

Make a Homemade Thermometer!

In middle school your child will be learning all about heat energy and temperature measurement, and will likely get to use a lab thermometer. This project will enable your child to construct a homemade thermometer that will compliment what he's learning about this instrument in school.

What You Need:

- Tap water
- Rubbing alcohol
- 11-ounce clear, narrow-necked plastic bottle
- Red food coloring
- Clear plastic drinking straw
- Modeling clay
- Store bought thermometer (optional)



What You Do:

1. Add equal parts of tap water and rubbing alcohol to the bottle, filling about 1/8 to a 1/4 of the bottle.
2. Add a couple drops of red food coloring and mix by shaking the bottle.
3. Put the straw in the bottle, but don't let the straw touch the bottom.
4. Use the modeling clay to seal the straw in place. Leave a portion of the straw sticking out from the bottle, making sure the clay forms a tight seal around the straw and over the bottle mouth, but don't close off the straw's opening.
5. To test if the homemade thermometer works have your child place his hands around the bottle and observe what happens to the mixture in the bottle.

Other ways to test the thermometer are by placing it in a windowsill and observing how it reacts to the heat or cold there, or placing the thermometer in a bowl of hot water (always be careful!), followed up by placing the bottle into the refrigerator and the freezer.

What's Going On?

Just like any thermometer, the mixture expands when it's heated. As the alcohol-water mixture expands it moves up through the straw. If the bottle were to get very hot, the liquid would have come through the top of the straw.

As an extension, mark a scale for the thermometer; you'll need a real thermometer. By placing your homemade one in different areas of temperature you can use the store-bought thermometer to identify the exact temperature: use a pen to mark the line of the liquid on the bottle and write its value. Find other areas of varying warmth or coolness to create a temperature range for your thermometer.

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