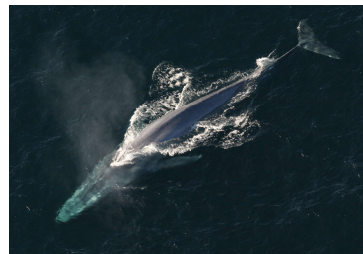


# I bet you didn't know... Whale song is changing

## Teacher Guide

### Curriculum Areas

Sound  
Climate change



### Ages

7-11



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## Safety note

PSTT advises teachers to refer to either CLEAPSS website or SSERC website for up to date health and safety information when planning practical activities for children.

This power point is intended to be a guide for teachers for their reference although they may wish to show certain slides in the classroom.

We would welcome any feedback on these materials.



Who are the scientists?

## Long-Term and Seasonal Changes of Large Whale Call Frequency in the Southern Indian Ocean

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Journal of Geophysical Research: Oceans, **123**, 8568–8580 (2018).

These scientists investigated whale song in the Southern Indian Ocean, but where do they normally work?

How did they manage to work together on this project?

## What did the scientists know?



Low frequency (lower pitch) sound waves travel further than high frequency sound waves.

**Frequency** of sound is measured in **hertz (Hz)**.

This means the number of vibrations per second the particles **are** making as they transmit the **sound**.



Blue and fin whales emit low frequency calls (<100 Hz) which can travel hundreds of kilometres.

The frequency of blue whale calls is decreasing worldwide.

A fin whale (*Balaenoptera physalu*)  
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How do whales communicate?  
How is this different from how humans communicate?

## What did the scientists do?

For 7 years, at 6 sites in the Indian Ocean, scientists measured low-frequency calls from 3 subspecies of large whales:

- fin whales
- Antarctic blue whales
- pygmy blue whales

They also measured the 'ambient' noise levels (the loudness of sound) in the ocean.



A blue whale (*Balaenoptera musculus*) is the largest animal known to have ever existed.

What other sounds do you think you might hear in the ocean?

## What did the scientists find out?

Researchers found the call-frequency of all 3 types of whales decreased over 7 years.

Why?

Scientists think that the frequency (pitch) of the whale's call is related to the intensity (loudness) of the call - if the frequency decreases, the loudness of the call decreases.

If this is true, whales may be calling more quietly because...

- The population of whales has increased.
- The oceans have become more acidic which reduces sound absorption, so sound travels further.

Also, Antarctic blue whale low-frequency calls increased during the Antarctic summer (Jan – Feb) and decreased during the autumn and winter.



Why do you think the whale calls increased during the warmer season?

## Quick activity



How can you change the pitch (frequency) of a sound wave?



Tap or blow across the neck of the bottles.



Cut the flattened end of a straw into a point. Put pointed end in your mouth & blow.



Flick the ruler against the table.

### Top Tip:

**What happens if you change the water level / shorten the straw / move the ruler?**

### Resources

Glass bottles filled with different amounts of water, plastic straws, plastic 30cm rulers, musical instruments (e.g. guitars, recorders)