

Hearing ranges and ultrasound

Physics - Key Stage 3

Sound waves - Lesson 8

Miss Mason



Recap

Describe what your ear does when a high pitched sound wave enters your ear canal.

Use the words: **drum, ossicle, cochlea, vibration, frequency**



Quick check

1. What is human hearing range?
2. How many Hz are in 1 kHz?
3. Convert 16 kHz into Hz (multiply by _____)
4. Convert 50 Hz into kHz



Quick check

1. What is the human hearing range?

Challenge: give the range in kHz.

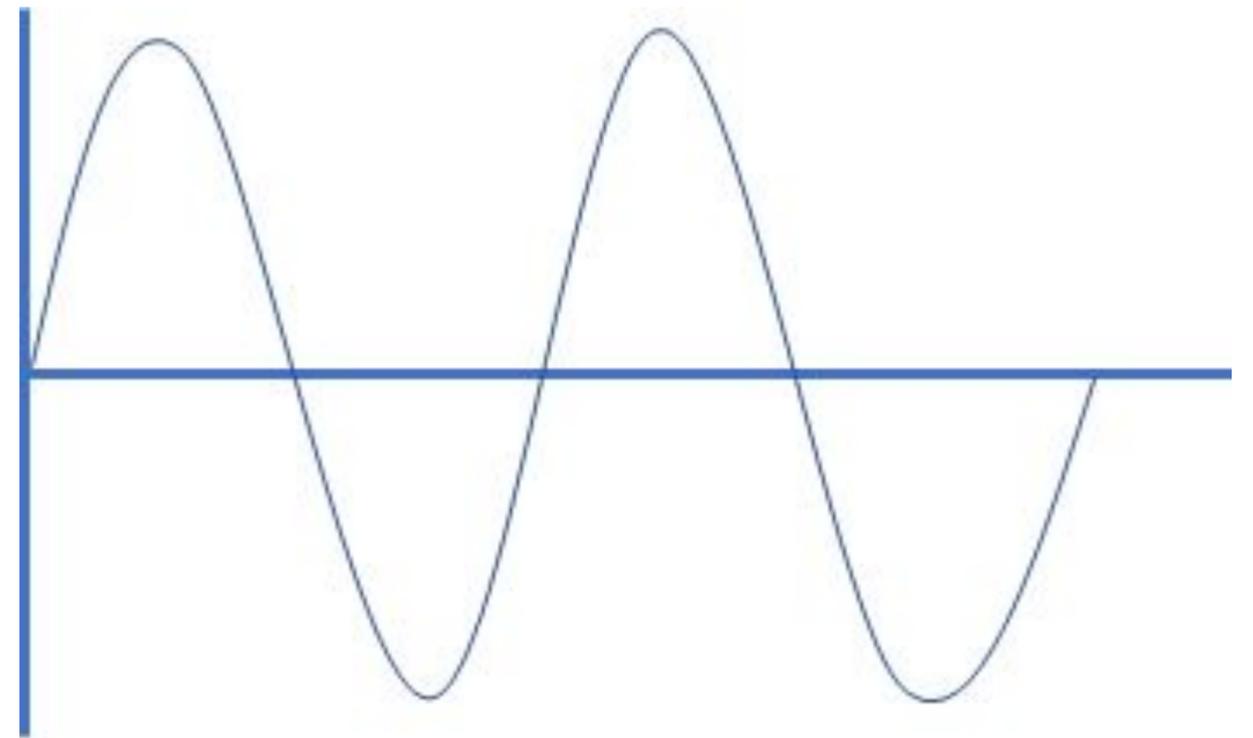
2. What happens to your hearing range as you get older?



Ultrasound

Quick check:

1. What frequency do ultrasound sound waves have?
2. Where is ultrasound used?
 - a. M_____ i_____
 - b. C_____
 - c. N_____
 - d. T_____ m_____
3. Draw a sound wave with a higher frequency but the same amplitude as the one shown



Quick check

1. Which frequency is NOT an ultrasound wave?
 - a. 15,000 Hz
 - b. 21,000 Hz
 - c. 45 kHz



Quick check

The bat emits a sound wave and detects the echo after 0.2 s.

Sound travels at 330 m/s

How far away is the object the bat has located?

(remember distance = speed x time)



Quick check - correct these statements

1. In ultrasound imaging each tissue layer absorbs the sound wave
2. The slow vibrations of ultrasound waves can be used to clean jewellery
3. A bat emits a sound wave and detects the echo after 0.6 s. Sound travels at 330 m/s so the object is 198 m away
4. Ultrasound is used to find cracks in pipes as we can hear the sound coming out of any cracks



Explain how and why ultrasound is used to create an image of a baby

Key words: *high frequency, Hertz, reflect, image, cancer*

Ultrasound is...

The wave is emitted on to the woman's uterus and...

It is better to use ultrasound than X-rays because...

