Sunflower STEAM Kit

Teacher Guide

Thank you for participating in the Sunflower STEAM Kit Project this Spring! If you have any questions or need more information, please contact Ellen Messerly at emesserly@LandTrustTN.org.

The Land Trust for Tennessee's mission is to conserve the unique character of Tennessee's natural and historic landscapes and sites for future generations.

Sunflower STEAM Kit

Teacher Guide: Kit Contents

This teacher guide includes instructions and activity ideas to supplement learning as students use the materials provided to grow their own sunflowers.

Materials included:

- Johnny's Dwarf Sunflower Seeds
- Peat pots (5" x 6")
- Field Journals
- Books
- Send-home flyer
- Student Sheet Master Copies (English and Spanish)

Supplies needed:

- Potting soil (one 2 cu ft bag)
- Crayons or markers
- Ruler or measuring tape
- Scissors
- Glue
- Sunny window and water for plant

Activity Guides:

- *Sunflower From Scratch:* Plant your sunflower seeds and discuss what they will need to grow.
- *Growing Tall:* Record and measure observations as your sunflowers grow.
- *Parts of a Plant:* Label the parts of a plant
- *Sunflower Sequence:* Cut and paste Plant Life Cycle
- *Extend the Learning:* Other activity ideas, useful links and resources

Sunflower STEAM Kit

Teacher Guide: Standards

Kindergarten	
Art	K.VA.Cr2.A Through experimentation, build skills in various media and artmaking approaches, using developmentally appropriate craftsmanship.
	K.VA.Cr2.C Create art that represents natural and constructed environments.
Math	K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
	K.OA.A.2 Add and subtract within 10 to solve contextual problems using objects or drawings to represent the problem.
Science	K.LS1: From Molecules to Organisms: Structures and Processes 3) Explain how humans use their five senses in making scientific findings.
Engineering	K.ETS1: Engineering Design 1) Ask and answer questions about the scientific world and gather information using the senses. 2) Describe objects accurately by drawing and/or labeling pictures.
	K.ETS2: Links Among Engineering, Technology, Science, and Society 1) Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions.

First Grade	
Art	1.VA.Cr1.B Use observation and investigation in preparation for making a work of art.
	1.VA.R1.A Compare images that represent the same subject.
Math	1.MD.A.2 Measure the length of an object using non-standard units and express this length as a whole number of units.
Science	1.LS2: Ecosystems: Interactions, Energy, and Dynamics 1) Conduct an experiment to show how plants depend on air, water, minerals from soil, and light to grow and thrive.
	1.LS1: From Molecules to Organisms: Structures and Processes 1) Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants). 2) Illustrate and summarize the life cycle of plants. 3) Analyze and interpret data from observations to describe how changes in the environment cause plants to respond in different ways.
Engineering	1.ETS1: Engineering Design 1) Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.

Sunflower STEAM Kit

Activity Guide: *Sunflower From Scratch*

Time Needed

30 minutes

Grade Level

K - 1

Key Vocabulary

- Seed
- Space
- Nutrients
- Light
- Air
- Water

Materials

- Sunflower From Scratch worksheet
- Pot (5" x 6")
- Soil
- Dwarf Sunflower Seeds
- Sunny spot or windowsill
- Water

Summary

Students plant their own sunflower seeds and identify the five things that plants need to grow.

Teacher Notes

The seeds included in the kit are dwarf sunflowers. They will grow to their full height (approx. 12-18 inches) in the pots provided.

We have provided enough seeds for each student to plant three seeds per pot. This increases the chance of one successfully sprouting. If all three seeds sprout and you feel the pot is crowded, you can trim to one plant.

Dwarf sunflowers take up to 12 weeks to flower.

Procedure

1. Distribute a pot, soil, seeds, and the 'Sunflower from Scratch' Student Sheet to each student.

2. As students follow the instructions for planting their sunflower seeds, ask the students to hold up or point to the item that provides the following plant needs. To make the basic needs of a plant easier you can use the acronym LAWNS:

- **Light**: The sun provides light. Sunflowers like up to 8 hours of sunlight per day!
- **Air:** Plants use the carbon dioxide from the air for photosynthesis.
- **Water:** We will need to water the seeds every 2 to 3 days so they can grow.
- **Nutrients:** The soil provides nutrients that can be absorbed through the roots.
- **Space:** The pot provides space for the plant to grow.

3. After the students follow the steps to plant their seeds, they can identify, write, and color in the needs on their worksheet.

Sunflower from Scratch

Student Sheet NAME: _____

1. Fill your pot with soil. This gives your seeds space to grow and nutrients!

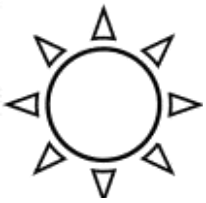
2. Use your finger to poke three small holes in the soil about ½ inch deep.

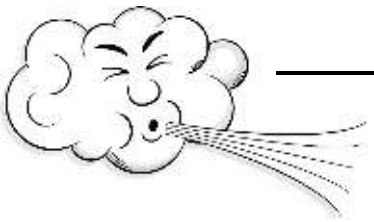
3. Carefully drop one sunflower seed into each hole and cover with soil.

4. Water your seeds when you plant them, then every 2 to 3 days.

5. Place your pot in a sunny spot. It may take up to two weeks for the seed to sprout!

What are the 5 things plants need to survive?

_____ 

 _____

_____ 

 _____

_____ 

Un girasol sembrado por ti

Hoja del estudiante NOMBRE: _____

1. Llena la maceta con tierra de la bolsa. Disuelve los terrones que haya.

2. Haz tres pequeños agujeros en la tierra de alrededor ½ pulgada de profundidad.

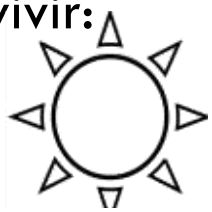
3. Con cuidado, coloca una semilla de girasol en cada orificio y cúbrela con tierra.

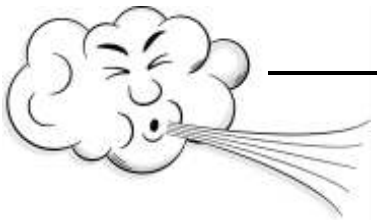
4. Échale agua a las semillas cuando las siembres, luego cada 2 o 3 días.

5. Coloca la maceta en un lugar soleado. ¡Se puede tomar hasta dos semanas para que la semilla germine!

Nombra y colorea todo lo que las plantas necesitan para sobrevivir:

_____





_____

_____

_____

_____

Sunflower STEAM Kit

Activity Guide: *Growing Tall*

Time Needed

30 minutes, once a week

Grade Level

K - 1

Key Vocabulary

- Measure
- Observation
- Height
- Inch

Materials

- Sunflower in pot
- Ruler
- Field Journal
- Optional: Copies of 'Observations' Hand-out

Summary

Students measure their sunflower as it grows over several weeks and record their observations in a Field Journal.

Teacher Notes

This activity should be started once the sunflowers have sprouted. It may take up to two weeks for sunflowers to sprout after planted.

Make a copy of the following two pages for each student to cut and paste into journal if desired.

Procedure

1. Have students write their name on their journal and decorate it with stickers or markers.

2. Students measure how tall their sprout is by holding up a ruler or measuring tape next to their sprout, being careful not to disturb the soil or the sprout with the ruler! Measure from the base to the top of the tallest leaf.

Students may also work in groups or record observations for one 'class' plant.

3. In their Field Journal, students should note the date, draw their observations, and write the current height of their flower.

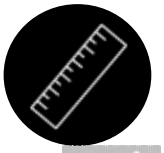
Extensions

"How much did your plant grow?" Students can calculate the *difference* in the height from the last observation by subtracting the last measurement from the current measurement.

Growing Tall

Student Sheet NAME: _____

In this activity, be a scientist and record your observations as your sunflower grows!



After your sunflower sprouts, use a ruler to carefully measure how tall your sunflower is from the base of the stem to the tallest point.

Record your observations in the Field Journal provided. Here is an example of what to write:

DATE: _____

HEIGHT: _____

OBSERVATIONS:

Drawing of your sunflower

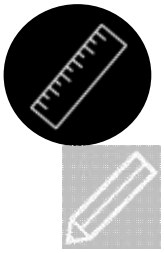
Describe your sunflower in words _____

_____

Crecimiento

Hoja del estudiante NOMBRE: _____

En esta actividad, asume el papel de científico y anota tus observaciones a medida que el girasol crece.



Después que germine el girasol, usa una regla para medir cuidadosamente la altura del girasol desde la base del tallo hasta el punto más alto.

Anota tus observaciones en el Diario de campo que te dieron. Este es un ejemplo de lo que puedes anotar:

FECHA: _____

ALTURA: _____

OBSERVACIONES:

Dibujo de tu girasol

Describe tu girasol con palabras _____

_____

DATE: _____

HEIGHT: _____

OBSERVATIONS:

DATE: _____

HEIGHT: _____

OBSERVATIONS:

DATE: _____

HEIGHT: _____

OBSERVATIONS:

DATE: _____

HEIGHT: _____

OBSERVATIONS:

Sunflower STEAM Kit

Activity Guide: *Parts of a Plant*

Time Needed

30 minutes

Grade Level

K - 1

Key Vocabulary

- Leaf
- Stem
- Roots
- Flower

Materials

- Parts of a Plant worksheet

Summary

Students act out the different parts of a plant, then label the parts correctly on their worksheet.

Teacher Notes

The labels included on the student sheet include roots, stem, leaves, and flower. These are the most basic plant parts that can be identified on a sunflower. Some plants produce a fruit that contains seeds, however sunflowers produce seeds that will be visible on the head of the flower.

Procedure

1. Using a diagram or a real plant, point out the different parts of a plant and ask students if they can help you describe the function of each part. For an extra challenge, have them form the shape of each part as they say them.

   Roots: Absorb water and nutrients and provide stability

   Stem: Supports the plant and carries water and nutrients

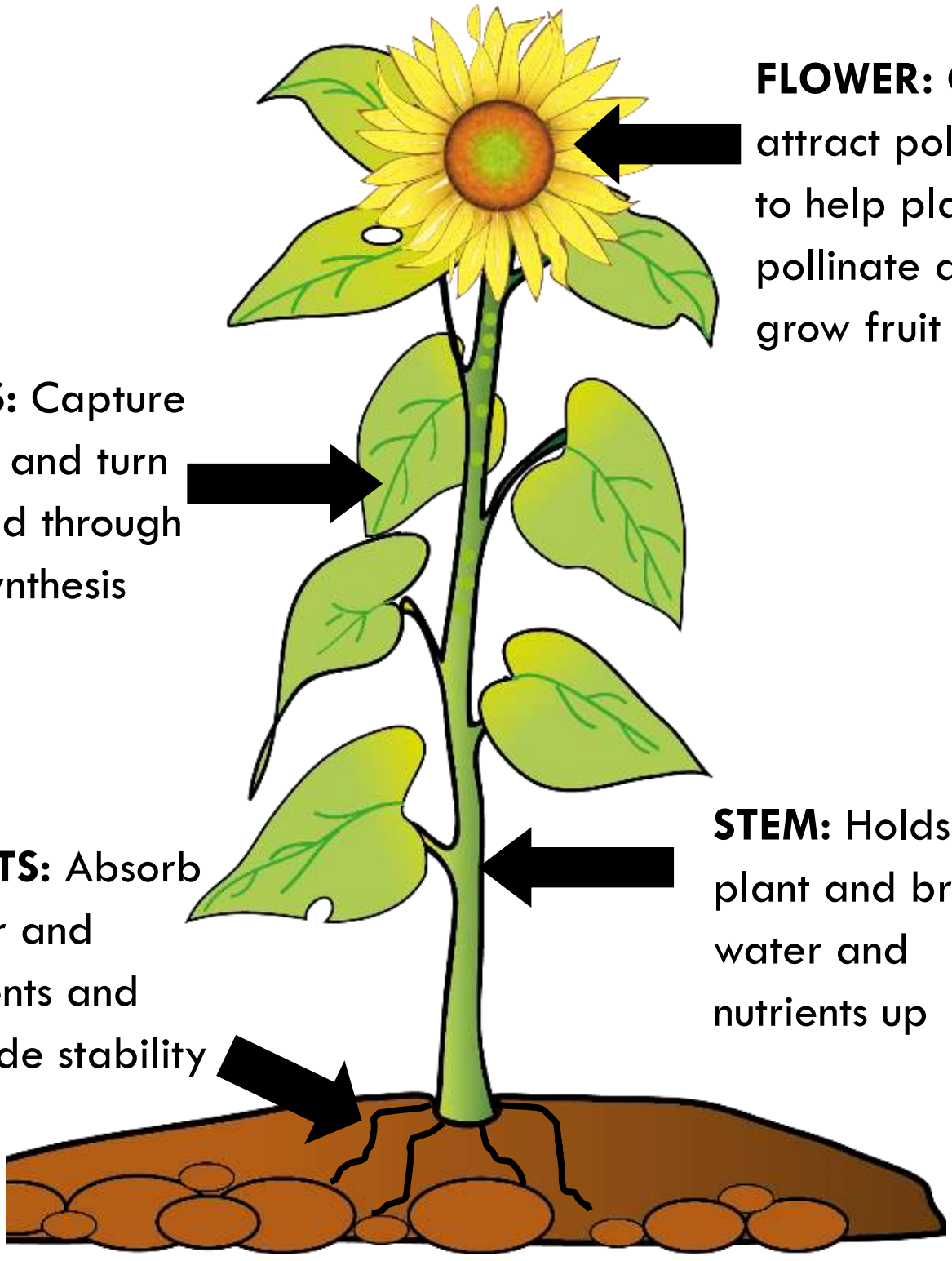
   Leaves: Absorb sunlight to make food through photosynthesis by taking in carbon dioxide and release oxygen

   Flower: Attracts pollinators and produces seeds to grow more plants

Extension

Have students sing "Head, Shoulders, Knees, and Toes" substituting "Flowers, Stems, Leaves, and Roots" while making the shape of each part with their body as they sing!

Parts of a Plant



FLOWER: Colors attract pollinators to help plant pollinate and grow fruit

LEAVES: Capture sunlight and turn into food through photosynthesis

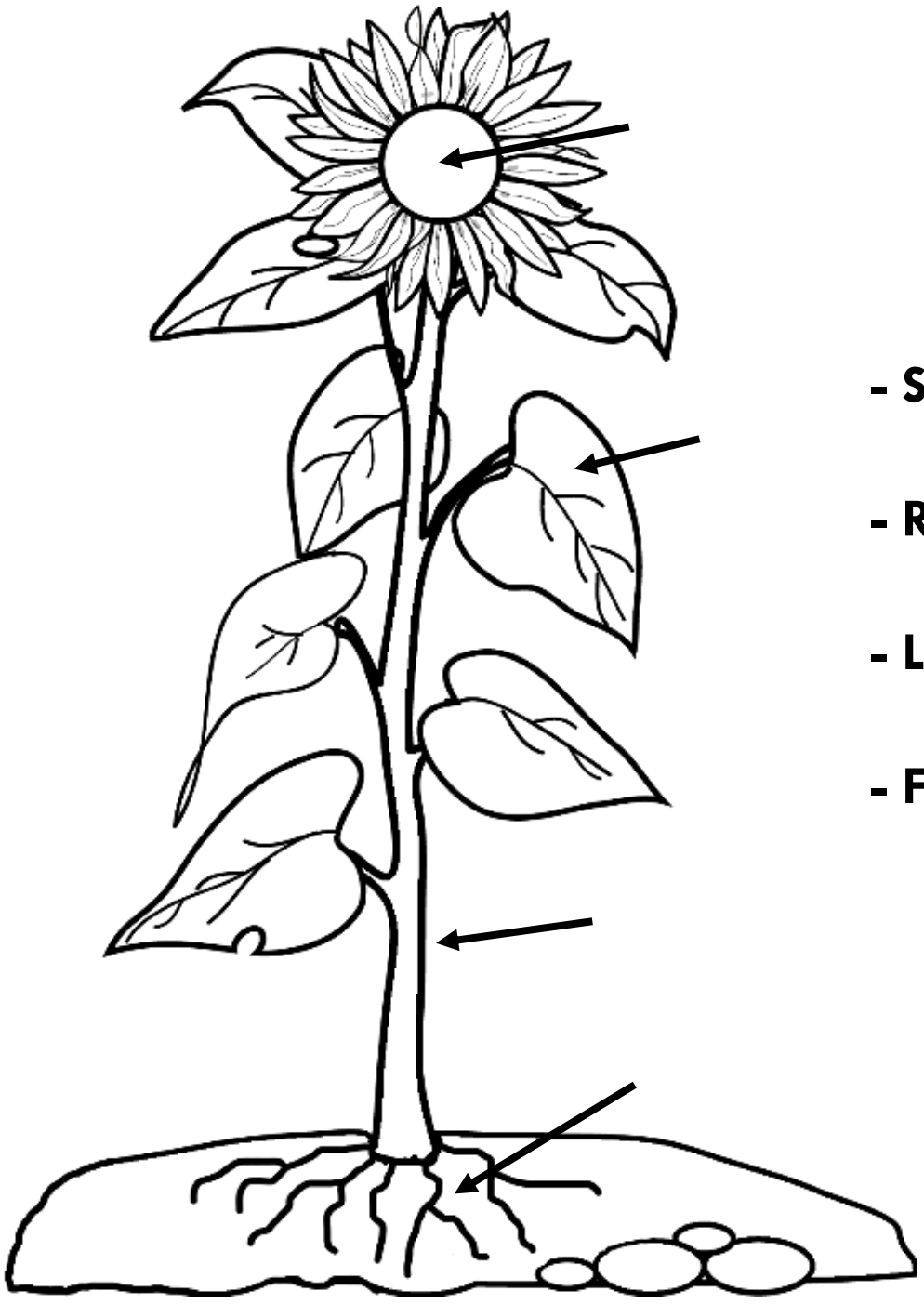
STEM: Holds up plant and brings water and nutrients up

ROOTS: Absorb water and nutrients and provide stability

Parts of a Plant

Student Sheet NAME: _____

Draw a line to connect each word to the correct part of the flower.



- STEM

- ROOTS

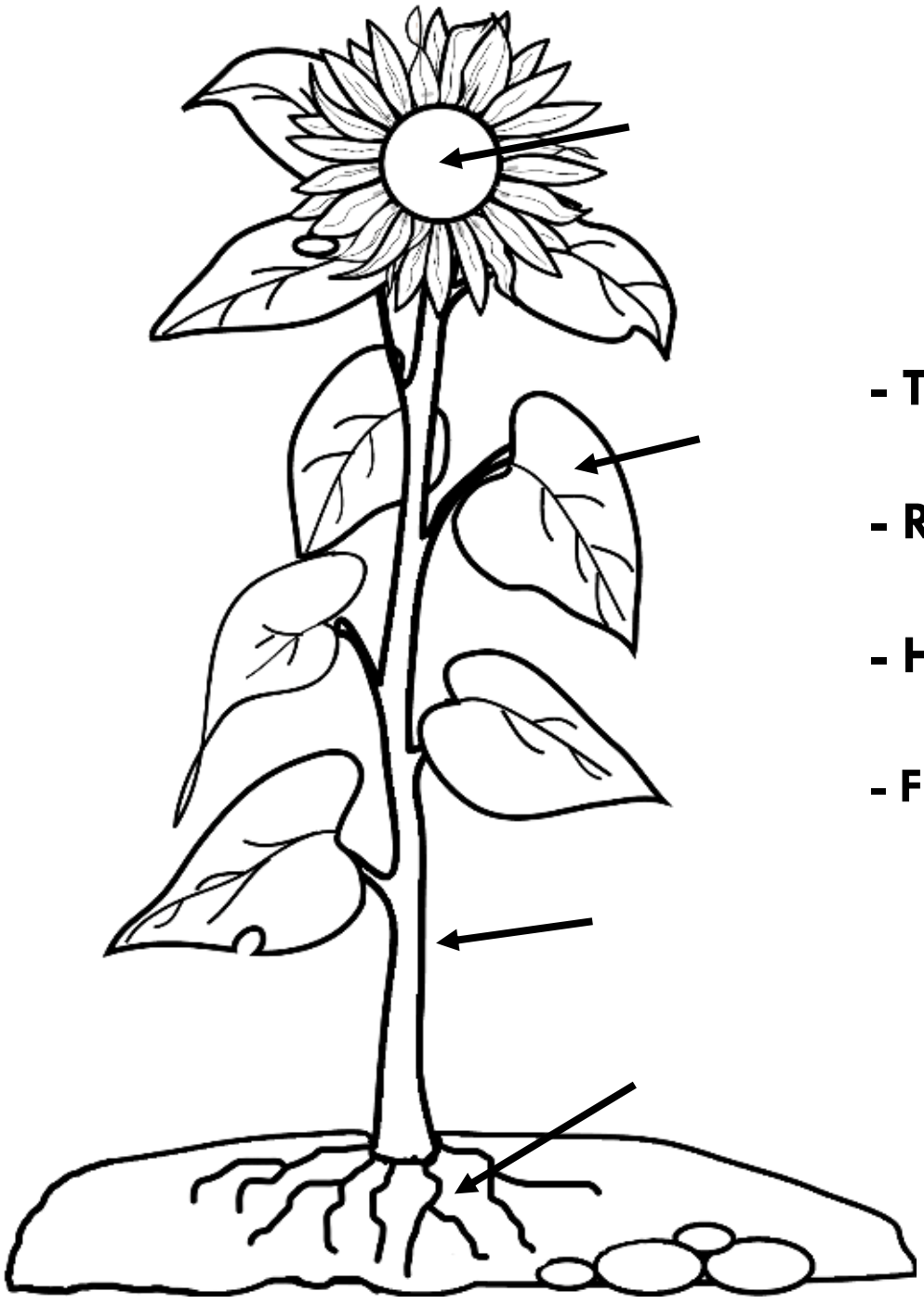
- LEAF

- FLOWER

Partes de la planta

Hoja del estudiante NOMBRE: _____

Dibuja una línea para conectar cada palabra
con la parte correspondiente de la flor.



- TALLO

- RAÍCES

- HOJA

- FLOR

Sunflower STEAM Kit

Sunflower Sequencing

Time Needed

45 minutes

Grade Level

K - 1

Key Vocabulary

- Life Cycle
- Seed
- Sprout
- Plant
- Bud
- Flower

Materials

- Sunflower Sequencing worksheet
- Sunflower Life Cycle Diagram

Summary

Students will name the stages of a plant life cycle as they watch their sunflower grow, then complete an activity to put the stages in the correct order.

Teacher Notes

The next page has a diagram of the Sunflower Life Cycle that can be used to explain the stages of growth of a plant. Ideally, students will identify the stages as their own sunflower grows, but this activity can be completed at any point during the project.

Procedure

1. Using the diagram, tell the story of the plant life cycle, from seed to flower. Students can act it out by crouching down into a ball (seed) that is planted in the ground and growing up into a plant.

2. The life cycle begins again when the seeds fall from the dead flower. Some of these will be eaten by birds and some will fall back to the soil where they will grow a new flower next year!

3. Have students cut out the squares on the bottom half of the Sunflower Sequencing worksheet and glue them in the correct order.

Extensions

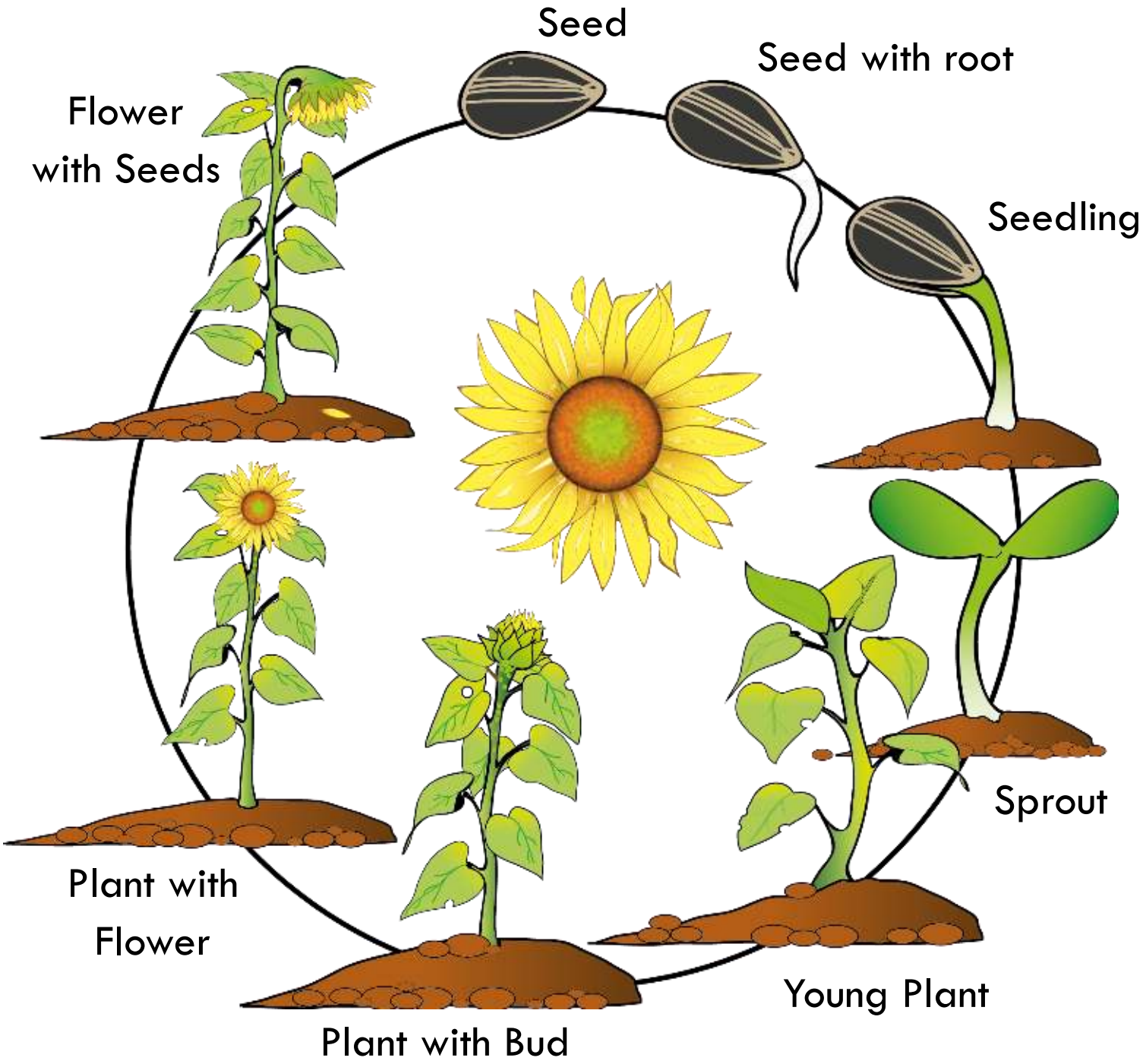
Compare the life cycle of a sunflower to the life cycle of a tomato plant (or other fruit-producing plant such as strawberries, pumpkin, cucumber).

Q: What is the difference?

A: After a flower is pollinated on a tomato plant, it produces a fruit that has the seeds inside of it (instead of the seeds being on the flower itself)!

Sunflower STEAM Kit

Sunflower Life Cycle

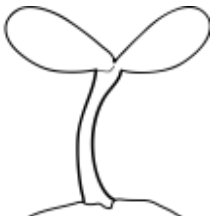


Sunflower Sequencing

Student Sheet NAME: _____

Cut out the pictures of the sunflower life stages, and glue them in the correct order.

1	**2**	**3**	**4**
5	**6**	**7**	**8**

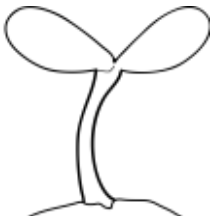
 Young Plant	 Sprout	 Seedling	 Sunflower
 Seed (from Flower)	 Seed with Root	 Bud	 Seed

Secuencia del girasol

Hoja del estudiante NOMBRE: _____

Recorta las imágenes de las etapas de crecimiento del girasol y pégalas en el orden correcto.

1	**2**	**3**	**4**
5	**6**	**7**	**8**

 Planta joven	 Brote	 Semilla germinada	 Girasol
 Semilla (de la flor)	 Semilla con raíz	 Botón	 Semilla

Sunflower STEAM Kit

Activity Guide: *Extend the Learning*

Read a Book Outside:

Your kit includes a book for each student. Foster literacy and a love for the outdoors by taking students outside to read their book on a sunny day.

Grow Your Own Food:

Apply what you have learned about growing a sunflower to growing your own food at home! Students can watch this video to see different ways they can grow plants using food they have in their kitchen right now. Adapted from this blog.

Reduce, Reuse, Recycle:

Discuss the importance of reducing waste! Visit this website for ideas and have your students start a project in your classroom that will help reduce waste in a way of their choice.

Compost:

In the U.S., 30 to 40% of our food supply is wasted! Food scraps are the single largest contributor to landfills. Composting is a way of recycling our food scraps - and creating quality soil for the garden too!

The peat pots included in the kits are compostable - this means you can plant them in the ground or put them in your compost bin and they will turn back into soil. Learn more about composting here and give it a try!