

# **The Plant Life Cycle**

## **Objective:**

Students will learn about the plant life cycle by hands-on observation and planting of vegetables and/or plants. The experiments will be used to encourage student to think about the importance of the Plant Life Cycle and its benefits to humans.

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## **LS1.B: Growth and Development of Organisms**

Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)

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## **Docent Lab Guidelines:**

**Schedule a date and time with your teacher to have the students come into the lab. Allow 45-60 minutes of class time.**

**There is an eating activity. Please check in with your teacher to make sure there are no food allergies to Cheetos.**

**Input the day and time into the Science Lab Master Schedule. Please make sure you add set up and clean up time to the class time.**

**Allow 30 minutes to set up and 30-45 minutes of clean up time.**

**Give a brief discussion on the plant life cycle and pollination. There are some photos on the iPad that can be utilized during your class discussion. The photos include: diagram of the plant life cycle, basic parts of a plant, diagram of pollination and photos of bees pollinating flowers. The photos can be found on the Photo/Gallery Icon on all three iPad.**

**Check with the teachers to see if they would like to take their plants back to the classroom or take them home.**

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## **General Docent Information**

Begin with a brief review of the plant life cycle. You may wish to show one of these videos at the beginning or at the end of the lab session.

### **Video on the Plant Cycle:**

How Does a Seed Become a Plant? By Science Show Kids (run time 3 min. 46 sec.)

<https://www.youtube.com/watch?v=tkFPyue5X3Q>

What is the difference Between a Fruit and a Vegetable? By Science Show Kids – Time

**Kindergarten, Session 4**

**Science Docent**

**Kindergarten, Session 4 Life Science**

Lapse (run time 4 min. 8 sec.)

[https://www.youtube.com/watch?v=DTK-uWx\\_VQo](https://www.youtube.com/watch?v=DTK-uWx_VQo)

The Beauty of Pollination – Moving Art (run time 4 min. 16 sec.)

<https://www.youtube.com/watch?v=MQiszdkOwuU>

Time Lapse of Sunflower (2 min. 30 seconds)

<https://www.youtube.com/watch?v=dKo5lvvtvWw>

Time-Lapse: Watch Flowers Bloom Before Your Eyes | Short Film Showcase (National Geographic) (3 min. 24 seconds) <https://www.youtube.com/watch?v=LjCzPp-MK48>

NOTE: There are two activities. One part involves planting a seed or sprout and the other part is a hands-on demonstration of pollination. Docents can decide if they would like to have the entire class do each activity all together or have rotating stations. In the past, we have found it works to call each table group over to do the planting while the other students color their flowers for the Pollination experiment, then to the pollination activity all together.

## **The Plant Life Cycle:**

### **Seeds**

Most kids are familiar with what a seed looks like. You may have even eaten them a time or two. But do you know what a seed does? The inside of a seed contains all that is necessary to create a new plant life, which includes an embryo and endosperm. The embryo is actually a very tiny new plant. The endosperm is the food that feeds the embryo. The outside of the seed is protected by a shell that is called a seed coat. This coat may be hard or it can be soft. It is important because it keeps the inside from becoming dry or injured. They can differ in appearance depending on the plant they came from. Some seeds are planted in the ground deliberately in order to grow a specific type of flowering plant. Other seeds may fall from a plant naturally or be dispersed by the blowing wind or an insect or bird. Either way, the first step of the flowering plant's life cycle often depends on a seed.

### **Seedling**

When seeds begin to grow, it is called germination. For this to happen, seeds need four very important things. These are oxygen, the right temperature, the right type of light, and moisture. The right temperature and type of light depends on the plant and the type of seed. Sometimes, a seed will germinate if there is a lot of light, but sometimes, darkness is better. As germination happens, leaves push out of the seed coat and out of the dirt where it has been planted. This young new plant is a seedling.

### **Mature Plants**

With the continued right conditions and nutrients, the seedling grows into a mature plant. A mature plant is an adult plant that is fully grown. When a plant is mature, it will have roots and leaves. It will also begin to produce flowers. The flower is the part of the plant that produces the seeds that start the life cycle. After a while, the mature plant will begin to die. Although this ends the life cycle of the plant, when it dies, it becomes nutrients for the dirt and future plants that might grow from it.

### **The Flower and its Parts**

The flower that grows from the mature plant is very important because of the seeds that will come from it. But how can a flower make seeds? To understand that, it's important to know what the flower's parts are. The part of the flower that people like to look at are the petals. Petals are really a type of leaf that protects the inner parts of the flower. Petals are so pretty because pollinators will think they are pretty as well. Pollinators are birds or insects such as bees that transfer pollen. For flowers, pollen is very important.

### **Seedless Plants**

Did you know that not all plants have seeds? Well, it's true! While seeds are an important part of a plant's life cycle, they aren't always necessary. Ferns and moss are both plants that do not produce seeds. Instead, they reproduce and grow from spores. Spores are carried by the wind to new locations, where they land on the ground and grow into new plants.

## **Demonstration: Whole Class**

*Estimated time: 5-10 minutes*

### **Materials:**

- Sample pictures of tree trunks painted white, plants cuticle and upper epidermis.

The cuticle and upper epidermis are the outer protective layers for a plant. There are many jobs for the cuticle and upper epidermis and one of the jobs is that it helps the plant defend itself against too much sun. Like our skin, plants also need some sun to grow, but too much can be harmful.

### **Instructions:**

1. Show the pictures of the Aloe plant being split open & the picture labeling the cuticle & upper epidermis. Point out the plant's cuticle & epidermis layer in both pictures.
2. Discuss what the jobs might be for a plant's "epidermis"/skin.
3. Compare a plant's epidermis to our epidermis.
4. Show the picture of the tree trunks painted white.
5. Discuss why people paint the tree trunks. (It helps avoid sunscald which is a sunburn for a plant & reflects sunlight during the daytime, helps keep them warmer at night, and can protect against rodents/insects).
6. Ask how we can protect ourselves from the sun like we do with the tree trunks. (Sunscreen & protective clothing)

## **Activity #1: Planting**

*Estimated time: 15 minutes*

### **Materials:**

Plastic cups and or empty water bottles cut in half (use bottom half only)  
Soil  
Seeds or Sprouts  
Labels to put names on cups  
Popsicle sticks to label type of plant in cup  
Markers to decorate their cups

Water  
Spoons or cups for scooping soil  
Butcher Paper – to cover tables

**Preparation:**

For easier clean up, cover the tables with butcher paper.  
Set out plastic cups or water bottles (one per student)  
Set out bowls of soil and scooping utensils (or hands works perfectly too), or you could have the kids bring their cups over to where the soil is located.  
Set out sprouts or seeds at each table.  
Create a table with markers, Popsicle sticks and labels for kids to make signs for their planter identifying what they have planted and their names.

**Instructions:**

Students will work at table groups.  
Scoop soil into the container.  
Place sprout or seeds at the appropriate depth based on the type of bulb.  
Add water.  
Create labels for each planter.  
Add water.  
If time allows students can decorate their cups with markers or stickers.

**Activity #2: Cheetos Pollination**

*Estimated time: 15 minutes*

**Materials:**

Cheetos  
Small paper bags  
Copies of flowers  
Markers or crayons  
Copies of Bee Puppet  
worksheet  
pencils, crayons or makers  
Glue sticks

**Preparation:**

Make copies of flower sheet. There are 4 per sheet. Cut out flowers. (1 flower per student)  
Make copies of Bee puppet. There are 3 bees per sheet. Cut out the bees. Also cut out the smaller middle circles on each bee so students can put their fingers through the hole and use it as a puppet. (1 bee per student)  
Set out glue sticks  
Cut paper bags in half

## **Instruction:**

Have each student color their flower and glue their flower onto a paper bag with a glue stick.

Docents to fill the paper bags with Cheetos.

Students put their bee puppet on their fingers and “fly” their bee over to the flower. Give the students several minutes to have their bees “land” on the flower. Allow several minutes for each student to eat the Cheetos with the hand that is wearing the bee puppet.

Remind students NOT TO LICK their fingers. They want to keep the “pollen” – Cheetos dust on their fingers.

You might ask them:

What happened when the bee landed on the flower?”

What happened to your fingers (the bee’s legs)?

What does the Cheetos dust represent?

Have the students pick a partner. The students will “fly” their bee to their partners flower and land. During this time the student will land and walk their messy Cheetos/pollen hand over their partner’s flower.

Ask “what happened when their bees landed in the flower?”

As a class, discuss the questions on the worksheet (What did your hand represent? What did the Cheetos represent? What happened and why?) The students do not need to complete the worksheet—it’s just a guide for discussion. The Pollination video listed above has amazing footage of the animals and insects that pollinate plants.

## **Options for Early Finishers:**

### **IPad Resource: The Science of Gardening from the SF Exploratorium**

If students finish early they can use the IPad to view some interesting close up photos of different flowers. Have the site open and ready at the start of class.

The site is called the ***Secret Lives of Flowers*** at:

[http://www.exploratorium.edu/gardening/bloom/secret\\_life\\_of\\_flowers/index.html](http://www.exploratorium.edu/gardening/bloom/secret_life_of_flowers/index.html)

## **SUPPLY LIST**

**Plastic or paper cups (or bottom part of water bottle) to plant seeds in (1 per students)**

**Potting soil (1 cubic foot) and small shovels or scoops**

**Markers**

**Water (can use watering cans)**

**Labels or craft sticks for putting names on cups**

**Seeds (2 per student; beans sprout quickly)**

**Paper lunch bags (1 per student)**

**Markers or crayons**

**Glue Sticks**

**Copies of flower picture (1 per student)**

**Bee puppets cut out on cardstock (30—reusable)**

**Cheetos (1 large bag per class)**