

Inside a Seed **Teacher Resource**

Grade Level **K-12**
Objectives

1. The student will learn the anatomy of a monocot vs. a dicot seed.
2. The student will dissect a seed to see the embryo and cotyledon(s).
3. The student will investigate the characteristics and basic needs of plants.
4. The student will employ simple equipment and tools to gather data.
5. The student will demonstrate the use of 21st century technology with a document camera.

National Standards

[NS.K-4.1](#); [NS.5-8.1](#); [NS.9-12.1](#)

Science as Inquiry

[NS.K-4.3](#); [NS.5-8.3](#); [NS.9-12.3](#)

Life Science

[NS.K-4.5](#); [NS.5-8.5](#); [NS.9-12.5](#)

Science & Technology

[NT.K-12.1](#)

Basic Operations and Concepts

[NT.K-12.3](#)

Technology Productivity Tools

[NT.K-12.6](#)

Technology Problem-Solving & Decision-Making Tools

Teacher Background Information

In this investigation, the student will be identifying the differences of angiosperms, specifically between a monocot and a dicot seed. Students will see the differences in size, color, and shape of the two different seed types. A monocot (monocotyledon) seed has a tiny embryo inside, but once the seed coat is removed the seed will not split in half to reveal the embryo. There is only one cotyledon that is very thick and does not store food. The food is stored right around the embryo in a monocot seed. A great example of a monocot seed is the corn kernel. A dicot (dicotyledon) seed has a tiny embryo inside, but it is tucked in between the two halves of the seed. Each half of the seed is referred to as a cotyledon, hence the name dicotyledon. The cotyledon is filled with food and nutrients for the embryo to develop. A great example of a dicot seed will be the lima bean.

Soak the seeds 24 hours before to decrease the days of germination. It should take 3-6 days.

MATERIALS

Document Camera
Personal Computer
Interactive White Board/Projector
Corn Seeds
Lima Bean Seeds
Water
Pipettes
Paper Towels
Petri Dishes
Ruler (optional)

PROCEDURE

1. Each student gets a Petri dish, a paper towel, a lima bean seed, and a corn seed.
2. Have each student compare the two seeds by taking an image of each seed.
3. Have the students answer the following questions:
 - a. How are the seeds alike?
 - b. How are the seeds different?
 - c. Hypothesize:
 - i. Which seed will sprout first?
 - ii. How many days will it take the seed to sprout?
 - iii. Will the root or stem sprout first?
4. Place the paper towel in the Petri dish and add water until the towel is damp.
5. Place the lima bean on the left side and the corn kernel on the right side of the Petri dish.
6. Set up a computer and document camera over the Petri dish to start collecting data.
7. Start the time-lapse recording for several days until there is a fully sprouted seed.

8. After the sprouting is completed, review each day's images and record the length of the root and stem in mm in the data table.

If you are not using computer software that can make the measurements, then use a ruler

PRESENTATION

Have students prepare a lab report including the data, images, and video to give a presentation on the interactive white board or projector for the class.

EXTENSION

- Put beans in Ziploc bags and test the following conditions:
 - ✓ No Water, No Light, No Food, No Air