Shadow

What is a Shadow?

- A shadow is a dark area formed when light is blocked by an opaque object.
- It is formed on the side opposite to the source of light.

A shadow is the dark area formed on a surface when an opaque object obstructs the path of light.

Simple Activity to Observe a Shadow

- Light a torch and direct its beam at a wall.
- Place an opaque object (like your hand) between the torch and the wall.
- You will see the shadow of your hand on the wall.
- If the torch is switched off, no shadow is formed.

Conditions Needed to Form a Shadow

For a shadow to be formed, three things are required:

i. A source of light (e.g., torch, Sun)

ii. An opaque object (e.g., hand, book)

iii. A surface/screen to catch the shadow (e.g., wall, ground)

Did You Know?

- Sundials, the world's earliest clocks, used shadows formed by the Sun to measure time.
- Multiple light sources create multiple overlapping shadows.
- Soap bubbles reflect light rays differently, creating beautiful swirling rainbow patterns due to light interference.

Properties of a Shadow

Always Black – A shadow is always black, no matter the object's colour.

Outline Only – A shadow only shows the shape (outline) of the object, not its colours or details.

Depends on Distance:

Shadow size and sharpness change based on:

- Distance between the light source and the object
- Distance between the object and the screen

Shadow Formation During the Day

As the Sun moves across the sky, the angle of sunlight changes, which changes the length of shadows:

Time of Day	Position of Sun	Length of Shadow
Morning	Low in the sky	Long shadows
Noon	Overhead	Short shadows
Evening	Low in the sky (opposite)	Long shadows again

This change is due to the Earth's rotation.

Formation of Day and Night

Why Do We Have Day and Night?

The Earth rotates on its axis once every 24 hours.

While rotating:

- The side facing the Sun has daylight.
- The side away from the Sun experiences night.

As the Earth continues to rotate, every place moves between day and night.

Rotation vs Revolution

- **Rotation** = Earth spinning on its own axis (causes day and night).
- **Revolution** = Earth moving around the Sun (causes seasons, not day/night).

Quick Summary

Concept	Key Points
Shadow	Formed when an opaque object blocks light
Needed for Shadow	Light source, opaque object, screen
Shadow Properties	Always black, only shape is visible, size depends on distance
Day and Night	Caused by Earth's rotation
Shadow Change	Shadow length varies due to Sun's angle during different times of the day