



We run on it, play in it, and plant things in it. But do we really think twice about it? Yes, I am talking about dirt or soil.

The world thinks soil is so important that they have dedicated a whole year to it. Yes 2015 will for ever be known as the International Year of Soils. On 5 December we also celebrated World Soil Day.

So what is soil anyway? Soil is like a cake made from lots of different things. Soil consists of crumbling rock or sand, clay, dead plant and animal remains, fungi and even manure. It also contains lots of tiny creatures, so many in fact that soil is called 'home' by a quarter of the world's plant and animal life. Just one shovel full of soil has more living things in it than all the humans ever born. Soil also holds 0.01% of the Earth's water.

DID YOU KNOW?
A scientist who studies soil is called a pedologist.

Not all dirt is the same. If you cut into the soil you will see many layers. This is called a soil profile. The top layer of soil is called the surface litter layer. This is where all the 'litter' of any ecosystem lies, such as leaves, branches, animal waste, and mushrooms.

The next layer down is called the topsoil layer or humus. This layer is made up of rotting organic matter from the litter layer and minerals from rocks that are weathering and breaking down over time into little bits. The rotting organic matter helps the soil hold water so it is good for growing plants.

The next layer down is called the subsoil, and is made up of crumbling rock, sand, clay, gravel and silt. Then below that is the parent material, which is the actual bed-rock underlying all the soil layers.

Soil influences many areas of our lives. It is an important part of our ecosystem. Whatever soil is made up of (called the composition of the soil) has a direct effect on the plant and animal life there. Think, for example, about sand in a desert compared to the soils in a rainforest.

Important for that other scarce resource, water, is that soil is a natural filter and regulator of water flow. One of the key functions of soil is to act as a natural purification system (many modern water treatment plants use sand filtration systems as part of the water purification process, for example). Over time soil has the ability

LET'S TALK ABOUT SOIL

It takes hundreds of years to grow just a tiny bit of soil!

to filter, absorb and transform substances. Polluting substances can become trapped in the soil, therefore preventing them from reaching clean water supplies.

Soil is also a key regulator of water flow. Soil can absorb much of the rain that falls on it, but the amount varies according to texture, structure, organic matter content and vegetation cover. Well-structured loamy soil under grass or woodland acts like a sponge and can absorb as much as 40% of its volume as water. Soil also acts like a tap, turning water flow on and off by storing and releasing water for plants when needed.

People designing cities and towns now realise that covering soil with materials such as concrete and asphalt can make floods worse as it reduces the soil needed to absorb the water. When this happens more water

ADDITIONAL RESOURCES

- Visit the website for the International Year of Soils, www.fao.org/soils-2015/en/
- Watch a video on the importance of soil, <https://www.youtube.com/watch?v=YdBpLfhuZuk>
- Africa has its own soil atlas. Visit http://eusoils.jrc.ec.europa.eu/library/maps/africa_atlas/



World Soil Day organism poster

will flow over the land, causing floods and possible damage to infrastructure.

Virtually all the food crops grown on Earth are planted in the soil, as well as all the fodder for livestock. Even some of the fibre crops we need to clothe us need soil. Think

of cotton, for example. We also need soil for the trees that produce our paper. And what would a good game of rugby or soccer be without a nice sports field?

It takes a very long time for the Earth to create soil. In fact, it takes more than 500 years to form just two centimetres of topsoil. This makes soil a very precious resource. We should value it. Damage to the soil can disturb nature's balance and prove a threat to life.

A big problem in many areas of South Africa is soil erosion. When a raindrop hits soil that is not protected by a cover of vegetation and where there are no roots to bind the soil, it has the impact of a bullet. Soil particles are loosened, washed down the slope of the land and either end up in the valley or are washed away by streams and rivers.

Erosion removes the topsoil first. Once this nutrient-rich layer is gone, few plants will grow in the soil again. Without soil and plants the land becomes desert-like and unable to support life. Erosion occurs



The soil is full of living things, such as earthworms.

when we overstock or overgraze land by animals such as cows and goats; use inappropriate farming techniques, and plant crops down the contour instead of along it.

Soil around our homes can get polluted by fluids from leaky vehicles, pet waste, pesticides, or leftover household chemicals that are poured or spilled. When the soil is contaminated, storm water can move the pollutants along into washes and the wastewater system, causing problems in the environment and at wastewater treatment facilities.

There are various ways in which you can help protect soil. Start composting! This puts nutrients back into the soil and makes it healthier. Make sure you keep the soil healthy by not pouring leftover or used chemicals or oils on it. Help your parents in the garden by pulling up weeds. This reduces the needs to use harmful chemicals on the plants. □

DO-IT-YOURSELF SOIL DISCOVERY

For this experiment, you will need:

- A waterproof table covering
- A jar with a lid
- A spoon
- Some soil
- A jug of water
- Paper towels
- A magnifying glass

Cover your work surface. Fill a jar half-way with soil. Add water nearly to the top of the jar. Put the lid on, and tighten it securely.

Shake the jar vigorously for half a minute, and then set it down. Let the jar stand until the soil and water settle. The soil will settle into layers.

Observe the layers in the jar, and see what you can tell about them. How many layers are there? Which layer is made of the biggest particles? Which is made of

the smallest? Can you guess why?

To further examine the different layers and what they are made of, you can sort out the soil materials and examine them. Use a spoon to skim off the objects floating in the water. Place them on a paper towel.

Then carefully pour off the water on the top and scoop out the grains of the next level onto another paper towel. So the same if there is another level.

After each layer has been placed onto towels, they can be examined with the magnifying glass. What else can you tell about the different layers after further examination?

Source: For this and other soil experiments, Visit: <http://www.howstuffworks.com/crafts/other-arts-crafts/science-projects-for-kids-soil-experiments.htm>



Soil is crucial for growing plants.