

# Bay Area Scientists in Schools Presentation Plan

Lesson Name Roots, Seeds, and Stems – Putting Plants Together

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Grade Level 1 Standards Connection(s) Needs of Living Things , How plants meet needs.

## Teaser:

Ever wonder how plants live? They don't eat breakfast, lunch, and dinner like we do, so how do they get the nutrients they need? How do the different parts of the plant work together to make sure that it continues to grow and produce new plants? Students will get to "dissect" plants to see their root and seed systems in this lesson!

## Objective: *As a result of your lesson, what will students learn? What will they be able to do?*

Students will be able to identify the main parts of a plant and describe the basic purposes of each part. They will see how different plants can have different root systems and seeds but that they are all related and serve similar purposes. The lesson would serve as a great starting point to continue the exploration of plants in the classroom with experiments involving plant growth and outdoor field trips.

## Vocabulary/Definitions:

3 – 6 important (new) words

**Stem**  
**Leaf**  
**Roots**  
**Flower**  
**Seeds**  
**Nutrients**

## Materials:

*What will you bring with you?*

Different seeds  
Potted plants to see roots  
Carnation  
Food dye  
Vase + water  
Newspaper

*What should students have ready?*

Piece(s) of paper and a pencil  
Clean desks

## Classroom Set-up:

Students will be split in two groups once the introduction is completed. Some students will be digging in dirt and will need access to a sink once they are done.



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## Classroom Visit

### 1. **Personal Introduction:** \_\_\_\_\_ **5** \_\_\_\_\_ **Minutes**

I'm Laurie and I am a chemical engineer. I study peptides, which make proteins that you find in your body. Just like you eat proteins for nutrition, plants consume sunlight and nutrients from the ground to live and today we are going to talk about how plants survive!

Hi, I'm Anton and I am also a chemical engineer. I study ways to turn different materials, such as plants, into fuel for your car. Plants are great at making all sorts of complex molecules that could be used for all kinds of things ranging from medicine to gasoline. This afternoon/morning we are going to talk about how plants make some of those compounds using the sun and nutrients from the air and ground and how they move around the plant.

Hi, I'm Tania and I am a molecular biologist at UC Berkeley. I study how living things work on the inside in very small detail. By the end of today, you will know more about the different parts of plants and what they are for. We are going to show you how even plants that look very different, like trees and grass, still have the essential parts that make them plants.

### **Topic Introduction:** \_\_\_\_\_ **10** \_\_\_\_\_ **Minutes**

Ask students to draw a picture of a plant (any plant that they want!). What common features do these plants have? Use this to introduce the first 5 vocabulary words (stem, leaf, roots, flower, seeds). Now discuss with students that plants are living things just like you and me but how do they live? They don't eat breakfast, lunch, and dinner, or do they? This is a segway to the idea of plants taking different nutrients from their surroundings to grow and live. Could discuss how leaves breathe just like we do. This would lead nicely into how the other parts of the plant participate in keeping the plant alive.

### 2. **Learning Experience(s):** \_\_\_\_\_ **25** \_\_\_\_\_ **Minutes**

#### **Carnation Experiment:**

This experiment is used to reinforce the students' understanding of how nutrients in the ground can reach the rest of the plant. At the beginning of class, partially fill two vases with water. In one vase, add numerous drops of food coloring (blue or red work great) until the water is deeply colored. Next, trim the stems of the carnations (flowers that are white or some other light color work best) and place some of them in each vase. Tell the students that we will come back to the flowers later in class and carry out the other experiments first.

After the other experiments have been completed, come back to the carnations. What happened? How did the carnations in the colored water become colored? It happens because the plant stem is trying to take up "nutrients" from the water and sucks up the water to the top of the plant. Once it reaches the light colored flower, the dye that is dissolved in the water becomes easily visible showing that the carnation did indeed take up nutrients and transport them around the plant.



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Note: May be a smart idea to bring some pre-colored flowers just in case the color isn't deep enough. A lamp would also help speed up the process by encouraging more water movement.

### **Exploring Seeds:**

What are seeds? What are different kinds of seeds? Give a few examples and then ask students for more. (Sunflower seeds, pumpkin seeds, orange seeds, avocado cores, beans, etc.)

Why do plants make seeds? What are they for? What are the different parts of a seed? After a short introduction, students will look at pre-split seeds to see the different parts.

How do seeds get around? (Birds eat them and do not digest them, travel in fur of moving animals, planted by humans, fly away in the wind, etc.)

Do all plants make seeds? (No. Some plants bud off the mother plant, either directly from the plant or after a part of the mother plant falls off. Examples are cactus plants and potatoes.)

### **Roots and Nutrition:**

How do plants get the nutrition they need to grow? What do they "eat"? Plants "eat" nutrients from the ground (like water). The water travels up through the roots and into the leaves of the plant. Do you think that the roots of all plants look the same? (No, they are not!) How do you think roots are different between different plants? (They can be larger or longer, there could be more of them depending on how far away the plant must reach to get to water.)

Show the students different pots of plants (three of them). Talk about the different parts of the plant and what each part of the plant does. Ask which plant do they think will have the biggest roots? How do each of the plants differ? Do they have leaves? Do they each need a different amount of water to survive? Then, have a few students carefully dig up the plants and look at their roots. Have the students record what is different or draw a picture. See if their guess (hypothesis) matched the end result. What if it was different- will the size of the roots change over time?

### **3. Wrap-up: Sharing Experiences \_\_\_\_\_ 10 \_\_\_\_\_ Minutes**

Bring the students back together as an entire group and discuss what they just observed/learned.

What are the parts of a plant? (stems, leaves, roots, flowers, seeds...)

Discuss vocabulary words.

Ask students what they observed in each of the three demos.

### **4. Connections & Close: \_\_\_\_\_ 5 \_\_\_\_\_ Minutes**

Ask them if they have any houseplants. Not all kids may have backyards, so we do not want to make them feel left out. I (Tania) did not have a backyard growing up, but I liked plants and liked growing small ones in pots outside and on windowsills. Seeds that come from the kitchen, such as tomato seeds and beans, tend to grow really well.

**Total 50 – 60 Minutes**



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## **Follow-up – After Presentation**

*Suggest students write a letter explaining “How we learned about \_\_\_\_\_?”*

*List or attach examples of activities, websites, connections for additional learning.*

*Attach worksheets, hand-outs, visuals used in classroom presentation.*

- **Ask students to draw a plant before and after this lesson** and see what additional details they add!
- **Start a terrarium in the classroom.** Using a 2-liter soda bottle, cut open the bottle so that soil may be added. Add soil and seeds and place near a window. Have students take turns describing what they observe and watering the plants. This is a good activity to extend the material and remind students of the vocabulary words for weeks after the initial lesson!

[http://www.amnh.org/ology/features/stufftodo\\_climate/make\\_terrarium/?TB\\_iframe=true&height=500&width=770](http://www.amnh.org/ology/features/stufftodo_climate/make_terrarium/?TB_iframe=true&height=500&width=770)

### **Reading Connections:**

- **Flowers** by Vijaya Khisty Bodach (Capstone Plant Parts Series)  
<http://www.capstonepub.com/product/9780736896191>
- **Fruits** by Vijaya Khisty Bodach (Capstone Plant Parts Series)  
<http://www.capstonepub.com/product/9780736896207>
- **Leaves** by Vijaya Khisty Bodach (Capstone Plant Parts Series)  
<http://www.capstonepub.com/product/9780736896214>
- **Roots** by Vijaya Khisty Bodach (Capstone Plant Parts Series)  
<http://www.capstonepub.com/product/9780736896221>
- **Stems** by Vijaya Khisty Bodach (Capstone Plant Parts Series)  
<http://www.capstonepub.com/product/9780736896245>
- Plant Life Cycle Series by Linda Tagliaferro  
[http://www.lindatagliaferro.com/plant\\_life\\_cycles\\_51462.htm](http://www.lindatagliaferro.com/plant_life_cycles_51462.htm)



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