



# BIG GREEN LESSONS

PLANT LIFECYCLE: 3<sup>RD</sup>-5<sup>TH</sup> GRADE

## KEY

### UNDERSTANDINGS

In this lesson, students will...

- understand that each plant has a lifecycle and the plant lifecycle is a continual process.
- Articulate that a lifecycle is a continuous cycle that contains: birth, growth, reproduction, and death.
- Identify plants in the Learning Garden that are at various stages in their lifecycles.

## STANDARDS

### ALIGNMENT

Common Core – English Language Arts

- SL.3.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
- SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- SL.3.4. Report on a topic or text, tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
- SL.3.6. Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
- SL.4.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- SL.4.3. Identify the reasons and evidence a speaker provides to support particular points.
- SL.4.4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
- SL.5.3. Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- SL.5.4. Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.



## Next Generation Science Standards

- 3-LS1-1. Develop a model to describe that organisms have unique and diverse life cycles, but all have in common: birth, growth, reproduction, and death.

## **MATERIALS & PREPARATION**

- Lifecycle of a Plant worksheet – two pages/student (don't print double-sided)
- Scissors
- Glue stick
- Lifecycle of \_\_\_\_\_ worksheet, one per student/student group
- Clipboard or hard surface for sketching and coloring
- Pencils and coloring materials
- Review lesson and familiarize yourself with your Learning Garden
- Optional: supplies for additional Learning Garden activities

## **TEACHER BACKGROUND**

All of the plants that your students will be investigating and observing are considered angiosperms. Angiosperms are a group of plants that include almost every plant you see outside your window, except for conifers and cacti! An angiosperm is classified by their ability to produce seeds that are (usually) fully contained within a fruit. Many times, you may not even know you are looking at the fruit of an angiosperm because their fruit was designed to fly (dandelions), float (coconuts), stick to passers-by (burrs) or be consumed by animals (tomatoes, zucchinis, peppers).

Use the table below to help your students understand which of the crops on their worksheet are roots, fruits, seeds, leaves, stems, or flowers – some of these may even surprise you!

Roots	Fruits	Seeds	Leaves	Stems	Flowers
Carrot	Pepper	Pea	Lettuce	Celery	Broccoli
Beet	Tomato	Corn	Kale	Asparagus	Cauliflower
Radish	Squash	Bean	Spinach	Potato	Squash blossom

**ROOTS:** Roots absorb water and nutrients and along with the stem, provide structural support for the entire plant, anchoring it to the soil. Just like other parts of the plant, the root can serve as an important food crop.

**FRUITS:** Fruits hold and protect a fertilized and mature ovule – also known as a seed. Most seeds are on the inside of the fruit, which gives the seed protection from the surrounding environment. Some



seeds can be found on the outside of the fruit like corn or strawberries. Just like other parts of the plant, fruits can serve as an important food crop.

**FunFact!** Botanically speaking, a fruit is anything that has seeds on the inside. In the culinary world, things like peppers and tomatoes are usually referred to as vegetables. For this lesson, we will be looking at fruits from the botanical perspective, which means referring to peppers and tomatoes as fruits.

**SEEDS:** Seeds, or mature and fertilized ovules, germinate or sprout into baby plants. The seed is made up of three distinct parts: the embryo, which will eventually turn into the baby plant itself; the endosperm, which serves as a food storage area for the seed to use as it first sprouts; and the seed coat, which protects the seed from insects, disease and moisture. Most seeds all have the same structure, but there are always exceptions in science (like orchid seeds, which do not have an endosperm)!

**LEAVES:** Leaves collect sunlight and turn that sunlight into food or sugar for the plant. This process is called photosynthesis. Photosynthesis is also the reason our plants are green, chlorophyll molecules (which gives plants their green color) absorb the energy or sunlight used in photosynthesis! Leaves have broad, flat surfaces – this allows for more surface area to be exposed to the sunlight and helps support a high rate of photosynthesis.

**STEMS:** Stems support the transportation of water, food, and nutrients to the entire plant, in addition to playing a role in overall plant support along with the roots. Stems have three main components: xylem, phloem, and cambium. The xylem and phloem make up the plant's vascular system, which does all of the transporting of water, food and nutrients to the plant. The cambium, located between the xylem and phloem, is the site of cell division, which means this is the site of plant growth. When cells divide, the plant actually gets bigger!

**FunFact!** Above, you will see that the potato has been listed as a stem, even though it grows underground! It is a common misconception that the potato is a root, instead of a stem. Make sure to point this out to your students, as it can be confusing. Botanically speaking, the potato is a tuber, which is an underground enlarged stem.

**FLOWERS:** Flowers support plant sexual reproduction, which is why a flower is the showiest part of the plant. The color and fragrance of flowers, while pleasing to us, is to attract pollinators like bees and butterflies. The flower has two main components, the male pollen



and/or the female ovule. In addition, there are other accessory parts that support plant reproduction like the petals (colorful and fragrant) and sepals (green-based part of the plant that protects the bud).

### **INTRODUCTION**

Welcome students to their garden lesson, and spend time discussing the following introductory questions:

- What is inside a seed?
- What does a seed need to grow?
- Where do seeds come from?

### **CLASSROOM LESSON**

During the classroom portion of today's lesson, students will be learning about the lifecycle of a plant from seed to mature plant and onto the formation of new seeds.

1. Have a student volunteer to read the paragraph on the second page of the Lifecycle of a Plant worksheet aloud to the entire class. Other students can follow along on their own worksheets.
2. Let your students know they will be cutting out the stages of the plant lifecycle below the paragraph and then gluing the lifecycle stages in the correct order onto the first page.
3. Have your students work to complete the Lifecycle of a Plant worksheet.
4. When students have completed the worksheet, review the correct order and identify each stage.
5. In preparation for the Garden Activity, ask your students to think about the question, "Where do seeds come from?"

*Break here if completing this lesson in two sections.*

### **GARDEN ACTIVITY**

Welcome your students to the Learning Garden and line students up along one side. Stand on the opposite side of the Learning Garden so you can address the entire group. Ask students if they know what they will be doing in the Learning Garden today. Let them know that they will be continuing to learn about the plant lifecycle!

**NOTE:** As the teacher, be aware of poisonous plants and other hazards in and around your Learning Garden and review those concerns with students. Review any additional rules for the Learning Garden. Query students about known bee/wasp sting allergies before going into the Learning Garden.

1. Remind your students of the question posed at the end of the classroom lesson: "Where do seeds come from?"
2. Ask students to recall the last step (Step Five) in the plant lifecycle: a mature plant with flowers. Let students know that



flowers turn into fruits and most fruits have seeds on the inside.

3. Invite students to walk around the Learning Garden and hunt for plants that have seeds on the inside. Give your students 3-5 minutes to look around the garden. Once they are finished, gather them back to where you introduced the activity. Have students list the crops growing in the Learning Garden that have seeds on the inside. Students should note crops like tomatoes, peppers, cucumbers, etc.
4. Ask students if a tomato is a fruit or vegetable. Most students will refer to a tomato as a vegetable. Explain that botanically speaking, a fruit is any plant with seeds on the inside. In the culinary world, crops like peppers and tomatoes are usually referred to as vegetables.
5. Once finished introducing the concept of fruits vs. vegetables, let students know that using all of the knowledge they have, they will sketch the lifecycle of a plant growing in their Learning Garden.
6. Have students work individually or in pairs. Encourage students to use their imagination. Remind students that the plants they are observing are at one specific stage in their lifecycles. They will have to use their knowledge and creativity to imagine what that plant looks like at the other stages of its lifecycle.

### **CONCLUSION**

Have students share key parts of the day's lesson and review the Key Understandings.

### **ADDITIONAL LEARNING GARDEN ACTIVITIES**

Extend your Learning Garden experience and have students participate in any of the following activities as appropriate:

- Planting
- Watering
- Weeding
- Harvesting

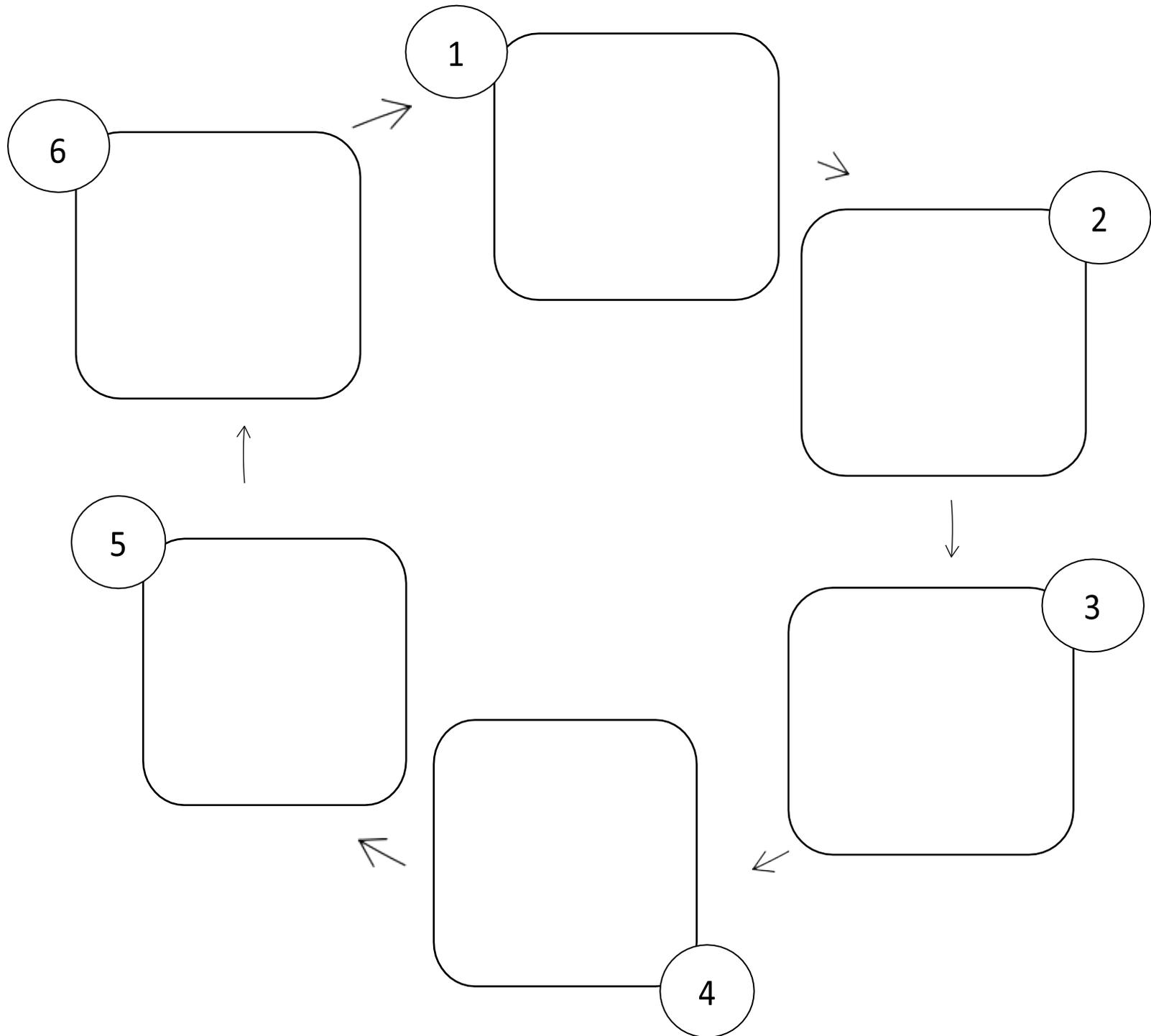


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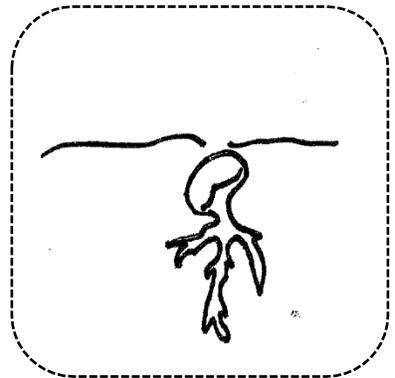
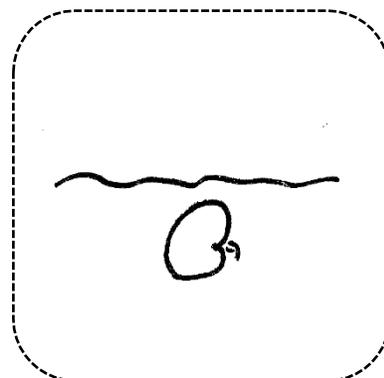
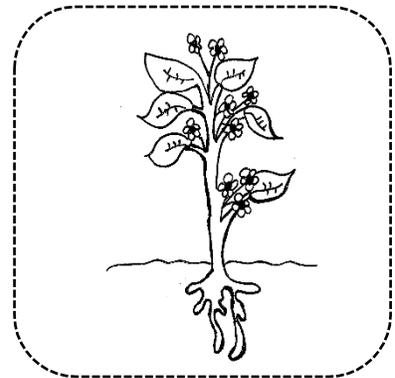
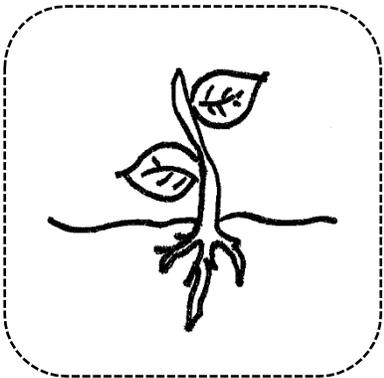
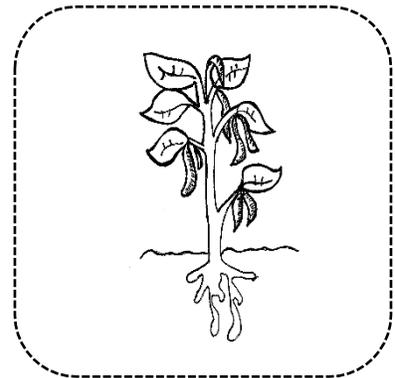
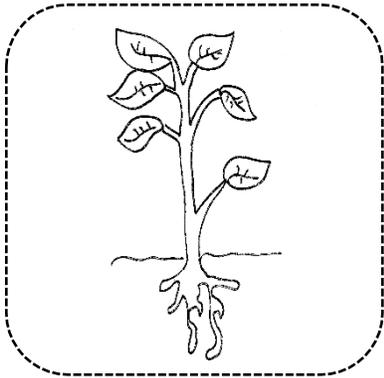
## Lifecycle of a Plant

Cut out the lifecycle stages and glue them in the correct plant lifecycle order.



## Lifecycle of a Plant

A plant starts out as a seed which is planted in the soil. As it rains, or as you water your seed and the sun warms up with soil, the protective seed coat breaks open and the seed begins to grow roots underground. Once the seed has grown roots in the soil, a stem with leaves will push its way above the ground. After the plant has grown roots and leaves, it will continue to grow both above and below ground. Eventually, as the plant gets bigger and stronger, the plant will start to grow flowers. Those flowers will produce a fruit that will hold new seeds. The process starts again when a new seed is planted, and the lifecycle continues.



Lifecycle of: \_\_\_\_\_

Write the name of the plant you will be sketching above. Below sketch out the different stages of the lifecycle. If you are finished early, you can start to color in your lifecycle stages.

