

ASSESSMENT

Student Assessment Questions/Answers

1 Vocabulary

Funnel cloud:

- a partial vortex, not reaching the ground.

Vortex:

- a spiral or whirling mass of water or air that draws objects with it to the center, or "eye".

Doppler:

- a visual echo of storms in this case from targets to measure their speed

Cloud rotation:

- When a cloud appears to have a circular formation and could spin or is spinning

Fujita scale:

- Measures the intensity of a tornado by examining the damage caused by the tornado to man-made structures

2 Observation

Using terms 1-4 above, explain what you see happening in the bottle.

- Answer may resemble the following: The water represents the _____ air, and the space in the center is air. In a tornado, this would be warm air rising through cold air. At the bottom of the bottle is the touchdown of the funnel, at the top

is the same thing as cloud rotation in a real tornado. The strength of the funnel dictates the items it moves. If we had a way to measure this, which is the use of Doppler, we could know the strength of the funnel and be prepared.

Which objects are affected most in the bottle?

- The larger ones

3 Application

Look at the bottom of the "tornado". Consider what technology also uses a vortex of sorts. List your suggestions and share with the class.

- Vacuum cleaner

Look at the top of the funnel, which is impossible to see of a tornado from the ground. Share where else in nature or technology you see this action.

- Sink draining, toilet flushing, whirlpool

Go online, read and summarize one article about measuring wind force, or Doppler radar, or tornado safety.

- List the website here:

T E A C H E R S G U I D E



**BOTTLE CONNECTOR
TORNADO TUBE
ITEM # 6455-55**

MECHANICS - DEMONSTRATION DEVICES

- What makes a tornado so powerful?
- How realistic was the movie Twister?
- Where can the power of a vortex be useful?

View your very own tornado! This simple-to-use connector enables two bottles to create vortex effects for up-close observation safely. Plastic tube allows experiencing the science of vortex energy of nature. Use with two soda bottles and model the work of air pressure. Inexpensive enough to use multiples in a class!



Materials

- Bottle Connectors
- two soda bottles per student or pair of students
- plastic confetti, and/or small items like charms or beads
- Sand
- Glitter
- movie clip from movie "Twister"
- Student Handouts
- Internet access

Goals & Objectives

Students will:

- observe the forces of wind, especially in a vortex.
- find similar forces in nature.
- look for ways this force is created or used in technology.

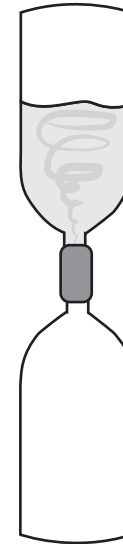
ASSESSMENT

Vocabulary, Observations, Application of concepts, Student Handout.

Assessment Questions and Answers on page 4

ACTIVITIES

- 1 View a clip from the movie Twister, which shows a funnel cloud and tornado, or vortex, up close, and the scientists looking at readings on the computer.
- 2 Define a list of terms the scientists were using.
- 3 Prepare the two bottles with water, objects, and connector.



- 4 Turn the bottles so one is upside down above the other. Shake in a circular motion to get vortex to begin.
- 5 Identify what is happening in the bottle with vocabulary words.

- 6 Compare what happens to the small objects in the bottle to what happens to the larger ones.
- 7 Look at the bottom of the "tornado". Consider what technology also uses a vortex of sorts. List your suggestions and share with the class.

Look at the top of the vortex, which is impossible to see of a tornado from the ground. Share where else in nature or technology you see this action.

Helpful Tip:

When the cap is removed from a soda bottle it often leaves behind a jagged "security ring." To ensure the best seal, cut off this ring before using our bottle connectors.



- 8 Go online, read and summarize one article about measuring wind force, or Doppler radar, or tornado safety.
- 9 Other Ideas:
Connect two small soda bottles and make a sand timer.

Emphasize the vortex, and patterns in the water, by adding colored glitter before shaking the bottle.

H A N D S T U D E N T S T U D E N T

Student Name: _____

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Vortex

Doppler

Cloud rotation

Fujita scale

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Application

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Observation

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