Types of Heat Transfer

Summary
Students will complete one mini lab on each type of heat transfer. You may have students complete all three mini labs in one class period or complete one at a time.

Time Frame
1 class periods of 60 minutes each

Group Size
Small Groups

Materials
colored hot water
ice
cold water
4 small glass or clear bottles
16 small marbles or rocks to weigh down the
small bottles of hot water t
hree 1000 mL beakers
paper towels
hot pads
hot plate
three 100 mL beakers
4 thermometers
4 dark cloths
4 heat (or incandescent lamps) lamps
pan
ladle
cold water container
- student worksheet
(attached)

Background for Teachers
You may explain conduction, convection, and radiation to your students beforehand or use these mini labs to introduce and explain the concepts.

Instructional Procedures
Go over the introduction material with students.
Instruct each group as to which experiment they should start and end with. For example: 1,2,3, 2,3,1, 3,1,2. If I have 12 groups then I have 4 groups start with each experiment so that they don't all need the same materials at once.
Ask students to record their work on a piece of paper for each experiment.

Assessment Plan
Example Paragraph Answers
: (answers will vary, occasionally students may not get expected results)
Experiment 1: The temperature of the thermometer increased because heat was transferred from the

lamp to the dark cloth/thermometer by radiation.

Experiment 2: The hot water rose out of the bottle and layered above the cold water in the beaker because it is less dense than the cold water. Some of the cold water went into the bottle to replace the water that had moved out. This is an example of convection.

Experiment 3: The temperature of the beaker increased when I poured hot water in it because heat was transferred from the water to the beaker by conduction.

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

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