

Name: _____
Mr. Willis
Biology: _____
Date: _____

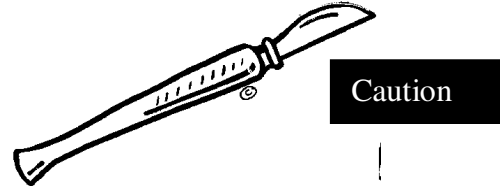
Unit I
The Nature of Science
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I

Activity 1 – Observing Seeds

What you need:

- Materials Needed per Student/Team
 - Scalpel
 - Toothpick
 - Magnifying Glass
 - Tray
 - Seeds



What to do

1. Identify the two seeds that you have received. Which one is the bean seed and which one is the corn seed (kernel)?
2. Make a detailed drawing of each seed in the box below.

BEAN

CORN

- 3. Look carefully at each seed. Examine the external features of each one. What are the similarities and what are the differences?

- 4. Take the bean seed and carefully split it open along the edge. It should separate easily. What do you see? Make a detailed drawing of your observations.

- 5. Now, carefully split the corn seed longitudinally from top to bottom (see illustration). What do you see? Make a detailed drawing of your observations.

- 6. Use the resources provided to label your drawings. Include embryo, endosperm, cotyledon(s), and seed coat.

BEAN

CORN

Resources for Seeds Activity

Vocabulary

Cotyledon – The seed leaf.

Monocotyledon (monocot) – plant having a single cotyledon or seed leaf such as corn, wheat, rice, grasses, barley.

Dicotyledon (dicot) – plant whose seeds have two cotyledons or seed leaves such as beans, peanuts, almonds, peas.

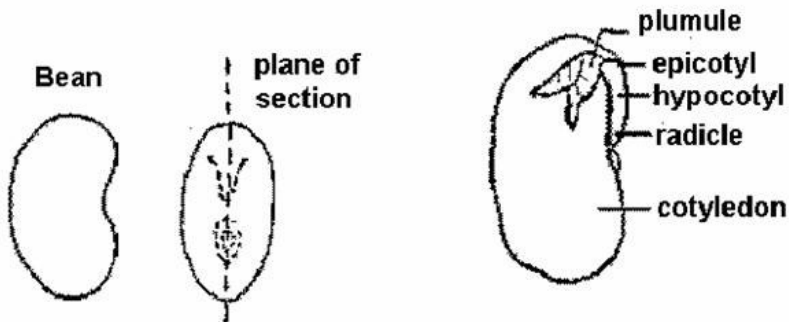
Seed Coat – the hard outer layer of a seed; the protective covering.

Embryo – any organism in its earliest stages of development.

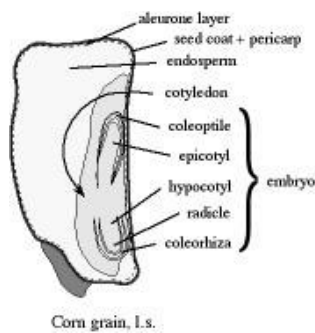
Endosperm – the food source for a growing plant during seed germination.

Germination – sprouting of a seed, and beginning of plant growth.

Bean Seed



Corn Seed



The Seed

The seed, which surrounds the plant embryo and protects it from desiccation in the uncertain conditions of a terrestrial environment, is one of the adaptations that has allowed plants to thrive as they gradually moved from water to land. Each seed consists of an embryo, food source, and protective outer coat; it can lie dormant for some time before germinating, waiting until environmental conditions are right.

Gymnosperm Seeds

The two classes of seed-bearing plants are gymnosperms (conifers) and angiosperms (flowering plants). The composition of the seed varies by type of plant. As discussed in Plant Classification, Gymnosperms,

the gymnosperm ovule develops into the seed after fertilization takes place. The tissue of the female gametophyte within the ovule, where the egg cell was generated, surrounds the developing embryo and becomes its food source. The integument (outer surface) of the ovule becomes the seed coat.

Angiosperm Seeds

The seeds of angiosperms are somewhat different from those of gymnosperms (see Plant Classification, Angiosperms). In angiosperms, the food source for the seed is derived (in a process called double fertilization) from a triploid nucleus that is formed during fertilization alongside the creation of the zygote. This triploid nucleus gives rise to a starchy substance called endosperm, which nourishes the developing embryo, and, in dicots, the seedling. Angiosperm seeds, which develop from ovules, are also distinguished from gymnosperm seeds because they are enclosed in protective ovaries. These ovaries, which are derived from carpels (modified leaves) on the flower, develop into fruit after fertilization. The fruit provides added protection against desiccation of the embryo and aids in its dispersal by wind and animals.

Dicot Seed

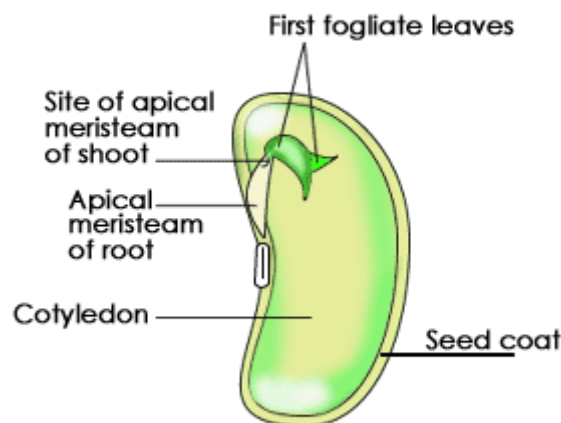


Figure 1.1: Typical Dicot Seed

As the angiosperm seed develops, so do the cotyledons, or seed leaves. Monocot embryos have one cotyledon, while dicot embryos have two. At the same time, embryonic "shoot" and "root" develop as well; taken together, they are called the embryonic axis. The part of the embryonic axis located above the point of attachment of the cotyledon(s) is called the epicotyl, and is destined to become the shoot. The embryonic axis below the cotyledon attachment site is called the hypocotyl, and is the progenitor of the root.