

LIGHT, SHADOW AND REFLECTION

CHAPTER 12



Shadow on a screen (Wall)



- Raj was a small boy. One day when he was playing in the ground, he found that there was a black coloured long structure that was following him. He got frightened, the black long structure disappeared when he went in to the room. When he came out again he noticed that the same structure appeared again...
- He got frightened and did not leave his house, his mother noticed that and explained him that, that was a shadow and it was formed by the light that falls on him...
- Then he was fine to move out of his house.

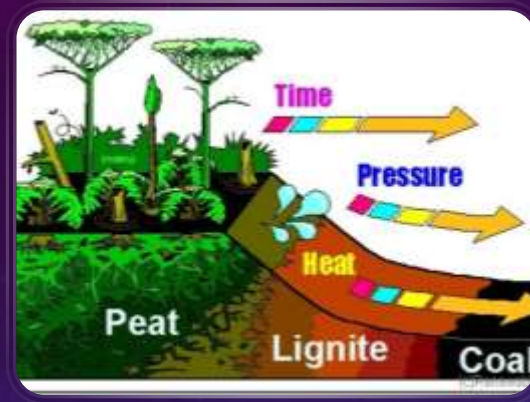
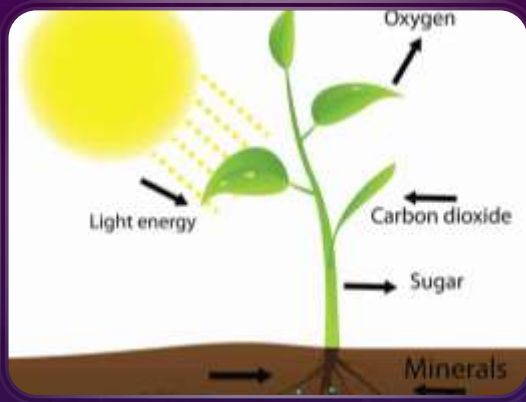
HOW THINGS AROUND YOU ARE VISIBLE...

- Because of the light.
- We can see the sunlight through the door hole...
- Light going from cinema projector to the screen...
- Can light pass through the room which is absolutely free from dust?..



LIGHT..

- Light is a form of energy. Which is essentially for life on a Earth.
- **How fast the light travel??**
- Galileo tried to measure the speed of light travel. But couldn't.....
- Light travel 3,00,000 km per second
- Appropriately $1/150^{\text{th}}$ of a second from Delhi to Chennai
- Time taken for the sunlight to reach the Earth is $8\frac{1}{4}$ min.



150,000,000 kilometers
300,000 km per second
= 500 seconds

The diagram shows a large, glowing yellow sun on the left and a smaller Earth on the right. The text is centered between them, providing the distance and the time it takes for light to travel that distance.

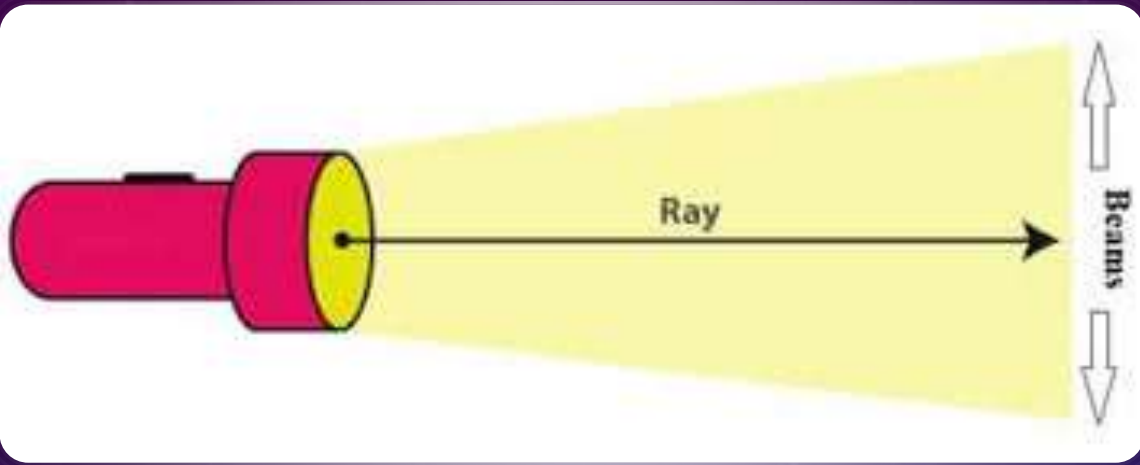
SOURCES OF LIGHT



- When the light hits the non luminous object it reflects back. Thus we are able to see the object.

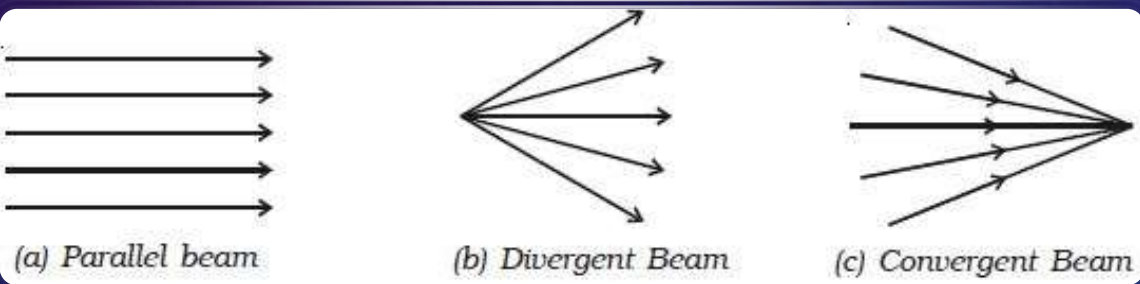
LIGHT TRAVELS IN A STRAIGHT LINE..

- <https://youtu.be/q5pzVJ197dc>



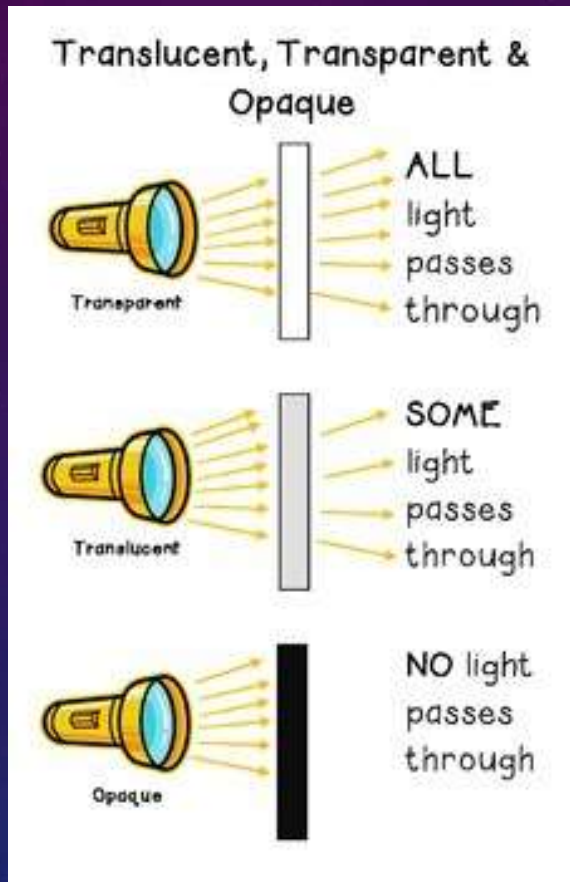
RAYS AND BEAMS

- Ray is a single narrow light path



- Beam is a many rays together

TRANSPARENT, TRANSLUCENT AND OPAQUE



Transparent Lets ALL light pass through	Opaque Lets NO light pass through	Translucent Lets SOME light pass through
		

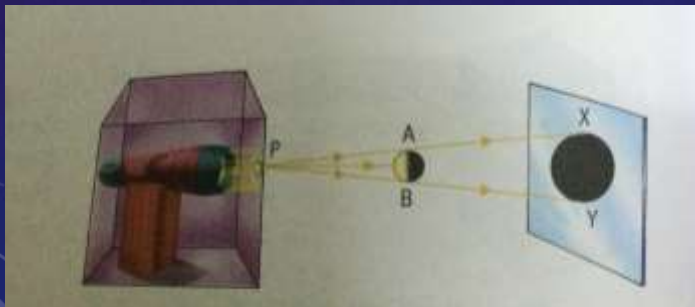
QUESTIONS??

- Travelling time of Sunlight to reach the Earth?
- Differentiate luminous and non luminous objects.
- What is rectilinear propagation of light?
- What is a ray and a beam?

SHADOW

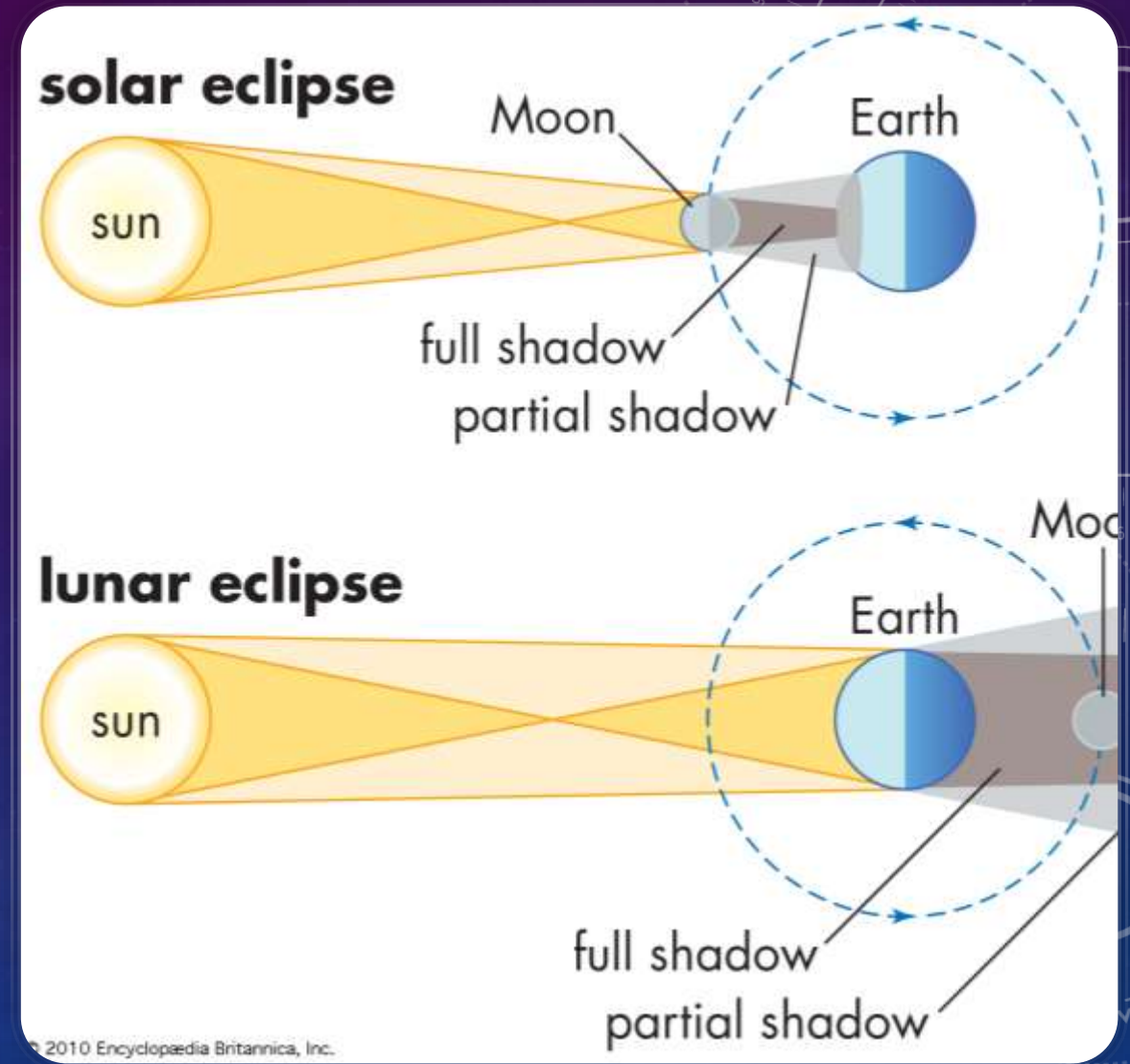


- A dark area or shape produced by a body coming between rays of light and a surface
- Few questions
- What is the colour of the shadow?
- Will it's colour change.
- Does it's shape and size change.
- Replace the object with the plastic, how is the image now?
- **A shadow is formed in the region where ray of light are stopped by an opaque object.**
- **A screen is needed for the shadow formation**

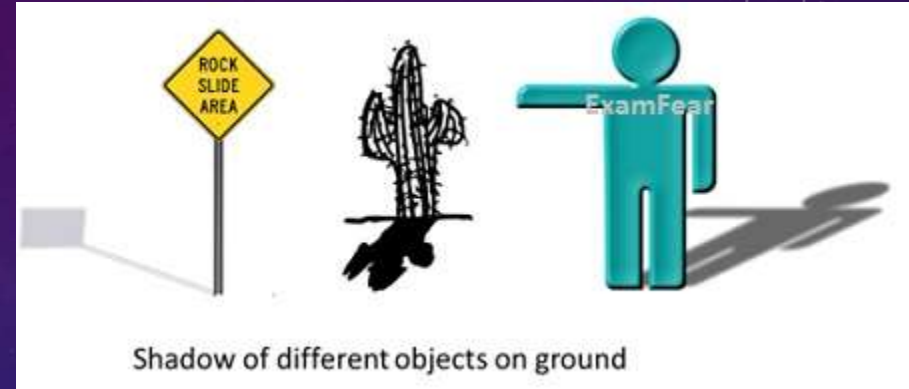


ECLIPSES

- Solar eclipse occurs in the new moon day
- Lunar eclipse occurs in the full moon day



SHADOW AND IMAGES



<i>Image</i>	<i>Shadow</i>
(1) It is formed by intersection of reflected rays.	(1) Shadow is formed when light does not reach behind the object.
(2) Image is seen when reflected rays approach to observer's eyes	(2) No light enters the observer's eyes.
(3) Image gives more information such as colour, structure etc.	(3) Shadow does not provide such information.
(4) Image can be straight or inverted.	(4) Shadow is never inverted.

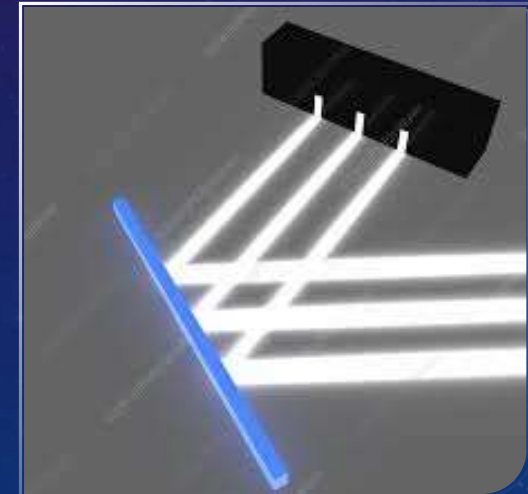
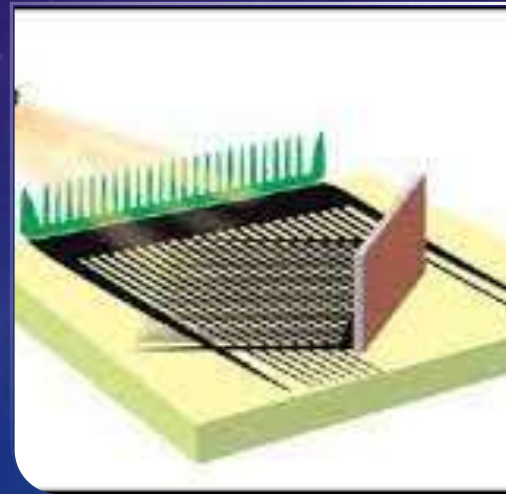
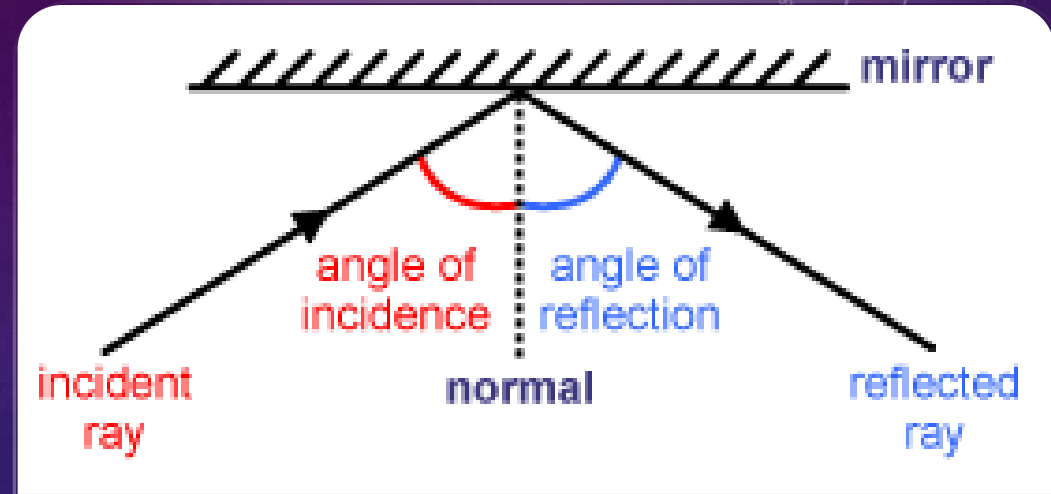


A PINHOLE CAMERA

- <https://youtu.be/cWr2jrBwLsY>

REFLECTION OF LIGHT BY A PLANE MIRROR

- A mirror changes the direction of the light that falls on it
- In other words, it reflects the light to a different direction



QUESTIONS

- 1) Characters of a shadow.
- 2) Differentiate shadow and image.
- 3) Law of reflection

