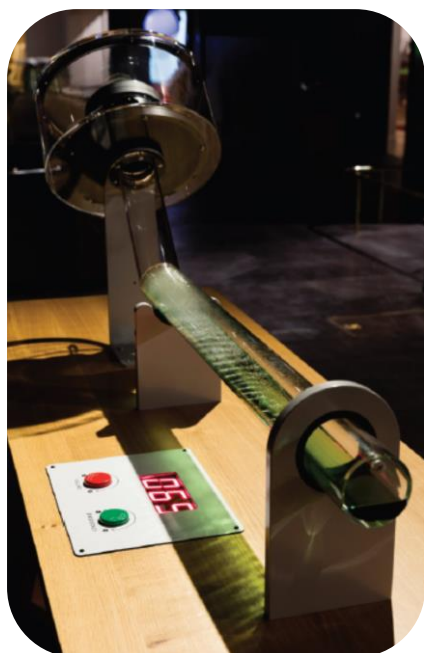


Can you find the biggest splash?

SOUND PATTERNS



| (Type) | Ages | Topic | Time |
|-------------------------|------|-------|----------|
| Science background | 7-14 | Sound | <10 mins |
| Skills used | | | |
| Observation - Curiosity | | | |

Overview for adults

Sound Patterns has a transparent pipe filled with oil with a speaker attached to it. You can change the frequency and volume of the sound that the speaker makes. At certain frequencies the sound in the tube will be at resonance. This will make the oil in the tube splash.

What's the science?

Sound waves from the speaker bounce up and down the tube. When the frequency of the sound is such that the number of waves in the tube is a whole number, the peaks and troughs of the sound wave and the reflected sound wave are in the same place. The waves combine and create points of high and low pressure which pulls the liquid up around the sound waves. At different resonant frequencies different patterns in the material will emerge.

Science in your world

You can create resonance on a swing. The time it takes you to swing backwards and forwards is your frequency. If someone pushes you at the same frequency, you can swing even higher. They can do this by pushing you at the highest point of each swing. This is when you are at resonance. If they push you too often or not often enough, it won't work.

Things to think and talk about ...

- How can sound make things move?
- Which frequencies create splashes in the tube?

Things to investigate ...

- Can you spot any patterns in which frequencies create splashes?
- How does changing the volume of the sound change the splashes?

Museum links

You can explore resonance more with the Resonance Carousel extension activity.

Did you know...?

If objects resonate too much, they can break. With the right frequency, you can break glass with sound. For this tube, that frequency is more than 10,000Hz. Thankfully the speaker doesn't go that high – so you won't get wet!