

Tornado!

Science Demonstration

Psalm 46:1-3

God is our refuge and strength, a very present help in trouble. Therefore will not we fear, though the earth be removed, and though the mountains be carried into the midst of the sea; Though the waters thereof roar and be troubled, though the mountains shake with the swelling thereof. (Psalm 46:1-3)

And he arose, and rebuked the wind, and said unto the sea, Peace, be still. And the wind ceased, and there was a great calm.
(Mark 4:39)



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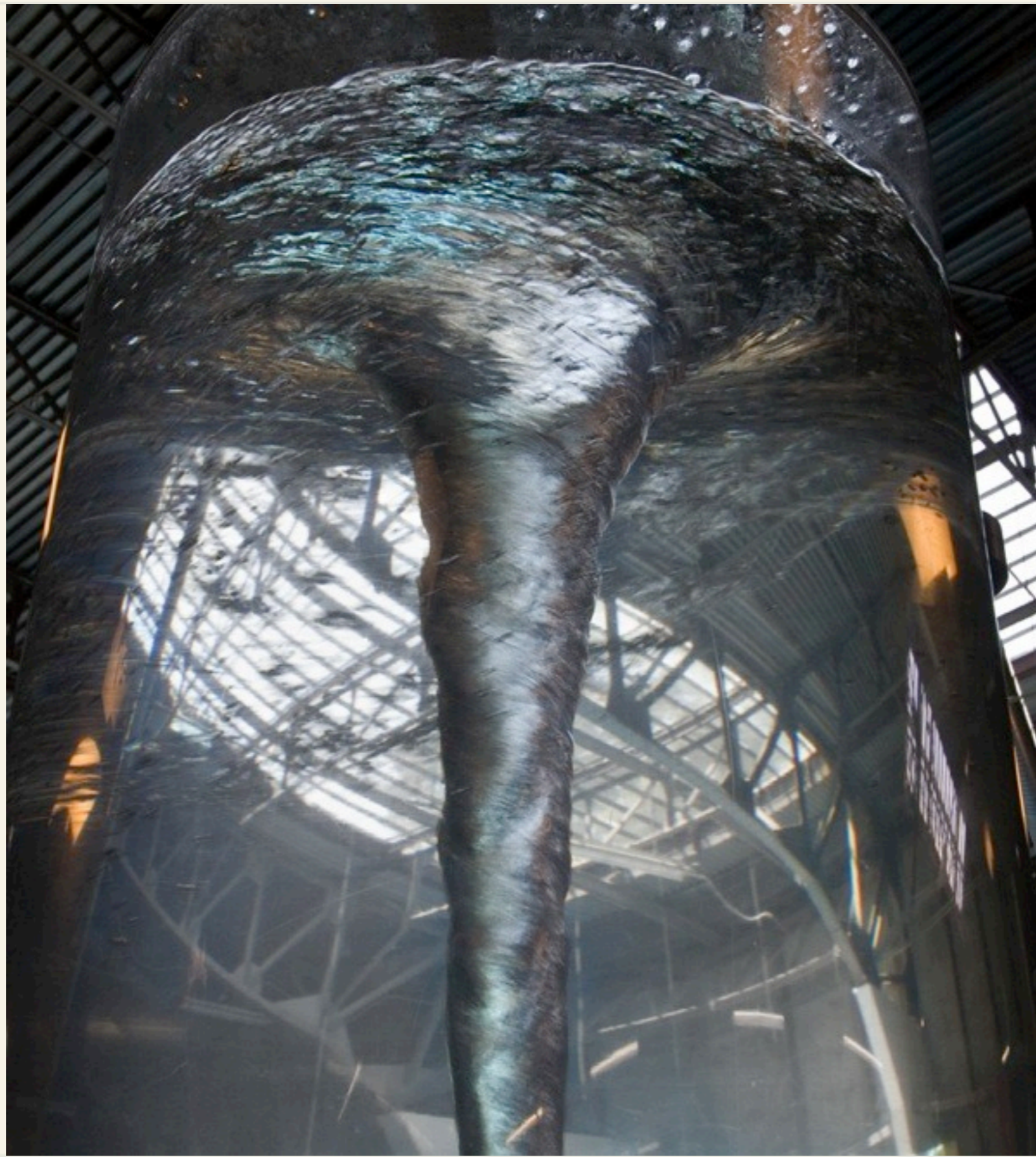
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Items Needed

- ~ Two 2-liter clear plastic soda bottles
- ~ A way to connect the two bottles--duct tape will work
- ~ Water

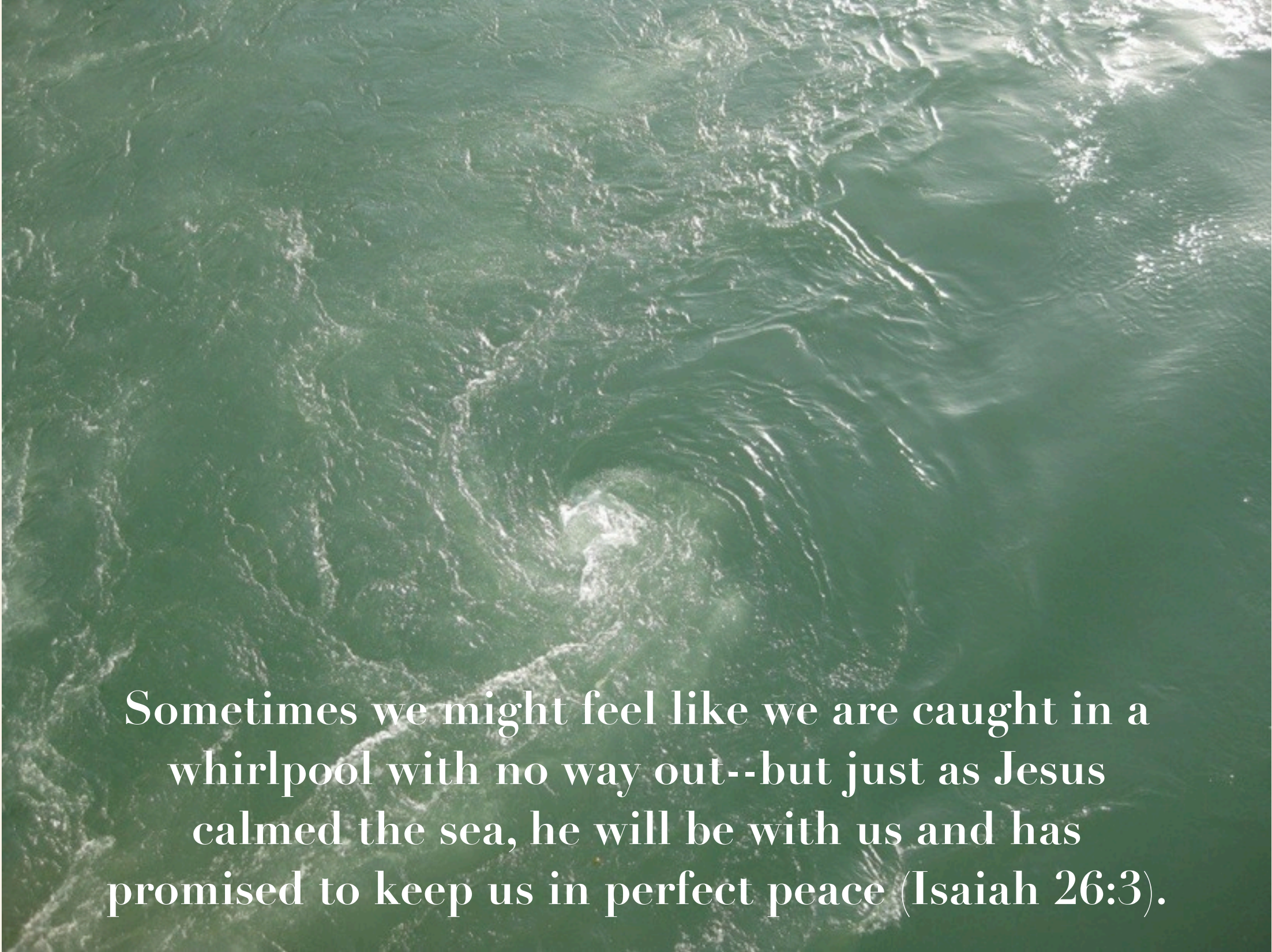
Procedure

- ~ Fill one bottle $\frac{3}{4}$ full with water. Put confetti in it, if you wish.
- ~ Puncture the twist cap, making a rounded hole about $\frac{1}{2}$ the width of the cap and screw onto the bottle with the water.
- ~ Tape the open end of the empty bottle onto the bottle of water.
- ~ Quickly invert and move the water bottle rapidly in small circles, then stop and watch.

Explanation

- ~ The water passing between the bottles undergoes turbulent motion. Turbulence describes the complicated swirling motion of liquids or gases. It occurs in ocean currents, clouds, and within various pipelines.
- ~ Turbulence is not well understood. The shape and motion of the whirlpool within the bottles cannot be predicted. No equation is available to exactly describe the motion. Turbulence is one of the great unsolved problems of physics.

A great deal of turbulence occurred with Joseph's brothers--when Reuben had to stay behind in prison, when Benjamin was required to go to Egypt to obtain food, and when the brothers learned that Joseph was a ruler in Egypt.

An aerial photograph of a whirlpool in the ocean. The water is a deep, dark green color, and the whirlpool is a swirling vortex of white and light green water in the center. The surrounding water has a textured, rippled appearance.

Sometimes we might feel like we are caught in a whirlpool with no way out--but just as Jesus calmed the sea, he will be with us and has promised to keep us in perfect peace (Isaiah 26:3).

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