



## Concept:

The thermal energy,  $Q$ , transferred from one sample to another is given by  $Q = mc\Delta T$  where  $m$  is the mass,  $c$  the specific heat, and  $\Delta T$  the temperature change. At  $15^\circ\text{C}$ , the specific heat of water ( $4186 \text{ J/kg} \cdot ^\circ\text{C}$ ) is almost five times the specific heat of aluminum ( $900 \text{ J/kg} \cdot ^\circ\text{C}$ ). Thus, for equal masses of water and aluminum, and the same amount of heat energy transferred to each sample, the sample of aluminum will experience the greater temperature change.

## Equipment:

- Jug of Water
- Paper Towels
- Metal Tray
- Demonstration Multimeter with Thermometer
- Hot Plate
- Balance Scale
- (2) 600 mL Pyrex Beaker
- 200 g Aluminum Cylinder

## Procedure:

1. Verify that one Pyrex beaker contains 400 g of water while the other contains 200 g of water and 200 g of aluminum.
2. Weigh each beaker to show that the contents have the same total mass.
3. Measure the temperature of the water in each beaker to show that they have the same starting temperature.
4. Place both beakers diagonally on the hot plate so that the bottom of each beaker is fully touching the hot plate.
5. Turn the hot plate dial to about  $75^\circ\text{C}$ .
6. After about 5 minutes, measure the water temperature in each beaker showing that the beaker with water and aluminum is hotter than the beaker with water only.