

Mystery Minerals

Aim: For students to investigate different characteristics of rocks to identify unknown minerals.

Mineral

Samples: Talc Quartz Hematite (Iron-Ore)
Galena Pendlandite (Nickel Ore) Malachite
Halite (Salt)

Testing

Materials: White tiles
Glass
Copper coins/washers
Steel nails
Magnifying glasses
Magnets

Introduction: Some minerals are valuable to us and some are not. It's useful to be able to identify those we want to use. Most identification is done just by looking at the mineral and observing its features. This is the job of a geologist. Properties that are most commonly used in identification of a mineral are colour, streak, luster, hardness and crystal shape (demonstrate each property with Halite-Salt).

Activity: After a short introduction to mineral classification students use various observation and testing techniques to identify the mystery minerals (students match their observations with the identification chart).

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Testing

Techniques:

Colour: *Describe the colour of the rock sample.*

Streak: The streak is the colour of the dust that the mineral leaves behind when it is drawn across the unglazed side of a white ceramic tile.

Draw the rock sample over the unglazed surface of a white tile. What is the colour of the dust, the rock has left behind?

Lustre: (Sheen) This indicates what the mineral's surface looks like, disregarding its colour.

Describe the rock sample as being metallic or non-metallic. How else could you describe lustre? (shiny, dull, grainy, glassy, waxy, pearly, dull, silky)

Hardness: The ability of one mineral to scratch another. Mineral hardness can be rated on a scale of 1 to 10 (Moh's scale of hardness).

A finger nail will scratch minerals up to a hardness of 2

A copper coin/washer will scratch minerals up to a hardness of 4

A steel nail will scratch minerals up to a hardness of 6

Minerals harder than 6 will scratch glass.

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IDENTIFICATION CHART

Mineral	Streak	Lustre	Hardness	Special Features	Uses
Hematite	Red-brown	Metallic	5 - 6	Also known as Iron-ore	Iron is used to make steel, which is then used to make railways, buildings and parts of cars.
Talc	White	Pearly or soapy, has a greasy feel	1	Talc is the softest mineral on Moh's scale of hardness.	Talc is ground up finely to make talcum powder, cosmetics. Talc is an important component of paper, tissues, rubber and toilet paper.
Bauxite	White	Earthy	Varied	Contains aluminium silicates	
Quartz	White (although may be too hard to streak)	Glassy	7	Quartz is one of the most common minerals in the Earth's crust.	Quartz, in the form of sand, is used in mortar for building walls, in concrete and glass. Quartz in the form of crystals can be made into jewellery.
Galena	Grey	Metallic	2 - 3	Also known as lead-ore	Lead is used to make motor vehicle batteries.
Pentlandite	Brown	Metallic, shiny, silvery	4	Also known as Nickel-ore	Nickel's main use is in the production of stainless steel.
Malachite	Pale green	Dull, soapy	3 - 4	Also known as copper-ore	Copper is used to make electrical wire, cookware and plumbing. Malchite is used for jewellery.
Halite	Colourless	Glass-like	2.5	Commonly known as salt	Salt is used for food preservation. It is also an ingredient in soap, fertilizers and paper.

C M E

Mineral	Colour	Streak	Lustre	Hardness	Special Features	Uses
Hematite	Red-brown to black	Red-brown	Metallic	5 - 6	Also known as Iron-ore	Iron is used to make steel, which is then used to make railways, buildings and parts of cars.
Talc	Pale green to white or grey	White	Pearly or soapy, has a greasy feel	1	Talc is the softest mineral on Moh's scale of hardness.	Talc is ground up finely to make talcum powder, cosmetics. Talc is an important component of paper, tissues, rubber and toilet paper.
Bauxite	Yellow to red	White	Earthy	Varied	Contains aluminium silicates	
Quartz	Colourless to pink, white or smoky grey	White (although may be too hard to streak)	Glassy	7	Quartz is one of the most common minerals in the Earth's crust.	Quartz, in the form of sand, is used in mortar for building walls, in concrete and glass. Quartz in the form of crystals can be made into jewellery.
Galena	Lead grey	Grey	Metallic	2 - 3	Also known as lead-ore	Lead is used to make motor vehicle batteries.
Pentlandite	Bronze yellow	Brown	Metallic, shiny, silvery	4	Also known as Nickel-ore	Nickel's main use is in the production of stainless steel.
Malachite	Bright Green	Pale green	Dull, soapy	3 - 4	Also known as copper-ore	Copper is used to make electrical wire, cookware and plumbing. Malchite is used for jewellery.
Halite	Usually clear or white	Colourless	Glass-like	2.5	Commonly known as salt	Salt is used for food preservation. It is also an ingredient in soap, fertilizers and paper.

MYSTERY MINERALS

Mineral	Colour	Streak	Lustre	Magnetism	Hardness
<i>Hematite</i>	Red, dark grey, black	Red or brownish red	Metallic	No	5-6
<i>Galena</i>	Silvery, lead-grey	Lead-grey	Metallic	No	2-3
<i>Pyrite</i>	Pale brassy yellow	Brownish black	Metallic	No	6-6.5
<i>Quartz</i>	White-transparent, purple, pink, brown, milky	White	Glassy	No	7
<i>Talc</i>	White, green, brown or grey	White to pale green	Pearly	No	1
<i>Malachite</i>	Bright Green	Pale green	Silky or dull	No	3.5-4
<i>Pentlandite</i>	Bronze, yellow	Bronze-brown	Metallic	No	3.5-4

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