



KNOWLEDGE ORGANISER

SCIENCE: LIGHT UP YOUR WORLD

YEAR SIX

KEY KNOWLEDGE:

QUESTION 1: How are shadows formed?

ANSWER

A shadow is made when an object blocks light. The shadow appears on the side of the object furthest from the light source.

The object must be opaque or translucent to make a shadow. A transparent object will not make any shadow, as light will pass straight through it.

Opaque objects make dark shadows. Translucent objects make faint shadows.

- If an object is moved **closer** to the light source, the shadow gets bigger.
- If an object is moved **further** away from the light source, the shadow gets smaller.



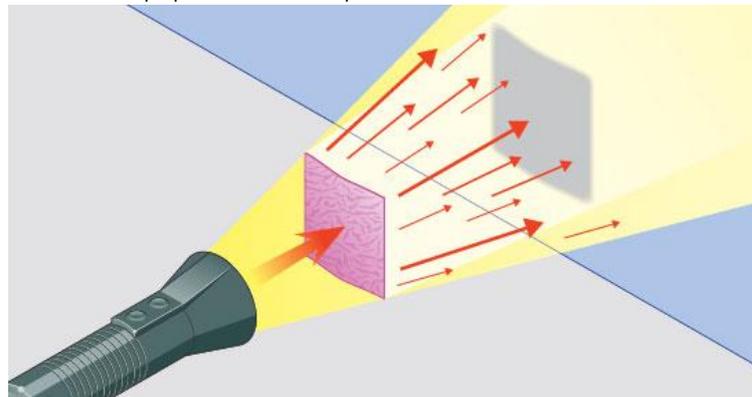
Transparent

Transparent materials let light pass through them in straight lines, so that you can see clearly through them. Glass is an example of a transparent material.



Translucent

Translucent materials let some light through, but they scatter the light in all directions, so that you cannot see clearly through them. Tissue paper is an example of a translucent material.





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Opaque

Opaque materials do not let any light pass through them. They block the light. Wood is an example of an opaque material.



QUESTION 2: How are Rainbows formed?

ANSWER

Rainbows happen when sunlight and rain combine in a very specific way. The beams of sunlight separate into the colors we see in the rainbow as they enter a raindrop. Sunlight is actually made up of different colors that we don't usually see. When a beam of sunlight comes down to Earth, the light is white. But, if the light beam happens to hit raindrops on the way down at a certain angle, the different colors that make up the beam separate so that we can see them — in the form of a rainbow.

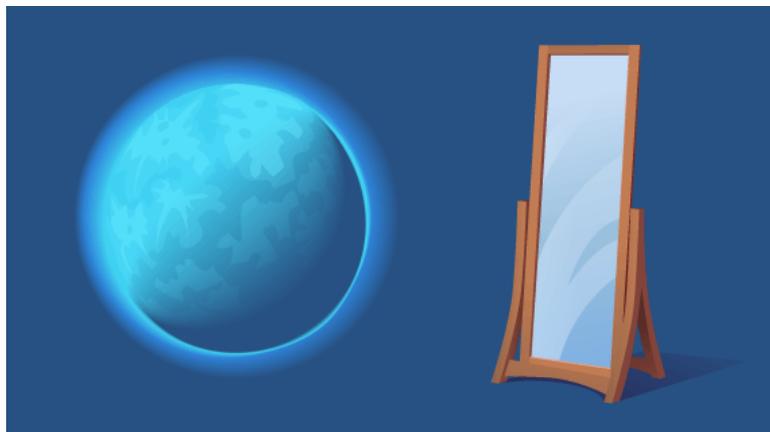
The angle for each color of a rainbow is different, because the colors slow down at different speeds when they enter the raindrop. The light exits the raindrop in one color, depending on the angle it came in, so we see only one color coming from each raindrop. Light at different angles coming through many raindrops form the rainbow that we see, in stripes of red, orange, yellow, green, blue, indigo and violet.

QUESTION 3: What is Light and what does it do?

ANSWER

A source of light makes light. The Sun and other stars, fires, torches and lamps all make their own light and so are examples of sources of light. Some animals, such as fireflies and glow-worms, are light sources. They make their own light to attract mates.

Reflection



- A mirror is not a source of light. It doesn't make its own light, it just reflects light.
- The moon is not a source of light. It reflects light from the Sun.

You would not be able to see a reflector of light, such as a mirror, in a completely dark room.

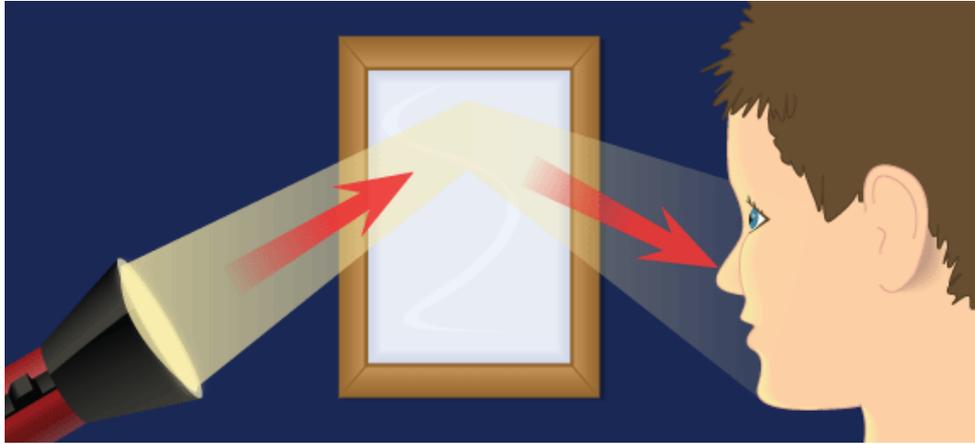


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Light travels in straight lines. When light hits an object, it is reflected (bounces off) and enters our eyes. This is how we see the object. When light from an object is reflected by a surface, it changes direction. It bounces off the surface at the same angle as it hits it.



Smooth, shiny surfaces such as mirrors and polished metals reflect light well. Dull and dark surfaces such as dark fabrics do not reflect light well.

Reflective surfaces

Reflective surfaces can be very useful.

- Mirrors inside cars reflect light to help drivers see objects behind them.
- Reflective strips on clothing and bikes help cyclists to be extra visible at night.
- 'Cat's eyes' on the road reflect light from car headlamps to help the driver see the road at night.