

# Activity—Hot Hands-on Science

## Standard II

### Objective 1

#### Connections

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Students will understand that the elements of weather can be observed, measured, and recorded to make predictions and determine simple weather patterns.

#### Objective 1

Observe, measure, and record the basic elements of weather.

#### Intended Learning Outcomes

1. Use science process and thinking skills.
4. Communicate effectively using science language and reasoning.

### **Background Information**

A thermometer is a delicate instrument used for measuring temperature. It needs to be handled carefully so that it doesn't break. The liquid inside the glass tube expands as it is heated and rises in degrees Fahrenheit or Celsius that can be read on the scale. Soil generally absorbs heat from the sun faster than water, so it is usually warmer. Shiny or light-colored surfaces reflect more of the sun's energy than dark colors, so they are cooler. Heat rises in a room, so temperatures taken at the ceiling level are generally warmer than at floor level. Communicate with necessary school personnel to let them know that students will be measuring temperatures around the building. Students should be asked not to measure the temperature of certain areas such as fish aquariums and toilets. They should also let the thermometer rest on a surface for at least two minutes before reading the temperature.

### **Invitation to Learn**

Learners will be given a thermometer and a baggie with ice cubes and asked to see if they can make the temperature rise and fall (without leaving their seat).

### **Instructional Procedures**

1. Assess the learner's understanding of the use and care of a thermometer.
2. Assign them to take a recording sheet, a thermometer, and their pencil outside or somewhere in the school. Tell them to take five minutes to measure the temperature of some surface and write down the location and the temperature on their recording sheet. Then they are to return to the classroom.

3. Ask them upon their arrival to share their findings. At this point, the data can be written on the board or on a weather chart in their journal.
4. Pass out materials and provide directions to make a homemade thermometer. Fill containers with cold water. Add two drops of red food coloring to the water. Punch a hole in the center of the lid with the nail and hammer. Place the lid on the container and slide the straw through the hole.
5. Place white glue around the straw to seal it in place. As the water in the container gets warmer, the water will rise in the straw.
6. Have the students write their name on the back of the card. Carefully tape the card to the straw and mark the height of the column of water on the card.
7. Use a thermometer to find the current room temperature and write it next to the mark you made.
8. Place the container on a plate (in case of spills) next to a window or outside where the air temperature can be measured.
9. Check to see if the liquid changes over the next few days. Record any changes in your journal. Also check the daily temperature using a commercial thermometer or the media.
10. Record the data on a graph or table.

### **Materials**

- water bottle with lid
- clear plastic straws (like the ones used in the school lunch program)
- red food coloring
- 3x5 index cards
- white glue
- hammer
- nail
- tape
- markers
- thermometers
- sandwich zip-lock baggies
- ice-cubes
- recording sheets

### **Possible Extensions/Adaptations/Integration**

1. Provide cups with hot water or ice cubes in them if students cannot go outside. Have students notice what effect the temperature has on plants and animals, including people. Can they predict what type of activities people will be doing or the clothes they would be wearing at certain outside temperatures? Can they make observations about where people may choose to live because of the temperature? Do they notice changes in the temperature outside as it becomes windy, cloudy, or starts to rain?
2. Explain to students that the Celsius scale is used by people in other parts of the world. Ask them to make comparisons to temperatures on the Fahrenheit scale.

### ***Assessment Suggestion***

Observe students for accuracy as they make measurements of temperature for accuracy. Evaluate their success at making a homemade thermometer. Check their journals, graphs, and tables for accuracy.

### ***Additional Resources***

Students can bring in newspapers with daily weather maps and forecasts. They can also check weather web sites ([www.ksl.com](http://www.ksl.com)) for current temperature readings and forecasts. Some communities provide a current time and temperature phone number that students can call.

### ***Homework & Family Connections***

Students with internet connections at home can be asked to visit web weather web sites. They can also be assigned to watch the evening weather forecast on one of the TV news channels. Some of them may be able to purchase a thermometer to place outside at their home to check the daily temperature. They could investigate experiments dealing with temperature as part of a school science fair.