

LESSON PLAN: SEED DISPERSAL PART 1

Adapted by Mary Garvilles and Haldre Rogers from
<http://www.ecologycenter.org/tfs/lesson.php?id=13340>

Lesson Overview: Students will collect seeds from their neighborhood or school grounds, draw them, and discuss likely dispersal mechanisms. Students will describe how the external features of their seeds that help in its dispersal.

Objectives: Students will:

- Learn the reasons for and diverse modes of seed dispersal
- Collect seeds and make educated guesses regarding their dispersal methods.

Time/duration: 50 min-1hr

Materials:

- Seeds/fruits (brought in by students)
- Microscope or hand-held magnifying glasses
- Journals
- Worksheets (1/student)

Background: Plants appear quite stationary. Unlike animals, they lack legs for running, arms for climbing, wings for flying, or fins for swimming. Yet plants do get around. For example, how did lush vegetation come to cover our islands in the middle of the Pacific Ocean? The answer is seed dispersal. Common dispersal vectors include: gravity, wind, water (e.g. *Pandanus- it floats!*, coconut), mammals (e.g. fruit bat; rodents that hoard seeds and forget about them; animals like deer, dogs and cats that get seeds stuck on their fur), birds, and ants. Fish have even been found to disperse seeds in the Amazon!

Most seeds have special adaptations that enable them to fly, float, roll, scatter, or ride far away from their parent plants. One of the most common adaptations is having a fleshy fruit surrounding the seed (like most of the fruit we eat). If all seeds simply fell to the ground and stayed beneath their parent plants, most would crowd each other, competing for light, space, water, and nutrients. If disease, disaster, or a predator struck, more of the plant population would be decimated if it was concentrated in one area.

Seed dispersal enables plants to maintain their population, expand their range, or change the location of their range in response to environmental change. For example, when a wildfire burns an ecosystem, animals, wind, and flowing water help bring seeds back to the scorched land, aiding recovery.

Useful websites for seed dispersal:

<http://www.mbgnet.net/bioplants/seed.html>

<http://www.mbgnet.net/bioplants/downloads/seeds.pdf>

<http://www.cas.vanderbilt.edu/bioimages/pages/fruit-seed-dispersal.htm>

<http://www.richard-seaman.com/Birds/NewZealand/PhotoGalleries/index.html>

Lesson Procedure

1. Either as homework prior to class, or in a short trip outside during class, each student should collect three different fruit/seed types and bring them to class.
 - Search the trees or plants in your yard, school garden, park, open field, abandoned lot. Collect any fruits you find.

- Walk through brush with your pants tucked in your socks or with socks over your hands. Pull the seeds off of your socks.
 - Wrap masking tape around your wrists and ankles with the sticky side facing outward, then walk through weeds. Bring in the masking tape covered in seeds.
2. Discuss the difference between fruits and seeds. Fruits often are the objects that get dispersed, although it is called “seed dispersal”.
 3. Individually, ask each student to fill out the attached worksheet, focused on these tasks:
 - Draw a picture of each seed or fruit.
 - Identify the plant type if you know it.
 - Write where and how you collected it.
 - Write how you think it may be dispersed, and why.
 4. As a class, explain that dispersal ensures that a seed moves away from its parent plant. Brainstorm why this is advantageous. Try during discussion, to introduce an island-to-island scale, as well as a local scale.
 5. Ask the students to predict different ways in which they think a seed might move away from its ‘parent’ plant to another place.
 6. Individually:
 - Have students look at their seeds again. Use a binocular microscope if available, or hand-held magnifiers. Ensure the examining area is well lit.
 7. As a group:
 - Share all the seeds with the class.
 - Discuss what the different shapes might say about how they are dispersed.
 - Divide the seeds into groups by size, morphology (shape), or probable dispersal type.
 - Talk about the samples.
 8. In journals, have students answer these questions and turn it in for points:
 - What are the pros and cons of seeds staying near to their parent plants versus dispersing far from their parent plants?
 - Compare this to your own choices as an offspring: What are the pros and cons of relocating far from your parent(s)? What are the pros and cons of rooting yourself close to your parent(s)?
 - List as many different dispersal methods as you can. Put them in order of increasing distance (i.e. which methods can move the seed the farthest?).

Evaluation: Grade the worksheet and journal entry.

Extension activities: Challenge students with these questions

- Which fabric is best for collecting hooked seeds?
- Is it true that all large plants grow from large seeds and small plants from small seeds?
- Do all fruits contain the same number of seeds? Examine a range of fruits to try and find out the answer. What about fruits from the same species- do they all contain the same number of seeds?

