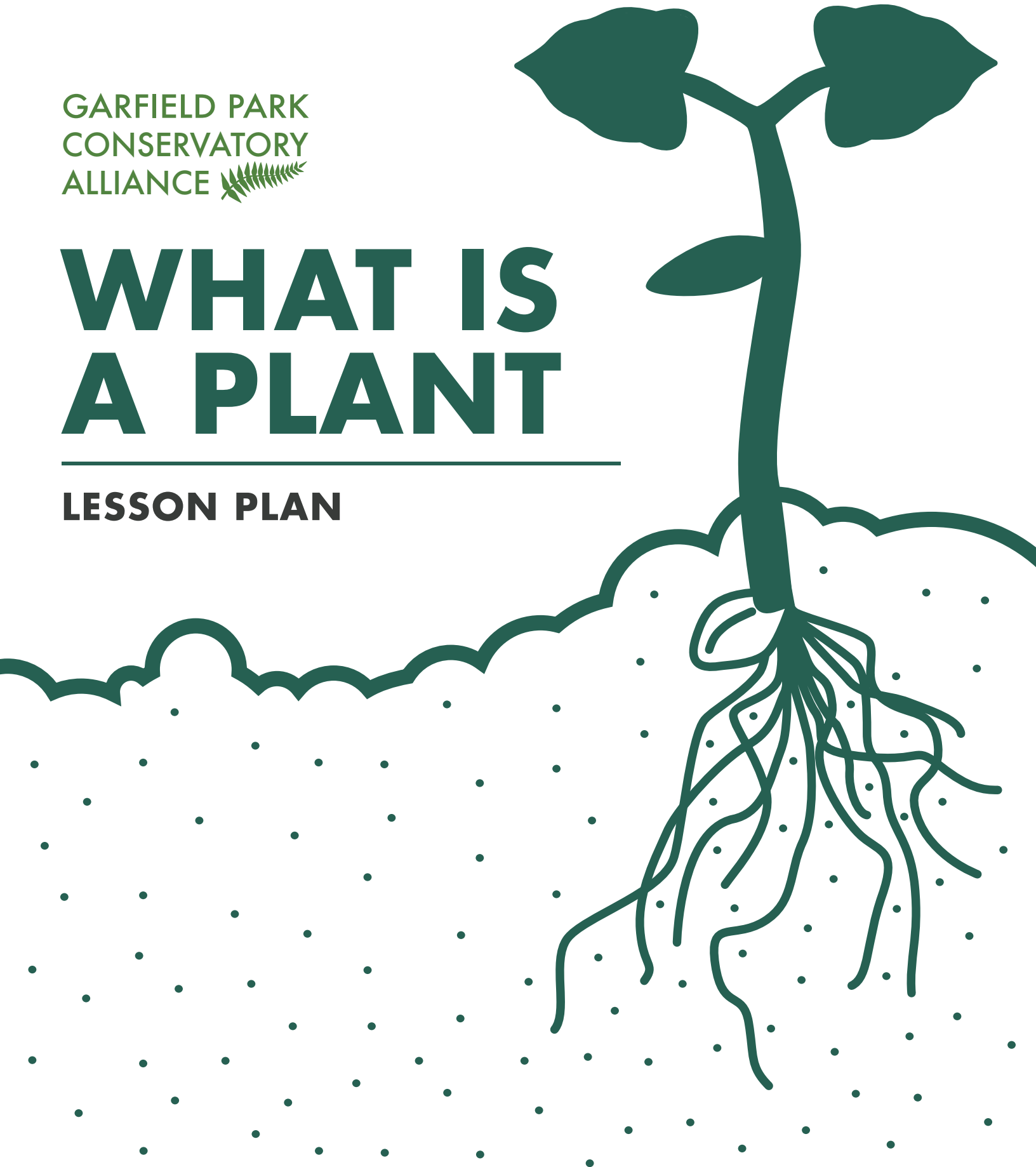


GARFIELD PARK
CONSERVATORY
ALLIANCE 

WHAT IS A PLANT

LESSON PLAN



What is a Plant?

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Topic/Focus: Basic plant structure and function; Intended for grades 3-5

Lesson Duration: 65 min

Objective(s): SWBAT describe the structure and function of the different parts of a plant, and will be able to articulate how these parts interact.

NGSS Standards: 3-LS3-2, 4-LS1-1, 5-LS1-1

Vocabulary: Root, stem, leaf, flower, seed, fruit

Materials: Post-its, butcher paper, real plant or plant photo, Who's Coming to the Plant Party?, Intro to Plants guidebook

Advance Prep: Gather post-its, writing utensils, and butcher paper so they are ready and easily accessible for the Explore activity. Make copies of plant part handout.

TEACHER BACKGROUND INFO

Plants are the foundation of all ecosystems. Without plants, there would be no life on Earth, as plants are the only things that can harvest energy from the sun to make food. We rely on plants for food, oxygen, shelter, tools, medicine, and more. The incredible diversity of plants supports all of our needs.

Plants are often multicellular, eukaryotic, photosynthesizing organisms. In other words, they are made up of more than one cell, are made of complex cells, and make their own food using energy from the sun. This definition is so broad because plants are extremely diverse. For example, not all plants make their own food. A Venus fly trap catches insects and eats them alive, just like we eat food! Some plants make their own food without using the sun, so technically they are not performing photosynthesis. These plants live at the bottom of the ocean near big vents that emit gases; the plants here use the chemicals from the gases to make food in a process called chemosynthesis. Typically, though not always, plants all contain similar structures: roots, stems leaves, flowers, fruit, and seeds.

Roots: In most cases, roots absorb water and nutrients from the soil. They also help plants stabilize and they provide support for the plants' weight. The roots grow deeper into the soil as the stem grows taller above ground—the taller the stem grows, the deeper the roots of a plant will extend.

Stems: Plants transport water, nutrients, and sugars (created by photosynthesis) from one part of the plant to another. Stems also aid in supporting the height and weight of the plant.

Leaves: Leaves are essential to the survival of green plants, as they are responsible for photosynthesis. They also mediate the absorption and release of gases and water above ground. Photosynthesis is the process by which green plants take energy from the sun, carbon dioxide, and water, and create glucose and oxygen.

Flowers: As beautiful as they can be, flowers serve a very important purpose: reproduction. Their petals and nectar will attract pollinators to the flower, where the pollinator will unwittingly brush against pollen from the flower while it is drinking the flower's nectar. Then, when the pollinator travels to a different flower, the pollen from the first flower will fall off the pollinator and pollinate the second flower. Fertilization can then occur, and new fruit and seeds can grow.

Fruit: Varying in size, shape, and color, fruit forms after fertilization takes place. Fruit is important because it helps the plant disperse, or spread, its seeds! When animals eat fruit, they often swallow the seeds. Later on, when they have traveled some distance away, they expel the seeds from the fruit in their waste. This is how new plants can grow far away from the original plant!

What is a Plant?

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ENGAGE (5 MIN)

In small groups, students will discuss:

- What do all plants have in common?
- Do all plants make flowers?
- Do all plants have roots?
- How do you know that plants are alive?
- Which part of the plant do you think is the most important? Why?

EXPLORE (15 MIN)

Distribute post-its to students, placing extra post-its in the center of the table.

- Students will quietly and individually brainstorm as many plants as they can think of and write down one plant per post-it. Set a timer for 2 minutes.
- Assign students to small groups. The group will place all of their post-its on a sheet of large chart paper.
- Students will rotate to a different team's paper. Once at the new paper, the team will divide the post-its into categories, without speaking.
 - ▶ If students are confused, you can make the following analogy to help them: If given a bin of school supplies, one might organize the supplies into writing utensils, notebooks, binders, etc.
- Students will return to their chart paper and be prepared to discuss the following:
 - ▶ Do you agree with the way the other team sorted your post-its?
 - ▶ If Martians came to planet earth and wanted to know what a "plant" was, what would you say?
 - ▶ The group will decide on a definition of the word "plant".

EXPLAIN (20 MIN)

Have students brainstorm questions they have about plants. These questions can be about plant parts, plant functions, etc. Then, have them do research to help answer some of their questions either individually, in pairs, or in groups. The University of Illinois Extension Program has a great interactive resource called "The Great Plant Escape" that students can use. They can also do their own searches. Students can record their findings in a science journal or a poster. You can also have them answer and discuss the following:

- Why is it difficult to define what a plant is?
- How do plants make their own food?
- What are some structures that most plants have and what are the functions of those structures? Show students a real plant (or a picture of a real plant if you do not have a real one) and point out these components.
- How do these structures vary depending on where the plant lives? Compare plant structures of plants from different places using our Intro to Plants Guidebook (accessible online)!
Suggestions of plants to compare:
 - ▶ Leaves of the Formosa palm v. spines of the chin cactus
 - ▶ Stem of the papyrus v. stem of the totem pole cactus
 - ▶ Roots of the sensation peace lily v. roots of the lobed aroid

What is a Plant?

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EXTEND (20 MIN)

Students will debate about what plant part is the most important.

- Give all students the handout "Who's Coming to the Plant Part Party?". Individually, students will read and fill out the accompanying questions.
- In their small groups, students will come to a consensus about which plant part they think is the most important and why. They should be prepared to present their position to the rest of the class.
- Come back together as a class. Have each group's representative state their group's position. Open up the discussion to the whole class and take a vote to decide which plant part "wins."
- After the vote, make sure to discuss that in reality, all plant parts are important for a plant's survival, and it is the different parts working together that enables plant survival, just like in a person (you can argue that the brain is "more important" than the heart, but really, the two work together to keep us alive).

EVALUATE (5 MIN)

On an exit slip, students will answer the following:

- Pick a plant part (roots, stem, leaf, flower, fruit, seed). What is a body part that you have that does the same job as the plant part you chose? Explain what the plant part and body part have in common, and write one difference between the two.

RESOURCES

The Great Plant Escape:

<http://extension.illinois.edu/gpe/index.cfm>

Who's Coming to the Plant Party?

Intro to Plants Guidebook:

https://garfieldconservatory.org/wp-content/uploads/2018/07/R_SCHOOLS18_IntroToPlantsGuidebook.pdf

Supplement this lesson plan with a visit to the Garfield Park Conservatory, where you can learn about different plant parts and see them for yourself, with the help of our amazing resources! Register your group at <https://garfieldconservatory.org/group-visits/school-field-trips/>.

Who's Coming to the Plant Part Party?

The Sun is hosting a Plant Part Party, but lost the names of the plant parts who are attending! Below, read about each plant part (stem, seed, etc.) that is coming to the Plant Part Party. Can you help the Sun figure out who is who? Once you do, write down in your own words how that plant part helps the plant!

I am green! When you find me on trees, you will see me turn different colors and fall to the ground during autumn. I use energy from the sun to make food for the plant.

Who am I? _____

How do I help the plant? _____

I am shy and do not like to come above the ground. I prefer to stay underground in the soil! That is where I can get water and nutrients for the plant. Even though you can't see me, I also help the plant stay standing up.

Who am I? _____

How do I help the plant? _____

I am the most beautiful party guest! I can be many colors and I often smell sweet. But I am also important for the plant. When birds and insects come to drink my nectar, they spread my pollen around to my friends. This helps new plant parts grow!

Who am I? _____

How do I help the plant? _____

I am tiny but mighty! Even though I am small, I have a big job. When I am planted in the soil and am given enough water, I will grow a whole new plant!

Who am I? _____

How do I help the plant? _____

I am usually the longest part of the plant and I have two jobs: I help the plant stand up straight and tall, and I bring water and nutrients to different parts of the plant.

Who am I? _____

How do I help the plant? _____

I am a very popular plant part because many people and animals like to eat me! Little do they know that when they eat me, they are also eating another important plant part. When they poop, they will poop out that plant part and then new plants can grow!

Who am I? _____

How do I help the plant? _____

Which plant part do you think is most important for the plant? Why do you think so? Feel free to use the back of this page if you need more room!

