

Contemporary Craft Works

Exploring Fibers

Overview: After completing this activity, students will be better able to explain the process of paper making and choose the appropriate materials for a task.

Age Group/Grade Level: 11-13 years, grades 6-8

Subject Area: Science, Visual Arts

Duration: approximately 135 min.

Background

The quality, lifespan, and use of types of paper vary according to the fibers used to make it. For example, newsprint is a low-quality paper with unpurified cellulose content; cellulose is a carbohydrate that makes up the majority of plants' cell walls. This type of paper becomes more acidic as it ages, and its fibers shorten over time. As a result, artworks made of newsprint become brittle and tear easily. Alternatively, the long mulberry bark fibers found in high-quality paper make it strong and resistant to breaking down over time.

- Additional information on fiber types and paper preparation techniques can be found at:

http://www.si.edu/mci/downloads/RELECT/teaching_with_papermaking.pdf

Paper can be made from fibers, as well as recycled and pulped paper. For steps in the paper-making process:

<https://www.youtube.com/watch?v=87w8kdjhFvU>

Discussion

Share the Demaines' *Hugging Circles* and Sylvia Seventy's *Breeders Flock: Caucus* with students. Consider beginning your conversation with the following questions:

- Based on what you can see, how might these artworks have been made?
- How do these works differ structurally?

Share the fact that both of these works are made of paper. Explain that papers made of different fibers have different qualities. Some types of paper bend softly, some form crisp folds, and others are strong enough to support weight.

- Based solely on what you can see, how might the properties of these papers differ?
- How might the artist's choice of a different paper fiber affect the final artwork?



Activity I

Assign students to five small groups. Provide each group with a microscope or magnifying glass and small samples of paper types to be pulped (newsprint or magazine paper, for instance), as well as fibers (denim, raffia or other grass, dryer lint, etc.). Guide exploration with the following questions:

- After looking closely, what do you observe about each material?
- Try bending or breaking the materials. How are they similar? How are they different?
- Generate a hypothesis based on your observations: What might paper made from these materials be like? Why?

Assign each small group to one of the sample paper types or fibers and have groups pulp that fiber type. Using the steps laid out in videos cited under "Background," have students make five sheets of paper from their single material. Explain that they will be using this paper for further experimentation.

For a full-size image of the Demaines' *Hugging Circles*, visit:
http://americanart.si.edu/images/2011/2011.54.2_1a.jpg

For a full-size image of Sylvia Seventy's *Breeders Flock: Caucus*, visit:
http://americanart.si.edu/images/1996/1996.86_1a.jpg

Activity II

Share *Hugging Circles* and *Breeders Flock: Caucas* with students.

- If you were choosing paper to create these works, what qualities would you find desirable? What do you see that makes you say that?

Have students return to the small groups created during Activity I. Distribute a sample sheet of each type of student-made paper to the groups. Have students devise and execute an experiment to test for the desirable qualities they just identified.

- During Activity I you generated hypotheses about each paper type based on the properties of its component material. How did your hypotheses bear out?
- Why do you think the properties of paper types differ?



Erik Demaine and Martin Demaine, [Hugging Circles](#), 2011, Zanders Elephantenhaut paper (elephant hide paper), 11 x 11 x 10 in., Gift of the artists in honor of the fortieth anniversary of the Renwick Gallery, 2011.54.2. © 2011, Erik and Martin Demaine



Sylvia Seventy, [Breeders Flock: Caucas](#), 1988, hand-molded recycled paper pulp, wax, trimmed feathers, and acrylic paint, 5 1/4 x 10 in. diam., Gift of Lloyd E. Herman, founding director and director emeritus of the Renwick Gallery (1971-1986), 1996.86.