



NATURAL SCIENCES: NATS4

LESSON 10

US 7509

NOTES AND ACTIVITY

THEME: Earth and Beyond

TOPIC: Minerals in South Africa

At the end of this unit, you should be able to:

1. Define what a mineral is.
2. Classify minerals as elements or compound.
3. Identify and distinguish between various forms of mining.

WHAT IS A MINERAL?

A **mineral** is a naturally occurring substance which is not formed from plant or animal material, i.e. it is an **inorganic substance**.

Each mineral has a definite *chemical composition* and specific *physical properties*.

CHEMICAL COMPOSITION OF MINERAL

- Minerals are made up of **elements** (*which are substances that cannot be chemically broken down into simpler substances*).
- **Geologists** (*a scientist who studies rocks and minerals found on Earth*) divide minerals into two groups, namely, native elements and compounds.
 - **native element** is a pure substance, for example: Gold (Au) and Copper (Cu)
 - **compound** is a substance made up of two or more elements combined in a specific ratio, for example: iron sulphide (FeS₂), silicon oxide (SiO₂) and sodium chloride (NaCl).

PHYSICAL PROPERTIES OF MINERALS

Geologists can identify minerals by studying their physical properties and the following are some properties found:

PROPERTIES	DESCRIPTION	EXAMPLE
Hardship	<p>Mineral hardness is tested by its resistance to being scratched. The scale used to test hardness is called the Mohs.</p> <p style="text-align: center;">MOHS SCALE</p>	<p>Diamond's hardness is 10, meaning is very hard to scratch.</p> <p>Talc's hardness is 1, meaning is very easily scratched.</p>
Colour	<p>Colour is not a very reliable guide to identify a mineral, as there are many minerals that would be of the same colour.</p>	<p>Quartz occurs in a range of colours, e.g. pink, green, blue, etc.</p>
Streak	<p>Streak of a mineral is the colour of the powder produced when it is dragged across an un-weathered surface .</p>	
Luster	<p>The way that a mineral reflects light or shine. Other terms used to describe luster are silky, glassy, metallic, greasy, dull, etc.</p>	<p>Diamond is glassy and asbestos is silky</p>

Other physical properties that may be studied include fracture and cleavage, specific gravity and crystal systems.

MINING OF MINERALS

There are many types of mineral mining used in South African. The table shows a few.

TYPE OF MINING	DESCRIPTION	EXAMPLE
Surface or Open-cast mining	Method of extracting minerals near the surface of the Earth	Coal
Underground or Deep mining	Extraction of minerals found far deep underground the surface.	Copper
Alluvial mining	Extracting minerals from streams and rivers.	Gold and diamond deposits

ACTIVITY

The following table shows the major minerals and resources that are mined in South Africa.

Mineral and Resources	% of South African industry
Gold	56
Diamonds	15
Coal	16
Iron ore	11
Other	2

- 1.1 Which mineral is mostly produced in South Africa? (1)
- 1.2 Give an example of a mineral that is mined through surface or strip mining. (1)
- 1.3 Give TWO other types of minerals mined in South Africa. (2)
- 1.4 Why is mining regarded as the corner stone of our economy? (2)
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