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What's the Temperature?

STORM Project

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Activity 1
What's the Temperature?
Level 1

Objective: Students will be able to read a Fahrenheit and a Celsius thermometer, and correctly indicate temperatures on a thermometer diagram.

National Science Education Standards: All students should develop an understanding of: properties of earth materials, objects in the sky, changes in earth and sky. Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.

Materials: large teaching thermometer, worksheets, internet access or copies of the maps found on the activity website <http://www.uni.edu/storm/activities/level1/>

Teacher Notes: You may want to do this activity several times throughout the year so that students can see the changes during the different seasons. An astronomer Ole Roemer of Copenhagen based his scale upon the two fixed points—the melting point of ice and boiling point of water. Gabriel Fahrenheit, who made instruments in Daanzig and Amsterdam, used mercury for the thermometer's liquid. Fahrenheit calibrated the scale of his thermometer and set the freezing point of water to 32 and the boiling point of water at 212. The interval between boiling and freezing points of water is 180 with temperatures measured on the scale as degrees Fahrenheit. In the 1700's scientists Carolus Linnaeus and Anders Celsius designed scales using a hundred point interval. In 1948, the term degrees centigrade was changed to degrees Celsius. This scale measures temperatures on a centigrade scale, with the freezing point of water as zero and the boiling point at 100. The readings are designated degrees Celsius.

Engage:

Ask students what they think the room temperature is. What do they think the temperature is outside? Ask if any of them have heard temperatures given in degrees Fahrenheit or degrees Celsius. Where did they hear these? Ask why they think there are several scales used to measure temperature. Do they know what normal body temperature is?

Explore:

Show students a large thermometer that has both Celsius and Fahrenheit scales alongside the glass tube. Show students how to read the thermometer. Tell them the temperature in Celsius and in Fahrenheit. Ask them which temperature seems lower. Which one seems higher? Explain that most of the world and scientists use the Celsius scale. The USA still uses Fahrenheit for reporting air temperatures. How might this cause some problems with communications?

The teacher will then lead a discussion about the need for standard measurements. The discussion will include the two standards used for measurement of temperature in our world - Fahrenheit and Celsius.

Explain:

1. The teacher distributes the thermometer worksheets (below) showing the readings of the two standards. The teacher reviews the thermometers with the students, taking care to point out that each line on the Celsius scale counts as one degree and each line on the Fahrenheit counts as two degrees.
2. The students then mark the freezing point of water and average room temperature on the thermometer. Freezing point is 0° Celsius and 32° Fahrenheit. Average room temperature is 20° C and 68° F. At the activity website click on “What’s the Temperature?” Click on “Current Temperatures” and have the students find the coldest and hottest temperature on the map. Have them record these on the thermometer.

Extend:

1. From the activity website, click on “Current Temperatures” or “State Temperatures” and choose your state, and then several towns in your state. Look at the current temperature for each town you chose and have students mark them on the thermometer worksheet.

Evaluate:

1. The teacher will review the thermometer recordings for each student and re-teach for those students who recorded incorrect temperatures.

For Further Inquiry: Ask students how they might learn how coldest and warmest temperatures on a map might change during the week. Tell them to design an activity to answers this question or any other question they might have about temperature. Have students record their data in both Fahrenheit and Celsius degrees.



