

Explorers Education Programme



Explorers Science Experiments - Whirlpool in a Bottle

Class: All classes

Strand: Energy and Forces

Strand Unit: Forces

Group size: Individuals. Demonstrate for Junior infants – 3rd class. 4th – 6th class can make their own.

Aim

To examine the physical properties of water when flowing through a confined space and to observe how this flow can be altered to speed up or slow down the water.

Students completing the worksheets will also develop writing and literacy skills.

Experiment suitable for teacher demonstration and/or supervised group experiment for 4th, 5th and 6th Class students.

Materials

- 2 x empty 2 litre plastic bottles
- Strong tape (Duct/Electrical)
- Water
- Food colouring

Methods

1. Fill one of the bottles $\frac{3}{4}$ with water and food colouring (Make sure not to add too much food colouring, you only need a light colour in the water).
2. Tape the empty bottle to the bottle with water (upside down-opening to opening).
3. Turn the bottles upside down and swirl in a circular motion.

What Happens

- When the bottles are turned upside down the air in the bottom bottle wants to get into the top bottle as fast as it can, while the water wants to get down as fast as it can.
- When you swirl the bottles it forces the water out to the edges and fastest route is for the water to go down the outside while the air comes up through the middle.
- This forms a tornado cone in the top bottle.

Discussion Points

- Discuss with the students how whirlpools may form naturally?
- Discuss where in the oceans whirlpools naturally occur and how?

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- Where might students have seen whirlpools in their own home?
- Get students to use the web and/or their school library to research these discussion points and the worksheet questions.

Outcome

The children in the class will have developed skills in the following:

- Questioning
- Observing
- Predicting
- Investigating and experimenting
- Analysing
- Recording and communicating
- Exploring
- Planning
- Making
- Evaluating

In addition the following skills in English will be developed:

- Reading for pleasure and information
- Developing competence, confidence and the ability to write independently
- Developing interests, attitudes, information retrieval skills and the ability to think

Useful Links

- <http://www.wisegeek.com/what-is-a-whirlpool.htm> - What is a whirlpool?
- http://wiki.answers.com/Q/How_do_whirlpools_form - How do whirlpools form?
- <http://www.yourdiscovery.com/earth/water/whirlpools/index.shtml> - Whirlpools in the sea



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Worksheet

What do you think will happen when the bottles are turned upside down and swirled?

My prediction	What happened and the reason why it happened?
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How do whirlpools occur naturally?

Name three countries that whirlpools occur naturally off their coasts?

Where might you have seen whirlpools in your own home?