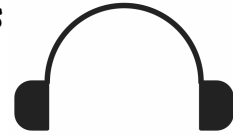


Designing ear defenders

People who work in noisy places need to wear ear defenders to protect their ears from damage.



Task:

Using your knowledge and understanding of sound and hearing, design a pair of ear defenders.

They should be made of a hard outer case and materials filling it to reduce the sound reaching your ears.

- Draw your design on a piece of A4 paper.
- Label the materials you use.
- Give reasons for your choice of materials.
- Use your scientific knowledge of sound to explain how your ear defenders will work.

Key words:

absorb, air particles, amplitude, insulator, loud, pitch, plastic, quiet, reflect, soundwave, vibrations

Level ladder:

What is your target level? Use the level ladder to help you reach it:

To get level	You might have:
5	<ul style="list-style-type: none"> • Chosen suitable materials to make the ear defenders. • Stated a reason for your choice of materials, using scientific knowledge. • Drawn simple particle diagrams to show how the ear defenders will work. • Drawn diagrams to show where sound will be reflected and where it will be absorbed.
6	<ul style="list-style-type: none"> • Chosen suitable materials to make the ear defenders. • Explained your choice of materials using detailed scientific knowledge and understanding. • Used detailed particle diagrams to compare the speed at which sound will move through the materials you have chosen. • Explained how the ear defenders will work using the Big Idea of Energy Transfer.
7	<p><i>Follow the instructions for level 6, using detailed scientific knowledge and understanding, and also:</i></p> <ul style="list-style-type: none"> • Used detailed particle diagrams and energy to explain how the ear defenders work. • Explained how the ear defenders will work using the Big Idea of Energy Transfer.