
Discover Wetland Plants



Purpose:

For students to learn the different types of plants that grow in Oregon wetlands and how those plants are adapted to survive.

Objectives:

1. Students will identify wetland plants found in Oregon by using a key and then list the wetland plants on a worksheet.
2. Students will discover the three different types of wetland plants by playing a movement game.
3. Students will infer that wetlands filter pollutants in a watershed by conducting an overnight experiment.

Materials:

- Provided
 - Wetland Plant Types (emergent, submergent, floater) (2)
 - Laminated Wetland Diagram (9)
 - Laminated Plant Photos (9 plant types - 12 sheets total)
 - Laminated Keys (9)
 - Laminated "My Plant List" (1)
 - Laminated "My Plant List" Teacher Copy (1)
- Not provided
 - Parachute or large bed sheet
 - Dry erase markers
 - Celery Stick
 - Jar
 - Food coloring

Time Required: 1 hour

15 minutes the next day

Appropriate grades: 3rd-8th

NGSS and Common Core Standards:

3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.

Activity:

Introduction	Opening <ul style="list-style-type: none">● Tell students “Today we are going to learn about the different types of plants you can find in a wetland and how important they are in filtering out harmful pollutants”
Body	Activity #1 Emergent, Floater, and Submergent GO! <ul style="list-style-type: none">● Using the laminated cards: “Wetland” and “Wetland Plant Types” explain the three types of wetland plants: Emergent, Floater, and Submergent.<ul style="list-style-type: none">○ <u>Emergents</u>: plants that rise above the surface of the water. We can see them without looking under the water. Their long stems transport oxygen upwards. Thick strands of emergent plants offer habitats and food for mammals, birds, and fish.<ul style="list-style-type: none">■ Cattails & arrowheads○ <u>Floaters</u>: plants that are rooted on the bottom of the wetland or are free-floating, but do not emerge very far above the surface of the water. We might be able to see them if we walked up to the edge of the water and looked down on the surface of the water. Some free-floating plants create mats of plantlets with thousands of dangling water roots. They use stomates, or tiny openings on the top of floating leaves to facilitate gas exchange. Stems or stalks are often spongy and inflated for buoyancy.<ul style="list-style-type: none">■ Duckweed○ <u>Submergents</u>: are plants that live entirely underwater (sometimes their flowers extend up to the surface). It would be hard for us to see them unless we were in the water.<ul style="list-style-type: none">■ Pondweed, milfoils, water celery, and bladderworts● Now let’s act it out! Using the parachute or sheet act out being a wetland plant:<ul style="list-style-type: none">○ Each student should stand around either a parachute or a large blue sheet and hold the edge tightly. Bring the sheet to lie on the ground, but make sure that everyone is holding onto it.○ Explain to the class that we are going to act out what a plant in a wetland would look like with the sheet being the height of the water.<ul style="list-style-type: none">■ <u>Emergent plants</u> emerge from the water. The sheet should be at the ground at the student’s feet.■ <u>Floater plants</u> float on the surface of the water, but the majority of the plant is below the surface. The sheet should be at the student’s shoulder height.■ <u>Submergent plants</u> are completely underwater and no part of the plant should be exposed above the surface. The sheet should be lifted above the student’s head.

- On the count of three, the teacher calls out either: **emergent**, **floaters**, or **submergent**. Together the class will bring the sheet up to the appropriate height. The teacher can call out the names as many times as they want until the vocabulary is understood.

Activity #2 Label Local Plants and Classify

- Place the laminated pictures of the plants and one laminated key with a dry erase maker in different locations around the room.
- Hand each student a “My Plant List” worksheet. The students should use the key to identify what type of plant is on the laminated picture set up around the room. They should circle “Yes” or “No” with the dry erase marker on the key and then write the name of the plant on their worksheet in the appropriate section.
- After students finish at station they will rotate to another until they have visited all 9 stations. At the end of the activity, they should have 9 plants written down in each category on their plant list.

Activity #3 Treatment Plants

- This activity is best spread out over two days. The first day, assemble everything (15 minutes). The second day, observe the results and answer questions (15 minutes).
- Each group of students prepares a solution in a jar by adding several drops of food coloring to the water. Explain that food coloring represents pollution by a toxic substance (for example, a pesticide)
- Ask students to imagine water flowing into a wetland with many wetland plants. Tell them that the celery stalks are like the plants of a wetland (cattails, sedges, grasses, etc.)
- Cut off the bottom half-inch of the celery stalks and place the stalks in water overnight. Over time, the colored water will visibly travel up the stalks, showing how plants can absorb pollutants when they “drink.”
- If the colored water is not visible on the outside of the stalk, break it open and see the colored water inside the plant tissue.
- Ask students the following questions:
 - Q: Why is the water remaining in the beaker still polluted?
 - A: Plants can only do so much. As new water (hopefully clean) flows into the system, the pollutants will be diluted and the water is less polluted.
 - Q: Where does the water go after uptake into the plant?
 - A: Transpires out through the pores (stomata) and evaporates
 - Q: What happens to the pollutants?
 - A: The pollutants get stored in the plant’s tissue. When the plant dies, the pollutants will be released back into the environment. Some pollutants change, like nitrates

	<p>and phosphates, into forms that are helpful and not harmful to the environment.</p> <ul style="list-style-type: none"> ○ Q: Why can't we dump all of our wastewater into wetlands? <ul style="list-style-type: none"> ■ A: Wetlands can only do so much. Too many pollutants will harm or destroy a wetland. The best solution is to reduce pollution.
Closure	<p>Ask Students:</p> <ul style="list-style-type: none"> ● Why is it challenging for a plant to live in a wetland? ● What adaptations have they developed to survive in this habitat? ● What do these adaptations help the plant to do? <ul style="list-style-type: none"> ○ Assessment: Have the students write their answers to one of these questions as an exit ticket for the end of the lesson.

Modifications:

- **Elementary:**
 - **Activity #3 Treatment Plants**
 - You will need to cut celery for younger students. Cut right before being placed into the water, or else the plant will lose its ability to draw water well.
- **Middle School:**
 - **Complete Activity #2 & #3**
- **High School:**
 - **Activity #3 Treatment Plants**
 - Older students can research how water is transported up the plant. The plant expends no energy, but simply allows the energy of the sun and the properties of water to move water up its tissues. Imagine, 200 ft tall trees transport water to their upper leaves expending no more energy than a 2-inch blade of grass.