

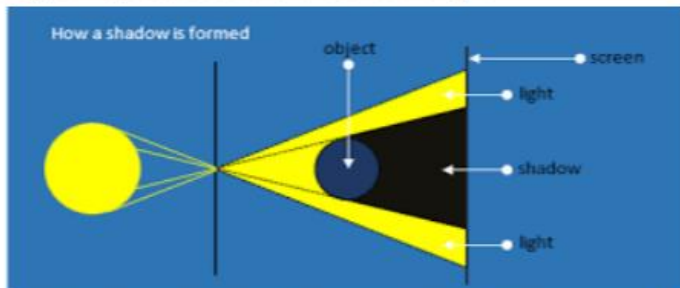
What we already know:

Certain things produce light (usually by burning or electricity)
 Shiny materials do not make light but do reflect it.
 Shadows are caused when certain materials block light.

What's next?

In KS3, children will look at the similarities and differences between light waves and waves in matter. Light waves travelling through a vacuum; speed of light. The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface
 Science. Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. Light colours and the different frequencies of light, white light and prisms, differential colour effects in absorption and diffuse reflection.

SHADOWS - Light travels in straight lines. This leads to shadows being formed because, if an object is in the way, the light will move in a straight line past it rather than surrounding it.

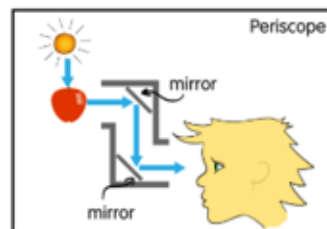
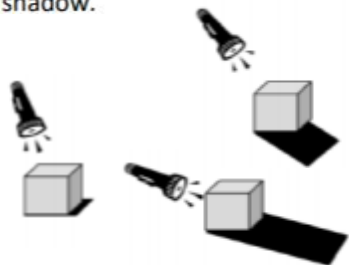


The shadows shape will be the same as the object which has blocked the light.



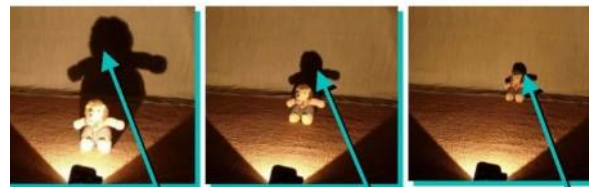
The size of the shadow changes as the light source moves, the further away from the light source the smaller the shadow is and the closer the light source is to the object the bigger the shadow.

The angle of the light source also makes a difference to the size of the shadow.



REFLECTION - When light from an object is reflected by a surface, it changes direction. It bounces off at the same angle 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.



LARGE SHADOW when the toy is close to the light

SMALLER SHADOW when the toy is further from the light

TINY SHADOW when the toy is a long way from the light

Know how the movement of light from source to object to eye can be explained.

LIGHT AND DARK - We need light so that we are able to see. Dark is the absence of light.

A light source can emit light by burning, electricity or chemical reactions, some examples include:

- Burning** – sun, flames from a fire, stars.
- Electricity** – lamps, car headlights, street lights.
- Chemical Reactions** – light is a product of the reaction e.g. glow sticks.

Example: light travelling and reflecting from a smooth surface.



Example: light travelling and reflecting from a rough surface.



Objects that block light will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object. Transparent objects will not block light. Opaque objects will obscure light (change the shape of the shadow)

Know that light contains seven colours (rainbow) and that these colours can be separated using water and prisms. This is called refraction.

Vocab

Tier One

- Reflect
- Light
- Shadow
- Dark
- Burning
- Angles
- Mirrors

Tier Two

- Emits
- Opaque
- Transparent
- Translucent
- Electricity
- Refraction

Tier Three

- Periscope