# Parts of a Plant

## Habitat Lab Field Journal Activity Lesson Plans & Resources

**Online Lesson Plans & Resources available on the Alabama Wildlife Federation website**

Students will explore the habitat lab to find a plant with a flower, and then they will draw it, label its parts, and answer questions about how its internal and external structures help the plant survive, grow, and reproduce.

**Materials:** Copies of the "Parts of a Plant" Field Journal Activity Page, Clipboards, & Pencils

**Duration:** Intro Discussion – 30 min. | Outdoor Exploration – 20 min. | Review Observations – 30 min.

## STEP 1: Engage through Discussion

The background information and questions below can be used to help introduce the topic, engage the students, and build a foundation to discuss the topic:

### Background Information (online as a Word Doc or PDF)

The internal and external structures of plants serve specific functions and they work together as part of a system to support survival, growth, behavior, and/or reproduction:

**Roots:** Just like us, plants need to take in water and nutrients (food) to stay alive. Of course, plants don't have mouths to eat and drink, so they draw nutrients and moisture in through their roots. Tiny root hairs stick out of some roots, helping in the absorption. Because roots have the ability to spread throughout the soil, they anchor the plant to the ground. This prevents the plant from getting whisked away when the wind blows or the rain water runs. The roots also store food for the plant for future use. Sometimes we eat these roots such as a carrot.

**Stem:** The stem is the stalk or trunk of a plant. Like the roots, stems also help the plant survive. They act as the plant's plumbing system, conducting water and nutrients from the roots and leaves to other plant parts. Stems can be **herbaceous** like the bendable stem of a daisy or **woody** like the trunk of an oak tree. The stem or trunk provides support for the branches and leaves in heavy winds and rain. Inside the stem are tiny tubes/capillaries called xylem and phloem. **Xylem** transports water from the roots to the rest of the plant, while **phloem** transport sugars and other minerals from the leaves to other parts of the plant.

**Leaves:** Most plants' food is made in their leaves. Leaves are designed to capture sunlight which the plant uses to make food through a process called photosynthesis. In addition, leaves take in carbon dioxide that the plant needs to survive, and then they release oxygen into the environment.

**Flowers:** Flowers are the reproductive part of most plants. Flowers contain pollen on the stamen or "male parts" of the flowers, and tiny eggs called ovules in the pistil or "female part" of the flowers. The color, smell and nectar of the flowers attract bees, butterflies and other pollinators that help spread the pollen from one flower to the ovules of another flower. After pollination of the flower and fertilization of the ovule, the ovule develops into a fruit. The fruit provides a covering for seeds that can be fleshy like an apple or hard like a nut. The seeds contain the genetic information to create new plants.

**Thorns & Other Adaptations:** In addition to the internal and external structures in a plant, plants also survive throughout time by adapting. For instance, think about a plant that is in the forest. If deer or other herbivores like eating this plant, then the plant might have limited growth or be unable to reproduce.

However, if this plant developed thorns then the plant has a greater chance of survival to grow and reproduce. Plants have a wide variety of adaptations to help them survive.

**Example Discussion Questions & Answers** (online as an Interactive PowerPoint or PDF)

**Q:** What do plants need to survive? What do they need to grow and reproduce?
**A:** *Just like us, they need food, water, air, and sunlight. Plant food can be found in the soil as minerals and nutrients. Water can be provided by rain fall or by us. Air is made of the gases that are all around us but we cannot see. Sunlight comes to us from the sun, and it provides the energy plants need to grow*.

**Q:** How do plants get food? Do they go to the store?
**A:** *No, plants can actually produce (or make) their own food using a process called photosynthesis. Plants store energy from sunlight in their leaves, and the cells inside their leaves convert the energy into sugar (food) using water from the soil and carbon dioxide from the air. The leaves release oxygen into the air.*

**Q:** How do plants get the water from the soil?
**A:** *The roots of a plant grow under the ground and absorb water and minerals*.

**Q:** What are other ways that roots help plants?
**A:** *They provide an anchor or support system in the soil to keep the plants from washing away or blowing over. They also help store plant sugars (food) that are made through photosynthesis.*

**Q:** How does the water get from the roots to the rest of the plant?
**A:** *Vascular tubes/capillaries (like straws) in the trunk, stems and roots called xylem help transport the water. As water evaporates from the leaves other water molecules are pulled up through the tubes, causing the roots to absorb more water*.

**Q:** How is the food transported to the rest of the plant?
**A:** *Vascular tubes/capillaries (like straws) in the trunk, stems and roots called phloem help transport the food produced from photosynthesis in the leaves to other parts of a plant such as the roots and stems. The phloem carries important sugars and minerals. Sap within the phloem simply travels by diffusion between cells and works its way from leaves down to the roots with help from gravity*.

**Q:** How are xylem and phloem different?
**A:** *Xylem carries water UP from the roots, while phloem transports sugars and minerals DOWN from the leaves to the rest of the plant. (Mnemonic tool to help you remember: xYlem goes "high" & phlOem flows "low")*

**Q:** What is the purpose of a plant's flower?
**A:** *A plant produces a flower to help it reproduce and create new "baby" plants. Plants require a male and female of the same species to reproduce. The male and female parts of a plant are found in its flower. The male part is called the stamen while the female part is called the pistil.*

**Q:** Do all flowers have a stamen and a pistil?
**A:** *Some flowers have both, but some only have a stamen and other may only have a pistil.*

**Q:** How do the stamen and pistil help a plant to reproduce?
**A:** *(1) The stamen (male part) produces pollen—the yellow, sticky powder in the center of the flower. (2) Then the pollen is transferred to the pistil (female part) where it fertilizes the tiny eggs called ovules. (3) Each ovule develops into a seed that contains a tiny plant called an embryo which can grow into a new plant when soil moisture and temperature are good for germination.*

**Q:** How does the pollen get from the stamen to the pistil?

**A:** *Plants use the colors, smells and nectar in their flowers to attract animals like bees, butterflies, and other insects to transfer pollen from plant to plant and flower to flower. This process is called pollination. These animals that help move the pollen are called pollinators.*

**Q:** Why do all plants have similar internal and external structures like the roots, stem, leaves, and flowers?
**A:** *They exist to assist the plants so that they can survive, grow, and reproduce*.

**Q:** Where can we observe different types of plants in our habitat lab?
**A:** *We can look for wildflowers, trees, grasses and bushes in the gardens and habitat areas*.

## STEP 2: Explore with Literature

These books can be used to further explore the topic with your students:

- *Amazing Plant Powers: How Plants Fly, Fight, Hide, Hunt & Change* by Loreen Leedy *(ISBN:* 978-0823422562)
- *From Seed to Plant* by Gail Gibbons *(ISBN:* 978-0823410255) **STEP**

## 3: Explain using Technology

This video can be used to further explain the topic to your students

- PBS's Think Garden: Plant Structure (2:52 min) https://www.pbslearningmedia.org/resource/5dea21b4-6c92-46ff-982c-8650f9429c01/thinkgarden-plant-structure/#.Wp2GmOjwY2w

## STEP 4: Elaborate with a Field Investigation in the Habitat lab 

The Habitat lab Field Journal Activity Observation Page(s) allow students to apply what they have learned as they investigate and record their real-world observations in their field journals. Before you go outside, don't forget to review the activity instructions and your Habitat lab Rules:

- Habitat lab Activity Tip**:** As students explore the habitat lab, they can identify how different plants have different types of flowers, stems, leaves and roots that all function to support survival. Make sure students know that plants include grasses, wildflowers, bushes & trees.
- Activity Instructions: Ask students to complete page 1 of the Activity Pages before going outside…OR…use page 1 as an Assessment after the activity. Then take students to the habitat lab to find a plant with flowers on it, draw a picture of the plant, and then label its parts including its flowers, leaves, stems, roots, phloem, and xylem. Then they should answer the questions about the plant's external structures.
- Example Habitat lab Rules: The habitat lab is not a playground, so do not run and do not climb on anything. Remember that the habitat lab provides habitat (a home) for local wildlife, and you should not damage the local wildlife habitat. Therefore, do not pick up wildlife, plants, flowers or rocks. Also, do not feed wildlife.

## STEP 5: Review and Assess

Review and assess the students' observations and answers on their observation pages. As an assessment, have students use iPads to research and then draw a picture of a native Alabama plant and label its parts…OR..use page 1 of the Activity Pages as an Assessment.

|  **Alabama Course of Study Standards for Fourth Grade** |
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| **Language Arts (2016):** 12.) Explain the relationships or interactions between two or more scientific concepts.<br>13.) Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a Grade 4 topics.<br>16.) Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.<br>23.) Write informative or explanatory texts to examine a topic and convey ideas and information clearly. |
| **Science (2015):** 9 ) Examine evidence to support an argument that the internal and external structures of plants (e.g., thorns, leaves, stems, roots, colored petals, xylem, phloem) and animals (e.g., heart, stomach, lung, brain, skin) function to support survival, growth, behavior, and reproduction. |