Waste Watch
Change the world around you

Paper Making

Facilitator's Notes KS2

Practical activities, highlighting the environmental benefits of recycling.

Learning Objectives:

By the end of this session pupils will be able to:

- Demonstrate the process of recycling paper;
- Identify the raw materials used to make paper;
- Explain why it is better to recycle paper than to make it from virgin materials; and
- Experiment with colour and texture by adding additional materials during the paper making process.

National Curriculum Links:

Geography KS2:

- knowledge and understanding of environmental change and sustainable development: and
- thematic study – waste in the school environment.

Science KS2:

- scientific enquiry – ideas & evidence in science: investigative skills & considering evidence; and
- materials & their properties - Grouping & Classifying Materials within an environmental context.
- QCA Unit 3C (Yr 3) characteristics of materials

English KS2:

- En1 Speaking & listening – speaking, listening, group discussion & interaction.

ICT KS2:

- Findings things out;
- Developing ideas & making things happen; and
- Exchanging & sharing information.

Design & Technology KS1:

- Developing, planning & communicating ideas: and
- Evaluating processes & products.

Art & Design KS1:

- Investigating & making art, craft & design.
- knowledge & understanding.

Citizenship & PSHE:

- Preparing to play an active role as citizens – discuss topical issues, sustainable resource use.

Cross Curricular: education for sustainable development.

Preparation:

Resources:

- Samples of different raw materials used to make paper: wood chippings, bamboo, cotton balls (used to make money) and shredded paper;
- J cloths (15 per group);
- Sponges (2 sponges per group);
- Newspaper (it is easier if the newspaper is cut into individual sheets) or computer paper;
- Plastic dust sheets to protect tables;
- Shredded paper or ripped up egg boxes/ newspaper/ paper;
- Washing up bowls or cat litter trays (enough for 1 per group);
- A source of water and jugs to transport it (1 jug per group is ideal);
- A potato masher or liquidiser *;
- Two frames, one with a mesh covering for each group (You can buy paper making kits and frames. However, they can work out expensive when you are purchasing enough for a whole class and you can make your own. It is suggested that you have enough kits for each group of 3 – 4 pupils; and
- Additional materials for experiments, e.g. glitter, tea leaves, confetti, tissue paper or paint.

* If a liquidiser is available it will simplify the pulping process, but it is not vital.

It is a good idea to make up some pulp and set up the paper making stations before the session to save time. You can talk through and demonstrate the pulp making process at the beginning of the session.

Making pulp:

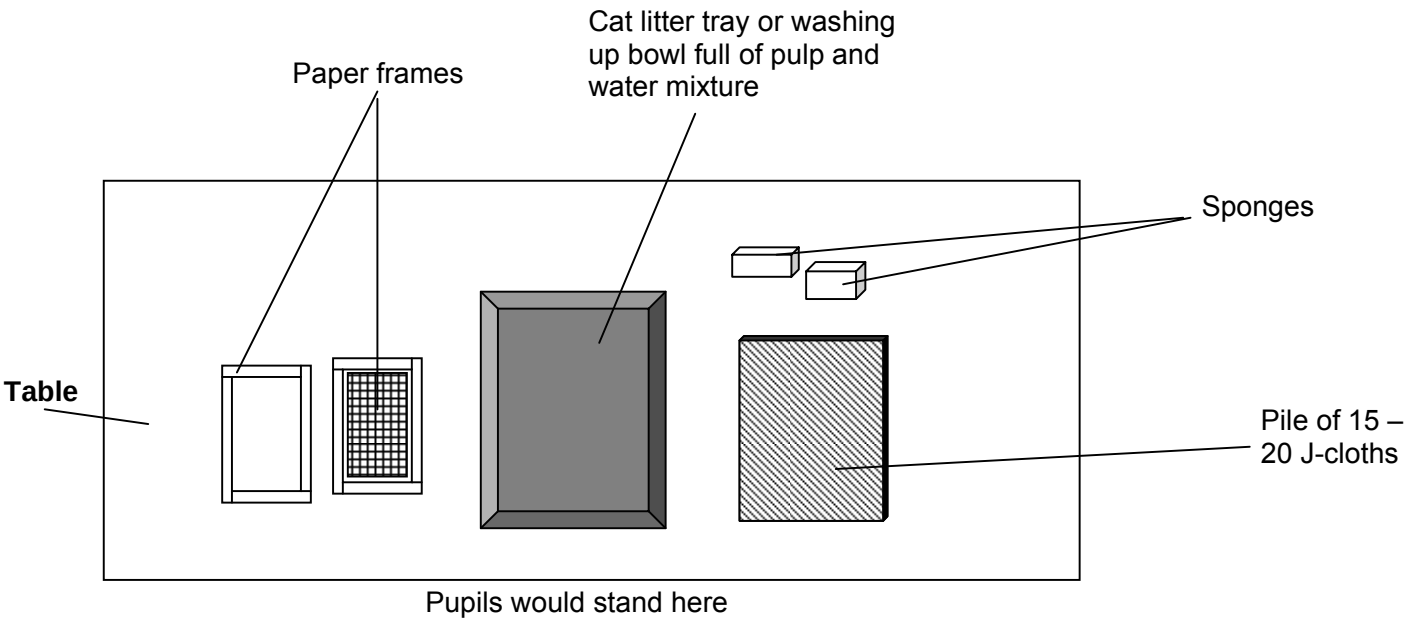
Soak the shredded / ripped up paper in warm water. This starts to swell and split apart the fibres. Liquidise or mash the soaked paper with a potato masher until the mixture becomes a

'thick soup' consistency. This is now ready to pour into the trays where more water should be added.

If you need to transport the pulp it is easier if you take the water out. This can be done by, straining through an old net curtain. The pulp can also be frozen. Don't leave with water over a long time as it will go mouldy.

Setting up the paper making station:

Cover the tables with plastic sheets to protect.



Fill each tray half full with water. Keep the sheets of newspaper on a separate table - they tend to get wet if kept on the same table! The newspaper is used to transfer the paper on to for drying.

Delivery:

- Gather pupils together on the floor and discuss the origins of paper. Pass around samples of the different raw materials used to make paper and discuss which material causes the least damage to the environment;
- Move pupils so they are sitting around a paper making station. Talk through the process of creating the pulp from the shredded paper, demonstrating the processes as you talk;
- Demonstrate how to use the equipment on the table to make recycled paper;
- Split the class into groups and allocate one group per table; and
- Talk through making the first piece all together.

Top Tips:

- If any parent helpers or classroom assistants are available, extra help is preferable;
- Give each person in the group a job to do during the making process, eg one person can dip the frames in, another can dab, another can fetch the newspaper;
- Tell the pupils to stay in the same order around the table and then move round for the next piece of paper, taking the job of the person whose place you have just moved in to;
- Don't allow pupils to move from their table unless they are the person fetching the newspaper; and
- After each person has had a go with the frames introduce the idea of experimenting with different materials for colour and texture.

Experiments:

Colour – you can experiment by adding glitter, marbling inks, watercolour paint and other colouring agents at different stages of the process.

Texture – you can experiment by adding more pulp or water to the pulp mixture or by adding saw dust, liquidised leaves, bits of fabric, pot pourri, confetti etc. at different stages of the process. By liquidising the pulp mixture for different lengths of time, different coarsenesses of paper pulp are created. Ironing the paper after it is dry also changes the surface texture.

Making Your Own kits

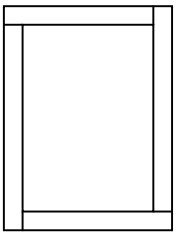
A5 size is the most effective and easy to use.

Equipment:

To makes 10 frames:

- 40 lengths of timber (approx. 2cm x 2cm thick) cut to 21cm;
- 40 lengths of timber (approx. 2cm x 2cm thick) cut to 15cm (from you local DIY store – they normally provide a cutting service);
- $3m^2$ of nylon tight weave net curtain or wire mesh;
- staple gun; and
- gaffa tape.

1. Take two of the 21cm and two 15cm lengths of timber and arrange into an A5 sized frame as shown below (if you have time to varnish or wood stain the wood to seal it, your frames will last longer):



2. Staple the joins together using 3 – 5 staples per join on each side;
3. Cut a piece of net curtain to fit over the frame. This needs to be attached so that a taught mesh surface is achieved inside the frame. Use the staple guns to attach the net; and
4. Finish the frame off and protect the net attachment by covering the frame with gaffa tape. (10 of these frames with netting should be produced).

Repeat steps 1 & 2 to make 10 empty fram