

Unit 14

Trash into Treasure



Teachers Notes

Learning Objectives

Students will be able to:

- identify materials which can be reused; and
- creatively adapt materials for another purpose.
- recognise the value of reusing materials.

Focus Questions

- How can you make better use of materials which are usually thrown away?
- What types of 'junk' material can be used for making models?
- What materials can you use in making your own paper?

Learning Outcomes

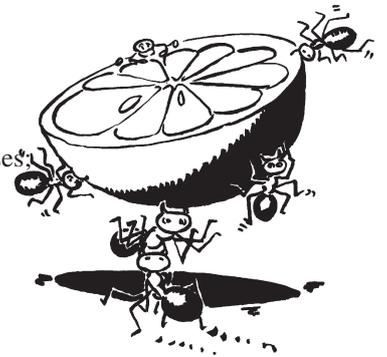
As per the National Profiles

Technology

- *Designing, Making and Appraising*
Investigating; Devising; Producing; Evaluating Materials
Nature; Techniques

The Arts

- *Creating, Making and Presenting*
Exploring and developing ideas; Using skills, techniques and processes;
Presenting



Activities

Junior Primary - Desk Sorter

Using milk cartons, students design a desk sorter or container for holding stationery.

Middle Primary - 'Junk Art' Models

Students use 'junk' material to make a science fiction space craft or a model of their own choice.

Upper Primary - Paper Making

Students make hand-made paper from used photocopy and other waste paper.

Background Information

The early Aboriginal inhabitants of Australia produced and discarded very little rubbish, mostly bones, shells and stone tools. These materials which were organic broke down naturally to become part of the environment. The early Europeans also produced little rubbish. Resources were scarce and what we would often throw out now they would reuse. Packaging also has changed with much of it being single use only and non reusable.

Since the 1950s garbage has become an increasing problem mainly because people are buying more goods in non-refillable or non-reusable packaging. Many people no longer have the obligatory dog, chooks, backyard incinerator (banned because of the pollution they caused) or compost heap. As a result more waste is going straight to landfill. It is also often cheaper and easier in our present society to throw away rather than fix and reuse.

According to the Commonwealth Environmental Protection Agency, Australians generate almost 800 kg of rubbish per person, per year. That's about the weight of one Clydesdale horse! It costs the government over \$500 million to collect and dispose of this waste; with householders contributing to this through local government fees and charges.

About one third of all waste going into landfill in Australia belongs to households and local councils. The rest consists of commercial, industrial, and building and demolition waste.

We can make a significant reduction in our personal waste by rethinking our buying habits, reducing packaging by choice of product, reusing what we can, composting and recycling. The backyard compost heap is a wonderful way to reduce, recycle and reuse valuable organic materials that would otherwise become landfill.



Activity Information

Junior Primary - Desk Sorter

Materials

1 well-washed milk carton per student
magazines
coloured paper
junk materials
glue
stapler
scissors
trimming knife



Activity

Purpose: to consider ways of reusing waste which would otherwise be thrown away.

1. Cut off one side of the milk carton so that students have an open box.
2. Brainstorm ideas for the design of the desk sorter such as a boat, crocodile, pig and so on and then get students to decorate boxes.
3. When completed, students can use their desk sorters to keep the desk tidy.
4. Students can brainstorm '101 Uses for a milk carton'. List these on the board.
5. Discuss why it is better to use junk material rather than new material.

Middle Primary - 'Junk Art' Models

Materials

a large collection of assorted junk material
art/craft materials
Activity Sheet 40

Activity

Purpose: to understand that materials can be reused.

1. Prior to the activity, engage students in a class 'junk' material collecting competition.
2. Explain that the material will be used for making models in art. The winners of the competition may receive a nominal prize.
3. When there is enough material collected, invite the students to make models of spacecraft which could be suspended from the roof of the classroom. They can be as big and as grand as they like.
4. Direct the students to keep a record of the materials they used to make their models. These lists will be suspended beside their models to show the clever and creative use they made of the 'junk' material.
5. Once all the class model making is underway, or at the end of the lesson, bring to students' attention the good use they are making of material that would normally be thrown away. Encourage them to continue bringing in materials while the model building is in progress.

Upper Primary - Paper Making

Materials

See Information Sheet P for materials.
Information Sheets P & Q.

Activity

Purpose: to experience the true process of recycling.

Paper is such an essential part of our lives that it is difficult to imagine how we would manage without it. Much of our paper is needlessly wasted and contributes to the overall waste problem.

You can introduce the class to the joys of hand-made paper and creatively turning waste into a product that can be used in a variety of ways.

Some parents may be interested in learning this art - a few more willing adult hands would be helpful!

Free Resources

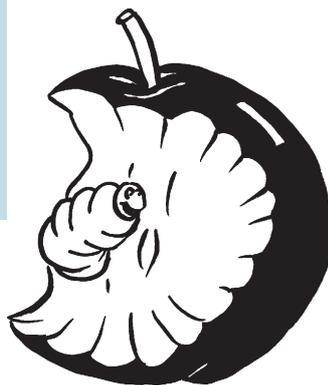
“Save the Planet”

Carton Crafts Booklet

Making Paper from milk cartons”

A3 Poster

Available from the Association of Liquidpaperboard
Carton Manufacturers
PO Box 6250
North Sydney NSW 2059
Ph: 02 9954 4588
Fax: 02 9954 4546



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Activity Sheet 40: 'Junk Art' Models

Name _____ Group Members _____

Date _____



Name of your model _____

Description of the model's special features _____

List of junk material used

Why is it better to use junk than new materials?



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Information Sheet P: Paper Making

The better the quality of the paper you use, the better your results will be. Brightly coloured tissue paper will add its own colour to the mix and give a fine fleck which is very attractive. Try dark purple, deep red, bright orange or yellow. Only mix compatible colours.

What do we need?

2 or more moulds and deckles (see Information Sheet Q)
2 pressing boards (old particle board works well)
1 or 2 buckets
some large ice-cream containers
fabric squares to fit on the boards, or 'chux'. You'll need one piece of fabric for every piece of paper made, plus one extra.
sponges
used photocopy paper, tissue paper, old Christmas cards, milk cartons (you must first tear the carton into strips and then, with an adult, boil them in water for 15 minutes - then cool the water and carefully remove the thin plastic layer on the carton).
water (hot water softens the paper faster)
hand-held blender, food processor or paint stirrer and drill
ladle or plastic margarine container
tub large enough to hold the deckle (for example, a baby bath)
sieve
2 or more C clamps (2 clamps for each set of pressing boards) or several bricks
coat-hangers and pegs if you choose to dry the paper this way
old towels to mop up excess water on tables
mop



How do we make it?

Step 1

Tear the paper into fine shreds and soak it in a bucket of water overnight (hot water is optional).

Step 2

Take extra care where water and electricity are in close proximity.

Use the blender to blend your paper to a fluffy pulp.

Add extra water if necessary, so that it will swirl around easily. The pulp can be kept for two to three days, depending on the air temperature, without any additives. In the interests of health and safety, any pulp that has been handled should be disposed of the same day.

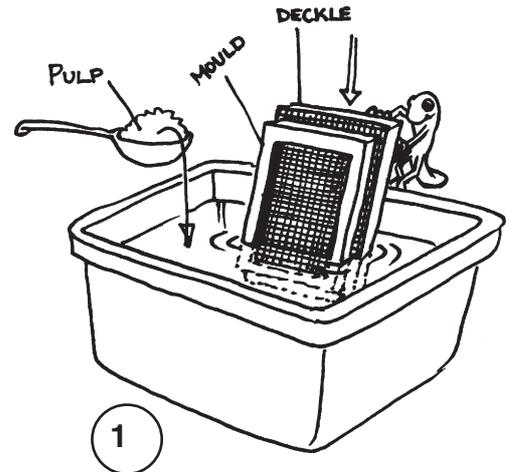
If you have a microscope, look at the different length of the cellulose fibres.

Step 3

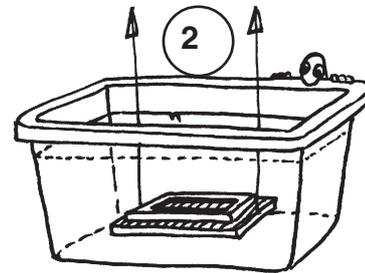
Have a large table to work on, preferably in the wet area. This is a sloppy activity and great for summer. Gather your mould and deckle, bucket of pulp, ladle and tub. Set up the pressing board with fabric squares or chux next to it. Have your ice-cream containers and sponges handy. Fill the large tub with about 10 cm of water. Can you easily fit the deckle into the tub? **OK, you're ready to go!**

Plunge that Pulp!

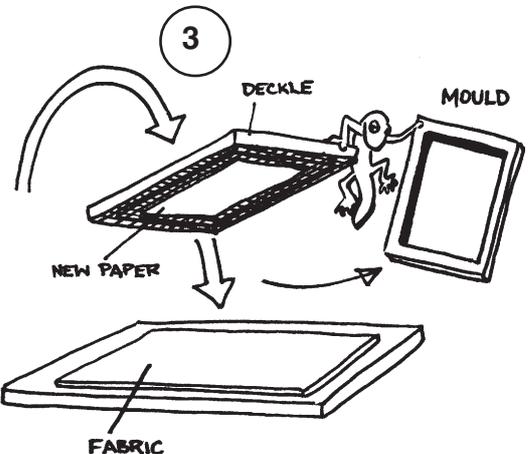
1. Ladle three or four scoops of pulp into the tub of water. Holding the mould and deckle firmly, immerse them edge on (vertically) into the water.
2. Once immersed, you can hold them horizontally (flat) under the water. Now bring them straight back up to the surface. You will be catching the paper fibres on the mesh as you do so. Slowly lift them from the water, allowing the excess water to trickle away.



3. Take your new paper over to the pressing board covered with fabric or chux. Remove the mould and invert the deckle over the fabric with the paper facing away from you.



4. 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.



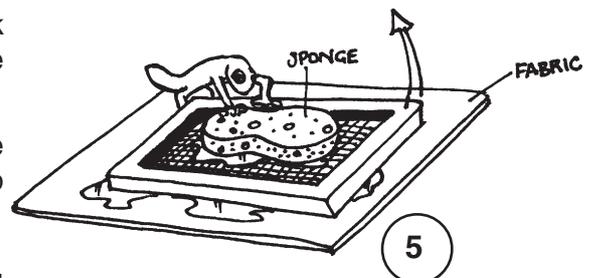
5. Using the sponge, sop up as much excess water as you can from the back of the mould. Squeeze out the sponge into the ice-cream container. Repeat this until you can't get any more water from the new paper.

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. 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.

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.

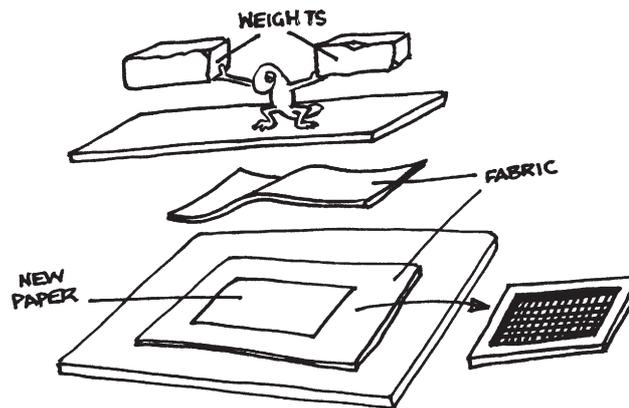


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The Big Squeeze

- 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.

Clean 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.

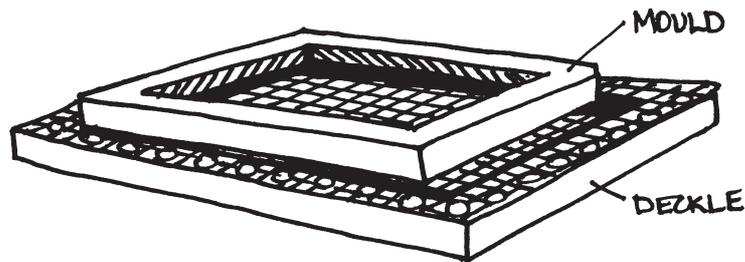
Wash hands with soap and water.



Information Sheet Q: Paper Making

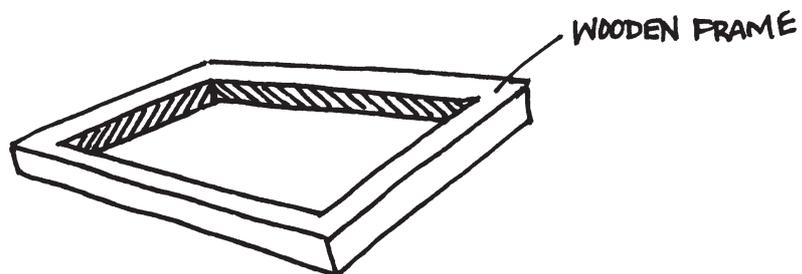
About Moulds and Deckles

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.

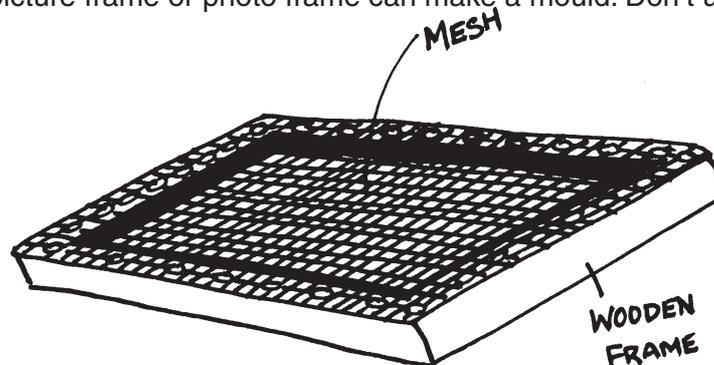


The pulp sits on the mesh of the deckle when you scoop it up from the water. The mould determines the size of the finished piece of paper.

Any rectangular frame to which you can attach a mesh will make a deckle. Your art department may have some old silk screen frames. The frame should be large enough to make a piece of paper of reasonable size but small enough to fit in the bath.



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.

