Ocean Academy Poole
an Aspirations Academy
Self-Worth | Engagement | Purpose

Learning Journey Map

Year: **6** Term: **Autumn 2**

Subject: **Science** Topic: **Light**

Driving Question: See Timecop: World War 2
Power Skill: See Timecop: World War 2

National Curriculum Learning Objectives

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Key Vocabulary

light	reflection	refraction	absorb	spectrum
transparent	translucent	opaque	concave	convex

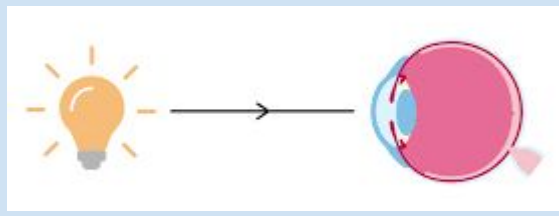
Key Learning

Revisit and revise: Year 3 Light Learning Journey Map.

Thinking Point
What do you remember about light from Year 3?
Tell your partner.

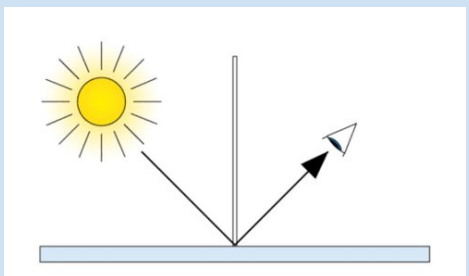


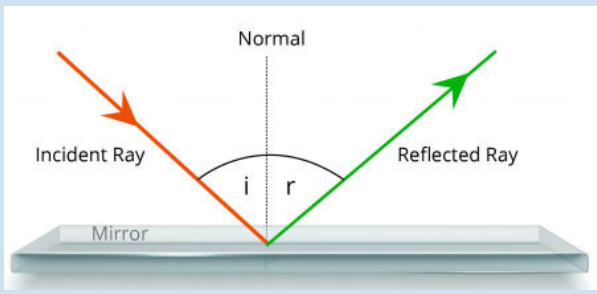
The light rays that leave a light source will travel in straight lines in all directions until they meet a material that changes their path. Some materials may stop light whereas others might allow light to travel through in a straight line. Other materials may scatter light rays in different directions, reflect light rays or even change the speed of the light rays which can cause the rays to change direction.

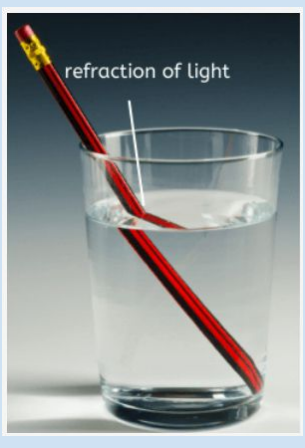


When light rays hit an object, they may; pass straight through (transmit), bounce off (scatter or reflect) or be stopped (absorb) – or a combination of these.

Reflection
Reflection is when light bounces off a surface, changing the direction of a ray of light. Light that is not reflected by objects is absorbed. Smooth materials, like mirrors, reflect lots of light and appear bright or shiny, while materials with rough surfaces scatter light in all directions and appear dull. Mirrors reflect light at the same angle.









Refraction
Refraction happens as the light rays travel at a slightly different speed. This causes the light to bend and change direction. For example, when light enters a more dense medium, such as water, the ray slows down.

Thinking Point
How can the path of light be changed?



Explore and Investigate
Investigating how shadows change with distance.
Conduct an investigation into shadows, to discover how shadows change in size and shape when the distance of the light source changes.

Resources:
Torches, transparent, translucent and opaque objects

‘Bringing Learning to Life: No Limits.No Barriers.’

Key Learning

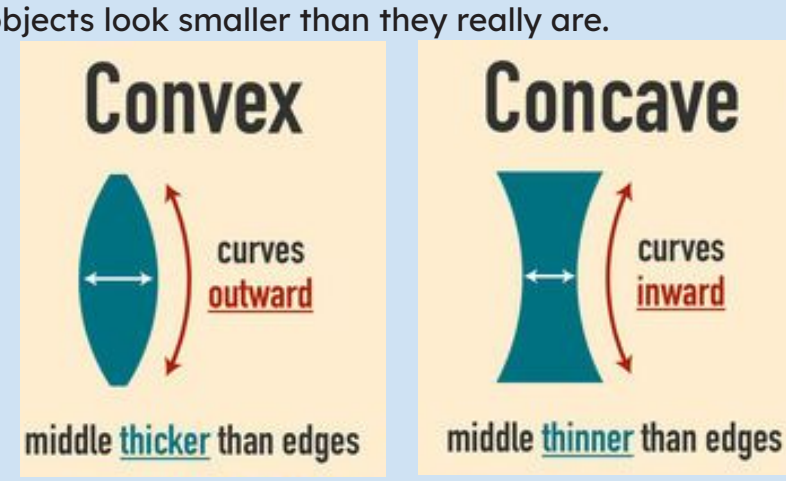
Convex and concave

A convex lens curves outward. It is thicker in the middle than at the edges. When light passes through a convex lens, the light rays bend toward each other. The rays meet at a single point on the other side of the lens. Convex lenses magnify objects, or make them look larger.

A concave lens curves inward. That means it is thinner in the middle than at the edges. When light passes through a concave lens, the light rays bend so that they spread apart. Concave lenses make objects look smaller than they really are.

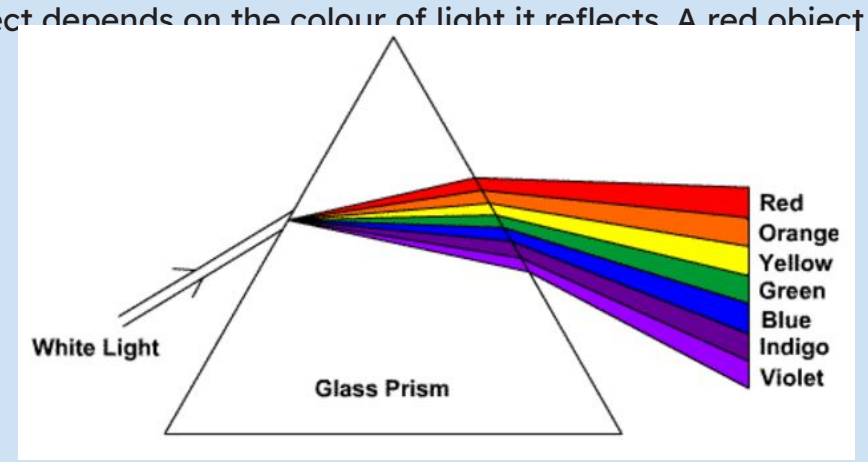
Thinking Point

How can lenses be useful in day to day life? What sort of objects use lenses and why?



Colour

White light is made up of different coloured light called a **spectrum.** You can see these colours when white light travels through a prism and is **dispersed.**The colour of an object depends on the colour of light it reflects. A red object will reflect red light and so on.



Transparent, translucent and opaque

A transparent material allows all light rays to pass through in a straight-line whereas an opaque material will not allow any light rays to pass through. The idea of a translucent material is quite difficult to explain and can lead to misconceptions being formed if not addressed with care. A translucent material only lets through some of the light rays. Some might be absorbed, and some might be reflected from the surface and therefore not pass through.

Thinking Point

Transparent, translucent and opaque objects create shadows. Do you agree?

Shadows

Light travels in straight lines. When light hits an opaque object, it is blocked and, therefore the area behind the object becomes dark. This is called a shadow. Totally transparent objects do not create shadows because light passes straight through them. Opaque objects make dark shadows. Translucent objects make faint shadows.

The size of the shadow depends on the distance between the object and the surface on which it appears. If the screen is moved further from the object, the shadow gets bigger.

The shape of a shadow is always determined by the shape of an object. When light hits an object at different angles, its shadow may appear stretched or squashed compared to what we see as the object’s shape.

Thinking Point

Why shadows have the same shape as the objects which cast them?

