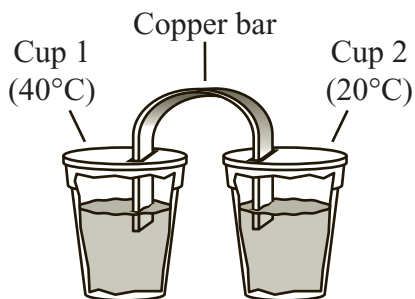


A student is investigating heat transfer. The student places the ends of a curved copper bar into two insulated cups, as shown below. The copper bar is at 20°C . Cup 1 contains 40°C water and cup 2 contains 20°C water. Each cup contains the same amount of water.



- Describe the direction of heat flow between the cups of water in the first few minutes of the investigation.
- Identify the **primary** method of heat transfer (conduction, convection, radiation) between the cups of water. Describe how the transfer of heat occurred for the method you identified.
- After 25 minutes, the water in both cups reaches thermal equilibrium. Explain how the student can determine that thermal equilibrium has been reached between the cups.
- On the grid in your Student Answer Booklet, copy the title, axes, and labels of the graph, as shown below. Draw **two** curves, one to represent the temperature of the water in cup 1 and the other to represent the temperature of the water in cup 2, over a 30-minute period. Assume no heat is lost to the surroundings.

Temperatures of Water in Cups 1 and 2

