

Activity: Where rivers get their water

Here is a demonstration of why it takes time for a river to begin to rise after a heavy rainstorm.

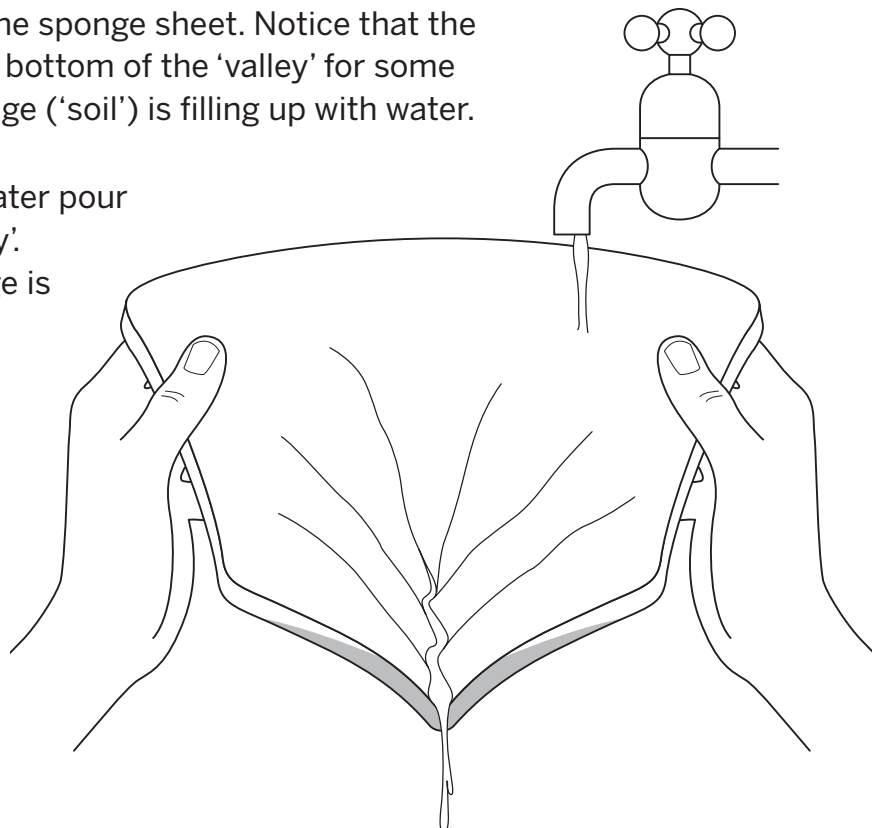
You need a sheet of sponge for this. The sponge should have quite small holes (pores).

1. Use a large water container with a tap near the bottom and place this on the table. Turn on the tap so that you have a slow stream of water running. It should be just slightly more than a drip, and enough to give a continuous flow of water.
2. Now place one hand on each side of the sponge and bend it into the shape of a valley. It works best if the sponge is more folded close to you, and more open on the edge away from you.
3. Tilt the 'valley' so that it is at a very steep angle.
4. Move the 'valley' so that one of the 'valley' sides is below the tap and the lowest part of the 'valley' is still over the sink, as shown in the diagram.

5. Watch the water soak into the sponge sheet. Notice that the water does not flow out of the bottom of the 'valley' for some time. This is because the sponge ('soil') is filling up with water.

6. After a while, you will see water pour out of the bottom of the 'valley'. This is your 'river'. If the sponge is big enough, water will actually flow over the surface of the sponge in the bottom of the 'valley'.

7. Now get a friend to turn the tap off. The 'river' will continue to flow even though the 'rain' has stopped. This shows how rivers continue to flow between rainstorms.



Background support

This demonstration uses the simplest of materials and yet shows one of the most complicated parts of the water cycle very clearly.

It is worth spending some time before a lesson making sure that you have the stream of water running from the tap at just the right flow to get the bottom of the sponge saturated without water flowing over the surface where the water hits the sponge.

To make the movement of the water clearer, you might like to consider using a few crystals of potassium permanganate, or food dye, on the surface of the sponge. The coloured trails will help show how and where the water is flowing.

You can also change the shape of the 'valley' to see what effect this has.

It is important that the 'valley' is kept steep so that water flows inside the sponge and does not flow out of the bottom of the sponge until the water reaches the lowest point.

Across the curriculum

Using this material you can link:

- ▶ Physical processes, such as evaporation and condensation;
- ▶ Weather phenomena, such as rain and clouds;
- ▶ The formation of soils, their porosity, and their permeability;
- ▶ The change in river flow with time, which requires the production of graphs such as hydrographs;
- ▶ The way that suitable materials can be used for models.