

Project 1 : Life Science - Build an animal habitat

This lesson focuses on these aspects of NGSS Three-Dimensional Learning:

science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models. Develop and/or use a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s).</p> <p>Analyzing and Interpreting Data. Use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems.</p> <p>Engaging in Argument from Evidence. Make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence.</p>	<p>ESS3.A: Natural Resources. Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.</p> <p>LS4.D: Biodiversity and Humans. There are many different kinds of living things in any area, and they exist in different places on land and in water.</p>	<p>Systems and System Models. Systems in the natural and designed world have parts that work together.</p>

Project 2 : Physics - Paper bridge design science

This lesson focuses on these aspects of NGSS Three-Dimensional Learning:

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying out Investigations. Make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons.</p> <p>Using Mathematical and Computational Thinking. Use quantitative data to compare two alternative solutions to a problem.</p> <p>Constructing Explanations and Designing Solutions. Generate and/or compare multiple solutions to a problem.</p>	<p>ETS1.C: Optimizing the Design Solution. Because there is always more than one possible solution to a problem, it is useful to compare and test designs.</p>	<p>Structure and Function. The shape and stability of structures of natural and designed objects are related to their function(s).</p>

Project 3 : Plant biology - Water transport in plant

This lesson focuses on these aspects of NGSS Three-Dimensional Learning:

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations. Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.</p> <p>Make predictions based on prior experiences.</p> <p>Analyzing and Interpreting Data. Record information (observations, thoughts, and ideas).</p>	<p>LS2.A: Interdependent Relationships in Ecosystems. Plants depend on water and light to grow.</p>	<p>Structure and Function. The shape and stability of structures of natural and designed objects are related to their function(s).</p>

Project 4 : Geology - Mapping Landforms

This lesson focuses on these aspects of NGSS Three-Dimensional Learning:

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models. Develop a model to represent patterns in the natural world</p> <p>Analyzing and Interpreting Data. Use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems.</p>	<p>ESS2.B: Plate Tectonics and Large-Scale System Interactions. Maps show where things are located. One can map the shapes and kinds of land and water in any area.</p>	<p>Patterns. Patterns in the natural world can be observed.</p>

Project 5 : Build a bird feeder to discover what animals need

Overview

In this lesson, each student will create a bird feeder from recycled, bird-safe materials. While designing their own bird feeders, students will discuss what basic needs an animal has and how they can meet these needs with the structure they build.

NGSS Alignment

This lesson helps students prepare for these Next Generation Science Standards Performance Expectations:

- **K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.

This lesson focuses on these aspects of NGSS Three Dimensional Learning:

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions. Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.	LS1.C: Organization for Matter and Energy Flow in Organisms. All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.	Structure and Function. The shape and stability of structures of natural and designed objects are related to their function(s).

Project 6 : Weather and atmosphere - How Sunlight warms the earth

Overview

Kindergarten students associate the sun with light and warmth. This lesson helps them expand this knowledge by getting their hands dirty! They will fill cups with soil, water and rocks and place them in the sun and shade for a while. By finding out how they can tell where a cup has been stored, they will learn how the sun affects Earth's surface. The students will have to figure out how to protect a territory from getting too hot in the sun.

NGSS Alignment

This lesson helps students prepare for these Next Generation Science Standards Performance Expectations:

- **K-PS3-1.** Make observations to determine the effect of sunlight on Earth's surface.

This lesson focuses on these aspects of NGSS Three Dimensional Learning:

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations. Make observations (firsthand or from media) to collect data that can be used to make comparisons.	PS3.B: Conservation of Energy and Energy Transfer Sunlight warms Earth's surface.	Cause and Effect. Events have causes that generate observable patterns.

Project 7 : Physics - Push and pull

Overview

Your kindergarten students are used to moving objects. They throw balls, play with toy cars, and sweep the floor, but how much do they think about these actions? In this fun, hands-on lesson, you will use a game (rolling balls) to explore how pushing and pulling affects an object's motion.

NGSS Alignment

This lesson helps students prepare for these Next Generation Science Standards Performance Expectations:

- **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.

This lesson focuses on these aspects of NGSS Three Dimensional Learning:

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying out Investigations. With guidance, plan and conduct an investigation in collaboration with peers.	PS2.A: Forces and Motion. Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. PS3.C: Relationship Between Energy and Forces. A bigger push or pull makes things speed up or slow down more quickly.	Cause and Effect. Simple tests can be designed to gather evidence to support or refute student ideas about causes.

Project 8 : Which season is this?

Overview

In this lesson, students will investigate seasonal patterns by matching various pictures to the different seasons. In small groups, students will analyze the pictures for clues to a specific season, describe what they observe, and explain what evidence they have found in each picture to identify the season. By comparing the images, students will be able to recognize patterns and identify seasonal changes over time.

NGSS Alignment

This lesson helps students prepare for these Next Generation Science Standards Performance Expectations:

- **K-ESS2-1.** Use and share observations of local weather conditions to describe patterns over time.

This lesson focuses on these aspects of NGSS Three Dimensional Learning:

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Analyzing and Interpreting Data. Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.</p> <p>Engaging in Argument from Evidence. Construct an argument with evidence to support a claim.</p> <p>Constructing Explanations and Designing Solutions. Use information from observations (firsthand and from media) to construct an evidence-based account for natural phenomena.</p>	<p>ESS2.D: Weather and Climate. Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.</p>	<p>Patterns. Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.</p>