

A person brings a cup of hot chocolate ( $70^{\circ}\text{C}$ ) into a room ( $20^{\circ}\text{C}$ ) and places a metal spoon ( $20^{\circ}\text{C}$ ) into the hot chocolate.

- a. Describe what happens to the temperatures of the hot chocolate, the spoon, and the air in the room after 10 minutes. Explain your answer.
- b. Identify **and** describe the primary method of heat energy transfer (conduction, convection, or radiation) between each of the following:
  - the hot chocolate and the spoon
  - the hot chocolate and the air in the entire room
- c. At what point will the net transfer of heat energy stop?