

# Light

- The objects emitting their own light are called **luminous object**. Example - sun, stars etc.
  - Emission of light by an organism is called **bioluminescence**.
  - The objects that do not emit their own light are **non-luminous objects**. Example - planets, chairs etc.
  - The objects that are produced by the humans to emit light are called **artificial light emitting objects**. Example - bulbs, LEDs
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- The objects that give out or emit light of their own are called **luminous objects**. Example: Sun.
  - **Types of objects**

| Transparent objects                                                           | Translucent objects                                                       | Opaque objects                                                   |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------|
| These objects allow light to pass through them.                               | These objects allow light to pass through them partially.                 | These objects do not allow light to pass through them.           |
| One can see clearly through transparent objects.                              | One can see through translucent objects but not very clearly.             | One cannot see through opaque objects.                           |
| Transparent objects do not cast a shadow because they do not block the light. | Translucent objects cast faint shadows as they block the light partially. | Opaque objects cast dark shadows as they block light completely. |

- **Classification of objects by sense of vision**

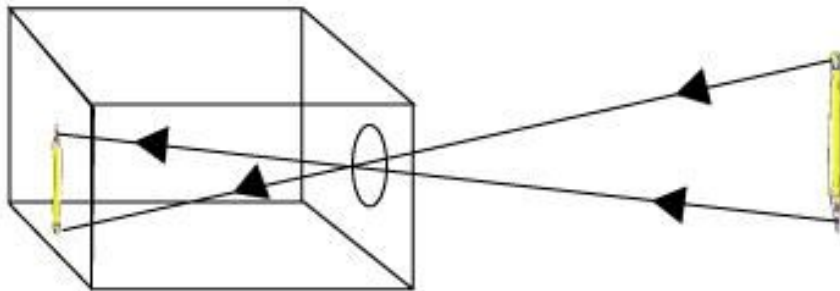
| Object/material | See-through | Shadow cast by it | Classification |
|-----------------|-------------|-------------------|----------------|
| Pencil          | Not at all  | Dark              | Opaque         |
| Paper           | Not at all  | Dark              | Opaque         |

|                |           |           |             |
|----------------|-----------|-----------|-------------|
| Ordinary Glass | Fully     | No shadow | Transparent |
| Water          | Fully     | No shadow | Transparent |
| Smoke          | Partially | Light     | Translucent |
| Butter paper   | Partially | Light     | Translucent |

- Light travels only in a straight line in all directions.
- This phenomenon is called the **rectilinear propagation of light**.
- Light emanating from a source (bulb) travels in all directions.
- The formation of image in a pinhole camera is a proof of **rectilinear propagation** of light.

| Medium      | Speed of light (in m/s) |
|-------------|-------------------------|
| Air/ Vacuum | $3 \times 10^8$         |
| Water       | $2.25 \times 10^8$      |
| Glass       | $2 \times 10^8$         |

- A **pinhole camera** is a simple optical device that forms an image without using a lens or a mirror.
- The image formed by a pinhole camera is **real, inverted, and diminished**.



- The formation of image in a pinhole camera is a proof of **rectilinear propagation** of light.
- Image form in the pinhole camera shows the colours of the object.
- A shadow is always dark and does not depend on the colour of the object. It is obtained only on a screen.
- We need a source of light and an opaque object to see a shadow on a screen.
- The formation of shadow shows that the light rays travel in a straight line.

- The size and nature of the shadow of an object depend upon its position from the source of light.
- **Sundial** is an instrument that measures the time of a day by the position of the shadow of an object cast by the sun.