

Name:

Date:

Seed Dissection Lab - Monocots and Dicots

Purpose: The purpose of the lab is to dissect a corn and bean seed in order to identify all of the parts of an embryonic plant (including the cotyledons, embryonic root (radicle), distinguish between monocots and dicots, epicotyl, hypocotyls, and seed coat.

Background Information:

1. There are two kinds of seed-bearing plants: the flowering plants are called “angiosperms”, and the non-flowering plants are called “gymnosperms”. Most seed plants are the flowering kind. There are over 250,000 species of flowering plants, and only about 600 non-flowering plants. Corn and beans are angiosperm seeds.
2. A seed is a tiny life-support package. All seeds have three parts: a tough covering (seed coat), an embryonic plant consisting of the plumule (embryonic leaves), epicotyl (upper stem), hypocotyls (stem of adult plant), and radical (roots), and a food supply (cotyledon). The hilum is the site of attachment to the ovary.
3. The outer covering of the seed is called the seed coat. The seed coat helps protect the inside of the seed from insects, disease, and damage. Sometimes the seed coat is smooth and paper-thin like that of a pinto bean. A coconut’s seed coat, however, is rough, thick, and hard. A seed cannot develop into a plant until the seed coat is broken.
4. The embryo is the tiny plant inside the seed. The embryo is the source of the root, stem and leaf structures.
5. Surrounding the embryo is the food supply. The food supply is the seed’s only source of nourishment as it pushes up through the soil and grows into a young plant. When the food supply is gone, a green plant begins to manufacture its own food through photosynthesis. The food supply for a bean is used up in about two weeks.
6. Once a seed reaches its sprouting spot, it begins to grow. Various environmental conditions trigger germination, including moisture level and temperature.
7. Germination is the process through which the embryo inside the seed begins to grow. As the seed germinates, it develops roots, a stem, and then leaves. If a seed is not allowed to germinate within a certain length of time, the embryo inside the seed dies. Each kind of species of seed has a different amount of time that it can survive before it uses up all of its stored food. The food supply is very important to the seed as it germinates. A bean seed without its food supply grows poorly, if at all. A seed with half of its food supply grows better, but a seed with both halves does the best of all. Some species of seeds need to sprout within two weeks while others can wait as long as two thousand years. Seeds germinate at different rates depending on how much food they have stored.

Name:

Date:

Directions: You will be dissecting corn and bean seeds. Have your Plant Reproduction notes handy with the diagram of the seed parts. First, answer the pre-lab questions below. Then, gather your materials and follow the remaining instructions.

Supplies

- Paper towel
- Seeds of corn and beans
- Dissecting probes
- Petri dish
- Forceps
- Iodine dropper bottle
- Magnifying glass

Pre-Lab Questions

1. What might be some reasons to use frozen corn and beans??
2. What plant structure would you find a seed inside?
3. Where does the plant get its food once the seed has germinated?
4. Is a seed inside a seed packet on a shelf considered living or dormant?
5. Are the seeds you will soon dissect living or dormant?
6. Are the seeds you are dissecting an angiosperm or a gymnosperm? How can you tell?
7. Are the seeds you are dissecting monocots or dicots? How can you tell?

Seed Dissection:

Dissection Procedure

1. Answer the pre-lab questions prior to beginning your dissection.
2. Place the seed on a paper towel or dissecting tray. Using the probes, gently separate the cotyledons. Illustrate what you see on your data sheet.
3. View the seed under a hand held magnifying glass. Illustrate what you see
 - a. Cut the corn seed into 2 halves
 - b. Try to remove the seed coat (does it come off?)
 - c. Locate the embryo in both seeds
4. Answer the analysis questions.

Name:

Date:

Data Sheet

Corn	Bean

Label the parts of your diagram. Be sure to use these terms: seed coat, cotyledon.

Analysis Questions:

1. Which seeds were easiest to split in half? Why?
2. There is an outer layer of the seeds that probably came off as you were dissecting the seed. What is this called?
3. What is the purpose of the cotyledon?
4. What adult plant parts will each of the embryonic parts become?
5. Identify the significant differences between monocots and dicots.