Whale song

Whales communicate with each other by producing very low pitched sounds that can travel over huge distances. Scientists have noticed that as their ocean environment has changed in recent years - possibly because their numbers have increased or because human industrial activity has made the seas more acidic - whales have changed the pitch of their sounds.

ACTIVITY

How can you change the pitch of a sound wave?

ACTIVITY OVERVIEW

There are four possible activities, each with different sets of equipment (see resources lists).

Activity leader should start by demonstrating how to produce a sound using each set of equipment and encourage children to explore all four activities:

1. Watch the video using the QR code (bottom right), then explore how different objects sound.
2. Tap a pencil on a half-full bottle of water and then blow across the top of the bottle.
3. Lay a ruler over the edge of a table, hold the ruler and flick the free end.
4. Cut the flattened end of a straw to a point and blow this pointed end forcefully.

Challenge children to see if they can create sounds and then change the pitch in each case.

KEY FACTS/SCIENCE

Sound waves consist of particles vibrating in the same direction as the travelling wave. Such waves can travel through solids, liquids and gases. Different materials produce different qualities of sound because they vibrate in different ways.

Loudness (volume) - this is the size of the sensation produced when sound waves reach the ear. Louder sounds have more energy than quieter sounds.

Pitch - this is the number of vibrations per second the particles make and is measured in Hertz (Hz) - it determines how high or low a note sounds. Low pitch (low frequency) sound waves travel further than high pitch (high frequency) sound waves. Changing the length of a vibrating material changes its pitch. E.g., altering the length of the ruler, straw or amount of water/air in a bottle changes the pitch of note produced.

RESOURCES

ACTIVITY 1

wire coat hanger (and other objects)

wool or string

scissors

ACTIVITY 2

glass bottles (empty)

jug of water

pencil

ACTIVITY 3

30cm plastic ruler

table

ACTIVITY 4

plastic straws

scissors

QUESTIONS FOR LEARNING

- How did you change the pitch of the sound in each case? Can you describe how to make higher and lower-pitched notes?
- How can you make the sound louder or quieter (change its volume)?

https://www.rigb.org/families/experimental/musical-coat-hangers