How People, Plants, and Animals Depend on Each Other

Unit Information

- **Unit #:** ASHCT-00035856
- **Grade Level:** Kindergarten
- **Subject:** Science
- **Interdisciplinary Focus:** STEAM
- **Author:** Carly Levine
- **Duration:**
- **Dates:**

Unit Overview

In this unit, students explore how plants, animals, and humans depend on one another and their environment to survive. They investigate what living things need (water, air, food, light, and shelter) and how living things interact with and change their environments. Students also examine how human actions impact the natural world and how those impacts can be reduced.

Instruction may be supported with hands-on investigations, observations, and multimedia resources such as lessons from Mystery Science.

Standards Alignment

Next Generation Science Standards (NGSS)

- **K-LS1-1:** Use observations to describe patterns of what plants and animals need to survive
- **K-ESS2-1:** Use and share observations of local weather conditions to describe patterns over time
- **K-ESS2-2:** Construct an argument supported by evidence for how plants and animals can change the environment

- **K-ESS3-1:** Use a model to represent relationships between needs of different plants/animals and places they live
- **K-ESS3-2:** Ask questions to obtain information about weather forecasting
- **K-ESS3-3:** Communicate solutions that reduce human impact on the environment

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Crosscutting Concepts

- **Patterns:** Patterns in nature can be observed and used as evidence
- **Systems and System Models:** Living things and environments work as interconnected systems

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Connections to Engineering, Technology, and Society

Students will:

- Ask questions and define simple problems
- Develop and communicate solutions using drawings and models
- Explore how human choices impact the environment

Common Core Connections

ELA/Literacy

- RI.2.1
- W.2.6
- W.2.8
- SL.2.5

Mathematics

- MP.2
- MP.4
- MP.5
- 2.MD.D.10

Stage 1: Desired Results

Enduring Understandings

Students will understand that:

- All living things need specific resources to survive
- Plants and animals depend on their environment and each other
- Living things can change their environment
- Humans impact the environment and can make responsible choices

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Essential Questions

- Why do woodpeckers peck wood?
- Where do animals live?
- How can you find animals in the woods?
- How do animals make their homes?
- How do plants grow?
- Why might an old log be important in an ecosystem?

Knowledge

Students will know:

- Plants need water and light to grow
- Animals need food and water to survive
- Weather follows observable patterns
- Living things live in environments that meet their needs
- Humans use natural resources

Skills

Students will be able to:

- Ask questions based on observations
- Collect and organize data (charts, drawings, graphs)
- Identify patterns in data
- Develop and use simple models
- Communicate ideas through drawings, writing, and discussion

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Stage 2: Assessment Evidence

Performance Task 1: Living Things Needs Investigation (K-LS1-1)

Students will:

- Organize data about plant and animal needs
- Identify patterns (food, water, light)
- Explain how living things meet their needs

Performance Task 2: Weather Patterns Study (K-ESS2-1)

Students will:

- Track and record daily weather
- Identify patterns over time
- Explain how weather changes throughout the day and across months

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Performance Task 3: Severe Weather Inquiry (K-ESS3-2)

Students will:

- Ask questions about severe weather
- Gather information from texts and media
- Explain how weather forecasts help people prepare

Performance Task 4: Human Impact Project (K-ESS3-3)

Students will:

- Describe ways humans impact the environment
- Identify positive and negative effects
- Communicate solutions through drawings or writing

Other Evidence

OE1: Environmental Change Argument (K-ESS2-2)

- Explain how plants and animals change their environment
- Use examples (nests, burrows, roots, human structures)
- Support ideas with evidence

OE2: Habitat Model (K-ESS3-1)

- Create or interpret a model showing:
    - Living things
    - Their environment
    - Resources they need
- Explain relationships within the system

Stage 3: Learning Plan

Learning Activities

- Investigate animal behavior (e.g., woodpeckers)
- Observe and record local weather
- Conduct plant growth experiments
- Build models of habitats
- Discuss human impact on the environment
- Use multimedia lessons (e.g., Mystery Science)

Sample Lesson Structure

- **Objective:** Identify what plants need to grow
- **Activity:** Plant experiment (light vs. no light)
- **Discussion:** What changed? Why?
- **Assessment:** Student drawing + explanation

Resources

- Classroom experiments (plants, weather tracking)
- Informational texts
- Videos and online lessons (e.g., Mystery Science)
- Chart paper, science journals

Differentiation / Support

- Visual supports and sentence stems
- Hands-on investigations
- Small group instruction
- Extension: student-designed habitat models

Notes / Comments

- Continue emphasizing real-world connections
- Reinforce vocabulary through visuals and repetition
- Adjust pacing based on student observation skills

Unit Title: Pushes and Pulls

Grade: K
Subject: Science (STEAM approach)
Unit Focus:
Students explore how forces—pushes and pulls—affect motion. They learn that forces can vary in strength and direction, and can start, stop, or change the motion of objects.

Key Understandings & Standards

- **Forces & Motion:** Pushes and pulls can have different strengths and directions (K-PS2-1, K-PS2-2).
- **Interactions:** Objects push on each other when they collide, changing motion (K-PS2-1).
- **Energy & Forces:** Bigger pushes or pulls affect speed and motion more significantly (PS3-0.C1).
- **Engineering Connections:** Students explore problems that can be solved using pushes/pulls (K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3).

Essential Questions:

- How can you knock down a wall made of concrete?
- How can we protect a mountain town from falling rocks?

Knowledge & Skills

- Understand that objects move differently depending on the strength and direction of pushes and pulls.
- Conduct simple investigations to see how pushes/pulls change motion.
- Analyze data and compare outcomes from different forces.

Skills Practiced:

- Planning and conducting guided investigations.
- Organizing and interpreting data visually (charts, drawings, pictographs).
- Communicating observations and reasoning about cause and effect.

Performance Tasks

1. **K-PS2-1:** Investigate how different strengths and directions of pushes/pulls affect object motion.
2. **K-PS2-2:** Analyze if a design solution changes motion as intended.
3. **K-ESS2-1:** Organize and interpret local weather patterns (cross-unit integration).

Learning Activities

- **Bouncy Ball Investigation:** Design polymer balls, push/pull, and record distances.
- **Digital Science Labs & Games:** Record differences between big and small pushes/pulls.
- **Marble Tracks/Roller Coasters:** Observe collisions and changes in direction/speed.
- **Simple Machines with K'Nex:** Explore levers, ramps, pulleys, and wheels to apply pushes and pulls.

Resources:

- BBC Push and Pull Game
- BrainPOP Jr. videos and games (Push & Pull, Simple Machines)
- Coaster Creator Game

Assessment Evidence

- Students predict, observe, and explain motion changes from pushes/pulls.
- Students organize data visually and describe patterns.
- Students connect observations to cause/effect relationships.

Weather and the Sun

Grade: K
Subject: Science (STEAM approach)
Unit Focus:
Students explore weather patterns, the warming effect of sunlight on Earth's surface, and strategies to protect themselves and structures from the sun. They also learn to observe, record, and interpret weather data.

Key Understandings & Standards

- **Weather Patterns:** Weather is a combination of sunlight, wind, precipitation, and temperature. Patterns can be observed, recorded, and used to make predictions (K-ESS2-1, ESS2.0.D1).
- **Sunlight Effects:** Sunlight warms Earth's surface, and materials respond differently to sunlight (K-PS3-1).
- **Engineering/Design:** Students design solutions to reduce the warming effect of sunlight or protect from severe weather (K-PS3-2, K-2-ETS1-2).
- **Forecasting & Safety:** Severe weather forecasts help communities prepare and respond (ESS3.0.B1).

Essential Questions:

- How can we protect astronauts or ourselves from the Sun?
- How can you get ready for a big storm?
- What will the weather be like on your birthday?
- How could you warm up a frozen playground?
- How could you walk barefoot across hot pavement without burning your feet?

Knowledge & Skills

- **Knowledge:**
    - Severe weather patterns and forecasting.
    - Sunlight warms Earth materials differently.
    - Weather conditions include multiple interacting elements.
- **Skills:**
    - Collect and record weather and sunlight observations.
    - Analyze patterns over time.
    - Design structures or solutions to mitigate warming or withstand severe weather.
    - Use tools, materials, and collaborative problem-solving.

Performance Tasks

1. **K-PS3-1:** Investigate how sunlight affects temperature of Earth materials (sun vs. shade).
2. **K-PS3-2:** Design and build a structure to reduce warming from sunlight, evaluate effectiveness.
3. **K-ESS2-1:** Organize and interpret local weather data, describe patterns over time.
4. **K-2-ETS1-2:** Model design solutions, represent components, and explain how they solve problems.

Learning Activities

- **Solar Paper & Sun Prints:** Visualize sunlight reaching Earth's surface and engineer ways to block light.
- **UV Beads Bracelets:** Detect UV light; test materials (sunglass lenses, sunscreen) for protection.
- **Simulated Sunlight Temperature Tests:** Compare surface temperatures under light vs. shade.
- **Weather Recording & Forecasting:** Students observe, chart, and predict local weather.
- **Model Disaster-Resistant Houses:** Apply knowledge of weather to protect structures.

Resources:

- Solar paper kits, UV beads, pipe cleaners, thermometers, light sources.
- Hands-on engineering materials for structures and model houses.
