
Plant Magic

Plant Adaptations



Purpose:

The purpose of this lesson is for students to explore the environment around them. They are looking for patterns in flowers/seeds, leaves, and trees in order to identify plant adaptations. Students will compare leaves to identify similarities and differences in their adaptations.

Objectives:

Students will identify different adaptations of plants found in the Rogue Valley
Students will explain how plants are adapted to their environments in order to survive.

Materials:

Provided

- Pictures of Oregon Grape and Big Leaf Maple
- Adaptation question cards

Not Provided

- Pencils
- Paper for the assessment
- Leaf Samples (collect from around your school. Examples are Ponderosa Pine, Douglas Fir, California Black Oak, Oregon White Oak, Black Cottonwood, and Oregon Ash). If you can't find leaves, use the leaf samples from the Tree Identification Lesson.

Time Required: 60 min. or two 30-minute sessions.

Appropriate grades: 3rd -8th

NGSS and Common Core Standards:

3.LS4.3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

MS.LS4.6 Use mathematical representation to support explanations of how natural selections may lead to increases or decreases of specific traits in populations over time.

Other Considerations: This activity is done outdoors.

Suggested Sites for this activity (In the Ashland/Medford area):

- McGregor Park
- Cantrell Buckley Park
- Tou Velle State Park
- Lithia Park
- North Mountain Park
- Lower Table Rock
- Prescott Park

Activity:

<p>Introduction 5 min.</p>	<ol style="list-style-type: none">1. Start a discussion of adaptations and how they help plants survive. Begin by asking simple questions. For example, “Are all plants the same?” “Why are they different?” Students will most likely start to give examples of plants and how they are different. Ask, “Would _____ plant be able to survive in a different habitat? Why or why not?”2. Throughout the discussion introduce the vocabulary term adaptation. Students may only consider animals to have adaptations, but it is important for them to recognize that all plants have adapted to their environments as well. It is also important for students to connect how the adaptation benefits the plant.3. Tell students that today they will look for plants outside with different adaptations.4. Show pictures of a few examples of plants and have students share with a partner or class what characteristics they see on the plant and that may be an adaptation to help the plant survive. This is to help students see there are adaptations all around us.
<p>Body 25 min.</p>	<p>Plant Exploration: 15 min.</p> <ol style="list-style-type: none">1. Introduce the terms evergreen, deciduous, conifer, seed, and flower. Ask, “How do these terms relate to adaptations?”2. Split students into groups of 2 or 3.3. Give each group a yellow (flower), blue (leaf), and green (tree) card. Each card has examples of adaptations and questions to help student find plants outside with specific adaptations.4. Students will search the area for an example of what each card asks. *Emphasize that this should be done without damaging or killing any living thing.5. After all students have found a plant for each card have teach group share their favorite one. Ask students to identify at least one adaptation



	<p>of that specific plant. The teacher can contribute additional comments and information from the Background Information section.</p> <p>Leaf Investigation: 25 min.</p> <ol style="list-style-type: none"> 1. Group students in groups of 3 or 4. 2. Either collect leaves before the lesson or have students collect samples of leaves. (about 6 leaf samples) 3. Have students make observations on the leaf type. Look for color, shape, size, texture, and any other observations they can make. 4. Have students make predictions of why different leaves have different characteristics. What adaptations does the Ponderosa Pine have that the Cottonwood does not? Why do specific trees need these specific adaptations? Students should compare adaptations of all 6 samples. 5. Ask: How do you think the environment (location, elevation, sun exposure, etc.) impacts where specific plants can live?
<p>Closure 15 min.</p>	<ol style="list-style-type: none"> 1. Have students turn and talk to a partner about one of the plants they found today and how it has adapted to survive in its environment. How do the adaptations benefit the plant? 2. Assessment: Once students have returned to the classroom, have them choose two of the leaf examples and compare their adaptations. Ask them to illustrate their comparisons. Do the two samples share any adaptations? How are their adaptations different? Why is it important for your samples to have this specific adaptation? This assessment will help students solidify the knowledge gained in the field and allow you to evaluate the student's understanding of the concepts. 3. Extension for Older Students: Have students compare all six samples by grouping them into conifers, oak, and riparian trees. How have the two samples in each category adapted over time to best fit their environment? Do they share any adaptations? How are their adaptations different? Why is it important for the samples to have these specific adaptations?

Modifications:

- **Elementary:** For younger students, only give groups one of the plant adaptation cards (either a flower, leaf, or tree card). You can choose to do both activities or focus on one.



- **Middle School:** Have students compare all six samples by grouping them into conifers, oak, and riparian trees. How have the two samples in each category adapted over time to best fit their environment? Do they share any adaptations? How are their adaptations different? Why is it important for the samples to have these specific adaptations?
- **High School:** High school students can still perform the leaf investigation and then choose two specific species and research to compare the adaptations of the species.

Pictures for the Intro:



Oregon Grape

Retrieved from: [https://commons.wikimedia.org/wiki/File:Oregon_Grape_\(4715021348\).jpg](https://commons.wikimedia.org/wiki/File:Oregon_Grape_(4715021348).jpg)



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Big Leaf Maple

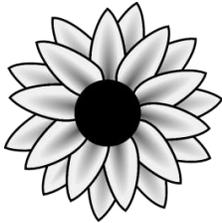
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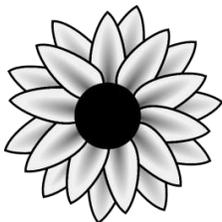
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Cards:

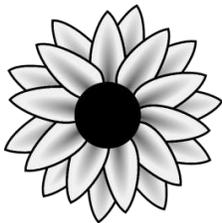
Flowers & Seeds:



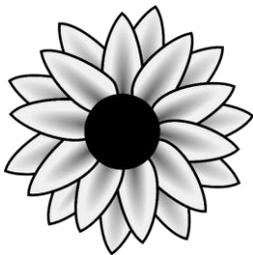
Are there any flowers around you? Find one and look for what animals are around. What kinds of animals do flowers attract? What type of adaptation does the flower have?



Find a flower. What do animals get from flowers? Can you find a flower an animal might use? What type of adaptation does the flower have?

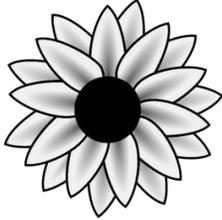


Some seeds are hidden in cones. Can you find any of these? Sometimes squirrels and rodents will tear cones apart to eat the seeds. Do you see any cones that have been munched on? What type of adaptation does the cone have?

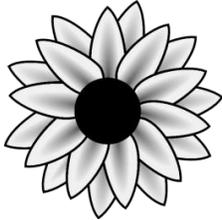


Find several different types of seeds around you. Can you guess how each of the different seeds may be spread throughout the area? Examples: Do they float through the wind or water? Do they attach themselves to animals and humans? Are they eaten and carried inside of an animal? What type of adaptations do the seeds have?





Find examples of seeds and flowers. What develops first - the flower or the seed? Why do you think so?



When a seed begins to grow it needs water, sunlight, and nutrients from the soil. Can you find an example of a newly grown seed in the soil, a baby plant?

Leaves:



Find a plant or a tree. Study the leaves. How big are they? What shape are they? What shades of green are the leaves? Can you think of any reasons that the leaves are this way? Any adaptations?



Find a plant or a tree. Does the position of the sun seem to affect your plant or tree? How? Have the leaves adapted to this amount of sun exposure?

What happens to the leaves in the autumn when it gets colder? Do





all the trees stay the same or do some change? Why do some trees change? Any adaptations? Find an example.



Some trees have leaves called needles. Can you find one? Why might it be good to have needles? Any adaptations?



Leaves of green plants and trees produce food for the plant through a chemical process called photosynthesis. The three things needed for photosynthesis are water, carbon dioxide from the air, and sunlight. Look at the plants around you. Are they able to get the things they need? How?



Some leaves have chemicals that taste bad or are poisonous to some animals including humans. What kind of adaptation is this and can you find an example?



Trees:



Find a tree. Describe what you can see of the tree's roots. How far do you think they reach down and what purpose do they have? What would happen to your tree if it did not have roots?



Describe a leaf from your tree. Look at its shape, its edges, its color above and below, its veins, and its size. What kinds of adaptations do the leaves have? Do they like shade or lots of sun? Do they need lots of water? Are all the leaves on your tree exactly the same?



What happens in the autumn when it gets colder? Does your tree stay the same, or does it change somehow? What happens to the tree in the spring? What type of adaptation does this tree have?



Find a tree with fruits or seeds on the tree. How do you think the seeds are spread?





Find a tree. What type of bark does your tree have? Is it smooth or rough? Are there ridges and are they deep or shallow? What do you think the bark does for the tree?



Find a tree. What kinds of animals might use the tree for a home or for food?

