

SEED SURVIVAL

OBSERVE AND IDENTIFY AND MODEL SEED DISPERSAL TYPES

4th Grade NGSS Correlations:

- [LS1.A](#): Structure and Function
 - [4-LS1-1](#)
- [ETS1.A](#): Defining and Delimiting Engineering Problems
 - [3-5-ETS1-1](#)
- [ETS1.B](#): Developing Possible Solutions
 - [3-5-ETS1-2](#)
 - [3-5-ETS1-3](#)
- [ETS1.C](#): Optimizing the Design Solution
 - [3-5-ETS1-3](#)

Pre-Trip Information:

- [What is a Seed? NewsELA Article](#)
- [Seeds and Seed Dispersal Video](#)
- [Seed Racer Speed Dispersal Game](#)

Materials:

- Seed specimens
- Seed dispersal example cards
- “Seed building kits (5)”

Objectives:

- Investigate a variety of seed dispersal techniques
- Observe seeds in a natural environment
- Design a seed to meet a specific dispersal challenge

Introduction:

All living things have a lifecycle, which includes everything from birth to death, including reproduction. How do plants reproduce? Many plants produce **seeds**, which are plant **embryos** (baby plants) enclosed in a protective outer coating with some nutrients that will help them grow. If the seed can find a good spot (where it has food, water, oxygen, and space) it will sprout.

However, plants can't move much, can they? A fully grown tree can't get up and walk around to find a nice place to set its seeds down, can it? So how do plants make sure their seeds can move around and find a good place to grow? Over time, plants have had to develop (or **evolve**) different ways to **disperse** (spread or scatter) their seeds so that they have the best chance of finding a good location.

There are a few types of ways that plants disperse their seeds:

- **Gravity** –grow heavy and fall to the ground (example photo: peach)
- **Wind**- have adaptations that help seeds float or flutter to the ground (example photo: dandelion)
- **Water**- float on the surface of moving water (example photo: coconut)
- **Animals**- are ingested (example photo: blackberry), 'hitch hike' on (example: velcro plant) or carried by an animal (example photo: acorn) to a new location
- **Ballistic**- (typically a pod) explodes and scatters seeds in every direction (example photo: jewel weed)

Many seeds use multiple types of dispersal to get the maximum distance from their parent plant. For example, a coconut grows into a heavy fruit that eventually falls to the ground (gravity dispersal). Since the coconut tree naturally grows on beaches or near water, when the fruit drops to the ground there is a good chance it is very close to some sort of water. If it rolls into the water, it will then it will float along (water dispersal) until it is deposited on land again, possibly thousands of miles away from the parent plant.

Explain that we are going to observe several different types of seeds from plants that are found in this area, are going to search for seeds in nature, and then are going to be challenged to create their own seed using one of these types of seed dispersal.

- Divide students into groups of 4 or 5. This will be their group for the duration of the activity.

Activity (part 1):

- Distribute seed specimen boxes around the tables (or other activity space).
- Have students spend about 5 minutes moving around the tables and looking at the different local and non-local seeds.

Activity (part 2):

- Have students get together with their groups and give them 5-10 minutes and a designated area (e.g. the pavilion to the orchard) in which to search for seeds in nature.
- Remind students that they should not pull anything living from the ground or off a tree, but to observe the seeds, the trees, etc. without disturbance as much as possible.

Activity (part 3): Explain to students that now that they've had a chance to observe several seeds and plants, they will be given a challenge and must work together with their group to complete it.

- Give each group a pre-assembled "seed building kit." Explain that every group has the exact same materials in their kit, and that they have **ONLY THESE MATERIALS TO WORK WITH**. We will not replace any materials during the activity.
- Explain that they are trying to design a seed that best meets one of the following criteria (choose 1):
 - Takes as long as possible to reach the ground when dropped (falls slowly)
 - Sticks to a Velcro covered board when thrown at it
 - Can be easily blown by a gentle breeze (someone blowing on it)
- Give the groups about 5-10 minutes to work together on their designs, then have all groups stop work and test each design.
 - If you have additional time, give them another 5 minutes to make modifications to their design and then have them test it again.

Discussion:

- Ask: Why are there several different ways that seeds disperse? How does this help plants survive and reproduce?
- Ask: Was it easy to spot seeds in nature?
- Ask: Was it easy to design your own seed?
- Ask: Do you think it is easy for a plant to reproduce successfully?

Post-Trip Activity (to be done in class after the trip)

- Ask students to think of human-made objects that mimic seeds (e.g. helicopter rotors, parachutes, etc.). Have them research one of these objects and write a short list comparing the similarities and differences to seeds. ([3-5-ETS1-2](#), [SEP.2](#), [SEP.8](#), [SL.4](#))
- Have students bring in a toilet paper roll to create their [own biodegradable planter](#). Plant seeds in the classroom and observe them growing for a few weeks. Measure sprout growth, draw pictures of the sprout each day, etc.