

A Recipe for Soil – Teacher Demonstration

Soils are the top layer of most of the Earth's crust, consisting of the unconsolidated products of rock erosion and organic decay, along with bacteria and fungi.

Soil supports all plant (and indirectly animal) life on land and in the ocean. This photograph demonstrates a cutting through soil and into the underlying limestone rock near Fremantle. A progression upward from yellowish fresh rock to dark humus rich topsoil is visible. Perhaps a road cutting near your school could be used to demonstrate a similar progression?



Will Keith Kellogg, father of the breakfast cereal industry, famously quoted

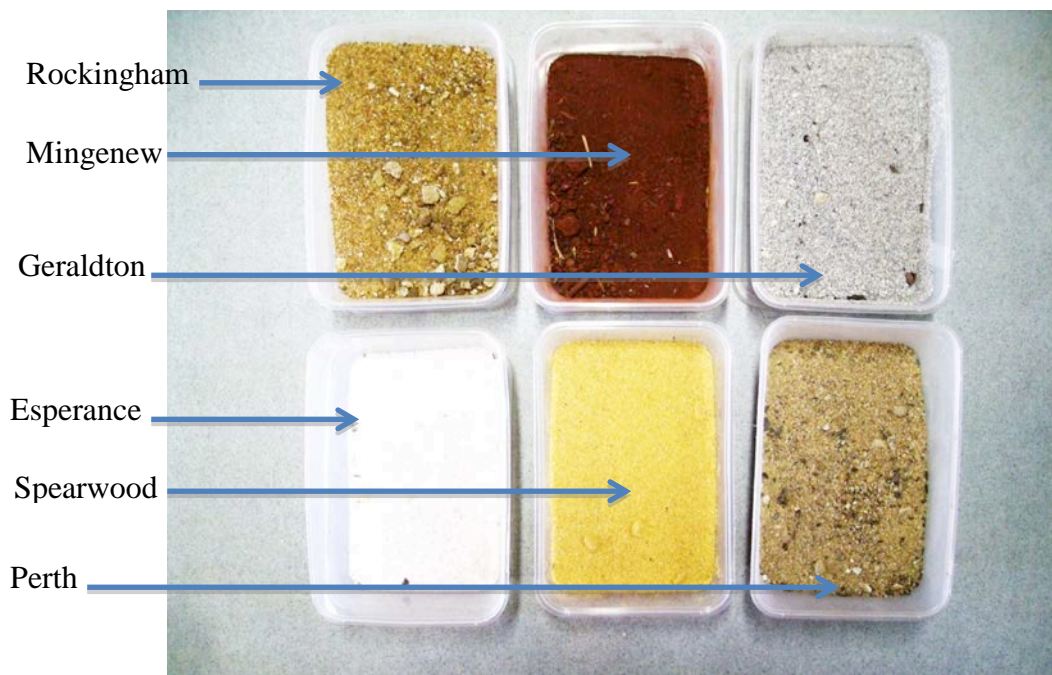
“There is no soil without life nor Life without soil”

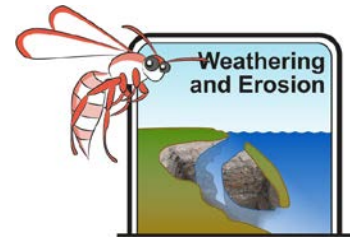
Some interesting soil facts

1. One tablespoon of soil has more living organisms than there are people alive on Earth
2. It takes about 200 years to create 1cm of topsoil
3. Nearly all antibiotics used by doctors to fight infections are obtained from soil organisms (mostly fungi). If the name of the medicine ends in “mycin” it is derived from a fungus e.g. streptomycin, Penicillin is also from a fungus.

There are many different soils in Western Australia. Six appear below. Their characteristics depend on:

- The differing chemical composition of rocks from which their mineral fragments came.
- Their history of erosion and deposition (what has been removed and what has been added).
- The climate when the rocks were originally weathered and under which the soils remain.
- The activities of the living things that are in them and around them.





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Soils are useful resources for:

- Growing food, wood, shelter and recreation areas
- Making rammed earth buildings
- Sheltering decomposers and other animals
- Holding and filtering water
- Burning for fuel (peat)

Teacher Demonstration

Teachers may wish to introduce students to the subject of soils by mixing together materials and asking students what they are making. When students recognise that you are making “soil” you can extend the activity by asking what proportions of each ingredient would be best to create a good fertile soil.

Some students may interchange the words “soil” and “dirt”. Technically “dirt” is misplaced soil.



Materials

- A mixing bowl and spoon
- Clean sand (building sand or beach sand)
- Some dry living material (dead leaves, grass etc.)
- Some compost (school garden)
- Water in a jug

What is missing from this mix? [Living things. Soil has living things.](#)

Some students may point to desert soil and say nothing lives there. Many living things in desert soil survive when there is no water and in great heat by having a resistant stage in their life cycle. Plants may survive as seeds to revive when it rains. Fungi have hard resistant spores. Algae, bacteria, mosses and lichens can form hard microbial crusts. Some plants hold water reserves in their bodies such as cacti. Trees can have extremely deep roots like the desert oaks. Aboriginal people used to penetrate their hard bark and drink the water their roots were pulling up from many metres below. Animals like the water holding frog (Tiddalick) move underground and change their metabolism to slow down until water is available again. Some mammals such as wallabies and quokkas actually make their own water during the chemical breakdown of food. They also do not have separate systems for defecation and urination and save water by having a single cloaca to do both processes together. Insects like termites build structures that are naturally air-conditioned