

Trees - Coniferous vs. Deciduous

Lesson Overview

Trees are amazing living things! They come in all shapes and sizes and can be found all over the world. In this lesson, students will investigate the two main type of trees, coniferous and deciduous. They will also take a closer look at a cross-section of a tree trunk to observe its transportation system for food and water.

Objectives

- Compare and contrast the shape, leaves, and seeds of coniferous and deciduous trees
- Explain how each type of tree's structure contributes to its survival
- Identify the main parts of the transportation system of food and water within a tree trunk

Standards (NGSS and Common Core)

For state specific standards visit edu.zspace.com

Next Generation Science Standards

- Life Science - From Molecules to Organisms: Structures and Processes
 - 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.

Common Core Connections

- Language Arts
 - W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
 - RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

Differentiation (Δ)

- Group students heterogeneously to allow students with a strong command of the English language to assist in reading or interpreting questions
- Work as partners or in small groups (younger children could partner with older buddies)
- Enrichment: Students could work on the discussion questions and lead the class discussion

Grade level: 3rd - 5th Grade

Lesson Time: 120 Minutes

Key Terms:

Coniferous
Deciduous
Evergreen
Heartwood
Phloem
Pith
Sapwood
Vascular Cambium
Xylem

Resources:

Answer Key
Trees - Coniferous vs.
Deciduous worksheet

Materials needed:

Celery stalks
Cups of water
Food coloring
Magnifying glasses
Knife (teacher use only)

Introduction

The teacher will start the discussion by asking the students to name all of the ways that trees are useful. For example, students may provide answers like shade, protection, warmth, shelter, food, or wood products. The teacher will ask the class to describe how trees change over the seasons and why these changes occur. Students will share their ideas. The teacher will then explain that they will learn about two different types of trees, coniferous and deciduous, and they will investigate how their different structures affect their functions.

Activity

Trees - Coniferous vs. Deciduous

This section to be completed in Studio along with the Trees - Coniferous vs. Deciduous worksheet.

Scene 1

Have you ever stopped to just look at a tree and enjoy its beauty? Trees are really amazing living things! They come in all shapes and sizes and can be found all over the world. Let's take a closer look at the two main types of trees.

Scene 2

Coniferous Trees: Here are some examples of coniferous trees: firs, spruces, and pines.

- Analyze the shape of the trees.
- Analyze the shape of the coniferous tree leaves.
- What do you know about the seeds of coniferous trees?
- Do you know if coniferous trees lose their leaves in the winter, or do they keep them all year?

Scene 3

Deciduous Trees: Here are some examples of deciduous trees: maple, birch, oak, and apple.

- Analyze the shape of the trees.
- Analyze the shape of the deciduous tree leaves.
- What do you know about the seeds of deciduous trees?
- Do you know if deciduous trees lose their leaves in the winter, or do they keep them all year?

Scene 4

Whether coniferous or deciduous, the tree trunk is a very important part of the tree. Not only does it connect the roots to the leafy crown, it also transports important water and nutrients up and down the tree.

- Use the Dissect stylus mode to analyze the parts of the tree trunk.

Celery Experiment and Additional Research

Students will conduct a simple experiment to observe the xylem and phloem inside a vascular plant, a celery stalk. Students will place a freshly cut celery stalk into a cup of water with several drops of food coloring. Students will make predictions. Leave overnight and observe the results the following day. Cut the celery stalk so that each student has a cross section to examine with a magnifying glass. Students will share what they discovered. (The dyed areas are the vascular bundles, which contain the xylem and phloem). Students will conduct additional research about the xylem and phloem and their important roles in the trees and other vascular plants.

△ Students could also cut one celery stalk in half lengthwise, halfway up the stalk from the bottom, and place the ends in two cups of different colored water.

△ Students could use carnation flowers instead and predict similarities and differences from the celery stalk.

Closing

Students will share something new that they learned about coniferous or deciduous trees. Alternatively, they can share what they learned about the transportation system inside the trunk.

Questions for Discussion

1. How does the overall shape of coniferous and deciduous trees help in their survival?

Answers will vary. Sample Answer: The triangular shape of coniferous trees helps to give them strength and to keep their branches from breaking from the weight of snow. The rounded shape of deciduous trees helps to provide their leaves with more available sunlight.

2. How does the shape of the leaves of coniferous and deciduous trees help in their survival?

Answers will vary. Sample Answer: The long needle shape of coniferous leaves helps to conserve water. The broad flat shape of deciduous leaves helps to absorb the most sunlight.

3. How does the shape of the seeds of coniferous and deciduous trees help in their survival and reproduction?

Answers will vary. Sample Answer: The seeds of coniferous trees grow in cones. When the conditions are right, the cones will open and the seeds will be planted in the ground. The seeds of deciduous leaves are usually in a fleshy fruit or a hard nutshell. Animals eat these nuts or fruits and then pass the indigestible seeds in locations away from the parent tree.

4. Based on your research, what is the role of the xylem and phloem in a tree?

Answers will vary. Sample Answer: The xylem transports water and nutrients from the soil to the leaves. The phloem transports food from the leaves to the rest of the tree.

Δ Investigate Further

Follow-up Activity: Ginkgo Leaf and Key Factors for Plant Growth - Cyber Science 3D

Extension Activity: Students could analyze the cross-sections of real tree trunks. Students could count the number of rings to determine the tree's age. Students could research why some rings are larger than others.

Answer Key

Activity Questions Provided in Studio.

1. Have you ever stopped to just look at a tree and enjoy its beauty?

No answer required.

2. Analyze the shape of coniferous trees and their leaves. What do you know about the seeds of coniferous trees? Do you know if coniferous trees lose their leaves in the winter, or do they keep them all year?

Answers will vary. Sample Answer: Coniferous trees are triangular in shape and grow upward instead of outward. Their leaves are either long pointed needles or small flat scales. The seeds of coniferous trees grow in cones. Coniferous trees are sometimes called evergreen because their leaves stay on the tree for several years and fall off gradually.

3. Analyze the shape of deciduous trees and their leaves. What do you know about the seeds of deciduous trees? Do you know if deciduous trees lose their leaves in the winter, or do they keep them all year?

Answers will vary. Sample Answer: Deciduous trees are round in shape and grow outward instead of upward. Their leaves are broad and flat and need sunlight and water to survive. This is why the leaves of deciduous trees change color and fall off in the winter. The seeds of deciduous trees are usually in a fleshy fruit or a hard nutshell.

4. Use the Dissect stylus mode to analyze the parts of the tree trunk.

No answer required.

Name _____ Date _____

Trees - Coniferous vs. Deciduous

Complete this worksheet as you view the *Trees- Coniferous vs. Deciduous* tour in Studio. Conduct additional research if necessary.

Coniferous Trees	Deciduous Trees
Shape of Tree	Shape of Tree
Shape of Leaves	Shape of Leaves
Shape of Seeds	Shape of Seeds
Do coniferous trees keep their leaves or lose them? Why?	Do deciduous trees keep their leaves or lose them? Why?
Describe how the shape of the tree, leaves, and seeds function for survival and reproduction. Tree: Leaves: Seeds:	Describe how the shape of the tree, leaves, and seeds function for survival and reproduction. Tree: Leaves: Seeds: