

LESSON NOTES

Subject: Basic Science

Year/Level: 10

Week 24

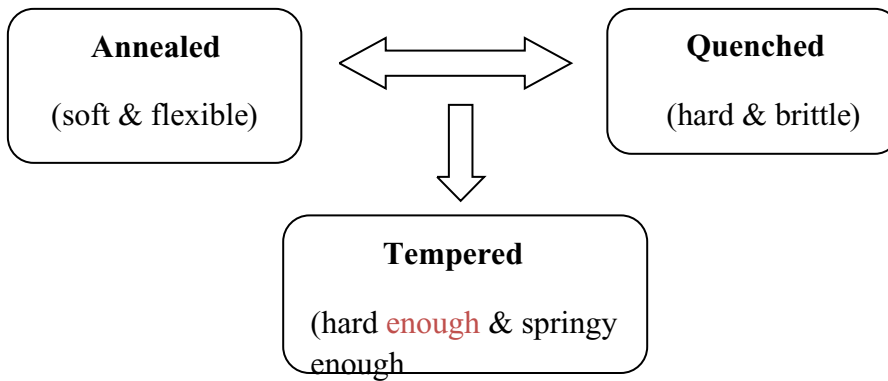
Strand	2: MATTER
Sub Strand	2.2 : INVESTIGATING MATTER
Content Learning Outcome	Investigate the differences in the properties and uses of metals and non-metals and describe the change in properties of metals when heated or cooled or when doing work on them.

2.2.3

Effect of Heating and Cooling of Metals

- ❖ Over 75% of all elements are metals.
- ❖ Manufacturers want *metals to be malleable and ductile so that they can be shaped easily.*
- ❖ But they also want them to be hard and strong, so that they are useful.

	Annealing	Quenching	Tempering
Description: Heating/Cooling Process	heat process whereby a metal is heated to a specific temperature /colour and then allowed to cool slowly.	heat process whereby a metal is heated to a specific temperature /colour and then allowed to cool rapidly by dipping the heated metal in water.	heat process whereby a metal is gently heated to bluish purple colour and then allowed to cool.
Physical Property	*relatively soft and flexible. *It can be cut and shaped more easily. *They bend easily when pressure is applied	*hard and brittle. *Hardened metals are difficult to cut and shape. *They are very difficult if not impossible to bend	hard enough and springy enough.



2.2.4

Work on Metals

Changing the Shapes of Metals

- ✓ Most metals we use in our daily lives have had their shape changed during manufacturing.
- ✓ Very few were ‘cast’ or poured when molten and allowed to solidify into their present shapes.
- ✓ **Work** is when we use force and when we make something move.

Methods of Changing Metal Shapes

1. **Hammering** – metals are beaten into shapes
2. **Rolling** – the large blocks of metals are rolled back and forth between heavy rollers, and the block gradually becomes longer and thinner, e.g. making flat sheet of iron.
3. **Pressing** – a sheet of metal is pressed down, using enormous pressure until it takes up a new shape, e.g. the shape of motor car bodies
4. **Pulling** – the long piece of metal is pulled out through a hole that is smaller than the thickness of the metal, the metal becomes longer and thinner, e.g. making wires and nails.
5. **Spinning** – a flat piece of metal is held at its center and spun around while being pushed from one side until it takes a hollow shape, e.g. saucepans and cooking pots.
6. **Twisting** – heating a metal bar until red hot and twist the heated part with wrench. Then heat it again and slowly cool it.

Magnetic Metals

- ✓ those that can be attracted by a magnet and can also form a magnet when magnetized.
- ✓ only magnetic metal is iron and if a metal has iron in it, eg. steel

Magnetic and Non Magnetic Metals

- A **magnet** is a metal that can attract other metals.
- Only certain materials can become magnets
- A material that can become a magnet is called a **magnetic substance**.
- A magnetic substance can be also picked up by a magnet
- Magnets are made in many sizes, shapes and strengths.
- Magnets have many uses.



ACTIVITY:

1. State the physical property of:

a) Annealing?

b) Quenching?

c) Tempering?

...STAY SAFE... 