

Flowchart for Papermaking in the K-12 Classroom

Pulp sheets
(purchased)

Plain paper
(recycled)

1. Tear apart paper into ~2x3" strips.
2. Soak the paper overnight in water.
3. Blend in a household blender using small (quarter to half dollar size globs) added to $\frac{3}{4}$ filled (water) blender. If blender bogs down, add less pulp.
4. Add blended bits including water to the vat. Start with less pulp/water in the vat and add as necessary. Otherwise, you have to remove pulp to get the right consistency. Test consistency by making a sheet. If pulp is a pillowy mound on the mold cut with water. Sheets should be just visible on the top of the mold.

Other Additions to the vat

Formation Aid (not required, but better paper)

1. Fill $\frac{3}{4}$ blender with water
2. Agitate the water
3. Add $\frac{1}{2}$ tsp of formation aid
4. Blend 4 seconds and stop
5. If too thick, add more water
6. Pour $\frac{1}{2}$ to $\frac{3}{4}$ blender in the vat. This addition slows down water from the sheet, disperses fiber and creates a more even sheet of paper. You may have to add more.

Mica (decorative, not required)

1. Fill $\frac{3}{4}$ blender with water
2. Add nickel to quarter sized piece of mica, broken up into smaller chunks.
3. Blend until dispersed.
4. Add to the vat. Mica adds a sheen to the paper, almost equivalent to adding glitter, but more subtle.

Form the Sheet

1. Prepare cooching (sounds like couch) area by laying down thick towel and cooching cloth (sheeting made to the size of the mold) with sponges nearby.
2. Before sheet forming, make sure pulp is well dispersed by using the 'Beauty Queen' wave to prevent splashing. Do this *each time* before making a sheet.
3. Put together the mold and deckle. The mold is on the bottom, the deckle on top. Hold these two together on the sides and upright vertically toward the side of the vat furthest away. If done properly, you'll look like you're holding a frame up looking at a picture with arms fully extended.
4. Emerge the mold and deckle in the vat (turning it flat against the bottom of the vat) and gently but quickly bring it towards your body, lifting it out of the vat at the last second. Pulp should be resting on top of the horizontal mold bounded by the deckle.
5. Let the paper drain water for $\frac{1}{2}$ a minute, remove the deckle.
6. Take the mold and go to the cooching area. In one swift motion, line up the bottom edge of the mold with the cooching cloth and turn upside down so that the paper touches the cooching cloth. Once in this upside down position, take sponges and remove excess water from the back of the mold. *Set aside a bowl for accumulating excess water.*
7. Remove mold from the paper by lifting one edge of the mold to see if the paper is still stuck to it (if so, remove more water). If the paper remains on the cooching cloth, completely remove the mold.
8. Gently grab the edges of the cooching cloth and hang the paper to dry on a clothesline (don't clothespin the paper). Alternately, if done inside, you can leave the cooching cloths on lab tables and they will dry provided you have removed most of the moisture.

Decorative Additions to the Sheet

1. Add plant parts to the pulp in the vat and they will automatically get bound with the paper. If you use flowers (even dried ones), many floral pigments will bleed into the pulp water, which may or may not be a desired effect. Adding grass or other plant parts is best done if they are dried flat first. Otherwise, they shrink in the paper over time that may cause undesirable effects.
2. Add plants directly to the sheet. It is best to use dried plant parts and drape some additional pulp over those parts before you leave the vat. In this way, the parts get bonded in the paper. Otherwise, they rest on top and may require some glue to stay in place.

Supplies needed for Papermaking

- Pulp** (can be purchased in sheet form or raw beaten form). Take care when using recycled paper-if too often recycled, the paper fibers become shorter and therefore can't bind together to make paper.
- Blender** – Handy for beater blending pulp and additions to the vat like mica or other plant parts.
- Mold/Deckle** – For creating sheets. Available in many sizes/shapes or possible to make your own.
- Formation aid** – While not required, the use of this chemical allows the pulp to be more evenly distributed across the sheet.
- Old towels** – Use 4-5 old towels in the cooching area to sop up the water as it drips off the mold.
- Old sheets** – Use sheets cut into lengths tailored to your mold/deckle as cooching cloths. Once the sheet has been formed on the mold/deckle, use these cloths to transfer from the mold to the cloth for drying.
- Bucket** – For carrying water to the vat and emptying the vat when finished.
- Vat** – Can be a cement mixing tub or any plastic tub at least 2' x 3'.
- Old pantyhose** – For straining off the remnants of pulp once you're finished making paper. Pulp can be refrigerated for up to 9 months after usage.
- Sponges (6-10)** For mopping up water from the back of the mold during cooching.
- Dried plants** – Any dried plant parts-pressed flat- can be added on top of the mold once you've finished making the sheet. However, do add additional pulp on top of that or the material will not stay without glue. Plant parts can be added to the vat but take care with floral parts-many pigments will bleed in the watery vat and may cause an undesired effect.
- Plastic margarine tub (2 or more)** – For collecting excess water from sponges. Not needed if working outside.

For hand papermaking supplies, see <http://www.carriagehousepaper.com> or <http://www.twinrocker.com>