

# Plant an Orange Tree

## Objective

In this lesson students learn about seed germination, the parts of a plant, what plants need and how to plant their own orange tree

## Grade level

For grades 1-3

## Time

45 minutes in small groups; 10-15 minutes at each station

## Materials

You will need two classroom helpers to facilitate at two of the stations

### Station 1 | Seed Germination

- Bean seeds, one for each student or pair (lima bean seeds work well)
- Paper towels, one for each student or pair
- Water in a pan or bucket
- Rubber bands
- Plastic bags
- Permanent markers

### Station 2 | Orange Seedling

- Oranges (make sure the oranges have seeds in them, Navel oranges are seedless)
- Paper cups, one for each student
- Pencils
- Potting soil
- Water in a pitcher

### Station 3 | Plant Parts

- Plant parts PDF
- Plant books for research (see partial list of suggested titles below):
  - *Plant Parts* by Spilsbury and Spilsbury
  - *Seeds, Stems, Roots and Leaves* all part of the Plant Part series by Vijaya Bodach
  - *Eyewitness Books: Plants* by DK Publishing
  - *The Magic School Bus Plants Seeds* by Joanna Cole
- Crayons or markers
- Pencils

## Background

There are many different kinds of plants. Flowering plants such as orange trees have basic plant parts: roots, stems, leaves and flowers. These parts play a vital part in the life of the plant. Roots anchor the plant and help absorb the water and minerals the plant needs to survive. Stems provide the support and structure of the plant.

They also act as a highway carrying water, minerals and sugar from the roots to the leaves and back again. Leaves are the powerhouses. Through photosynthesis they capture energy from sunlight and turn it into sugars. Leaves also “breathe” by exchanging carbon dioxide and oxygen. Flowers attract birds and insects that pollinate the flowers, which allows the flowers to turn into seeds and/or fruit which the plant uses to reproduce.

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## Procedure

1. Before dividing the class into small groups, have a large class discussion about the parts of a plant and what plants need to grow.
2. Divide the students into three groups and explain what will happen at each of the three stations.

### Station 1 | Seed Germination

3. Pass out the paper towels and seeds. Ask students what kind of seed they think it is. How do they think the seed will turn into a plant? What do seeds need to germinate? Explain that germinate means to sprout and turn into a plant, and water is very important.
4. Explain how the students are going to help the lima beans sprout. Have students wet the paper towels and gently wrap the seeds up in the paper towels. (See Image 1.1)
5. Loosely wrap a rubber band around each paper towel/seed roll and place it in the plastic bag. Write students' names on the bags. (See Image 1.2)
6. Ask students to predict how long it will take the seeds to sprout. Write down everyone's predictions. Make sure to ask follow-up questions about how students came up with their predictions.
7. Each day after the lesson, gently unwrap the seeds to see if they have germinated. It should take a couple of days.

### Station 2 | Orange Seedling

8. Peel an orange and pass segments out to each student.
9. Have students eat the orange segment but save the seeds. Compare how many seeds were in each segment.
10. Pass out the paper cups. Have students write their name on the side of the cup and poke two small holes in the bottom of the cup for drainage with their pencils.
11. Fill each cup  $\frac{3}{4}$  full with potting soil.
12. Plant the seed a  $\frac{1}{2}$  inch down in the soil. (See Image 2.0)
13. Add enough water so the soil is moist but not flooded with water.
14. Cover the cup with plastic wrap and place in a warm spot.
15. Ask students what they think could affect the seed sprouting. What do seeds and plants need to sprout and grow?
16. Each day after the lesson, check on the cups to make sure they have enough water. They should be moist but not soggy. Remove the plastic wrap once the seed has sprouted.



Image 1.1



Image 1.2



Image 2.0

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## ***Station 3 | Plant Parts***

17. Have several books about seeds, plants and plant parts on the table at this station.
18. Have students label the various parts of the plant: root, stem, leaf, blossom and fruit. Students can use the books if they need help.
19. After they have labeled the parts, have students research the function of each plant part in the books and write at the bottom of the sheet the role each part plays.
20. Students can color in the plant parts when they are done.

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## Standards Correlation

Lesson content was developed to meet the National Science Standards and California State Science Standards and Frameworks. Each standard addressed is indicated below.

To view a full list of National Standards please visit the National Science Education Standards [<http://books.nap.edu/html/nses/6a.html>] website. To view a full list of California State Standards please visit the California State Board of Education [<http://www.cde.ca.gov/be/st/ss/>] website.

## National Science Standards

### Grades K – 4

#### *Science as Inquiry Standards*

- Abilities necessary to do scientific inquiry

#### *Life Science Standards*

- The characteristics of organisms
- Organisms and environments

## CA State Science Standards and Frameworks

### Grade 1

#### *Life Sciences*

2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:
  - b. Students know both plants and animals need water; animals need food, and plants need light.
  - e. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.

#### *Investigation and Experimentation*

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
  - a. Draw pictures that portray some features of the thing being described.

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## Grade 2

### *Life Sciences*

2. Plants and animals have predictable life cycles. As a basis for understanding this concept:
- e. Students know light, gravity, touch or environmental stress can affect the germination, growth and development of plants.
  - f. Students know flowers and fruits are associated with reproduction in plants.

### *Investigation and Experimentation*

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
- a. Make predictions based on observed patterns and not random guessing
  - g. Follow oral instructions for a scientific investigation.

## Grade 3

### *Life Sciences*

3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:
- a. Students know plants and animals have structures that serve different functions in growth, survival and reproduction.

### *Investigation and Experimentation*

5. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
- d. Predict the outcome of a simple investigation and compare the result with the prediction.