

## Unit VI: Worksheet 4

- Two cups of water are placed on a table. One cup is filled with hot water ( $45\text{ }^{\circ}\text{C}$ ) another is filled with cold ( $5\text{ }^{\circ}\text{C}$ ).
  - Equal volumes of hot and cold are mixed. What would be the new temperature of the water?
  - 25 mL cold is mixed with 75 mL hot. What would be the new temperature of the water?
  - Draw a qualitative graph showing how the two temperatures would reach thermal equilibrium with the temperature of the room. (time on the x-axis, temp on the y-axis)
- Copper has a specific heat of  $385\text{ J/kg}^{\circ}\text{C}$ . How much heat is absorbed by 60.0 g of copper when its temperature is raised from  $20.0$  to  $80.0\text{ }^{\circ}\text{C}$ .
- Brass has a specific heat of  $376\text{ J/kg}^{\circ}\text{C}$ . A 45.0 g sample of brass is heated using a Bunsen burner flame until it reaches thermal equilibrium. It is plunged into a 1000 mL container of room temperature water ( $25.0\text{ }^{\circ}\text{C}$ ) and heats to a temperature of  $27.5\text{ }^{\circ}\text{C}$ .
  - Calculate the energy used to change the temperature of the water.
  - From where did the energy of the water come?
  - Calculate the change in temperature of the brass. What was the original temperature of the flame?

