

STEM Program



Ocean in a Bottle

Water and Hydro-Energy

Waves are created when something creates a disturbance on a water's surface, such as air, a dropped rock or a boat. This then changes the water pressures and creates waves. Here's a link to some other existing activities:

[Water Waves in a Bottle Experiment | 3M Science at Home](#)

Suited to Section



Joey Scouts



Cub Scouts



Scouts



Venturer Scouts



Rover Scouts

Key SPICES Growth



SOCIAL



PHYSICAL



INTELLECTUAL



CHARACTER



EMOTIONAL



SPIRITUAL

Challenge Area



COMMUNITY



PERSONAL GROWTH



OUTDOORS



CREATIVE

Likely Scout Method Elements



COMMUNITY INVOLVEMENT



LEARNING BY DOING



NATURE AND THE OUTDOORS



PATROL SYSTEM



PERSONAL PROGRESSION



PROMISE AND LAW



SYMBOLIC FRAMEWORK



YOUTH LEADING, ADULTS SUPPORTING

STEM Program



Ocean in a Bottle

Plan

Materials needed:

1. Two similar, clean, transparent bottles with caps (two-litre soft drink bottles work well)
2. Vegetable oil, enough to fill one bottle two thirds full
3. Water
4. Food colouring your choice to colour water
5. A workspace where spilled oil and water can easily be cleaned up
6. Funnel for easier filling of the bottles (optional)
7. Two small pieces of wax (Pieces cut off of a candle work well. Have an adult help you safely cut these.)

Do

1. In an area that can get wet: fill Bottle 1 and Bottle 2 one third full of water using funnel.
2. Add food colouring to the water in both bottles
3. Put the lid on Bottle 1 tightly
4. In Bottle 2 fill to the top with vegetable oil (use funnel to prevent spills)
5. Put the lid on Bottle 2 tightly
6. Lie the bottles on the side to observe.
7. Tilt each bottle to create a wave and observe what happens.

Review

Things to consider:

1. What happens? What is different between the two bottles?
2. You could time how long it takes for the waves to stop in each bottle
3. You can add the piece of wax to represent a boat floating

Variations

- If you have a local beach organise a Unit or Patrol activity to spend some time at the beach watching the waves. Compare the size and number of waves with the amount of wind and wind speed.

Why Does This Happen?

Waves are created by wind causing a disturbance on the water surface. The water from the crest (peak) then pushes down on the water underneath and eventually pushes it out from underneath the crest, forming a wave. The atmosphere, air, covers all the surfaces of the oceans, seas, and rivers. Although air is less dense than water (the same amount of air as water weights 1000 times less) it still can affect the water enough to create waves. You can see this effect in this experiment!

SciScouts Physics of Waves

The SciScouts Physics of Waves is a National Science Week project, undertaken in collaboration with Fizzics Education. These instructions were prepared by Scouts for Scouts. This National Science Week project is supported by the Australian Government.

Scouting has always been strong on STEM skills. Maths to calculate catering quantities and navigate, the science of water purification, the physics of abseiling, and the engineering of pioneering structures – they all have their place. In the current program for our youth members, STEM and Innovation forms one of six Special Interest Areas that enable Scouts to set goals and pursue their own ideas.

