

# Instant STEM Activities

# 3

## Core Ideas and Practices

### Includes

- Physical, Life, Earth and Space Sciences
- Engineering, Technology, and Applications of Science
- Informational Text
- Project-based Activities
- STEM Occupations

### Air and Water in Soil

Plant roots need to get air and water from soil. Where can you find air and water in soil? Remember that soil is made up of particles.

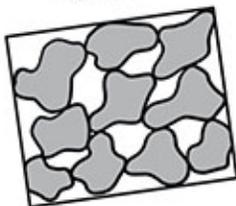
#### The Spaces Between Particles

Imagine you have one clear plastic cup filled with stones. Another cup is filled with sand. You can see spaces between the stones in the cup. Think of the stones as large particles. Large particles do not fit closely together. There are large spaces between the particles.

Sand particles are much smaller than stones. Small particles fit closely together. They leave only tiny spaces between particles. The particles are so close together that you cannot see the tiny spaces between the particles.

The spaces between large particles are larger than the spaces between small particles.

large particles



In soil, you can find air and water in the spaces between particles.

#### Soil Particles

Remember that sand, silt, and clay particles are much smaller than silt particles. The spaces between silt particles are much smaller than the spaces between sand particles.

When there are larger spaces between particles, there is more air and water in the soil.

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### Experiment: What Is in This Soil?

Try this experiment to find out what is in a sample of soil.

#### What You Need

- A clear jar with straight sides (not too small)
- Enough soil to fill the jar halfway
- Water
- A spoon or stirring stick

#### What You Do

1. Add dirt to the jar almost halfway. Notice how the dirt looks.
2. Slowly add water to the jar until the jar is almost full. Watch for several moments. Do you see any bubbles rising from the dirt?
3. Stir the water and dirt to mix them together.
4. Leave the jar for 2 or 3 hours. Do not touch or move the jar.
5. When the water at the top clears, take a close look at the soil. (Do not move the jar or you might mix up the soil and water again.)



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Designed for teachers with parents in mind.

Use this resource to help students gain practice in the following:

### **Grade 1 Standards—Reading: Informational Text**

#### **Key Ideas and Details**

- Ask and answer questions about key details in a text.
- Identify the main topic and retell key details of a text.
- Describe the connection between two individuals, events, ideas, or pieces of information in a text.

#### **Craft and Structure**

- Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
- Know and use various text features to locate key facts or information in a text.
- Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.

#### **Integration of Knowledge and Ideas**

- Use the illustrations and details in a text to describe its key ideas.
- Identify the reasons an author gives to support points in a text.

### **Next Generation Science Standards—Eight Practices of Science and Engineering**

- 1. Asking questions (for science) and defining problems (for engineering)**
- 2. Developing and using models**
- 3. Planning and carrying out investigations**
- 4. Analyzing and interpreting data**
- 5. Using mathematics and computational thinking**
- 6. Constructing explanations (for science) and designing solutions (for engineering)**
- 7. Engaging in argument from evidence**
- 8. Obtaining, evaluating, and communicating information**

Instant STEM Activities Grade 3  
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As we live in a rapidly changing society, exposure to and fluency in Science, Technology, Engineering, and Mathematics (STEM) ensures that children will gain the skills they will need to succeed in the 21st century. It is essential that children gain practice in becoming good problem solvers, critical thinkers, innovators, inventors, and risk takers.

## Teaching Tips for Parents

### Encourage Topic Interest

Help your child develop an understanding and appreciation of different STEM concepts by providing an area to display topic-related non-fiction books, pictures, collections, and artifacts as a springboard for learning.

### What I Know... What I Wonder... What I Learned... (KWL Chart)

Introduce each STEM unit by asking what your child thinks he or she knows about the topic, and what your child wonders about the topic. Complete this activity as a brainstorming session. Once your child has had a chance to complete the questions, combine the information to create a chart for display. Throughout the study, periodically update your child's progress in accomplishing the goal of what she or he wanted to know, and validate what he or she wondered about and has learned.

## Vocabulary List

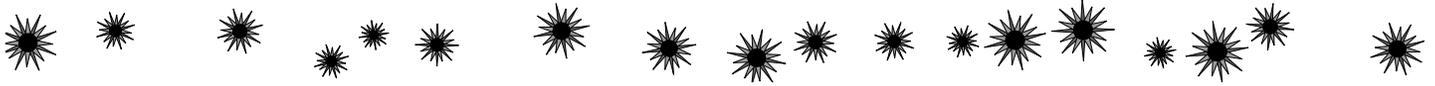
Keep track of new and content-related vocabulary on chart paper for your child's reference. Encourage your child to add words to the list. Classify the word list into the categories of nouns, verbs, and adjectives. In addition, have your child create a personal science dictionary as part of his or her learning log.

## Learning Logs

Keeping a learning log is an effective way for your child to organize thoughts and ideas about the STEM concepts presented and examined. Your child's learning log also provides insight on what follow-up activities are needed to review and to clarify concepts learned.

Some ideas for a learning log include keeping a special notebook, a binder or folder to hold papers, or a scrapbook. A learning log could include the following types of entries:

- Your child's personal reflections
- Questions that arise
- Connections discovered
- Labeled diagrams and pictures
- Definitions for new vocabulary
- KWL Chart



# What Do Plants Need?

Here are things that plants need to stay alive.

**Air:** Plants need air just like you need air. You take in air through your nose and mouth. The leaves and roots of a plant can take in air.

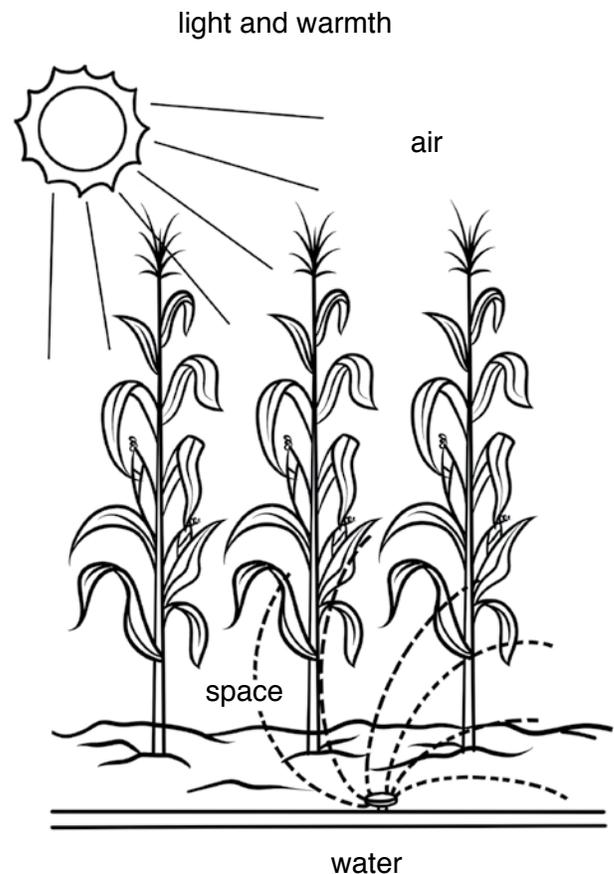
**Water:** All types of plants need water. Plants that grow outdoors get water from rain. Indoor plants need to be watered. Outdoor gardens need to be watered when there is not enough rain.

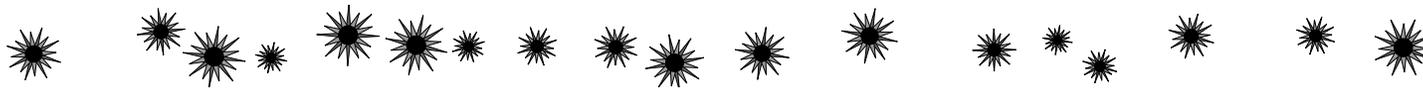
**Light:** Plants use sunlight for energy. Some plants need more sunlight than others. Some plants can grow in shady places. Other plants need a lot of bright sunlight.

**Warmth:** All plants need warmth. Plants in a garden do not grow in winter because it is too cold. Some plants grow well in very hot places, such as deserts. Other plants grow well in places that are warm, but not too hot.

**Space:** A plant needs enough space to grow. A plant's roots need space to spread out in the soil. If too many plants are growing close together, they may not get enough sunlight, water, or nutrients.

On many farms, fields are planted in rows. The space between each row gives each plant enough space for its roots to spread out. The plants are not too close together, so each plant can get enough light.





## “What Do Plants Need?”—Think About It!

1. Some of the things plants need are things that people need, too. In the chart below, write an “X” to show things that plants need and things that people need. The first one is done for you.

	Plants	People
Water	X	X
Time to sleep		
Air		
Soil		
Warmth		

2. Why do many indoor plants grow well near a window?

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3. A large plant will not grow well in a small pot. Explain why.

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4. Name a type of plant that you like. Tell why you like it.

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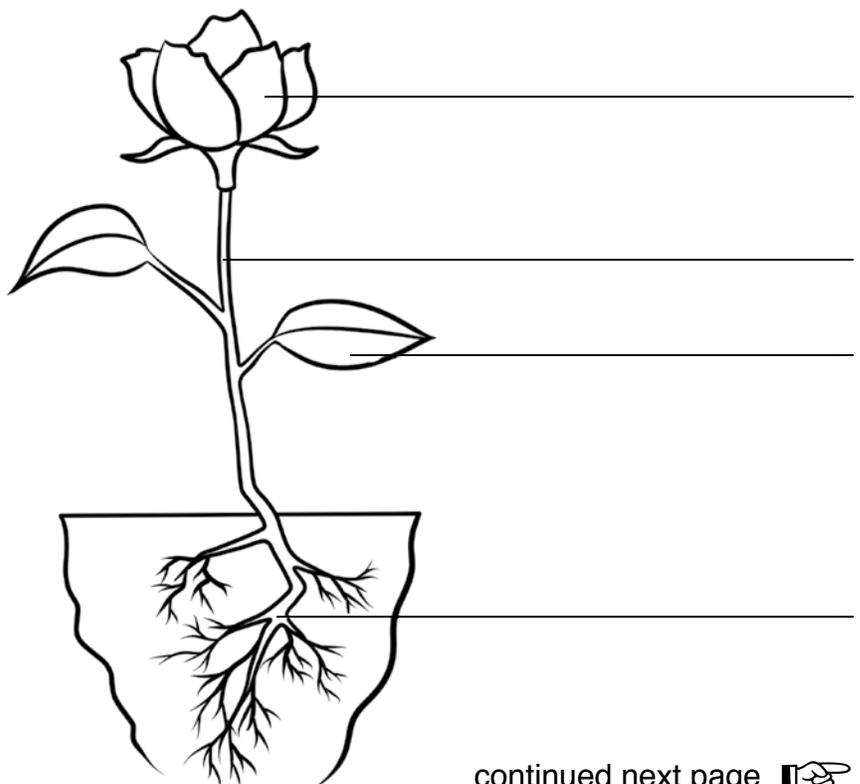
# Parts of a Plant

Read the chart to find out about the different parts of a plant.

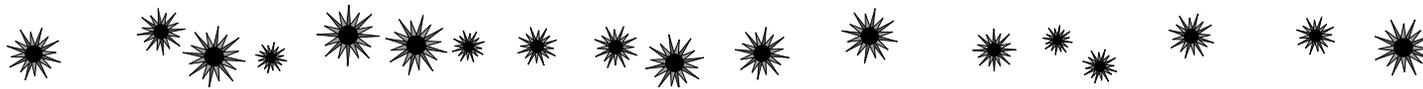
Part of a Plant	What Does This Part Do?
Roots	The roots grow in soil and soak up nutrients and water for the plant. Roots also hold the plant in place, so the wind does not blow it away.
Stem	The stem carries nutrients and water from the roots to the rest of the plant. The stem also holds up the plant.
Leaf	Leaves make food for the plant. Sunlight gives the leaves energy to make food.
Flower	Flowers grow fruit and seeds so that new plants can grow. Seeds are usually inside the fruit. You can see tiny seeds on the outside of strawberries.

## Think About It!

1. Label the parts of the plant.



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## "Parts of a Plant"—Think About It! (Continued)

Answer the plant riddles.

2. Food and water move through me from the roots to the rest of the plant.

What part of a plant am I? \_\_\_\_\_

3. You cannot see me because I grow underground.

What part of a plant am I? \_\_\_\_\_

4. Because of me, a plant grows seeds.

What part of a plant am I? \_\_\_\_\_

5. We are two parts of a plant. Without us, plants would not have food.

What parts of a plant are we? \_\_\_\_\_ and \_\_\_\_\_

6. I am the part of a plant that grows fruit.

What part of a plant am I? \_\_\_\_\_

7. On a tree, I am very tall. On a dandelion, I am short.

What part of a plant am I? \_\_\_\_\_

8. I am the most colorful part of many plants.

What part of a plant am I? \_\_\_\_\_



# Parts of a Flower

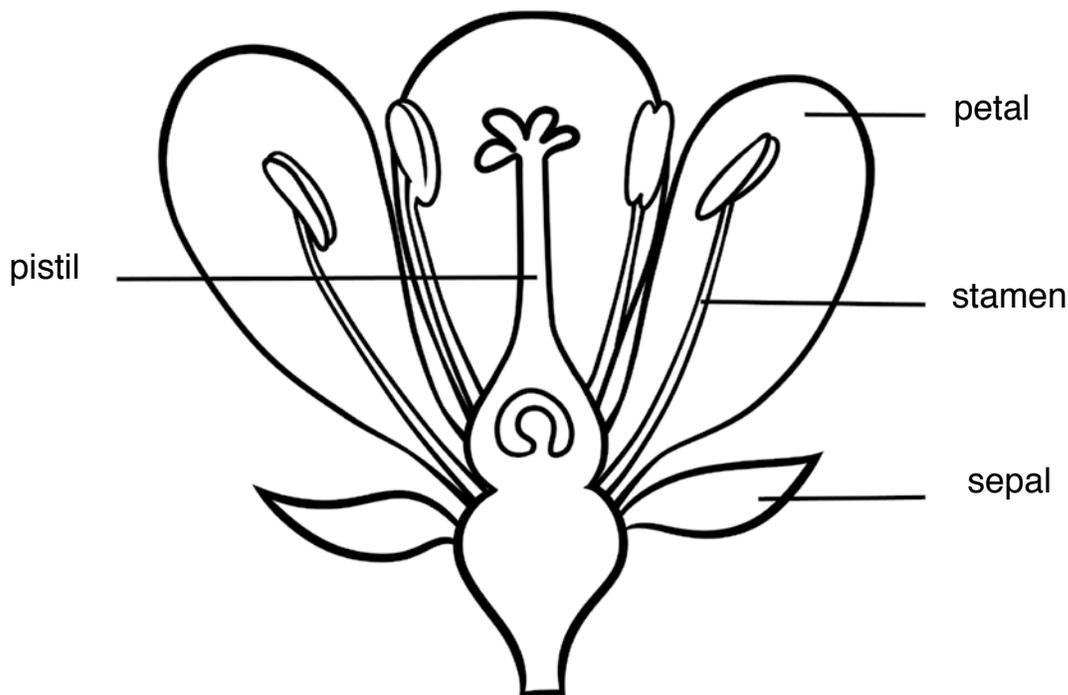
What do the different parts of a flower do?

**Sepals:** A flower starts out as a flower bud. On the outside of the flower bud are small green leaves called sepals. The sepals protect the flower growing inside. When the flower blooms, you can see the sepals at the bottom of the flower.

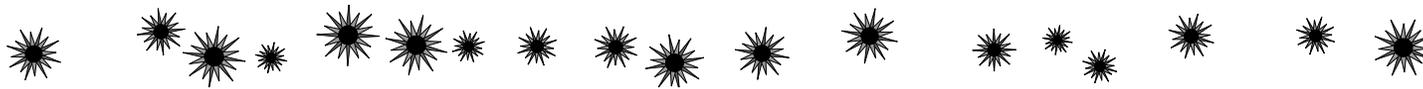
**Petals:** Some flowers have large petals, and some have small petals. The petals are often brightly colored. The petals can make birds and insects want to come to the flower.

**Pistil:** The pistil is in the middle of the flower. At the bottom of the pistil is a thick part where seeds grow.

**Stamens:** The stamens are long and thin. They grow all around the pistil. The top part of the stamen makes a powder called pollen. Pollen from the stamen gets on the top of the pistil. Then a seed grows in the pistil.



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## Making Seeds

A flower makes seeds. Pollen helps make the seeds. Pollen must get from the stamen to the pistil. How does this happen? Wind can blow pollen from the stamens to the pistil. Or, insects can move the pollen. An insect might visit the flower and land on a stamen. Some pollen sticks to the insect's feet and body. That pollen can rub onto the pistil when the insect passes it. Pollination happens when pollen gets on the top part of the pistil.

### Think About It!

1. How many of each part does a flower have? Circle the correct answer.

<b>Petal</b>	one	more than one
<b>Sepal</b>	one	more than one
<b>Stamen</b>	one	more than one
<b>Pistil</b>	one	more than one

2. Fill in the blanks.

Flowers have a powder called \_\_\_\_\_. The powder is on top of a \_\_\_\_\_ . A flower can make \_\_\_\_\_ when the powder gets to the top of the \_\_\_\_\_ .

3. Brightly colored petals can make insects want to come to the flower.

How do insects help flowers?

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# Life Cycle of a Plant

Read about the life cycle of a plant that makes fruit with seeds inside.

1. A seed gets water. A tiny plant pushes out of the seed.



2. A root begins to grow down into the soil. The stem grows up out of the soil. Now the plant is called a sprout.



3. The sprout's stem grows taller and leaves appear. Now the plant is called a seedling.



4. Over time, the plant grows larger. More leaves grow. The plant becomes an adult plant. Now it can grow flowers.



5. Each flower turns into a fruit that has seeds inside. The fruit falls on the ground and rots away. The seeds do not rot. The seeds get buried in the soil and the cycle starts over.



## Seed Facts

A seed always grows into the same type of plant that made it. A seed from an orange only grows into an orange tree.

One plant can make many seeds. Why do plants make so many seeds?

Some of the seeds might not grow into adult plants. Here are two reasons why:

- The seed might fall on rocky ground where it cannot grow.
- The seed might fall in a dry place. It might not have enough water to grow.



## "Life Cycle of a Plant"—Think About It!

1. Label the life cycle diagram. Use the words below.

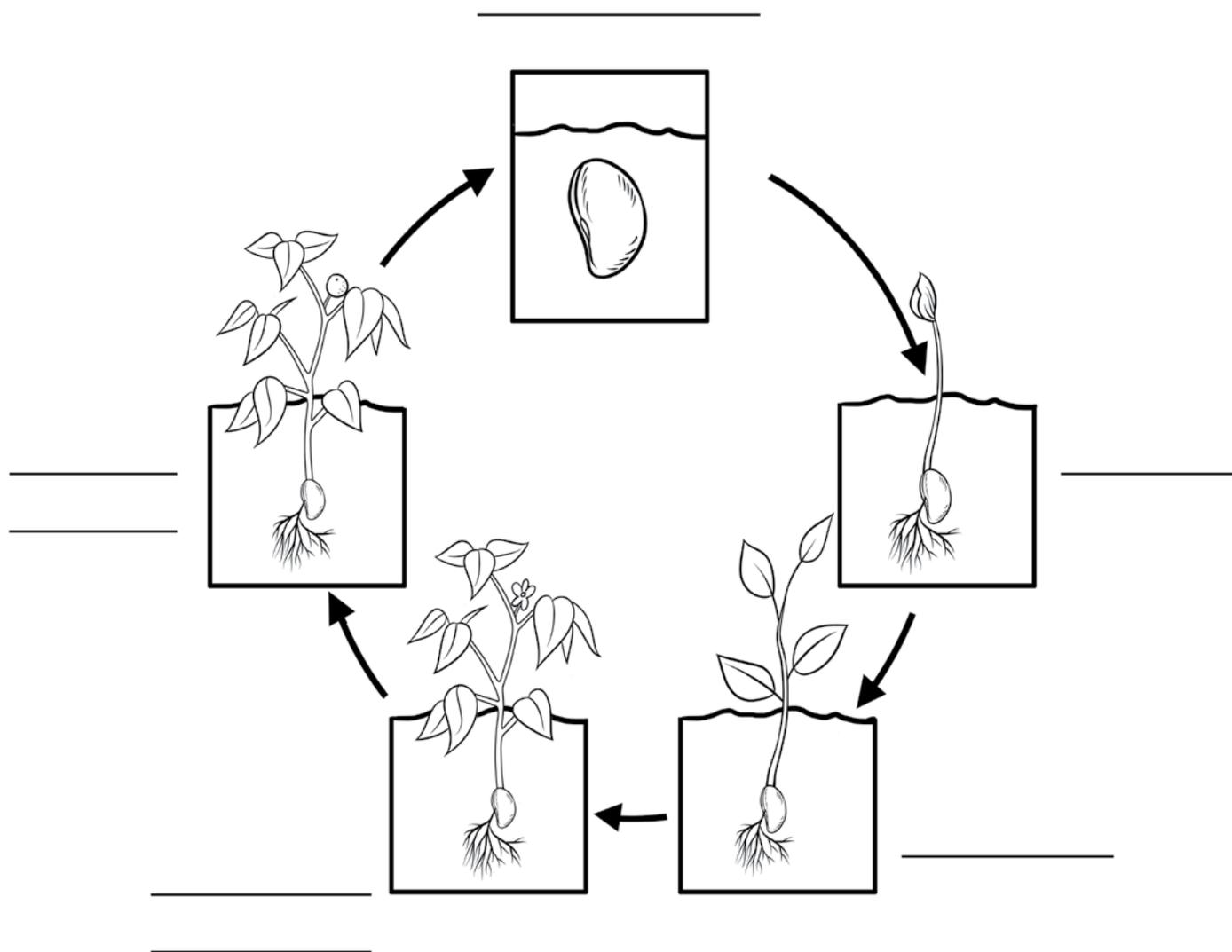
adult plant

seedling

seed

sprout

plant with fruit



2. Tell a partner about the life cycle of a plant. Explain how it makes fruit with seeds inside. Use the diagram to help you.

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