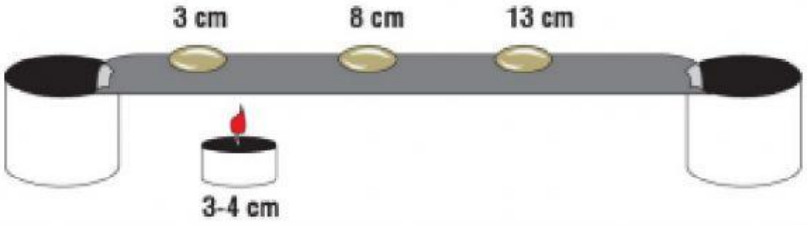
Part II: Conduction

Recall that matter is made up of tiny particles that are always in motion (kinetic energy). When a thermometer is used to measure the temperature of a substance that is considered "hot," the particles of the substance are moving fast. Much faster that when the thermometer measures the temperature of the same substance that is considered "cold." When a substance is heated, its particles increase their motion. As the particles move more vigorously, they bump into nearby particles making them move faster, too. Thermal energy can transfer when particles of matter are in direct contact with each other, as they are in solids, liquids, and sometimes gases. Thermal energy can transfer when particles touch. This form of thermal energy transfer is called conduction.

Remember that the direction of thermal energy transfer is always from higher temperatures toward lower temperatures. Complete the activity to explore how thermal energy transfer occurs by conduction, when the particles of matter are in direct contact.



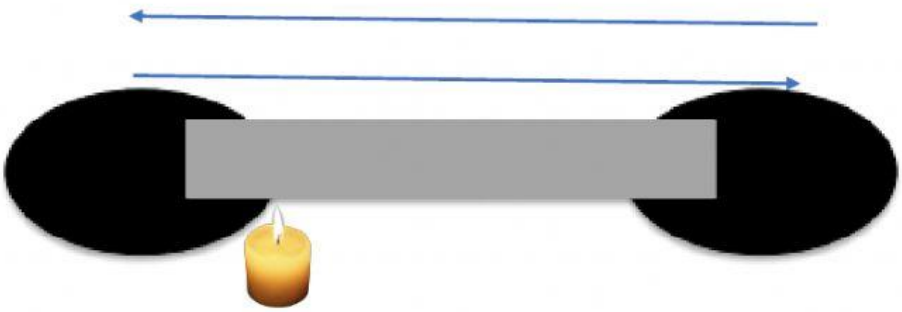
Procedure:

1. Use the ruler to place your cans so they are spaced about 15 cm apart.
2. Place the aluminum foil bridge over the top of the cans.
3. Use the masking tape to fasten the foil to the inside top of the can. (See picture below.)
4. Place the small wax chips at 3 cm, 8 cm, and 13 cm across the foil.
5. Make sure the candle will be about 3-4 cm below the foil.
6. Light the candle with a match. Follow all fire safety rules and do not touch the foil or flame.
7. Slide the candle under the first chip (located at 3 cm).
8. Start the timer.
9. Record the time it takes for each chip to begin melting. The chips will look glossy when they begin to melt.
10. Record your data in your Thermal Energy document and complete the Part II questions.
11. When cleaning up be sure to recycle the aluminum foil.

1. Data Table: Melting Wax Chips by Conduction

Chip	1	2	3
Time			

2. Select the arrow that correctly shows the direction that heat flowed in the experiment.



3. What type of heat transfer occurs along the aluminum foil?

4. What pattern was evident in the movement of thermal energy?

5. What evidence did you observe that showed heat transfer.

6. In your own words, define conduction.