



Did you ever wonder where paper comes from? Paper is usually made from trees. To make paper, wood from trees is ground into very small fibers called wood pulp. The wood pulp is then washed with water, and pressed into paper sheets. Every year, people in the United States use more than 750 pounds of paper each! To produce that much paper, a 100-foot tall tree would have to be cut down for each person. Luckily, about 75% of the paper used in the United States today is recycled. (Source: Georgia Pacific) To recycle your own paper, follow the simple steps below.

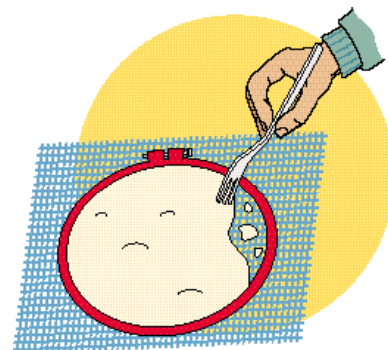
Materials

Newspaper
Blunt-end scissors
Ruler
Bowl
Measuring cup
Water
Blender or food processor (optional with adult supervision)
Disposable plastic fork
2 Pieces of nylon screen (30 cm, or 1 foot square each)
Plastic needlework frame (15 cm, or 6 inch round)
Rolling pin
Hairdryer (optional)

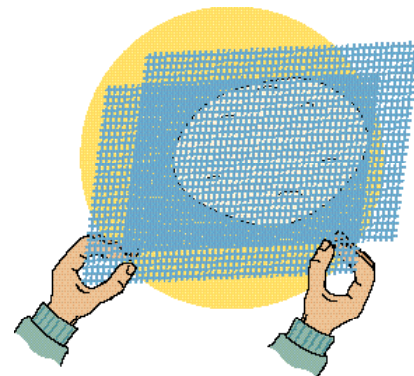
SAFETY: Be sure to follow Milli's Safety Tips! Do not eat or drink any of the materials used in this activity. An adult must do all the steps involving the blender or food processor.

Procedure

1. Cut a piece of newspaper that is 30 centimeters (12 inches) wide and 40 centimeters (15 inches) long.
2. Rip the paper into small pieces that are about 1 centimeter ($\frac{1}{2}$ inch) square, and place the pieces into a bowl.
3. Add $\frac{1}{2}$ cup water to the bowl and set it aside for two days.
(Alternatively, you can add the water and paper to a blender or food processor. An adult must complete all steps involving the blender or food processor! After the lid has been fastened securely onto the appliance, the water mixture should be blended on medium speed for 5 minutes. Skip to step 5.)
4. Using a plastic fork, mix the paper with the water until the paper disintegrates into pulp.
5. Stretch one piece of the nylon screen into the needlework frame.



6. Using the plastic fork, strain the pulp and drop it onto the nylon screen in the needle work frame. Then spread the pulp evenly across the surface of the screen.
7. Carefully, remove the nylon screen from the frame and place it pulp side up onto a pile of newspaper.
8. Place the second piece of nylon screen over the pulp, so that you make a sandwich with screen on top and bottom and the pulp in the middle.



9. Use the rolling pin to squeeze all of the water out of the pulp by rolling it over the top of the nylon screens.



- Without removing the screens, move your newly formed paper to a dry spot, and allow it to dry overnight. (Alternatively, you can dry the paper using a hair dryer. An adult must perform this step.)
- Remove the paper from the nylon screens.
- Pour the liquids down the drain, recycle any unused paper, and throw everything else in the trash. Thoroughly clean your work area, and wash your hands.

Try this...

Make a second batch of recycled paper adding in a few pieces of colored paper, yarn or string to the newspaper. You can also add small pieces of leaves or grass to change the texture of the paper.

Where's the Chemistry?

Plants use the energy of the sun to make all sorts of chemicals like sugars and complex carbohydrates. One of these complex carbohydrates is called cellulose. Cellulose is tough and indigestible. It is the main ingredient in wood pulp. Plants use cellulose to make their limbs and trunks strong and stiff. Without it, they would not be able to stand. Cellulose can be made into many different products like paper, cardboard, rayon fabric, and insulation. By recycling paper we cut down on the amount of waste in our landfills, save trees, and conserve energy.

What Did You Observe?

What does your paper look like? Is it white? Why not?

Two sets of handwriting lines for student response. Each set consists of a solid top line, a dashed middle line, and a solid bottom line. A small circle is provided on the left side of each set of lines to indicate the starting point for writing.



The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".

