

Home learning activities

Subject
Science
Year Group
Year 8
Unit of work / Knowledge organiser
Light - Revision
Activities
<ul style="list-style-type: none">• Complete the 'Knowledge Check' by clicking on the link below (Mr Tobin has also emailed this link out to you): https://forms.office.com/Pages/ResponsePage.aspx?id=tWqUKrjGMEuM3bZvypd0-1JR5WsjulFPvbjl4VXu0Y1UNVUwTExPNjAzOUtQV0RGWVdOUUpCMDZZNy4u• Read through the Sections of the 'Knowledge Organiser' on 'Light'.• Make careful and details notes on the Sections of the 'Knowledge Organiser' on 'Light', including writing out the details from the Section on 'How We See Colour'.• Describe, in your own words, how we make white light, without looking at your earlier notes from the 'Coloured Light' Section.• Read the 'Key Revision Facts' sheet carefully.• Describe, in your own words, what is meant by 'refraction' and when it occurs, without looking at the 'Key Revision Facts' sheet.• Complete the 'Match and Draw', 'How We See' and 'Colour' activities on the 'Test Yourself' pages using the 'Key Revision Facts' sheet to help you; the answers are provided at the end, but do not look at these until you have tried to complete the work yourself (be strict with yourself here).• Complete the 'Exam Style Questions' on 'Light' using the 'Key Revision Facts' sheet to help you. Use the mark scheme (once you have tried the question) to mark your answers carefully.
Where do you complete the work?
In Study Books.

What to do if you finish the work? (Extension activity)

- Make sure you have completed the previous set work on 'Rates of Reaction' and then work on the 'Mini Project' on 'Light'.

These websites might help:

- BBC Bitesize -> Secondary -> KS3 -> Science -> Physics -> Waves -> Light Waves

If you are struggling with your work or if you have finished.

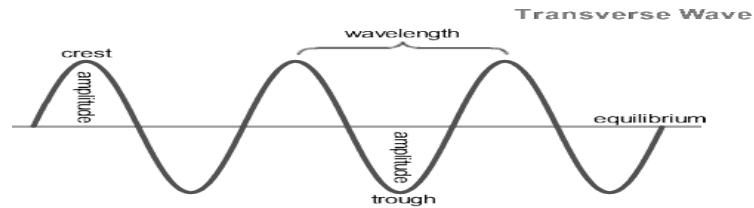
Please email your classroom teacher directly using the email list found in the Home Learning section of the website.

Year 8—Light

1. Light

Light travels extremely quickly. Its maximum speed is approximately 300,000,000 m/s, when it travels through a vacuum.

Light travels as waves. These are **transverse** waves, like the ripples in a tank of water. The direction of vibration in the waves is at 90° to the direction that the light travels.

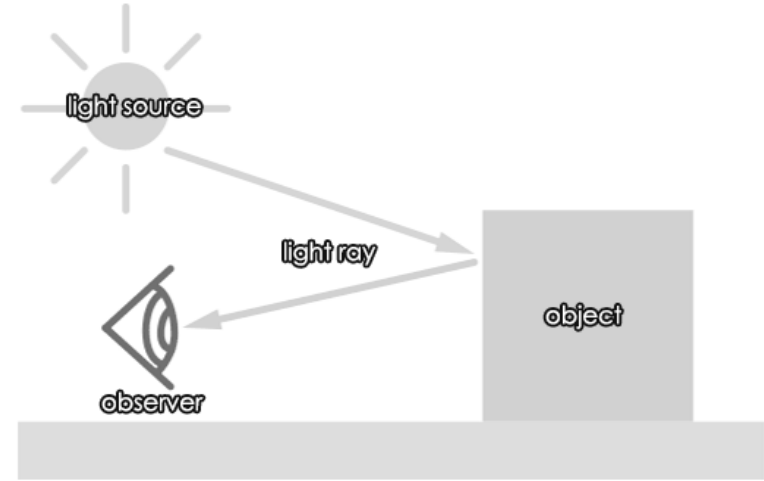


Light travels in straight lines, so if you have to represent a ray of light in a drawing, always use a ruler.

Unlike sound waves, light waves can travel through a **vacuum** (empty space).

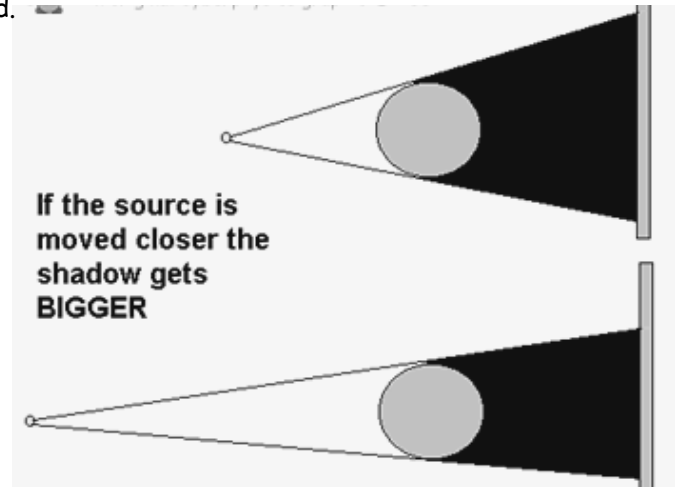
They do not need a substance to travel through, but they can travel through **transparent** and **translucent** substances.

2. How we see

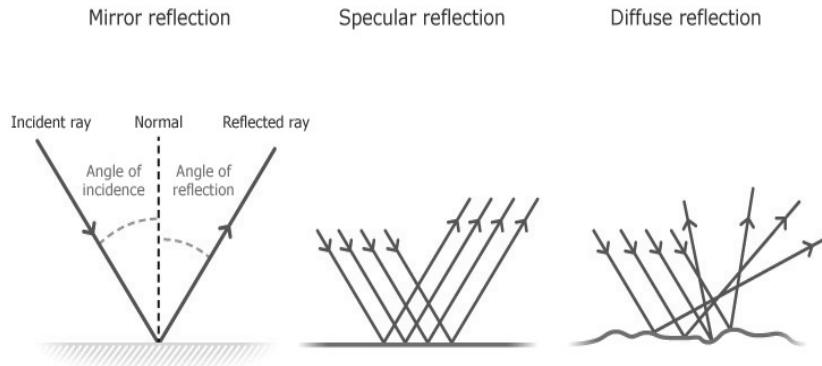


4. Shadows

Light travels in straight lines. An object that does not allow light to pass through will form a **shadow**. Shadows are formed by light, because if light shines onto an object, and the object blocks the light, the light will go sideways of the object and a shadow is formed.



3. Reflection



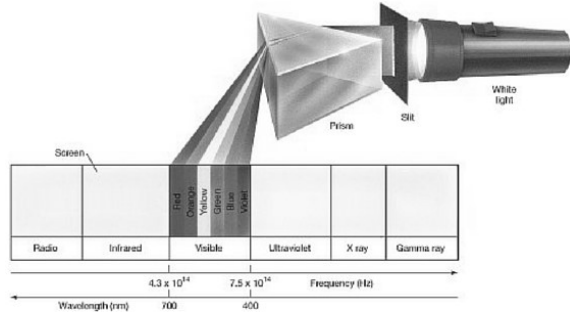
Year 8—Light

5. Colour

White light is a mixture of many different colours, each with a different frequency. White light can be split up into a spectrum of these colours using a prism, a triangular block of glass or Perspex.

Light is refracted when it enters the prism, and each colour is refracted by a different amount. This means that the light leaving the prism is spread out into its different colours, a process called dispersion.

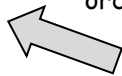
The Visible Light Spectrum



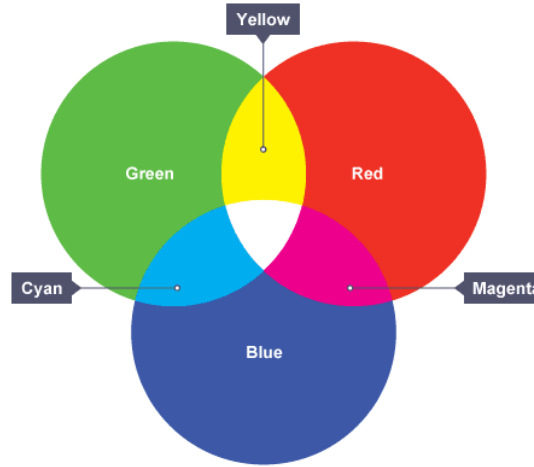
There are 7 colours in the spectrum, they are listed below from the lowest frequency to the highest frequency:

- Red Richard
- Orange Of
- Yellow York
- Green Gave
- Blue Battle
- Indigo In
- Violet Vain

Use this to remember the order of the spectrum



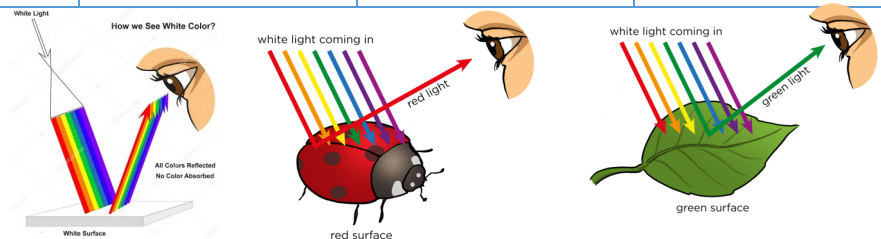
6. Coloured light



There are 3 **primary** colours in light, **red, green, and blue**. These can be added together to make the **secondary** colours **magenta, cyan and yellow**. All 3 primary colours added together make white light.

7. How we see colour

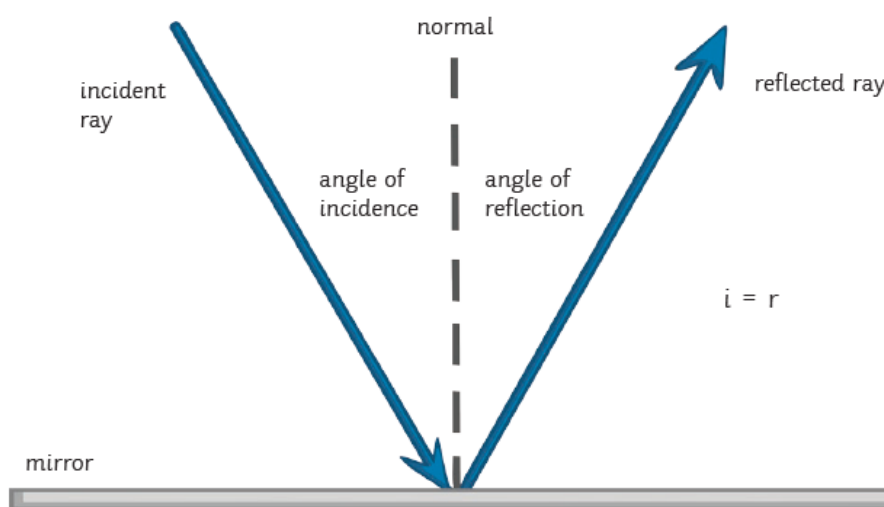
	White paper	Red apple	Green apple
Colours that the object can reflect	All	Red only	Green only
Appearance of object in white light	White (no colours absorbed)	Red (all colours absorbed except red)	Green (all colours absorbed except green)
Appearance of object in red light	Red (only red to reflect)	Red	Black (no green to reflect)
Appearance of object in green light	Green (only green light to reflect)	Black (no red light to reflect)	Green
Appearance of object in blue light	Blue (only blue light to reflect)	Black (no red light to reflect)	Black (no green light to reflect)



Light

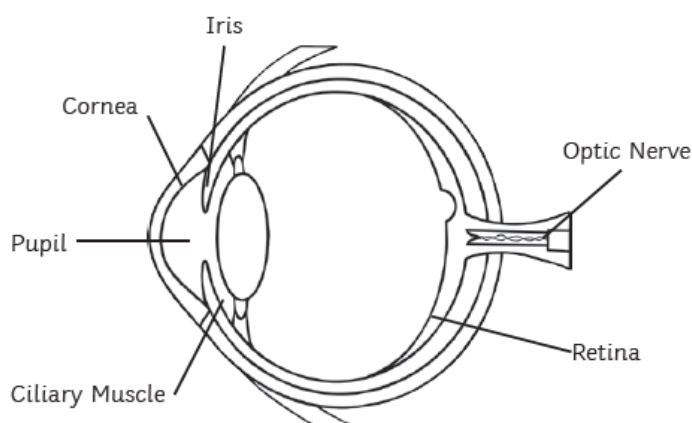
Key Revision Facts

- Transparent: light can pass directly through the object.
- Translucent: only some light can pass through the object.
- Opaque: no light passes through the object and a shadow is formed.
- White light consists of 7 colours: red, orange, yellow, green, blue, indigo and violet.
- The primary colours are red, blue and green.
- The law of reflection states that the angle of incidence equals the angle of reflection.

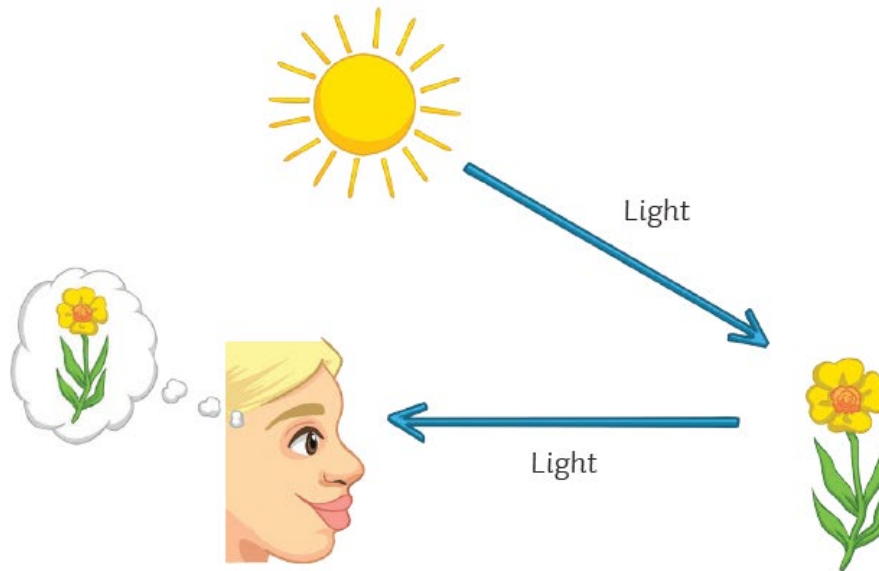


- Refraction is the bending of light. It occurs when the medium light is travelling through changes.
- Lenses help you to focus on an object. The lens in your eye is convex.

The Eye



How We See



- Light enters the eye through the pupil.
- The size of the pupil is altered by the iris.
- The cornea and lens, focus light onto the retina.
- The retina contains two light sensitive cells called rods and cones. When light hits these cells, chemical reactions produce electrical impulses that travel via the optic nerve to the brain.

Light Test Yourself

Match and Draw

Draw a line to match the words and their definitions.

Opaque

Objects that allow light through them

Translucent

Objects that do not let light pass through them

Transparent

Objects that allow some light to pass through them

How We See

Number the sentences to show the process of how the eye enables us to see objects.

The size of the pupil is altered by the iris

The retina contains two light sensitive cells called rods and cones. When light hits these cells, chemical reactions produce electrical impulses that travel via the optic nerve to the brain

Light enters the eye through the pupil

The cornea and lens, focus light onto the retina

Colour

In terms of colour, why do we see...

this mouse as white

and

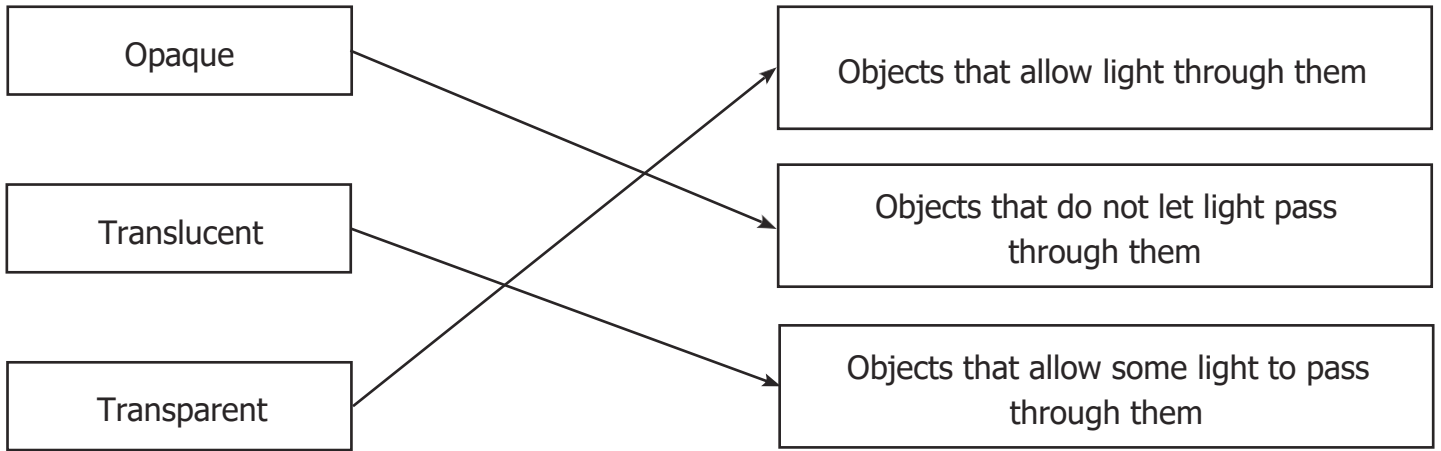
this cat as black?



Light Test Yourself Answers

Match and Draw

Draw a line to match the words and their definitions.



How We See

Number the sentences to show the process of how the eye enables us to see objects.

2	The size of the pupil is altered by the iris
4	The retina contains two light sensitive cells called rods and cones. When light hits these cells, chemical reactions produce electrical impulses that travel via the optic nerve to the brain
1	Light enters the eye through the pupil
3	The cornea and lens, focus light onto the retina

Colour

In terms of colour, why do we see...

this mouse as white

and

this cat as black?



White objects reflect all the colours of the spectrum, whereas black objects absorb all the colours.

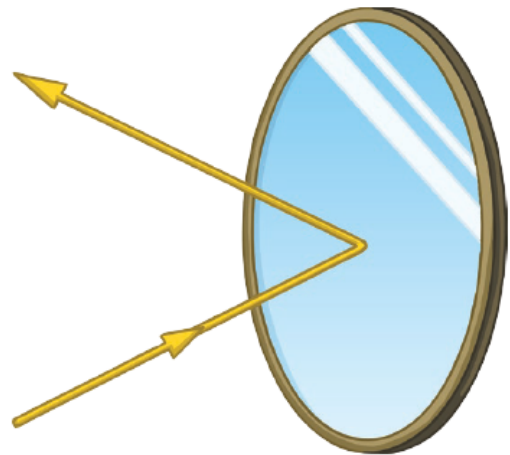
Light Exam Style Questions

1. A young boy switches a torch on and shines it at a mirror. Add arrows to the diagram below to show how the light travels from:

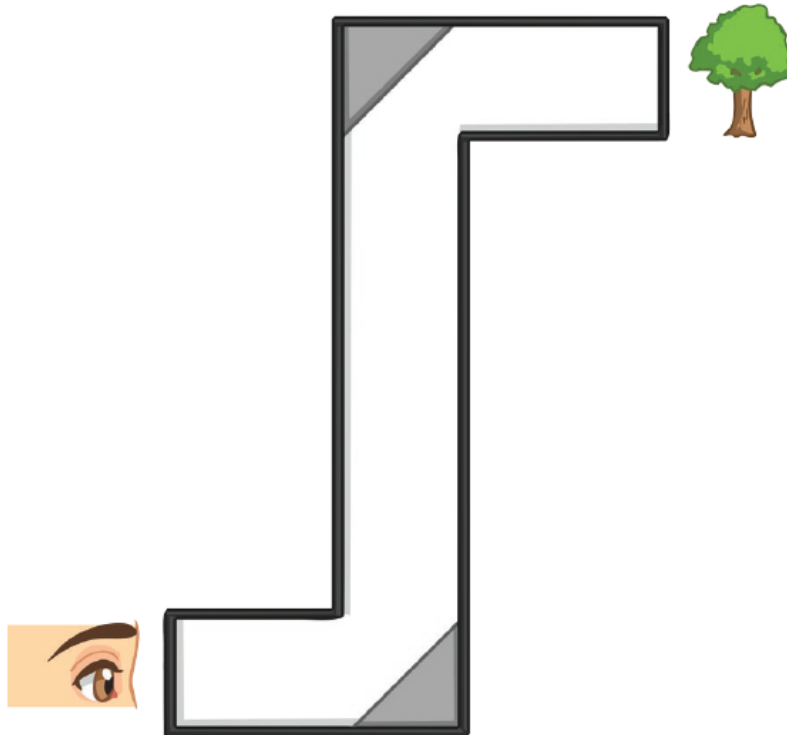
- the torch to the mirror
- how the light is reflected from the mirror.

Now,

- Label the incident ray.
- Label the reflected ray.



2. Draw light arrows on the periscope below to show how it works.



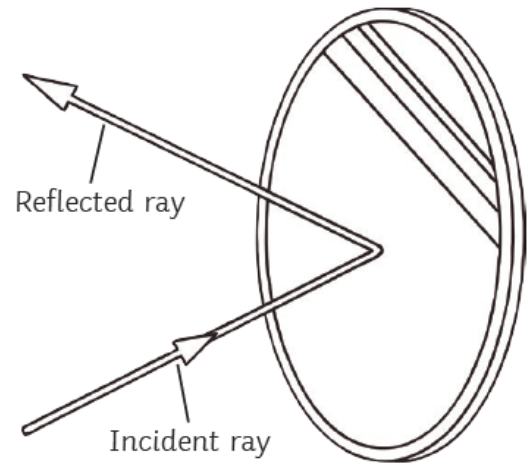
Light Exam Style Questions Answers

1. A young boy switches a torch on and shines it at a mirror. Add arrows to the diagram below to show how the light travels from:

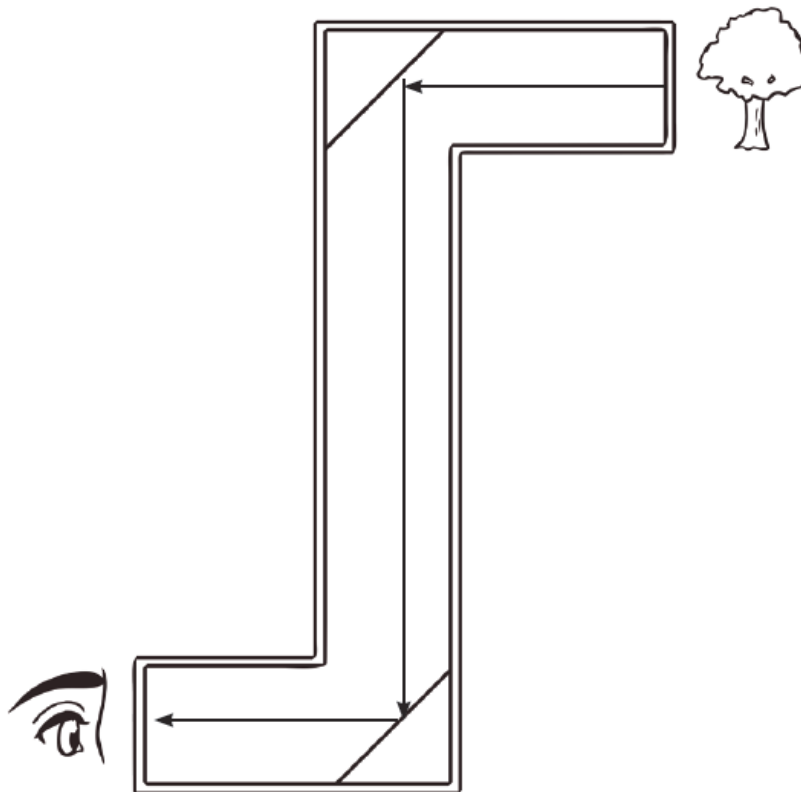
- the torch to the mirror
- how the light is reflected from the mirror.

Now,

- Label the incident ray.
- Label the reflected ray.



2. Draw light arrows on the periscope below to show how it works.



Light

Watch this video: <https://www.youtube.com/watch?v=hjKme3ci8W0>

Task	Description
1	Explain: <ul style="list-style-type: none">• How do we see things?• The formation of shadows• Draw a diagram of a pinhole camera and explain how pinhole cameras suggest that light travels in straight lines.
2	Define 'reflection' and explain in your own words how the periscope could help you see over a wall.
3	Refraction and dispersion effects: Write all the factors that affects the way light travels through different Materials.
4	Plants need light to make food. What would happen if you tried to grow plants under green light? Explain your answer using the words absorb, transmit and reflect.
5	How is sound made and how does it travel?
6	Mary's parents are thinking about confiscating her drum kit. What could Mary do to stop the noise leaving her room? Use words reflect, transmit, absorb and energy in your answers.
7	Make a glossary of the keywords from this topic. A glossary is a detailed list of keywords and their meanings or descriptions.