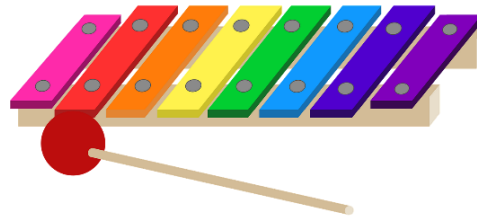


How to Make a Water Xylophone!



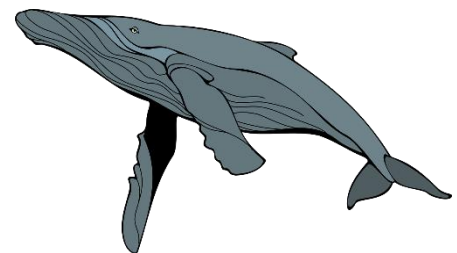
GREEN-SCHOOLS
STAY HOME - WATER

Did you know that sound travels four times faster through water than it does through air? You can also hear



higher pitched sounds underwater than you can in air, because of the way the sound waves vibrate in our skulls rather than our ears when we're underwater – and it's much harder to tell what direction the sound is coming from too!

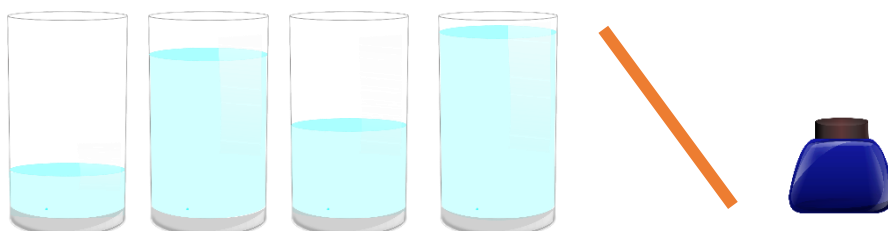
Lots of aquatic animals communicate over large distances using sound – for example, whales and dolphins. In this experiment, we explore sound waves by making a homemade xylophone!



Set up time: 5 minutes **Wait time:** None

What do you need?

1. 4 identical (or at least similar) clean empty jars or old tumbler glasses
2. 1 or 2 wooden skewers or chopsticks, the handle of a wooden spoon will do if you don't have a chopstick
3. Food colouring dye (optional)
4. Access to a tap

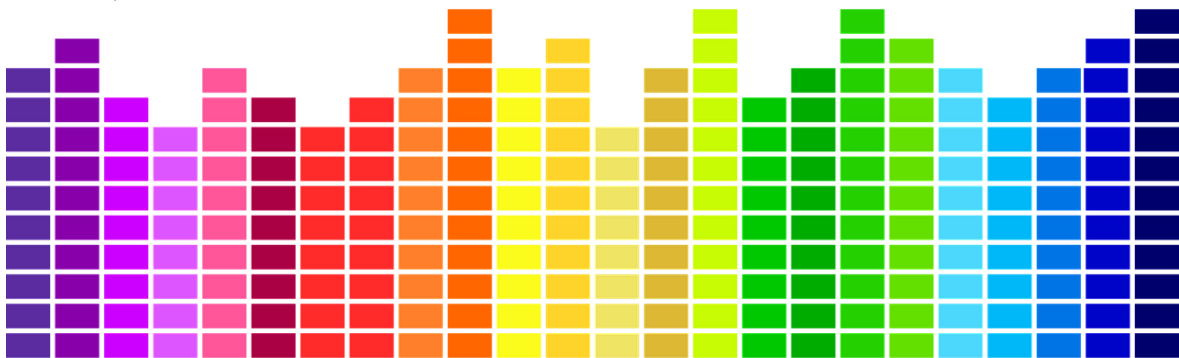


What do you do?

1. First, use the wooden chopstick or skewer to tap the rim of the empty jars. Does it make a sound? Can you hum the note back? What do you think will happen when you add water?
2. Next, add water to the four jars, fill one almost to the top, one with only a small amount of water, and the other two at different levels in-between. What do you think they will sound like when you tap them now?
3. Tap the rims of the jars again. Do they all sound the same? Which has the highest-pitched sound, and which has the lowest sound?



If you have it, you can add a couple of drops of food colouring to each jar to differentiate between them, either using different colours for each, or by adding more to the lowest-sound jar to make it the darkest, and using the colour to

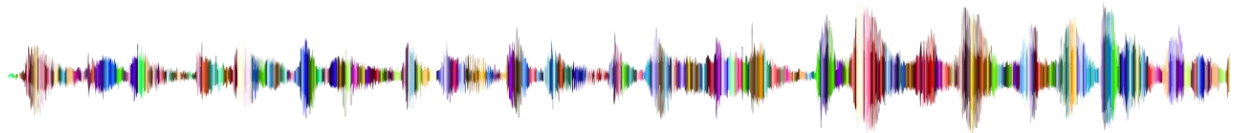


represent the sounds. Line the jars up from lowest to highest pitch.

Extra tests:

- Does tapping the sides of the jars make a different sound than tapping the rims of the jars?
- Try adding more or less water to the jars to create new sounds.

- Test different tools for tapping the jars. Can you tell the difference between the wooden chopstick and a metal fork?
- Use different liquids and compare the results. Sound waves will travel differently through liquids with different densities. Fill two jars to the same level but with two different liquids and compare them! For example, you could use saltwater (dilute a few teaspoons of salt in warm water), washing-up liquid, cooking oil.
- **Advanced:** You can even try to tune your water xylophone to specific musical notes using a tuning app or if you have a keyboard or other instrument at home! Can you play any simple songs on your water xylophone?



Explanation:

Sound travels in waves, these waves are changes in pressure which occur when an object vibrates, and these vibrations are transferred to the air (or in this case, water!) around the object.

Sound waves travel faster through water than air because water is denser than air: water molecules are more tightly packed together than air molecules are, so the sound wave can move more easily through it. Sound travels even faster through solids (most of the time!) than liquids – it travels 17 times faster through solid steel than it does through air!

See a similar experiment demonstrated at the link below!

<https://www.youtube.com/watch?v=sJO-JhMvu6M>