B1 ACTIVITY 2: THE DIFFERENCE BETWEEN HEAT AND TEMPERATURE

Background

We do not measure temperature directly. Instead, we **read the changes** that heating and cooling produce.

Liquids **expand when heated** and **contract when cooled**. The **mercury thermometer** uses these facts to show temperature. The mercury in the thermometer absorbs heat and expands when it comes in contact with anything warmer than itself. It grows smaller when in contact with something cooler than itself. **Temperature is a measure of whether one object will give heat to, or absorb heat from, another object**.

This activity allows students to observe the **difference** between two bodies that both have the same temperature but contain different quantities of **heat energy**.

Equipment required:

- Test tube with support stand
- Beaker with tripod and gauze mat, or support stand
- Two candles (ideally tea lights)
- Matches
- Two mercury/spirit thermometers (best for this experiment)
- Stopwatch
- Access to water

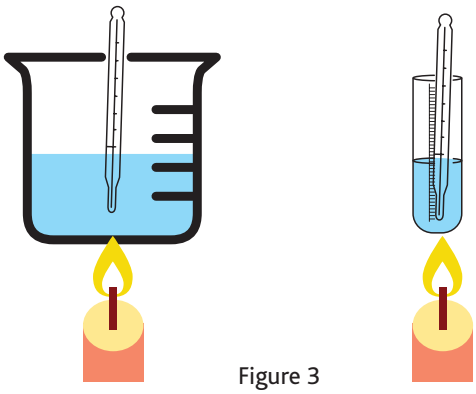

Figure 3

What to do:

1. Fill the beaker up halfway with water.
2. Add a small amount of water to the test tube.
3. Check the temperature of the water in both containers and make a note of it.
4. As indicated in Figure 3, position each container over the flame of a candle or a Bunsen burner. Use support stands, or tripod and gauze.
5. Heat both amounts of water for the same length of time and no more than five minutes.
6. Check and record the temperature of the water in each container.

   ? ***Are the temperatures the same?***

   ? ***If not can you explain why not?***

   ? ***Which container contains the most heat energy?***

   ? ***What are the variables in this activity?***

   ? ***Which one did you keep constant?***