

Name: _____

Date: _____

What Is Food for Plants?

INVESTIGATION 1: Are Water, Carbon Dioxide, and Minerals in the Soil Food for Plants?

Plants take in water through their roots. They take in minerals from the soil through their roots as well. These minerals are sometimes called **fertilizers** or **plant food**. Plants also take in carbon dioxide from the air through tiny holes in their leaves. All these materials are important for plants.

*But are they **food** for plants?* Do they provide both the energy and the matter plants need to live and grow?



Photo courtesy of Freevector.com

Water



Photo courtesy of Openclipart.org

Minerals in the Soil



Photo courtesy of Pixabay.com

Carbon Dioxide in the Air

What evidence can help us answer these questions? Think back to our study of the nutrition labels in lesson 1.

Write in your science notebook:

1. *I think water (is or is not) food for plants. My evidence is ...*

2. *I think carbon dioxide (is or is not) food for plants. My evidence is ...*

3. *I think minerals or fertilizers in the soil (are or are not) food for plants.*

My evidence is ...

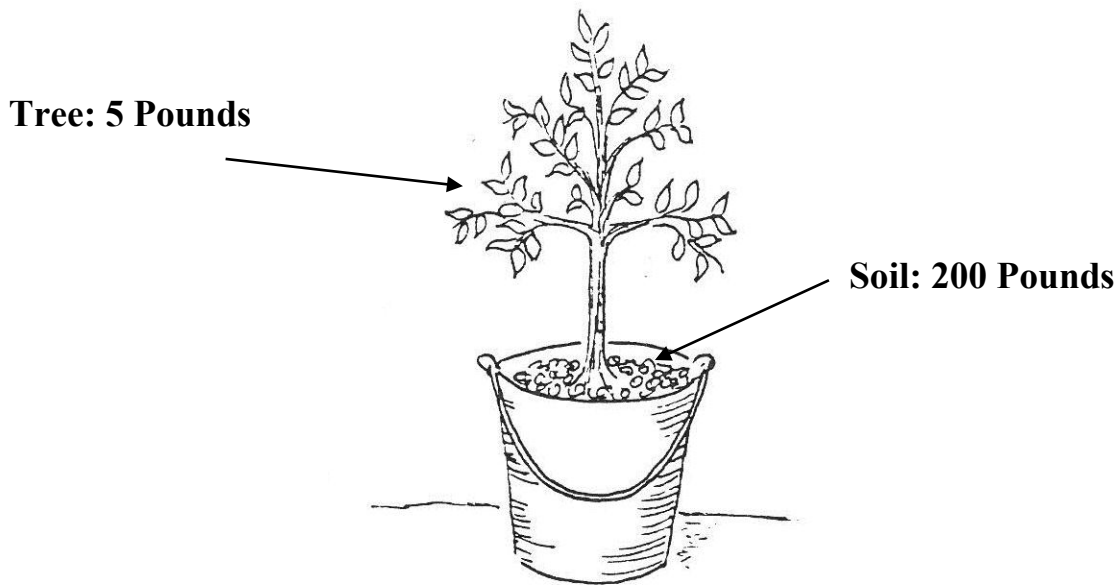
INVESTIGATION 2: Is Soil Food for Plants?

More than 350 years ago, a scientist named Jan van Helmont did an experiment to answer the question, *Is soil providing plants with their food?* Van Helmont planted a young tree in a bucket of soil. He weighed the soil and found that its mass was 200 pounds. Then he weighed the tree and discovered that its mass was 5 pounds.

What do you think will happen to the weight (mass) of the **tree** as it grows? Will it go up, go down, or stay the same? Write your prediction in the box below labeled “How the Mass of the Tree Will Change.”

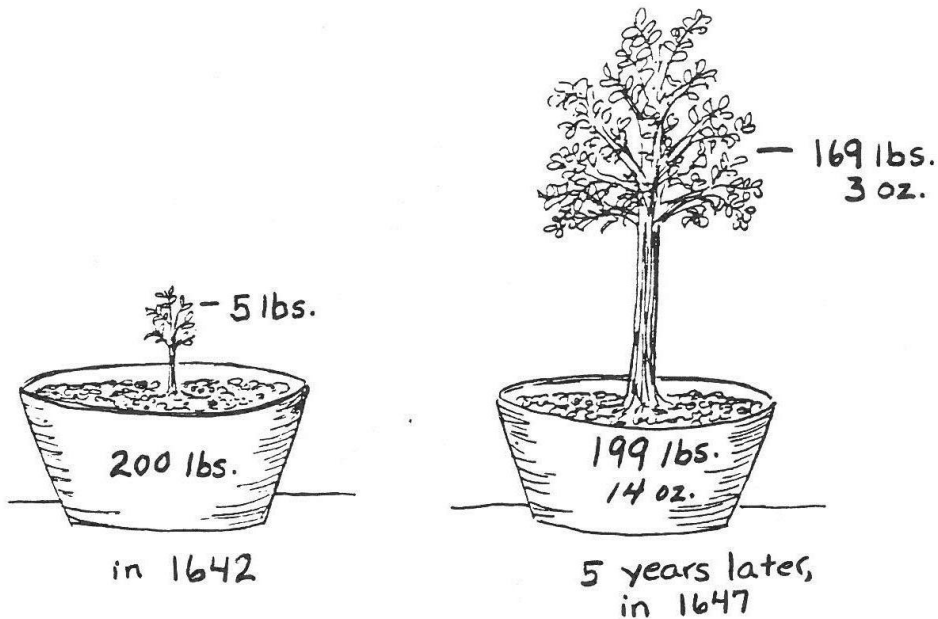
What do you think will happen to the weight (mass) of the **soil** as the tree grows? Will it go up, go down, or stay the same? Write your prediction in the box labeled “How the Mass of the Soil Will Change.”

How the Mass of the Tree Will Change	How the Mass of the Soil Will Change



What Happened?

Look at the picture below to see what happened to the mass of the tree and the mass of the soil after 5 years. In the boxes below, write down the mass gained by the tree and lost from the soil.



Mass the Tree Gained	Mass the Soil Lost

The tree gained a lot of weight (mass), but the soil lost very little weight! Use Van Helmont's experiment to think about the question, *Is soil, or minerals in the soil, providing food for plants?*

Analysis Questions

Answer these questions in complete sentences in your science notebook:

1. Van Helmont's tree gained 164 pounds. Do you think all of this weight gain came from the soil or minerals in the soil? What is your evidence?

I think the 164 pounds the tree gained (came from the soil or did not come from the soil) because ...

2. What do you think now about whether plants get their food from the soil?

I think plants (do or do not) get their food from the soil. My evidence is ...

INVESTIGATION 3: Is Sunlight Food for Plants?

Is sunlight food for plants? As you think about this question, remember the scientific definition of food:

Food is **matter** (building materials) that contains **energy** living things can use to live and grow. All living things need the matter and energy in food to grow, to heal wounds, and to keep all their parts working.

1. Observe the plants your teacher shows you that have been grown in the light and in the dark.

Talk about how the plants in the light are different from the plants in the dark.

2. Think about **the plants you observed**, and **the scientific definition of food**. Talk with your group about the two questions below. Be ready to have a group answer to each of these questions.

- a. Do plants need sunlight? What is your evidence and reasoning?

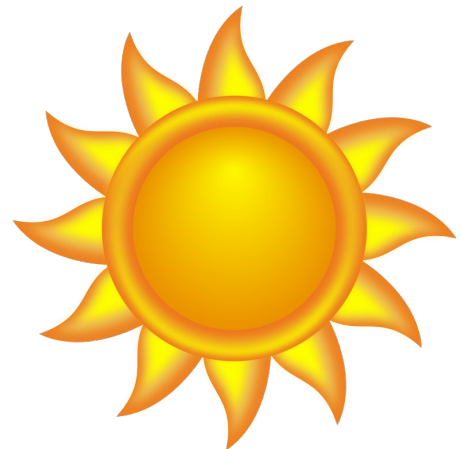
We think plants (need or don't need) sunlight. Our evidence is ...

- b. Is sunlight food for plants? What is your evidence and reasoning?

We think sunlight (is or is not) food that plants can use to live and grow. Our reasoning is ...



Photo courtesy of Pexels.com



3. Read the following paragraph about sunlight to find out how to finish this sentence:

Sunlight (is or is not) food for plants by the scientific definition because ...

Reading:

The Sun provides energy that we can detect as either heat or light. This energy has no mass. We cannot weigh this energy. It has no size in terms of width, length, or diameter because it doesn't take up any space. It's really strange to think about something we can see (light) that doesn't take up any space. Because it has no mass and doesn't take up any space, sunlight is **not** matter. So can it be food for plants? Think about the scientific definition of *food*.

- a. Does this reading give you any new ideas for answering the question, *Does sunlight provide food that plants can use to live and grow?*

Talk with a partner about any new ideas you now have about the answer to this question.

- b. Now complete the following sentence **in your science notebook**:

Sunlight (is or is not) food for plants by the scientific definition because ...