

EduTrend Contents

W4C · EARTH SCIENCE & GEOLOGY · PRIMARY

Soil Secrets

What is soil made of, and which soil drains best?

Ages 8–11 | Level: Developing | 60 minutes | Groups of 3 · up to 30 | Activity 02

Inside: activity at a glance · step-by-step session plan · facilitator notes · 3 pupil worksheets · assessment checklist

ACTIVITY 02 · AT A GLANCE

Soil Secrets

Pupils investigate what soil is made of and why different soils behave differently. They shake soil with water in a jar and watch layers settle, then test how fast water drains through sandy soil, clay soil and garden soil. They use their results to advise a gardener.

Learning outcomes

By the end of the session pupils can:

- describe soil as a mixture of rock particles, organic matter, water and air;
- observe and draw layers in a settled soil sample;
- carry out a fair drainage test;
- explain which soil suits which plants.

KEY WORDS

soil · particle · sand · clay · humus · drainage · layer

CURRICULUM LINKS

Science: rocks and soils, plants. Maths: measuring volume and time. Geography: land use and farming.

1	2	3	4	5	6
QUESTION	**OBSERVE**	**PREDICT**	**TEST**	**RECORD**	**EXPLAIN**
What do we want to know?	Look and handle	What might happen?	Try it fairly	Measure and note	Read the evidence

Materials (per group)

- 3 soil samples: sandy, clay, garden soil
- Clear jar with lid, water
- 3 cut plastic bottles as funnels with cotton wool
- Measuring jug, stopwatch
- Hand lens, tray
- Worksheets 1, 2 and 3

Before the session

- Collect soil samples; dry and label them.
- Prepare funnel set-ups with cotton wool plugs.
- Set up one shake jar a day early to show settled layers.
- Measure out equal cups of soil for each group.

SAFETY

Wear gloves or wash hands after handling soil. Check soil for sharp objects. Do not put hands near the face.

ACTIVITY 02 · SESSION PLAN

Step by step

Timings are for 60 minutes. The shake jars need time to settle: start them first and look again at the end.

Time	What happens	Say or ask
0–5 min **Hook**	Show a jar that has settled into layers. What is soil made of?	*"Is soil just dirt?"*
5–15 min **Shake jar**	Groups half fill a jar with soil, add water, shake and leave it to settle.	*"What do you predict will happen?"*
15–25 min **Observe**	Groups look at dry soil with a hand lens and describe particles.	*"Can you see bits of plants?"*
25–45 min **Drainage test**	Groups pour 100 ml of water through each soil and measure how much drains in 2 minutes.	*"How will you keep it fair?"*
45–55 min **Revisit jars**	Groups draw the layers in their jar.	*"Why did the big particles settle first?"*
55–60 min **Advise**	Groups write advice for a gardener. Worksheet 3.	

CHALLENGE CARD (print or copy onto the board)

A gardener wants to grow plants that hate wet roots. Test three soils and recommend the best one. Use your drainage results as evidence.

ACTIVITY 02 · FACILITATOR NOTES

The geology in brief

Soil is a mixture of tiny pieces of rock, rotting plant and animal material (humus), water and air. When shaken with water, the heaviest particles, such as small stones and sand, settle first, then silt, then clay, with humus floating on top.

Sandy soil has large particles and big gaps, so water drains quickly. Clay soil has tiny particles packed closely, so water drains slowly and the soil can become waterlogged. Garden soil with humus holds water but still lets air in, which suits most plants.

Common ideas to listen for

- "Soil is only dirt." It contains rock particles, living things and decaying material.
- "Clay soil is useless." It holds nutrients well but drains slowly.
- "All soil drains the same." Particle size makes a big difference.

Adapting the activity

Support

Test two soils and give pupils a marked measuring jug.

Stretch

Measure the height of each layer in the jar and calculate the percentage of sand, silt and clay.

WORKSHEET 1

Soil layers

Name: _____ Class: _____ Date: _____

Draw your jar after it has settled. Label each layer.

My jar

Label: stones, sand, silt, clay, water, floating humus.

Why did the layers form in this order?

WORKSHEET 2

Drainage test

Pour 100 ml of water through each soil. Measure how much drains in 2 minutes.

Results

Soil	Prediction	Water drained (ml)	Fastest?
Sandy			
Clay			
Garden			

Bar chart



y-axis: water drained (ml)

x-axis: soil type

WORKSHEET 3

Gardener’s advice

Use your results.

My advice

The best soil for plants that hate wet roots is _____ because

What I can do

I can…	Not yet	Nearly	Yes!
say what soil is made of			
run a fair drainage test			
read my bar chart			
give advice using evidence			

FOR THE TEACHER

Assessment checklist

Use during the session. One sheet covers up to eight pupils; copy as needed.

Pupil	Describes soil parts	Tests drainage fairly	Uses results to advise

Suggested codes: W = working towards · E = expected · G = greater depth

ABOUT THIS ACTIVITY

Soil Secrets is a sample activity from the EduTrend Contents W4C Earth Science & Geology programme (primary, level: developing). Every activity in the programme follows the same format: a practical challenge, a clear session plan, facilitator notes and ready-to-print worksheets, so that teachers, club leaders and parents can run it without extra preparation.

Full 15-, 20- and 32-week programmes are available from EduStore at edutrend.org.

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