

The Science of Sound

Amazing Fact

The 'anechoic chamber' at Orfield Laboratories in South Minneapolis is officially the quietest room in the world. The walls and structure prevent 99.99% of all sound from penetrating into the room. Once the room is plunged into pitch darkness users have experienced difficulty staying in it for longer than 30 minutes.

Sound is a vibration, which requires a material to travel through. Some materials allow sound to travel through them very easily, especially hard, rigid materials. Softer materials, such as cotton wool, absorb sound, making it difficult for the vibrations to travel.

Challenge

Think about it:

- In what situations might you want to block out loud noises?
- How do you think you could block out loud sounds?
- What sort of materials do you think would block out sound most effectively?

Let's investigate!

Equipment

You will need:

- 2 plastic cups
- a selection of soft materials (cotton wool, paper towel, foil, bubble wrap etc.)
- a sound source (musical instrument, sound recording, music etc.)

Predictions

Look carefully at the available materials and spend some time exploring them.

Predict which of the materials will absorb sound most effectively and give reasons for your prediction.

Record your predictions in the table on the next page.

Method

1. Place the materials, one at a time, inside the plastic cups.
2. Place one plastic cup over each ear.
3. Begin to walk away from the sound source until you can no longer hear the sound.



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4. The distance can be recorded each time.
5. Ensure the investigation is a fair test by using the same amount of material, same sound source and same person each time.

Material	Prediction	Observation

Conclusion

Which material blocked out sound most effectively? Why?

How would you describe the most effective material?

Write your conclusion here:

Safety points

- Do not place any materials inside your ears.

You could also try to find out:

- how lack of sound or light affects your balance;
- what noises you can hear from your body in the room;
- how the experience affects your thoughts.