Table of Contents

Make Your Own Thermometer

The thermometer you have in your house usually contains either colored alcohol or a special liquid metal known as *mercury.* Alcohol thermometers are usually red inside, while mercury thermometers look like they contain silver. However, both work the same way. A thermometer measures temperature by the expanding or contracting of liquid contents. Hot temperatures cause the liquid to expand and rise inside the thermometer. Cold temperatures cause the liquid to contract and fall inside of the thermometer.

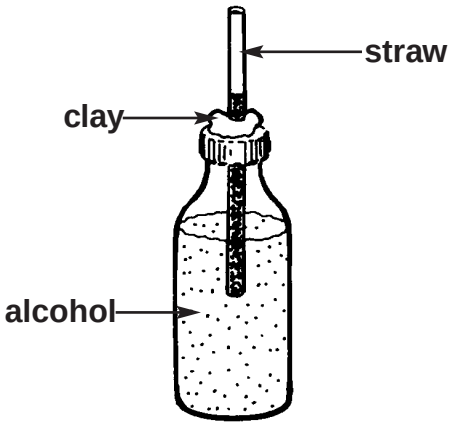
You can make your own alcohol thermometer. Here is how.

Materials:

- pan
- cold water
- hammer
- clay
- hot water
- food dye
- ice
- nail
- rubbing alcohol
- clear drinking straw
- empty plastic bottle of drinking water with a screw-on lid

Procedure:

1. Use the hammer and the nail to make a hole in the center of the screw-on lid of the plastic bottle. (The hole should be just large enough to allow the straw to enter.)
2. Fill the bottle three-fourths of the way full with alcohol and add a few drops of food dye for color.
3. Insert the straw into the lid so that when the lid is screwed onto the bottle, the straw is about one inch (2.5 cm) below the surface of the alcohol.
4. Screw the lid onto the bottle. Make certain that it is tight.
5. Pack clay tightly around the lid opening to prevent air from entering or escaping from the bottle (not so tightly that it blocks the straw, however).
6. Place your thermometer in a pan. Add hot or cold water and observe the results.
7. Continue trying different temperatures of water in the pan.



Results:

In hot water, the alcohol in the thermometer will expand and rise into the straw. In cold water, the alcohol will contract and will recede from the straw.

Closure:

1. Does your thermometer rise and fall to the same level as a classmate's thermometer? _____
2. How could you calibrate your thermometer? _____

_____

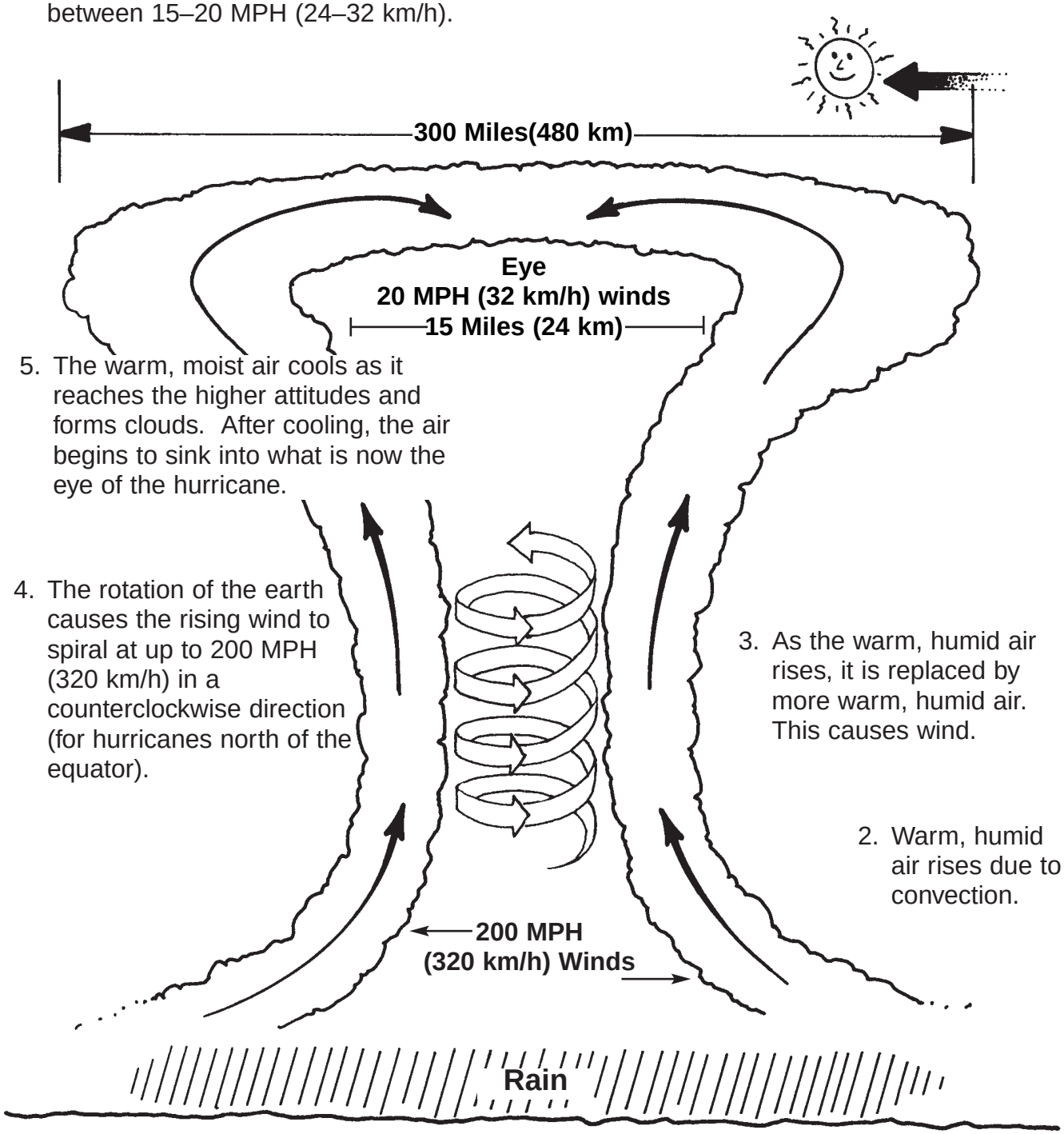
Answers *(Note: Unless students are to self-check their responses, fold the following answers under before reproducing the page.)*

1. No, each thermometer will be unique.
2. Place the homemade thermometer in water next to a real thermometer in the same water. Use a permanent marking pen to mark the degrees on the homemade thermometer.

How Hurricanes Are Formed

The class soon finds themselves over a tropical ocean. They have arrived at a breeding ground for hurricanes. Hurricanes are storms which are not formed in the same way typical storms are created. Cold fronts and warm fronts do not collide to create hurricanes. Instead, hurricanes and their cousins, typhoons and cyclones, are formed in the following way:

6. Pre-existing winds push the hurricane (in the Atlantic Ocean) northwest at speeds between 15–20 MPH (24–32 km/h).



5. The warm, moist air cools as it reaches the higher attitudes and forms clouds. After cooling, the air begins to sink into what is now the eye of the hurricane.

4. The rotation of the earth causes the rising wind to spiral at up to 200 MPH (320 km/h) in a counterclockwise direction (for hurricanes north of the equator).

3. As the warm, humid air rises, it is replaced by more warm, humid air. This causes wind.

2. Warm, humid air rises due to convection.

1. The ocean water must be at least 200 feet (61 m) deep and 80°F (27°C).

