

## ACTIVITY 11

# Hand-made Paper

**Making hand-made paper from used office paper is a way of recycling paper. By re-using or recycling office paper, we are reducing the need to cut down trees to make new paper, reducing habitat destruction as well as reducing the amount of paper entering landfill.**

**Science ACSSU002** Living things have basic needs, including food and water

**Science ACSSU211** Living things live in different places where their needs are met

**Science ACSSU003** Objects are made of materials that have observable properties

**The Arts ACAVAM 107/107** Use and experiment with different materials, techniques, technologies and processes to make artworks

**Sustainability OI.1 – OI.9** The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future. Actions for a more sustainable future reflect values of care, respect and responsibility.

## Preparation before the activity

Read the instructions on paper-making before this activity. Paper pulp must be made in advance of this activity, for example, the night prior. Papermaking should be conducted outdoors, as it is a wet process, preferably under a verandah. After the paper is made, there will be a wait of about two days before the paper is ready to hang and dry.

## You will need

1. About 40 sheets of used office paper – preferably paper which has been printed on both sides. Some coloured paper can be added too
2. Around 6 papermaking moulds\* and deckles\* (purchased from craft shops OR instructions on how to make these are below OR embroidery frames and hoops)
3. A (rectangular) tub/trough large enough to immerse the moulds and deckles

4. A paint stirrer with hand-held electric/battery powered drill plus 'Bamix'/hand-held blender, or as an alternative to those, an electric blender
5. Approx 100 Chux superwipes or similar ('couching cloths') cut to approximately 1.5 times the size of your mould/s
6. Approximately 5 old newspapers
7. Two buckets
8. Access to hot and cold water
9. A (wooden) board, larger than the size of your mould
10. Soft petals, scrap thread, fine yarn, small flat paper pieces, glitter (all optional)
11. Two or three benches, tables or trestles (which are allowed to get wet) – one low bench can be for the pulp, one can be for the finished paper sheets and one table can be for decorating the paper sheets
12. Small pieces of paper approx. 3x1cm, to be used as name labels, 2-3 per child
13. Biro's to name the labels (not felt tip pens)
14. String
15. Clothes pegs

\*If you make the mould and deckle, you will also need

- 2 similarly sized wooden frames that are flat across their top surfaces (old picture frames work OK)
- A small piece of fly screen (available from hardware stores or some-one's back shed)
- Tacks, or a staple gun
- A hammer (if you use tacks)



## Method

### Do this ahead of time:

#### Step 1 – If you have no moulds or deckles

Stretch the fly screen tightly over the surface of one of the matching frames and attach the screen to the back of the frame with the tacks. The second frame will be used as the deckle, which makes the sheet of paper the desired size. If you use an embroidery frame, attach fly screen to the embroidery frame: then the deckle will sit over the screened frame to create a slight rim or lip for the pulp to be captured in. That second frame (deckle) does not need a fly screen attached, it is to be left bare.

#### Step 2 – tear up old paper

1. With the children, tear the office paper into small pieces, roughly 2cm square, alternatively put the paper through a paper shredder.
2. **After school**, place the torn/shredded paper in a bucket and add enough **BOILING** water to cover the paper.
3. Soak **OVERNIGHT**.

#### Step 3 – Prepare the pulp

4. Before the lesson, blend all the paper in the bucket with the paint stirrer attached to the drill. Once coarsely pulped, use the Bamix to complete the pulping, to make it fine. **ALTERNATIVELY** put a handful of paper in the blender and add water until the blender is half to 3/4 full. Cover the blender and turn it on high for about two minutes. This will turn your paper into pulp. Repeat this process until all your paper is blended into a pulp and is very soft to touch. Or, put the wet pulp in a pillowcase and rub vigorously to make a soft pulp.
5. Put a pile of approximately 8-10 newspaper sheets on one of the tables. Wet the newspapers down by pouring water on top.
6. Soak about 10-15 couching cloths in water in the second bucket. Place one wet couching cloth flat on the wet newspaper.
7. Put about 3 handfuls of the pulp into the rectangular tub, which could either be on the ground or on a low bench. Add warm water, to about 2/3 full: the mixture will be like a thin soup. Add enough water to the pulp mixture so that the ratio is about 20% pulp and 80% water.

#### Step 4 – Start the lesson, as a whole class

##### ENGAGE

8. Explain that you will be making hand-made paper today, as a way of recycling used paper. Ask if any of the children made hand-made paper before. Does anyone know what paper is made from these days (e.g. *wood*), and what paper was made from in the past? (e.g. *papyrus, cotton, flax*).

Then have a conversation with the whole class about the origins of paper, the use of paper in society, why we need trees, how recycling paper can reduce our reliance on harvesting trees.

Then explain how one group of children at a time (around 6 students) will be chosen to do the activity outdoors while others stay behind, in approximately 20 minute rotations, according to your schedule.

Choose those children in the first group to go to the papermaking area with the teacher or aide.

##### EXPLORE

9. For each small group, encourage the children to feel the paper pulp 'porridge'!

#### Step 5 – Make the new paper using the pulp

10. Each child should hold a mould, screen side up. Add the deckle on top. Place thumbs over the deckle frame with fingers holding the frames of the mould and deckle together. Do not have fingers or thumbs touching the screen of the mould.
11. Take turns to dive each mould, with deckle on top, into the pulp along the closest inner side of the wall of the tub, then scrape almost along the bottom. Wait for about 5 seconds. Gently wiggle it side-to-side until the pulp on top of the screen looks even. Continue to hold the mould and deckle ensuring thumbs are not touching the screen of the mould.



12. Slowly lift both the mould and deckle up (together) until they are above the level of the water and wait for a moment until most of the water has drained from the new sheet of paper. Keep the mould flat.



13. Place the mould and deckle on the decorating table. Lift the deckle off the mould.
14. Decorate the wet paper pulp with a small amount of petals, fine wool or thread, if desired. Too many embellishments could compromise the integrity of the paper.



15. Ask each child to write their name on a paper name label. Place the named label near the corner or side of the piece of wet paper (see photo).
16. Carry the mould over to the wet newspaper pile.
17. Flip the mould with the newly made sheet of paper over onto the wet couching cloth (on the wet newspaper) so that the decorated side is down.
18. Gently press the mould to squeeze water out.
19. Slowly lift the edge of the mould. The wet sheet of paper should remain on the couching cloth.
20. Place another wet couching cloth over the new, wet sheet of paper in anticipation for the next person's piece of paper. Repeat the steps above and stack the sheets of paper (with the wet couching cloths in between each piece).
21. Over the last piece of paper, place a couching cloth, then place the wooden board on top of the whole pile – then put a heavy weight such as a few bricks or heavy books on top of that pile.
22. Leave this pile for **two or three days**. Outdoors is OK.

### Step 6 – Dry the paper

23. After two or three days, take the weights off, then peel each couching cloth off, with its attached name tag. (If the paper is too wet, it will start to fall off the cloth. In that case, continue to press the paper for another day). Hang each piece of couching cloth with its corresponding paper sheet from a 'clothesline' (made with the string) under a verandah or in the classroom using a peg on two corners of the cloth, so the paper dries flat (but vertical!)
24. In a day or two, the paper should be dry. Peel off the couching cloth. Keep these couching cloths for the next paper-making session.
25. Press the bundle of dry sheets of paper beneath some heavy books for a day, to flatten them.
26. You should be able to identify and distribute each child's piece of paper using their name labels. These labels can be peeled off afterwards.



**EXPLAIN:**

As per Activity 7 above, ask the following questions, in the following order.....

1. What is paper normally made from? (e.g. trees)
2. What animals live in the trees? (e.g. birds, possums, insects)
3. If we use lots of paper, what will happen to the trees? (e.g. more trees cut down)
4. What will happen to the animals? (e.g. they could die, lose their homes)
5. What will happen if we use less paper, or recycle paper? (e.g. less trees will be cut down)
6. If we don't cut down so many trees, what will happen to the animals (e.g. it saves their homes)
7. So, why do we reduce, re-use and recycle paper? (e.g. to save the trees and the animals)

**ELABORATE**

**Step 7 – Further ideas**

Materials such as petals can be added directly to the pulp. Food colouring can also be added to the pulp, although the colour tends to fade. If coloured paper is desired as an outcome, coloured paper should be used in the pulp. Wildflower seeds can be added on top of the paper. Cards made with seeds can later be planted by the recipients to create gardens. Care should be taken to note which seeds are added – obviously weed seeds should not be used.



A leaf could be placed on the wet paper sheet, then the leaf peeled off once the paper is dry – an impression of the leaf will be left on the paper. If this is undertaken, then the paper pulp would need to be quite thick though, otherwise the paper will rip.

A piece of yarn can be embedded between two pieces of wet paper. Students could even write their name in yarn. Once the paper is dry, it gives a textured effect.



Be aware that the colours in tissue paper and crepe paper may bleed – this can be used to great effect if desired, when added to the paper sheet. However, be aware that undesired colours may run from one piece of handmade paper to the next person's paper in the pile.

When making the pulp, it is OK not to fully macerate all the pulp. If paper with text has been used to make the pulp, you may get the occasional piece of pulp with letters/text on it – the children might enjoy finding these letters.

Handmade paper can be written on, or glued to coloured card and made into a greeting card.

A layer of wet paper pulp can be pressed into a cup oiled with cooking oil to make a plant pot, then dried – a plant can be planted in this paper pot, given as a gift, then the whole pot planted directly into the ground.

PVA glue could be added to paper pulp and this can become a strong sculptural material. However it will not be waterproof.



## Trouble-shooting

It takes a while for the pulp to soften in the warm water in the trough. Allow about 10 minutes for the pulp to soften in the warm water – otherwise the first (demonstration) pieces of paper pulp may not bind well together. You can add pulp and keep working with this pulp as the session progresses.

As a general rule, if you can see the screen through the paper pulp once the deckle is lifted, then the pulp is too thin and the paper will tear. More pulp should be added to the mix, and that thin layer on the mould should be tapped back in the trough. Alternatively, if a particular piece of wet paper is too thin on the couching cloth, another piece of wet paper could be placed on top of that thin one.

The water in the tub should be kept warm to ensure the pulp is soft. Sporadically add warm water to the trough throughout the activity.

Make a couple of spare pieces in case there are some that are lost or destroyed.

## Cleaning Up

Left-over pulp should be disposed of thoughtfully. Paper fibres can clog drains, so leftover pulp should not be drained into the sink. Left-over pulp could be used as a mulch around the base of trees if it is OK with the school grounds staff. Remaining pulp can be frozen for later use.

Seeds could be incorporated into small balls of pulp, to be used as seed 'bombs' for planting.



## Step 8 - Reflection

### EVALUATE

Encourage the students to admire each beautiful and unique piece of handmade paper they have created. Indicate that they have gained a first-hand understanding of the papermaking process and an appreciation of the importance of paper recycling and paper conservation. Ask the students to recall any problems with the papermaking process and how these issues were or could have been rectified. See if the students can mentor another class in papermaking. Observe students doing so.

## Resources

Auman, H (2014) *Garbage Guts*, Dog Ear Publishing, USA.

Australian Association for Environmental Education (2019) *Getting Started with Sustainability in Schools*, viewed 15 February 2021, <https://sustainabilityinschools.edu.au/resources>

Bethel, E (2008) *Michael Recycle*, Koala Books, Sydney, Australia.

Below is an example of the efforts of one Early Years Centre to reduce, re-use and recycle their waste:

- Purchased less cardboard due to increase in re-use and resourcefulness.
- Increased re-use of its own useful materials such as cardboard boxes, one-sided paper and shredded paper from the office, bottle tops from the kitchen etc.
- Purchased only recycled paper towels and recycled toilet paper.
- Children trained to use the 'green trays' set up in each craft area to facilitate re-use of one-sided paper.
- Increased creative, resourceful reuse of materials from home in art projects.
- Organised regular supply of one-sided paper and other craft materials from parents, local businesses, library or council.
- Conducted paper-making activity with kids using shredded office paper and other paper unsuitable for reuse in other ways.
- Excursion to the Tip Shop to purchase craft supplies and investigate Reduce Reuse Recycle with kids.
- Excursions to the river to clean up litter, which was then used to make art.