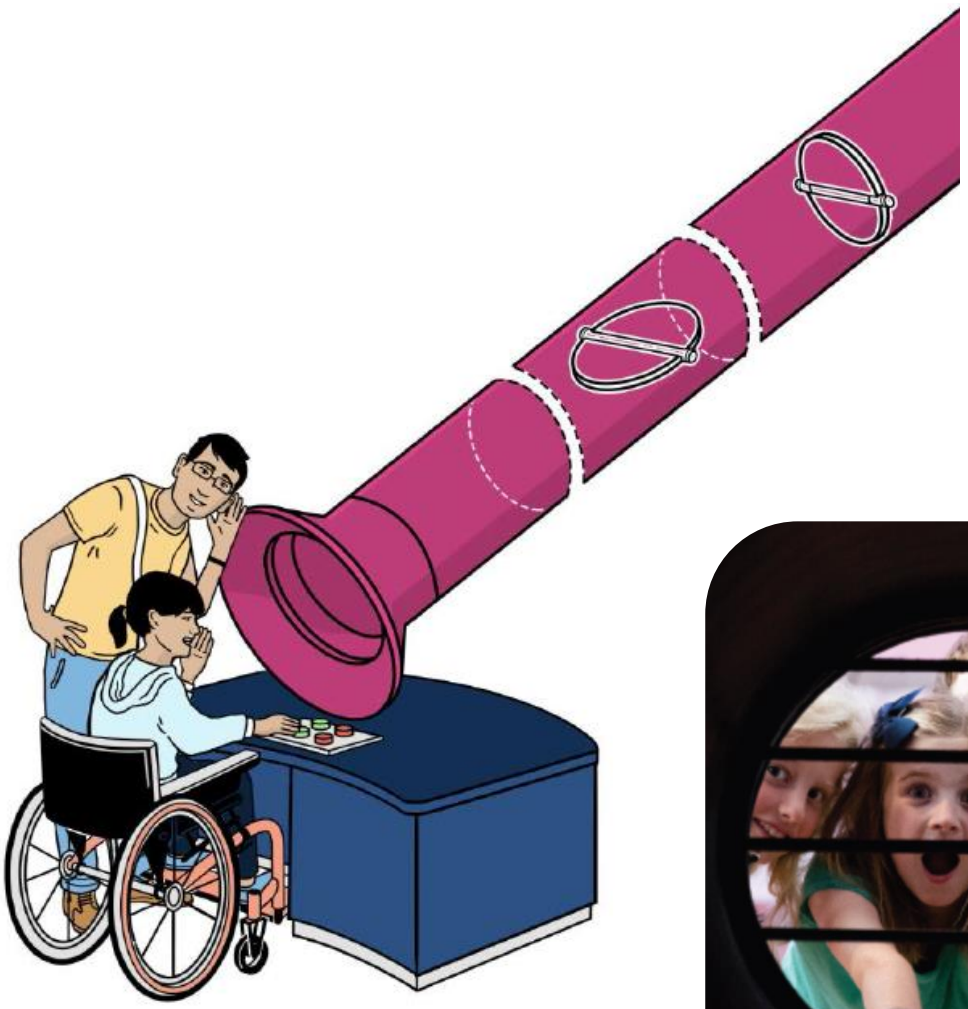
Can you reflect sound?

ECHO TUBE



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

Overview for adults

Echo Tube is a 15 metre hollow tube. When you shout or make a sound into the tube, it is reflected off the end of the tube and comes back to you. You hear this as an echo. The tube has two flaps within it that you can open or close, changing the length of the tube and the length of time it takes the echo to bounce back to you.

What's the science?

Sound travels through the air as sound waves. When these sound waves meet a surface, they are reflected back to where they came from. Sound travels at 330 meters per second in air, which is much slower than light. This means that when light is reflected, we see its reflection instantly but when sound is reflected, we can hear the delay as an echo. The surface that the sound bounces off doesn't have to be solid. The echo tube is open at both ends. The air pressure inside the tube is higher than the air pressure outside. When the sound wave meets the open end of the tube, this change in pressure causes a wave to be reflected down the tube from the open end.

Science in your world

Echoes from the open ends of tubes are what make musical instruments such as horns and trumpets work. The sound wave reflects up and down the tube from the open ends. We hear this as a loud musical note.

Things to think and talk about …

- Why does an echo sound different from the original sound you make?
- What do you think the sound is reflecting off?

Things to investigate …

- Try making other noises, like clapping, into the tube. Does it still echo?
- Does the echo change if you make high or low sounds?

Museum links

Check out the Sound lab room in our Wonderlab to discover more about sound and how it travels.

Did you know…?

Inside tunnels and under bridges are great places to practice making echoes. The world's longest echo was made by a scientist playing the saxophone in an oil tank in Scotland. It took 75 seconds to fade away.