

Light

? How do
? we see? ?

This question is the theme for this unit. We will revisit it every lesson and your understanding will get greater each time.

L.O. I am learning how light is reflected

Look at the statements about how light is reflected. Decide which is correct and explain your thinking.

Reflection
Explanation 1

Reflection is the process of light bouncing off an object or surface. Only shiny objects like metal reflect light. If the shiny object is in the Sun, it will reflect light well. Rough and dull objects do not reflect light.

Reflection
Explanation 2

Reflection is when light bounces off an object or surface. All objects reflect light when they are held at the correct angle. Light can bounce off any object or surface, but they need to be at a special angle.

Reflection
Explanation 3

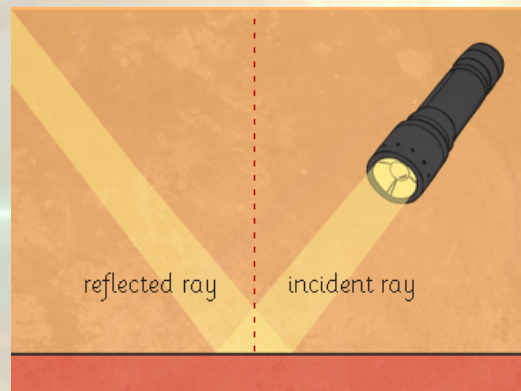
Reflection is the name for light bouncing off objects or surfaces. Smooth and shiny surfaces reflect light clearly, but all objects reflect light. Dull and rough surfaces scatter the reflected rays so they do not create a clear image.

Reflection
Explanation 4

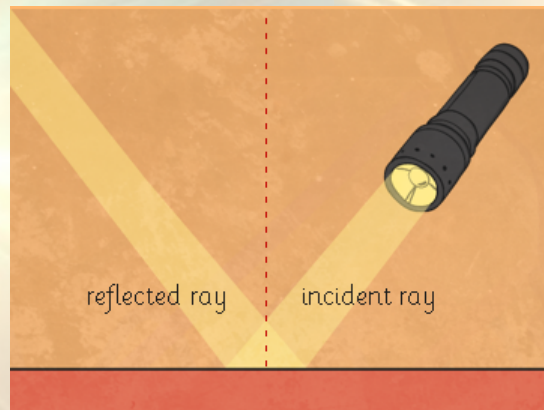
Reflection is when light is blocked by an object and a shadow is formed. The light cannot get through some objects, so reflection causes a darker area behind the object. Not all objects reflect light to make a shadow, just opaque ones.

Which of these statements do you think is correct? Explain why you think this, and try to use scientific vocabulary in your explanation.

- *Reflection* is when light bounces off a surface, changing the direction of a ray of light.
 - All objects reflect light.
- Smooth and shiny surfaces reflect all the rays of light at the same angle.
 - Rough or dull surfaces scatter the rays of light.

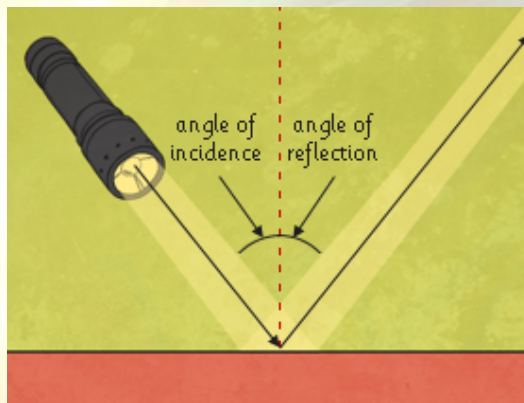


The light ray that hits the mirror or other object is described as the **incident ray**, and the ray of light that bounces off is known as the **reflected ray**.



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 (perpendicular) to the reflector.



What do we use to measure angles?

What is the soldier in the middle of the picture looking through?

Why is he looking through it?





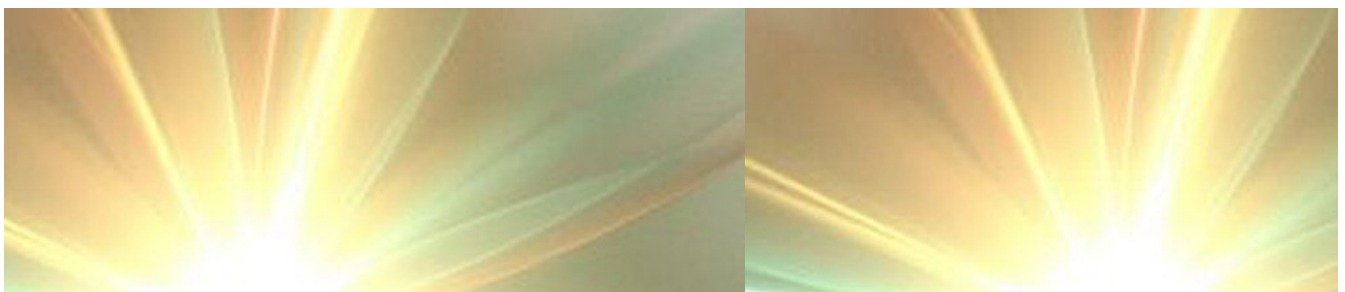
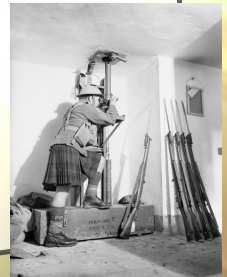
World War 2 Mission



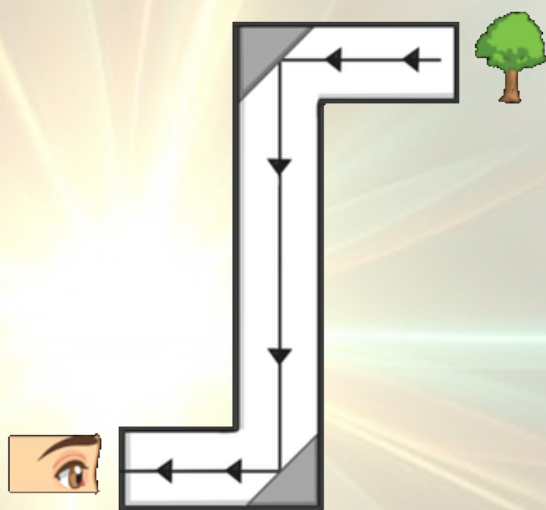
During WW2, there were many spies, who went into enemy territory to find out and send back information that would help to win the war.

These spies needed to be inconspicuous.

They used periscopes, which helped them to see around corners without revealing themselves.



Periscopes use the law of reflection to see round corners.



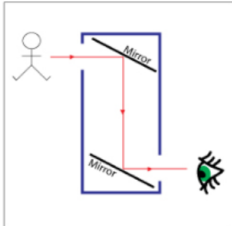
Can you think of any other examples of when periscopes would be useful?





Going Deeper

Is this image correct?
Explain your thinking.



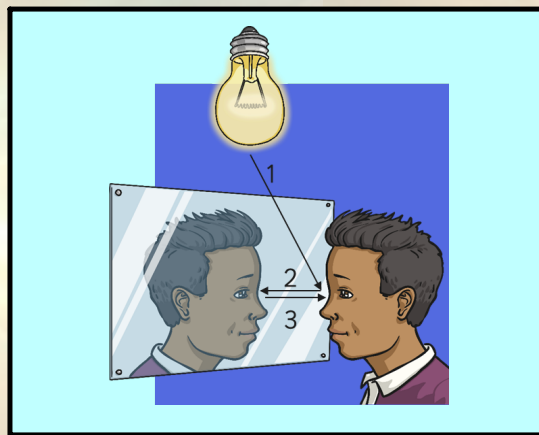
Going Deeper

Is this image correct?
Explain your thinking.

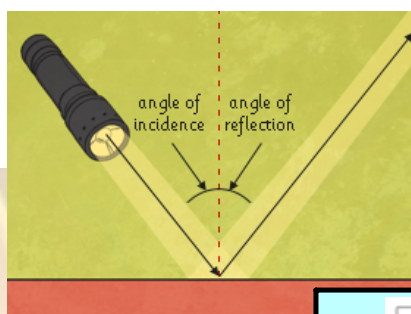


The boy's face is not flat, therefore it scatters light in all directions and not just in a single set angle.

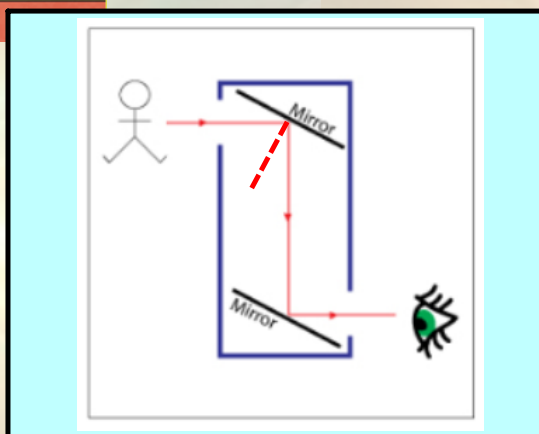
It is also important to remember that a light bulb emits light rays in all directions. The arrows in this diagram are only showing one ray.

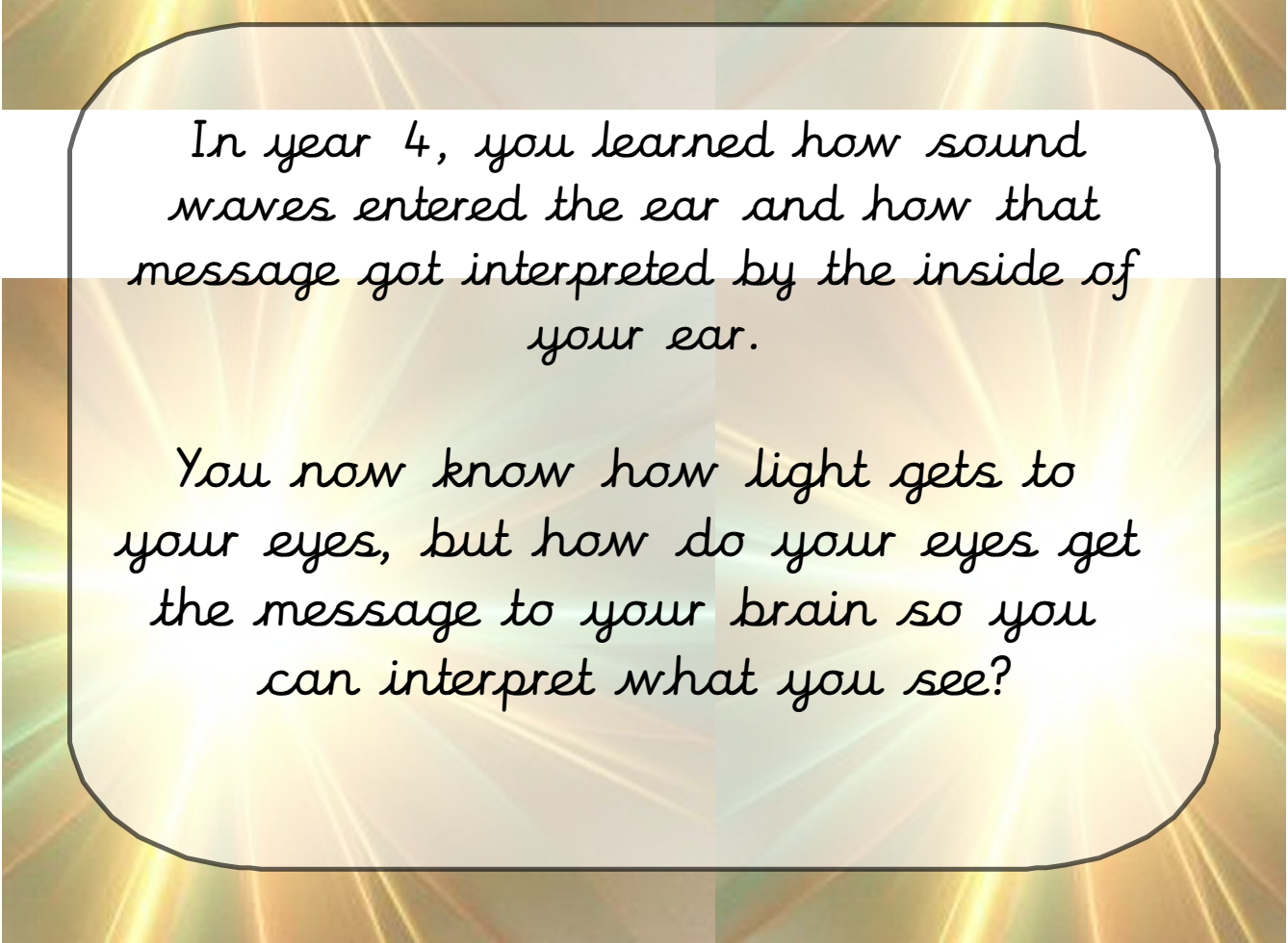


The mirrors are not at the correct angle.



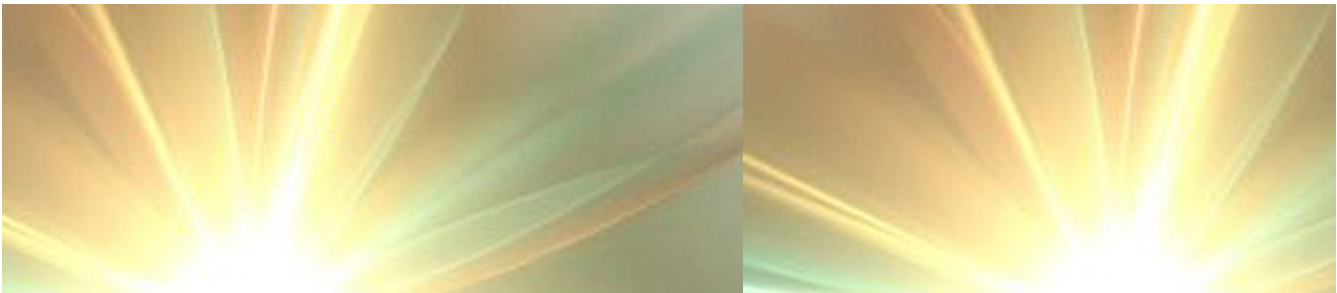
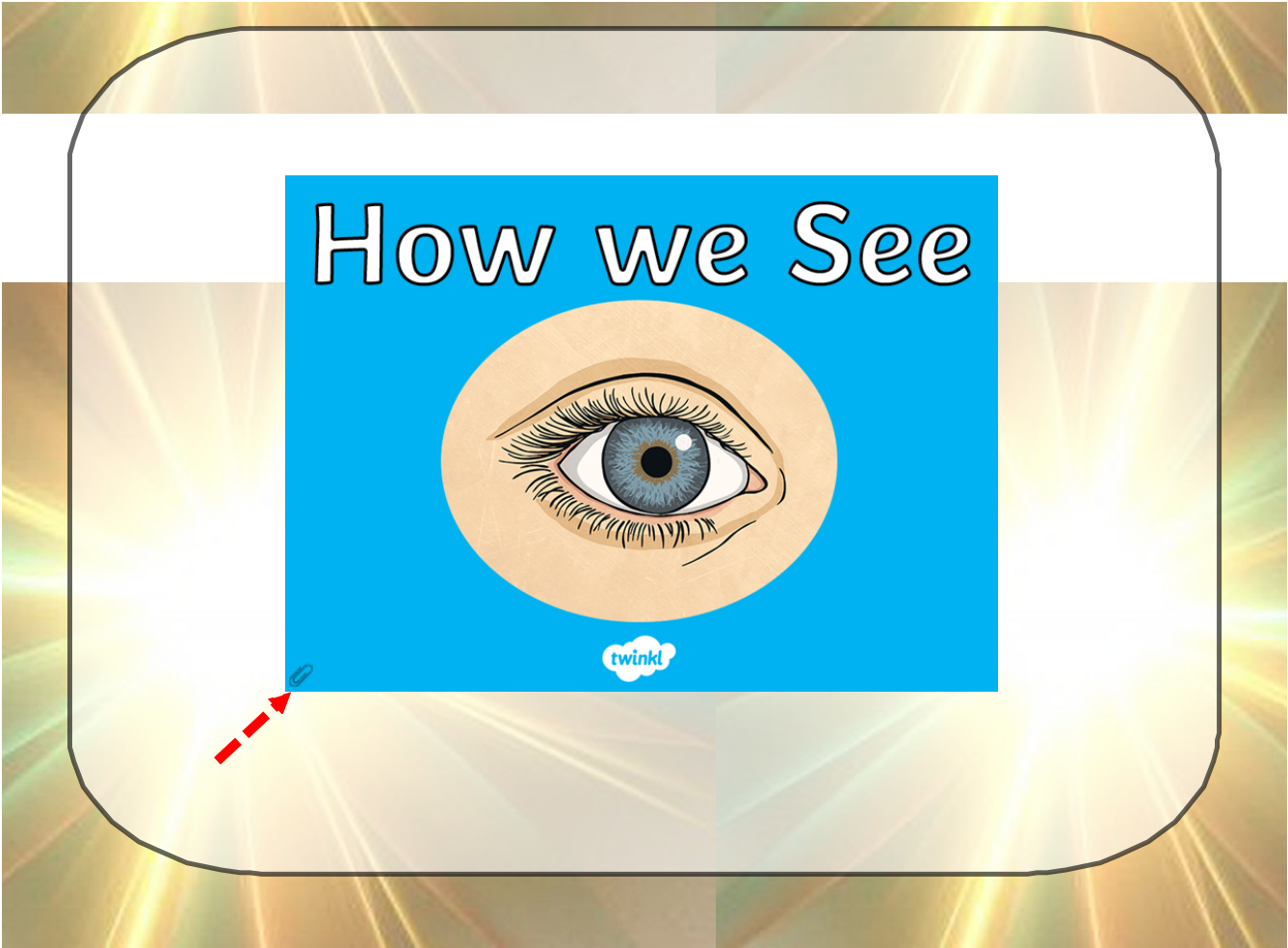
*The angle of incidence should be equal to the angle of reflection.
If we were to draw the normal line for this diagram, this would not be true.*





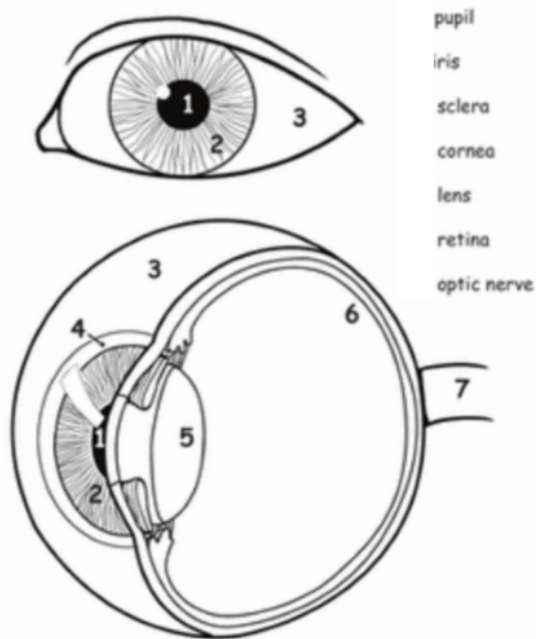
In year 4, you learned how sound waves entered the ear and how that message got interpreted by the inside of your ear.

You now know how light gets to your eyes, but how do your eyes get the message to your brain so you can interpret what you see?



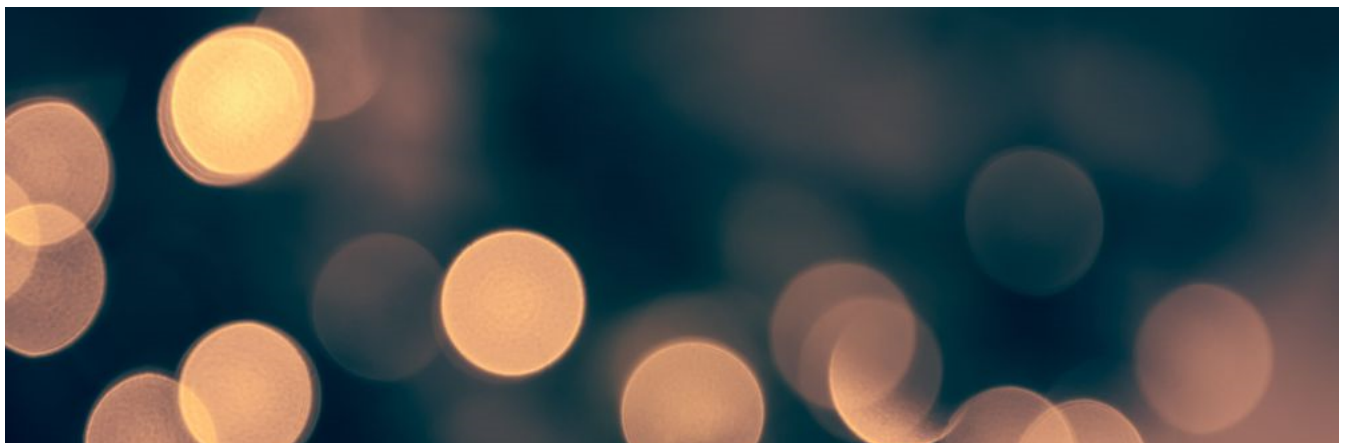
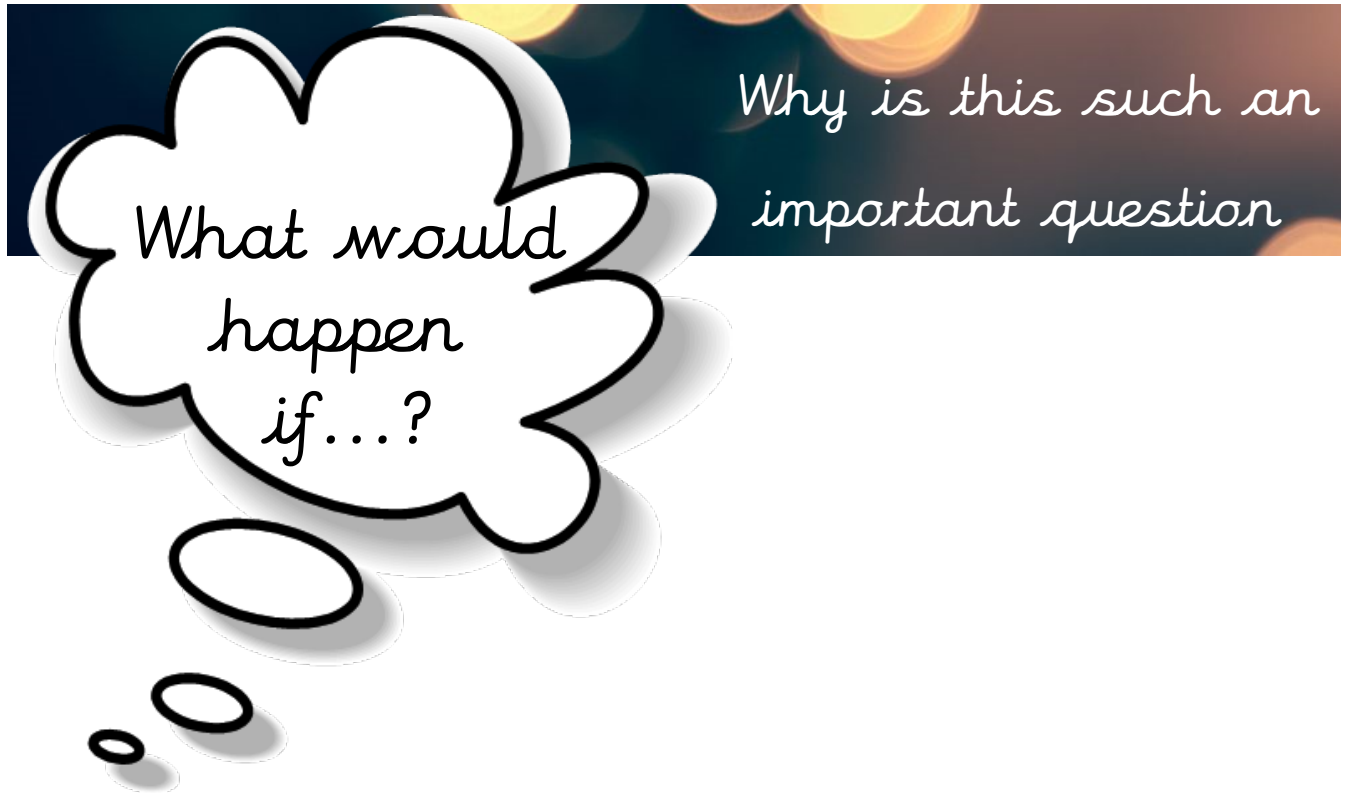
L.O. I am learning about how we see.

The Eye



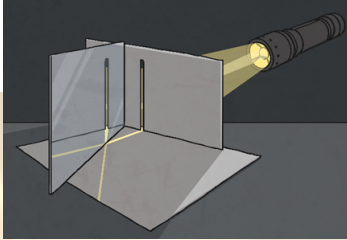
Task

Draw a labelled diagram of an eye and explain how it receives light and sends this as a message to your brain.

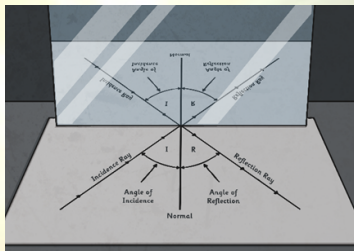


What would happen if...?

Home Challenge



Use blutack to stand a mirror up on a piece of white paper. Make a very narrow slit in a piece of card. Dim the lights and shine a torch through the slit towards the mirror.



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. Use a pencil and ruler to draw and label the incident and reflected rays on the paper. Draw a dashed line perpendicular to the mirror to show the normal line.

Attachments

How-we-See-Powerpoint.ppt