



GROWING TOMATOES

Overview

The life cycle of growing a tomato from a seed to the plate requires labor, energy and many materials. This process begins with sunlight, root stability and nutrients. Tomato plants develop in stages and produce fruit in adequate environmental conditions.

Objectives

1. Compare and contrast the differences between tomato varieties using descriptive vocabulary.
2. Identify tomato growth stages and development characteristics.
3. Identify the parts of a tomato plant.
4. Observe the growth of tomato plants in a grow lab.

Background Information

K-State Research and Extension reports that tomatoes are the most popular vegetable grown in home gardens. Tomato plants are easy to grow, because of how well they grow in different conditions. Although tomato plants can be grown from seeds, most gardeners prefer to purchase small plants and transplant them into their own gardens. Transplanting shortens the growing season and allows fruit production to occur before summertime temperatures get too high. The optimum daytime growing temperature for tomato plants is 70 to 75 degrees Fahrenheit. When temperatures are above 90 degrees and the humidity is low, tomato blossoms wither and will then drop off the plants or are poorly pollinated, resulting in lowered fruit production. If allowed to ripen on the vine, tomatoes will not turn red in color when daytime temperatures reach 95 degrees or higher. However, tomato plants often begin producing again once temperatures are lower in the fall.

A tomato plant grows upright, with one main stem. During the first month of growth, a tomato plant's energy is directed at producing leaves. The plant grows very rapidly and may double in size every 12 to 15 days.

To maximize photosynthesis, tomato plants need to be supported so that they will continue to grow in an upright position, rather than being forced to the ground by the weight of the fruit and additional branches. Stakes or cages are used to support the plants, which improves yields and the overall quality of the fruit produced by the plants.

**Suggested
Grade Level:**
3rd-5th

Time:
50 minutes

Subjects:
Science
Math

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Background Information Continued

From smallest to largest, the five major tomato types are cherry, plum, pear, standard and beefsteak. There are many different tomato varieties producing fruit that range in size from cherry tomatoes weighing as small as half an ounce, to larger tomatoes weighing more than two pounds.

There are two main types of tomato plants - determinate and indeterminate. Determinate tomato plants follow a genetically pre-determined pattern of growth and fruit production. These tomato plants stop growing when the tomatoes begin to fill, and the leaves begin to die as the tomatoes ripen. This type of tomato plant is appealing to commercial growers since all the fruit ripens at the same time and the plants can be mechanically harvested. Indeterminate tomato plants continue to grow and produce fruit as long as the plants are alive.

Plants require several things for sufficient growth. The easiest way to remember these factors is the acronym **P.L.A.N.T.S.:**

Place: Where is the plant located? Is it in a pot? In a garden? In a sunny location?

Light: In order to grow, plants need light for the process of photosynthesis.

Air: Plants need air so they grow sufficiently.

Nutrients: Plants require nutrients such as nitrogen, potassium and phosphorus. It is important that there are nutrients available to the plant in the form of fertilized commercial or organic.

Thirsty: Like people, plants need water on a regular basis.

Soil: The medium in which plants should be grown for optimum results.

IMPORTANT FACTS:

Tomatoes are the fourth most popular fresh vegetable and the largest commercially produced vegetable crop in the United States.

Tomato plants are self-pollinating. Each flower contains both male and female parts, and the wind transfers the pollen between the two.

Early names for tomatoes included "love apples" and "wolf peaches."

George Washington Carver authored a bulletin in 1918 titled, "How to Grow the Tomato and 115 Ways to Prepare it for the Table."

One medium-sized tomato provides 40 percent of the recommended daily allowance of vitamin C and 20 percent of the recommended daily allowance of vitamin A.

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Vocabulary

Determinate Plant: A plant that follows a genetically pre-determined pattern of growth and fruit production such as a tomato plant that stops growing when the tomatoes begin to fill. The fruit will ripen at the same time and the plant can be mechanically harvested.

Growing Media/Medium: A material used to culture plants, such as soil.

Heirloom: An open-pollinated type of tomato.

Hybrid: Combines two different varieties of tomato plants to produce a tomato with traits from both plants.

Indeterminate Plant: A plant that continues to grow and produce fruit as long as the plant is alive.

Nutrient: A substance needed for an organism to grow and function properly.

Open Pollination: These are seeds that will “breed true,” meaning the resulting seeds will produce plants roughly identical to their parents.

Photosynthesis: The process by which the cells containing chlorophyll in green plants and trees convert sunlight into chemical energy.

Pollinate: To transfer pollen from the anther to the stigma of a flower.

Stakes (Cages): A piece of wood, plastic or metal used to support stem’s leaves.

Transplant: The process of digging up a plant and moving it to another location.

Yield: The amount of a specified substance produced per unit area.

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Tomato Varieties

Cherry tomatoes are generally served whole, although they can be cut in half and used in many dishes. Many are consumed as a quick snack. They contain a large amount of seeds and juice. Cherry tomatoes are about the size of a quarter.



Plum tomatoes are shaped like eggplants. They can be either red or yellow. Plum tomatoes are excellent for making sauce, canning and pizzas. Roma tomatoes are a variety of plum shaped tomatoes. Roma tomatoes are easily found at grocery stores around the country.



Pear tomatoes are known for their unique shape. They are best eaten straight off the vine. They are used for canning, garnishing salads and preserving.



Standard tomatoes are very uniform in shape and size. They are used mostly for slicing and canning. These are common at local grocery stores. These can also be grown in greenhouses.



Beefsteak tomatoes can weigh up to two pounds each. This tomato is perfect for many dishes, but it is especially famous for being served raw in salads or on sandwiches. The shape is very unique with rippled edges.

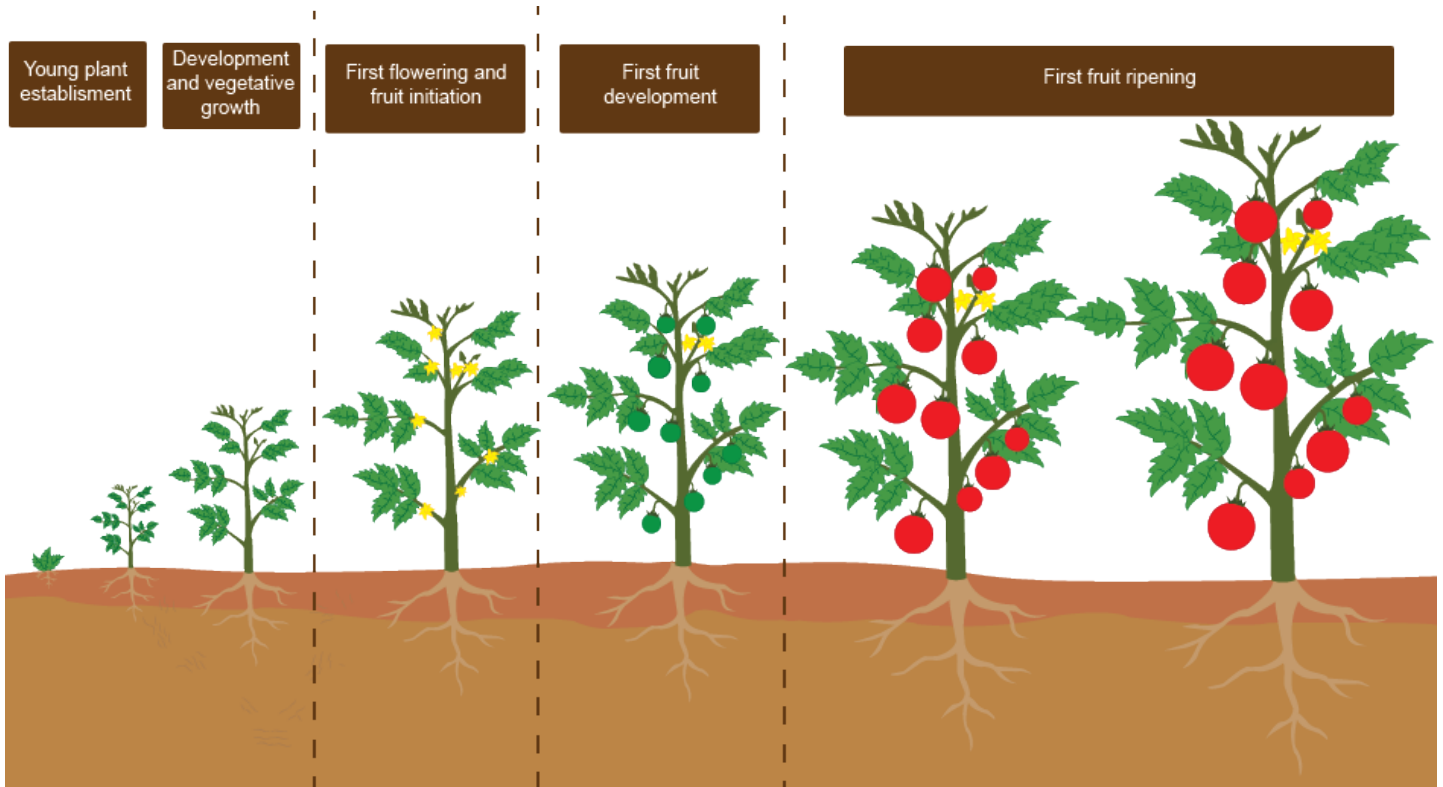


Heirloom tomatoes are an open-pollinated type of tomato, which means you can save the seeds from the heirloom tomato, plant them and watch them grow into new tomato plants. They have become increasingly popular. However, they are not the most attractive tomato, with deep cracks and bumps. They usually have a shorter shelf life of one to two days and it is recommended they stay on the counter away from other produce that could harm them.



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Growth Stages of a Tomato Plant

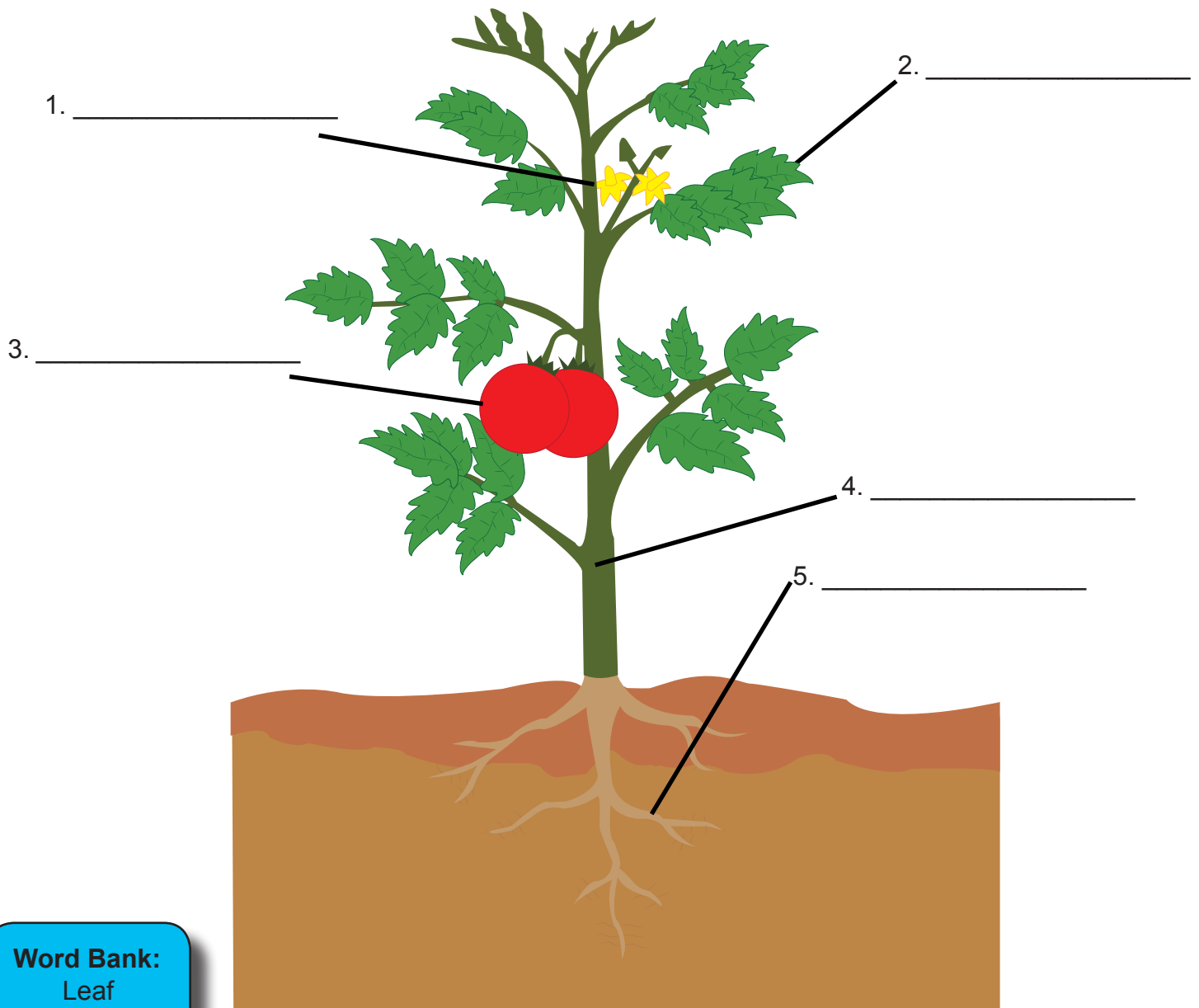


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Tomato Plant Parts

Name _____

Identify the part of the tomato plant by filling in the blank beside each part.



Word Bank:

- Leaf
- Fruit
- Stem
- Root
- Flower

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Determinate or Indeterminate

Name _____

- | | |
|--------------|-------------------|
| Plant type | Skin color |
| Plant height | Flesh color |
| Fruit size | Disease resistant |
| Fruit shape | Flavor |

Tomato 1			Tomato 2
	Shared Characteristics		
Tomato 3			Tomato 3