

**Task 1**

1 Why is it impossible for sound to travel through a vacuum?

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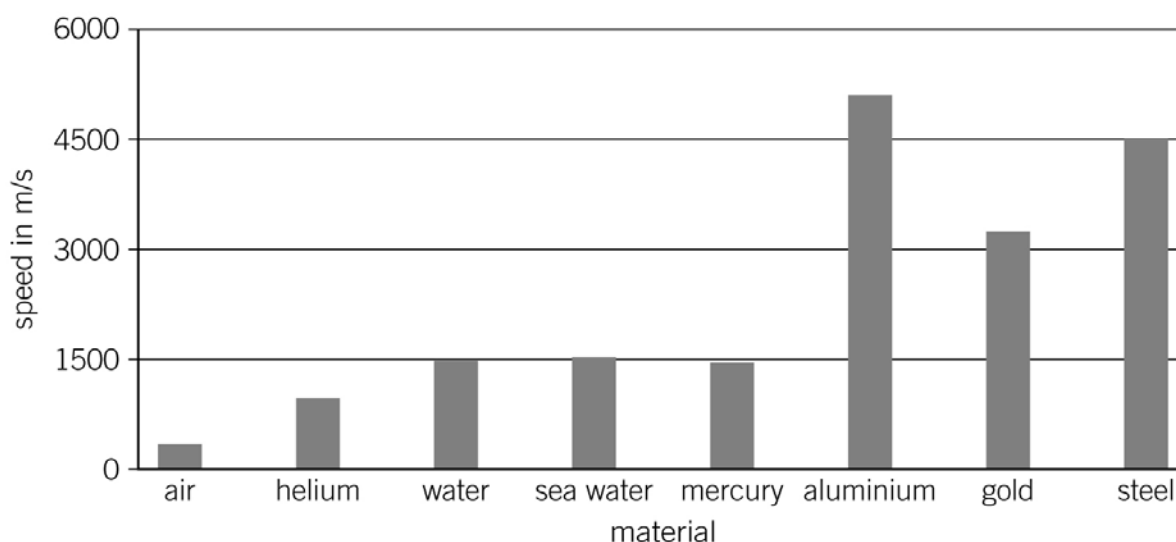
2 How do molecules move when a sound wave passes through them?

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3 Look at the graph that shows the speed of sound in different materials.

Why does sound travel faster in denser materials?



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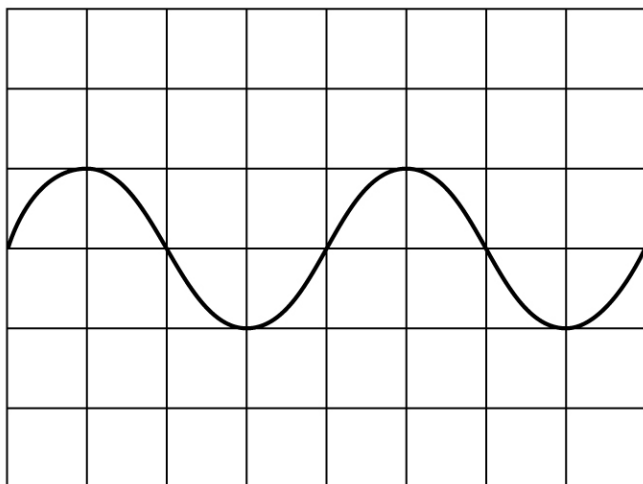
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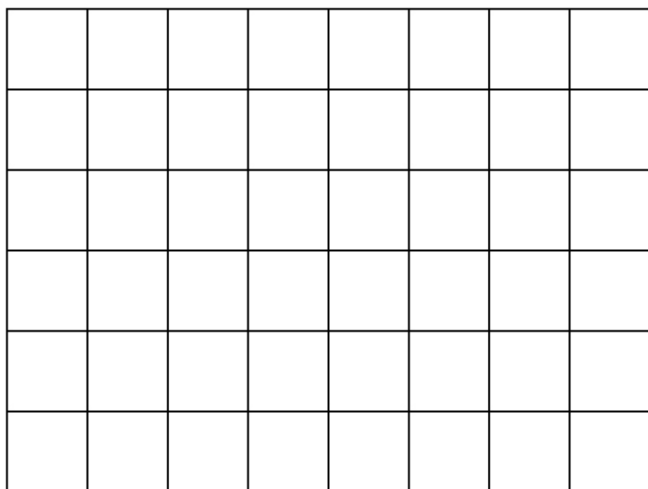
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**Task 2**

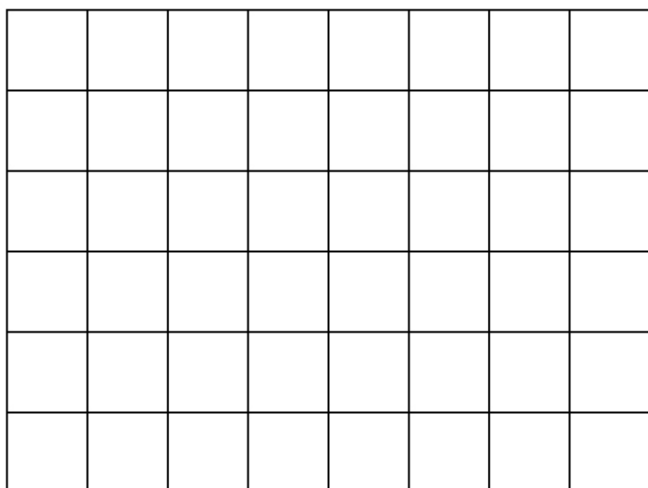
Look at the first image of a wave trace on an oscilloscope. In the following blank charts, draw the traces described.



- 1 Draw the trace for a sound that is louder than the original trace.



- 2 Draw the trace for a sound that is quieter than the original trace.

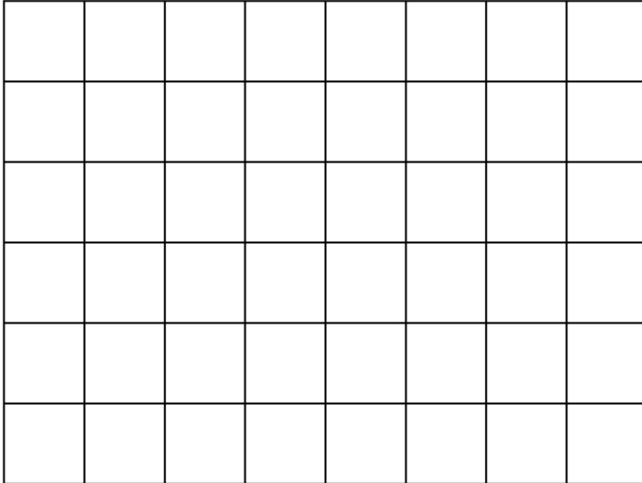


- 3 Draw the trace for a sound that has twice the amplitude of the original trace, but the same pitch.


- 4 Draw the trace for a sound with a higher pitch than the original trace.


- 5 Draw the trace for a sound with a frequency that is half that of the original trace.


- 6 Draw the trace for a sound with the same amplitude as the original trace, but twice the frequency.



### Task 3

During a solar eclipse the Moon casts a shadow onto the surface of the Earth.

Complete the diagram below to show the Sun, Moon, and Earth.

Add rays to show where the shadow is cast onto the Earth's surface.

Label the umbra and penumbra.



In the space below, describe what the difference is between what you experience during an eclipse if you are standing in the umbra instead of the penumbra.

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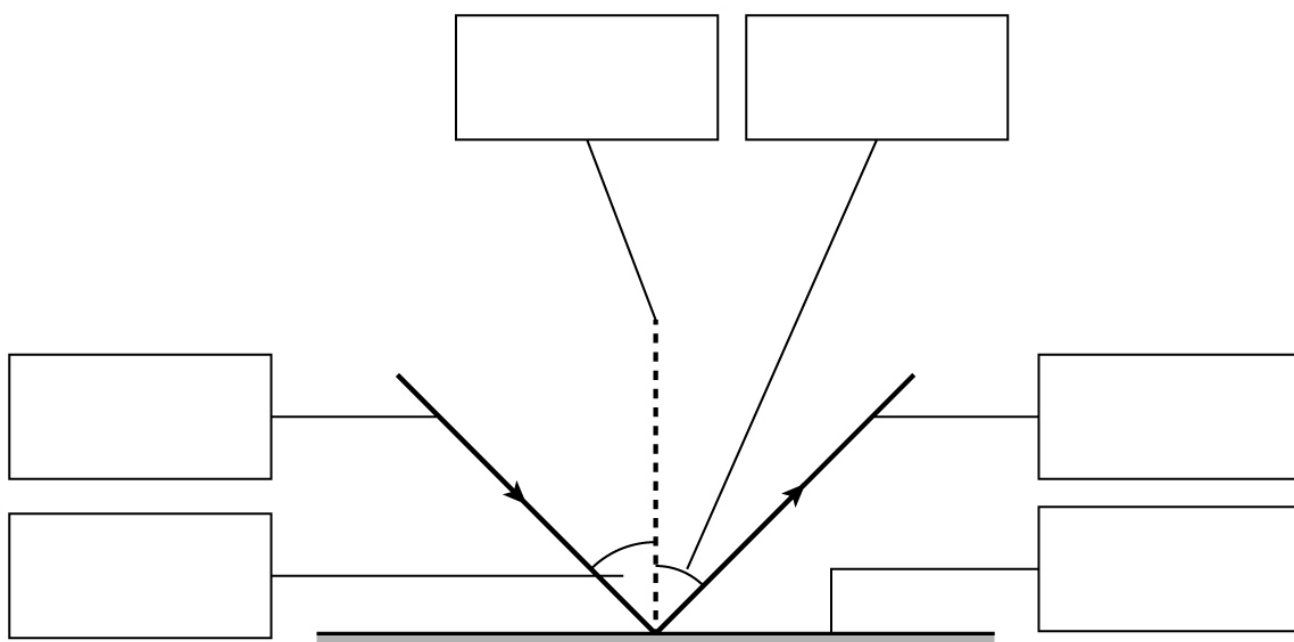
**Task 4**

1 State the law of reflection

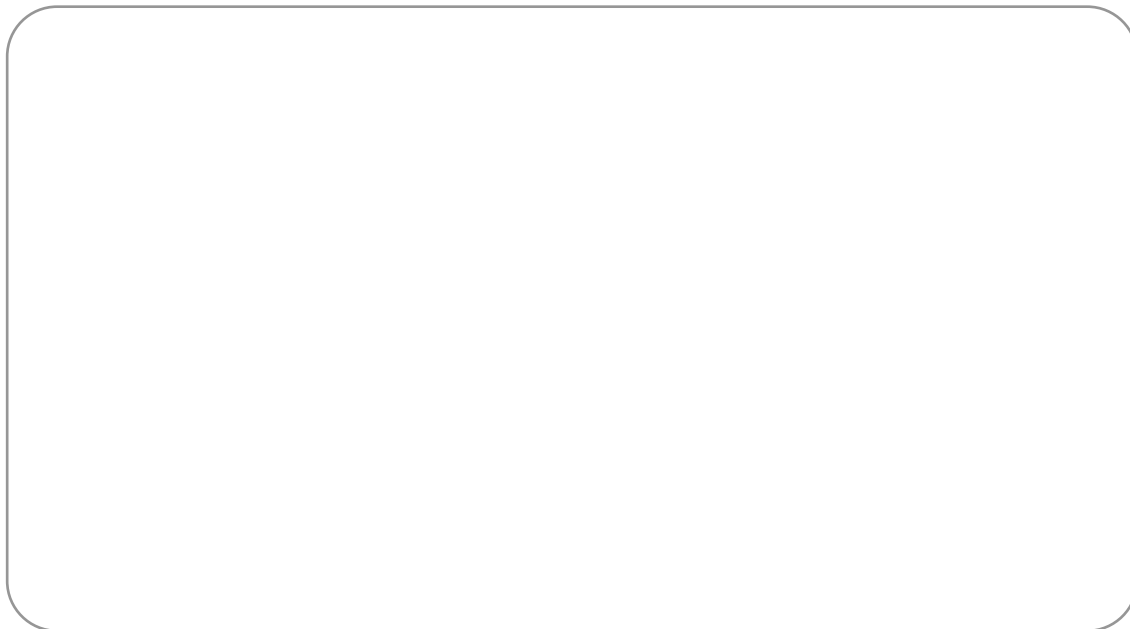
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2 Complete the diagram by labelling the following features.

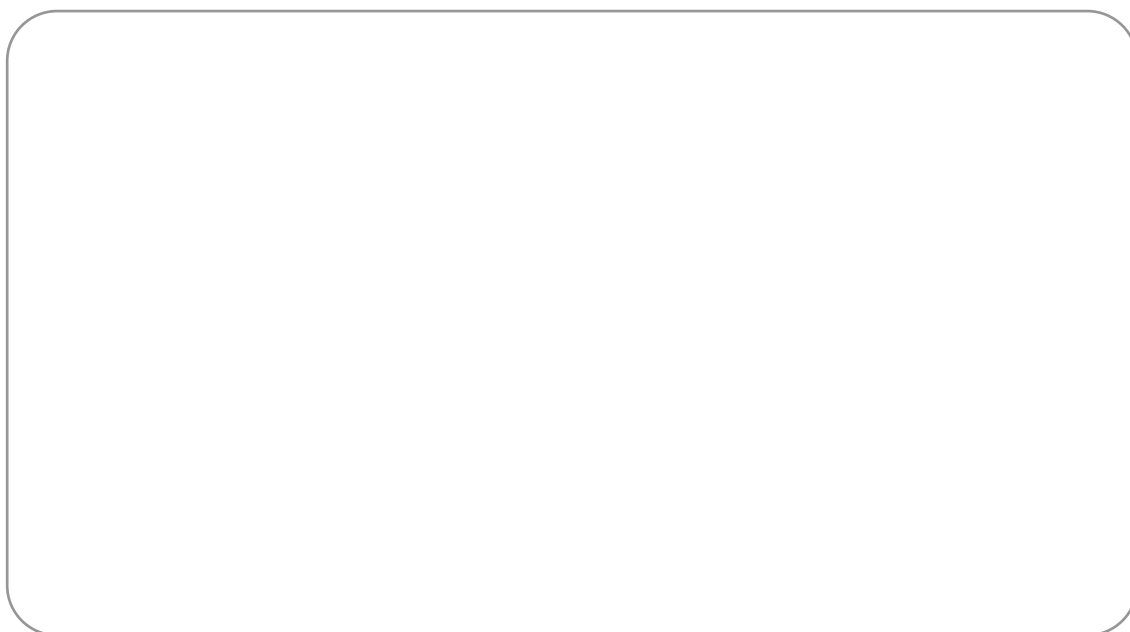
- mirror
- normal
- incident ray
- reflected ray
- angle of incidence
- angle of reflection



- 3 In the space below draw a diagram to show specular reflection from a smooth surface.



- 4 In the space below draw a diagram to show diffuse scattering and describe why it occurs.



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**Task 5**

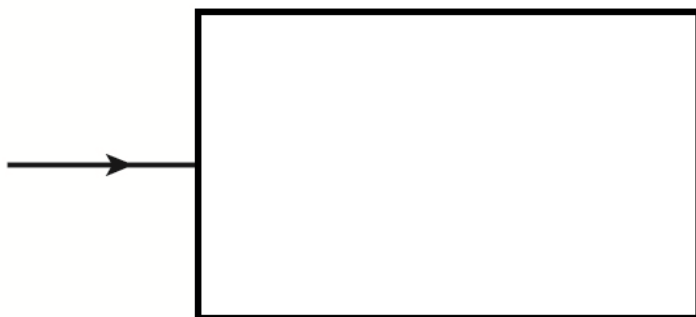
- 1 Use the words provided to complete the sentences describing how light is refracted when it enters and leaves a glass block.

**towards                  away from                  refraction                  direction**

When light enters a glass block, the \_\_\_\_\_ the light is travelling in changes. The ray of light bends \_\_\_\_\_ the normal. As the light leaves the glass block, it bends \_\_\_\_\_ the normal. This is called \_\_\_\_\_.

- 2 Complete the diagrams to show how light is refracted in different shaped glass blocks.

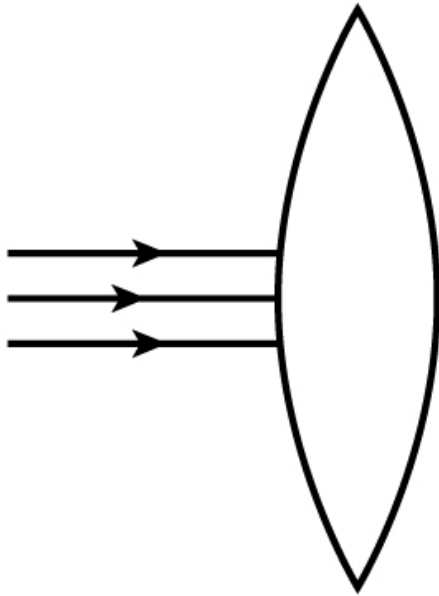
**a**



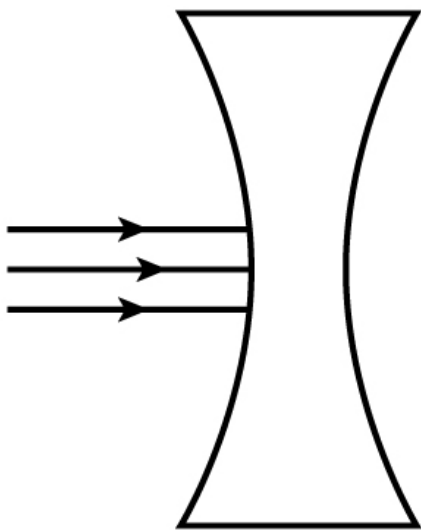
**b**



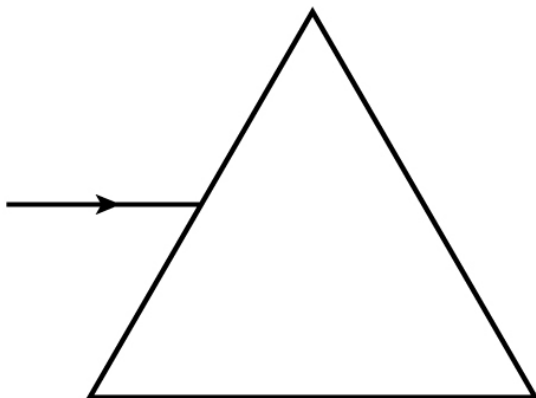
c



d



e





**Task 6**

1 Match the part of the eye with its function.

retina

transparent outer part of the eye  
that refracts the light

iris

where the image is formed in the  
eye

cornea

light goes through this, and the size  
of it affects how much light enters  
the eye

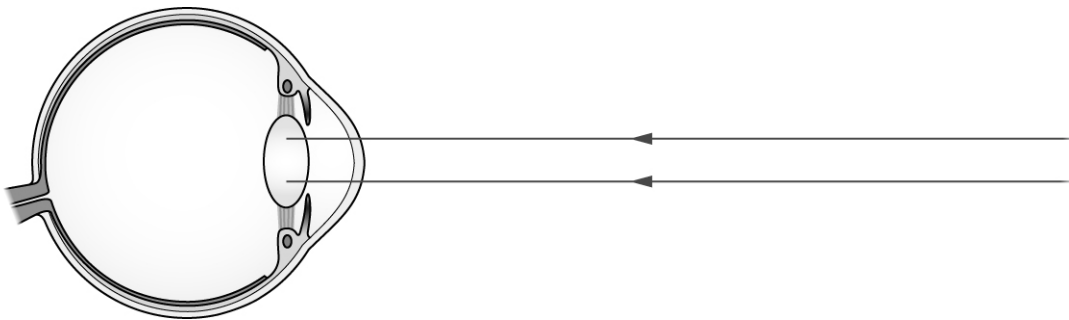
pupil

the muscle that controls the size of  
the pupil

2 Lenses can be used to correct the vision of people with long and short sight.

People with short sight cannot see distant objects clearly because their eyeball may be too long, or the lens and cornea refract the light too much.

a Complete the rays in the diagram to show where the image is formed in the eye of someone with short sight.

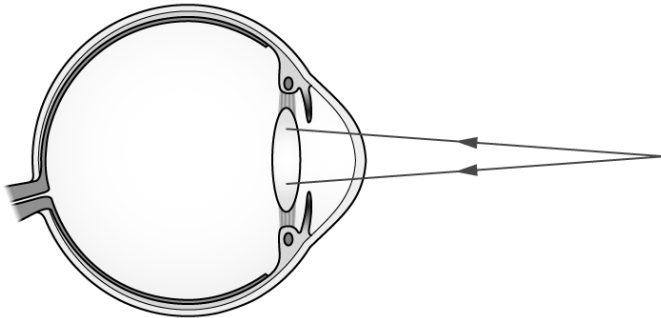


b Complete the diagram to show how a lens can be used to correct the vision of someone short-sighted.



People with long sight cannot see close by objects very clearly because their eyeball may be too short or the lens and cornea do not refract the light enough.

- c** Complete the rays in the diagram to show where the image is formed in the eye of someone with long sight.



- d** Complete the diagram to show how a lens can be used to correct the vision of someone long-sighted.



## Task 7

Answer the following questions about colours.

- 1** What are the three primary colours of light?

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- 2** Name the three secondary colours of light and describe which two coloured lights need to be mixed to create them.

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- 3 Complete the table below by filling in what colour the coloured object would appear in different coloured light.

Colour of the object	Colour of the light		
	Blue	Red	Green
Blue			
Green			
Red			
Yellow			
Cyan			
Magenta			