

LESSON NOTES

Subject: Basic Science














Year/Level: 9

Week 21

<b>Strand</b>	<b>2: MATTER</b>
<b>Sub Strand</b>	<b>2.2 : MATERIALS</b>
<b>Content Learning Outcome</b>	<b>Beware of the value of materials in their lives</b>








Plastics

- ❖ man-made raw materials.
- ❖ made from chemical compounds obtained from:
  - plants
  - coal
  - petroleum.
- ❖ soft or liquid-like when first made
- ❖ can be moulded into different shapes under heat or pressure before they harden.
- ❖ been replacing many materials in the making of useful products as they can be shaped into almost any form and has a wide range of hardness and colour.

TYPES OF PLASTIC	PROPERTY	EXAMPLE OF PRODUCTS
PVC (poly vinyl chloride)	<ul style="list-style-type: none"> <li>❖ Strong</li> <li>❖ Flexible</li> <li>❖ easily coloured,</li> <li>❖ resistance to chemicals and weather.</li> </ul>	<ul style="list-style-type: none"> <li> Pipes</li> <li> Raincoats</li> <li> Toys</li> </ul>
Polystyrene	<ul style="list-style-type: none"> <li>❖ Lightweight</li> <li>❖ Odourless</li> <li>❖ Cheap</li> </ul>	<ul style="list-style-type: none"> <li> Cups</li> <li> bowls</li> <li> Computer disks</li> <li> Packaging material</li> </ul>
Polythene	<ul style="list-style-type: none"> <li>❖ Lightweight</li> <li>❖ Flexible,</li> <li>❖ Feels waxy.</li> </ul>	<ul style="list-style-type: none"> <li> Bags</li> <li> Pails</li> <li> Food Wrapper</li> </ul>
Bakelite	<ul style="list-style-type: none"> <li>❖ Tough</li> <li>❖ Withstands heat</li> <li>❖ resists wear.</li> </ul>	<ul style="list-style-type: none"> <li> Radio</li> <li> Camera</li> <li> Plugs</li> </ul>

Effect of Soap and Detergents on Water Types

Sources of Water

- |   |  |   |
|---|--|---|
|  Wells |  Swamps |  Springs |
|  Lakes |  Rivers |  Streams |
|   |  Sea.   |   |

Types of Water

Water

- Basic necessity of life.
- Two classifications of water based on its chemical content:

### 1. Hard Water

- contains mineral salts of calcium and magnesium, mainly bicarbonates, chlorides, sulphates and sometimes irons.
- Temporary hardness
  - caused by calcium bicarbonate.
  - Removed by :  
Boiling (converts bicarbonates to the insoluble carbonate).
- Does not form lather with soap
- can pose serious problems in industrial settings, where water hardness is monitored to avoid costly breakdown in boilers, cooling towers and other equipment that handles water.

### 2. Soft Water

- contains very few or absolutely no traces of minerals such as calcium and magnesium.
- derived from igneous rocks such as granite or sedimentary rocks such as sandstone which have low mineral content.

### Differences between Soap and Detergents.

<b>SOAP</b>	<b>DETERGENT</b>
made from vegetable oils and caustic soda	made from petroleum or mineral oils from under the sea
reacts with stomach acids to form harmless substances	<ul style="list-style-type: none"> <li>✚ Do not react with stomach acids and our bodies cannot digest or change it</li> <li>✚ If swallowed:               <ul style="list-style-type: none"> <li>• remains as detergent to form foam and froth inside our bodies</li> <li>• interfere with our intestines and make us sick</li> <li>• may even cause death</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>✚ Soapy water is thrown away it finds its way into streams, creeks, ponds, lagoons, rivers, or the ocean, <u>bacteria, quickly destroys it.</u></li> <li>✚ Soap is not likely to poison fish or spoil our water supply.</li> </ul>	<ul style="list-style-type: none"> <li>✚ not easily destroyed by bacteria.</li> <li>✚ stay as detergent and water containing them stays frothy and bubbly.</li> <li>✚ may be harmful to living things in the water, and may spoil drinking water.</li> <li>✚ too much detergent in the water supply makes the rivers and lagoons become dirty or “polluted.”</li> </ul>
<ul style="list-style-type: none"> <li>✚ <u>Biodegradable:</u> when they go into the rivers or into the ground, bacteria can break them up into harmless substances.</li> <li>✚ does not pollute water.</li> </ul>	<u>Non-biodegradable</u>

### Effect of materials on the environment

- Every material we use affects the environment.
- Sometimes the effect on the environment is positive but often it is negative.
- Often the environmental effect is obvious but sometimes it is hidden.
- Synthetic material also has left harmful imprints on the environment and perhaps human health.
- Plastics:
  - ❖ long-lived products that could potentially have service over decades

- ❖ main use:
  - ✚ lightweight
  - ✚ inexpensive materials
  
- ❖ contribute to environmental problems:
  - ✓ Chemicals added to plastics are absorbed by human bodies and can alter hormones or have other potential human health effects.
  - ✓ Plastic debris, laced with chemicals and often ingested by marine animals, can injure or poison wildlife.
  - ✓ Floating plastic waste, which can survive for thousands of years in water, serves as mini transportation devices for invasive species, disrupting habitats.
  - ✓ Plastic buried deep in landfills can leach harmful chemicals that spread into groundwater.

**ACTIVITY:**

1. Give two properties of the following types of Plastic :

a) PVC?

- i. \_\_\_\_\_
- ii. \_\_\_\_\_

b) Polystyrene?

- i. \_\_\_\_\_
- ii. \_\_\_\_\_

c) Polythene?

- i. \_\_\_\_\_
- ii. \_\_\_\_\_

2. Name the two types of water.

- i. \_\_\_\_\_
- ii. \_\_\_\_\_

3. What is the following made up of:

i. Soap?

\_\_\_\_\_

\_\_\_\_\_

ii. Detergent?

\_\_\_\_\_

\_\_\_\_\_

4. Define Biodegradable.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

...STAY SAFE... 