



## MINI VORTEX

Determine what conditions create a vortex.

### Materials

- 2 2-liter clear plastic bottles (empty and clean)
- Water
- Food coloring
- Duct tape

### Procedure

- Fill one 2-liter bottle  $\frac{3}{4}$  full of water. Add several drops of food coloring.
- Place the mouth of the second 2-liter bottle over the mouth of the first 2-liter bottle. Make sure there aren't any gaps between the two mouths, then secure them together with duct tape. Make sure to use lots of tape so the bond is nice and sturdy.
- Flip the bottles so that the water-filled one is on top, and give it a swirl. What happens to the water as it leaves the top bottle? What happens if you don't swirl the top bottle?

### Results

The water creates a vortex or tornado shape as it's leaving the top bottle.

*Tornadoes can reach wind speeds of up to 300 mph. The worst tornadoes can destroy buildings, uproot trees, and lift vehicles.*

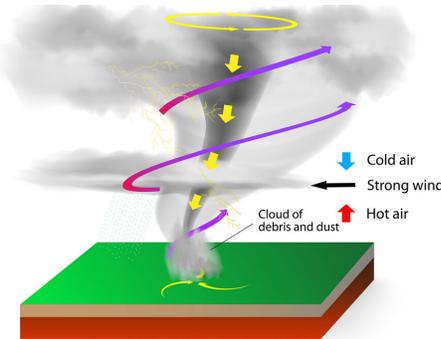


Photo Credit: UCAR Center for Science Education

### Why?

A vortex is liquids and/or gases to move in rotation with each other around a specific point. For the water to fill the bottom bottle it needed to displace or move the air in the bottom bottle first. When you gave the bottles a swirl, you created a vortex, allowing the water and the air to move through the "neck" of the 2 bottles at the same time.

A tornado is a vortex that forms when a thunderstorm meets specific weather conditions. Large amounts of cool air from the storm sinks to the ground, pushing equally large amounts of warm air into the atmosphere, creating a cycle of rising and falling air. This causes the air near the ground to start spinning. The spinning air on the ground can be pulled upright by the force of rising air, allowing a tornado to form.

To learn more about weather, check out the Pink Palace Museum's *Weather Whys* Program.