

Thermal Conductivity

Recommended for Chapter(s): 9

Demo #031

Materials NOT in box

1. Ice (use the ice in the freezer of the demonstration room in this demo).
2. Document camera (the document camera is on the bottom shelf of the shelving on your right as you come into the demonstration room next to demo # 049).

Procedure

1. (Prep) Get ice out of the freezer in the demonstration room. Please refill the ice tray if you empty it.
2. (Prep) Set up the document camera so it is focused on the blocks.
3. Ask a student to explain to the class how the blocks feel.
4. Ask the class to predict which block will melt the ice first.
5. Place a piece of ice on each block. The “colder” block will melt the ice first.

Clean Up

1. Return the materials to the cart in the demonstration library room.

Stockroom

1. Return items to demonstration tub.
2. Return tub to the demonstration library.
 - a. The goggles go in the goggle box.
 - b. The document camera goes on the bottom shelf of the shelving on your right as you come into the demonstration room next to demo # 049.
3. Check to make sure that ice cube trays in the freezer in the demonstration room are full.

Discussion

This demonstration can be used to illustrate the differences between heat and temperature. Ask a student to describe how the two blocks feel to the class. Most likely the student will say that one of the blocks “feels colder” and one of the blocks “feels warmer.” To emphasize this to the rest of the class you can have them feel the metal part on their seat and the wood part on their seat. Have the students predict which block will melt the ice first. Most likely the majority of students will think that the block that feels warmer will melt the ice first. However, the block that feels colder will melt the ice first. Ask the class if we put a thermometer on the wood part and the metal part of their desk if the thermometer would read different temperatures. Explain that object will come to

thermal equilibrium with the room. Therefore, the wood and metal parts of the desk are at the same temperature. When we say that the metal feels colder what we are feeling is the exchange of heat between us and the object as we and the object try to reach thermal equilibrium. Therefore, the “colder” the object feels the faster the object is extracting heat from us. Objects that can extract heat fast are good thermal conductors. When the ice is placed on the block that is the best thermal conductor (the block that feels the coldest) will melt the ice the fastest.

Materials for demo 031

1. Two melting blocks
2. Paper towels