

Lesson 3: Seeds (2 Days)

Getting Started

✿ Questions to Explore

- How are plants dependent on living things?



Facts and Definitions

- The parts of a seed are the seed coat, stored food, and the embryo.
- **Germination** is the process through which a seed grows into a plant.
- The male part of a plant is the stamen, and the female part is the pistil.

• Skills

- Explain why the number of seeds a plant produces depends on variables such as light, water, nutrients, and pollination. (S)
- Observe and discuss how bees pollinate flowers. (S)
- Observe, describe, and record properties of germinating seeds. (S)

Introduction

Ask your child how new plants are formed. Your child may say from seeds. Then ask where seeds come from. Explain that plants make the seeds that eventually turn into new plants.

Give your child a variety of seeds. Let him examine the seeds closely, using a magnifying glass. Discuss the shapes, sizes, and textures. Let your child create groups for the seeds, sorting them by color, size, texture, or shape. Encourage him to sort them by a second attribute, such as round or oval, large or small, smooth or rough, dark or light.

✂ Materials

- | | |
|---|--------------------------|
| • chalk powder (kit) | • pipe cleaners (kit) |
| • colored pencils or markers | • science journal |
| • colored pencils or markers* (Activity 1 - Option 2) | • scissors |
| • glue | • teaspoon |
| • magnifying glass (kit) | • variety of seeds (kit) |
| • pencil (kit) | • wiggly eyes (kit) |

Reading and Questions

Let your child read the PDF called "Seeds" at the following web link. Ask the following questions.



www.beyondthepage.com/link/9683/

1. What are the parts of a seed?

Seed coat, embryo, food

2. What does it mean for a seed to germinate?

The seed grows when provided with the right conditions.

3. How is the plant dependent on each part of the seed in order to germinate?

The outer coating protects the seed and keeps it moist. The food nourishes the growing plant. The embryo will grow into the root, stem, and leaves.

4. How are seeds dependent on animals?

Many types of seeds are spread by animals. The seeds get caught in the animal's fur and then become loose and drop to the ground.

5. What are other ways that seeds are spread from a plant to the ground?

Wind and water

Activities

Activity 1: Inside a Seed

Explain to your child that within each seed is food and an embryo. In order for a seed to germinate, it must absorb water until it swells and bursts its seed coat. Part of the embryo within the seed grows into a root as the seed begins its life cycle. Then the shoot grows up from the seed, pushing its way through the soil to find the sun.

Select one of the following options for your child.

Option 1

For this option, your child will label the parts of the seed and describe the function of each part.

Answer Key:

- A. embryo (the baby plant inside the seed),
- B. seed coat (protects the seed and helps keep it moist), and
- C. stored food (nourishes the baby plant until it can make its own food).

Option 2 (Advanced)

For this option, your child will draw and label the parts of a lima bean seed. Then he can put an A, B, or C beside each part and write a sentence that describes each part at the bottom of the page.

Answer Key:

- A. embryo (the baby plant inside the seed),
- B. seed coat (protects the seed and helps keep it moist), and
- C. stored food (nourishes the baby plant until it can make its own food).

Activity 2: Examining Seeds

Yesterday your child began soaking several lima beans in water. Those will be used in this activity.

Encourage your child to examine a hard lima bean with her naked eyes and with a magnifying glass. Ask her to scratch the seed coat with her finger nail. Explain that this hard outer coating protects the seed and

help to keep it moist inside.

Ask your child to take a lima bean that has been soaking. Ask her what has happened to the outer coat. (It should be softened by the water.) Have her remove the outer coat with her finger nail. With the outer coat removed, she can use her fingernail to break the seed into two halves. Ask her if she can identify the two different parts inside the seed — embryo and food. If she can identify the embryo, see if she can see that it has two parts. One part will grow into the stem and leaves, and the other part will grow to make roots.

Activity 3: Pollination

Show your child the diagram of the flower on the page called "Pollination: Plant Diagram." Point out the stamen. Explain that this is the male part of the flower where pollen is found. Then show your child the pistil, also known as the female part of the flower. Review the name and function of each flower part.

Explain to your child that seeds are formed when the male cell of a plant (pollen) and the female part of a different flower (stigma) are joined together. This process is called pollination. Tell your child that bees or the wind carry pollen from one plant to another. On the flower diagram, show your child that pollen is produced in the stamen. A bee or the wind transfers the pollen to the stigma. Then, the pollen travels down to the ovary, and the ovules become seeds. Ask your child how flowers attract bees. Explain to your child that the flowers' bright colors and scents help bees to locate them.

For this activity, your child will create a bee from pipe cleaners. Then he will design the flowers and assemble them. Follow the instructions on the "Pollination" page. Let him put chalk powder on the stamen in one flower. Using the bee he created, he will fly the bee to the flower with the pollen, touch the stamen (getting powder on the bee), and carry the pollen to the stigma of the other flower. Now he has demonstrated pollination!

Day 2

Activity 4: Scattering Seeds

Explain to your child that once seeds are formed within flowers, they must be moved from the flower to the ground so they can grow. Ask your child if he knows of any ways that seeds are transferred from a plant to the ground, where they can germinate and make a new plant. Ask your child to brainstorm other ways seeds might be transferred (blown by the wind, they fall in the water and get washed ashore, or animals eat the seeds and excrete them). Then learn about ways seeds are dispersed using any of the following web links.



How Do Plant Seeds Travel?

www.beyondthepage.com/link/10950/



Falling Far from the Tree: 7 Brilliant Ways Seeds and Fruits Are Dispersed

www.beyondthepage.com/link/10949/

In his journal, ask your child to illustrate three ways that seeds are scattered to different areas. Encourage him to glue real seeds on his picture — poppy seeds or other small seeds.

Activity 5: Plant Life Cycle

Review the fact that we call the process by which a seed grows into a new plant **germination**. A seed must have oxygen and water in order to grow once wind, water, or an animal has dispersed it. The seed absorbs water and begins to swell, it splits open, and the first shoot and roots grow.

Ask your child to cut out the pictures of the life cycle of a plant found on page 1 of "Plant Life Cycle." Then encourage him to put the photos of the cycle in order on page 2.

Activity 6: Song, Poem, or Drama

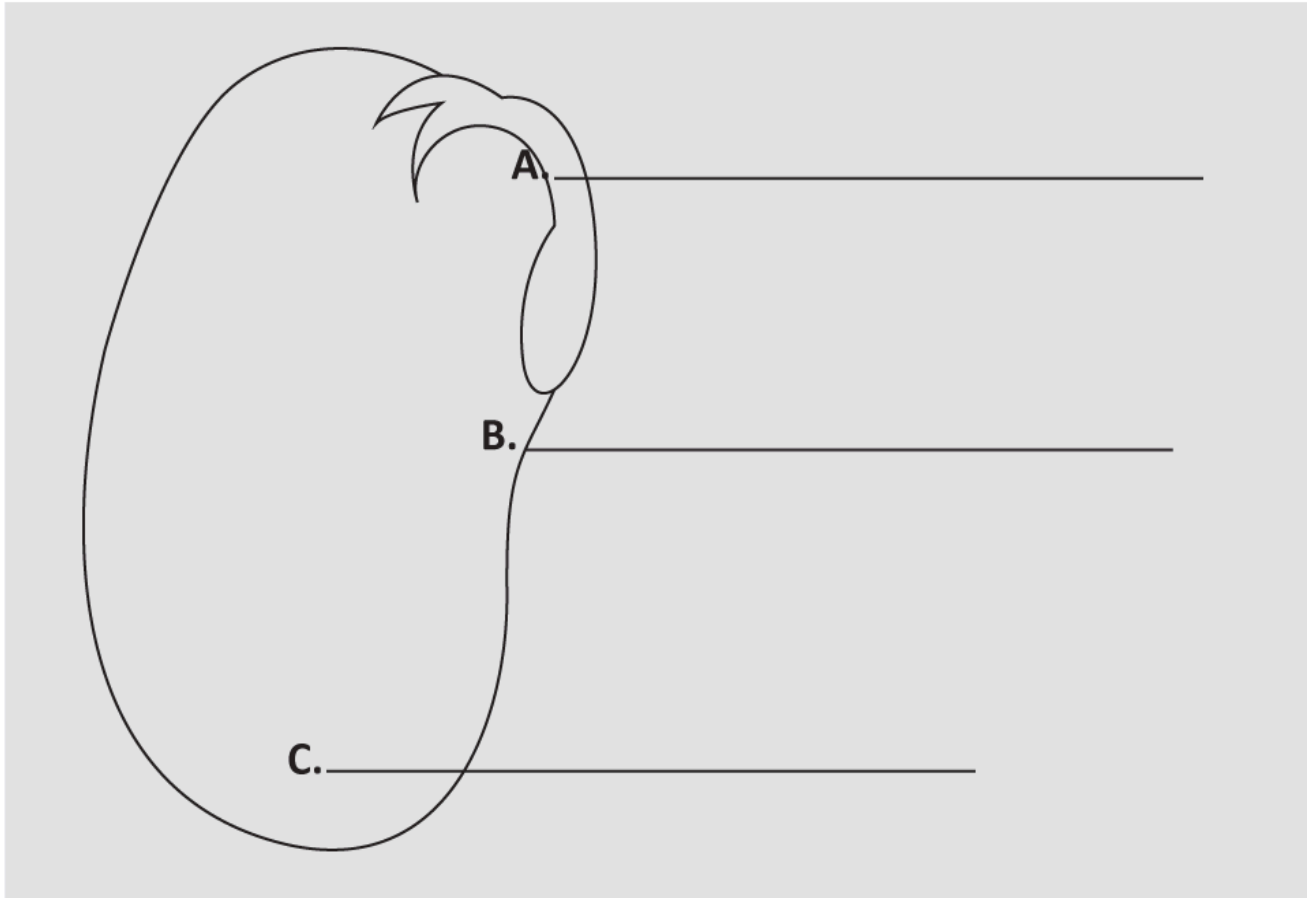
For this activity, your child will apply his understanding of the plant's life cycle to write a poem or song, or he can act out the life cycle of a plant. Remind him that his song, poem, or skit should describe or demonstrate each phase of the plant's life cycle that he learned about in Activity 5. Let him decide which option he would most enjoy.

Wrapping Up

Ask your child to demonstrate how bees pollinate flowers using the bee and flowers he assembled. Then ask your child to describe the life cycle of a plant.

Inside a Seed

Directions: Label the parts of the seed and then write a sentence to describe each part.



A. _____

B. _____

C. _____



Inside a Seed



Directions: Draw the inside of a lima bean seed and label the parts of the seed.
Then write a sentence to describe each part.

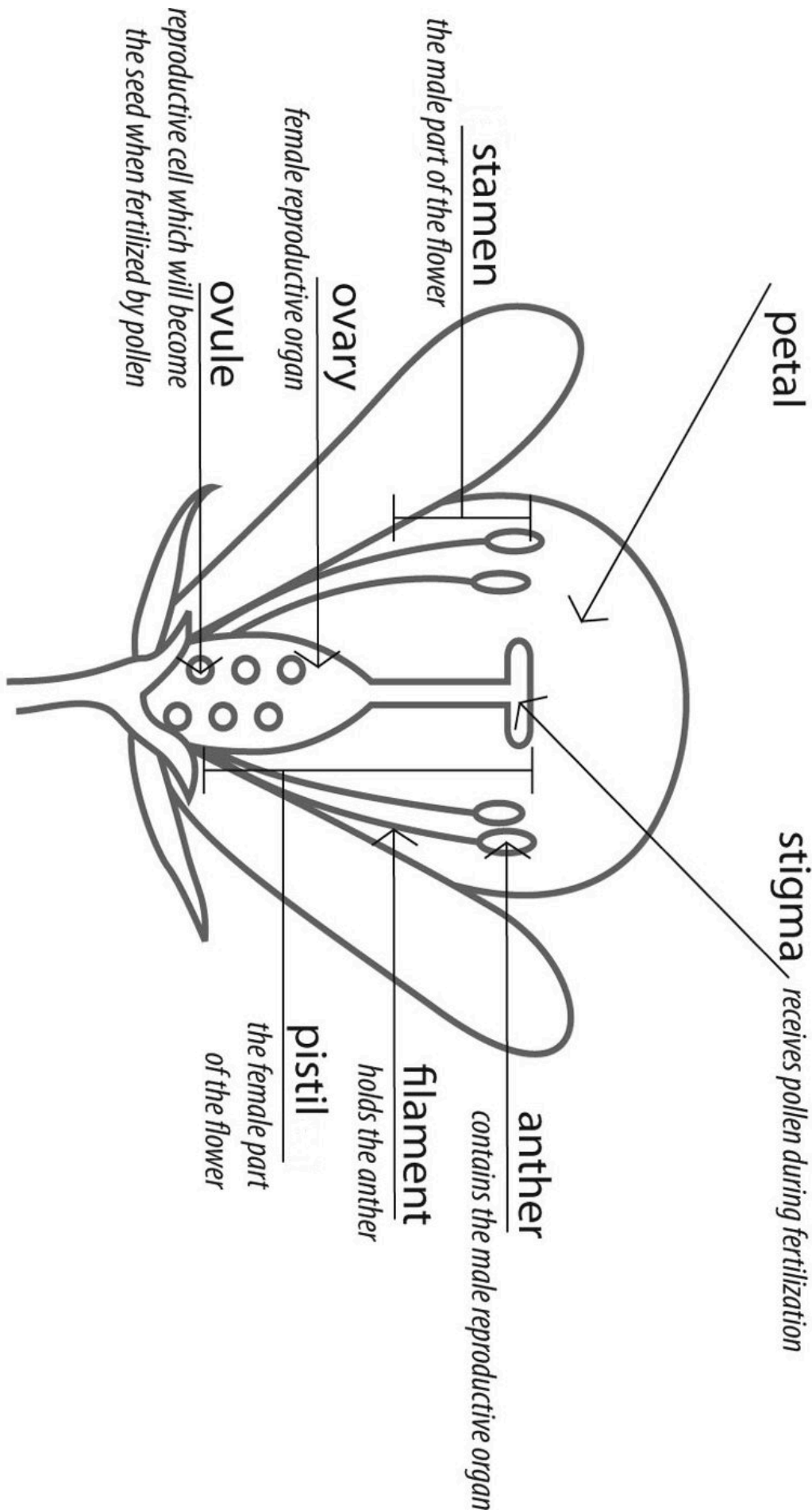
A large, empty rectangular box with a thin black border, intended for a student to draw the internal structure of a lima bean seed.

A. _____

B. _____

C. _____

Pollination: Plant Diagram



Pollination

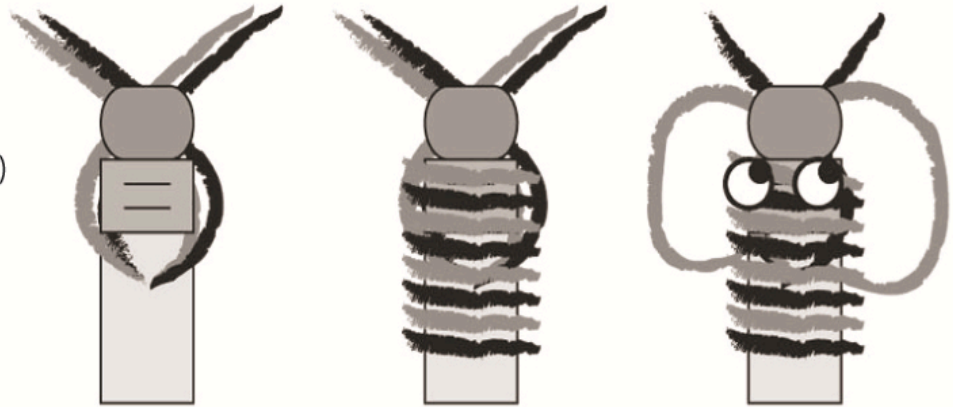
Pencil Bee

What you need:

- 1 yellow pipe cleaner (kit)
- 1 black pipe cleaner (kit)
- 2 tiny wiggle eyes (kit)
- 1 pencil (kit)
- glue

What you do:

1. Cut both pipe cleaners in half so that you have four pipe cleaners. Place one yellow and one black pipe cleaner together and fold in half to form a "V." Put the eraser of the pencil inside the "V" and twist the pipe cleaners tightly around the pencil. The top of the "V" will stick out past the eraser.
2. Place the other two pipe cleaners together and wrap them tightly around the top of the pencil and wrap the "V" so that the bottom of it is not seen.
3. The ends of the black "V" pipe cleaners will be sticking out over the eraser to form the antennae. Now fold the yellow "V" pipe cleaner down and around to form the wings. Glue the wiggle eyes to the bee's body and get ready to pollinate!



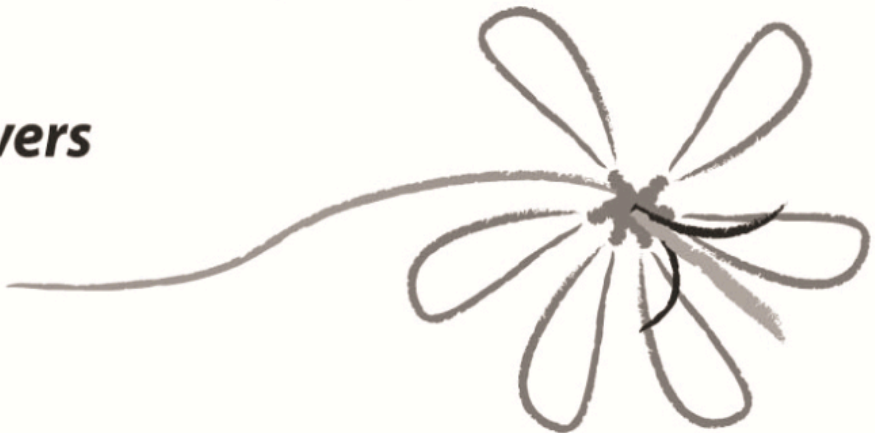
Pipe Cleaner Flowers

What you need:

- 2 green pipe cleaners (kit)
- 1 black pipe cleaner (kit)
- 1 yellow pipe cleaner (kit)
- 6 pink pipe cleaners (kit)

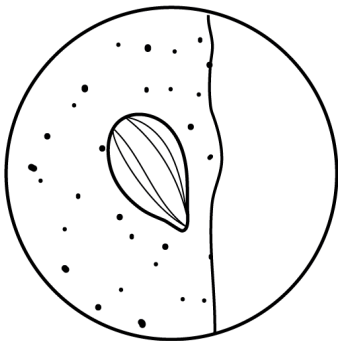
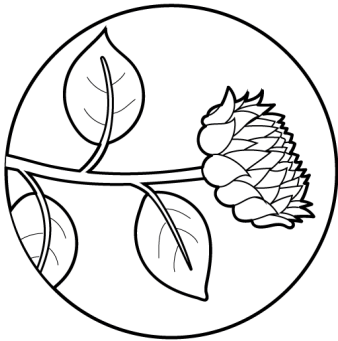
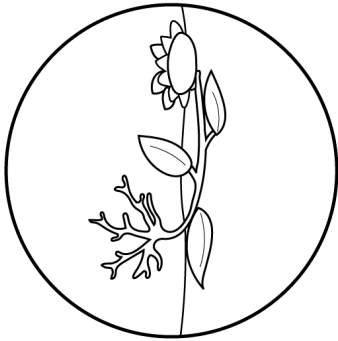
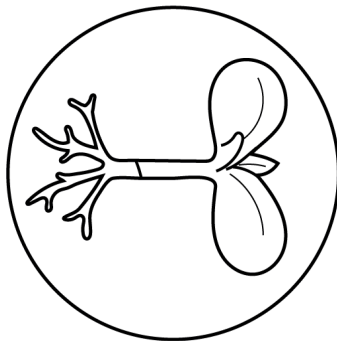
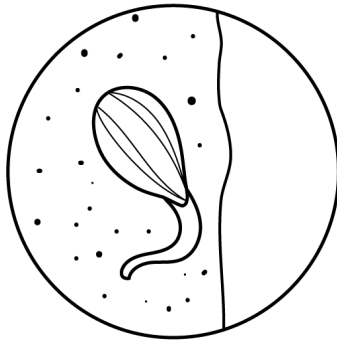
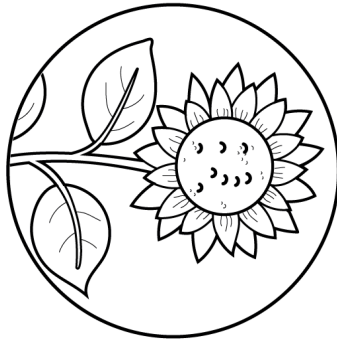
What you do:

1. Take 3 of the pink pipe cleaners and cut them in half. Fold each of these 6 pipe cleaner pieces in half and round them out to make the petals of the flower. Twist the ends to make 3 separate petals.
2. Cut the black pipe cleaner and the yellow pipe cleaner in half. Set one half aside for the next flower. Take a piece of the black pipe cleaner and fold it in half to be the pistils. Twist a piece of the yellow pipe cleaner around it to form the stamen.
3. Twist the petals around the yellow and black pieces and attach the stem to create your first flower.
4. Repeat the steps above to create your second flower to get ready for pollination!



Plant Life Cycle

Directions: Cut out the pictures below and put them in order to glue onto the next page. Match each stage with its description.



A seed falls on the ground.

Leaves and roots develop.

Seeds are formed in the flower.

The seed coat breaks open.

A flower blooms on the adult plant.

The plant dies and the seeds are scattered.

Plant Life Cycle

Directions: Put the stages of the plant life cycle in order and glue them onto the diagram below. Write a description of each stage on the lines provided.

