

LESSON NOTES

Subject: Basic Science

Year/Level: 9

Week 20

Strand	2: MATTER
Sub Strand	2.2 : MATERIALS
Content Learning Outcome	Investigate how the properties and interactions of materials influence their use.

SUB-STRAND 2.2 : MATERIALS

- ❖ **Material:** substance that is used for making objects.
- ❖ Objects are made from:
 - naturally occurring materials
For example, the cotton in your school uniform is processed more than the wood used in furniture.
 - synthetic or manufactured materials
 - ✓ made from raw materials by changing them chemically through heating them together or reacting them with other substances, example, plastic containers.

Materials from naturally occurring substances

These can be from non-living sources and from living sources.

Non-living sources	Living sources
<ul style="list-style-type: none"> • Building materials from rocks, such as slate ,marble ,stone, gravel • Metals from ores, eg. Iron, copper 	<ul style="list-style-type: none"> • Wood from trees for buildings and furniture and for making paper and cardboard • Canvas and ropes from plants • Silk, wool and cotton fibers for clothing from silk worms , sheep and cotton plants • Rubber from latex of rubber trees • Leather from animal skins

[Source: SCIENCE BOOK 1, LOWER SECONDARY ; page 39]

Classes of Materials: synthetic or manufactured materials

Material	Manufactured from	Examples
Ceramics	Clay, Sand and other minerals	chinaware, concrete, bricks, tiles
Plastics	Crude oil and other substances	polythene, polystyrene, formica
Glass	Sand, limestone and other minerals	soft soda glass, glass fibres, pyrex glass
Alloys	Mixtures of metals and other substances	steel, brass, bronze
Synthetic fibers	Crude oil and other substances	Nylon, terylene, polyester
Composite materials	Two or more materials such as plastic reinforced with glass fibre	Plastic reinforced with glass fiber for canoes, baths and plastic reinforced with carbon fibers for tennis rackets

[Source: SCIENCE BOOK 1, LOWER SECONDARY ; page 39]

Properties and interactions of materials

Properties of Materials

- ❖ How a material is used depends on its properties.
- ❖ Describe how it behaves and what it is like.
- ❖ Given below are properties of the main group of materials.

Group of Materials	Properties
Glass	• Transparent, brittle, unreactive, high melting point, non-conductor of heat and electricity
Metals and Alloys	• Usually hard, strong, dense, malleable, ductile, have high melting point, conduct heat and electricity
Plastics	• Flexible, low density, moulded when warm, many melt easily and some burn on heating, good insulator of heat and electricity
Ceramics	• Brittle, hard, high melting point, unreactive, non-conductors of heat and electricity
Fibres	• Flexible, low density, many burn on heating, long strands
Composites	• Have the properties of the materials making them

[Source: SCIENCE BOOK 1, LOWER SECONDARY ; page 40]

When describing the properties of materials, the following words are used:

Property	Meaning
Transparent	Clear, can see through it, for example, glass and some plastics
Strong	Resists the effect of forces, for example, steel.
Brittle	Hard but breaks easily for example, glass
Dense	A large mass compared with its volume, for example, lead.
Flexible	Can be bent or twisted without breaking for example, some plastics and fibres.
Malleable	Can be hammered into shape, for example, copper.
Ductile	Can be drawn out into wires, for example, copper.
Conductor of heat (or electricity)	Lets heat (or electricity) pass through it easily, for example, copper
Non- conductor (insulator of heat (or electricity)	Difficult for heat (or electricity) to pass through it, for example, P.V.C

[Source: SCIENCE BOOK 1, LOWER SECONDARY ; page 40]

ACTIVITY:

1. Define Material.

2. Describe the properties of the following Materials:

- a) Glass?

- b) Plastic?

- c) Ceramic?

...STAY SAFE... 