

Heat Conductors

Sixth Grade

Activity: 5

Time: 1 Class Period

General Description

Students will investigate what it means for a material to conduct thermal energy.

Objectives

Students will invest what the term conduction means in terms of thermal energy.

Students will describe how heat energy can be transferred by conduction.

Arizona State Standards

SC06 S5C3 PO4 Explain how thermal energy (heat energy) can be transferred by:

- conduction
- convection
- radiation

SC06 S1C1 PO2 Formulate questions based on observations that lead to the development of a hypothesis

SC06 S1C2 PO1 Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry

SC06 S1C2 PO5 Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs

SC06 S1C3 PO1 Analyze data obtained in a scientific investigation to identify trends

SC06 S1C4 PO1 Choose an appropriate graphic representation for collected data:

- line graph
- double bar graph
- stem and leaf plot
- histogram

M06 S2C1 PO1 Formulate questions to collect data in contextual situations

M06 S2C1 PO2 Construct a histogram, line graph, scatter plot, or stem-and-leaf plot with appropriate labels and title from organized data

M06 S2C1 PO4 Answer questions based on simple displays of data including double bar graphs, tally charts, frequency tables, circle graphs, and line graphs

M06 S4C4 PO1 Determine the appropriate measure of accuracy within a system for a given Contextual situation

M06 S4C4PO 2 Determine the appropriate tool needed to measure to the needed accuracy.

Teacher Information

Conduction is the transfer of thermal energy from one substance to another through direct contact. Conduction can also occur within a substance such as a piece of metal or glass.

Materials

Hot water

Metal spoons

Wooden spoons

Plastic spoons

Glass rod

Shallow pans to hold hot water

Procedures/Exploration

1. Divide the students into groups.
2. Explain to the students that they will be gathering some data that they will need to graph. Have the students brainstorm how they will keep track of the data.
3. Have the students create the table they will be using to keep track of the data.
4. Explain to the students what they will be doing; testing the conductivity of heat through a material.
5. Make predictions about which spoon will conduct heat the best.
6. Pour about one inch of heated water into the pan.
7. Place a thermometer in the water and attach one with tape to the end of the spoon or rod.
8. Record the temperature of the water and the end of the spoon at the start.
9. Record the temperature of both the water and object every 30 seconds for two minutes.
10. Repeat steps 8 and 9 for all the different objects.
11. Graph the results.
12. In their groups have the students discuss what they discovered.
13. Have the students share whole their results.
14. Provide students with the opportunity to develop their own definition of conduction and illustrate it in their science notebooks.
15. Ask students if they think the same would find similar results if they used ice water instead; would the same materials conduct the temperature at the same rate?