

Hands-on Science: Seeds

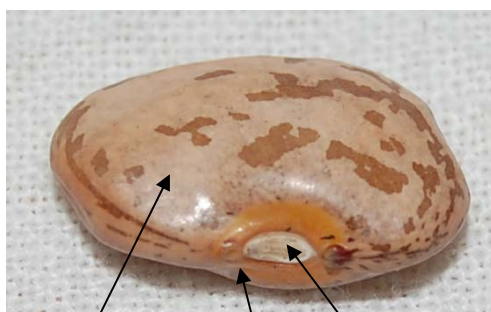
What are the parts of a seed?

You will need:

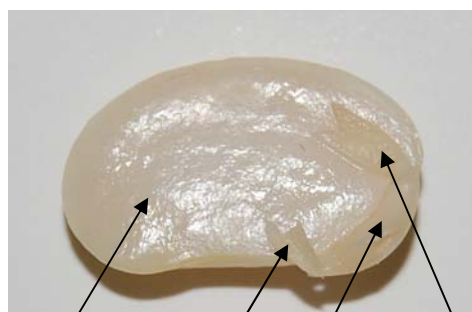
several pinto beans
1 jar with lid
water
paper towel or cloth

This experiment will take 1 day.

- Look closely at a pinto bean. Use the diagram to help you locate the seed coat, hilum, and micropyle.
- Place the beans in a jar of water and close the lid.
- Leave the jar in a refrigerator or cool place overnight.
- Remove the beans from the jar and dry them.
- Carefully remove the seed coat from a bean. Use your fingernails to split the bean open. You may need to open all the beans to find all the parts intact.
- Use the diagram to help you locate the parts of the baby bean plant inside the seed: cotyledon, epicotyl, hypocotyl and radicle.



seed coat micropyle hilum



cotyledon radicle epicotyl
hypocotyl

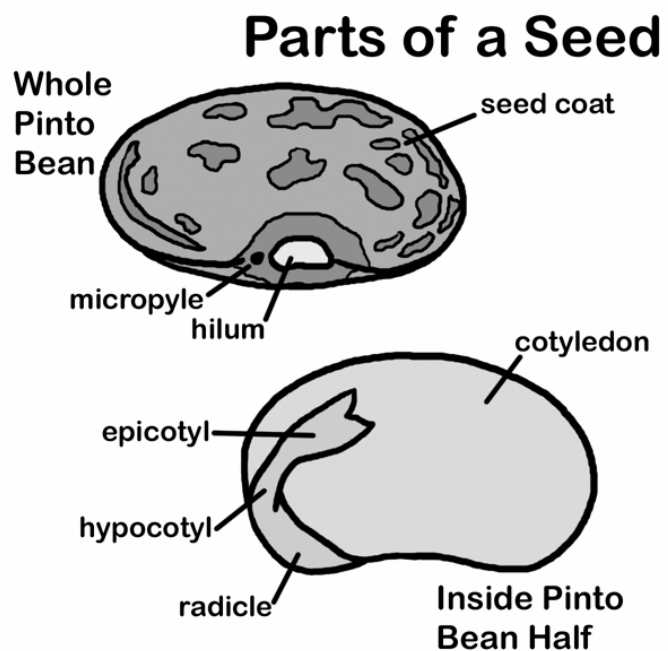
The Seed Story

Have you ever wondered what is inside a seed that causes it to grow into a plant? A seed carries all the genetic material necessary to grow a brand new plant. The new plant will be the same kind as the plant from which the seed came.

Seeds are produced within the fruit of a plant. They grow there until they are mature. Once the seeds are mature, they are dispersed or released. Some seeds fall to the ground near the parent plant. Other seeds are carried to new areas by the wind, insects, or other animals.

Seeds can lie dormant for long periods of time, meaning that they wait until conditions are right before they begin to develop. When a seed does begin to develop, that process is called germination. Seeds usually need moisture, soil, and sunlight to germinate.

Seeds are covered by a protective covering called a seed coat. A scar on the seed coat indicates the place where the seed was attached to the fruit or ovary of its parent plant. That scar is called a hilum. The micropyle is a tiny opening in the seed coat where pollen entered the seed and caused it to mature. The micropyle is also where most of the action takes place when a seed germinates. At the beginning of germination, growth takes place inside the seed. The radicle forms a tiny root. The hypocotyl grows into an early stem. The epicotyl takes the shape of a tiny leaf. Once formed, these parts grow quickly. The root emerges first and pushes downward into the soil. The stem begins to grow upward pulling the seed along with it. The cotyledon is the large area of the seed. It provides food for the new plant, and in many plants it forms two seed leaves. The stem pushes the cotyledon out of the ground where the seed coat is shed. Soon the stem grows beyond the cotyledon and new leaves develop and grow. Eventually the cotyledon drops off the plant. The plant continues to grow and mature until one day it begins to develop seeds of its own.



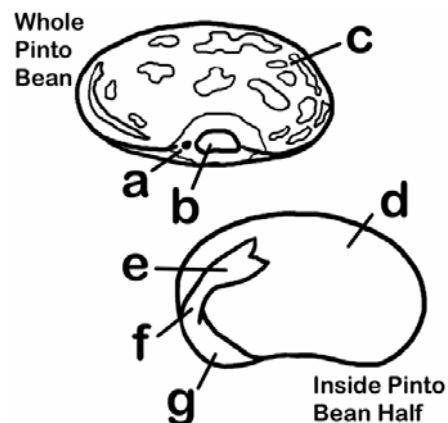
Name: _____ Date: _____

Answer the questions about *The Seed Story*.

1. Seeds are produced within the _____ of a plant.
a. stem b. roots c. fruit d. leaves
2. A _____ seed is waiting for the right conditions to develop.
a. germinating b. lazy c. genetic d. dormant
3. The development process of a seed is called _____.
a. photosynthesis b. germination c. transpiration d. dormancy
4. The _____ is the protective covering of a seed.
a. stem b. hilum c. seed coat d. micropyle
5. The scar where the seed was attached to the fruit is the _____.
a. stem b. hilum c. seed coat d. micropyle
6. Pollen enters the seed through the _____.
a. stem b. hilum c. seed coat d. micropyle
7. Inside the seed, the _____ forms a tiny root.
a. radicle b. cotyledon c. hypocotyl d. epicotyl
8. The baby stem is formed by the _____.
a. radicle b. cotyledon c. hypocotyl d. epicotyl
9. The first leaves are formed by the _____.
a. radicle b. cotyledon c. hypocotyl d. epicotyl
10. The _____ provides food for the new plant.
a. radicle b. cotyledon c. hypocotyl d. epicotyl

11..Label the diagram.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____



ANSWERS:

1. c
2. d
3. b
4. c
5. b
6. d
7. a
8. c
9. d
10. b
11. a. micropyle
b. hilum
c. seed coat
d. cotyledon
e. epicotyl
f. hypocotyl
g. radicle