

MIXED UP SEEDS: TEACHER GUIDE

Subject: Life Science

Grade Level: Middle School

Last Updated: March 7, 2008

Case Summary

LeTiffany has to spend part of her spring break helping her mom with the gardening. To make things worse, she knocks the seeds all over the floor and mixes them all together. Can LeTiffany sort out the different types of seeds before her mom finds out and grounds her for all of spring break?

Credits

This case was written by Caitlin Lyman (undergraduate student, Emory University, Atlanta, GA), a fellow of the PRISM program (<http://www.prism.emory.edu>).

Learning Objectives

By the end of the case, students will be able to:

1. Classify plants according to appearance, using appropriate taxonomy.
2. Describe plant anatomy and recognize parts of the plant.
3. Practice making observations and conclusions, and differentiating between the two.
4. Differentiate between monocot and dicot.
5. Differentiate between angiosperm and gymnosperm.
6. Differentiate between taproot and fibrous root.
7. Hypothesize factors that enable and inhibit plant growth.

Georgia Performance Standards

S7CS1. Students will explore of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works. (NSES Content Standard A)

- a. Understand the importance of—and keep—honest, clear, and accurate records in science.
- b. Understand that hypotheses can be valuable, even if they turn out not to be completely accurate.

S7CS3. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations. (NSES Content Standard A)

S7CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities. (NSES Content Standard A)

S7CS6. Students will communicate scientific ideas and activities clearly. (NSES Content Standard A)

S7CS9. Students will investigate the features of the process of scientific inquiry. (NSES Content Standard A)

S7L1. Students will investigate the diversity of living organisms and how they can be compared scientifically. (NSES Content Standard C)

- a. Demonstrate the process for the development of a dichotomous key.
 - b. Classify organisms based on physical characteristics using a dichotomous key of the six kingdom system (archaeobacteria, eubacteria, protists, fungi, plants, and animals).
- S7L2. Students will describe the structure and function of cells, tissues, organs, and organ systems. (NSES Content Standard C)

Assessment

Students will complete a laboratory exercise in which they will plant seeds of unknown species and observe the growth for 2 weeks. The students will make a daily log of their observations during this period. The students should be able to identify their plants and then classify the plants (phylum to species level). The students will then complete an assessment that includes the complete classification of their plant. Students can choose from creating a poster, writing a rap song, or writing an end to the case story.

Implementation Strategy

Although this case covers the span of 2 weeks, the students will only spend a few minutes a day recording their daily observations.

Day 1

Read Scene 1	10 min
Data, Questions, Learning Issues (whole class)	20 min
Plant seeds	30 min

Day 2 - 9

Examine growth of seeds and record observations	10 min
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Day 10

Examine growth of seeds and record observations	10 min
Research/identification of plant	30 min
Group work on assessment	60 min

Case Notes

For this case, you will need to provide the following materials:

- 5 seed types that have quick germination times (such as Wisconsin Fast Plants™)
- plastic cups or Dixie cups
- potting soil
- a sunny window and water or lights for growing plants
- pictures of the seeds and plants you give students as unknowns for later identification

Facilitator Guide (optional):

Some Facilitator Questions:

- What do you know about seeds?
- What are some ways you can distinguish your plant from any other?
- What can LeTiffany do to figure out which seeds are which?
- What's the best way to grow your seeds?
- What things do seeds need in order to grow?
- What things might prevent their growth?