

## Eco-Schools Scotland Water Live Lesson

### Water workshop activity:

*“It’s just one piece of paper! - What does it really take to produce just one sheet of paper?”*

#### Description:

We use paper all the time, especially in the classroom. Have a look around, how many things can you see that are made of paper? As a society we are becoming increasingly dependent on technology in our every day lives, but we still use paper for lots of things – packaging and post, newspapers and magazines, books, display boards – even this worksheet! However, do we really know what is needed to make just one piece of paper? One of the most important materials in making paper is water. In the live lesson we looked at just how important water is, and that it is a finite resource that we need to conserve.

The following activity is an experiment that will allow pupils to see first-hand how much water is needed to produce one sheet of paper, and the process needed to manufacture it on the scale which we use it.

#### Aim:

To make a sheet of recycled paper, in order to identify the amount of water and other materials needed and understand the process undertaken to manufacture it.

#### Materials:

- Water (lots! – try and keep track of how many litres you use)
- Scrap paper (Ideally shredded. Card or thicker paper work best, but you can also use newspaper and printer paper)
- Washing up bowl or other large bowl
- Rectangular baking tray or stationary tray
- Sieve
- 2 cotton cloths (an old pillowcase cut into two works well) or tea towels
- Sponge (ideally rectangular to get into the corners)
- Towel or absorbent cloths
- Rolling pin

#### Quantity:

These instructions are to make one sheet of recycled paper, for every pupil to make a sheet of paper you may wish to scale-up operations! Use a large storage box to make enough pulp (step 3) for a 2 handfuls per participant. You will also need enough equipment, such as trays, to share in small groups.

## Method:

*(This can be a very messy activity, you may need to cover tables with newspaper or plastic sheets).*

**Step 1: Shred.** It might be easiest to use an electric cross-shredder if you have one. Alternatively, tear up the scrap paper into small pieces. The smaller the better, try and get them to be less than 3cm in width.

**Step 2: Soak.** Put 4 – 5 handfuls of shredded paper into the bowl. Fill the bowl with water to above the paper level. Remember to take a note of how much water you used. Leave the paper to soak in the water overnight, or longer.

**Step 3: Pulp.** This is the messy bit. Using your hands mush up the paper, tearing into even smaller pieces if you can. Swirl it around in the bowl and make sure it is thoroughly pulped and you haven't missed any. Leave to soak for another 30 minutes.

**Step 4: Strain.** Empty the pulp into the sieve. Carefully press or stir the pulp to help with draining.

**Step 5: Rinse.** Whilst the pulp is in the sieve, pour over some fresh water to rinse it through. Remember to make a note of how much water you use to do this. *This will stop the paper being stained by the ink on the scrap paper (see question 1 below).* Allow as much water as possible to drain out before going onto step 6.

**Step 6: Shape.** Line the rectangular tray with one of the fabric cloths. Gradually empty the pulp into the tray, spreading it evenly as you go. Don't worry if it doesn't fill the whole tray, you can either add more pulp if you have some left, or press it at the size it is.

**Step 7: Sponge.** Place the second fabric over the top and use the sponge to remove all remaining water, pressing down as you go. This will take a while, but the more thorough you are with sponging off, the more secure your paper will be. Get right into the corners, even if the pulp isn't there. Take a note of how much water is being removed from the paper and how long it takes to do *(see question 2 below).*

**Step 8: Press.** Spread out the towel. Carefully lift the fabric and paper from the tray and lay it on the towel. Use the rolling pin to press out all the remaining moisture and flatten your paper.

**Step 9: Dry.** Transfer onto a dry surface and carefully remove the fabric from both sides of the paper, making sure not to tear the sheet as you go. Leave it to air dry in a sunny or well-ventilated spot overnight.

**Step 10: Enjoy.** Once your paper is completely dry, pick it up, have a feel and appreciate your recycled paper creation. Well done. *(see question 3 below)*

## Questions which relate to aspects of the experiment:

1. Is it essential that we need white paper? How much water could you have saved without rinsing out the ink?
2. Do you think this is an efficient process? Even if using machines, like when mass-producing paper, is it an easy method?
3. How long did the whole process take to produce just one piece of paper? How much water did you use in total?

## Extension:

Why don't you use your paper to write out a best version of the Folktale you wrote inspired by Allison Galbraith's workshop? Take a photo and send it to [ecoschools@keepscotlandbeautiful.org](mailto:ecoschools@keepscotlandbeautiful.org) or tag @KSBScotland on social media.