

**Science – Year 3/4B Autumn 1**

Rocks

# **This Planet Rocks**

Session 5

**Resource Pack**

## Session 5 Teacher's Notes

### Safety

This session involves handling soil which can pose a risk to children if not managed safely. Real soils are by far the richest educational resource as they will give you the full range of components in the soil for the children to discover. This includes organic matter (partly broken down plants and animals) e.g. leaf litter, roots, insect wing, dead beetle and also live creatures e.g. worms, ants, woodlice, beetles. However real soils will also contain millions of micro organisms including bacteria and fungi some of which may be harmful to health. They may also contain animal waste and broken glass. Many teachers prefer to use real soil and manage the risks safely (through a risk assessment).

### **Managing the risks in using real soil**

- Provide the children with plastic gloves to wear whilst handling soil
- Talk to the children about the dangers of germs in the soil and the need to keep their gloves on and keep their hands well away from their faces
- Wash hands immediately after removing gloves
- Cover surfaces in the classroom e.g. with newspaper
- Disinfect tables after soil handling tasks
- Check the soil for obvious contaminants like broken glass by turning it into a plastic box or tray and combing through it with a trowel before the session
- Keep it in lidded containers

### **Alternatives to using real natural soil**

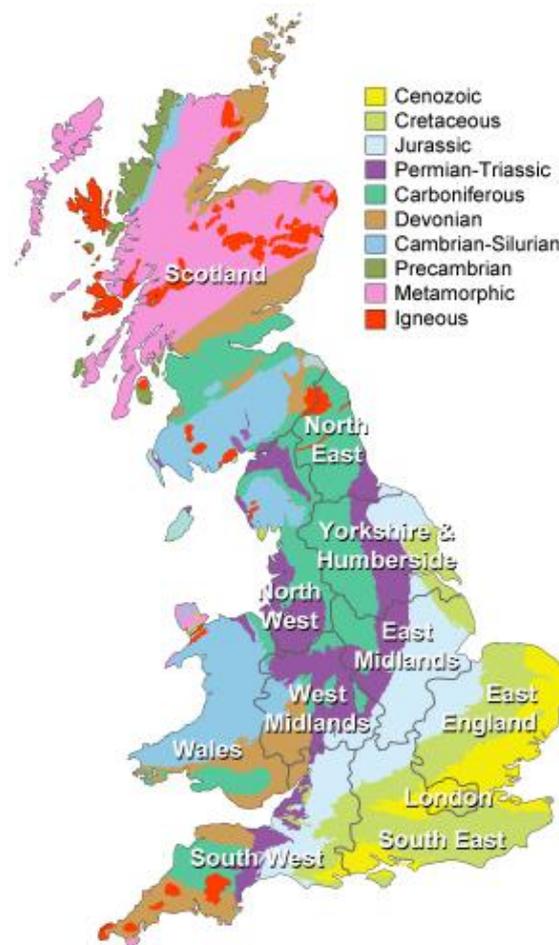
- **Sterilise real soil** - It is possible to sterilise real soil by microwaving your samples however this will not only kill the micro organisms but also the living creatures in soil that are an important component (for the Soil Detectives task)
- **Make simulated soil** – mix potting compost, sand, grit, small stones, roots, bits of leaf, small twigs etc. It is hard to make this “soil” look and feel like real soil. Another disadvantage of using simulated soil is that it will not contain any live creatures or even dead animal components like insect wings. You could add these to your simulated soil for the Soil Detectives task (see note on samples below)

### Soil Samples

**Soil Detectives** -You need a soil for the main teaching activity – Soil Detectives, where the children will be identifying and classifying the components within the soil. This soil should ideally have a few live components in it (e.g. ants, woodlice, millipedes, worms) as these are a crucial part of the whole living system of soil. The session involves identifying and classifying soil components and one of the headings is *Things that are alive*. You will not need many as this is a whole class activity where children will pool their discoveries. Consider sourcing a few live creatures to add to the soil if necessary to ensure that children discover this element. You will need to store the soil in lidded containers.

**3 Different Soil Samples** – The group activities involve testing and comparing 3 different soils. Ideally these should be collected from 3 different locations and it will not matter if you sterilise them through microwaving. Soil can vary dramatically from one location to another and using different soils will help children understand that not all soils are the same, that they have different properties

and that they are different because the underlying bedrock is different – soil is made from eroded bedrock. Britain is rich in different rock types and you will probably not have to go far to source different soils. You may find you can persuade colleagues to collect a small sample for you if anyone is travelling away for the weekend. A lidded ice cream tubful should be sufficient. Ensure samples are sourced responsibly though. They should be obtained (with permission) from private land rather than public land.



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# What am I?

Read the clues and guess  
How many clues will you need?

I am made of rock



But I'm not a building

I am very precious



But I'm not a diamond

I am made of different layers



But I am not sedimentary rock

It takes 500 years to make 2cm of me



But I'm not a fossil

Half of me is made of air and water



But I'm not a wet sponge

I can help prevent flooding



But I'm not a flood barrier

A handful of me contains more micro-organisms than there are people on the Earth



But I'm not mouldy cheese!

I am home to many creatures



But I'm not a zoo or a farm

Without me there would be no life on  
Planet Earth!



?

Have you guessed what I am?



**Soil**

Let's recap on what we know about soil



Without soil there would be no life on Earth

A handful of soil contains more micro-organisms than there are people on the planet

It can help prevent flooding because it can absorb large amounts of water

It is made from rock and other things



Half of it is made of air and water

It is very precious because everything needs it to survive

## Soil

Is made of different layers in the ground

It takes more than 500 years to make 2cm of soil

### Soil Shake up

Look at the 3 soil samples. Think about how they are different. Write some notes to describe each one.

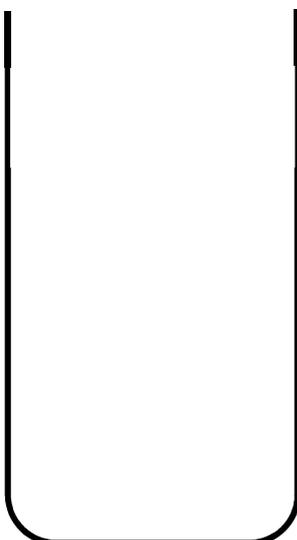
Soil 1	Soil 2	Soil 3

A good way to compare different soils is by doing a soil shake up. Work in a group of 3. It would be good if different groups choose different soils because you can swap and compare with one another.

1. Spoon soil from **one** of the samples into a plastic jar that has a well fitting lid
2. Continue spooning until the jar is a little more than half full
3. Now pour carefully pour water into the jar until it is almost full
4. Screw the lid on tightly and shake the jar to mix up the soil and water
5. When everyone has had a good shake, put the jar on the table in front of you and allow the contents to settle

**What do you notice happening?** (scientists observe and make careful notes)

**Why?** (scientists always ask themselves this question)

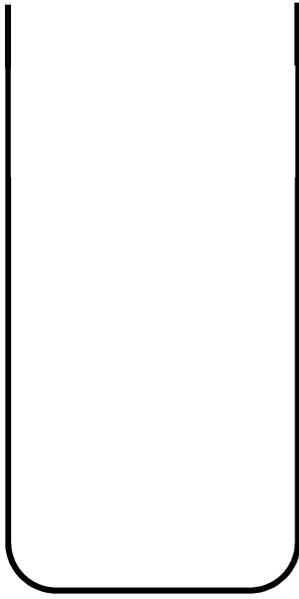


**Our soil is number .....**

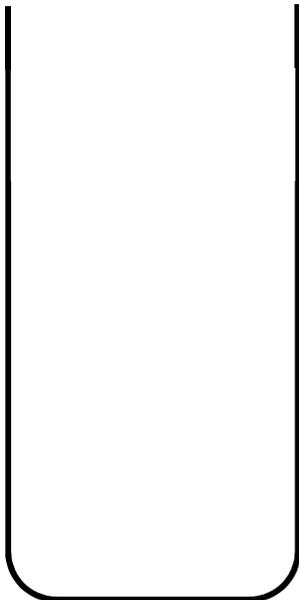
Look carefully at the layers you can see in the jar. Draw, colour and label them. Write down anything you notice.

If you have time, take a look at jars of the other two soils. Draw, colour and label the different layers. Write notes on what makes each soil different.

Soil number .....



Soil number .....



### Soakers and Drainers

Look at the 3 soil samples. Think about how they are different. Write some notes to describe each one.

Soil 1	Soil 2	Soil 3

Soils can also be different in ways you can't see, for example when it rains, some soils absorb lots of water (let's call these *soakers*) but others allow the water to drip right through them very quickly (we will call these *drainers*).

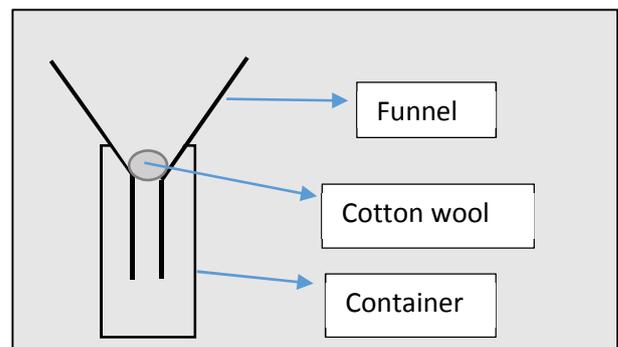
Let's do a scientific test to find out which of our soils is the best soaker (the one that absorbs the most water), which is the best drainer (the one that let's through the most water) and which one is in the middle.

**My prediction** - Guess which soil will be which!

Best soaker	In between	Best drainer

#### Our Method

1. Put a cotton wool plug inside a funnel
2. Stand the funnel inside a container
3. This is your soil test equipment. You will need to make one for each type of soil
4. Your soil will go in the funnel and you will be able to pour water over it to see how much drains through into the container
5. Measure the exact amount of water (in ml) that drains through by pouring it into a measuring cylinder



To make it a fair test we will

### Our Results

	Soil 1	Soil 2	Soil 3
Amount of water that drained through	ml	ml	ml

**Bar graph to show which soils were the best drainers and soakers**

*Write a suitable ml scale on the vertical axis to show the difference in the amount of water draining through each soil (e.g. going up in 5s). Complete the bar graph.*

Amount of water that drained through in ml			
		Soil 1	Soil 2

**Was your prediction correct?**

**Scientists are always asking the question - *Why?***

Why do you think Soil ... was the best soaker?

Why do you think Soil ... was the best drainer?

**What have you learnt?**