Grade K, Science, Unit 1, Pushes and Pulls

Content Area: **Science**
Course(s): **Science**
Time Period: **January**
Length: **4 weeks**
Status: **Published**

Next Generation Science Standards

SCI.K-PS2-1	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.
SCI.K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
SCI.K-PS2-2	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.

Student Learning Objectives

The students will:

• plan and conduct an investigation in collaboration with peers with guidance.

• analyze data from tests of an object or tool to determine if it works as intended.

• ask questions based on observations to find more information about the natural and/or designed world(s).

• define a simple problem that can be solved through the development of a new or improved object or tool.

• develop a simple model based on evidence to represent a proposed object or tool.

• create a diagram to show the difference between a push and a pull.

Enduring Understanding

Students will 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.

Essential Questions

#1 Why do scientists like to play soccer?

#2 How can you design a simple way to change the speed or direction of an object using a push or pull from another object?

Assessment

Assessment

Children are assessed through observation, questions and conversations while they work in small groups at stations, interacting with various objects that demonstrate pushing or pulling. Notes will be taken and scored the children using a rubric.

Sort: Sort images int too push or pull. See link http://www.harmonydc.org/Curriculum/pdf/kindersample.pdf

Instructional Activities

The students will:

• design simple tests to gather evidence to support or refute their ideas about causes. (K-PS2-1), (K-PS2-2)

• determine how the shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-1)

• identify different ways scientists study the world. (K-PS2-1)

PUSH

Soda bottle bowling: Children experiment with pushing a ball hard and with less force to knock over soda bottles. They can compare a big push to a small push. What kind of push made the ball move the fastest? They will see how when objects collide (ball and soda bottle), they push on one another and can change motion.

Ramps and Matchbox cars: Children create ramps using flat, rectangular wooden blocks and Duplo Lego bricks. They will investigate how the height of a ramp can change how fast and far their Matchbox car can go. They will also compare the distance and speed of the car on the ramp to using no ramp.

PULL

Chair pulley: Loop a lightweight rope around the back of two chairs. Hang a small basket within the loop to send back and forth by pulling. Kids will experiment with pulling the rope hard and then gently. What kind of pull moved the basket the farthest?

PUSH/PULL/MOTION

Computer games: Children play games to reinforce push, pull and motion.

Push: Piggy Push from Cool Math Games
Pull: Hook the Fish from Cookie
Motion: Josie Jump's Dance-athon from BBC

Reinforcement/Closure (Return to Whole Group)
Watch a video to reinforce pushes and pulls. For further reinforcement, the next day, have children go on a **scavenger hunt** and try to find things around the classroom that they can push and pull.

Interdisciplinary Connections

English Language Arts

In order to integrate English Language Arts into this unit, students need the opportunity to participate in shared research that will enhance their understanding of the effect of forces (pushes and pulls) on objects. This could include exploring simple books and other media or digital resources. With prompting and support, students should ask and answer questions about key details in texts in order to seek help, get information, or clarify something that they do not understand. With support from adults, students will also recall information from experiences to answer questions and clarify their thinking. With support and/or collaboration, they can use digital tools to produce and publish simple informative writing or to document their observations of the simple force and motion systems they design and build.

Mathematics

During this unit of study, students will make connections to Mathematics in a number of ways. Kindergartners can use simple nonstandard units to measure the distances that two different objects travel when pushed or pulled or the distances that an object travels when varying the strength of a push or a pull. If using two objects, students can compare them using a measurable attribute, such as weight, to see which object has “more of” or “less of” the attribute, and describe the effect that increased weight has on the distance that an object travels. As students conduct multiple trials with the two objects (or with a single object, varying the strength of the push or pull), they can document the distance traveled in a simple graph. Then they can analyze the data in order to describe the cause-and-effect relationship between forces and motion of objects. As students collect and analyze data, they are learning to reason abstractly and quantitatively and use appropriate tools strategically.

Texts and Resources

http://www.state.nj.us/education/modelcurriculum/sci/ku1.pdf

Links:

http://www.weareteachers.com/blogs/post/2014/09/16/simple-physics-experiments-for-kids-pushing-and-pulling

Curious George Ramp and Roll
http://www.pbslearningmedia.org/resource/cg8.sci.phys.ramproll/curious-george-ramp-n-roll/

Picture Book List:

I Fall Down. Vicki Cobb. HarperCollins, 2004.

Gravity is a Mystery. Franklyn M. Branley. HarperCollins, 2007.

Forces Make Things Move. Kimberly Brubaker Bradley. HarperCollins, 2005

And Everyone Shouted, "Pull!" A First Look at Forces and Motion. Claire Llewellyn. Picture Window Books, 2004.

Zoom! Diane Adams. Peachtree, 2005.

Waking Upside Down. Philip Heckman. Atheneum, 1996.

Newton and Me. Lynne Mayer, Sylvan Dell, 2010

And Everyone Shouted "Pull!": A First Look at Forces and Motion. Claire Llewellyn. Picture Window Books (2004). Hop on the cart and join the farm animals as they find out how to take their heavy load on the hilly journey to market.

Videos:

Brain Pop Jr. https://jr.brainpop.com/science/forces/pushesandpulls

Bill Nye https://www.youtube.com/watch?v=8iKhLGK7HGk

Grade K, Science, Unit 2, Effects of the Sun

Content Area: **Science**
Course(s): **Science**
Time Period: **October**
Length: **6 weeks**
Status: **Published**

Next Generation Science Standards

SCI.K-PS3-2	Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.
SCI.K-2-ETS1-1	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.
SCI.K-2-ETS1-2	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.
SCI.K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
SCI.K-PS3-1	Make observations to determine the effect of sunlight on Earth's surface.

Student Learning Objectives

The students will:

Make observations (firsthand or from media) to collect data that can be used to make comparisons.

Work cooperatively in small groups to brainstorm and design a device to protect an object from the sun.

Create a device that solves a specific problem or a solution to a specific problem.

Predict outcomes and test predictions with student created devices.

Ask questions based on observations to find more information about the natural and/or designed world(s).

Define a simple problem that can be solved through the development of a new or improved object or tool.

Record and analyze recorded data using the table provided.

Enduring Understanding

Students will apply an understanding of the effects of the sun on the Earth's surface.

Essential Questions

Question #1:

How does sunlight affect the playground?

Question #2:

Imagine that we have been asked to design a new playground. How would we keep the sand, soil, rocks, and water found on the playground cool during the summer?

Assessment

Question #1

Students who understand the concepts are able to:

Observe patterns in events generated by cause-and-effect relationships.

Make observations (firsthand or from media) to collect data that can be used to make comparisons.

Make observations to determine the effect of sunlight on Earth's surface. (Assessment of temperature is limited to relative measures such as warmer/cooler.)

Examples of Earth's surface could include: Sand, Soil, Rocks and Water

Question #2

Students who understand the concepts are able to:

Observe patterns in events generated by cause-and-effect relationships.

Describe how the shape and stability of structures are related to their function.

Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.

Use tools and materials to design and build a structure (e.g., umbrellas, canopies, tents) that will reduce the warming effect of sunlight on an area.

Develop a simple model based on evidence to represent a proposed object or tool.

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.

Analyze data from tests of an object or tool to determine if it works as intended.

Analyze data from tests of two objects designed to solve the same problem to compare the strengths

Instructional Activities

Activity #1

Students should test a variety of materials that are found naturally on the surface of the Earth, including sand, soil, rocks, and water.

Samples of each of these materials can be placed on two separate paper plates or shallow plastic containers; one container can be placed in direct sunlight, and the other can be placed out of direct sunlight. After a period of time, students should compare the relative temperature of each. Students should record their observations, then analyze and compare the data to determine if there is a pattern. They should draw the conclusion that the sun has the same warming effect on all the materials found on the surface of the Earth.

Activity #2

Repeat the above activity again with Black versus white paper and predict and compare again.

As students come to understand that the sun warms the surface of the Earth, they should engage in the engineering design process as follows:

Students are challenged to design and build a structure that will reduce the warming effects of the sun.

Students brainstorm a list of objects that reduce the warming effects of the sun (e.g., shade trees, umbrellas, large hats, canopies).

Challenge Students to build a structure that will protect an ice cube from melting.

Take the students outside and place structures in the sun with an ice cube.

Use a timer to record and collect data to copmpare the structures and thier success.

As a class, students determine what the design should be able to do (criteria).

For example:

The structure must reduce the warming effects of the sun.

The structure should be built using materials provided by the teacher.

The structure should be easy to carry and fit through the doorway of the classroom.

Groups of students then use simple drawings or diagrams to design a structure, and use given tools and materials to build their design. Groups should be given a predetermined amount of time to draw and build their designs.

Groups share their designs with the class, using their drawings or diagrams, and then test their designs outside. (Groups can place their structures in a sunny area, then compare the relative temperature of the ground under the structure and the ground in direct sunlight.).

Students make and use observations to determine if the designs worked as intended, then compare the strengths and weaknesses of how each design performed.

While engaging in this process, students should use evidence from their observations to describe how their structures reduced the warming effect of sunlight. Through this process, students learn that the shape and stability of structures of designed objects are related to their function. They will use tools and materials to design and build their structures. Because there is always more than one possible solution to a problem, students will test and compare their designs, then analyze data to determine if their structures work as intended. drawings or diagrams to design a structure, and use given tools and materials to build their design.

Groups should be given a predetermined amount of time to draw and build their designs.

Groups share their designs with the class, using their drawings or diagrams, and then test their designs outside. (Groups can place their structures in a sunny area, then compare the relative temperature of the

ground under the structure and the ground in direct sunlight.).

Interdisciplinary Connections

English Language Arts

With guidance and support from adults, students recall information from experiences and gather information from books (read-alouds, big books) and other resources about the warming effects of the sun. Strategies such as Think-Pair-Share can be used to encourage students to think about and use information from books to answer questions and share their thinking. Kindergartners can add drawings or other visual displays to descriptions to provide additional detail about the structures they built to reduce the warming effects of the sun. With guidance and support from adults, students produce and publish their descriptions and observations of the structures they designed and built.

Mathematics

Students make comparisons of objects using relative temperature [hotter, colder, warmer, cooler] and describe the objects as warmer or cooler. Students can classify the objects into categories (warmer/cooler), then count and compare the number of objects in each category. Data should be organized and compared so that students understand that placing objects in the sun generates an observable pattern of change (i.e., the objects get warmer). Kindergarteners attend to the meaning of various quantities using a variety of measurement tools, such as thermometers without scale markings, to determine if an object has gotten warmer when placed in the sun. They mathematically represent real-world information by organizing their data into simple graphs or charts or by diagramming the situation mathematically.

Texts and Resources

http://www.state.nj.us/education/modelcurriculum/sci/ku4.pdf

Picture Books:

The Sun is My Favorite Star by Frank Asch

Hello, Sun! by Dayle Ann Dodds

My Light by Molly Bang

The Sun by Seymour Simon

Sun By Steve Tomecek

Sun Up, Sun Down: The Story of Day and Night. Jacqui Bailey.

Day Light, Night Light. By Franklyn M. Branley

Brain Pop Jr.: https://jr.brainpop.com/science/space/sun

You Tube:

"I'm So Hot" by The Story Bots https://www.youtube.com/watch?v=t-kzdR93bqw

"The Sun Song" https://www.youtube.com/watch?v=aa2Aw5dbS7I

"Hello, Sun!" by Dayle Ann Dodds https://www.youtube.com/watch?v=8yyacaOr0n8

Grade K, Science, Unit 3, Weather

Content Area: **Science**
Course(s): **Science**
Time Period: **September**
Length: **6 weeks**
Status: **Published**

Next Generation Science Standards

SCI.K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
SCI.K-2-ETS1-1	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.
SCI.K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Student Learning Objectives

The students will:

Record daily weather over a period of time.

Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.

Construct a graph using the recorded weather data.

Ask questions based on observations to find more information about the designed world.

Ask questions based on observations to find more information about the natural and/or designed world(s).

Define a simple problem that can be solved through the development of a new or improved object or tool.

Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.

Enduring Understanding

Students will develop an understanding of patterns and variations in local weather and the use of weather forecasting to prepare for and respond to severe weather.

Essential Questions

Question #1 What types of patterns can be observed in local weather conditions?

Question #2 How does weather forecasting help us to prepare for and respond to severe weather?

Assessment

Question #1

Students who understand the concepts are able to:

Observe and use patterns in the natural world as evidence and to describe phenomena.

Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.

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

Question #2

Students who understand the concepts are able to:

Observe patterns in events generated by cause-and-effect relationships.

Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.

Ask questions based on observations to find more information about the designed world.

Ask questions to obtain information about the purpose of weather forecasting to prepare for and respond to severe weather. (Emphasis is on local forms of severe weather.)

Define a simple problem that can be solved through the development of a new or improved object or tool.

Ask questions, make observations, and gather information about a situation people want to change in order to define a simple problem that can be solved through the development of a new or improved object or tool.

Instructional Activities

Students are expected to develop an understanding of patterns and variations in local weather and the use of weather forecasting to prepare for and respond to severe weather. Throughout the unit, students will look for patterns and cause-and-effect relationships as they observe and record weather events. Students will have opportunities to ask scientific questions, analyze and interpret data, and communicate their findings to others.

Weather Experiments http://www.weatherwizkids.com/weather-experiments.htm

http://teacher.scholastic.com/activities/wwatch/

Students learn that problem situations can be solved through engineering, and that in order to design a solution, we must first define the problem. As described in the narrative above, students define problems caused by severe weather events by asking specific questions, making observations, and gathering information that will help them understand the types of problems they might face when severe weather conditions exist in and around their homes, schools, and communities.

Students first develop an understanding that patterns in the natural world can be observed and documented, and that, like scientists, they can use these patterns as evidence to describe phenomena and make predictions

Making Rain Activity http://www.education.com/activity/article/rain_in_a_bag_kinder/

Students first develop an understanding that patterns in the natural world can be observed and documented, and that, like scientists, they can use these patterns as evidence to describe phenomena and make predictions.

Cloud Observation Activity http://www.education.com/activity/article/filming-clouds-window/

Students also learn that weather events have causes that generate observable patterns over time, and that these patterns help weather scientists predict severe weather

Tornado in a bottle http://www.weatherwizkids.com/experiments-tornado-bottle.htm

Students need opportunities to ask questions about weather forecasting and how it can help us prepare for and respond to different types of severe weather.

Make lightening in your mouth http://www.weatherwizkids.com/experiments-lightning-mouth.htm

Interdisciplinary Connections

English Language Arts

With adult support, students use trade books (read-alouds, big books) to learn about and discuss severe weather. Strategies, such as Think-Pair-Share, can be used to encourage students to think about information from books and to use that information to ask and answer questions about key details. With guidance, students use online media resources to view examples of severe weather. They can ask questions in order to understand how severe weather affects people and communities and to determine how communities prepare for and respond to severe weather.

Mathematics

With adult support, students measure and record various types of weather (e.g., rainfall or snow amounts, relative temperature at different times of the day and over a period of time). They mathematically

represent real-world information by organizing their data into simple weather charts and graphs. Kindergarteners attend to the meaning of various quantities using a variety of units of measure and use counting to analyze data and determine patterns in charts and graphs. By using media resources, students explore how weather scientists represent real-world weather data with picture representations, charts, and graphs. They can use this information to think about how weather scientists use tools to collect and record weather data in order to determine patterns of change. Students will attend to the meaning of various quantities used in simple weather charts and graphs, both from classroom observations and from media sources, by counting and comparing severe weather data with daily weather data (e.g., relative amounts of rainfall, snowfall). By analyzing data from weather graphs and charts, young students begin to understand how severe weather affects people and communities and that weather scientists play an important role in predicting severe weather conditions.

Texts and Resources

http://www.state.nj.us/education/modelcurriculum/sci/ku3.pdf

http://www.weatherwizkids.com/weather-experiments.htm

http://teacher.scholastic.com/activities/wwatch/

Brain Pop Jr.: https://jr.brainpop.com/science/weather/

Pintrest: Weather sensory bottles

Picture Books:

Come on, Rain! by Karen Hesse

Hurricane by David Wiesner

Flash, Crash, Rumble, & Roll by Franklyn Branley

Feel the Wind (Let's Read & Find Out Science) written & illustrated by Arthur Dorros

Oh Say Can You Say, What's the Weather Today?: All About Weather by Tish Rabe

On the Same Day in March A Tour of the World's Weather by Marilyn Singer

The Cloud Book by Tomie dePaola

TWISTER by Darleen Bailey Beard

Storm is Coming by Heather Tekavec

Grade K, Science, Unit 4, Basic Needs of Living Things

Content Area: **Science**
Course(s): **Science**
Time Period: **March**
Length: **8 weeks**
Status: **Published**

Next Generation Science Standards

SCI.K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
SCI.K-ESS3-1	Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
SCI.K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Student Learning Objectives

The students will:

Make observations (firsthand or from media) to collect data that can be used to make comparisons.

Observe (firsthand or from media) and describe patterns in the natural world in order to answer scientific questions.

Create a model to represent relationships in the natural world.

Construct an argument with evidence to support a claim.

Categorize images into living or non-living using a T chart.

Compare and contrast a real duck with a rubber duck.

Describe the differences between a living and non-living thing.

Enduring Understanding

Students develop an understanding of what plants and animals need to survive and the relationship between their needs and where they live. Students compare and contrast what plants and animals need to

survive and the relationship between the needs of living things and where they live.

Essential Questions

Question #1: What do plants need to live and grow?

Question #2: What is the relationship between what plants need and where they live?

Question #3: How can plants change their habitat?

Assessment

Question #1

Students who understand the concepts are able to:

Observe and use patterns in the natural world as evidence.

Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.

Use observations to describe patterns in what plants need to survive.

Examples of patterns could include: Plants do not need to take in food. All plants require light. All living things need water.

Use observations to describe patterns in what animals need to survive.

Examples of patterns could include: Animals need to take in food, but plants do not. Different kinds of food are needed by different types of animals. All living things need water.

Question #2

Students who understand the concepts are able to:

Observe that systems in the natural and designed world have parts that work together.

Use a model to represent relationships between the needs of different plants and the places they live in the natural world.

(Plants, animals, and their surroundings make up a system.)

Examples of relationships could include that grasses need sunlight, so they often grow in meadows.

Examples of models include diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards.

Use a model to represent the relationships between the needs of different animals and the places they live in the natural world.

(Plants, animals, and their surroundings make up a system.)

Examples of relationships could include that deer eat buds and leaves and therefore usually live in forested areas.

Examples of models include diagrams, drawings, physical replica, dioramas, dramatizations, and storyboards.

Question #3

Students who understand the concepts are able to:

Observe that systems in the natural and designed world have parts that work together.

Use a model to represent relationships between the needs of different plants and the places they live in the natural world.

(Plants, animals, and their surroundings make up a system.)

Examples of relationships could include that grasses need sunlight, so they often grow in meadows.

Examples of models include diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards

Instructional Activities

Prior to starting the unit, display pictures of living and non-living things. Direct students to sort the pictures into two groups: living and non-living. Ask students to explain how they decided which pictures represented living things and which represented non-living things.

Watch the PBS video “Is It

Alive?" http://www.pbslearningmedia.org/resource/tdc02.sci.life.colt.alive/is-it-alive/ Stop after each picture and ask students if it's alive or not. Ask them to explain how they can tell. (This activity will also provide an opportunity to pre-assess students' understandings and/or misconceptions. It will also provide an opportunity for students to think about what having life means.)

Watch the TeacherTube video "Living or Non-Living?" http://www.teachertube.com/video/living-and-non-living-176491 (This activity provides similar experiences for students as the PBS video. The difference is that after each picture and question, the narrator provides the answer with reasoning.)

Sort into Living and non living http://www.themailbox.com/magazines/science-worksheet-classifying-living-and-nonliving-things/living-or-nonliving

Different Ducks http://www.themailbox.com/magazines/different-ducks/different-ducks

Interdisciplinary Connections

English Language Arts

With adult support, kindergarteners use trade books (read-alouds and big books) to learn about plants and animals. With prompting and support strategies, such as Think-Pair-Share, students can discuss what they have learned and read and answer questions using key details from text. As students learn about different types of plants, animals and the environments in which they live, they will use models, such as diagrams, drawings, physical replicas, or dioramas, to represent the relationships between the needs of living things and the places they live in the natural world. Using models in this way gives students an opportunity to use simple informative writing to provide additional detail that will enhance their visual displays.

Mathematics

With adult support, kindergarteners use simple measurements to describe various attributes of plants and animals. Kindergarteners can use simple, nonstandard units to measure the height of plants or the amount of water given to plants. For example, they might use Unifix cubes to measure height or count the number of scoops of water given to a plant on a daily or weekly basis. Students should work in groups to measure and record their data. They also measurements to describe various attributes of animals. Kindergarteners can use simple, nonstandard units to measure such attributes as height, length, or weight. They can also count numbers of appendages or other body parts. They might use Unifix cubes to measure height or length and wooden blocks to measure weight. Students should work in groups to measure and record their data.

With adult guidance and questioning, students can then learn to analyze their data. As students use data to

compare the amount of growth that occurs in plants that get varying amounts of water or sunlight, they are given the opportunity to reason abstractly and quantitatively. For example, students can measure and compare the height of a sunflower grown in the shade compared to the height of a sunflower grown in the sun, or they can count and compare the number of leaves on bean plants that receive different amounts of water daily. These investigations will give students evidence to support claims about the needs of plants. Students should also have opportunities to solve one-step addition/subtraction word problems based on their collected data.

Texts and Resources

http://www.state.nj.us/education/modelcurriculum/sci/ku4.pdf

Are You Living? song https://www.youtube.com/watch?v=Z_aAkuK_8nQ

Picture Books:

Are You Living? A Song About Living and Nonliving Things. Laura Purdie Salas. Picture Window Books, 2009

Zoom. Istvan Banyai. Puffin Books (1995). Nothing is ever as it seems in this wordless book of pictures within pictures. Gives students a fun way to practice the scientific skills of observation, inquiry, and prediction.

Do You Know Which Ones Will Grow? Susan Shea. Blue Apple Books, 2011.

I Am a Living Thing. Bobbie Kalman. Crabtree, 2008.

Is It Living or Nonliving? Rebecca Rissman. Heineman, 2009

Living and Nonliving. Angela Royston. Heinemann, 2008.

Living Things Need Water. Bobbie Kalman. Crabtree, 2008.

What Kind of Living Thing Is it? Bobbie Kalman. Crabtree, 2010.

Plants are Living Things. Bobbie Kalman. Crabtree, 2008

What's Alive? Kathleen Weidner Zoehfeld. Collins, 1995.

Grade K, Science, Unit 5, Basic Needs of Humans

Content Area: **Science**
Course(s): **Science**
Time Period: **May**
Length: **6 weeks**
Status: **Published**

Next Generation Science Standards

SCI.K-2-ETS1-1	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.
SCI.K-ESS3-3	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

Student Learning Objectives

The students will:

Make observations (firsthand or from media) to collect data that can be used to make comparisons.

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

Ask questions based on observations to find more information about the natural and/or designed world(s).

Define a simple problem that can be solved through the development of a new or improved object or tool.

Brainstorm ways students can help the environment.

Enduring Understanding

Students develop an understanding of what humans need to survive and the relationship between their needs and where they live.

Essential Questions

How can humans reduce their impact on the land, water, air, and other living things in the local environment?

Assessment

Students who understand the concepts are able to:

Observe patterns in events generated due to cause-and-effect relationships.

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

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

Ask questions based on observations to find more information about the natural and/or designed world.

Define a simple problem that can be solved through the development of a new or improved object or tool.

Ask questions, make observations, and gather information about a situation that people want to change in order to define a simple problem that can be solved through the development of a new or improved object or tool.

Instructional Activities

As a class or in groups, students participate in shared research to find examples of ways that people solve some of the problems created by humans' use of resources from the environment.

For example, people in the community might choose to:

o Recycle plastic, glass, paper, and other materials in order to reduce the amount of trash in landfills;

o Plant trees in areas where trees have been cut down for lumber to renew regional habitats for local wildlife;

o Set up rainwater collection systems so that rainwater can be used to maintain landscaping instead of using water from local reserves.

Groups of students then develop a simple sketch, drawing, diagram, or physical model to illustrate how the solution reduces the impact of humans on land, water, air and/or other living things in the local environment.

Groups need the opportunity to communicate their solutions with the class in oral and/or written form, using their sketches, drawings, diagrams, or models to help explain how the solution reduces the human impact on the environment.

Water Pollution Activity:

https://www.pinterest.com/pin/287597126179448555/

Recycling Crayons Activity:

http://www.inspirationalmomma.com/recycled-crayons/

Interdisciplinary Connections

English Language Arts

With adult support, students participate in shared research in order to find examples of ways that humans reduce their impact on the land, water, air, and other living things in the local environment. With prompting and support, students will ask and answer questions about key details in a text. Students, with adult support

and/or peer collaboration, can also use simple books and media resources to gather information and then use drawings, simple informative writing (or dictation), and visual displays to represent some of the ways that people lessen their impact on the environment. With support from adults, students will recall information from experiences or gather information provided from sources to answer a question. Students can clarify their ideas, thoughts, and feelings using simple informative writing.

Mathematics

With adult support, students will classify data by one attribute, sort data into categories, and graph the data. For example, students can keep track of the amount of materials recycled over a period of time. They can classify recycled trash as paper, plastic, or glass, then count and graph these data, using bar graphs or picture graphs. Student should have opportunities to analyze and compare the data and then use the data to solve word problems. As students work with their data, they are learning to reason abstractly and quantitatively, model by diagramming the situation mathematically, and use appropriate tools strategically.

Texts and Resources

http://www.state.nj.us/education/modelcurriculum/sci/ku5.pdf

Brain Pop Jr.: https://jr.brainpop.com/science/conservation

If You're a Kid (Earth Day version) https://www.youtube.com/watch?v=Z_aAkuK_8nQ

Reduce, Reuse, Recycle video https://www.youtube.com/watch?v=d1mFymbRmv

Picture Books:

What does it mean to be Green? by https://www.youtube.com/watch?v=iyNPa37G_2s

The Lorax By Dr. Seuss

Recycle! By Gail Gibbons

What If Everybody Did That? By Ellen Javernick

Michael Recycle b y Ellie Bethel

Look Out For Litter by Lisa Bullard

Here Comes the Garbage Barge! By Jonah Winter

Charlie and Lola We Are Extremely Very Good Recyclers By Lauren Childs

Where Does the Garbage Go? Revised Edition (Let's-Read-and-Find-Out Science 2) by Paul Showers

The Adventures of an Aluminum Can A Story About Recycling (Little Green Books)

The Adventures of a Plastic Bottle A Story About Recycling (Little Green Books)

Miss Fox's Class Goes Green By Eileen Spinelli

Compost Stew An A to Z Recipe for the Earth By Mary McKenna Siddals