

# Solar Race

**First Grade**

**Activity: 3**

**Time: 1 Class Period**

## General Description

Students will investigate the properties of solar energy by comparing the temperature of water placed in a variety of locations.

## Objective

Students will identify the effects of solar energy on water in a variety of locations.

## Arizona State Standards

SC01 S1C1 PO1 Compare common objects using multiple senses

SC01 S1C1 PO3 Predict results of an investigation based on life, physical, and Earth and space sciences (e.g., animal life cycles, physical properties, Earth materials)

SC01 S1C2 PO1 Demonstrate safe behavior and appropriate procedures (e.g., use of instruments, materials, organisms) in all science inquiry

SC01 S1C2 PO2 Participate in guided investigations in life, physical, Earth and space sciences

SC01 S1C2 PO4 Record data from guided investigations in an organized and appropriate format (e.g., lab book, log, notebook, chart paper)

SC01 S1C4 PO1 Communicate the results of an investigation using pictures, graphs, models, and/or words

SC01 S6C2 PO1 Identify evidence that the Sun is the natural source of heat and light on the Earth (e.g., warm surfaces, shadows, shade)

SC01 S6C3 PO2 Analyze how the weather affects daily activities

M01 S2C1 PO1 Formulate questions to collect data in contextual situations

M01 S2C1 PO2 Make a simple pictograph or tally chart with appropriate labels from organized data

M01 S2C1 PO3 Interpret pictographs using terms such as most, least, equal, more than, less than, and greatest

M01 S2C1 PO4 Answer questions about pictographs using terms such as most, least, equal, more than, less than, and greatest

M01 S2C1 PO5 Formulate questions based on graphs, charts, and tables

M01 S2C1 PO6 Solve problems using graphs, charts, and tables

## Teacher Background

Water will increase in temperature in the shade but typically does not reach as high a temperature as in direct sunlight. Placing a colored piece of paper over the container of water will affect the rate of temperature increase of the water. By giving students the opportunity to investigate how color increases or decreases temperature students can then apply that knowledge to what colors they should wear at different times of the year.

**Materials** (per student group)

(8) containers labeled A, B, C, D, E, F, G, and H of water at room temperature

Thermometers

(8) 4-inch square pieces of colored paper (2-white, 2-black, 2-red, 2-pink)

Recording Sheet (below)

**Procedure/Exploration**

1. Students will take the temperature of each container while still in the classroom.
2. Students will take the eight containers of water outside to a level, safe location on the playground. Four will be placed in the sun and four in the shade
3. Place a colored piece of paper over the top of each container. (white, black, red and pink in the sun and the other set in the shade)
4. Allow the containers to set for 10 minutes.
5. Take the temperature of each container after 10 minutes and record.
6. Back in the classroom have the students share their data for each color.
7. Create a class graph (tie to Math Standards)
8. Analysis the data by determining which color absorbed the most solar energy and which absorbed the least.
9. Using this information, have the students draw and color pictures of the clothes they would wear in the winter and those they would wear in the summer.

Use the following table to record your data:

Recording Sheet

Color	Beginning Temperature	Final Temperature
Black (sun)		
White (sun)		
Red (sun)		
Pink (sun)		
Black (shade)		
White (shade)		
Red (shade)		
Pink(shade)		