



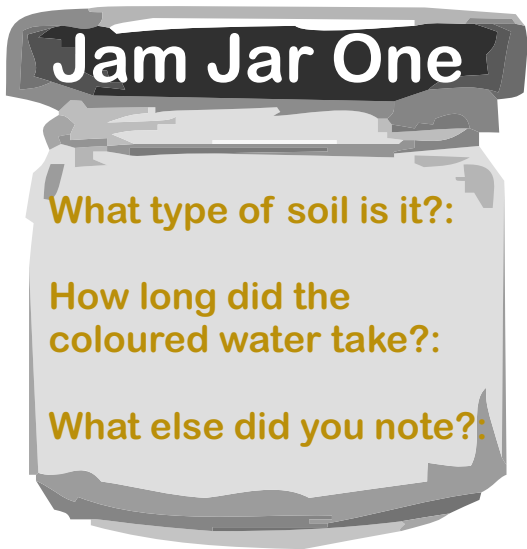
Activity: Soaking Soils

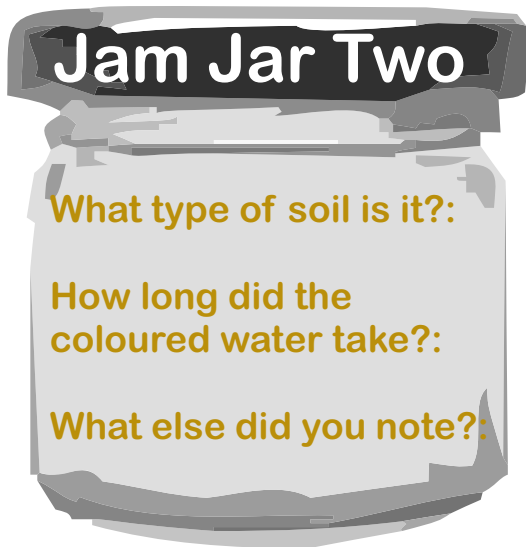
<http://www.soil-net.com>

Use the coloured water provided

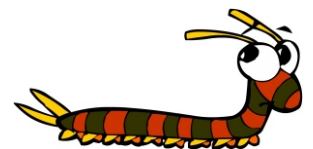
Sprinkle the water into the jar

Start the stopwatch and time how long it takes for the coloured water to appear at the base:





Were there any differences? If so, what were they?:





Activity: Soaking Soils

<http://www.soil-net.com>

This activity, helps students to begin to understand the relationship between soil and water. Adding water to soil and observing infiltration rates teaches how differing pore sizes in soil affect water transmission rates.

The learning outcome of this exercise is that **'the larger the particle, the quicker the water passes through because the pores (gaps) are larger'**.

Prepare a series of clear-sided identical jam jars for each group of students. Fill one with fine playground 'silver sand'. Fill another with earth from the school grounds. If possible, also try samples of other soil types from the area – soils can vary enormously within a short distance. Label jars with the sources. Have another jar of pea-gravel.

Have mixtures with and without stones, make mixtures with varying amounts of sand. Use sieved and un-sieved soils. Have some soil that is damp to start with and some that is powder dry.

Prepare measured beakers with a mixture of water and a bright dye (e.g. diluted red paint). Students are given one beaker per jar and a stopwatch. They must gently pour water onto each jar, time and record how long it takes before the dye appears at the base.

Soils with a larger soil particle size should wet first. Heavier soils, such as clay, may never fully wet through. Times may vary considerably.

For an alternative exercise, try repeating with one jar with loose sand shaken up, and one jar with packed sand, well pressed down. You should see a marked difference. Does dribbling the water in, or pouring all at once affect the experiment? There are lots of opportunities for class discussions!

Note that this experiment may prove difficult - the key thing is to discuss the **concepts** involved, which are:

1. Soils contain air gaps or 'pores' through which rainwater passes (and air exists for animals to breathe).
2. Soils is a mixture of different particle sizes; sand has large particles (and relatively large pore sizes), whereas clay has very very fine particles (and relatively small pore sizes)
3. When it rains, water (i) soaks (infiltrates) down into the soil and water remains in the soil for plant roots. Some water (ii) flows over the surface to rivers and some water (iii) passes deep down to the aquifer.
4. Soil may also have cracks and fissures in it which act as 'preferential channels' down which water can flow. Baked cracking clay has these cracks. Sieved versus un-sieved soil may demonstrate this.
5. The gravel jar clearly demonstrates large pore size = fast infiltration. In reality water can 'stick' to the soil particles (like a magnet attracts iron filings) - so clay may wet up and take a long time to dry. Soils all have different characteristics.

Lesson glossary: texture, cracks, soaking, sand, silt, clay, pore

