

## Post-Visit Activities

The following highlighted GLE’s and GLC’s are covered in this section:

*GLE 6) Distinguish among reducing, reusing, recycling, and replacing as conservation techniques.*

### Recycling and Reusing “Earth Materials and Resources” Program Activities: Making Recycled Content Paper

#### INVESTIGATION SUMMARY

Students will discuss the paper making process and make samples of their own recycled content paper. Follow-up activity for student observations of the paper and its properties will be completed in the classroom following this museum activity. This activity can also be used to complement 3.1 Properties of Matter of the CT Science Framework.

#### Purpose

- Students investigate how paper is made.
- Using scientific thinking processes, they make observations and develop questions about the characteristics of their paper samples, measure materials, and compare data and observations about different papers.
- Students use data analysis to construct explanations about characteristics of paper and the practical uses of paper.

#### SCIENCE CONCEPT

Most paper products are made with some recycled content. Wood and trees, the base ingredients of most papers, as well as the water and energy used to make paper, are earth resources that should be conserved.

#### Materials

Blender

One Dipping Pan-- flat plastic or metal container for the activity to hold the paper slurry  
(Approximately 6-10” deep, 12” by 14” or larger)

Hot water

Recycled office paper, shredded fine

5 gallon bucket for soaking

250 ml measure (1 cup)

1000 ml measure

News paper for finish blotting (4-6 double sheets for each group)

One or two blotting stations—5 pieces of aluminum screen (12” x 12”) stacked and attached to a plastic cutting board, set into a large flat plastic container

Note: The blotting station is optional. Groups may use their hands and a lot of recycled newspaper instead of this station.

## CT Science Standard 3.4 – Earth’s Resources

*Earth Materials provide resources for all living things, but these resources are limited and should be conserved.*

For each group of 4-5 students:

One Large mixing bowl or pan to drain screen over

Screen--One piece of aluminum screen attached to cover an 8” x 10” picture frame

4 pieces of cotton fabric (12” x 12” )

Several squares of waxed paper (12” x 12” )

### Procedure

Have most of the slurry for the activity pre-made to save time. Demonstrate how to mix the slurry using one batch as directed below.

*Note: Extra slurry may be frozen and thawed for future use. Do not dispose of any paper pulp or slurry in sink drains. Strain any leftover slurry through several layers of screening to minimize the pulp content, freeze the concentrated pulp, or dry handfuls of the de-watered pulp in patties to be used in other activities.*

This activity may be done with one type of paper or with several different types. If it is done with several types, the supplies must be multiplied. Making paper from several types of materials will allow students to compare and experiment with the paper produced.

Stock that may be used includes:

- Recycled office paper
- Newspaper
- Cereal box cardboard
- Corrugated cardboard
- Construction paper

For each type of paper stock, use the following procedure:

Mix shredded paper/stock in a 5 gallon bucket with water. This should be soaked for at least one hour before mixing in blender. Cardboard stock should be soaked longer to soften.

You will need to have about 1000 ml (about 1 quart) of slurry for each group.

For each batch of slurry, measure into a mixing bowl:

250 ml (one cup) full of soaked shredded paper

1000 ml of warm water

Mix in a blender, filling blender about ½ full for each mixing. Cover tightly. Blend on high until the texture of thick soup. Pour out into a bowl until entire mix is blended.

Pour slurry into dipping pan

1. Each group will dip their screen under the slurry in the dipping pan and lift to allow water to drain off. Slurry should cover screen completely.
2. Drain screen over the group drip pan until water stops dripping.

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3. Cover top of slurry on screen with a 12” x 12” piece of fabric. Take care not to make wrinkles in the fabric. (wet fabric may be reused)
4. Gently press the “sandwich” of fabric, slurry, and screen, pressing out extra water. Carefully turn the screen on edge to have children press the “sandwich between their hands.
5. Flip the screen onto the table fabric side down and gently peel the paper pulp away from the screen. Cover the pulp side with another piece of fabric.
6. Lay the fabric-pulp-fabric assembly on the blotting station. Use hands to press as much water as possible from the “sandwich”. (Newspaper may be used instead of the blotting station. Plan on at 4-8 double sheets for this step, placing paper both under and over the “sandwich” and pressing.
7. After blotting, gently peel the top piece of fabric off the assembly without tearing the pulp. Turn the assembly onto a piece of waxed paper and gently remove the bottom fabric.
8. Dry the paper for future use.

Groups will be sent home with a baggie of the shredded paperstock used in the activity for observation in their classroom.

View the “How to make recycled paper” video from Teacher’s Domain (you will need to register if you have not already done so).

<http://www.teachersdomain.org/resource/ess05.sci.ess.earthsys.recycledpaper/>

The video is 4:53 and the file is fairly large (14.6 MB). Ask your students to reflect on how the procedure in the video is similar and different from their experience making paper. Would they be able to make the same paper using this method?

### A Closer Look at Paper

Set up observation stations for groups of 4-5 students.

Provide: Science Notebooks or paper to record observations

Hand lenses for each student

Small bags of the various types of dry shredded paper their slurry was made from during the science center activity

Ask students to observe and record what they see as they look at and examine the shredded paper. (Alternatively, observations may be recorded on a class list by the teacher)

*Have students open the bags and compare the different samples of paper and record what they notice. Are all the papers the same? How are they different? If students are not used to writing comparison observations, lead them with some questions about how we notice differences: sight, smell, touch, etc. Students may find it difficult to use words to describe characteristics like “translucence.” Brainstorm with students to build a set of vocabulary words that they can use in making descriptions.*

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Share out—have students share their observations and the comparisons they made.

*Next, give groups a piece of the paper they made at the science center. Ask them to make observations and notice any similarities and differences between the paper they made and the other comparison samples. Can they identify which dry papers their recycled paper was made from?*

Share out student observations about the comparisons they made.

#### **Discussion:**

Different kinds of paper are better for different activities. Ask what we do with paper---discussion should lead to things such as writing, paper bags, drawing or painting, making boxes or containers, folding (origami) and other activities.

*What activities do you think your science center paper would be good for? What activities would it not be good for?*

Ask student to write a reflection about their science center paper and what they could use it for, and why.

### **Supplemental Activities**

#### Extensions: Recycled Paper and the Properties of Matter

Folding Stations: Provide 12” squares of various paper products for each group of students to compare. Ask them to fold each kind of paper and make observations and comparisons.

Paper samples might include: white paper, construction paper, cereal box, corrugated, handmade paper, origami paper, tissue paper, paper toweling, and toilet paper.

Students should record their observations about folding each kind of paper. They should create a data table of their observations and list as many qualities as they can that affect the folding of the paper product.

Different papers are better for different tasks. Give each group one of the “task” cards below.

“Challenge: make an envelope”

“Challenge: write a letter”

Classify each paper sample that you have as to how it would likely perform the task on your card. Discuss with your group and make a list (best to worst) of how the papers will perform. Write an explanation of your best and worst choices in your science notebooks, explaining why you ranked that paper as ‘best’ or ‘worst’ for that task.

As a group try to complete your challenge task with each of your papers. How did your ranking work out? Is there anything you would add or change about your decision?