

The Anatomy of a Bean Seed

Subject Area: Plant Science

Unit Title: Parts of Plants - Seeds

Grade Level: 4th & 5th

Objectives: To create an understanding of the different parts of a seed and their functions.

Colorado Content Standards to be covered:

SCIENCE

Standard I - Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

Standard III - Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.

Anticipatory Set:

Using a concept map on the board (or photocopy attached) ask students to name types of seeds they are familiar with or eat. Possibilities include: lima beans, peas, green beans, sunflower seeds, black-eyed peas, and pinto beans.

Materials:

Dried lima beans, paper plates, water, magnifying glasses

Input:

Make copies of attached bean seed diagrams and go over the following parts and definitions:

Key Vocabulary:

- 1. micropyle** - the small pore in a seed that that allows water absorption
- 2. hilum** - the scar on a seed coat at the location where it was attached to the plant's stalk during development
- 3. seed coat (testa)** - the outer, protective skin covering the seed
- 4. embryo** - developing plant still inside the seed
- 5. cotyledon** - part of the seed that contains stored food used for initial growth
- 6. dicotyledon** - (or dicot for short) seed with two cotyledons

Checking for Understanding: At the end of this section, choose one of the following for a quick check: ask the students to partner share and think, pair and share, do a quick 3 word write up as an exit slip, do a quick sketch or give each other a quick thumbs up or down to check for understanding. Determine the level of mastery for each student and provide individual remediation as needed.

Prep:

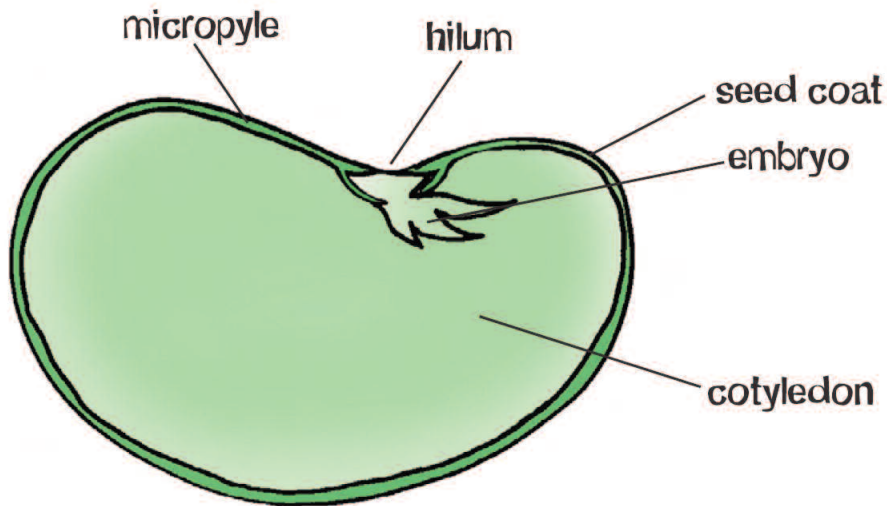
On the day before starting the experiment, soak dried lima beans in water. They will absorb some of the water and get a soft outside covering (seed coat).

Procedures/Activities:
Examining a Bean Seed

1. Give each student a lima bean on a paper plate. Identify the seed coat.
2. Carefully rub the seed between your thumb and fingers. The seed coat will crack and slip off the seed easily.
3. Identify the cotyledon. This is the large oval part of the seed containing the food the seed needs before it can get nutrients from the soil and water.
4. The bean seed has a slit going down the middle of the seed. Split it open into 2 halves. Inside is a tiny plant called an embryo. A bean seed has two parts. Therefore, it is a dicotyledon, or dicot for short.
5. Observe the bean parts using a magnifying glass.

Handout

Anatomy of a Bean Seed



micropyle - the small pore in a seed that that allows water absorption

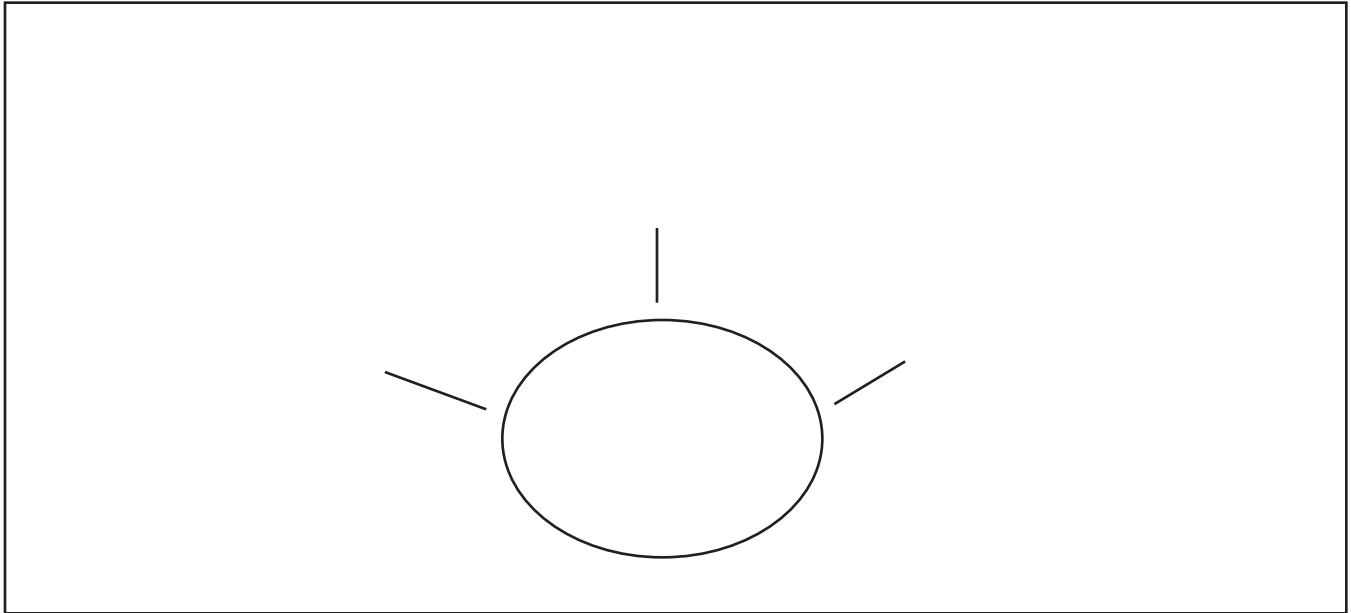
hilum - the scar on a seed coat at the location where it was attached to the plant's stalk during development

seed coat (testa) - the outer, protective skin covering the seed

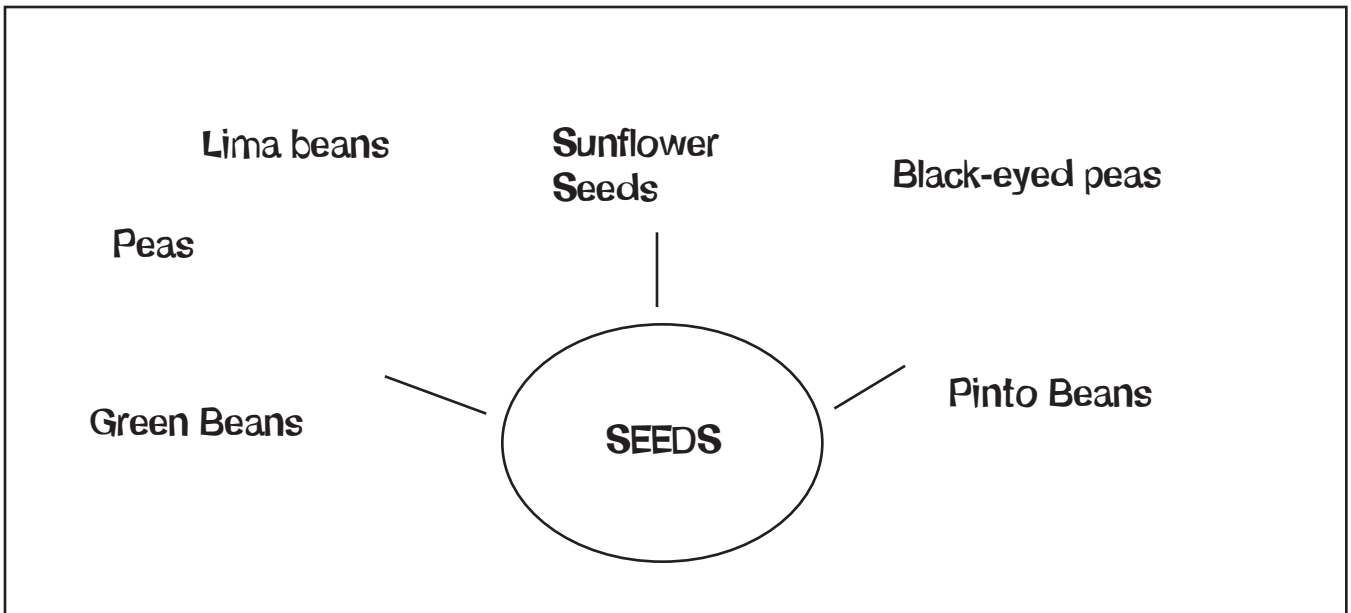
embryo - developing plant still inside the seed

cotyledon - part of the seed that contains stored food used for initial growth

Concept Map



Possible Answers



Closure: Review and clarify the key points of the lesson referring to the handout. Wrap up by talking about how we all eat seeds, but maybe didn't realize it.