

Recycled Papermaking

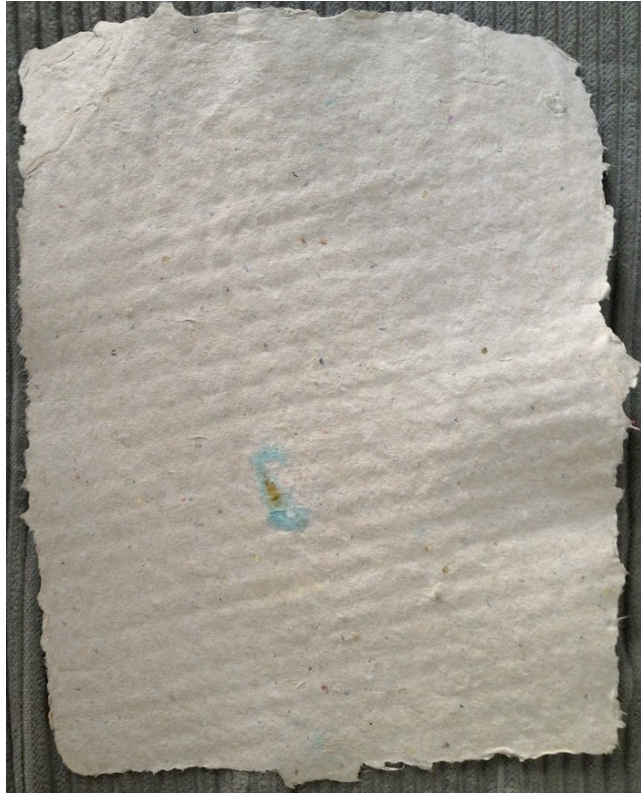
(Inspired by Chinese
Techniques)

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Grade Level: 9-12

Time Span: Two 45-minute
classes

Essential Question: What is the
importance of handmade
materials?



Guiding Questions: What is the history of papermaking? How did the Chinese first make paper? How can paper be made using recycled scraps? What is the importance of paper made by the artist who intends to use it?

Objective: Students learn about the history of papermaking with a focus on ancient Chinese techniques. Students understand the process and materials associated with papermaking. Students apply new techniques to make their own paper using recycled scraps collected by the class.

Vocabulary:

Cockling: The natural warping of paper as it dries, cockling occurs when the paper is air-dried or if there is not sufficient weight on top of the drying stack.

Couching: Transferring a freshly made sheet of paper from the mold surface onto a receiving surface

Deckle: The frame that is held on top of the mold during papermaking to contain the loose pulp and determine the size, shape and thickness of the sheet of paper

Fiber: Plant cells that impact elasticity, flexibility and tensile strength in plants (Fiber is most often found in the structural parts of plants, such as stalks, stems, and trunks, although some plants have fibrous leaves, seedpods, or seed hairs.)

Mold: The fundamental papermaking tool, upon which sheets of paper are formed. The mold's surface is a mesh screen held rigid by a frame that acts like a sieve as paper is formed, catching the fibers on top and allowing the water to drain through.

Pulp: The wet mass of plant material that has been traditionally cooked and beaten, or contemporarily soaked and blended from which paper is made

Materials:

- Plastic drop cloths
- Buckets for soaking collected paper
- Handmade papermaking frames (need to be pre-made prior to the lesson),
Molds and Deckles: wood, window screen, staple gun
- Large tubs that can fit the molds and deckles with the ability to submerge
- Blender
- Sponges
- Pieces of 8 ½ x 11 store-bought craft felt
- Paper scraps (computer paper, construction paper, brown paper, tissue paper, newspaper, phonebook paper- anything that is not coated or

- waxed)
- Heavy books to press water out

Resources:

China: The dragon's ascent. (2009). [Web Video]. Retrieved from

http://www.youtube.com/watch?v=y-Gg_6Zgbz4

Heibert, H. (1998). *Vocabulary for papermaking.* Retrieved from

https://oasis.colum.edu/ICS/icsfs/Vocabulary_for_Papermaking.pdf?target=062ab405-0334-4523-af21-2b56ca69982b

PaperRep history of paper. (2009). [Web Video]. Retrieved from

<http://www.youtube.com/watch?v=sDGxy5ft6w8>

Performance Tasks: Students are asked to bring in paper scraps prior to the papermaking lesson. Computer paper, construction paper, paper bags, tissue paper, newspaper, and phonebook paper can all be used to make recycled paper. Any paper that is not coated or waxed will work for paper making (not magazines or any other shiny or filmy paper).



At the start of the class, the collected paper is torn into small pieces and put into



buckets and covered with hot water. This will start the process of breaking down the paper fibers. If different stations wish to create their own paper, separate paper soaking buckets for each group should be provided.

While the paper is soaking, the lesson is introduced with two short Youtube videos on this history of paper and the history of Chinese papermaking. Students are then asked what materials can paper be made from. The instructor reinforces the fact that the first paper made in China was made from mulberry bark, rags, hemp, and old fishnets. The instructor emphasizes that papermaking was originally a recycling technique, whereas now it is often a wasteful process. However, in this lesson students will learn how to recycle factory made paper into beautiful unique handmade paper.

The instructor then gives a papermaking demo to the students. The instructor shows how just a handful (about a cup), of soaked scrap paper is first added to the blender, and then how the blender is filled to the 4 cup line with water.





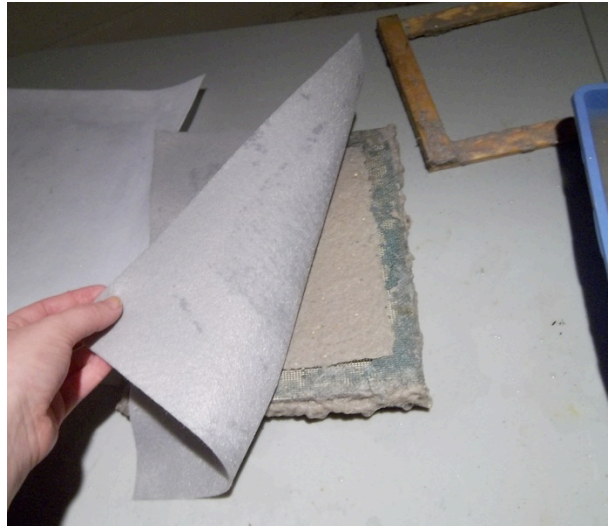
The paper is then blended on high until it is about the consistency of wet oatmeal, (about 30 seconds for most blenders and pulp). Thicker pulp produces thicker more textured paper, while more blended pulp creates thinner paper with a smoother texture. The instructor explains how the paper fibers separate, absorb water, and become hydrated, which eventually creates the paper pulp.

The instructor then explains what a mold and deckle are and what their purposes are in papermaking: the mold holds the pulp evenly on the surface; the deckle creates the shape of the paper and contains the wet pulp in the water vat. The instructor then demonstrates that the vat filled with water is deep enough to cover the mold and deckle. The instructor pours some of the blended paper pulp on top of the submerged mold into the deckle. More pulp creates thicker paper while a little bit of pulp will yield a thin delicate piece of paper. The instructor emphasizes that the mold and deckle need to be softly agitated from side to side while submerged and while lifting in order to create an even piece of paper.

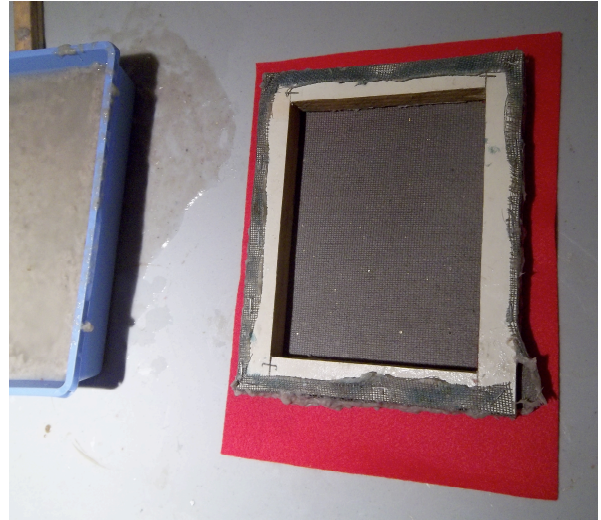




The instructor demonstrates removing the deckle, and how to press excess water out with craft felt after the paper has been lifted from the pulp, and while the mold is still over the pulp bucket.



The instructor then demonstrates the couching method used in the lesson. Couching is the papermaking technique of transferring the paper from the mold onto a receiving surface. The instructor gives tips for removing the paper, and shows how to carefully pull from the corner of the paper, and how thicker paper, and paper that has been thoroughly pressed is easier to couch.



The instructor explains that paper can be left to dry as is (which might lead to cockling, or the natural warping of paper left to dry naturally), or paper can be pressed between thin

cardboard weighted with heavy books (which takes longer to dry, but produces flat pieces of paper).

The instructor then checks for understanding before letting the students start blending paper.

The simplified steps students need to adhere to are:

1. Tear paper into small strips.

2. Soak in warm water for at least 15 minutes, (cold water: several hours).
3. Add about 1C soaked paper to about 4C water in a blender.
4. Blend on high until the pulp is the consistency of oatmeal.
5. Pour pulp into a tub with additional water, (enough so that the mold and deckle are able to be submerged).
6. Submerge and gently agitate the mold and deckle while lifting the new paper from the water and pulp.
7. Remove the deckle and use craft felt to press out the excess water from the pulp.
8. Turn over the mold and couch the paper onto a piece of thin cardboard or craft felt.
9. Let dry as is, or press under cardboard and heavy books.

Students are expected to make at least one whole piece of paper, which will eventually be used as their book cover in the Japanese Stab-Bound book lesson. Experimentation and making additional sheets is encouraged.

Students are asked to answer three questions that will be used for assessment:

What was your handmade paper made from?

What are the steps essential to paper making?

How does this method of papermaking compare to the ancient Chinese method?

Clean up: The last 15 minutes of class is reserved for clean up. Students are responsible for cleaning up their station with their group. Excess pulp should be poured through a fine screen so paper fiber does not clog the drain. Stray pulp can easily be wiped up with a wet sponge. Screens should be rinsed as well as possible to remove caught fibers before they dry.

Modifications: Advanced students can be taught how to make their own mold and deckle using small pieces of wood or picture frames, mesh wire, and a staple

gun. Paper can be embellished with dried flowers, seeds, or bits of colored paper after it has been couched. Strong colored pulps can be made and then combined while wet in the vat, which can yield some interesting multicolored blended paper. Paper pulp can be made using a mortar and pestle rather than a blender; the hand ground method just takes more time. Younger students can work in teams making paper, or stations could be made for tearing, blending, pouring pulp, couching, and pressing and stations could be timed and rotated to facilitate organization and clear instruction.

Assessments: After the assignment, students are asked to explain what went into their handmade paper, to write out the steps essential to papermaking, and to compare the papermaking method used in class to the method used by the ancient Chinese. The pages students are asked to write on are measured out for the final bookmaking lesson, and a 2" margin should be reserved on the left side for the binding.

Maine Learning Results:

A. Disciplinary Literacy - Visual Arts: Students show literacy in the art discipline by understanding and demonstrating concepts, skills, terminology, and processes.

A3. Media, Tools, Techniques, and Processes:

Students compare the effects of *media* and their associated *tools, techniques, and processes, using elements, principles, and expressive qualities in art forms and genres.*

B. Creation, Performance, and Expression - Visual Arts: Students create, express,

and communicate through the art discipline.

B1 Media Skills:

Students choose multiple suitable *media, tools, techniques, and processes* to create a variety of original art works.

E. Visual and Performing Arts Connections: Students understand the relationship among the arts, history and world culture; and they make connections among the arts and to other disciplines, to goal-setting, and to interpersonal interaction.

E1 The Arts and History and World Cultures:

Students analyze the characteristics and purposes of products of the visual/performing arts to understand history and/or world