10 Soils and water

Some soils let water pass quickly through them. They get dry and dusty easily in summer. Other soils hold the water for plants to use.

Have you ever seen countryside or school playing fields covered with water? These soils are waterlogged – they can't let the rainwater seep through fast enough.

Have you ever noticed that the grass dries out and goes brown in some parts of a playing field during the summer, while it stays green elsewhere? Soils which dry out quickly can't store enough water for plants during a drought.

To know why some soils become waterlogged and why others dry out quickly, you need to investigate the way water passes through a soil (Picture 1).

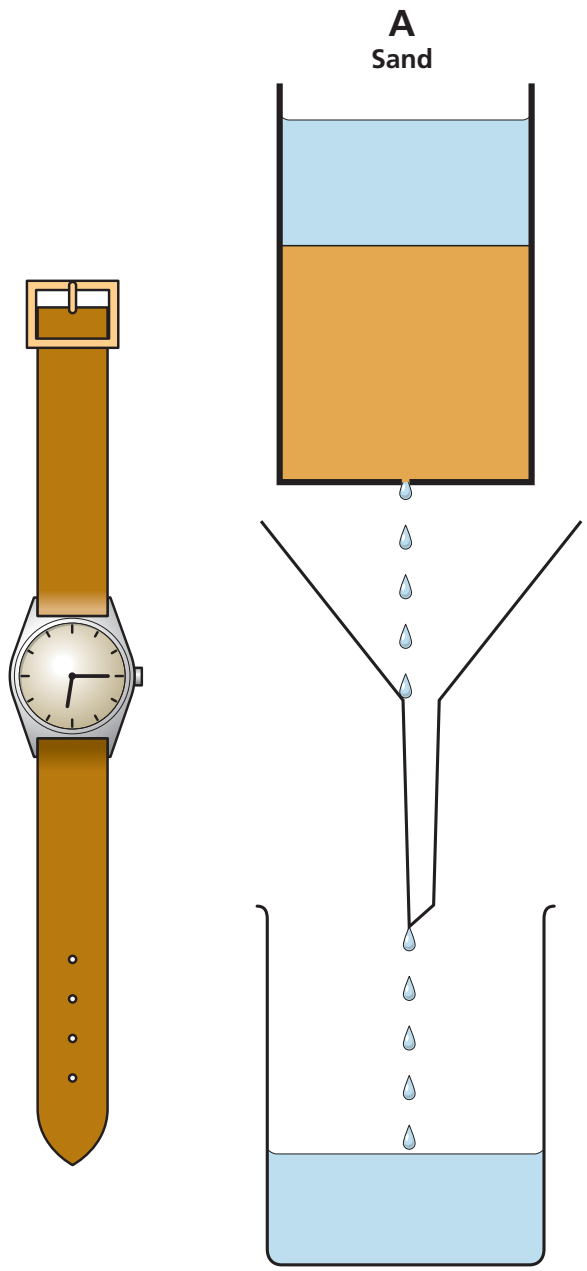
How water flows through soils

A soil is made of many tiny grains packed together (Picture 2).

If all the grains are small, they pack together very well, leaving only small gaps in-between. It is hard for water to squeeze through these tiny spaces. Instead, the water seeps in and gets stuck inside. Clay soils are made of tiny grains. Clay soils easily fill up with water and become waterlogged.

If all the grains are large, the gaps between them are large, so that water easily flows through. But very little water is trapped. Sandy soils are made of large grains and so they easily dry out.

If there is a mixture of soil grains, then there are some big gaps which let the water flow through, but some small ones to store water, too. These are the best kinds of soils. A soil with a mixture of all kinds of sizes is known as **LOAM**.

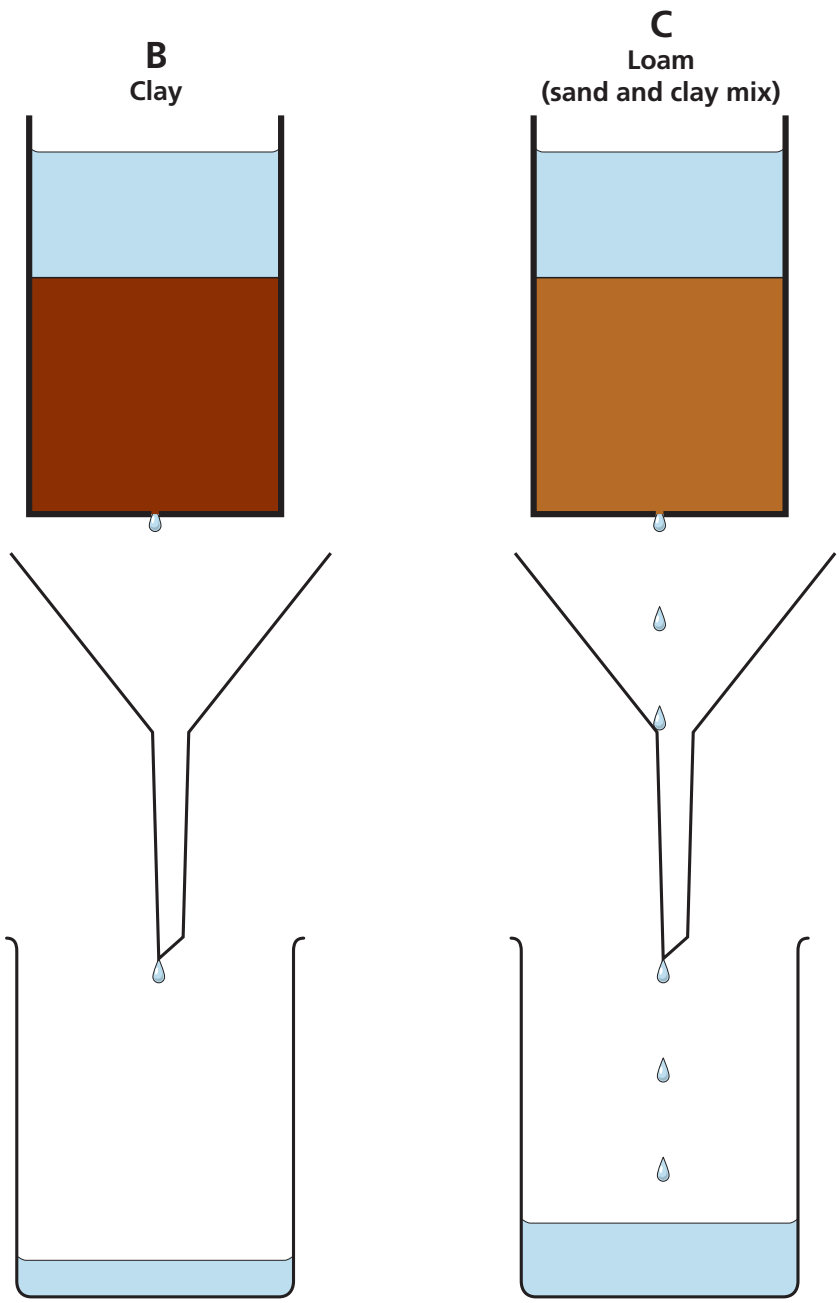


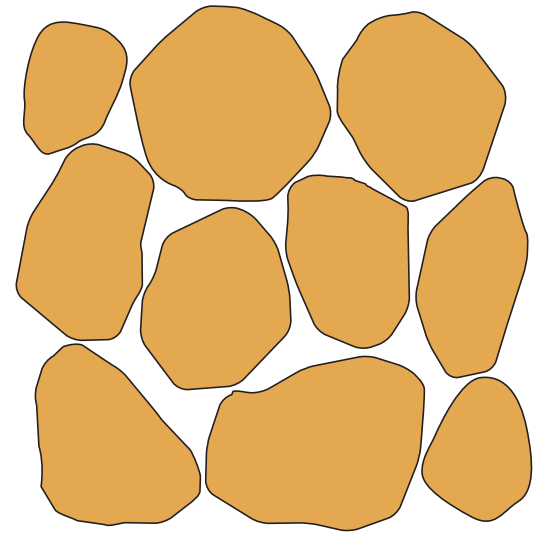
Weblink: www.science-at-school.com

▼ (Picture 1) This fair test was set up to see how water passed through different soils.

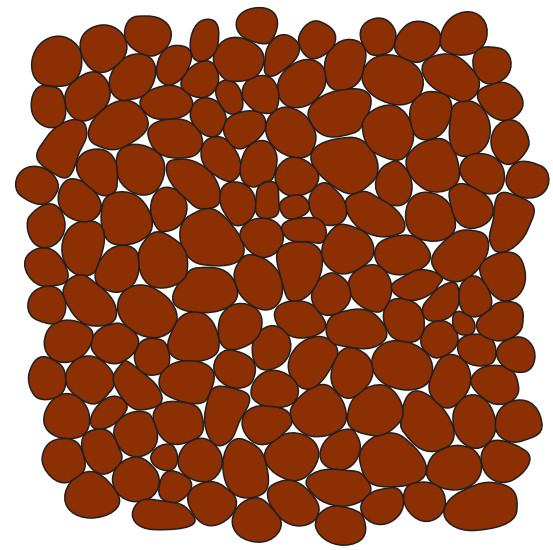
Three pots of the same size and with the same sized drainage holes were filled with the same amounts of different soils. The same amount of water was added to each soil and each soil was allowed to drain the water for the same amount of time. The amount of water that passed through the soil in this time showed how well the soil drained.

The results show that a sandy soil drains quickly (A), while a clay soil drains slowly (B). Neither is a good soil. What is needed is a loam soil that drains well but holds some water (C).





▲▼ (Picture 2) The gaps between sand grains are large. The gaps between clay grains are small.



Summary

- Sandy soils do not hold water well.
- Clay soils fill up with water.
- Loam soils drain well and keep back enough water for plants.