

Engineer A Seed Getaway

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Lesson Overview: This activity engages students in learning about plant life cycles, adaptations and characteristics that contribute to survival. Students observe a variety of seeds and classify them according to their “get-away” strategy from the parent plant, then incorporates engineering as student design a seed get away that will allow the seed to be carried the furthest by the wind (a box fan).

Target Grade/Subject: Gr. K, 2, 3, 6-8, 10; life science or biology

Learning Objectives

At the end of the lesson, students will be able to:

1. Explain the role of the seed in the plant life cycle
2. List 3 ways seeds disperse from the parent plant.
3. Explain why seeds disperse?
4. Explain how seed dispersal strategies contribute to the survival of the species?

Content Standards (Michigan)

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.

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.

2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-2 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

MS-LS4-4 Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals’ probability of surviving and reproducing in a specific environment.

MS-LS4-6 Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

Supplies needed

Fan (and possibly extension cord)

Seed design materials—tissue paper, confetti, feathers, colored paper, etc.

Lentils, beans, or other seeds

tape, scissors, glue sticks

Pencils & data sheet

Cups/water for float test

Towel bits or old socks for stick-to-fur test

Seeds to classify (wild grape, crab apple, highbush cranberry, mountain ash, milkweed, bunch grasses, goldenrod, aster, cattail, boxelder, clematis, sunflower, hollyhock)

Marker & masking tape

PROCEDURE

Opener: bring in plants that have seeds on them, and put one on each table. Ask students to find the seeds on the plant.

1. **What is a seed? Why do seeds disperse?** 5-7 min.
 - Seed is a complete packet that can start a new plant
 - Seeds come in many shapes, sizes—show or name some (coconut to poppy seed)
 - Seeds like to get away from their parents
 - Parent plants take up sun, water, nutrients making it hard for young plants to compete
 - Seeds use gravity, wind, water and animals to disperse. Show a couple examples.

For younger audiences: have students act out the life of a plant from seed to parent plant dropping its seeds.

2. Seed Classifying by Dispersal Mechanism

10-15 min.

Have several types of seeds ready, some that use animals (e.g. burdock, beggar ticks, berries, sunflower seeds); some that float (crab apple); some that are windblown (e.g. milkweed, maple, basswood, cattail); some that use gravity (evening primrose). Have a piece of towel or sock to act as fur for testing. Have a cup or container half-full with water to test for floating.

Put 6-10 seeds in compartments of an egg carton per student group with the data sheet. Allow 10 minutes, then go over it together and add some fun facts about each plant, like burdock being the inspiration for Velcro.

3. Use the Engineering Design Process to Design a Seed Get-Away

15 min.

Tell students they are to design a seed that could be wind dispersed. They want it to fly as far as possible. They will test it with a fan. Students choose a seed—lentils, split peas, beans—that are light and easy to hold onto. Provide gluestick, scissors, and a variety of attachments such as tulle, tissue paper, confetti strands, shredded paper, small feathers, etc. Follow the engineering design process:

Ask: can you design a way for the seed to get away from the parent plant?

Imagine: with a partner, write down at least 3 ideas for helping a seed to get away.

Plan: tell students what materials they will have. Have them draw their seed get away using these materials.

Create: one group member will go up and collect the needed supplies. Follow their plan and create their seed get-away.

4. Test & Improve the Seed Design

5-10 min

When most students have a design ready, start the test. Have a fan pointing along an open floor with at least 12 feet clear for seeds to fly. Each student drops their seed into the air stream. Have each student place tape with their name to mark the location where their seed stops. If time allows, make improvements to their design and test again.

5. Assessment

What is a seed?

List 3 ways seeds disperse from the parent plant.

Why do seeds disperse?

Student(s) Name(s) _____

Seed Sorting ~ Discovering Seed Dispersal Mechanism

For each seed, fill out a row in the table below.

| Seed # | Color | Size (Sm, Med, Lrg) | Does it look good to eat? (yes or no) DO NOT EAT ANY SEEDS! | Sticks to fur/cloth? (yes or no) | Does it fly in wind? (Throw it up in the air and watch it fall) (yes or no) | Floats? (yes or no) | Method of dispersal Wind? Water? Animals? Gravity? |
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