



## The Active World of PLANTS!

**Grade:** 3<sup>rd</sup>

**Subject:** Science

**Time Required:** 45 Minutes

**Setting:** Indoors or outdoors

**Materials:**

- Provided photos (see additional document)
- Yarn
- Scissors

**Objectives:**

Students will 1) identify different parts of a plant, 2) recognize what a plant needs in order to grow and survive, 3) demonstrate how non-native invasive plants can be harmful to native plants, and how a plant responds to different stimuli.

**Vocabulary:**

- **Root:** Part of a plant that is usually underground. Roots grow downward toward the pull of gravity and they hold the plant in the ground. They absorb water and nutrients from the soil.
- **Stem or trunk:** The part of the plant above ground that supports the plant. Stems carry water and nutrients from the roots to the rest of the plant.
- **Leaf:** Part of a plant that usually grows from a plant stem or branch and provides the plant with food through photosynthesis. The leaves take in sunlight and carbon dioxide, and produce food for the entire plant and oxygen as waste.
- **Flower:** Part of many plants that usually grows from a plant stem or branch and develops seeds and sometimes fruit (which provides food and shelter for the seed). Flowers help the plant reproduce (or make more plants).
- **Seed:** Part of a flowering plant that grows into a new plant.
- **Native plant:** A plant that grows naturally in a specific area.
- **Non-native plant:** Plants that have been introduced to an area where they are not originally from. Many non-native plants come from different countries, regions, or continents and can be harmful to native plants and/or animals.
- **Invasive plant:** A plant that is dominating, or taking over a habitat and/or causing harm to many of the other living things in an environment.
- **Plant Steward:** A person that helps care for and protect plants.

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## **Background:**

Most plants consist of basic parts including roots, stems, leaves, flowers and seeds. Plants have certain requirements that they need in order to live and reproduce including sunlight, water, nutrients, and air (carbon dioxide). Many things in a plants habitat can interfere with the requirements that plants need to survive including insects, animals, disease. This is a natural process in nature.

Native plants grow naturally in a specific area while non-native plants have been introduced to an area where they are not originally from. Many non-native plants come from different countries, regions, or continents and can be harmful to native plants and/or animals. Humans have a big role in the introduction of non-native plants to an environment. When a non-native plant dominates, or takes over a habitat, we refer to them as invasive plants. The non-native, invasive plants compete with the native plants for sunlight, water, nutrients, and space. Non-native, invasive plants often grow and reproduce faster than natives, and they have fewer -if any- predators. Non-native, invasive can take over a habitat and result in the loss of native plants in an ecosystem.

## **Preparation for Activity:**

Print (double sided, flip on short side of page) the attached pictures of the parts of a plant, the needs of a plant, the non-native invasive plants, and the stewards to make as signs for each student. It's suggested that the pictures be printed on thick paper or laminated. There should be a few copies of roots, leaves, flowers, and stewards depending on the number of students in the class. Hole punch at the top corners of each picture, and lace yarn though each so that each student can wear their picture around the neck.

## **Activity:**

- 1) Ask students to name the different parts of a plant and draw out each one on a whiteboard to illustrate.
- 2) Then ask the students to name each of the things that a plant needs to grow and survive, and also record on the whiteboard
- 3) We usually think of plants as not doing a lot or moving, but there is actually a lot going on in the life of a plant! Explain to students that as a plant grows, other things in nature may get in the way of its growth (including: not enough water, not enough sunlight, insects or animals eat them, they get a disease, etc.). Discuss how scientists that study plants have also discovered that certain non-native, invasive plants are bad for the growth of native plants. Two very common non-native, invasive plants that humans introduced to our area are the Brazilian Pepper and the Australian Pine trees. Brazilian Pepper grows very quickly and can make birds and wildlife sick when eaten, and the Australian Pine tree also grows very quickly and take up the surrounding habitat. Air Potato vines are also non-native, invasive plants found in Florida that also grow extremely fast and take over other native plants very quickly. But humans can be good environmental stewards and do their part to help protect the native habitat!
- 4) Tell the students that they are going to "build a plant". Each student has one of four roles: 1) a part of the plant; 2) something a plant needs to grow; 3) a non-native, invasive plant; 4) a steward. Pass out one picture to each student, then have the students stand in 4 different groups with their related roles: parts, needs, invasive & non-native plants, and stewards.

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- 5) Read the following aloud and have each student perform their roll according to each of their pictures:
- Roots are beginning to sprout from a seed! If you are a root, sit on the floor beside the other roots in a half circle facing outward.
  - A stem is growing upward from the ground! If you are the stem, stand tall and strong behind the roots with your arms raised like branches.
  - Leaves are beginning to grow! If you are a leaf, stand by the stem and touch the stems branches (or arms). It's a windy day; the leaves may sway gently back and forth.
  - Flowers are blooming! If you are a flower, find a leaf and hold onto the leaf's arm.
  - Flowers are beginning to make seeds! If you are a seed, find a flower and hold on to the flower's arm. One day, when you are ready, you may drop off of the flower and become your very own plant!
  - Now the plant is complete!
- 6) Remind the students that a plant needs certain things to grow and survive. Read the following aloud and have the children act out their rolls:
- It's a beautiful sunny day! If you are the sun, stand out in front of the plant with your hands on your hips, shining onto the plant. Leaves face the sun and are happy!
  - Here comes some rain! If you are water, sit at the feet of the roots. If you are roots, make a slurping sound as you take in water from the ground and share it with the rest of the plant.
  - A plant's roots take nutrients from the soil! If you are nutrients, sit at the feet of the roots. If you are roots, make eating sounds as you take in the nutrients from the ground and share them with the rest of the plant.
  - Plants need small molecules found in air! If you are carbon dioxide, walk in a circle around the whole plant. If you are leaves, take a deep breath.
  - Now the plant has all the things it needs to grow!
- 7) Uh-oh! Tell the children that non-native, invasive species have found their way into the area! Read the following aloud and have the children act out their rolls:
- Someone planted a Brazilian Pepper tree, and now they are growing all around and blocking the sunlight from reaching other shorter native plants! If you are a Brazilian Pepper tree, stand between the sun and the plant with arms raised and feet apart to block the sunlight from getting to the plant.
  - Someone planted an Australian Pine tree, and now they are growing all around and taking the water and nutrients from the soil away from the native plants! If you are an Australian Pine tree, take the water and the nutrients by the hand and bring them away from the plant.
  - Someone planted an Air Potato vine, and it is now covering the surrounding native plants and taking the air they need to survive! If you are an Air Potato vine, take the carbon dioxide by the hand and bring him/her away from the plant.
  - Oh no...the plant no longer has what it needs to live and grow, and it's beginning to die. All of the different parts of the plant (roots, stem, leaves, flowers) hunch over or squat and try to look smaller and "withered".

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- 8) Great news! Help is on the way! Read the following aloud and have the children act out their rolls:
- The stewards (or friends of the native plant) have arrived! Each steward should find one of the invasive, non-native species and take them by the hand, away from the plant. This represents pulling out the invasive, non-native plants.
  - Now the plant has what it needs to grow again! Each steward should bring back the nutrients, water, and carbon dioxide back to where they were.
  - The plant is doing much better now! All of the different parts of the plant (roots, stem, leaves, flowers) should straighten back out to be “un-withered”. The plant parts stand tall and strong because the plant is safe and healthy! Thank you, stewards, for saving the native plant!

#### Extensions:

- 1) Have students draw the parts of a plant and things the plant needs to live.
- 2) Have students discuss some of the unique adaptations of mangroves. (**Answer** – they can live in places that other plants cannot. Mangroves are adapted to live in freshwater, brackish water, and even water as that’s more salty than the ocean! Mangroves also have root adaptations. The Red Mangrove has roots that begin above ground and they grow extending into the water. The Red Mangrove roots can regulate the amount of salt entering their roots through a special adaptation. Their roots are so specialized that they can filter water! The Black Mangrove has an extensive network of underground roots that shoot vertical root extensions about ground. We call these vertical roots pneumatophores or, snorkel roots. Because most of the roots of a Black Mangrove are underground in the thick, low-oxygen layers of detritus, the Black Mangrove has adapted to these conditions by sending out pneumatophores. Pneumatophores allow the Black Mangrove roots to exchange gases with the atmosphere. )
- 3) Have students differentiate between native, non-native, and invasive plants. (Answer: **Native** plants have evolved with the local ecosystem and are beneficial to the food web. If they are removed from a food web, the local wildlife may have to either relocate or die. **Non-native** plants are plants that did not evolve with the local ecosystem but does not act as a threat to the local food web. In fact, some non-native plants may prove beneficial to local wildlife. Some species of clover are very common to find around our home and school yards. Most species are non-native but are not considered invasive. In fact, they provide extra pollen resources for our local pollinators! Check out a list of Florida non-native plants and their status as evaluated by UF/IFAS: <https://assessment.ifas.ufl.edu/assessments/trifolium-repens/>. **Invasive** plants pose a threat to local food webs by utilizing limited resources thereby, preventing Florida natives from thriving.
- 4) Place a stalk of celery in a jar with water and food coloring. Explain to the students that a plant takes up water and nutrients through its roots, into its stems and leaves. Inform students that since the water is colored, they will be able to see it slowly traveling up the stem and into the leaves. Look at the plant every 15 minutes and make observations until the process is complete. A great resource to complete this experiment can be found here:

<https://www.acs.org/content/dam/acsorg/education/resources/k-8/science-activities/motionenergy/graphing/celery-soaks-it-up-science-for-kids.pdf>

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