

Lesson Plan 4 - Activity 1

Paper Making



Objective

To introduce children to methods used in making paper and to highlight the waste occurring as a result of using virgin paper and not recycling

Activity

Making Paper

Curriculum Links

Curriculum Links Key stage 1

Art and Design

Knowledge, skills and understanding

Pupils should be taught to:

2b) Try out tools and techniques and apply these to materials and processes including drawing

QCA Links - Science

Unit 3C – Characteristics of materials

PRACTICAL ACTIVITY

Planning required for activity

Apparatus Required

Several deckle frames need to be constructed in order to make the recycled paper.






- Potato masher
- Cup (approx 250ml)
- Large mixing bowl
- Old washing-up bowl
- Warm water
- Jug
- A deckle frame (see how to make a deckle frame)
- 10-20 j-cloths or towels
- Sponges
- Ruler
- Paper, this can be scrap paper, paper towels, tissues or newspaper
- A sheet of newspaper
- An apron
- Food colouring and dried flowers or herbs (optional)

Making a deckle frame

1. The frame needs to be able to fit inside a washing-up bowl, a good size is approximately 27cm x 22cm. It is easy to construct or purchase a frame, a good place to look is in a local charity shops where old picture frames can be purchased cheaply (fig 1)
2. Fine wire gauze is required to trap the paper fibres. This can be bought from a DIY/hardware store
3. Hold the gauze over the frame and using a felt tip pen mark the outline of the frame on the gauze (fig 2). Then using a pair of scissors cut out the shape
4. The gauze can be attached to the frame either by using a staple gun (fig 3) or a hammer and pins (figs 4 & 5). Pin/staple the gauze on to one side of the frame and then stretch the gauze across and attach it to the other side of the frame, try to make it as taut as possible. Pin or staple the other two sides and the deckle frame is now complete (fig 6). It takes approximately 15 minutes to construct each frame
5. It is also possible to make a deckle frame from a wire clothes hanger or an embroidery hoop. Using a wire coat hanger it is possible to make many different shapes. The hanger should be covered with a nylon stocking and stapled in place. Using an embroidery hoop is an inexpensive simple method of making a deckle frame, just insert a screen or nylon stocking between the hoops

Activity Procedure

This activity is best carried out in small groups.

1. 1½ sheets of newspaper will be required for each sheet of paper being made. Tear the paper into pieces, approximately 2.5cm by 2.5cm. Using a ruler or a long object with a straight edge can help when doing this (fig 7) 
2. Drop the torn pieces of paper into the mixing bowl
3. Pour five cups of warm water into the bowl 
4. Mash the paper in the bowl until it turns into pulp. This will look like thick grey soup and is called a slurry (fig 8)
5. Pour the pulp into a jug. At this point you can add the food colouring, approximately 6-8 drops per sheet of paper to be made (fig 9). Adding dried flowers or herbs can also make the paper more eye-catching 
6. Pour approximately 2½cm of water into the washing-up bowl
7. Put the frame in the washing-up bowl 
8. Pour the pulp over the mesh
9. Using your fingers spread the pulp evenly over the mesh
10. Spread out the towel or j-cloths on a desk
11. Carefully lift the frame from the bowl and let the water drain (fig 10)
12. Place the mesh with the pulp face down on the j-cloths or towel
13. Press down on the pulp with a sponge or j-cloths to remove excess water (fig 11)
14. Remove the frame
15. Place a sheet of newspaper on top of the paper pulp and turn the pile upside down
16. Carefully remove the towel/j-cloths (fig 12)
17. Leave the paper to dry for 24 hours (fig 13) 
18. Once the paper is dry peel it away from the newspaper

Supporting Information

Before paper was invented people used a variety of different materials to write on such as clay, metal and wax. 5000 years ago (3000BC) the Egyptians used Papyrus, this is a tall reed that grows along rivers ¹. The name Papyrus is where the word paper comes from. This was improved with the invention of paper in China in AD105. The process of capturing the paper fibres on the wire mesh you will use in the activity is the same as the original process

The methods employed today use the fibres found in wood pulp to create paper. An average family in the UK uses 8.5kg of paper per week, so large numbers of trees are required in order to produce the wood pulp required for the paper making process ²

It is a misconception that recycling paper saves trees. The trees for making paper are grown especially for this purpose in sustainable forests; they are a long-term crop. When mature trees are felled (cut down) they are replaced by saplings (young trees). The problem associated with the forests created for paper production is the fact that they take up a lot of room and are normally only one species of tree, conifers. Because of the huge demand for paper the forests are taking over other land. Changing what is growing on the land affects the ecosystem and can result in a loss of habitats for wildlife. Forests with only one species of tree are replacing the old forests with many different types of tree; this limits the biodiversity (this is the number of species that can live there)

The biggest problem related to the use of virgin paper (does not contain any recycled paper) is that it uses vast amounts of water and energy during the production process. Recycling 1 tonne of paper saves nearly 7,000 gallons of water (that is 63,644 500ml drink bottles worth of water), it also saves enough electricity to run a house for 6 months ²

References

¹ www.hqpapermaker.com

² www.wasteonline.org.uk

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