

Making Waves – Teacher Notes

Waves in water (energy transfer)



This is a lovely activity to be performed outside on a hot day.

Materials

- An empty student tray (from below their desk), laboratory tray, large basin or sink. The deeper the water the better the effect.
- Water.
- An inverted cup or glass. (A blocked inverted filter funnel is ideal – see above).
- A small floating object (bath toy, ping pong balls, cork, piece of wood).
- Newspaper if not using wet area.



Method

1. Lay down newspaper to collect any splashes, if directed to.
2. Fill the container with water, almost to the top.
3. Place the blocked filter funnel into the water (upside down) and push it up and down to create waves. This needs to be done near to the surface and slowly.
4. Observe and note down what happens.

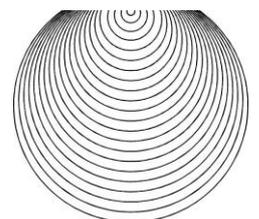
The moving raised surface of water is called a “wave front”.

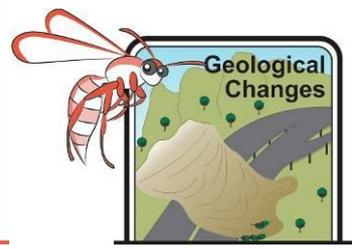
5. Place the floating object (e.g. bath duck) half way along the container.
6. Gently raise and lower the blocked filter funnel to create waves again.
7. Observe and note down what happens to the floating object.

Observations

What did you observe when the surface of the water was disturbed? **Waves or ripples formed.**

In which direction did was the movement? **They moved away from the disturbance in every direction.**





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Sketch the shape and movement of the waves below.

Diagram of waves

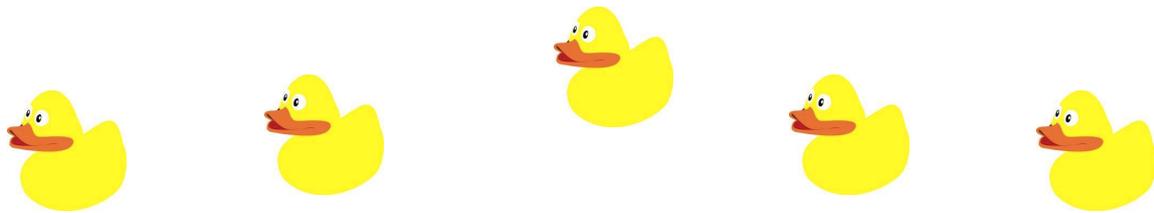
Scale 1:

HINT if your sketch is one fifth of the size of the real object, the scale is 1:5. Similarly if your sketch is one tenth of the real object then the scale is 1:10

Describe how the floating object moved when the wave passed through the water. **It bobbed up and down. It moved slightly but returned to its original position. Only if the water is shallow (near shore) will the object move in front of the wave as it is affected by friction from the sea bottom**

At this point you may wish to either demonstrate with a Newton's cradle or by visiting <http://www.youtube.com/watch?v=GyhaVaZggTl> how energy can be passed through molecules of seawater without them being displaced.

Draw what would happen to the ducks as a wave front passed through them from left to right



Students may use arrows to demonstrate the ducks bobbing up and down in sequence as the energy from the wave front passes through them.

Vocabulary Column of water, wave, wave front and tsunami

Extension or Homework

This can also be carried out in a swimming pool using floating empty cool drink bottles. Waves could be generated by students (or their families) jumping into one end of the pool. Pool safety rules must be strictly followed.

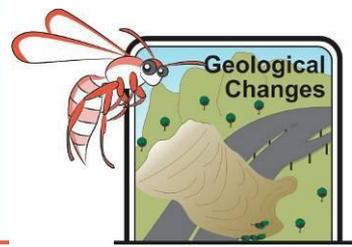
Which safety rules must you follow when in a pool area? [Local pool safety rules apply](#)

Place a line of bath ducks or something else that floats across the water and send out a wave. Describe what happened to them.

They defined or outlined a wave front.

Repeat with the ducks (or other) in a line leading away from the initial water disturbance. Describe what happened.

The ducks bobbed up and down in sequence away from the disturbance.

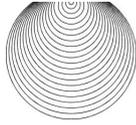


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Extension - Plunge a penguin in a pool

What shape would the wave fronts generated by the plunging penguin be? **Concentric circles increasing outward from the penguin**

Diagram



Could a plunging penguin in a swimming pool cause a tsunami? Explain your answer.

No. Tsunamis need water to shallow towards the shore to build up the tsunami wave. (Unless the swimming pool shallows to one end)

