

Recycle Right

Trash into Treasure

Lesson Objectives

After completing this lesson students will be able to:

- ♻ Identify materials which can be reused
- ♻ Creatively adapt materials for another purpose
- ♻ Recognise the value of reusing materials – closing the loop.

Background

Australian homes and workplaces use approximately 2.4 million tonnes of paper per year for printing, writing and reading uses alone¹. Recycling all types of paper and using recycled paper products helps reduce the use of energy, water and raw materials that go into paper production.

Introduction

In this lesson students will learn how to make recycled paper from a range of paper products that they collect from home and school.

Duration

This activity is carried out over a period of one week to allow for the collection of materials, overnight soaking, papermaking and drying of the paper.

Materials

These are the minimum requirements for two papermaking stations.

- ♻ 2 moulds and deckles (see the 'More Information' section at the bottom of this lesson plan for more about moulds and deckles.)
- ♻ 2 pressing boards
- ♻ 2 buckets
- ♻ 1 large tub that will easily hold the deckle
- ♻ 2 large ice-cream containers

- ♻ Fabric squares or chux to fit on the pressing boards. You will need one piece of fabric for every piece of paper made, plus one extra.
- ♻ Sponges
- ♻ A variety of used paper eg photocopy paper, tissue paper, Christmas cards
- ♻ Hand held blender, food processor or similar
- ♻ Ladle or container to use as a scoop
- ♻ 2 C-clamps or bricks/heavy objects
- ♻ Sieve
- ♻ Coat hangers and pegs
- ♻ Old towels to mop up excess water
- ♻ Mop

Activity

1 Collect Material

- Have students collect 3 or 4 used paper items each from home and around the classroom. They can also collect leaves, fallen petals, tea leaves or make some confetti to add to the paper for a more creative finish.

2 Prepare Materials

- Tear the paper into fine shreds and soak it in a bucket of cold or warm water overnight.

3 Making Pulp

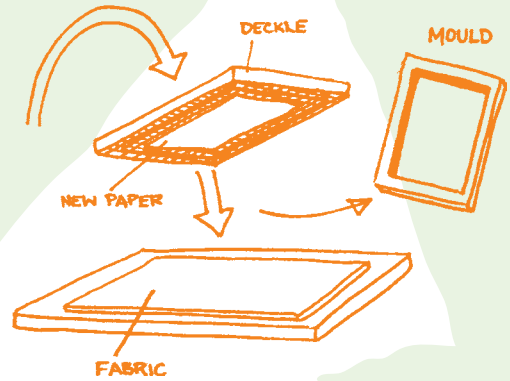
- Use the blender or food processor to blend your paper into a fluffy pulp.
- Add extra water if necessary, so that it swirls around easily. In the interests of health and safety any pulp that has been handled should be disposed of the same day.
- If you have a microscope, look at the different lengths of the cellulose fibres.

¹ Australian Plantation Products and Paper Industry Council (a3p.asn.au)

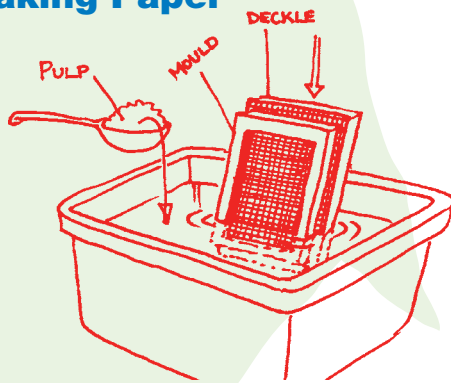


4 Setting Up For Making Paper

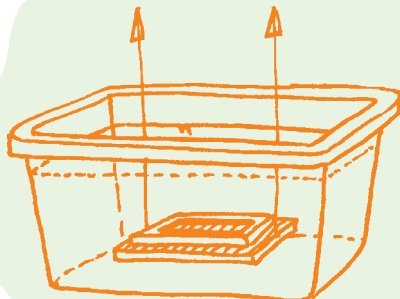
- Setup a large table to work on. This is a sloppy activity so you should setup in an area that can get wet.
- Gather your mould and deckle, bucket of pulp, ladle and tub. Setup the pressing board with fabric squares or chux next to it. Have your ice-cream containers and sponges handy.
- Fill the large tub with about 10cm of water.
- Check that your deckle will fit easily into the tub. If so you're ready for the next step.



5 Making Paper

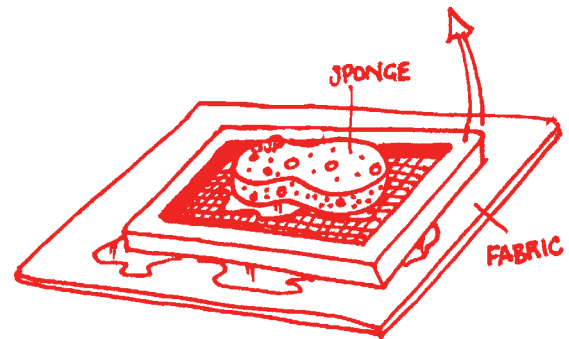


- Ladle 3 or 4 scoops of pulp into the tub of water. Then holding the mould and deckle firmly, immerse them vertically into the water. Hint: If the paper is coming out too thin, add more pulp to the tub. If it is too thick, remove some pulp from the tub with the sieve. To make more creative paper, add tea leaves, crumbled petals, confetti or very small leaves to the water.



- Once immersed you can hold them horizontally (flat) under the water. Bring them straight back up to the surface. You will be catching the paper fibres on the mesh as you do so. Slowly lift them from the water, allowing excess water to trickle away.

- Cover your new paper with a fabric square of chux and take over to the pressing board. Remove the mould and invert the deckle over the fabric with the paper facing away from you
- Don't lift the deckle off straight away. Use your hands or the sponge to push the paper firmly against the fabric, especially against the corners, otherwise it will lift off when you attempt to take the deckle away.



- Using the sponge, sop up as much excess water as you can from the back of the mould. Squeeze out the sponge into the ice-cream container. Repeat this until you can't get any more water from the new paper.
- Take one end of the deckle and slowly lift it up. You can use your other hand to press against the mesh as you raise the deckle, to help stop the paper from coming away.
- Your new paper should be left behind on the fabric.

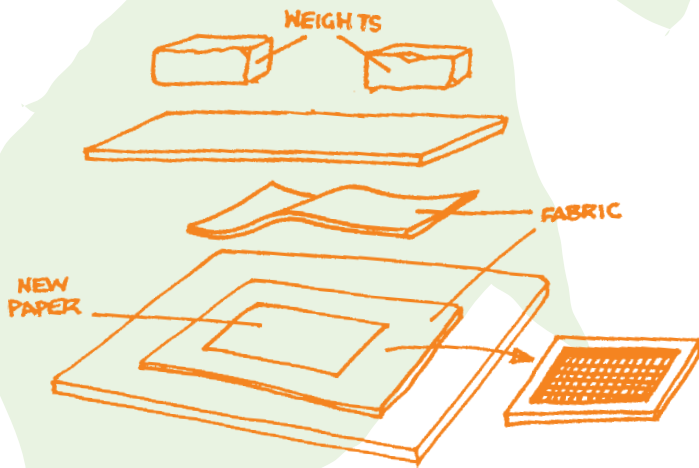
6 Repeating the Process

- Place a fresh piece of fabric or chux on top of the new paper and repeat the process, making a stack of paper, each new sheet separated from the others by fabric.



7 Drying the Paper

- Put the second pressing board on top of your stack of new paper. Put one C clamp, or a few bricks, at each end of the stack. Tighten clamps. A fun way to squeeze is to have students stand on the paper stack!
- Place the stack on an angle (a brick or block at one end will do) and let it drain overnight.
- Unclamp and separate the paper. Hang it to dry on coat-hangers (use pegs) or place each sheet between ample sections of newspaper.



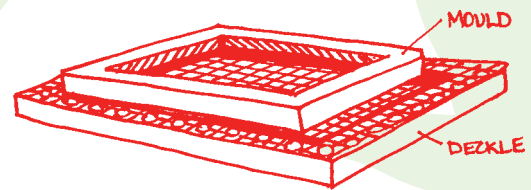
8 Cleaning Up

- Pulp and plumbing do not agree with each other!
- Put the sieve over a bucket to catch the pulp and drain away the water.
- Any pulp that is left can be used for papier-mache, worm food in the worm farm, to make paper pots, or in the compost bin.
- Wash hands with soap and water.

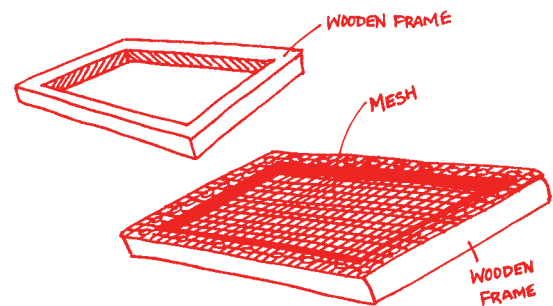
More Information

About Moulds and Deckles

- The deckle is a rectangular frame with a mesh stretched over it. The mould is a smaller rectangular frame which will give your paper pulp its shape.



- The pulp sits on the mesh of the deckle when you scoop it up from the water. The mould determines the size of the finished piece of paper.
- Any rectangular frame to which you can attach a mesh will make a deckle. Your art department may have some old silkscreen frames. The frame should be large enough to make a piece of paper of reasonable size but small enough to fit in the tub.



- An old, empty picture frame or photo frame can make a mould. Don't use really small ones.
- If you are handy with timber and tools you can make your own moulds and deckles.

Paper Recycling

For more information on paper recycling download the paper recycling factsheet from schoolsrecycle.planetark.org/coords/factsheets.cfm



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