



HOME DEMO NO. 12

## Twistin' Tornado

Make your own tornado in a bottle.

### *What you need:*

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1. Two plastic soda bottles
2. Duct tape
3. Food coloring

### *What you do:*

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1. Fill one of the bottles three-quarters full with water. Add a few drops of food coloring, any color you like.
2. Pull off a strip of duct tape about 10 cm. (4 inches) long and place it on the edge of a table, where you can reach it.
3. With a dry towel, make sure the neck of the bottle is very dry.
4. Put the empty bottle on top of the full one, neck-to-neck, and tape them together with your short strip of tape, so that they stay together and they're straight.
5. Now, wrap them with a long length of duct tape. The more neatly you wrap, the better it will work.
6. Turn your tornado twister upside down, and give it a swirl. Try it again, without giving it a twist.

### *What's happening?*

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Gravity pulls the water down into the empty bottle. But the empty one isn't really empty. It's full of air. When the water swirls through the necks of the bottles, an open space forms in the middle. It's a whirlpool. The air in the lower bottle can flow up through the open center of the whirlpool into the upper bottle. The spinning water holds a steady shape. Without the whirlpool to let the air go by, the water burbles it's way through. The flow is not smooth and it's often much slower than the whirlpool's flow.

Tornadoes work the same way. When huge air masses move across the ground, they start to roll like a carpet. If one rolling air mass runs into another rising warm one, the rolling mass gets tipped on end and the rising warm air rushes up through the whirling middle. Tornado wind speeds are often over 400 kilometers per hour, often more than twice as fast as winds in a hurricane! And, you've got a whirling tornado in a bottle.