

INQUIRY ACTIVITY  
LABS 2001  
RON GRIMM

Dandelion Seed Fecundity

This lesson is designed to engage students in determining the rate of seed production for dandelions and the corresponding rates of viable offspring.

Through the activities of this lesson, students will utilize and discover the principles of

- \*Natural Selection
- \*Populations
- \*Limiting Factors
- \*Exponential Growth
- \*Adaptations
- \*Seed Dispersal

This lesson is designed to be completed in 3-4 forty minutes class periods, with a corresponding 2-3 week experimental planting activity.

Learning objectives for the lesson include plant identification, data collection, experimental design, predicting, graphing, and laboratory procedure.

Students will need prior knowledge of

- \*Dandelion identification
- \*Basic plant parts
- \*Simple math
- \*Scientific Methods

Background information for students should include

- \*Where and how to collect seeds
- \*Designated areas of school grounds or other sampling area
- \*Data organization and graphing

Materials

- \*Plastic sandwich bags
- \*Planting medium
- \*Planting trays
- \*Sunny windowsill or grow lights
- \*Graph paper
- \*Notebooks
- \*100-meter tape

Students will need to plant collected seeds and maintain them until they sprout to sufficient size to be counted.

Instructional methods

1. Have students collect dandelion seed heads.
2. Students will count seeds per head in groups of 4 to 6
3. Have groups compare # of seeds per head. Allow for discussion.
4. Allow students to determine the need for a class average with which to work.
5. Ask students how many dandelions there are at school and record predictions.
6. Using the groups, disperse students and have them count the # of dandelions in a given area. (It is necessary to show students how to identify dandelions in their various stages and morphologies.)
7. Have students compare and share data until they come up with a population total for the school area.
8. Ask students how many dandelions there will be after that population reproduces. Have the groups record their predictions and then share ideas with the class. Engage students into discussions of why and how they came up with their predictions. (This is where you may have to guide students to use the previous seed count data in making predictions.)
9. Have groups design experiments to test their predictions. (This is where you may guide students toward a planting experiment although be open to any reasonable experiments that can be conducted.)
10. Run experiments. (Ideally students should select a set # of seeds and then plant them.)
11. Using seeds per head and population count, have students calculate the # of dandelions for the next three (or more) generations and then graph their results. (At this stage, you can begin talking about exponential growth and limiting factors.)
12. When experimental plants are large enough, have students count them. Students should then calculate survival percentages and compare this # with their earlier predictions.
13. Allow students to present results and lead to class discussion.

Assessment can be done using several methods. Experiments can be assessed using a rubric based upon their use of and adherence to the scientific method. General knowledge can be assessed using a test consisting of short answer and problem solving essay questions.

## My Experience:

The experiment works well with dandelions but any plants that are easy to identify, with accessible seeds, and short germination period may be substituted (I may try maples). This may be necessary if your school lawn is treated for “weeds” or if it is mowed too often. My class was put off for an extra 10 days due to poor timing with the mowing, so bear that in mind. Dandelions are nice because they flower twice during the school year. The main flowering period is April to May with some flowering from late August to mid-October. This allows for experiments to be run in fall or spring, or a spring experiment with a fall follow-up. Or do both a fall and spring to compare results.

The timetable that I listed is pretty accurate although I needed to push them on the counting and planting to get it done in one day. ***Important: Do not bury dandelion seeds. They will only germinate on the surface.*** Have the students press the seeds firmly into the surface of the planting medium, but don't bury them. Watering the plantings is another issue. Remind students that too wet can be as bad as too dry. We lost a few plantings to rot. Once the plants were up and running the rest took care of itself. The plants can lend themselves to other experimentation or a nice addition to salads. Most students were surprised to find that dandelions are edible.