



Mayan Crop Science

The Mayans were master crop cultivators, and their agricultural society flourished because of advanced farming techniques. Dissect a seed and learn how the different parts support plant growth!

TEKS:

SCI K.10 D: The student is expected to observe changes that are part of a simple life cycle of a plant: seed, seedling, plant, flower, and fruit.

SCI 3.10: Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environments.

SCI 3.10 A: The student is expected to explore how structures and functions of plants and animals allow them to survive in a particular environment.

SCI 3.10 B: The student is expected to investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady beetles.

Materials:

- Dry beans (lima, kidney, or similar)
- Magnifying glass
- Paper towels
- Plastic baggie
- Water

Preparation:

- Place dry beans inside a damp paper towel, and place the paper towel into a plastic baggie. Let the beans soak for 2-3 days, adding water as needed, until some of the beans just begin to sprout.

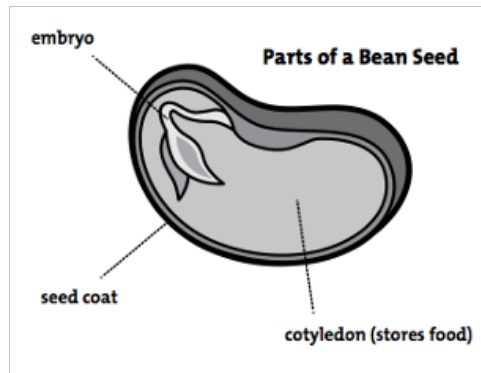
How To:

1. Take out a bean that has been soaking for 2-3 days.
2. Rub the bean between your fingers. A thin seed coat should come off in your hands.
3. Use your fingers to split the bean in half.
4. Use a magnifying glass to observe the inside of the bean! Can you find all of the parts that are shown in the diagram below?

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5. Read the STEM Explanation below to learn more about the different parts of a seed.

STEM Explanation:

The seed that you dissected today can tell us a lot about how plants grow!

- The seed coat is the outer covering of a seed and helps protect the internal parts. Bean seeds have thin seed coats which are easily removed after they've been in contact with water.
- The cotyledon (kah-tuh-lee-dun) is the largest part of the inside of a bean seed. Cotyledons absorb food from the parent plant and store it for the new plant, or embryo. They also help protect the embryo. When the bean germinates, or begins to grow, the baby bean plant starts to take shape inside the bean seed and uses the starch that's in the cotyledon as food.
- The embryo is the baby plant inside a seed. All the cells needed to develop a mature plant are present within the embryo. For the embryo to begin growing, seeds need water, warmth, and a good location (like soil). Once the embryo emerges from the soil, it will need water, warmth, nutrients, and light to keep growing into a healthy plant. See what happens if you plant your sprouted bean seeds into some soil!

Reliable food production was incredibly important to the well-being of the Mayan Civilization, and agriculture was closely linked to astronomy and religion. Crop cultivation was so important that around 90% of the Maya population was involved in farming! The principal crops for the Maya were corn, beans, squash, and fruit trees. Because the Mayans studied the plants they grew, they were able to create fields of crops that sustained their villages and resulted in a more dependable harvest and varied diet. The Mayans engineered irrigation systems to keep their plants watered more efficiently, and many individual homes even had their own small gardens.

Career Connection:

Botanists, also known as plant biologists, study plants. They understand the anatomy of plants and study how plants interact with each other and their environment. Usually, botanists pick one type of plants in which to specialize, such as grasses, flowers, trees, or marine plants.

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Resources:

<http://sciencing.com/type-seeds-use-science-experiment-7915838.html>

<https://buggyandbuddy.com/dissect-a-bean-seed-science-invitation-saturday/>

<https://www.toppr.com/guides/evs/seeds-and-seeds/seed/>

<https://www.ancient.eu/article/802/maya-food--agriculture/>

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