

University of Washington Botanic Gardens

Seeds on the Move Virtual Field Trip

Next Generation Science Standards Alignment

Science and Engineering Practices

- **Practice 1: Asking Questions and Defining Problems**
 - K-2: Ask questions based on observations to find more information about the natural and/or designed world(s).
 - 3-5: Use prior knowledge to describe problems that can be solved
- **Practice 2: Developing and Using Models**
 - K-2: Compare models to identify common features and differences
 - 3-5: Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution
- **Practice 3: Planning and Carrying Out Investigations**
 - K-2: Make observations (first hand or from media) and/or measurements to collect data that can be used to make comparisons; Make predictions based on prior experiences
 - 3-5: Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
- **Practice 4: Analyzing and Interpreting Data**
 - K-2: Record information (observations, thoughts, and ideas), compare predications (based on prior experiences) to what occurred (observable events).
- **Practice 6: Constructing Explanations and Design Solutions**
 - K-2: Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena
 - 3-5: Use evidence (eg: measurements, observations, patterns) to construct or support an explanation or design a solution to a problem; Identify the evidence that supports particular points in an explanation

Cross-Cutting Concepts

- **Cause and Effect:** Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.
 - Cause: Seeds need certain things to grow and develop successfully
 - Effect: Plants have adapted to create seeds with structures that allow them to disperse to locations where they may stand a better chance of obtaining those things that meet their basic needs
- **Energy and Matter:** Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior.
 - The life cycle of a plant demonstrates the cycling of matter through plant communities
- **Structure and Function:** The way an object is shaped or structured determines many of its properties and functions.
 - Observation and investigation of seed samples from plants around the arboretum explore the relationship between the external structure of a seed and their dispersal method.

Disciplinary Core Ideas

- **LS1.A (k-2):** All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.
- **LS1.B (k-2):** Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive.
- **LS1.C (k-2):** 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.
- **LS2.A (k-2):** Plants depend on water and light to grow; plants depend on animals...to move their seeds around.
- **LS4.D (k-2):** There are many different kinds of living things in any area, and they exist in different places on land and in water.
- **ESS3.A (k-2):** 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.
- **ETS1.A (k-2):** Asking questions, making observations, and gathering information are helpful in thinking about problems.
- **LS1.A (3-5):** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.
- **LS1.B (3-5):** Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.
- **LS2.A (3-5):** The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants...Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met.

Performance Expectations to Work Towards—Where can you take it next?

- **K-LS1-1:** Use observations to describe patterns of what plants and animals (including humans) need to survive.
- **K-ESS3-1:** Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
- **1-LS1-1:** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- **1-LS3-1:** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
- **2-PS1-2:** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
- **2-LS2-1:** Plan and conduct an investigation to determine if plants need sunlight and water to grow.
- **2-LS2-2:** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
- **2-LS4-1:** Make observations of plants and animals to compare the diversity of life in different habitats.



- **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.
- **3-LS1-1:** Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
- **3-LS3-1:** Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.
- **3-LS3-2:** Use evidence to support the explanation that traits can be influenced by the environment.
- **4-LS1-1:** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- **5-LS1-1:** Support an argument that plants get the materials they need for growth chiefly from air and water.
- **5-LS2-1:** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- **3-5-ETS1-1:** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.