

## HOW DO YOU MAKE A TORNADO?



**Related Subject:** Climate and Weather

**Group Size:**

**Length of Activity:**



### **Overview**

Participants will understand the following:

- A tornado is a vortex.
- A vortex is a spiral motion of fluid that sucks everything near it toward its center.
- In the case of a tornado, the fluid is air.
- A thunderstorm may draw up air from the ground, creating unstable combinations of rising and falling air and resulting in a violent rotating storm. If the storm touches the ground, a tornado is born.
- A tornado can cause devastating damage.

Materials for each group:

- Plastic bottle with cover
- Water
- Salt
- Teaspoon
- Liquid detergent
- Food coloring
- Small plastic objects, such as tiny houses from a popular board game

Procedures

## How Do You Make a Tornado?

- Tell participants they are going to make a “tornado” in a bottle. Divide the class into groups, and provide each group with the materials listed above.
- Give participants the following instructions:
  - Fill the bottle with water to 1 inch (3 centimeters) from the top.
  - Add a teaspoon of salt.
  - Cover the bottle, and shake it until the salt is dissolved.
  - Add a drop of liquid detergent.
  - Add a drop of food coloring.
  - Cover the bottle tightly and move the bottle in a swirling motion.
- To demonstrate the destructive potential of tornadoes, have participants place small plastic objects, such as tiny houses from a popular board game, in the bottle, swirl, and observe what happens to the objects.
- To make sure participants understand the relationship between the model tornado they have made and a real tornado, ask them what the water in the bottle represents. (The water in the bottle represents swirling currents of air in a real storm.)
- Discuss with your participants what they have learned about storms in general. Ask: What are tornados? How do they begin? What damage can they cause? (A thunderstorm may draw up air from the ground, creating unstable combinations of rising and falling air and resulting in a violent rotating storm. If the storm touches the ground, it becomes a tornado.) A tornado can cause extensive and devastating damage.
- Further explain to participants that a tornado is a vortex, or spiral motion of fluid. In the case of a tornado, the fluid is air. (You may have to explain that, while we usually think of air as a combination of gases, gases and fluids are very similar with regard to the way they move, or flow.)
- Have each participant use what he or she has learned from the project to write a brief description of a real tornado, including an explanation of its causes and effects.

### Discussion Questions

1. Discuss the nature of seasons. Why does the Earth experience seasonal change? Explain why the Northern Hemisphere experiences winter while the Southern Hemisphere experiences summer.

## How Do You Make a Tornado?

2. Discuss the tools used by meteorologists to make accurate predictions about the weather.
6. Discuss how a vacuum cleaner simulates a tornado. How is it like a real tornado?
7. Discuss the destructive forces on a house caused by a tornado.
8. Discuss what to do in the event of a tornado. Make a tornado plan for your house and family. What precautions should you take in the event of a tornado warning?

### Adaptations

--Try using the inner tube portion of your CoCoRaHS rain gauge to make a tornado.

--Instead of making "bottle tornadoes," have participants concentrate their energies on researching the causes and effects of tornadoes. Each participant might write about an actual tornado in history, describing its effects on the local population.

Credit: [www.weatherwizkids.com](http://www.weatherwizkids.com);

Wonders of Weather -

<http://school.discovery.com/lessonplans/programs/wondersofweather/>;

## National Science Education Standards:

### NSES K-4:

Science as Inquiry (4ASI)

Abilities necessary to do scientific inquiry (4ASI 1)

Understandings about scientific inquiry (4ASI 2)

Physical Science (4BPS)

Properties of objects and materials (4BPSI 1)

Position and motion of objects (4BPSI 2)

Earth and Space Science (4DESS)

Changes in earth and sky (4DESS 3)

### NSES 5-8:

Science as Inquiry (8ASI)

Abilities necessary to do scientific inquiry (8ASI 1)

Understandings about scientific inquiry (8ASI 2)

Physical Science (8BPS)

Motions and Forces (8BPS 2)

Earth and Space Science (8DESS)

Structure of the earth system (8DESS 1)

Science in Personal and Social Perspectives (8FSPSP)

Natural hazards (8FSPSP 3)