Formation of Shadow

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A shadow is formed when light is unable to pass through an opaque object.

When an opaque object obstructs the path of light, the area behind the object becomes dark due to the absence of light, forming a shadow.

- The rest of the surroundings remain illuminated as there is no obstruction to light.
- A shadow is always cast on the side opposite to the light source.

Conditions Required to Form a Shadow:

Presence of a Light Source: Shadows cannot be formed in the absence of light.

An Opaque or Translucent Object:

- Opaque objects create dark shadows as they completely block light.
- Translucent objects create faint shadows since they allow some light to pass through.
- Transparent objects do not form shadows because they allow all light to pass through.

A Screen or Surface: The shadow is visible when projected onto a surface.

Factors Affecting Shadow Size:

Distance from Light Source:

- When the object moves closer to the light source, the shadow becomes larger as it blocks more light rays.
- When the object moves away from the light source, the shadow becomes smaller as it blocks fewer light rays.

Shadow Formation by the Sun:

The position of the Sun affects shadow size throughout the day.

Morning and Evening:

- The Sun is lower in the sky, causing long shadows.

Noon:

- The Sun is at its highest point, creating the shortest shadows.
- This variation occurs due to the angle at which sunlight falls on objects at different times of the day.

Shadow Terminology:

Light Source: The origin of light responsible for shadow formation.

Core Shadow: The darkest part of the shadow where light is completely blocked.

Shadow Cone: The area where the shadow extends.

Cast Shadow: The actual shadow formed on a surface due to obstruction of light.

Screen: The surface on which the shadow is observed.