

Build a Thermometer _____

Levels



Grades K-4

Overview:

During this project, students build a thermometer which they will use to measure relative temperature in another lesson.

Objectives:

The student will:

- construct a simple thermometer.

GLEs Addressed:

Science

- [3-4] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [3] SD3.1 The student demonstrates an understanding of cycles influenced by energy from the sun and by Earth's position and motion in our solar system by using recorded weather patterns (e.g., temperature, cloud cover, or precipitation) to make reasonable predictions.

Materials:

- Glass beakers
- Hard plastic tubing (about 12 inches long)
- Rubber stoppers (with holes sized to fit tubing)
- Water (room temperature and warm)
- Bowl (for teacher demonstration)
- Red food coloring
- Transparent tape
- TEMPLATE: "Thermometer Cards"
- STUDENT INSTRUCTION SHEET: "How to Build a Thermometer"

Activity Preparation:

1. Fill each beaker with 200 ml water. Add 4 drops of food coloring, stir, and allow the water to set until it is room temperature.
2. Insert each plastic tube into a rubber stopper, positioning the stoppers about two-thirds of the way down the tubing.
3. Copy the Template: "Thermometer Cards" and cut out 1 thermometer card for each student.

Activity Procedure:

1. Explain to students that during this activity they will build a thermometer. A thermometer is an instrument that measures temperature (how hot or cold something is).
2. Distribute the Student Instruction Sheet: "Build a Thermometer" and the following materials to each student: 1 beaker with colored water, 1 rubber stopper with a plastic tube through it, 1 thermometer card, tape.
3. Using the Student Instruction Sheet: "Build a Thermometer" as a guide, lead students through the process of building their thermometers. *Note: When assembling the thermometers, gently push the black rubber stopper down until the water in the tube rises about an inch above the stopper. Create an airtight seal so the water level in the tube remains constant.*

4. After students finish their thermometers, explain that the water level in the tube will rise if the thermometer gets warmer. Demonstrate by placing a thermometer in a bowl of warm ($\sim 90^\circ \text{F}$) water. *Note: the water will bubble out the top of the tubing if the water is too hot.*
5. Leave the thermometers in a place where they will be undisturbed until students conduct the “Measuring Temperature” activity.

Build a Thermometer

Student Instruction Sheet

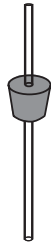
Levels



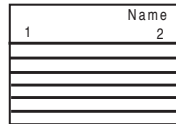
You will need:



Beaker



Plug



Card



Tape

Make a thermometer:



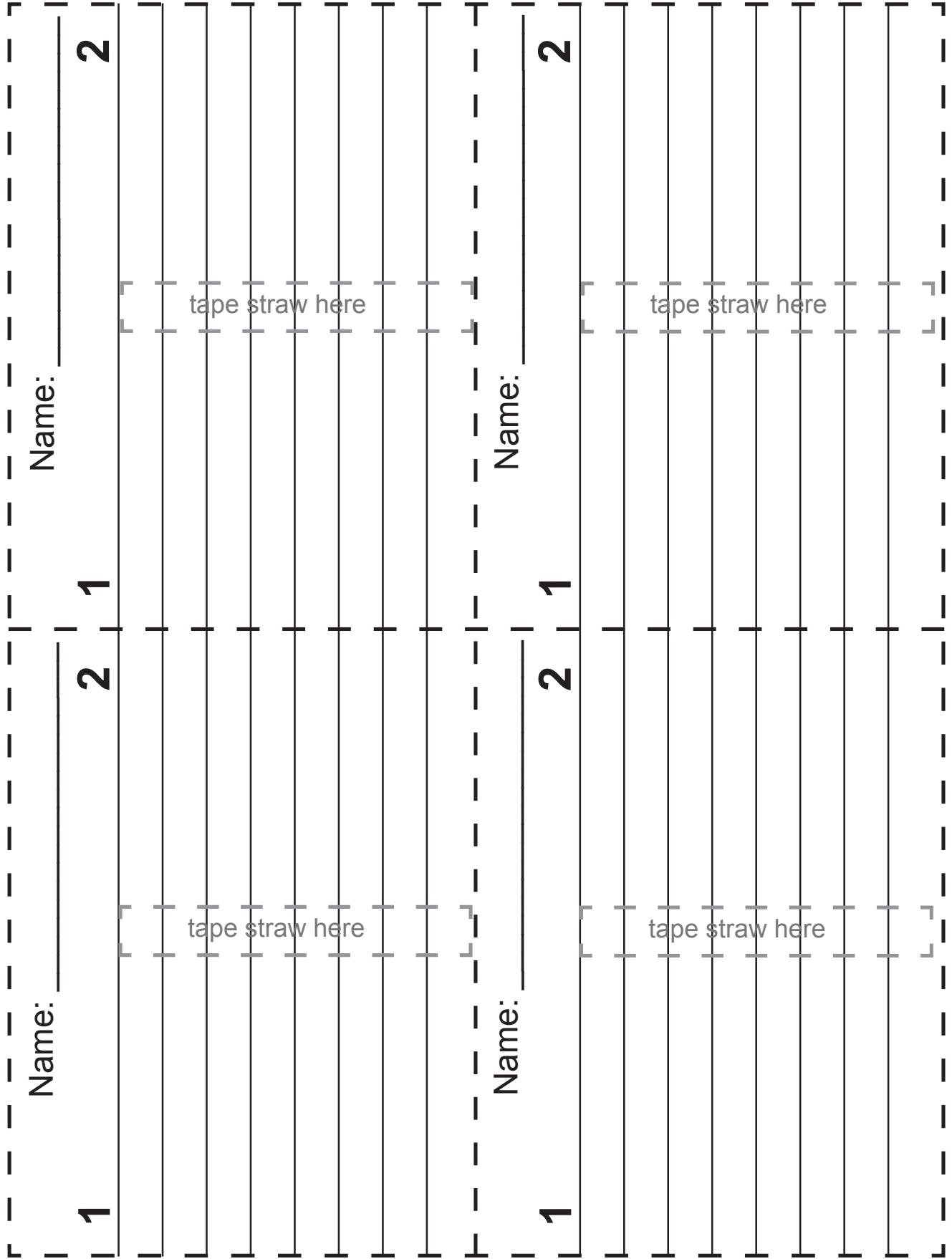
1.

Put the plug in the beaker.

2.

Tape the card to the tube.

Template: Thermometer Cards



cut along dashed lines
Build A Thermometer