

Land, water and bees – don't take us for granted: I need a drink

Student activity sheet

The issue

Contaminated water can cause serious health problems for people who come into contact with it or drink it. It can carry parasites and potentially fatal diseases. In many parts of the world, water for cooking and washing has to be collected from dirty rivers or wells by women or by young people your age.

Practical investigation: filtering a water sample

Aim

In this investigation, you will be given a sample of discoloured water to clean. This will be water to which previously sterilised (oven-dried) sand, compost, stones etc. have been added so that it is discoloured and clearly not clean. Your teacher will give you a selection of filters, which you can use to remove some of the impurities from the sample. Look at the size of the holes in each type of filter and think about the size of debris that it would remove. Start with the filter with the biggest holes and finish with what you think is the finest filter.

Method

Safety

Carry out a risk assessment with your teacher. What hazards do you predict, and how will you control them?

Wash your hands before and after the practical investigation.

You should never eat or drink in the lab, so do not drink the water.

Equipment

- sample of discoloured water
- filters × 5 (different grades of paper; different types of cloth) in order of coarseness
- beakers × 5
- funnel and stand
- elastic bands

1. Fix the first, coarsest filter over a beaker. If it is cloth you can hold it in place with a rubber band, making sure that the filter is loose enough to dip in the middle (Figure 1). Paper filters can be folded into a funnel in a stand over the beaker.

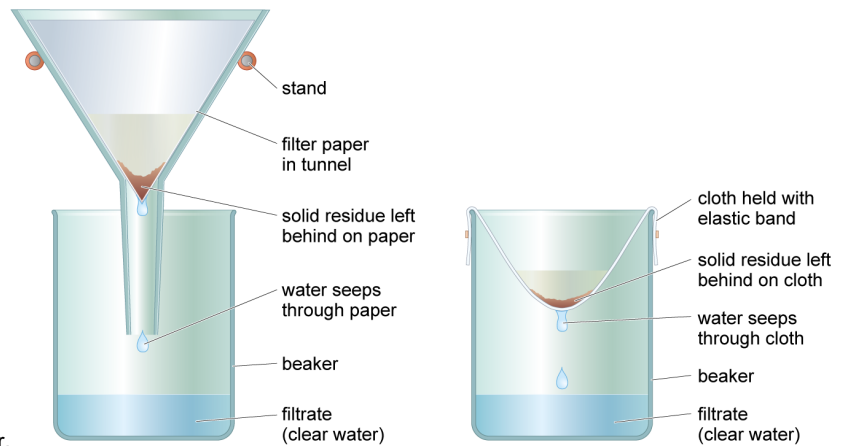


Figure 1 How to set up your filter.

2. Pour plenty of your water sample through the first filter. Watch carefully and draw the results onto the first beaker outline in Figure 2. Include all the bits of debris and use colour and labelling to illustrate your findings.

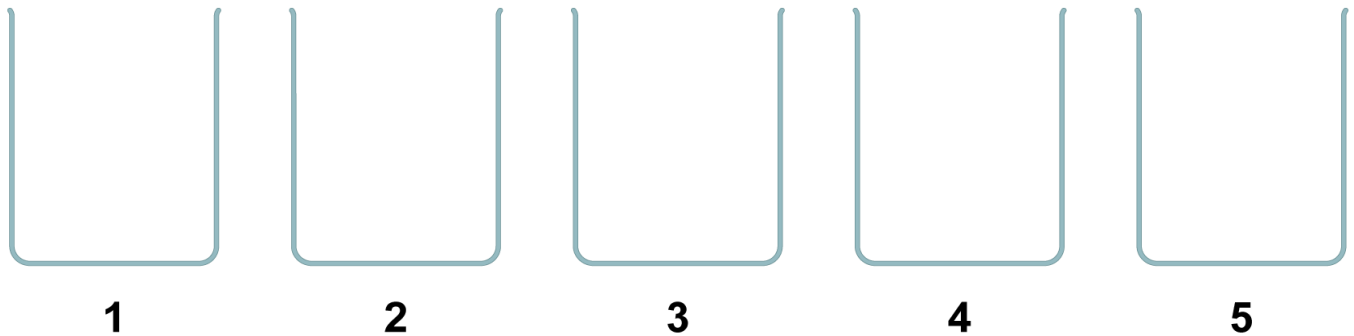


Figure 2 Note your results in the space above.

3. Pour the liquid that you have just filtered into the next filter. Again, draw the results onto the next beaker outline.
4. Repeat this process with the remaining filters, making sure that you have enough water in your filtered sample to see the changes clearly as you filter the water.

Questions

1. What happened to the colour of your sample as you went through the different stages of filtration?
2. What do you notice about the amount of debris that you removed from your sample as you went through the different stages of filtration?
3. Imagine that the water you have just filtered came from a stream. Do you think the final sample would be safe to drink? If not, what might still be in the sample that could cause health problems, and what do you think you would need to do to make it safe to drink?