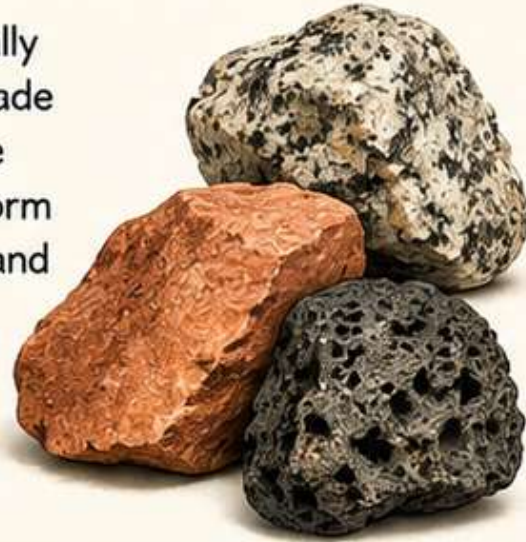


What is a rock?

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:



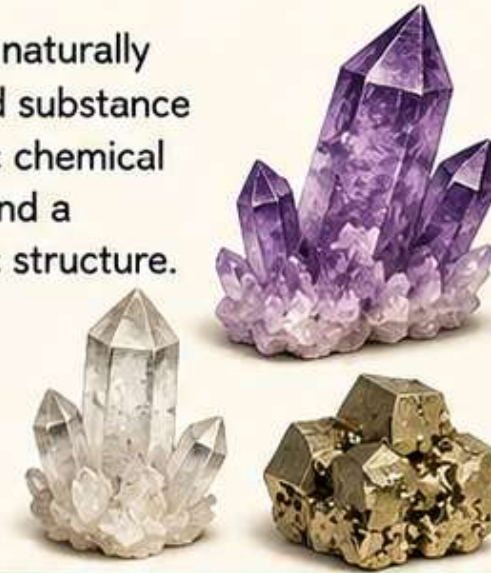
Granite

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



The colour of a rock can help us describe and identify it.

Examples:



Texture



The feel or smoothness of a rock's surface.

Examples:



Grain size



The size of the grains or pieces that make up the rock.

Examples:



Fine

Medium

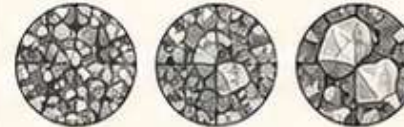
Coarse

Crystal size



The size of the crystals you can see in the rock.

Examples:



Small

Medium

Large

Lustre



How shiny or dull the surface of the rock appears.

Examples:



Shiny

Dull

Hardness



How well a rock resists being scratched or marked.

Examples:





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:

- 1 Decide what you are sorting by (e.g. texture, colour, hardness).
- 2 Create column headings for each category.
- 3 Look at each item and decide which category it belongs in.
- 4 Place or write the item in the correct column.
- 5 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	2-6	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, silky (sheets)	Fine (layers, not grains)	2-3	Shiny, pearly

HOW TO USE:

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



VENN DIAGRAMS

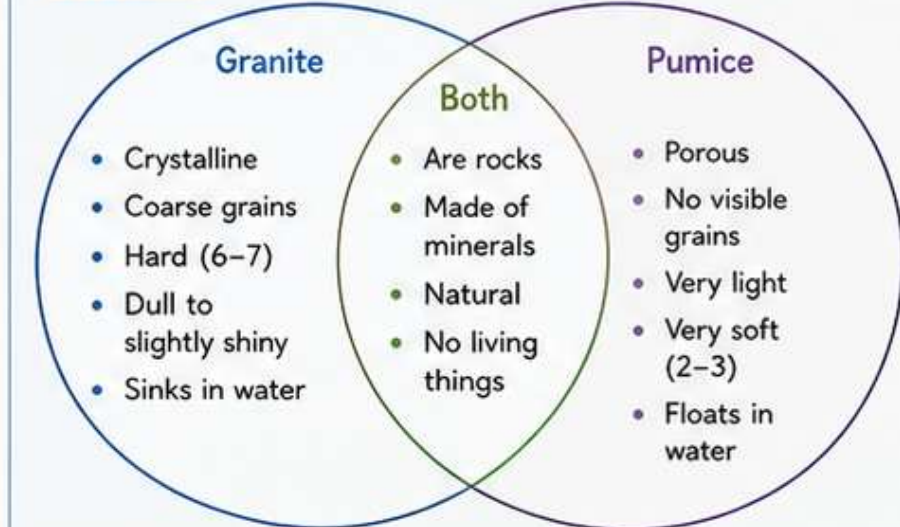
Used to compare two or more things and show similarities and differences.

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.

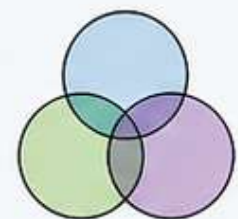


EXAMPLE Comparing Granite and Pumice.



HOW TO USE:

- 1 Draw two (or more) overlapping circles.
- 2 Write the names of the items in each circle.
- 3 Write the similarities in the overlapping area. (What do they have in common?)
- 4 Write the differences in the outer parts.
- 5 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



Glass 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?





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!