



Q: What is light and what is the difference between natural and artificial sources of light?

Light:

Light is a form of energy that helps us to see things around us.

- We are unable to see in the dark.
- The Sun is the biggest source of light. Life will not exist on earth without it.
- Light travels at the speed of 300,000 km/s.
- It takes about eight minutes to reach the earth from the sun.

Students' Learning Outcomes

Identify natural and artificial sources of light.

Short Questions

1. What is light?
2. What is the speed of light?
3. Differentiate between natural and artificial sources of light.
4. What would have been the situation without the Sun?

Sources of light:

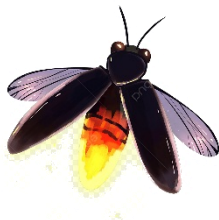
There are two types of sources of light.

Natural sources of light

Natural sources of light are present naturally and have not been made by human beings.

For example:

- ✚ The Sun
- ✚ Stars
- ✚ Moon
- ✚ Fireflies



Artificial sources of light

Artificial sources of light are man-made.

They do not occur naturally.

For example:

- ✚ Torch
- ✚ Bulb
- ✚ Candle
- ✚ Lamps





Q. How does light travel?

How light travels?

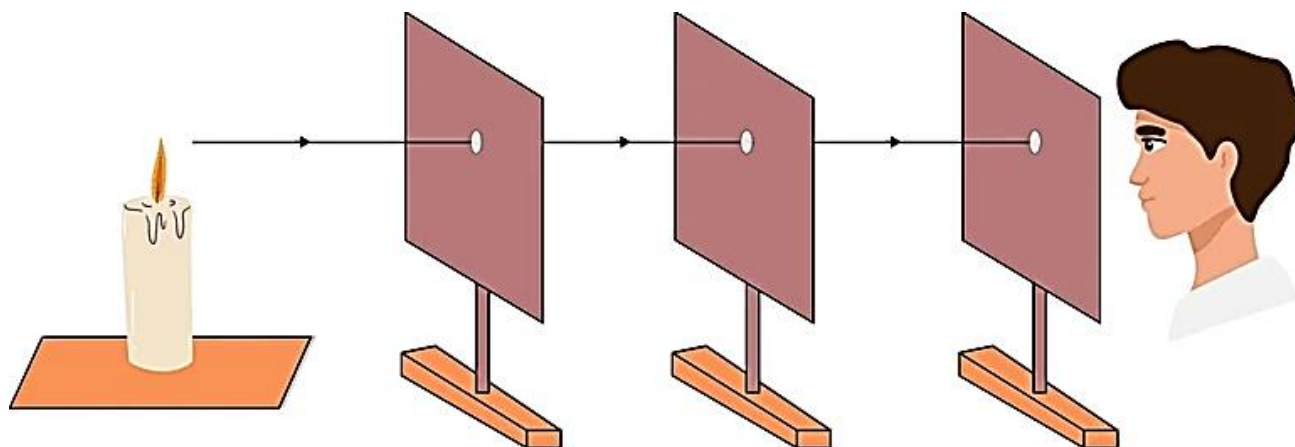
Light coming from a source always travels in a straight line.

This is the fact behind:

- ❖ Shadow formation.
- ❖ Eclipse formation.

Experiment:

1. Take three similar card boards of same size.
2. Make holes in the center of these cards.
3. Place them on a table in a straight line.
4. Light a candle and place it on one side of the cardboard in such a way that flame is in front of the holes in the card boards.
5. You can see the flame.
6. Now move any one of the card so that holes are not in straight line.
7. Now you cannot see the flame of the candle.
8. This experiment proves that *“light travels in a straight line”*.



Students' Learning Outcomes

Justify that light emerges from a source and travels in a straight line.

Investigate that light travels in a straight line.

Short Question

Write down the properties of light.

Ans: Light travels in a straight line. When an opaque object blocks the way of light, it forms a shadow.



**Q. What are the different types of objects on the basis of light production?
Differentiate between luminous and non-luminous objects.**

Type of objects on the basis of Light production

According to production of light, there are two types of objects.

Students' Learning Outcomes

Investigate luminous and non-luminous objects in daily life.

Luminous objects:

The objects which emit their own light are called luminous objects.

For example:

- ❖ Candle
- ❖ The Sun
- ❖ Stars
- ❖ Bulb

Exercise based Short Question

6. Wood and charcoal are naturally non-luminous objects. Can they be made luminous? How?

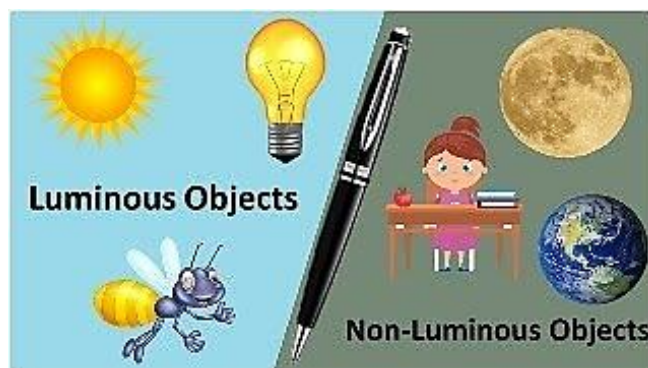
Answer: Wood and charcoal are naturally non-luminous objects. But we can make them luminous by burning them.

Non-luminous objects:

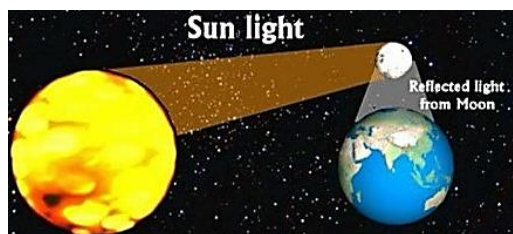
The objects which do not emit their own light are called non-luminous objects.

For example:

- ❖ Books
- ❖ Chair
- ❖ Moon
- ❖ Planets



Note: Though moon looks luminous but it is a non-luminous object. Because it does not have its own light. It shines because of the light reflected from the Sun.



Exercise based Short Question

6. The Moon is non luminous object like our Earth. How does it look luminous to us?



Q. Differentiate between transparent, opaque and translucent objects with examples.

Type of objects on the basis of light passing through them:

There are three different types of objects on the basis of light passing through them.

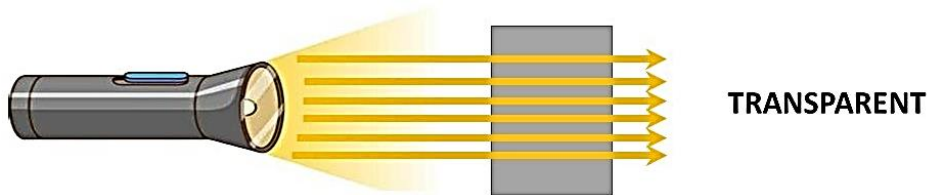
Students' Learning Outcomes

Identify and differentiate between transparent, opaque and translucent objects in their surroundings.

Transparent objects

Transparent objects are those objects which allow all the light to pass through them.

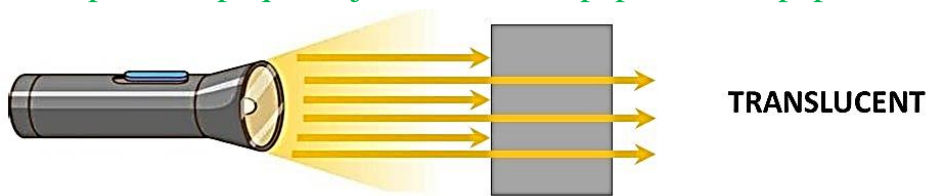
- + We can clearly see through them.
- + For example, glass, transparent sheet, glass pane window etc.



Translucent objects

Translucent objects are those objects which allow some light to pass through them.

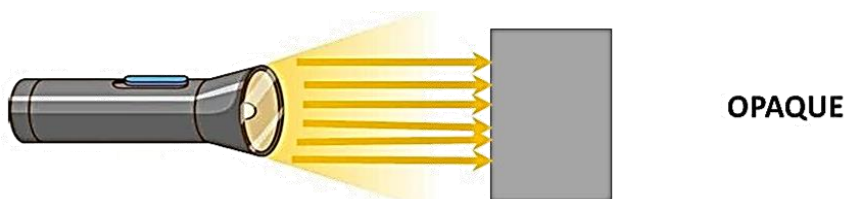
- + We cannot see things clearly from translucent objects.
- + Things appear blur behind these objects.
- + Examples of opaque objects are tissue paper, butter paper etc.



Opaque objects

Opaque objects are those objects which do not allow any light to pass through them.

- + We cannot see through these objects.
- + For example, wood, metals, brick wall etc.





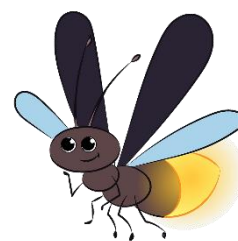
Activity 6.1

Some light sources are given below. Tick ✓ the natural sources of light.



✓

✓



✓

✓

Exercise based activity

Objects	Completely	Partially	Do pass at all
1. Window pane	✓		
2. Wax paper		✓	
3. White thin cloth (dupatta)		✓	
4. Geometry box			✓
5. Kite paper		✓	
6. Tissue paper		✓	
7. Wooden door			✓
8. Clean water	✓		
9. Cardboard			✓



Short Question

7. Define the following terms with examples:

- a) Transparent
- b) Translucent
- c) Opaque



Exercise based Short Question

8. What is transparent object?

Write the names of the three transparent objects.

Activity 6.2

Tick ✓ the non-luminous objects from the given objects given below.

			
✓	✓	✓	✓
			
			



How shadow is formed?

Shadow:

A shadow is a dark area that appears when an object blocks light.

Shadow formation:

Shadow formation needs three things:

1. A light source.
2. An opaque object
3. A screen where shadow is to be formed.

Students' Learning Outcomes

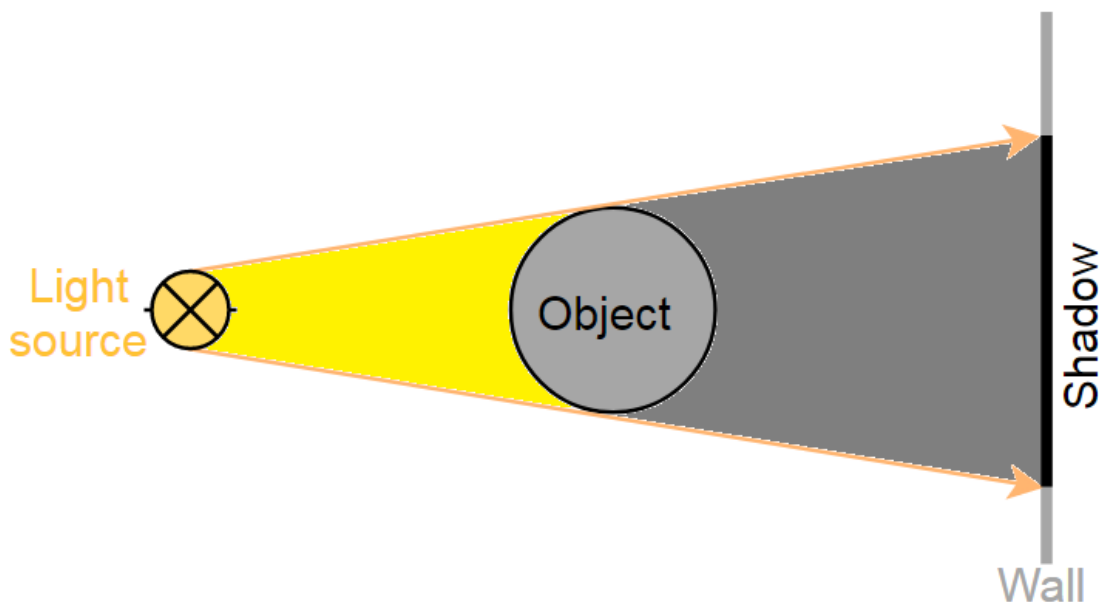
Explain the formation of shadows.

Short Question

Which three things are needed to form a shadow?

What is the shape of rotating objects?

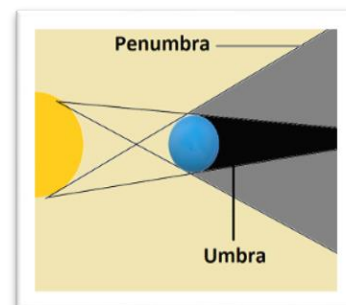
Ans: The rotating object does not have a clear shadow when it is in circular motion.



Types of shadow: (Umbra and Penumbra)

Umbra: The darker shadow is called umbra.

Penumbra: The lighter shadow is called penumbra.





When the shadow is bigger and smaller?

Size of shadow:

Size of shadow depends upon:

1. Distance between object and light source:

- ❖ If light source is closer to the object, the shadow will be larger.
- ❖ And if light source is away from the object, the shadow will be smaller.

2. Position of the light source.

Size of shadow also changes with the position the light source. Like, size of shadow is smallest during afternoon and longest at morning and evening.

- ❖ Light from above makes a shorter shadow.
- ❖ Light from side makes a longer shadow.



Students' Learning Outcomes

Predict the location, size and shape of a shadow from a light source relative to the position of objects.

Exercise based Short Question

9. When is your shadow the shortest and the longest in the sunlight?

Exercise based Short Question

10. Can you be the winner while running with your shadow? Give the reason also.

Answer: No, we cannot be winner while running with our shadow because our shadow is attached with us and it is difficult to leave it behind



Q: What is the shape of shadow of an object?

Shape of the shadow:

The shape of the shadow looks like the shape of the object. For example,

- ❖ Shadow of a tree.
- ❖ Shadow of a house.
- ❖ Shadow of a person.

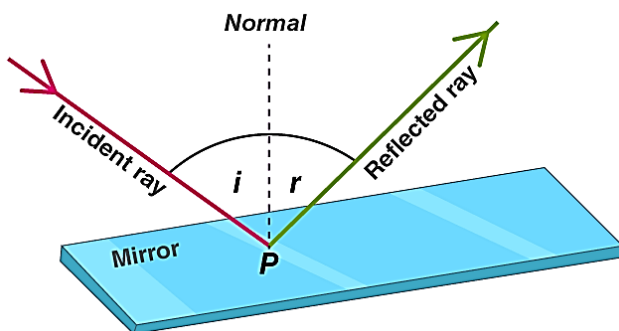


Define the reflection of light.

Reflection of light:

The bouncing back of light from a surface is called reflection of light.

- ❖ Smooth, shiny surfaces reflect more light.
- ❖ Dull, rough surfaces reflect less light.



Students' Learning Outcomes

Demonstrate that shiny surfaces reflect light better than dull surfaces.

Short Question

What kind of objects reflect more light?

Short Question

How did sailors communicate before the invention of radio?

Ans: The sailors used light signals for communication before the invention of radio.

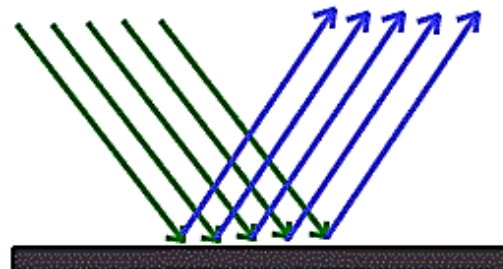


Differentiate between regular and diffused reflection.

There are two types of reflect:

Regular reflection:

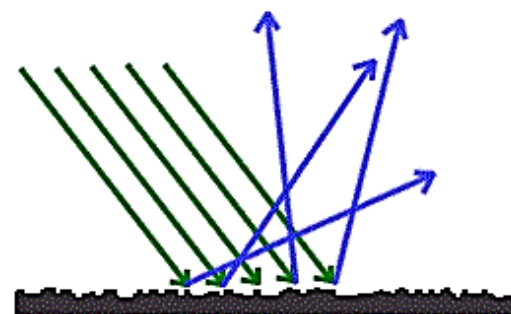
When light falls on a shiny or polished surface, it reflects almost all the rays of light with the same angle, this is called reflection of light.



Regular reflection

Irregular/ Diffused reflection:

When rays of light fall on a dull or unpolished surface, it reflects some of the light rays but spreads the rays in all directions, this is called diffused reflection.



Irregular reflection

Short Question

Q: Light is not reflected by a dark surface. Explain your answer.

Ans: The dark surface absorbs all the light so that a dark surface does not reflect any light.



Choose the right option.

1. How does light travel?

- a. In a circle b. Along curved path. c. Along straight line d. In dispersed path.

Reason: Light travels in straight lines in a uniform medium. This property is fundamental to the behavior of light and is observed in various optical phenomena such as shadows and reflections.

2. Which object reflects maximum light?

- a. White paper b. Coloured paper c. Mirror d. Brick wall

Reason: A mirror reflects nearly all the light that hits it, making it highly reflective compared to other objects like white paper, colored paper, or a brick wall.

3. A boy is standing in front of a light source, his shadow is formed because boy is:

- a. Opaque b. Transparent c. Translucent d. Non-luminous

Reason: The Sun is a natural source of light as it emits light and heat through nuclear fusion processes. In contrast, a torch, candle, and bulb are artificial sources.

4. Identify the natural source of light?

- a. Torch b. Candle c. The Sun d. Bulb

Reason: The Sun is a natural source of light as it emits light and heat through nuclear fusion processes. In contrast, a torch, candle, and bulb are artificial sources.

5. Which of the following object is transparent?

- a. Glass window b. Wood c. Metal d. Paper

Reason: A glass window is transparent because it allows light to pass through it clearly, whereas wood, metal, and paper are not transparent.

6. When the source of light is nearer to an object, it makes a shadow:

- a. Smaller b. Dim c. Larger d. Inverted



Reason: When a light source is closer to an object, the shadow it casts is larger because the light spreads out more as it travels further from the object.

7. Which of the following give of its own light?

- a. Book b. Chair c. The Moon d. Candle

Reason: A candle emits its own light through the process of burning. In contrast, a book, chair, and the Moon do not emit light; they reflect it.

8. Which of the following is the artificial source of light?

- a. Candle b. Firefly c. The Sun d. Stars

Reason: A candle is considered an artificial source of light because it is man-made, unlike fireflies, the Sun, and stars, which are natural sources.

9. Light travels at the speed of:

- a. 100, 000 km/s b. 200, 000 km/s c. 300, 000 km/s d. 400, 000 km/s

Reason: Light travels at approximately 300,000 kilometers per second in a vacuum, which is its maximum speed.

10. The objects which emit light are called:

- a. Luminous b. Non-luminous c. Transparent d. Opaque

Reason: Luminous objects are those that emit light, such as the Sun, light bulbs, and candles.

11. The objects which allow all the light to pass through them are called:

- a. Transparent b. Translucent c. Opaque d. Luminous

Reason: Transparent objects allow all light to pass through them without significant scattering, making them clear.

12. The bouncing back of light is called:

- a. Refraction b. Reflection c. Diffraction d. None of these

Reason: Reflection is the process by which light bounces back after hitting a surface, such as a mirror or water.

13. The light from the Sun to earth reaches in:

- a. 2 Minutes b. 4 Minutes c. 6 Minutes d. 8 Minutes



Reason: Light from the Sun takes approximately 8 minutes to reach Earth. This is because light travels at 300,000 kilometers per second, and the average distance from the Sun to Earth is about 150 million kilometers.

14. A shadow is the blocking of:

- a. Air b. Sound c. Light d. Water

Reason: A shadow is formed when an object blocks light from a source, preventing it from reaching certain areas and creating a dark shape on the opposite side.

15. Light is a form of:

- a. Mass b. Energy c. Weight d. Matter

Reason: Light is a form of energy that travels through space and can be absorbed, reflected, or transmitted by different materials.

16. Shadows are shortest during:

- a. Dawn b. Dusk c. Afternoon d. Mid night

Reason: Shadows are shortest when the Sun is at its highest point in the sky, typically around noon or early afternoon, due to the angle of the sunlight.

17. When a ball is kept in front of flash light, its shadow is formed because:

- a. Light will not pass b. Light will partially pass c. Light will completely pass d. Light will be dispersed

Reason: A shadow is formed when an object blocks light from a light source. Since the ball obstructs the light path, no light passes through the area behind the ball, creating a shadow.

18. Leaves of a tree are an example of _____ object.

- a. Transparent b. Luminous c. Translucent d. Opaque

Reason: Leaves are translucent because they allow some light to pass through but not enough to see clearly through them.

19. The light reaches on earth from moon in _____.

- a. 1 min b. 1.5 sec c. 2 min d. 8 min



Reason: The Moon is about 384,400 kilometers away from Earth, and light takes approximately 1.5 seconds to travel from the Moon to Earth.

20. The beauty and fascination of our universe is because of:

- a. Tube light b. Torch c. Sunlight d. Dim light

Reason: Sunlight is responsible for the brightness and colors we see in the universe, contributing to its beauty and fascination.

21. The objects through which light can pass completely are called:

- a. Transparent b. Luminous c. Translucent d. Opaque

Reason: Transparent objects allow all light to pass through them without significant scattering or absorption.

22. The objects through which light can pass partially are called:

- a. Transparent b. Translucent c. Opaque d. Non-luminous

Reason: Translucent objects allow some light to pass through but scatter it, so objects on the other side are not clearly visible.

23. The object through which light cannot pass:

- a. Transparent b. Translucent c. Opaque d. Non-luminous

Reason: Opaque objects do not allow light to pass through them at all, blocking the light completely.

24. The objects which give off their own light:

- a. Transparent b. Luminous c. Translucent d. Opaque

Reason: Luminous objects emit their own light, such as the Sun, light bulbs, and candles.

25. The objects which do not give off their own light:

- a. Transparent b. Translucent c. Opaque d. Non-luminous

Reason: Non-luminous objects do not emit their own light; instead, they reflect light from other sources.

26. The dark shadow is called _____.

- Umbra Penumbra Both A and B None of these



Reason: The umbra is the dark, central part of a shadow where the light source is completely blocked.

27. The lighter shadow is called _____.

- a. Umbra b. Penumbra c. Both A and B d. None of these

Reason: The penumbra is the lighter, partial shadow surrounding the umbra, where the light source is only partially blocked.

28. Light is a form of _____.

- a. Force b. Energy c. Matter d. Compound

Reason: Light is a form of energy that travels in waves and can be absorbed, reflected, or transmitted by materials.

29. The object in the picture is



- a. Luminous b. Non-luminous c. Transparent d. Translucent

Reason: If the object in question does not emit its own light and only reflects light, it is non-luminous.

30. Non-illuminated objects are illuminated by:

- a. Heating b. Cooling c. Freezing d. Melting

Reason: Non-illuminated objects can be illuminated by being exposed to light sources. The choices provided don't directly apply to illumination but heating can sometimes indirectly contribute to light emission through processes like thermal radiation.