Investigating Soils

You will need:

- Soil samples — a cupful of soil for each group. It's best to dig down 10-15 cm or so into the ground in order to take the soil samples. All soil should be sourced responsibly.
- Newspaper/plastic trays for pupils to spread the samples out on.
- Hand lenses or magnifying glasses (if available).

Notes

- Pupils should be reminded to wash their hands after handling soil.
- Wet and dry soils often have quite different properties. You may wish to provide pupils with a small amount of water to add to their soil samples to demonstrate this.
- If you are able to provide samples of different soil types, different groups could analyse and compare their properties.
- Your local soil type may not be described in this resource (e.g. chalky soil). It may also be a mixture of more than one soil type. This is fine — encourage pupils to describe what's different about it.

Ideas for further discussion

- You could discuss the properties of your local soil and how this might affect the plants that grow there.

Investigating Soils

Look at the soil sample your teacher has given you. Use a hand lens if you have one. Pick up some soil and rub it between your fingers. Now wash your hands. Answer these questions about your soil sample.

1. Which **one** of these colours is closest to the colour of your soil sample? Circle your answer.

   dark brown **light brown** **red** **black** **yellow** **grey**

2. Which of these words best describes how your soil sample feels? Circle **at least two** answers.

   wet **dry** **soft** **hard** **sticky**

   sandy **lumpy** **rocky** **smooth**

3. What size are the bits (particles) that make up your soil sample? Tick the box next to the sentence that best describes your soil.

   The particles in this soil are very small. ☐

   The particles in this soil are quite big. ☐

   There is a mixture of small and large particles in this soil. ☐

4. Does your soil sample have any of these things in it? Circle your answers.

   stones **plant roots** **leaves** **grass** **worms** **insects**

5. Your teacher will tell you where your soil sample has come from. Write it down here:

   .....

Investigating Soils

Read this information about some different types of soils and then answer the questions that follow.

Soil is usually made up of sand, silt and clay.
The pieces that make up the sand, silt and clay are called particles.

A sandy soil is mostly made up of sand particles. Sand particles are quite big.
A sandy soil feels gritty when you rub it between your fingers. It dries out quickly.

A clay soil is mostly made up of clay particles.
Clay particles are very small and fine.
Clay soil is very hard when it is dry.
When it is wet, it feels very sticky, and it is easy to press into lumps.

A silty soil is mostly made up of silt particles. A dry silty soil feels a bit like flour when you rub it between your fingers. When it is wet, a silty soil feels silky.

A loamy soil is made up of equal amounts of sand, clay and silt. It feels soft and crumbly.

6. Using this information, what type of soil do you think is in your sample?
If you think your soil is different to all the soils described above, write this down.

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7. Explain your answer to question 6.

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Investigating Soils

Soils are made of rocks that have crumbled into tiny pieces.

8. Which of these rocks do you think might have crumbled to make a sandy soil?
   Circle the answer.

   slate **granite** **chalk** **marble** **sandstone**

9. What do you think might cause a rock to crumble over time?

   .....

   .....

10. Sandy soil dries out quickly.
    Why might this make it difficult to grow plants in sandy soil?

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Soils are also made of 'organic matter'.
This is dead plant and animal material, for example, leaves.
When dead plant and animal material rots away,
it breaks down and releases lots of nutrients into the soil.

11. Why do you think gardeners like soil with lots of organic matter in it?

    .....

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    .....

What Are Soils Made of?

Answers

Look at the soil sample your teacher has given you. Use a hand lens if you have one.
Pick up some soil and rub it between your fingers. Now wash your hands.
Answer these questions about your soil sample.

Many possible answers.

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Circle the answer.

slate **granite** **chalk** **marble** **sandstone**

9. What do you think might cause a rock to crumble over time?

E.g. wind / rain / waves / freezing and thawing

10. Sandy soil dries out quickly.
Why might this make it difficult to grow plants in sandy soil?

E.g. plants need water to survive and grow. If the soil dries out quickly, the plants might not get enough water.

Soils are also made of 'organic matter'.
This is dead plant and animal material, for example, leaves.
When dead plant and animal material rots away,
it breaks down and releases lots of nutrients into the soil.

11. Why do you think gardeners like soil with lots of organic matter in it?

E.g. plants need nutrients to survive and grow. If the soil has lots of organic matter, it will have lots of nutrients and plants will grow bigger/taller/stronger.