

Curriculum - Kindergarten

High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Standard K.PS2.A.1

Learning Goal

Students can 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.

Proficiency Scale

4: Student demonstrates advanced application and understanding of forces and interactions.

3: Student demonstrates mastery with the learning goal as evidenced by:

- developing a plan to investigate the relationship between the strength and direction of pushes and pulls and the motion of an object.
- describing the cause and effect relationship between pushes and pulls and object motion to be determined.
- comparing the effects of the motion of the objects caused by changes in the strength or direction of the pushes and pulls and recording their data.

2: Student demonstrates he/she is nearing proficiency by:

- predicting the effect of the push or pull on the motion of the object.
- describing the relative strengths of the push or pull that will be applied to the object to start or stop its motion or change its speed OR describing the relative directions of the push or pull that will be applied to the object.

1: Student demonstrates limited understanding of forces and interactions.

Learning Targets- Pushes and Pulls Unit

Science and Engineering Practice

With guidance, plan and conduct an investigation in collaboration with peers.

Disciplinary Core Ideas

- Understand pushes and pulls can have different strengths and directions.
- Compare how pushes and pulls can change the speed or direction of an object.
- Identify that a bigger push or pull makes things speed up or slow down more quickly.

Cross Cutting Concept

Generalize that a bigger push or pull makes things speed up and move more quickly than a smaller push or pull.

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Standard K.PS2.A.2

Learning Goal

Students can 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.

Proficiency Scale

4: Student demonstrates advanced application and understanding of forces and interactions.

3: Student demonstrates mastery with the learning goal as evidenced by:

- organizing data using graphical or visual displays.
- describing relative changes in the speed or direction of the object caused by pushes or pulls from the design solution.
- describing, from the observed data, whether the push or pull from the design solution causes the intended change in speed or direction of motion of the object.

2: Student demonstrates he/she is nearing proficiency by:

- organizing data with guidance.
- describe how the pushes or pull from the design solution causes the change in the object's motion.

1: Student demonstrates limited understanding of forces and interactions.

Learning Targets- Pushes and Pulls Unit

Science and Engineering Practices

- Collect observational data on the motion of objects.
- Analyze observational data and categorize what made an object's motion change (i.e., go slower, go faster, go farther, change direction, stop).

Disciplinary Core Idea

- Describe the ways we can cause an object to change motion.

Cross Cutting Concept

Describe the effect of actions on an object to make it change motion (i.e., go slower, go faster, go farther, change direction, stop) and generalize the relationship between the force applied and resulting motion of an object.

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Standard K.PS3.A.1

Learning Goal

Students can make observations to determine the effect of sunlight on Earth's surface.

Proficiency Scale

4: Student demonstrates advanced application and understanding of weather and climate.

3: Student demonstrates mastery with the learning goal as evidenced by:

- describing observations of the relative warmth of materials in the presence and absence of sunlight.
- identifying patterns of relative warmth of materials in sunlight and in shade.

2: Student demonstrates he/she is nearing proficiency by:

- describing that sunlight warms the earth.
- comparing the warmth of earth materials placed in sunlight and the same earth materials placed in shade.

1: Student demonstrates limited understanding of weather and climate.

Learning Targets- Weather and Climate Unit

Science and Engineering Practice

Collect observational data using relative terms (e.g., warmer, hotter, colder, cooler, brighter, darker, lighter) on the effect of sunlight on Earth's surface.

Disciplinary Core Idea

Recall that sunlight warms Earth's surface and that more sunlight means more warmth (e.g., it is generally warmer in the day than at night).

Cross Cutting Concept

Generalize that the shielding or reduction of direct sunlight will result in reducing the warming effect of sunlight and that, conversely, an increase in direct sunlight will result in increasing the warming effect.

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Standard K.PS3.B.1

Learning Goal

Students can use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.

Proficiency Scale

4: Student demonstrates advanced application and understanding of weather and climate.

3: Student demonstrates mastery with the learning goal as evidenced by:

- designing and building a structure that reduces warming caused by the sun.
- describing whether the structure meets the expectations in terms of cause (structure blocks sunlight) and effect (less warming of the surface).

2: Student demonstrates he/she is nearing proficiency by:

- designing and building a structure with guidance and support.
- describing that the structure is expected to reduce warming for a designed area by providing shade.

1: Student demonstrates limited understanding of weather and climate.

Learning Targets- Weather and Climate Unit

Science and Engineering Practices

- Design and build a model device, using provided tools and materials, to reduce the warming effect of sunlight.
- Generate and compare multiple solutions to the engineering challenge.

Disciplinary Core Idea

Recall that sunlight warms Earth's surface

Cross Cutting Concept

Generalize that the shielding or reduction of direct sunlight will result in reducing the warming effect of sunlight and that, conversely, an increase in direct sunlight will result in increasing the warming effect.

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Standard K.ESS2.D.1

Learning Goal

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

Proficiency Scale

- 4: Student demonstrates advanced application and understanding of weather and climate.
- 3: Student demonstrates mastery with the learning goal as evidenced by:
- organizing data from given observations (firsthand or from media) about local weather conditions using graphical displays (pictures, charts, etc.).
 - describing patterns and sharing that:
 - certain months have more days of some kinds of weather than do other months.
 - the differences in relative temperature over the course of a day are directly related to the time of day.
- 2: Student demonstrates he/she is nearing proficiency by:
- organizing data with guidance and support.
 - identifying in the data:
 - the change in the relative temperature over the course of a day.
 - the relative number of days of different types of weather conditions in a month.
- 1: Student demonstrates limited understanding of weather and climate.

Learning Targets - Weather and Climate Unit

Science and Engineering Practice

Analyze observations (data points).

Disciplinary Core Idea

Make relevant local weather observations that include noticing the amount of sunlight, wind, snow/rain, and temperature, both throughout a day and/or across multiple days.

Cross Cutting Concept

Identify general patterns in the local weather data collected over a period of time.

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Standard 1.PS3.A.1

Learning Goal

Students can identify the source of energy that causes an increase in the temperature of an object.

Proficiency Scale

4: Student demonstrates advanced application and understanding of energy.

3: Student demonstrates mastery with the learning goal as evidenced by:

- identifying a source of energy and explaining how the source can cause an increase in the temperature of an object
- describing, using evidence, that the Sun is a source of energy that can increase temperature

2: Student demonstrates he/she is nearing proficiency by:

- identifying a source of energy
- understanding that energy can increase the temperature of objects.

1: Student demonstrates limited understanding of energy

Learning Targets - Weather and Climate Unit

Science and Engineering Practices

- Ask questions based on observations to find out more information about the natural and/or designed world.
- Ask and/or identify questions that can be answered by an investigation.
- Use information from observations to construct an evidence-based account for natural phenomena.

Disciplinary Core Ideas

- Energy sources that increase the temperature of objects (e.g., sun, stove, flame, light bulb, oven)
- The sun is the primary source of energy on Earth.
- Temperature is a measure of hot or cold.

Cross Cutting Concepts

- Energy can cause the temperature of an object to increase.
- Events have causes that generate observable patterns.
- Simple tests can be designed to gather evidence to support or refute student ideas about causes.

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Standard K.LS1.C.1

Learning Goal

Students can use observations to describe patterns of what plants and animals (including humans) need to survive.

Proficiency Scale

4: Student demonstrates advanced application and understanding of plants and animals.

3: Student demonstrates mastery with the learning goal as evidenced by:

- organizing data from given observations (firsthand or from media) using graphical displays (pictures, charts, etc.).
- describing the patterns identified in the data provided to show evidence that:
 - plants and animals need light and water to live and grow.
 - animals get their food from plants, other animals, or both.

2: Student demonstrates he/she is nearing proficiency by:

- organizing data with guidance and support.
- identifying patterns in the data including:
 - all animals eat food.
 - all animals drink water.
 - plants cannot live or grow if there is no water or light.

1: Student demonstrates limited understanding of plants and animals.

Learning Targets - Plants and Animals Unit

Science and Engineering Practices

- Collect observations and information on the needs of various plants and animals.
- Organize or classify collected observations into like survival categories (e.g., food sources, water sources, shelter, air).

Disciplinary Core Ideas

- Understand the basic food source needs of animals.
- Understand that plants need water and light to live and grow.

Cross Cutting Concept

Make a generalization about the similar needs of all plants and similar needs of all animals and describe that pattern in the natural world.

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Standard K.ESS2.E.1

Learning Goal

Students can construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Proficiency Scale

- 4: Student demonstrates advanced application and understanding of plants and animals.
- 3: Student demonstrates mastery with the learning goal as evidenced by:
- making a claim to be supported by evidence that plants and animals (including humans) can change the environment to meet their needs.
 - supporting the claim and presenting an argument connecting various needs of plants and animals to show evidence about how plants/animals change their environments to meet their needs.
 - The argument includes:
 - examples of how plants affect other parts of their system by changing their environments to meet their needs.
 - examples of how animals affect other parts of their systems by changing their environments to meet their needs.
- 2: Student demonstrates he/she is nearing proficiency by:
- making and supporting a claim with guidance and support.
 - identifying and describing:
 - examples of plants changing their environments.
 - examples of animals (including humans) changing their environments.
 - examples of plant and animal needs.
- 1: Student demonstrates limited understanding of plants and animals.

Learning Targets

Science and Engineering Practices

- Engage in an argument.
- Use relative evidence to support a claim.

Disciplinary Core Ideas

- Describe how plants and animals change their environment (e.g., squirrel digs in the ground, ants build anthills).

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- Identify ways humans have altered the natural environment and recognize how plants and animals have changed the environment to meet their needs (e.g., tree roots break concrete, vines grow around fences, birds use some human-made materials to build nests).

Cross Cutting Concept

Describe the relationship (system) between plants and animals and their environment (natural or human-made).

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Goal K.ESS3.A.1

Learning Goal

Students can use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

Proficiency Scale

4: Student demonstrates advanced application and understanding of plants and animals.

3: Student demonstrates mastery with the learning goal as evidenced by:

- using a given model to represent and describe the relationships between the components including:
 - the relationships between the different plants and animals and the materials they need to survive.
 - the relationship between places where different plants and animals live and the resources those places provide.
 - the relationships between specific plants and animals and where they live.
- using a given model to describe that plants and animals, the places in which they live, and the resources found in those places are each part of a system, and that these parts of systems work together and allow living things to meet their needs.

2: Student demonstrates he/she is nearing proficiency by:

- identifying and describing the components in a given model representing:
 - different plants and animals (including humans).
 - the places where the different plants and animals live.
 - the things that plants and animals need.
- describing the relationship between the components with guidance and support

1: Student demonstrates limited understanding of plants and animals.

Learning Targets

Science and Engineering Practices

- Use a model.
- Relate a model to relationships in nature.

Disciplinary Core Ideas

- Describe the needs of living things, both plants and animals (including humans).

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- Identify that living things use their environment to meet their needs.
- Understand that humans use natural resources daily.

Cross Cutting Concept

Identify the mutual relationship between living things and their natural environment (i.e., deer eat buds and leaves and are therefore often found in forest, grasses need sun and are therefore often found in meadows).

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High Priority Standards (Missouri Learning Standards, National, CREDE, etc.)

Missouri Learning Goal K.ESS3.C.1

Learning Goal

Students can communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

Proficiency Scale

4: Student demonstrates advanced application and understanding of plants and animals.

3: Student demonstrates mastery with the learning goal as evidenced by:

- communicating information clearly about solutions in oral and/or written form.
- communicating information about solutions that reduce the negative effects of humans on the local environment, including:
 - examples of things that people do to live comfortably and how those things can cause changes to the land, water, air, and/or living things in the local environment.
 - examples of choices that people can make to reduce negative impacts and the effects those choices have on the local environment.

2: Student demonstrates he/she is nearing proficiency by:

- communicating information, with guidance and support, about solutions in oral and/or written form
- describing information about:
 - how people affect the land, water, air, and/or living things in the local environment in positive and negative ways.
 - solutions that reduce the negative effects of humans on the local environment.

1: Student demonstrates limited understanding of plants and animals.

Learning Targets

Science and Engineering Practices

Communicate solutions with others in oral and/or written forms, using models and/or drawings that provide detail about scientific ideas.

Disciplinary Core Ideas

- Understand that humans impact the world around them.
- Create sketches, drawings, or physical models to communicate ideas for a problem's solutions.
- Identify ways to reduce human impact on land, water, air, and other living things.

Cross Cutting Concept

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Identify the impact of human choices on the environment and the general observable patterns that are formed.