

Seed Dispersal and Seed Germination: What Can You Germinate?

GRADE LEVEL

Grades 6-8

SUBJECTS

Science/Botany

ESTIMATED TIME

Three or more 50-minute sessions

"Flowers changed the face of the planet. Without them, the world we know--even man himself--would never have existed."

OVERVIEW

This project is a lab investigation about the diversity of seeds in the soil. This lesson is meant to develop an understanding of biodiversity, have students design and conduct a scientific investigation, and apply species classification/identification skills. This activity can be used as an extension of the lesson plan titled "Evolution of Angiosperms/"How Flowers Changed the World."

This activity relates to the "soundless explosion" (*Loren Eiseley Reader*, page 28) and also where Eiseley talks about the dispersal of the seeds, stating, "They were travelers" (*Loren Eiseley Reader*, pages 32, 34).

This activity could also be used in Grades 4-5, depending on the students' level of sophistication.

MATERIALS AND TECHNOLOGY

- A copy of the essay "How Flowers Changed the World" from *The Loren Eiseley Reader*
- Shoes/boots with ruts in soles
- Old newspapers or paper towels
- Small containers, e.g., plastic margarine tubs, etc. (1 container per student)
- Potting soil and plant pots (1 pot per student)
- Water
- Plant identification guide

Suggested Web resources:

<http://plants.usda.gov/>

<http://arboretum.unl.edu/florasearch/>
<http://www.iowalivingroadway.com/NativePlants.asp>
<http://www.missouriplants.com/http://teachplants.okstate.edu/>
<http://www.seedimages.com/seed-identification/seed-identification.html>
<http://www.oardc.ohio-state.edu/seedid/>

Books:

The Loren Eiseley Society. *The Loren Eiseley Reader*. Lincoln: Infusionmedia Publishing Inc., 2009.

Stubbendieck, James L., Mitchell J. Coffin, and Lori M. Landholt. *Weeds of the Great Plains*. Lincoln: Nebraska Department of Agriculture, 2003.

Kaul, Robert B., David M. Sutherland, and Steven B. Rolfsmeier. *The Flora of Nebraska*. Lincoln: UNL School of Natural Resources, 2006 <http://nebraskamaps.unl.edu>

Runkel, Sylvan T., and Dean M. Roosa. *Wildflowers of the Tallgrass Prairie: The Upper Midwest*. Ames: Iowa State University Press, 1989.

Martin, Alexander C. and William D. Barkley. *Seed Identification Manual*. Blackburn Press, 2000.

Local field guides

PREPARATION

1. Browse the suggested web resources and books. Obtain copies of the books to bring to class for the students to use, and/or arrange for the students to have access to the Internet for any needed research.
2. Make a handout for the students with the suggested web resources and books.
3. Make copies of all handouts and have all materials available for use.

INSTRUCTIONAL PLAN

STUDENT OBJECTIVES

In this series of lessons, students will

- investigate the number of seeds in the soil.
- investigate the number of viable seeds in a seed bank.

SESSION ONE

1. Have students wear shoes or boots with corrugations or cleats/ruts in their soles. Take the students for a walk in an area with moist soil.
2. Return from your walk. Have the students remove the caked-on soil from their shoes/boots. Placing newspapers or paper towels under the shoes will reduce the mess.
3. Have the students separate their soil samples into two piles: one pile to be used in Session Two activities, and the other pile to be used with Session Three (comparison activities) below.
4. Students will then place their soil samples in individual small containers, e.g., margarine tubs or other plastic containers. Moisten the sample with a small amount of water. Let the moistened (muddy) mixture sit overnight.

SESSION TWO (AND BEYOND)

1. Have students add the soil mixture to some potting soil and place in a plant pot. Make sure each student clearly identifies his/her pot.
2. As a comparison with germination, have the students take their second soil sample and leave it out to dry.
3. Each student should observe what grows in the pots over the next few weeks.
4. Each student should record, either in a lab notebook or on a calendar, the dates of germination.
5. Ask each student to identify the plants and/or classify them by appearance.

SESSION THREE

1. After the second soil sample dries, have students break up the dry soil and remove any seeds they find. They may need a magnifier or dissecting microscope to assist in finding very small seeds.
2. Can they identify the seeds? Students should compare any identified seeds to the identification of the plants that germinated.

ENRICHMENT

1. Have students compare the different germination rates of the plants in the pots. Students can also research why the germination rates are so different.