

## Wavemaker Challenge

### STEM

In this activity students will follow directions, manipulate materials, experiment and think about solutions.

It links to the science curriculum and incorporates engineering design process skills: explore, create, and improve.

Ocean Day fact:  
Coral reefs reduce 97% of a wave's energy helping to protect our coastlines.

Wonder and Explore: What makes the sound of a crashing wave?

### Activity Outline:

First we'll explore materials to see what ones can make a loud sound, then you'll create a wave maker by trying out ideas and then improve it by trying out more.

### What you need:

1. A variety of different materials that will create a range of sounds. Suggested resources include: buttons, rice, beads, ribbons, pom poms, paperclips, dry pasta, sand
2. Small boxes - recycle materials by having students bring in used sultana boxes (or similar)
3. Mystery boxes - numbered small boxes filled with each of the materials you are using
4. Image on the board / table to depict either ends of the scale: quiet and loud
5. Sticky tape to seal up completed boxes
6. Glue sticks, strips of paper sized to cover their boxes, markers to decorate and / or any other resources for kids to decorate and personalise their wave makers.

### Explore:

- Have students describe the sound a big wave makes as it crashes onto a reef.



## Wavemaker Challenge

What do they think makes the sound?  
What sounds could these materials make?  
Show students the materials and discuss what sounds they think they may make.  
Shake a mystery box and have students guess which material they think is inside. Why?  
Place the mystery box on the board ledge/ table – have students decide where on the scale it should go.  
Continue to shake boxes, guess materials and place boxes along the scale – is it louder or quieter than those already on the board?  
Explain that in small groups they will get a chance to explore the materials then they will go to a 'make it' table to create a wave maker of their own. They can use any of the materials and can even mix them but the challenge is to make it sound like a loud wave.  
Students need to test an idea then try and improve it by trying something else.

Have a 'decorate' table that can be used by groups not at the 'explore' or 'create' tables.

On the 'explore table' have some of the materials and the mystery boxes for kids to investigate.

Ask students; What are you exploring? What have you found out?

On the 'make it' table; have the materials set out. Help students by putting an elastic band around their box to keep the tab down while they are experimenting.

Ask students: Does your wave maker sound loud or quiet? Which materials did you use? Why?

Even if it works well encourage students to try and improve.

What did you change? Is your wave maker louder than before? Does it sound like a crashing wave?

Have students count the number of materials they have placed inside.

Can they make a loud sound with fewer than 5 materials?

Curriculum links:

Science  
inquiry skills  
– Questioning  
and Predicting,  
Planning and  
conducting

The Arts  
Music – Skills  
Development  
of aural skills  
by exploring  
elements of music  
including dynamics  
(loud, soft)



## Wavemaker Challenge

WOW:

Sounds travels faster through the ocean than the air.

Why? Sound passes through molecules – it travels faster through water than air as the molecules are closer together. It travels even faster through solids.

General Capabilities – Critical and creative thinking

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Once students have come up with their favourite mix have them record which materials they used with pictures or words; take the elastic bands off and tape up their boxes.

Students can then go to the decorate area.

Reflection – End of activity

Play the sounds of crashing waves while children demonstrate their wave makers.

Play the soothing sounds of calm lapping water. What is making this sound?

How might we make this calm wave sound?

Leave the calming sounds on while you reset for the next part of the day.

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What does make the sound of a wave crashing?

- The popping of bubbles made by the wave.
- As a wave breaks millions of tiny bubbles form within the surface water.
- Its the sizes of these bubbles that determine what a wave sounds like.
- Big bubbles form when a wave curls over itself, smaller bubbles form from the splash when the tip of the wave collides with the front of the wave.
- Wave will sound different as they will have a different mix of big and small bubbles.

Reefs protect shorelines because they cause waves to break offshore, thus limiting the energy that hits the coastline.

In 2015, Scientists studied the impact of a cyclone that struck Ningaloo Reef and caused extensive damage along the coast of Western Australia. They compared cyclone impacts on coastlines with and without reef and found that the beaches without reef had ten times more erosion!

Extension:

We made wave sounds but did you know that sound travels in waves? There are many sorts of waves, what other ones can you think of?

