



YEAR 3



EARTH SCIENCE JOURNAL



ROCKS



MINERALS



SOILS



PLANTS



EARTH



Name: _____



Class: _____



Teacher: _____





LESSON 1 – ROCK DETECTIVES



VOCABULARY: rock • mineral • texture • lustre • crystal

1 OBSERVE AND RECORD



Sample	Colour	Texture	Grain / crystal size	Lustre	Hardness
1					
2					
3					



2 DESCRIBE YOUR BEST EXAMPLE

Choose ONE sample. Describe its observable properties using at least **3** scientific words.

3 ASK A SCIENTIFIC QUESTION ?

From your observations, what do you wonder about rocks or minerals?





LESSON 2 – SORTING SCIENTISTS



VOCABULARY: compare • classify • property • pattern • relationship

1 COMPARE THE SAMPLES



Sample	Key observable properties (colour, texture, grain/crystal size, lustre, hardness)
 Granite	
 Sandstone	
 Marble	
 Quartz	
 Pumice	
 Mica	

2 FIND A PATTERN



Which rocks or minerals have similar properties? What evidence shows this?

3 POSE QUESTIONS ABOUT PATTERNS AND RELATIONSHIPS

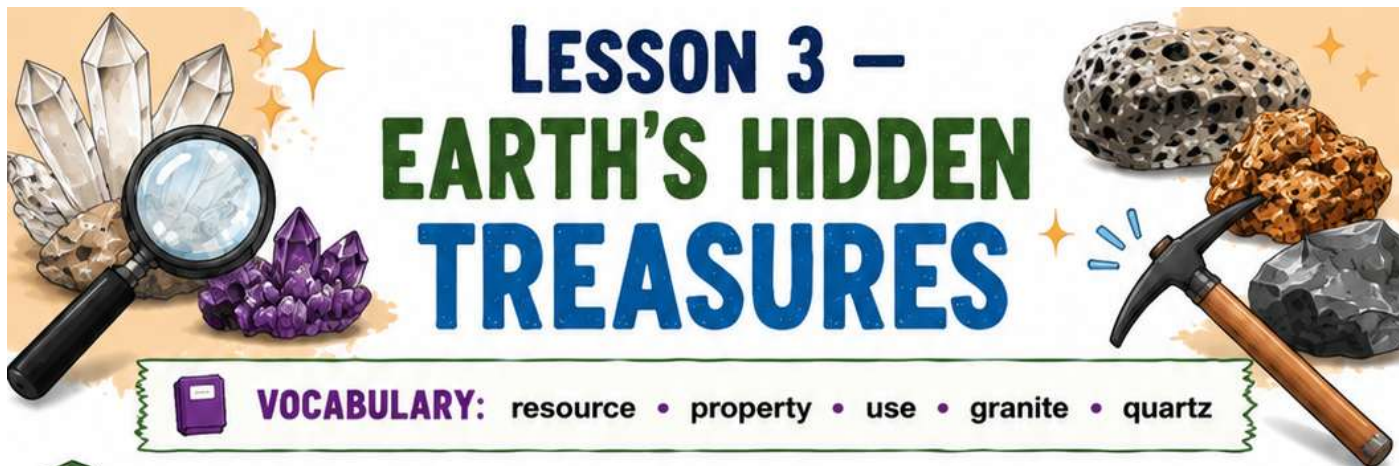


Pattern question: Do rocks/minerals with _____ also tend to

_____?

Relationship question: How does _____ relate to _____?





LESSON 3 – EARTH'S HIDDEN TREASURES


VOCABULARY: resource • property • use • granite • quartz

1 ROCK OR MINERAL → PROPERTY → USE

Resource	Use	Useful property	Why does the property suit the use?
Example 1			
Example 2			
Example 3			

2 RANGE OF EXAMPLES

Using your THREE examples, explain why rocks and minerals are important resources.



2

RANGE OF EXAMPLES



Using your THREE examples, explain why rocks and minerals are important resources.

3 FIRST NATIONS KNOWLEDGE

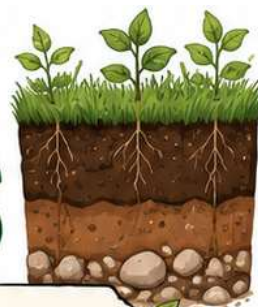
Record ONE example of Aboriginal and Torres Strait Islander Peoples' knowledge or use of rocks/minerals (for example ochre, grinding stones or stone tools).







LESSON 4 – SOIL SCIENTISTS



VOCABULARY: soil • texture • silt • humus • organic matter



1

SOIL OBSERVATION TABLE



Soil	Colour	Texture	What I can see
Sand 			
Clay 			
Loam 			
Garden soil 			

2

CLASSIFY THE SOILS



I classified the soils using this observable property: _____

Group 1	Group 2	Group 3

My evidence for this classification is:



3

DEVELOP AN INVESTIGATION QUESTION



Use today's information to write a question about a relationship between soil and plant growth.





LESSON 5 – WHICH SOIL WORKS BEST?



VOCABULARY: prediction • investigation • evidence • pattern • relationship

1 QUESTION AND EVIDENCE-BASED PREDICTION



Investigation question: _____

Evidence source	Evidence I will use
 My own observation	
 Another student/group's observation	
 Provided source (poster/card/book)	

Based on this evidence, I predict: _____



2 RESULTS



Soil type	Result
Sand	
Clay	
Loam	
Garden soil	



3 PATTERN, RELATIONSHIP AND CONCLUSION



Pattern I noticed: _____

Relationship between soil type and the result: _____

Conclusion – answer the investigation question using evidence: _____





LESSON 6 – SOIL PROBLEM SOLVERS



VOCABULARY: evidence • solution • nutrients • compost • organic matter

1 DIAGNOSE ONE SOIL PROBLEM

Choose ONE: • Dry soil • Sandy soil • Clay soil • Poor nutrients

My soil problem is: _____



2 COMBINE EVIDENCE FROM A RANGE OF SOURCES



Source	Evidence
 Previous investigation	
 New information from a card/book	
 What I already know / experience	

3 EVIDENCE → SCIENTIFIC EXPLANATION → DETAILED SOLUTION



Scientific explanation — why is this a problem for plants?

My recommended solution is: _____

Explain HOW the solution will improve the soil and use the evidence above to justify it.





LESSON 7 – EARTH SCIENCE SOLUTIONS EXPO



VOCABULARY:

properties • resource • classify
evidence • relationship

ASSESSMENT

Use evidence from Lessons 1–6.
You may create a poster,
presentation or display.
Complete this planning page first.

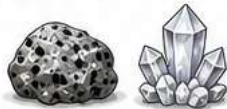
HOW TO COMPLETE THIS PLANNING PAGE

A. ROCKS AND MINERALS



1. Describe observable properties of **ONE** rock and **ONE** mineral.

- Choose one rock and one mineral.
- Write down what you can see, feel or test (colour, texture, hardness, crystals, shine, layers, etc.).
- Use scientific words.



2. Using at least **THREE** examples, explain why rocks and minerals are important resources.

- Choose at least three different rocks or minerals.
- For each one, write what it is used for.
- Explain why its properties make it useful.
- Show how these resources help people in everyday life.



B. SOILS



Explain how you classified different soil types.
Include observable evidence.

- List the soil types you studied (e.g. sand, clay, loam, garden soil).
- Write the observable properties you used to group or classify them (colour, texture, grain size, how it feels, how water drains, etc.).
- Explain how the evidence helped you decide which soils belong together.



C. INVESTIGATION



1. My investigation question and prediction.

- Write a clear question about soil and plant growth.
- Write your prediction (what you thought would happen and why).



2. What pattern or relationship did the evidence show?
What is your conclusion?

- Describe the pattern you noticed in your results.
- Explain the relationship between your results.
- Write a conclusion that answers your question using evidence.



D. SOIL SOLUTION



State the soil problem, your detailed solution and the scientific explanation. Show how evidence from different sources supports your solution.

- State the soil problem you chose.
- Describe your solution in detail (what you would do, materials, how it works).
- Explain the science — why this solution will help the soil and plants (think about nutrients, water, air, organic matter, etc.).
- Use evidence from different sources (your investigation, others' observations, posters/cards/books, and what you already know).



E. CONNECTED SCIENCE MESSAGE

In 2–3 sentences, connect what you learned about rocks, minerals and soils. Use scientific vocabulary.

- Link rocks, minerals and soils together.
- Explain how they are connected in nature and how people use or care for them.
- Use at least three scientific words from the vocabulary list.



EVIDENCE CHECK



☐ observable properties of rocks, minerals and soils



☐ importance of rocks/minerals using a range of examples



☐ classification of different soil types using evidence



☐ questions about patterns/relationships in rocks and minerals



☐ a soil/plant question developed from information



☐ prediction using my observations + others' observations + a provided source

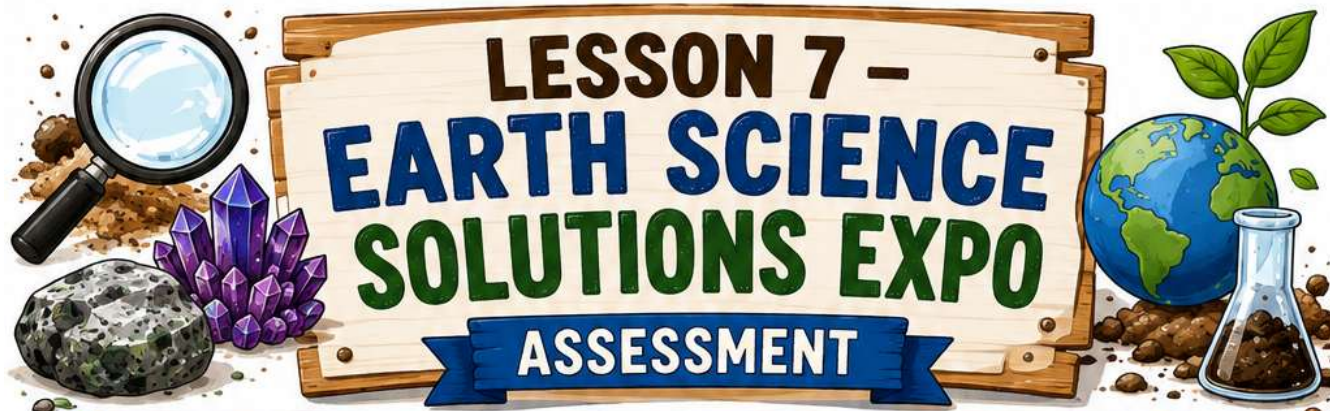


☐ detailed soil solution integrating a range of sources



☐ connected ideas and appropriate scientific vocabulary





VOCABULARY: properties • resource • classify • evidence • relationship



Use evidence from Lessons 1–6.
You may create a poster, presentation or display.
Complete this planning page first.



A. ROCKS AND MINERALS



Describe observable properties of **ONE** rock and **ONE** mineral.



Using at least **THREE** examples, explain why rocks and minerals are important resources.

B. SOILS



Explain how you classified different soil types. Include observable evidence.





LESSON 7 – EARTH SCIENCE SOLUTIONS EXPO

ASSESSMENT

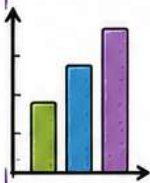
C.

INVESTIGATION



My investigation question and prediction:

What pattern or relationship did the evidence show? What is your conclusion?



D.

SOIL SOLUTION

State the soil problem, your detailed solution and the scientific explanation.
Show how evidence from different sources supports your solution.



E.

CONNECTED SCIENCE MESSAGE

In 2–3 sentences, connect what you learned about rocks, minerals and soils.
Use scientific vocabulary.





What is a rock?

A rock is a naturally occurring solid made up of one or more minerals. Rocks form in different ways and can be found all around us!



Examples:



Granite



Sandstone



Basalt

What is a mineral?

A mineral is a naturally occurring solid substance with a specific chemical composition and a regular atomic structure.



Examples:



Quartz



Amethyst



Pyrite

What does a geologist do?



A geologist studies rocks, minerals and the Earth. They find out how the Earth was formed and how it changes over time.



Geologists collect, observe and test rocks and minerals to learn about the Earth.

Students observe:

Colour	Texture	Grain size	Crystal size	Lustre	Hardness
 The colour of a rock can help us describe and identify it. Examples: 	 The feel or smoothness of a rock's surface. Examples: 	 The size of the grains or pieces that make up the rock. Examples: 	 The size of the crystals you can see in the rock. Examples: 	 How shiny or dull the surface of the rock appears. Examples: 	 How well a rock resists being scratched or marked. Examples: Soft 1 2 3 4 5 6 7 8 9 10 Hard (Mohs Scale)

Compare Rocks and Minerals using their observable properties.

Geologists observe:

- ✓ Colour
- ✓ Texture
- ✓ Grain size
- ✓ Crystal size
- ✓ Lustre
- ✓ Hardness



Property	Granite	Sandstone	Marble	Quartz	Pumice	Mica
 Colour What colour is it?	 Grey, black, white, pink	 Tan, brown, red, yellow	 White, grey, cream, green, pink	 Clear, white, grey, pink, purple	 Light grey, cream, tan	 Silver, black, green, brown, colourless
 Texture How does it feel?	Rough, grainy	Gritty, sandy, rough	Smooth, crystalline	Smooth, glassy	Very rough, porous	Smooth, silky, flexible (sheets)
 Grain Size How big are the grains?	Coarse (large visible grains)	Fine to medium (sand-sized grains)	Fine to medium (interlocking crystals)	Fine to medium (crystalline structure)	No visible grains (full of tiny holes instead)	Fine (layers/sheets, not grains)
 Crystal Size Can you see the crystals?	Large (crystals are easy to see)	No (individual crystals are too small)	Medium (crystals interlock like a mosaic)	Small to medium (crystals may be visible)	No (no crystals, just holes)	Large (crystals form in thin sheets)
 Lustre How does the surface shine?	Dull to slightly shiny	Dull	Slightly shiny to glassy	Glassy	Dull	Shiny, pearly to silky
 Hardness How hard is it? (Mohs Scale)	6-7 (Hard)	2-6 (Soft to medium hard)	3-4 (Soft to medium hard)	7 (Hard)	2-3 (Very soft)	2-3 (Soft, flakes easily)



Rocks vs Minerals

Rocks are made of one or more minerals.
Minerals are naturally occurring solids with a regular structure and specific composition.

Look Closely!

Geologists use these observable properties to identify and compare rocks and minerals in the field.



Think Like a Geologist!

- Which rock has visible grains that are easy to see?
- Which mineral is the hardest?
- Which rock is full of holes?
- Which mineral can be split into thin sheets?





STEM TOOLS FOR SCIENCE: ORGANISE, COMPARE, ANALYSE!



Scientists use tools to organise information and see patterns.
Three useful tools are classification charts, tables and Venn diagrams.

CLASSIFICATION CHARTS

Used to group things based on shared characteristics.

What are they used for?

- Sort and group information.
- Identify similarities and differences.
- Help identify patterns.
- Organise living and non-living things, materials, or ideas.



EXAMPLE Classifying rocks by texture.

Rough	Smooth	Porous	Crystalline
Pumice	Marble	Pumice	Granite
Sandstone	Quartz		Quartz
			Mica

HOW TO USE:

- Decide what you are sorting by (e.g. texture, colour, hardness).
- Create column headings for each category.
- Look at each item and decide which category it belongs in.
- Place or write the item in the correct column.
- Look for patterns or groups. What do you notice?



TABLES

Used to record and compare information in rows and columns.

What are they used for?

- Record observations or data.
- Compare multiple characteristics side by side.
- Identify patterns and trends.
- Keep information neat and organised.



EXAMPLE Comparing rocks using observable properties.

Rock	Colour	Texture	Grain Size	Hardness	Lustre
Granite	Grey, black, white	Rough, grainy	Coarse	6-7	Dull to slightly shiny
Sandstone	Tan, brown, red	Gritty, sandy	Fine to medium	3-5	Dull
Marble	White, grey, cream	Smooth, crystalline	Fine to medium	3-4	Slightly shiny
Quartz	Clear, white	Smooth, glassy	Fine to medium	7	Glassy
Pumice	Light grey, cream	Very rough, porous	No visible grains	2-3	Dull
Mica	Silver, black, brown	Smooth, silty (sheets)	Fine (layers, not grains)	2-3	Shiny, pearly

HOW TO USE:

- Decide what you want to compare.
- Choose the characteristics (headings) to include.
- List each item in the first column (rows).
- Record the information in the correct columns.
- Look across the rows and down the columns. What patterns can you see?



VENN DIAGRAMS

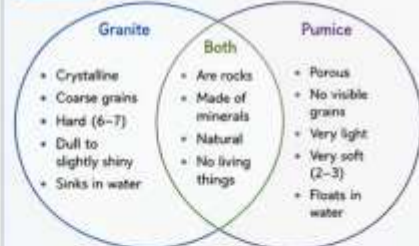
Used to compare two or more things and show similarities and differences.

What are they used for?

- Show what is the same (overlap).
- Show what is different (outside the overlap).
- Compare two or more items, ideas or groups.

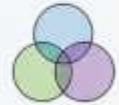


EXAMPLE Comparing Granite and Pumice.



HOW TO USE:

- Draw two (or more) overlapping circles.
- Write the names of the items in each circle.
- Write the similarities in the overlapping area. (What do they have in common?)
- Write the differences in the outer parts.
- Look at the diagram and describe how they are the same and how they are different.



★ **Remember:** These tools help scientists organise information, make comparisons and draw conclusions.



Observe → Record → Compare → Understand!



Why Rocks and Minerals are Important Resources

Rocks and minerals are natural resources. People use them every day in many ways. They help build, create, cook, write, heal and tell stories.



OBJECTS MADE FROM:

GRANITE Granite is strong, hard and lasts a long time. It is great for building and decorating.	Objects We Use Every Day Kitchen benchtops Stairs Monuments
QUARTZ Quartz is hard, clear or white and can be shiny. It is used in many different ways.	Objects We Use Every Day Watches Smartphones Glasses lenses
GRAPHITE Graphite is soft, slippery and a good conductor of electricity.	Objects We Use Every Day Pencil leads Car batteries Lubricants
SALT Salt is made of tiny crystals. It is important for food, health and many processes.	Objects We Use Every Day Table salt De-icing roads Soap and cleaning products
MARBLE Marble is smooth, can be polished and looks beautiful. It is used for art, buildings and decorations.	Objects We Use Every Day Statues Floor tiles Decorative items
BASALT Basalt is strong, dark and often from volcanoes. It is used for building and making roads.	Objects We Use Every Day Roads Paving stones Concrete blocks

Aboriginal and Torres Strait Islander Peoples' Knowledge and Use of Rocks and Minerals

For tens of thousands of years, Aboriginal and Torres Strait Islander Peoples have used rocks and minerals in clever and respectful ways. These resources are part of culture, Country and daily life.



OCHRE

Ochre is a natural clay with colours like red, yellow, white and brown.

USED FOR:

- Body painting for ceremony, culture and celebration
- Painting on rock shelters, objects and artwork
- Protecting skin from the sun and insects



GRINDING STONES

Grinding stones were used to crush, grind and mix food.

USED FOR:

- Grinding seeds, nuts and plant foods
- Making flour or pastes
- Preparing food on traditional Country



STONE TOOLS

Stone tools were made by shaping rocks like quartz, chert and basalt.

USED FOR:

- Hunting and fishing
- Cutting meat and plants
- Carving wood
- Everyday tasks



Respect, Knowledge and Connection

Aboriginal and Torres Strait Islander Peoples have deep knowledge of rocks and minerals. They know how to find them, use them and care for Country. Learning from and with Traditional Owners helps us understand and respect the importance of these natural resources.



★ **Key Idea:** Rocks and minerals are important resources. They are used in our daily lives and have special cultural significance for Aboriginal and Torres Strait Islander Peoples.



Think: Look around you. How many objects can you find that are made from rocks or minerals? Why do you think it is important to use and care for these resources wisely?

Soils Have Different Observable Properties.

Scientists observe soils to describe and compare them. Different soils look, feel, smell and behave in different ways.

SAND



Sand has large grains. It feels gritty. It drains water very quickly.

Common uses:
Beaches, playgrounds, building, filters.

CLAY



Clay has very tiny grains. It feels sticky when wet and hard when dry. It holds water.

Common uses:
Making bricks, pots and sculptures.

LOAM



Loam is a mix of sand, silt and clay. It holds some water but drains well.

Common uses:
Gardens, farmland, growing plant.

GARDEN SOIL



Garden soil is full of organic matter. It is usually dark in colour and great for plants.

Common uses:
Gardens, pots, growing vegetables and flowers.

SOILS ARE IMPORTANT!



- Soils help plants grow.
- They store water and nutrients.
- They are habitats for many living things.
- We use soils every day!

OBSERVABLE PROPERTIES – What can we observe?

COLOUR

Soils can be different colours.



Colour can give us clues about what is in the soil.

TEXTURE

How does the soil feel?

- Gritty (like sand)
- Sticky (like clay)
- Smooth or crumbly (like loam or garden soil)



SMELL

Soil can smell different. Fresh soil often smells earthy.



Tip: Soil that smells bad might be waterlogged or not healthy.

MAGNIFYING GLASS INVESTIGATION

Use a magnifying glass to look closely at soil.



- What can you see?
- Can you see tiny rocks, crystals or plant bits?
- Are there living things?

SOIL JAR TEST

This test shows what soils are made of.



- 1 Put soil in a jar.
- 2 Add water.
- 3 Shake well.
- 4 Let it sit for a few hours.
- 5 Look at the layers that form.

HOW TO OBSERVE SOIL

- 1 Collect a small sample of soil.



- 2 Look at the colour.



- 3 Feel the texture.



- 4 Smell the soil.



- 5 Use a magnifying glass to look closely.



- 6 Do the soil jar test.



THINK LIKE A SCIENTIST!



- How are these soils the same?
- How are they different?
- Which soil do you think would be best for growing plants? Why?
- What did you notice?

HEALTHY SOIL STRONG PLANTS!

Healthy soil helps plants grow, holds water and is full of life!

COMPOST



Compost is decayed food and plant scraps. It adds nutrients to soil and helps plants grow strong.

MULCH



- Mulch is a cover made from leaves, bark or straw.
- It protects soil, keeps it moist and stops weeds from growing.

WORMS



- Worms live in soil and help break down organic matter.
- They make tunnels that allow air and water to move through the soil.

ORGANIC MATTER



- Organic matter comes from dead plants and animals.
- It improves soil structure, adds nutrients and helps soil hold water.

WATER



- Water is essential for plant growth.
- Soil with good organic matter holds water like a sponge.
- Water helps carry nutrients to plants.

MIXING SOILS



- Mixing different soils can improve texture, drainage and fertility.
- A good mix helps plants get the nutrients and water they need.

Healthy soil Healthy planet Healthy future!