

## 24.4: Procedures

### Warning

- Be careful not to burn yourself during this investigation.

### Wire & Flame

You will hold two different types of wire in a candle flame.

1. Use the aluminum foil to create a candle stand. Light the candle and leave it lit.
2. Hold one wire in each hand such that about 2 inches of the length extends from your grasp.

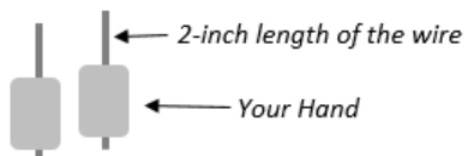


Figure 24.4.1

3. Place the ends of the 2-inch lengths of wire into the candle flame, at the same time (one person should be holding both wires), keeping both wires in the flame. **As soon as a wire becomes too hot to hold, let go of it.** Continue to hold the 2nd wire until it becomes hot; if the 2nd wire does not get hot within another 2 minutes then let go of it and end the experiment. Record which wire became hot first.

### Conduction & Containers

You will be measuring the change in temperature on the outside of three different containers.

4. Obtain 300 mL of water in the 400-500 mL beaker. Place the beaker on the heat source, cover the beaker with a foil lid, and bring the water to a boil. While you are waiting for the water to boil, securely attach thermometers to each container (250 mL Beaker, Metal can, and Styrofoam Cup). Make sure the end of the thermometer is in full contact with the container. You may need to balance the Styrofoam cup against something so it does not fall over

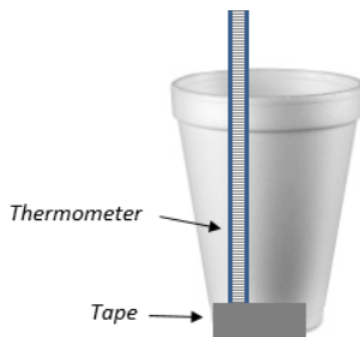


Figure 24.4.2

5. Draw a table in which to record temperature data for the three containers. **Do not fill in data until you have read the instructions for obtaining that data.**

Table 24.4.1: Container Temperature Data

	Initial Temperature (Celsius)	Final Temperature (Celsius)	Rank Order (Feel)	$\Delta T$	Rank Order ( $\Delta T$ )
Glass Beaker					
Metal Can					

	Initial Temperature (Celsius)	Final Temperature (Celsius)	Rank Order (Feel)	$\Delta T$	Rank Order ( $\Delta T$ )
Styrofoam Cup					

6. After the temperatures on the thermometers have settled, record the initial temperature of each container in your data table.
7. Once the 300 mL of water is boiling, use either heat gloves or beaker tongs to pour about 100 mL of boiling water into each container. Cover each container with foil. Observe the thermometers until the temperatures have peaked and then record the final temperature of each container in your data table.
8. Touch the outside of each container near the bottom of the container where the hot water is. Rank the order the containers from most conductive to least conductive, based on what you feel with your hand.
9. Calculate and record the change in temperature for each container. Rank order the containers from most conductive to least conductive, based on your calculated change in temperature,  $\Delta T$ .

### Clean-up

- Wash and dry copper and steel wires
- Dispose of all used foil
- Remove all tape from thermometers
- Completely dry all containers

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