DAY 1

**TOPIC: PARTICLES**

Aim : Use the kinetic theory model to explain the expansion of solids, liquids and gases on heating.

Acitvity 1:

Watch video V.15: Expansion of solids.

Answer the following questions, in your exercise book.

1. Does the ball go through the ring before it is heated? *yes*
2. After heating the ball for 5 minutes, can the ball still go through the ring? *no*
3. What has the heat done to the ball? *The heat has expanded the ring.*
4. A solid *expands* (gets bigger in volume) when it heated and *contracts* (gets smaller in volume) when it is cooled.

Activity 2:

Watch video V.16 : “Expansion of liquids and gases.”

Answer the following questions, in your exercise book.

Gases

The small clear bottle is filled with air (gas) and the red drop of oil is placed inside the straw to indicate the volume or space occupied by the air, inside the small bottle.

1. Describe what happens to the red drop of oil when the bottle is placed in: a) hot water b) cold water. *A) it rises up the tube b) it moves down.*
2. Explain why the drop of oil moves: a) up b) down. *A) the gas inside the small clear bottle expands and moves up the tube, pushing the drop of oil up. B) the gas contracts, pulling the drop of oil back down.*
3. This experiment proves that gases *expand* when heated and *contract* when cooled.

Liquids

1. Describe what happens to the red coloured water, when the small bottle is placed in hot water.

*It moves up the straw.*

1. Explain what is happening to the volume of the coloured water when it is placed in hot water.

*The volume of the coloured water is increasing.*

1. This shows that liquids *expand* when they are heated.
2. Describe what happens to the coloured water when the bottle is placed in cold water.

*The colored water moves down the straw.*

1. Explain what is happening to the volume of the colored water, when it is placed in cold water.

The volume is decreasing.

*The volume of the colored water is decreasing.*

1. This shows that liquids *contract* when they are cooled.

Activity 3:

When heated under the same conditions, gases expand more than liquids which expand more than solids. Complete the table below to show the difference in the expansions of a solid, a liquid and a gas.

|  |  |  |
| --- | --- | --- |
| **State** | **Expansion**  **(large, moderate, small)** | **Reason (use kinetic theory of particles)** |
| Solid | Small | Very strong force holding the particles together.  Particles do not move far apart, they only vibrate, thus expanding the solid a little, then move back to their original positions. |
| Liquid | *moderate* | *Weaker force holding particles together and there is space between the particles therefore particles are able to move away from each other and move to the available spaces thus expanding liquids faster than solids.* |
| Gas | *larger* | *Lots of space between particles, and there is almost no force holding particles together so they move quickly in all directions, expanding the gas more.* |