



## All About TEMPERATURE

How does it feel outside your front door? Check the air temperature. Air temperature is measured by using thermometers. In a mercury thermometer, the liquid expands as it is heated and contracts when it is cooled, so the length of the liquid column is longer or shorter depending on the temperature. Modern thermometers are calibrated in standard temperature units such as Fahrenheit or Celsius.

### Try This Outside Your Front Door!

- Lazy Man's Thermometer
- Recycled Thermometer

#### Lazy Man's Thermometer

Tree crickets are called the poor man's thermometer because temperature directly affects their rate of activity. Count the number of chirps a cricket makes in 15 seconds, and then add 37. The sum will be very close to the outside temperature! This project works best in the summer and fall. Write down the date and time with your temperature. Take your measurements for 3 days and write a paragraph describing the weather.

#### Recycled Thermometer

Here's what you will need:

- Recycled Clear plastic bottle - 11 or 20 oz. water bottles work
- Tap water
- Rubbing alcohol
- Clear plastic straw
- Modeling clay
- Food coloring

Here's how to make the thermometer:

1. Fill one quarter of the plastic bottle with equal amounts of water and rubbing alcohol.
2. Add a couple drops of the food coloring.
3. Without allowing the straw to touch the bottom of the bottle, place it in the liquid.
4. Modeling clay should now be used to seal the bottle and hold the straw in place.
5. Hold the bottom of the bottle and watch the thermometer work.

Try placing the thermometer outside or near a lamp and see what happens to the liquid. Write down the date and time and what you observe. Remember to take the temperature about the same time everyday. Do this for 3 days. Describe what you see and feel in a weather journal.

What do you think it means when liquid rises and falls?

### **The History Of Taking Air Temperature**

Buy a mercury thermometer and take temperature readings of your own for a full week. Record what you observe. Did you know that you can record the temperature with Fahrenheit or Celsius? Here's why: Daniel Gabriel Fahrenheit was the German physicist who invented the alcohol thermometer in 1709 and the mercury thermometer in 1714. In 1724, he introduced the temperature scale that bears his name - Fahrenheit Scale. In 1724, Fahrenheit sealed mercury inside a small glass bulb connected to a thin glass tube. His concept was that mercury in the enclosed bulb would respond to changes in temperature of air, water, etc., and could be measured by the movement of mercury up and down the glass tube. Fahrenheit then applied a scale to his new instrument, labeling the melting point of ice 32 degrees and the boiling point of water 212 degrees, and then marking 180 equal increments between the two. In 1742, another scale was introduced by Swedish astronomer Andres Celsius measured the freezing and boiling points of pure water and labeled them 0 degrees and 100 degrees, respectively, to create the centigrade scale. Centigrade means "consisting of or divided into 100 degrees," which is the exact difference between these two important temperatures. Most scientists use the Celsius scale although Americans read air temperature in Fahrenheit.

### **Chicago Area Temperature Extremes**

#### **Hottest Day Ever**

105F (40.5C) on July 24, 1934

#### **Coldest Day Ever**

-27 (32.8 C) on January 20, 1985

#### **Most Days In A Row With Freezing Temperatures**

43. In the winter of 1976-1977

#### **Longest Heat Wave**

11 days with temperatures at 90F or above in 1953, 1954, 1955, 1959

### **Test Your Temperature**

- A. In winter of 1976-1977 Chicago had freezing temperatures for 43 days in a row! A freezing temperature is anything less than \_\_\_\_\_F.
- B. On February 27, 1987 it was 75F in Chicago. This was the \_\_\_\_\_ recorded winter temperature in Chicago history.
- C. Centigrade is another word for \_\_\_\_\_.

#### **Answer Key:**

- A. 32
- B. Warmest
- C. Celsius

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Note: All of these experiments, encouraging recycling while learning about weather, are being presented by Amy Freeze.