Echoes and Superposition

Physics - Key Stage 3

Sound waves - Lesson 2

Miss Mason

Recap

1. What is sound caused by?

V_____

2. How does sound travel?

In w_____

3. What does a wave transfer?

E_____

4. Identify the 4 features of a wave you could label on an oscilloscope trace.

P____, t_____, w_____ and a_____

5. Sound is an example of a longitudinal wave. What does this mean?

It means the direction of the e_____ transfer is p_____ to the direction of w_____ travel

What is an echo?

1. What is an echo?
2. What kinds of surfaces absorb sound?
3. Which types of surfaces are best at reflecting sound?
4. What happens to the temperature of a surface that can absorb sound?

Echolocation calculations

Distance = Speed x Time

1. A bat uses echolocation to find its prey. The sound wave takes 0.2s to return to the bat and sound travels at 330m/s in the air. How far away was the prey?

2. A dolphin uses echolocation to find the rest of its family. Sound waves travel at 1480m/s in water and the echo takes 4s to return to the dolphin. How far away was the dolphin's family?

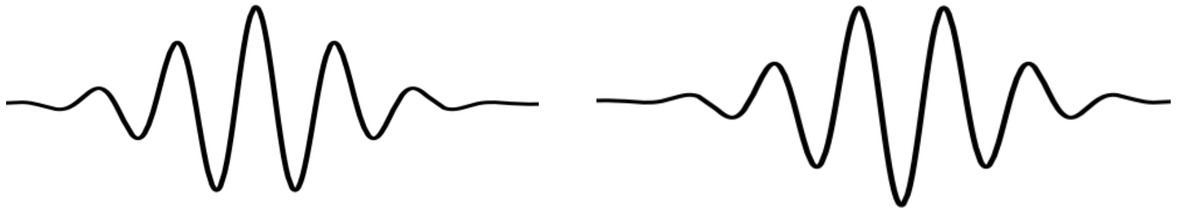
Knowledge check!

1. Superposition is when ___ or more waves interact and either ‘a____ t_____’ or ‘c_____ o____’.

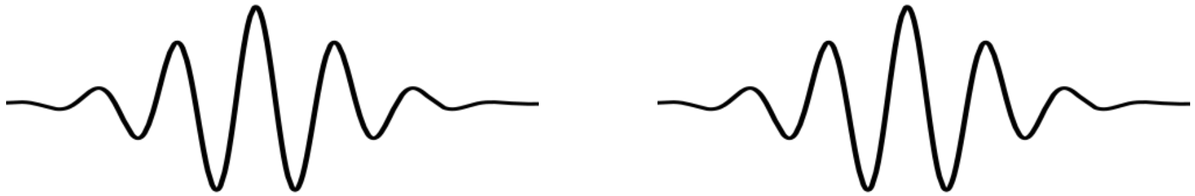
Superposition can be useful in….
However, this is only if…

2. What would happen to the sound if the following waves combined?

a)



b)



Answer the following questions:

1. Why would soundproofing a theatre or concert hall be a good idea and how can this be done?

2. Why would there be less echoes in a soundproofed room?