

# TRB 6:6 - Activity 1 - Heat and Color

## Summary

Students will conduct an experiment to learn that heat transfer occurs in three different ways: conduction, convection and radiation.

## Materials

- three or more shallow containers (pie plates, Styrofoam meat containers, etc.)
- food coloring
- thermometers (one for each container)
- paper towels
- heat lamp or incandescent lamp (desk lamp) or natural sunlight
- journal

## Background for Teachers

Heat transfer occurs in three different ways: conduction, convection and radiation. These three types of heat transfer often work in combination with each other. The following activity will allow students to identify heat transfer in all three ways. They will also discover how color affects heat. This activity can be completed using one container at a time or several. Make sure that the temperature and other conditions are the same when starting. Point out to students that this activity is easily replicated to check the results.

## Intended Learning Outcomes

- 1-Use science process and thinking skills
- 4-Communicate effectively using science language and reasoning
- 6-Understand the nature of science

## Instructional Procedures

### Invitation to Learn:

Have you ever walked across your lawn on a hot summer day in bare feet? Have you stepped onto an asphalt street and started to hop around? Why is the lawn comfortable and the street uncomfortable?

### Instructional Procedures:

Have students record in their journals the steps they take during the experiment. Encourage them to make drawings.

Place the three dishes next to each other.

Put a thermometer in each dish.

Cover the thermometer with the same amount of water in each dish.

Use food coloring to dye the water in each container a different color.

Record the temperature of the water before placing the heat source over the dishes. Make sure the water in each container starts at the same temperature before turning on the light.

Place the lamp over the dishes so that it lights them evenly. This could also be done outdoors on a nice day or in a window.

Measure and record the temperature every 30 seconds until it stabilizes.

Have students observe, describe, and carefully record all stages of the experiment.

Each group should report their findings to the class.

## Extensions

Have different groups measure and record different colors.  
 Experiment with different shades of the same color.  
 Compare the amount of time it takes the water to cool to the starting temperature.  
 Compare how fast different colors heat and cool over time.

Assessment Plan

The following rubric could be used or adapted for grading this activity.

Description						Total
Student set up demonstration correctly.	5	4	3	2	1	
Student's journal showed understanding in writing.	5	4	3	2	1	
Student's journal showed understanding with pictures/drawings.	5	4	3	2	1	
Student's journal showed evidence of self-learning.	5	4	3	2	1	
Oral report activity.	5	4	3	2	1	

Bibliography

This lesson is part of the Sixth Grade Science Teacher Resource Book (TRB3) <http://www.usoe.org/curr/science/core/6th/TRB6/>. The TRB3 is designed to be your textbook in teaching science curriculum to your students. This book covers all the objectives of each standard and benchmark. If taught efficiently, a student should do well on the End-of-Level (CRT) tests. The TRB3 is designed for teachers who know very little about science, as well as for teachers who have a broad understanding of science.

Authors

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