

Board:- CBSE

Class:-6<sup>th</sup>

Topic:- Light Shadows and Reflection

1. Rearrange the boxes given below to make a sentence that helps us understand opaque objects.

**O W S** **A K E** **O P A Q** **U E O** **B J E C** **T S M** **S H A D**

Ans: **O P A Q U E O B J E C T S M A K E S H A D O W S**

2. Classify the objects or materials given below as opaque, transparent or translucent and luminous or non-luminous:

Air, water, a piece of rock, a sheet of aluminium, a mirror, a wooden board, a sheet of polythene, a CD, smoke, a sheet of plane glass, fog, a piece of red hot iron, an umbrella, a lighted fluorescent tube, a wall, a sheet of carbon paper, the flame of a gas burner, a sheet of cardboard, a lighted torch, a sheet of cellophane, a wire mesh, kerosene stove, sun, firefly, moon.

Ans:

OBJECT	OPAQUE	TRANSPARENT	TRANSLUCENT	LUMINOUS	NON-LUMINOUS
Air	—	✓	—	—	✓
Water	—	✓	—	—	✓
A piece of rock	✓	—	—	—	✓
A sheet of aluminium	✓	—	—	—	✓
A mirror	✓	—	—	—	✓
A wooden board	✓	—	—	—	✓
A sheet of polythene	—	—	✓	—	✓
A CD	✓	—	—	—	—
Smoke	—	—	✓	—	✓
A sheet of plane glass	—	✓	—	—	✓
Fog	—	—	✓	—	✓
A piece of red hot iron	✓	—	—	✓	✓
An umbrella	✓	—	—	—	✓
A lighted fluorescent tube	✓	—	—	✓	—
A wall	✓	—	—	—	✓
A sheet of carbon paper	✓	—	—	—	✓
The flame of a gas burner	✓	—	—	✓	—
A sheet of card board	✓	—	—	—	✓
A lighted torch	✓	—	—	✓	—
A sheet of cellophane	—	✓	—	—	✓
A wire mesh	—	—	—	—	✓
Kerosene stove	✓	—	—	✓	—
Sun	✓	—	—	✓	—
Fire fly	✓	—	—	✓	—
Moon	✓	—	—	—	✓

3. Can you think of creating a shape that would give a circular shadow if held in one way and a rectangular shadow if held in another way?

Ans: Yes, many shapes give a circular shadow if held in one way and a rectangular shadow if held in another way. For example, a cylinder, a circular disc etc.

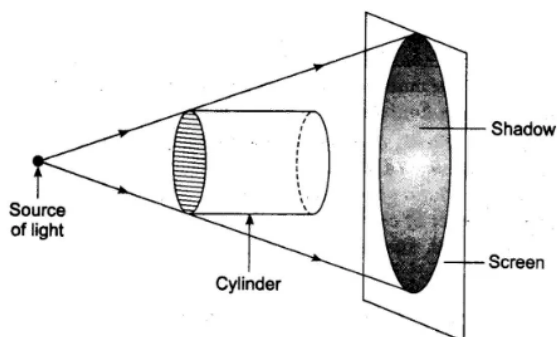


Fig. (a) Getting circular shadow with a cylinder

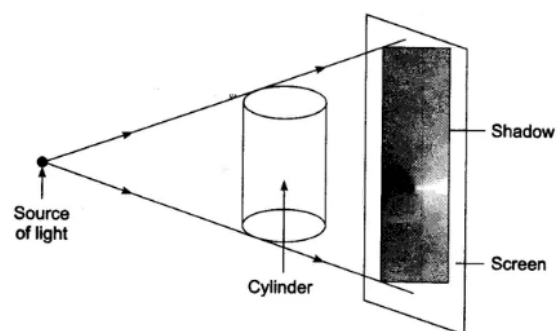


Fig. (b) Getting a rectangular shadow with a cylinder.

4. In a completely dark room, if you hold up a mirror in front of you, will you see a reflection of yourself in the mirror?

Ans: No, in a completely dark room, no image will be formed because there is no light in the room, so no reflection of light takes place, and no image will be formed.

## VERY SHORT ANSWER TYPE QUESTIONS

5. Whether the moon is a luminous or non-luminous body?

Ans: Moon is a non-luminous body.

6. What is umbra?

Ans: Umbra is the dark region behind object facing light that does not receive light at all.

7. How does a light ray travel?

Ans: Light ray travels in a straight line.

8. Give one natural source of light.

Ans: Sun is a natural source of light.

9. What is a shadow?

Ans: Shadow is the dark space behind an opaque object where light does not reach.

10. What is penumbra?

Ans: A penumbra is a less-dark shadow formed. The shadow present at the periphery of a dark shadow is known as the penumbra.

## SHORT ANSWER TYPE QUESTIONS

11. State the difference between a luminous and a non-luminous body.

Ans: The bodies which emit light are called luminous bodies. Example: sun, stars, burning candle etc. The bodies that do not emit light are called non-luminous bodies: moon, earth, and blackboard.

12. Why is the moon not considered a luminous body?

Ans: Moon is a non-luminous body because it shines by reflecting the sunlight falling on it.

13. What is an incandescent body? Give an example.

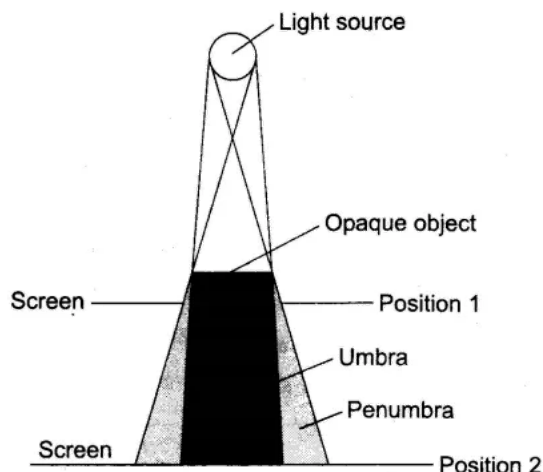
Ans: The bodies which emit light when heated to a very high temperature are called incandescent bodies. Example: electric bulb.

14. When does a shadow form?

Ans: Shadow is formed when light does not reach behind the opaque object kept in the path of light

15. Draw a diagram to illustrate the formation of umbra and penumbra.

Ans:



16. What are the essential conditions for the formation of shadow?

- Ans: (1) There should be an opaque material.  
 (2) There should be a source of light and screen.

The object must be placed in the path of light. Then shadow is formed on the screen.

17. Define reflection of light.

- Ans: Reflection is a phenomenon that occurs when light rays return to the same medium after striking the smooth and shiny surface.

18. Write the difference between shadow and image.

Ans:

Image	Shadow
(1) The intersection of reflected rays forms it.	(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.

19. How will you convert a glass sheet into a translucent sheet?

- Ans: There are the following two methods to convert a glass sheet into a translucent sheet:

(i) By smearing a thin layer of oil on a glass sheet.

(ii) By covering a side of the sheet with butter paper.

20. What is a shadow? How does the colour of an opaque object affect the colour of the shadow?

Ans: A dark outline or patch formed by an opaque object blocks light coming from a light source is called a shadow. The colour of an opaque object does not affect the colour of the shadow.

21. Write the differences between umbra and penumbra.

Ans:

Umbra	Penumbra
(1) It is the darkest part of a shadow.	(1) It is a less dark part of a shadow.
(2) No light reaches this region.	(2) Light from some parts of the source reaches.
(3) It is the central part of a shadow.	(3) It is the outer part of a shadow.

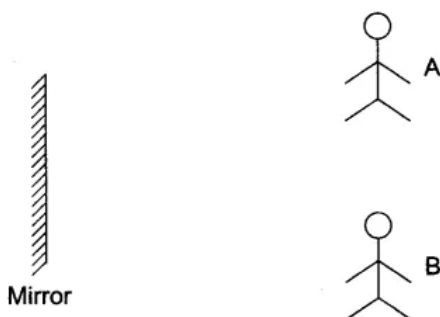
22. What do we need to see a shadow?

Ans: We need: (i) A source of light, (ii) a screen (in) an opaque object.

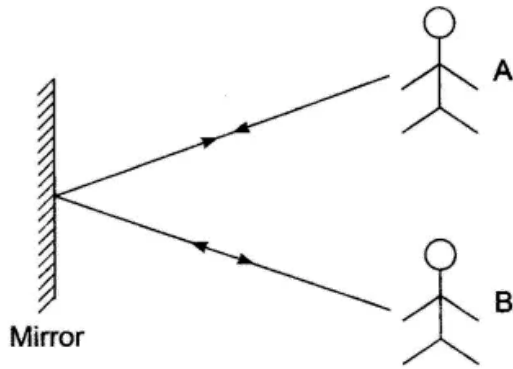
23. What do you mean by scattering of light?

Ans: When a beam of light falls on a rough surface, it is turned back in different directions. It is called the scattering of light.

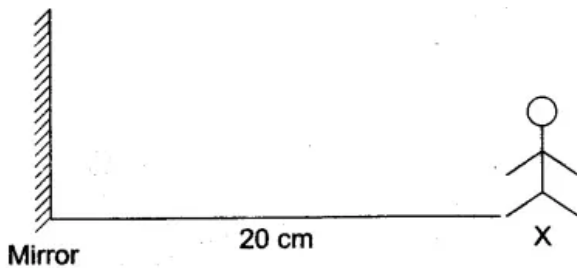
24. A and B are facing the mirror and standing so that A can see B and B can see A. Explain this phenomenon.



Ans: The light rays from A fall on the mirror and get reflected and reach B; B's light falls on the mirror and reflects on reaching A. The path of light is just reversed, as shown.



25. 'X' is 20 cm away from the mirror. If he moves few steps closer to the mirror, what will happen to the image



Ans: The size of the image will be the same as the size of the object.

26. Write the mirror image of 'SMART'?

Ans: THAM8

27. Have you ever seen an ambulance? It is written in the form of a mirror image on vehicles. Explain why it is done so and give the mirror image of AMBULANCE.

Ans: The mirror image of AMBULANCE is aovt/yuaMA.

It is written so on the vehicles that people can see in their rearview mirrors, read it correctly and immediately give way to the vehicle as it carries patients who need urgent medication.

28. You have to cast the shadow of your pencil on the wall with the help of a candle in a dark room. How can you obtain the shadow of the same size, small size and big size of the same pencil?

Ans: (a) The pencil's shadow will be small when the pencil is taken close to the wall and away from the candle.

(b) The shadow will be big when the pencil is taken closer to the candle.

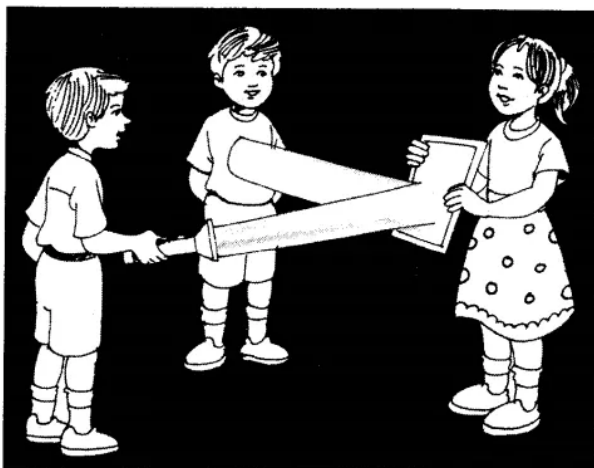
(c) To get the same sized shadow as the pencil is, adjust the distance between the wall, pencil and candle at equal distances.

## LONG ANSWER TYPE QUESTIONS

29. What is the reflection of light? Explain the reflection of light with the help of an activity.

Ans: When light rays fall on a highly polished (e.g. mirror) smooth surface and return to the same medium, it is called reflection of light.

Activity to show the reflection of light: This activity should be done at night or in a dark room. Ask your friend to hold a mirror in his hand at one corner of the room. Next, stand at another corner with a torch in your hand. Cover the glass of torch with your fingers and switch it on. There should be a small gap between your fingers. Direct the beam of torchlight onto the mirror that your friend is holding. Adjust the direction of the torch, so that patch of light falls on your friend standing in the room. This activity shows the reflection of light also that light travels in a straight line.

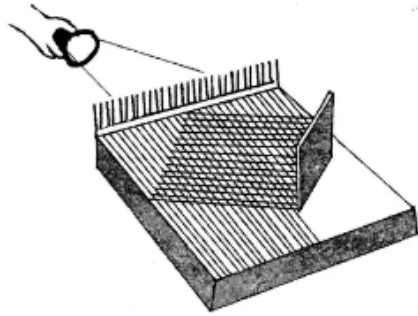


**Fig.** A mirror reflects a beam of light

30. Explain how light travels with the help of an activity.

Ans: Take a comb and fix it on one side of a thermacol sheet. Fix a mirror on the other side, as shown in the figure. Spread a dark coloured sheet of paper between the mirror and the comb. Send a beam of light from a torch through the comb. You get a pattern of light similar to that shown in the figure.

This activity explains how light travels and gets reflected from a mirror.



**Fig.** Light travelling in a straight line and getting reflected from a mirror

31. Explain that light has the property of rectilinear propagation.

**Ans:** We take three pieces of cardboard. Place them one on top of one another and make a hole in the middle of each cardboard by using a thick nail. Erect these cards up on the table at a short distance away from each other. Take a candle that is of the same height as the holes in the cards. Light the candle and place it in front of the cards. We see that candlelight is visible only when the holes on the cards lie in a straight line. If we disturb them, the light of the candle disappears. This experiment shows that light propagates in a straight line.

