ball of gases that gives off energy, life on earth depends on the light and heat from it  
rain- liquid form of water that falls from the sky in drops  
clouds- large collection of very tiny droplets of water or ice, the water or ice is so small it can float in the air  
lightning- flashing of light caused by the passing of electricity from one cloud to another or from cloud to earth  
snow- small white crystals of ice formed from water that falls to the earth from clouds  
wind- movement of air  
rainbow- an arc of color that forms in the sky opposite of the sun, it is caused by the sun shining through rain, mist, or spray  
forecast- to say what will happen in the weather in the future  
tornado- a powerful storm that has rotating winds that reaches from a cloud toward the ground  
flood- when water covers usually dry land  
temperature- the amount of hotness or coldness, it can be measured by a thermometer  
storm- a heavy fall of rain, snow, or sleet with strong wind

**Unit: Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment-**

Timeline: 18 Weeks

**Description:** February

Lesson 1 Living or Non-Living

Lesson 2 Living/Nonliving Sort

Lesson 3 Are Seeds Alive  
Lesson 4 Where Are Seeds?  
March  
Lesson 5 Seed Sort  
Lesson 6 Animals  
Lesson 7 Plants  
Lesson 8 Plants vs Animals  
April  
Lesson 9 Parts of a Plant  
Lesson 10 Healthy Habits  
Lesson 11 Where Is My Home?  
Lesson 12 Choose My Home  
Lesson 13 Animal Shared Research  
May  
Lesson 14 Bear's Home  
Lesson 15 What Is Wrong With My Home  
Lesson 16 Animals Affect Habitats  
Lesson 17 Humans Affect Habitats  
June  
Lesson 18 Reduce Reuse Recycle

**Skills:** TSWBAT  
-develop and use models  
-analyze and interpret data  
-engage in arguments from evidence  
-obtain, evaluate, and communicate information

**Essential Questions:** How do organisms use their habitats to survive?

**Content:** Content will include:  
-comparing and sorting living and nonliving things  
-predicting which seeds grow into which plants  
-where seeds are found  
-what plants need  
-what animals need  
-observing plants and animals  
-comparing plants and animals  
-labeling plant parts  
-what animals needs in their habitat  
-why people change their habitats

-reducing, reusing, and recycling

**Lessons:**

- Lesson 1 Living or Non-Living
- Lesson 2 Living/Nonliving Sort
- Lesson 3 Are Seeds Alive
- Lesson 4 Where Are Seeds?
- Lesson 5 Seed Sort
- Lesson 6 Animals
- Lesson 7 Plants
- Lesson 8 Plants vs Animals
- Lesson 9 Parts of a Plant
- Lesson 10 Healthy Habits
- Lesson 11 Where Is My Home?
- Lesson 12 Choose My Home
- Lesson 13 Animal Shared Research
- Lesson 14 Bear's Home
- Lesson 15 What Is Wrong With My Home
- Lesson 16 Animals Affect Habitats
- Lesson 17 Humans Affect Habitats
- Lesson 18 Reduce Reuse Recycle

**Vocabulary:**

- living
- plant
- animal
- flower
- seed
- stem
- leaf
- roots
- habitat
- change
- reduce
- reuse
- recycle
- earth

**Resources:** This unit was developed using the Next Generation Science standards. Teachers will use the Next Generation Science Resources purchased by the Primary Science Curriculum Writing Team along with FOSS kit resources and Pearson Science Concept Readers.

**STANDARDS:** **STANDARDS**  
NGSS Arranged by Topic - Science (2013)

- [K-LS1-1 \(Advanced\)](#) Use observations to describe patterns of what plants and animals (including humans) need to survive.
- [K-ESS2-2 \(Advanced\)](#) Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
- [K-ESS3-1 \(Advanced\)](#) Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
- [K-ESS3-3 \(Advanced\)](#) Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

**Topic: Unit 3 Living Things**

**Core Lesson Description:** The unit organizes performance expectations around the relationship between the needs of different plants and animals and the places they live. 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 to describe patterns of what plants and animals (including humans) need to survive.
- TSWBAT construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
- TSWBAT use and share observations of local weather conditions to describe patterns over time.
- TSWBAT use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
- TSWBAT ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
- TSWBAT communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- 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.

**Core Lesson Essential Questions:**

- What are organisms?
- What do organisms need to survive?
- How do organisms decide where to live?
- How do organisms change or affect their habitat?

**Core Lesson Big Ideas:** Organisms use their habitats to survive.

**Core Lesson Materials:** Teachers will use the Next Generation Science Resources purchased by the Primary Science Curriculum Writing Team along with FOSS kit resources and Pearson Science Supplemental Readers.

**Core Lesson Key Terminology & Definitions:**

- living- things that are alive and need air, water, and food
- plant- living things that cover much of the planet including grass, trees, flowers, bushes, ferns, mosses, and more. They make their own food.
- animal- living things that need to feed themselves by eating plants or other animals, they can sense what is happening around them, and they can react to what is around them
- flower- the part that blossoms, grows on plants, produces the seed
- seed- small part of a plant from where new plants grow
- stem- part of a plants that holds up the leaves and flowers, it moves the food and water around the plant
- leaf- usually a flat green part that grows from a plant stem and makes the plants food
- roots- a part of the plant that is hidden underground, it holds the plant up

habitat- the home of a plant or animal

change- the result of making something and becoming different

reduce- making something smaller

reuse- using something again instead of throwing it in the trash

recycle- taking objects ready to be thrown away and changing them into something that can be used again

earth- the planet we live on, it is the third planet from the sun, it travels around the sun, it appears bluish from outer space

## Unit: Engineering Design

Timeline: 3 Weeks

**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: **Science and Engineering Practices**

TSWBAT

-ask questions and define problems

-develop and use models

-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 the 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 given problem?

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

**Content:** Content will include:

-building roller coasters using force and motion

-test ways to stay safe in the sun

-find ways to reduce, reuse, and recycle

**Lessons:** Lesson 1- culminating activity from Unit 1 Forces and Interactions: Pushes and Pulls

Roller Coaster Challenge- plan, build, and share roller coasters

Lesson 2- culminating activity from Unit 3 Unit 3 Weather: Patterns and Effects of Sunlight

Sunscreen challenge- plan, create, and share effects on paper cutouts in sun, create shelters with a team as a form of sun protection

Lesson 3- culminating activity from Unit 2 Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment-

Reduce, reuse, recycle projects- plan, create, and share creations from trash

**Vocabulary:** ask  
imagine  
plan  
create  
improve

**Resources:** This unit was developed using the Next Generation Science standards. Teachers will use the Next Generation Science Resources purchased by the Primary Science Curriculum Writing Team along with FOSS kit resources and Pearson Science Concept Readers.

**STANDARDS: STANDARDS**

NGSS Arranged by Topic - 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:** 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 2 objects designed to solve the same problem to compare the strengths and weaknesses of how each preforms.

**Core Lesson 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 the 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 given problem?

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

**Core Lesson Big Ideas:** Collaborative problem solving

**Core Lesson Materials:** Teachers will use the Next Generation Science Resources purchased by the Primary Science Curriculum Writing Team along with FOSS kit resources and Pearson Science Supplemental Readers.

**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 to make it better