Wednesday 30th September 2020 – Science 1

LO: To investigate the reflectiveness of different materials.

We know that light travels in straight line and that if it is blocked by an object a shadow forms, so what if we want to redirect that beam of light to be able to see what is behind the object, or even to see what is behind us?

Stand in front of your bathroom mirror. You can see yourself, but what else can you see? Without turning round, list all the things that are behind you. How do you think you can see these things?

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Try this investigation. In a darkened room, turn on a torch or a lamp. Place a mirror in front of the beam of light and slowly move the mirror side to side and up and down.

What happened to the beam of light?

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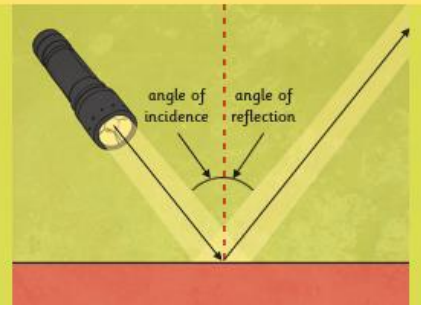
When rays of light reflect, they obey the law of reflection: The angle of incidence always equals the angle of reflection.

The red dashed line is called the 'normal' line. It is drawn at a right angle, or perpendicular to the reflector.

The angle of incidence is the angle between the normal line and the incident ray of light.



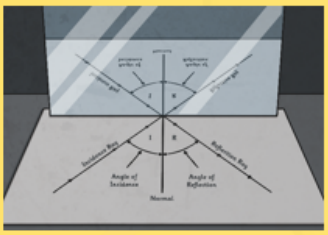
The angle of reflection is the angle between the normal line and the reflected ray of light.

Try shining your light on the mirror again. Can you see the angle of incidence (the beam of light travelling from the light source and to the mirror) and the angle of reflection (the beam of light reflected off the mirror)?

Use a pencil and ruler to draw the incident and reflected rays on the paper.

Draw a dashed line perpendicular to the mirror, from the point where the incident and reflected rays meet. This is the normal line.

Use a protractor to measure the angle formed between the incident ray and the normal line.



On the white paper, look for the incident ray and the reflected ray of light. You may have to play around with the angle of the torch and the distance you hold it from the mirror.

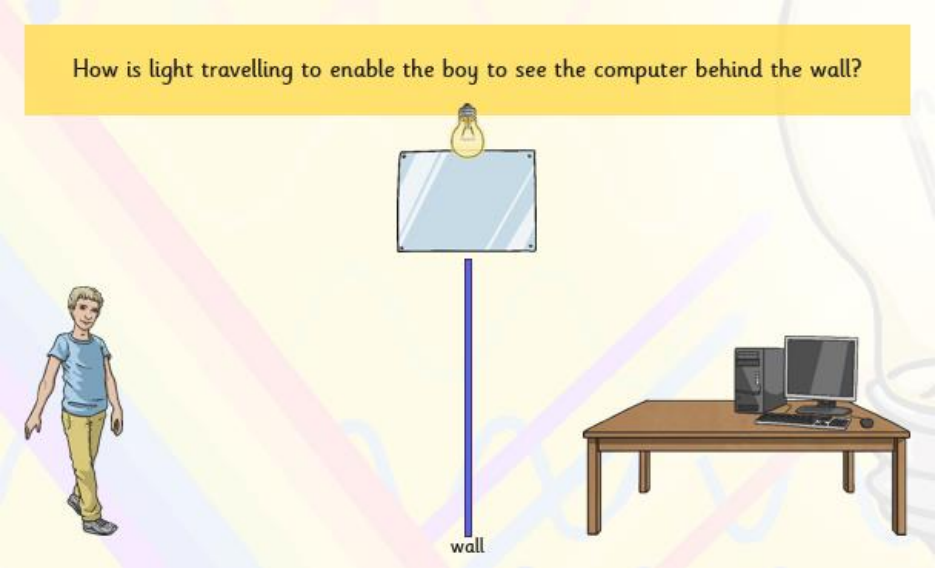
They should be equal.
Whenever light is reflected from a surface, it obeys this law.

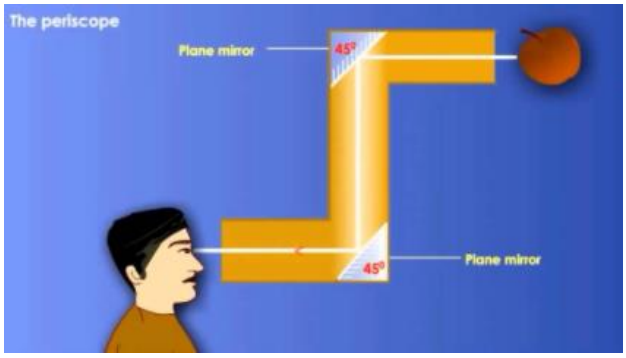
Have a go at this activity. You might need someone to help you hold the mirror straight. Take a picture or keep the diagram in your book for when you return to school.

Wednesday 30th September 2020 – Science 2

LO: To investigate the reflectiveness of different materials.

Think about what you have just learnt. In this picture, the boy is able to see the computer even though it is behind a wall. Draw arrows on this diagram to show how the boy can see the computer.





Have you heard of a periscope? Periscopes allow people to see over high walls and around corners (especially people who don't want to be seen).

A simple periscope is a tube with two mirrors. Light is reflected from one mirror to the other, allowing the person to see objects.

Can you try to explain this yourself here?

Use the following vocabulary:

Light source, reflects, first mirror, second mirror, object, eye, image, travel, periscope

Wednesday 30th September 2020 – Science 3

LO: To investigate the reflectiveness of different materials.

The next sheet contains instructions for how to make your own periscope. If you can, have a go at this and use it to help you understand how a periscope works. It's OK if you are unable to complete this task at home. You can use shiny paper or card instead of safety mirrors, if you have any.

Making a Periscope

Follow these instructions to make your own working periscope.

You will need:

A cereal box 

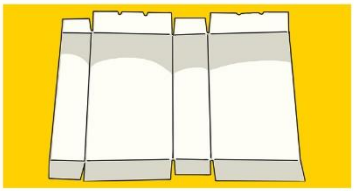
A pair of scissors 

2 safety mirrors 

Sticky tape 

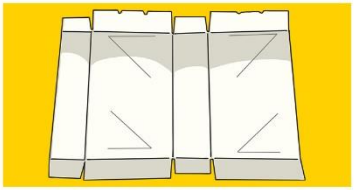
Step 1

Carefully open up your cereal box and lay it out flat.



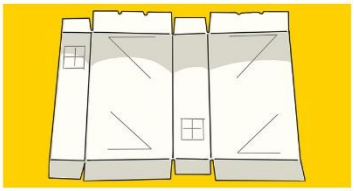
Step 2

Stick the 'mirror' templates in the centre of the wide panels of the cereal box.



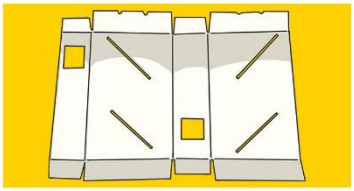
Step 3

Stick the 'window' templates in the centre of the narrow panels of the cereal box.



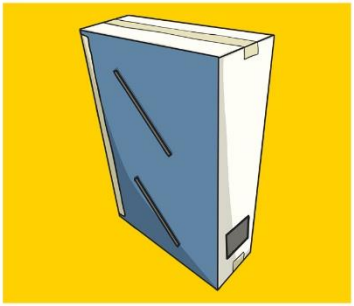
Step 4

Carefully cut along the lines for the mirrors, and cut out the windows.



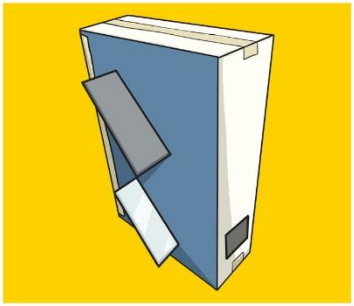
Step 5

Use sticky tape to stick the cereal box back together.



Step 6

Push the mirrors through the mirror lines you cut, and out the other side of the box so they are held firmly in place.



You should now be able to use your periscope to look around or over things!
Look through one viewing window to see an image from the other window.