CHaOS SCIENCE ROADSHOW

CHaOS@Home Experiment Files

Hearing High Sounds

About CHaOS

Cambridge Hands-On Science - CHaOS for short - is a volunteer led group from the University of Cambridge.

We believe that science is fun and relevant to everyone! CHaOS take our wide range of hands-on science experiments & enthusiastic student demonstrators to venues across the country!

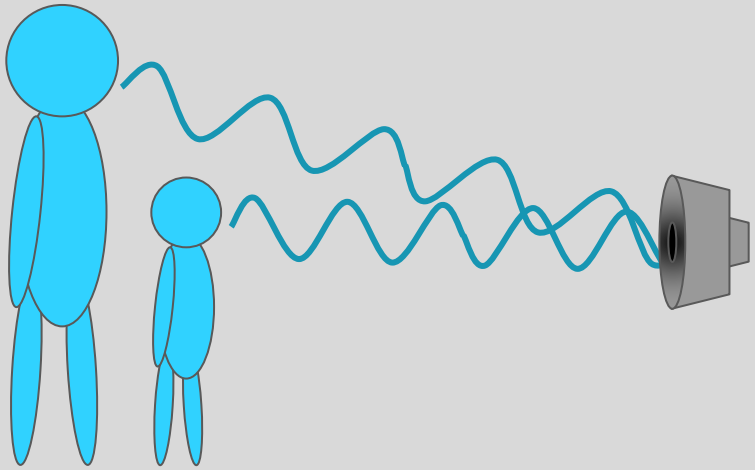
We always love to hear what you think of our experiments - so to get in touch, find even more experiments, and see more of what we do, visit our website!

www.chaosscience.org.uk

Disclaimer
This experiments should only be carried out **under supervision of a responsible adult.**
Teachers should perform a risk assessment before use.

I'm **Boris Bones**, the friendly CHaOS skeleton. I'm going to guide you through this experiment!

See who is better at **hearing high pitched sounds**: kids or adults!



YOU'LL NEED

- A smart phone
- Volunteers of different ages

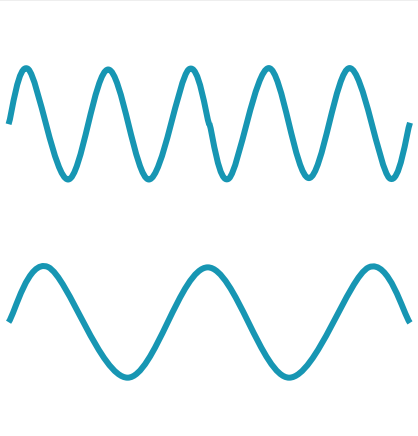
SAFETY

Listening to high pitched sounds for too long can cause **headaches**. Do not play the sounds for longer than needed.

Step 1

Download a frequency sound generator app on your phone.

It should be able to play sounds at different frequencies.



High frequency = high pitch

Low frequency = low pitch

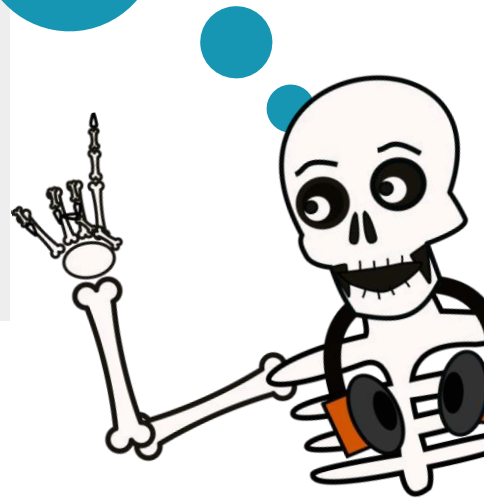
Frequency describes how fast the sound waves are moving. Higher sounds have higher frequency.

Step 2

Starting at 1000 Hz, gradually increase the frequency.

What is the highest frequency you can hear? What about the lowest?

What happens as people get older? Do they get better at hearing high frequencies, or worse?



Step 3

Test the hearing of people of lots of different ages.

Record your results.

CHaOS Experiment Files

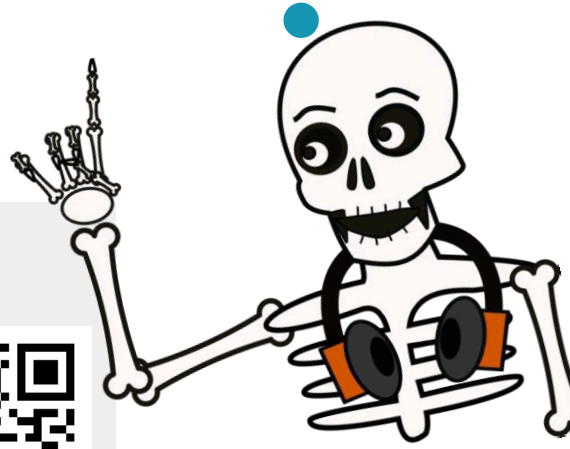
Explanation

As we get older, our ability to hear high pitched sounds decreases. This is because of how sound is detected. After sound enters the ear, it passes through a long tunnel that is lined with lots of tiny hairs. The sound waves cause the hairs to vibrate, and the vibrating hairs send a signal to the brain.

Over time these hairs begin to break, similar to what happens to your toothbrush when you use it a lot. Because the hairs that detect high pitched sounds are near the front of the tunnel, they break first. This is why old people can't hear high pitched noises - they have lost the hairs that detect these sounds.

Humans have a hearing range of about 20 - 20,000 Hz.

What about animals? What animals would you guess can hear higher than humans?



Fun fact!

Sounds that are too high for humans to hear are known as "ultrasound". However, special detectors can see where waves of ultrasound reflect. This helps us take pictures inside humans, such as baby scans done on pregnant women. Some animals use the same technique to find their prey.

Want more?

Check out about another type of wave - light - in **"Oil and Pyrex"** or **"Sunset Model"**!

CHaOS Experiment Files