**Expt 1:**

**Title:** To demonstrate solids expand when heated and contract when cooled

**Equipment:** Ball and ring, Bunsen burner

**Method:**

1. Pass the ball through the ring to show it fits
2. Heat the brass ball with Bunsen.
3. Try to pass the ball through ring again and note what happens
4. Cool ball down and try fit it through again

**Results:**

The ball fits through the ring when the ball is cold but not when hot. Solids expand when heated and contract when cooled.

**Diagram:**



**Expt 2:**

**Title:** To show liquids expand when heated and contract when cooled

**Equipment:** Round bottom flask, water, dye, marker, hairdryer, retort stand

**Method:**

1. Connect a glass tube to the top of a round bottom flask full of water (use dye to make the water more visible).
2. Mark the position of water in the tube.
3. Use a hair-dryer to heat liquid (or Bunsen burner)
4. Observe what happens. Mark new position of water in tube.
5. Cool the liquid and observe what happens

**Results:**

The water rises up the tube as it gets heated and drops back down as it cools. This shows that liquids expand when heated and contract when cooled.

**Diagram:**

**Expt 3:**

**Title: To show gases expand when heated and contract when cooled**

**Equipmemt:** Round bottom flask, water, beaker, hairdryer, retort stand

**Method:**

1. Set up apparatus as in diagram. Make sure end of tube is submerged in water.
2. Gently heat the flask of air (much better to use a hair dryer in case the flask breaks).
3. Observe what happens.
4. Allow gas to cool down and observe what happens

**Result:**

Bubbles come out of the tube when the flask is heated. This is because gas expand when heated and leaves the flask

As the flask of air cools water from the trough rises back up the tube because of the partial vacuum which has formed. When the gas contract the space that the bubbles left is filled with water.

**Diagram:**

**Expt 4:**

**Title: To show the effect of pressure on the boiling point of water**

**Reduced pressure decreases the boiling point of water**

**Equipment: Syringe, water**

**Method:**

1. Suck up water which is at about 80 0C into the syringe so that the syringe is about one-quarter full.
2. Cover the open end (watch out- it’s hot!) and pull back the handle to create a partial vacuum.

**Result:** The water begins to boil!

**Explanation:** the air acts like a blanket which presses down on the water and makes it difficult for the water molecules to leave (‘jump out of’) the liquid and become part of the air. Higher pressure therefore results in a higher boiling point (the molecules need to have more energy/ move more rapidly to make the transition).