



September 2010 – Trees & Forests

Learn how to guess the age of a tree, what's inside a tree's trunk, what lives in a forest, why some trees never lose their leaves, and much more!

Tree Science Projects

Take a Nature Walk

To learn more about trees, bring a few friends (including an adult) on an outdoor adventure. Pick a location that has many different kinds of plants and trees. A nearby park is a great choice. If you like, you can also visit a national park, or forest. If you choose this option, however, you should make sure that it is okay to pick up leaves and pine needles that you find.

What You Will Need:

- Magnifying glass
- [Sketchbook](#) or notebook with unlined pages
- Pencil
- Colored pencils or crayons
- Tape measure
- Calculator
- [Tree Identification Guide](#)
- Camera, if you want to take pictures

What To Do:

1. As you begin your walk, look at the trees that are around you. Are they mostly deciduous or evergreen? (Deciduous trees usually have flat leaves and evergreens have pointy needles.) How many different kinds of trees do you see?
2. When you see a tree that you would like to know the name of, get out your guide book. Ask yourself these questions to help figure out what kind of tree it is:
 - Is it deciduous or evergreen? Look closely at the bark, and examine the leaves or needles. Does the tree have cones on it?
 - Look for a tree that looks similar in the guide book. Does the tree you see in the book grow in this area? If not, try again.
 - If you aren't able to find the tree in your guide book, you can do more research at home. Take a picture, and if it is permitted to do so, take a leaf or two from the tree to bring home with you.
3. Draw a picture of the leaf or the tree. Draw details with colored pencils, such as the shade of green leaves or needles, and whether the bark is rough or smooth. You can also use the camera to take close-up pictures of the tree.

4. If you want to figure out how tall a tree is, you can use the shadow of a tree, compared to the shadow of something that you know the height of. However, this will only work in a sunny area that is not crowded with trees and plants.
 - Measure the tree's shadow (in inches), and then have someone measure your shadow, while you are standing straight in a sunny area. If you don't know your height, have them measure that as well. All measurements should be in inches.
 - To figure out how tall the tree is, use the calculator to divide your height by the length of your shadow. The number you get should be pretty small. Multiply this number by the length of the tree's shadow to get a much bigger number.
 - Have an adult help you round the number up to the nearest whole number, and that is a good guess at how tall the tree is in inches. To find out how many feet this is, divide it by 12 using the calculator.
5. How old do you think the trees you see are? Make a guess about one tree, and write it down.
 - Have an adult measure around the tree you guessed the age of, using the measuring tape. Make sure that your helper measures around the trunk at five feet above the ground. Write down the measurement.
 - On average, trees grow one inch in circumference (the distance around) each year. If your tree was 20 inches around, it would be about 20 years old.
 - How did your guess compare to what age you were able to measure?
6. As your walk comes to an end, think about the different trees you saw. Can you remember the names of the trees? What was your favorite part of the nature walk?



Living in a Tree

In this project, you can find out more about a particular kind of tree and discover all the insects that live there. You will need someone to help you.

What You Will Need:

- White bed sheet
- Magnifying glass
- Insect guide (You can use this [online guide](#), or check at your local public library)

What To Do:

1. Find a tree branch that is easy to reach. With your helper, spread the sheet out, then hold it as close to the branch as you can.
2. Have your helper firmly shake the branch for about 30 seconds, and then bring the sheet slowly down to the ground.
3. Begin examining what's on the sheet with the magnifying glass. You will most likely see spiders, beetles, and ants. You might also see young insects or caterpillars.
4. Try to identify what was in the tree by using the insect guide. Use the magnifying glass to see details about each bug.

5. When you're finished, gently shake out the sheet. If you like, you can do the same thing with a different kind of tree. What kind of insects do you think would live in a pine tree? How about an oak, or maple tree?
6. Do you see any animals near the tree? Many different animals make their homes in trees. Check the trees around you to see if you can spot a bird's nest. Squirrels and rabbits will often live in hollow tree trunks.

What's Happening?

Animals and insects use every layer of a wood or forest to make their home in. Birds live at the very top, building their nests in branches. Squirrels live inside tree trunks, and rabbits live at the base of the tree. A tree provides a dry and safe shelter for these different animals. Insects may live in the ground under a tree, or inside the bark. Insects like living by trees because they eat leaves and sometimes even bark. As you learned in this project, different trees have different kinds of insects and animals that want to make their home there.

Fun Facts

- The largest tree in the US is a Redwood tree growing in California. It is more than 360 feet tall (and it's over 2000 years old)!
- The oldest trees in the world, also in California, are called Bristlecone Pines. They have been alive for 4000-6000 years!
- Birch trees can produce as many as 1 million seeds in a year!

Silly Science

- What kind of tree has hands?
 - *A palm tree.*
- What does a tree wear to a pool party?
 - Swimming trunks!
- Why did the leaf go to the doctor?
 - *It was feeling green.*

Way Cool Websites

- Learn about [roots](#) and [trees](#) with these interactive lessons!
- Take a look at this great [tree identification guide](#).
- [Nature Notes](#) include pictures and information about many things you may find in the woods.
- Get an interactive tour on [forest layers](#) and the animals that live in them.

Teacher Tidbits

All About Trees

There are many kinds of trees in the world. Scientists use a system called **classification** to organize different types of trees and make them easier to identify and study. Classification breaks different kinds of similar things (such as trees) down into smaller groups so that all the

objects in the group have things in common.

All trees have several parts. The basic parts that all trees have in common are roots, a trunk, branches, and leaves. These are things that make trees trees. This is the first step in classification. It tells you that a tree is a tree and not an animal or a different plant.



Even though all trees have leaves, there are some major differences in what happens to those leaves. Trees that lose all of their leaves at once during one season (usually Fall) and grow new ones in a later season (usually Spring) are called **deciduous** trees. In contrast, some trees have leaves all year round. They do lose some of them, but new ones grow back right away. These types of trees are called **evergreens**.

Within the groups of deciduous and evergreen trees, there are lots of differences. There are fruit trees and trees that just get flowers, there are trees that don't have any flowers, and there are trees that have pinecones. All of those different trees are classified in different groups. Are you starting to understand how classification is helpful?

Tree Trunks

A tree's trunk is very important. It is how nutrients and water get from the tree's roots to its branches and leaves. It also gives the tree support - the trunk holds the whole tree up! So, what makes a tree trunk so special? Let's start from the outside layer.

You've probably touched many trees and maybe even climbed a few. If so, you know that some trees have smooth bark and some have very rough, chunky pieces of bark. Bark protects the tree from things like very cold or very hot temperatures, insects that try to get inside and eat the tree, and diseases that could harm or kill the tree.

Have you ever seen a tree stump leftover from a tree that was cut down, or looked at the end of a log? If you have, you may remember seeing lots and lots of rings or layers inside the trunk. These layers are created by the cambium (a thin layer in between the wood and bark of every tree), where new cells are made. Tree trunks grow a new layer each year, making the tree bigger and stronger.



The reason you can see the layers inside a tree trunk is because they start out a light color when they begin to grow in the spring, and by summer the outside of the new layer is much darker! Then, the next year, in the spring, a new layer will start that will be a light color again. The wider a ring is, the more the tree grew that year. That usually means that the tree received lots of rain. Narrow rings usually mean that the tree had trouble growing that year, or didn't get as much water or sunlight as it needed. If you want to see a drawing of the different parts of a tree, look [here](#).

Woods & Forests

Woods and forests cover nearly one-third of all the land on earth. What's the difference between woods and forests? If you look up in a wood you can see lots of sunlight coming

through the branches. A forest has lots of shade because trees grow very close together and it is sometimes hard to see the sun. Woods are usually smaller than forests and contain fewer kinds of plants and animals.

Forests that have deciduous and evergreen trees are called temperate forests and cover North America as well as parts of Europe and Asia. In colder climates there are forests that only contain evergreen trees, which have short needles and produce cones. These forests spread across Canada and parts of Europe and are called boreal forests or Taiga (say: TIE-gah).

How does a forest grow? Clumps of trees begin growing naturally and over time spread out, creating a dense forest. Deciduous and evergreen trees spread through seeds that the tree has dropped. Seed pods of different trees look very different. For example, the seeds of a pine tree are all inside of a pine cone. As animals come to live in the wooded habitat, they spread the trees' seeds so that new trees can begin to grow. The animals that live in woods and forests include deer, bears, raccoons, foxes, squirrels, rabbits, and many types of birds. Ants, beetles, and other insects live on the ground of a forest and also in trees.

Science Words

Classification - a way to organize things into groups to make them easier to study. Things that are similar are grouped together into one group, such as animals. Then that large group is divided into smaller groups, such as birds and mammals, and so on.

Deciduous - trees that lose all their leaves at once each year (usually in the fall).

Evergreen - trees that only lose a few leaves or needles at a time. When they do lose them, new ones grow back right away, so they have leaves all year round.

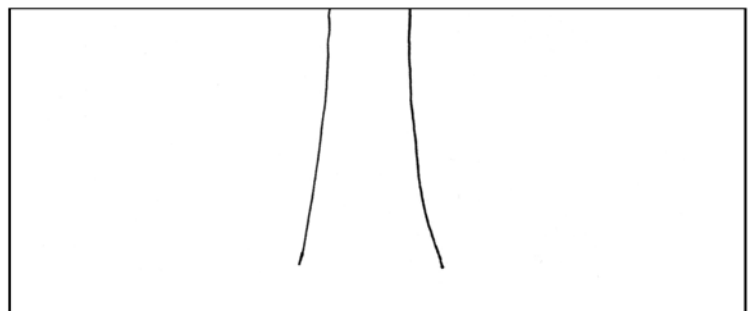
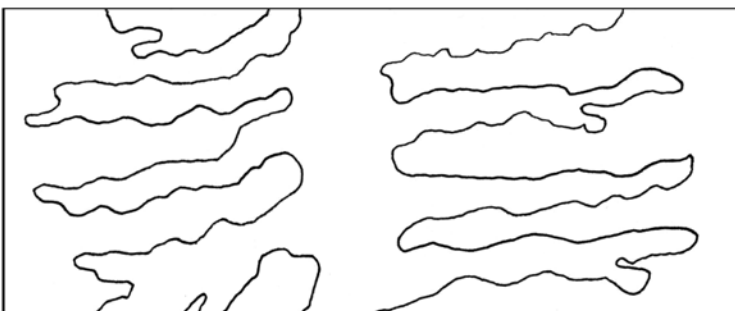
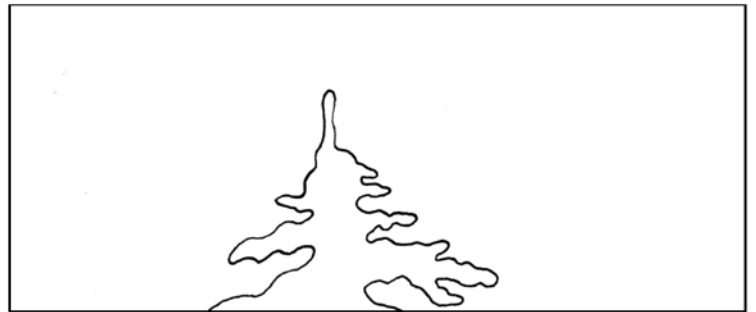
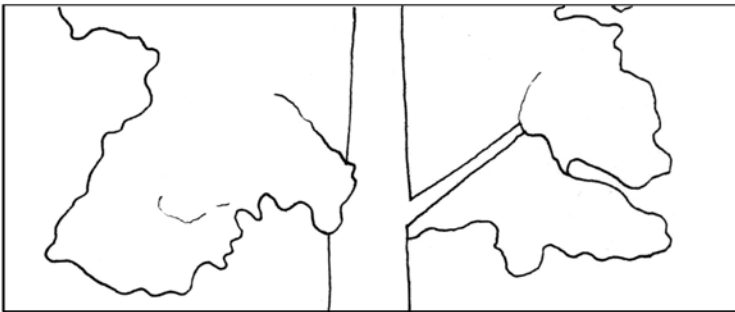
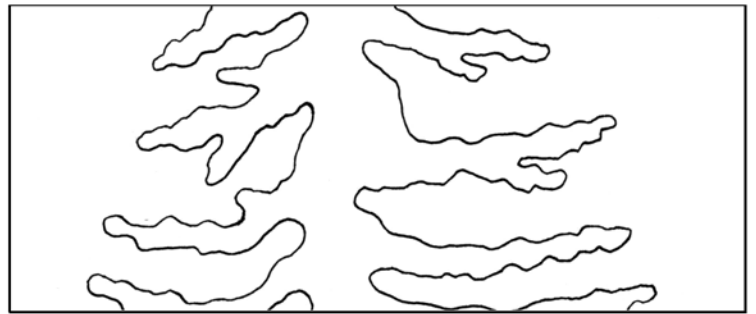
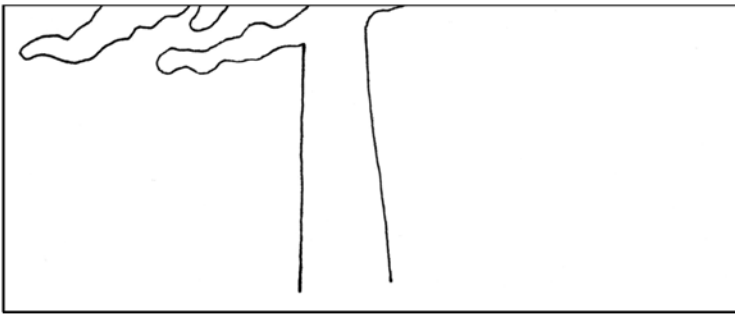
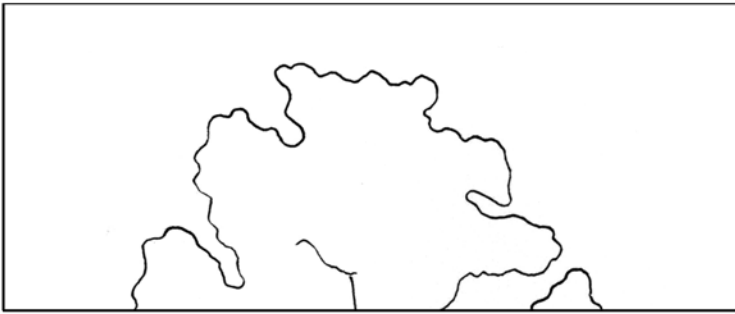
Printable Worksheet

Help kids review the differences between deciduous and evergreen trees with this two-page puzzle worksheet. Younger kids may require some assistance as this requires cutting and pasting.

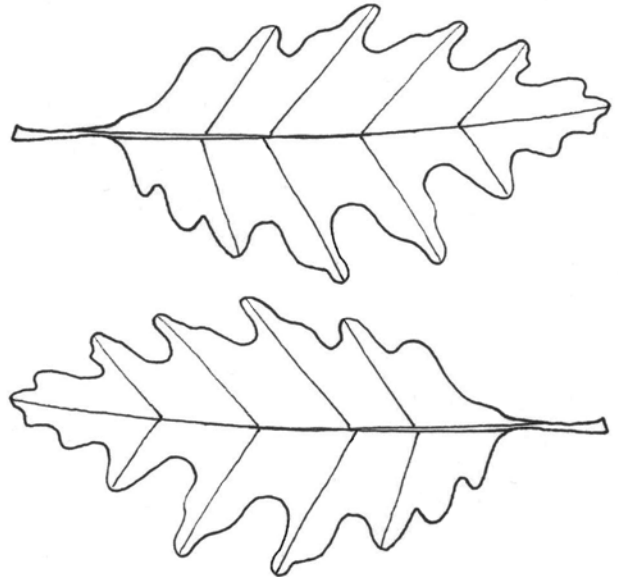
Trees

Color the puzzle pieces, then cut them out and glue them to the correct spaces on the next page.

There are four pieces for the evergreen tree and four pieces for the deciduous tree.

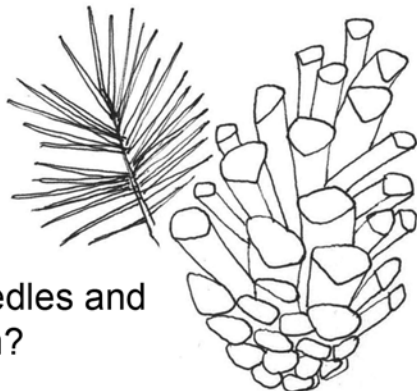


Glue the puzzle pieces into the spaces below. Put the pine tree on the left, and the deciduous tree (oak tree) on the right.



Color the oak leaves! Make one the color it would be in spring, and make the other leaf the color it would be in fall.

Color the pine needles and pine cone.



What kind of trees have needles and cones on them?

Hint: these kinds of trees do not lose their leaves all at once.