



# Making Paper

## Teacher's Tips

Making paper is a fun and engaging activity for kids. You can 'spice' up the simple instructions by having your kids collect dried natural objects to embed in their paper—maple seeds, dandelion fluff, fern leaves—all make lovely additions to the paper.



## OVERVIEW

Students investigate the concept of the value of forests by brainstorming why trees are important to us, and by making paper.

## OBJECTIVES

Students will:

1. List reasons trees are important.

## SUBJECTS

Social Studies, art

## VOCABULARY

## TIME

1 1/2 Hour

## MATERIALS

- Tree cookie name tags
- Handout of tree cross sections
- Large pan (square or rectangular) about 3 inches deep
- 3 cups of water for each student
- 1-1/2 sheets of newspaper to pulp to each student
- Newspaper sheets to use to soak up excess water (several sections)
- Piece of window screen that will fit in the pan (available at a hardware store)
- rolling pin blender

## NATIONAL SCIENCE EDUCATION STANDARDS

This activity supports the following National Academy of Sciences Science Education Standards (*Grades 5-8*):

**Life Science/Organisms:** Describe the characteristics, structure, and functions of organisms. Unifying Concepts and Processes Cause and effect

## BACKGROUND

North Carolina is a biologically diverse environment in which great natural beauty is created by the numerous species of plants and animals. This diversity extends into our forests where a variety of trees, plants, and animals interrelate and affect one another. Our forests differ noticeably in size, composition, and age of the trees found in the area. Generally, North Carolina's forests are in stages of transition from seedlings to mature trees.

Tree age goes largely unnoticed by the forest visitor, but to a forester, forest maturity is an important concept. Forests can be categorized into specific types, such as hardwood or conifer. North Carolina has more species of hardwoods than any other state. These species include oak, hickory, maple, ash, poplar, sweetgum, and blackgum. Our mountains include these hardwood species plus Fraser fir, yellow birch, mountain maple, mountain ash and red spruce which are also found as far away as Canada. Along with trees, wildflowers, shrubs, vines, and wildlife live in mountain forests. Pasture and cropland often border forested land.

Coastal areas may have forests with loblolly, longleaf pine, cypress, and Atlantic white cedar mixed with large shrubs and hardwoods such as sugarberry, hackberry, tupelo and oaks including water, willow, live, and cherry bark; or they may have wetlands teeming with ducks, geese, swans, snakes, turtles, alligators, and the endangered red wolf and Red-cockaded woodpecker.

The Piedmont, too, may have forests with a mix of pine trees and hardwoods, but wildlife is often limited because of the proximity of large population centers. However, hawks have been spotted in most of our cities, and eagles are found only a few minutes from Raleigh. Raccoons and beaver invade urban ponds, and deer and bear occasionally wander into towns. The acreage of old forests may be shrinking, but there are many newer areas of growth and protected areas such as parks and greenways. While the typical visitor does not consider parks or greenways "forest," these areas are important environmentally and play an important part of North Carolina's forest diversity.

## BEFORE THE ACTIVITY

Have all art supplies available

Have hand out (page 9) prepared for distribution



## LEAD-IN

The presentation will be centered around four main categories of the importance of trees. What's listed are ideas you can include if students don't generate these themselves.

### **Ecology**

Think of the trees that are growing in the forests and parks and on our street. What purposes do they serve in the environment? (List the students' suggestions and discuss briefly as they are mentioned. These may include

- a) homes for animals (squirrels, birds, insects)
- b) food for animals (fruits/seeds such as acorns, apples, etc.)
- c) dead trees and logs serve as homes for animals as well as food sources for insects and fungi
- d) base for mosses and lichen to attach and grow
- e) part of the water cycle (takes water from the soil and returns in transpiration)
- f) part of the carbon dioxide/oxygen cycle (takes in carbon dioxide during photosynthesis and releases oxygen)
- g) part of the nitrogen cycle (takes nitrogen from the soil and returns it when it decomposes)
- h) erosion control (helps hold soil in place)
- i) provides nesting materials for animals
- j) helps with stream life (offers shade so cools water; downed logs make ponds for spawning)
- k) provides food supply and homes for insects, as well (termites, ants, etc.)

### **Special Uses in Cities:**

- a) shade
- b) filters the air (traps dust, ash, smoke) and absorbs pollutants (sulfur dioxide and others).  
Twenty pounds of carbon dioxide are produced for each gallon of gasoline burned by an automobile. A young tree can remove 25 pounds of carbon dioxide in a year! Think of the number of trees that are needed to help keep our air breathable!
- c) windbreak
- d) muffles traffic noise
- e) pleasing to look at
- f) place for wildlife in the city (provides home and food)





## Clues to the Past

- a) Clues to the past, including species present and climatic conditions – fossilized seeds and other tree parts give us information about past climates. For example, if we found fossils of a palm tree, what would that tell us about the climate at that time? (It was hot)
- b) Clues to recent climatic conditions – by looking at tree rings, we can determine the richness of the soil, occurrence of droughts or floods, if and when fires might have occurred, the abundance of rainfall, amount of insect damage. How? What might you see if these different conditions occurred? (Good growth, so wide rings, occur if growing conditions are favorable, such as rich soil, abundant rainfall, etc. If drought or insect damage occurred, there is slow or little growth—the rings are close together. If a fire occurs, a darkened spot will be noticeable on the cross section.)

## ACTIVITY—Tree Cookies

Pass out the handout showing cross sections of trees. Have students determine the ages of these trees and whether they think there is any sign of drought, fire, etc. Again, students can share their findings with others doing the activity, work in groups, or the whole class can debrief the activity.

### Annual Growth Rings "Answer Sheet"

1. The tree is 12 years old. The best year of growth was during the 7th year; the worst during the 10th year.
2. The tree is 14 years old. The best year of growth was during its 6th year; the worst during the 11th year.
3. Note the fire scars (black marks)



## EXTENSION

As a math activity, students can take temperature readings for several days in the shade of a tree and in open areas in direct sun. Have them graph and analyze their findings to see whether/how much of a difference trees make in the local temperature. You can also make up math problems dealing with carbon dioxide production and tree purification. For example, you might post that they are taking a trip. Suppose they drive 150 miles and get 30 miles to a gallon of gas, and that young trees are planted at a rate of 400 trees/acre. Have them calculate the amount of acreage of young trees needed to remove the carbon dioxide produced from that single trip.

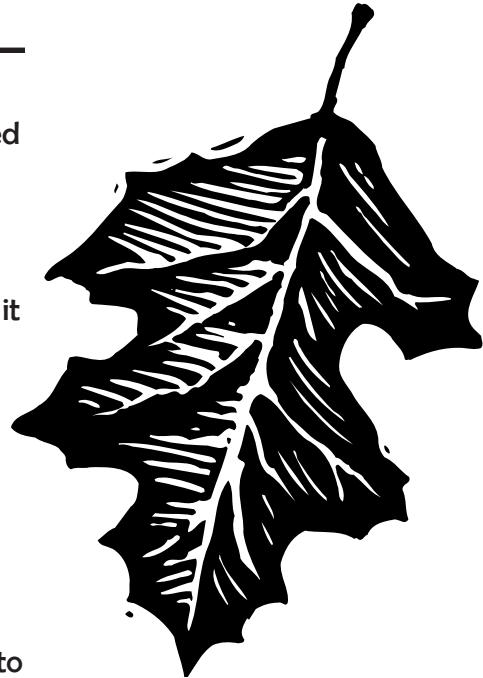
As an additional extension, students can come up with ways to reduce the amount of carbon dioxide we produce!

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### ACTIVITY—Paper Making

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- 1.** Tear newspaper into tiny pieces.
- 2.** Place paper and water into blender. Blend on medium speed for about 5 seconds. You now have pulp!
- 3.** Place the screen in the pan and cover with about an inch of water.
- 4.** Pour about one cup of the pulp over the screen and spread it around with your fingers. This will become your sheet of paper.
- 5.** Carefully lift the screen and let the water drain into the pan.
- 6.** Place the screen with pulp onto half of an open section of news paper.
- 7.** Close the section and flip it so the screen is on the top.
- 8.** Roll over the top of the folded newspaper with a rolling pin to help remove the excess water from the pulp.
- 9.** Open the section of newspaper and carefully remove the screen.
- 10.** Leave the newly made sheet of paper on the newspaper and place in an undisturbed area overnight so it can dry.
- 11.** Once it's dry, you can use it like any other piece of paper!



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#### Notes:

If you want to “speed” up the process, after removing the screen, an adult can use a clothes iron to help dry the paper.

Also, if you want to decorate the paper, you can add glitter, place on dried flowers, etc. after the rolling pin step. To scent the paper, add some vanilla extract to the blender!

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#### CREDIT

This activity is adapted from the Oregon State University Oregon Wood Magic curriculum. Go to their website to access additional information and materials about forests and forest products.  
<http://www.pppgijdfj.org>

## Student Worksheet—Tree Crossrings



This tree is \_\_\_\_\_ years old.

It's best year of growth was  
during the \_\_\_\_\_ year.

The worst year of growth was  
during the \_\_\_\_\_ year.



This tree is \_\_\_\_\_ years old.

It's best year of growth was  
during the \_\_\_\_\_ year.

The worst year of growth was  
during the \_\_\_\_\_ year.



The black marks were probably  
made by \_\_\_\_\_.

\_\_\_\_\_  
*Name*