**Light Shadows and Reflection Class 6**

**Light Shadows and Reflection Class 6 PHYSICS**

**NCERT for Class 6 Science Chapter 11 Light Shadows and Reflection**

**Transparent Opaque And Transculent Objects**

**Question 1.
Define luminous body.
Answer:
The objects which emit light of their own are called luminous bodies, e.g., the sun, the stars, etc.**

**Question 2.
What are luminous and non-luminous objects?
Answer:
Luminous objects: Objects that give out or emit light of their own, e.g., sun, torch, light, bulbs, etc.
Non-luminous objects: Objects that do not give out light of their own, e.g., the moon, chair, shoe, pen, etc.**

**Question 3.
Define opaque objects with example.
Answer:
Those materials which do not allow light to pass through them, are called opaque objects. Examples wood, stone, etc.**

**Question 4.
What are translucent objects?
Answer:
Those objects which allow only a small part of the light rays to pass through them are called translucent objects. These are the objects through which one cannot see properly.**

**Question 5.
What are transparent objects?
Answer:
Those objects which allow light rays to pass through them completely are called transparent objects. One can see clearly through these objects.**

**Question 6.
Classify the following into transparent, opaque and translucent objects:
Wax, spectacles, a heap of salt, a stone, dense smoke, wood, skin, balloon, rubber, membrane of a tabla, blood and milk.
Answer:
Transparent objects are Spectacles.
Opaque objects are A stone, wood, a heap of salt, , and membrane of table, skin, rubber, Blood, milk
Translucent objects are, wax, , dense smoke, baloon**

**Question 7.
Close your eyes while looking towards bright sunshine. Now, cover the eyes with your palm still keeping them closed. Do you notice any difference? On the basis of this experience, state whether your eyelids are transparent, translucent or opaque.
Answer:
On the basis of the experience, we observe our eyelids are opaque.**

**Question 8.
Sometimes, you are able to see the Sun or the Moon behind the clouds. What can you say about the ability of such clouds to transmit light? ‘
Answer:
We may say that clouds behave as translucent object.**

**Question 9.
How will you convert a transparent glass sheet into a translucent sheet? Suggest any two ways to do it.
Answer:**

1. **By smearing a thin layer of oil we may convert a transparent glass sheet into a translucent sheet.**
2. **By covering one side of the glass sheet by butter paper.**

**Question 10.
Name sources of light that are not hot.
Answer:
Tube light, jugnu.**

**Question 11.
List four natural sources of light.
Answer:**

1. **Sun**
2. **Stars**
3. **Fire**
4. **Jugnu (Firefly).**

**Question 12.
Write down four man-made sources of light.
Answer:**

* **Candle**
* **Oil lamp**
* **Electric bulb**
* **Torch.**

**Question 13.
Does the fire emit light?
Answer:
Yes, fire emits light.**

**Question 14.
On what factor does the proportion of light that enters an object depend?
Answer:
Optical nature of the object.**

**What Exactly Are Shadows?**

**Question 15.
What is an obstacle?
Answer:
An object which comes to the path of light is called an obstacle.**

**Question 16.
Give examples of two substances through which light does not pass?
Answer:
Wood and bricks are the substances through which light does not pass.**

**Question 17.
Whether a shadow is two-dimensional or three-dimensional?
Answer:
Shadow is not just the two-dimensional outline that you see on the ground. All the space behind the opaque object up to some distance behind it seems to be filled with the shadow
**

**Question 18.
What do we need in order to see a shadow?
Answer:
We need**

* **a source of light,**
* **an opaque object in the way of light, and**
* **a screen;**

**Question 19.
Does the direction of shadow change during the day? Does the length of shadow also change from season to season?
Answer:
Yes, the direction of shadow changes as the sun changes its position during the day. The length of the shadow also changes from season to season.**

**Question 20.
What is a shadow? How is it formed? How does the colour of an opaque object affect the colour of the shadow?
Answer:
A shadow is a dark outline or image cast by an opaque object that blocks light coming from a source of light. It is formed when light hits the opaque object which does not let the light pass through. Everywhere else around the opaque object, the light continues in a straight path until it bounces off the ground or wall behind the object. The wall or ground behind the opaque object is the screen. On this screen is a dark patch, or shadow, with the same outline as the object surrounded by light. The colour of the opaque object does not affect the colour of the shadow that is formed.**

**Question 21.
What is the difference between image and shadow?
Answer:**

|  |  |
| --- | --- |
| **Image** | **Shadow** |
| **1. Image is formed due to reflection or refraction of light** | **1. Shadow is formed when light falls on the opaque body.** |
| **2. Image is seen when light coming from the object after reflection or refraction enters the observes’s eye.** | **2. No light enters the eye from the shadow of the object.** |
| **3. Image gives more information such as colour, structure, etc., about the object** | **3. Shadow does not provide any detail about the object, it gives an idea about the shape of the object.** |

**Question 22.
Define screen.
Answer:
Screen is a surface on which images are formed.**

**Question 23.
What is umbra and penumbra?
Answer:
Umbra is the dark region behind object facing light which does not receive light at all.
Penumbra is the less dark part of shadow. It is the outer part of shadow.**

**Activity 24
Place a chair in the school ground on a sunny day. What do you observe from the shadow of the chair?
Does the shadow give an accurate picture of the shape of the chair? If the chair is turned around a little, how does the shape of the shadow change?
No, accurate shape of chair is not shown by the shadow. When turned around a little, the shape of the shadow will change because now different portions of the chair will obstruct light and make shadow.**

**Take a thin notebook and look at its shadow. Then, take a rectangular box and look at its shadow. Do the two shadows seem to have a similar shape?
Yes, the two shadows seem to have a similar shape.**

**Take flowers or other objects of different colours and look at their shadows. A red rose and a yellow rose, for instance. Do the shadows look different in colour, when the colours of the objects are different?
No, the shadows of the different coloured objects are not different.**

**Take a long box and look at its shadow on the ground. When you move the box around, you may see that the size of the shadow changes. When is the shadow of the box the shortest, when the long side of the box is pointed towards the Sun or when the short side is pointing towards the Sun?
Shadow of the box is the shortest when the short side is pinting towards the Sun.**

**A Pinhole Camera**

**Question 25.
Define pinhole camera.
Answer:
It is a device which forms a photograph like image of a bright object on a screen.**

**Question 26.
Can you think of a situation where we can see the path of the light?
Answer:
In a dark room, we can see with torch light which goes straight. Similarly, dust particles become visible when light enters the room through fine hole.
All these examples indicate that light travels in straight line.**

**Question 27.
Why is the image formed in a pinhole camera inverted?
Answer:
In a pinhole camera, image formed is inverted because the object is between radius of curvature and focus.**

**Question 4.
What is the path of light?
Answer:
Straight line.**

**Mirrors and Reflections**

**Question 1.
What is reflection?
Answer:
When a ray of light falls on a smooth and shiny surface, the whole of light is sent back in the same medium. It is called reflection. Mirrors do not allow even a small amount of light to pass through them. Mirrors show regular and complete reflection.**

**Question 2.
Define ‘Mirror’.
Answer:
A smooth shining surface, which rebounds the light back in same or in different direction is called a mirror.**

**Question 3.
Why is silvered glass used as a mirror?
Answer:
The silvered glass has a smooth surface and the smoothness helps in forming clear image. Silvering makes it shiny and the shiny surface helps in reducing the absorption.**

**Question 4.
What happens when light falls on a mirror?
Answer:
Mirror is silvered on one side, so it does not allow the light to pass through it. It reflects almost whole of the light falling on it.**

**Question 5.
What change in the path of light takes place when light falls on a shiny surface? What is this called?
Answer: The light comes back in the same plan when light falls on a shiny surface. This is known as reflection of light.**

**Question 6.
Why do we need a shiny surface for reflection?
Answer:
The extent of reflection depends upon the shine and smoothness of the surface. More is the shine and smoothness of the surface, more will be the reflection. That is why mirrors reflect most of the light falling on it. Hence, for reflection, shiny surfaces are required.**

**Question 7.
How are moon and planets visible to us, though they are not luminous?
Answer:
Because they reflect light from the sun.**

**Question 8.
What do you mean by scattering of light?
Answer:
When a beam of light falls on a rough surface, it is turned back in different directions, it is called scattering of light.**

**Question 9.
Why is the moon not considered as a luminous body?
Answer:
Moon is a non-luminous body because it shines by reflecting the sunlight falling
on it.**

**Activity 8.
Fix a comb on one side of a large thermocol sheet and 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. Keep this in sunlight or send a beam of light from a torch through the comb.**

**What do you observe? Do you get a pattern similar to that shown in figure?
**

**Fig. Light travelling in a straight line and getting reflected from a mirror
Light travels in straight line and gets reflected from the mirror. Yes, we get a pattern similar to that shown in the figure.**

**Objective Type Questions**

**Question 1.
Match the following items given in Column A with that in Column B:**

|  |  |
| --- | --- |
| **Column A** | **Column B** |
| **(a) Transparent** | **(i) Region of absence of light** |
| **(b) Opaque** | **(ii) Scattering back of the light by shining surface** |
| **(c) Translucent** | **(iii) Object through which one can see clearly** |
| **(d) Luminous body** | **(iv) Object through which one cannot see at all** |
| **(e) Shadow** | **(v) Formed due to reflection by mirrors** |
| **(f) Image** | **(vi) Object through which we cannot see clearly** |
| **(g) Reflection** | **(vi) Phenomenon of changing left to right** |
| **(h) Lateral inversion** | **(vii) Produces light of its own** |

**Answer:**

|  |  |
| --- | --- |
| **Column A** | **Column B** |
| **(a) Transparent** | **(iii) Object through which one can see clearly** |
| **(b) Opaque** | **(iv) Object through which one cannot see at all** |
| **(c) Translucent** | **(vi) Object through which we cannot see clearly** |
| **(d) Luminous body** | **(viii) Produces light of its own** |
| **(e) Shadow** | **(i) Region of absence of light** |
| **(f) Image** | **(v) Formed due to reflection by mirrors** |
| **(g) Reflection** | **(ii) Scattering back of the light by shining surface** |
| **(h) Lateral inversion** | **(vii) Phenomenon of changing left to right** |

**Question 1.
Fill in the blanks with appropriate words:**

1. **An object or material could be opaque, transparent, translucent or ……………….. .**
2. **This is a …………… on which the shadow is formed.**
3. **A …………….. is a dark outline of an opaque object that blocks light coming from a source.**
4. **Image formed by a pinhole camera is ……………….. .**
5. **Image formed by a plane mirror is …………….. .**
6. **In a plane mirror, our left hand looks like right hand. This phenomenon is called ……………………… .**
7. **……………… objects cast no shadow.**
8. **Opaque objects cast …………………. shadows in morning and evening while ………………… shadows at noon.**
9. **Light travels in a ………….. .**
10. **Shadow is …………… .**

**Answers:**

1. **luminous**
2. **screen**
3. **shadow**
4. **upside down / inverted**
5. **erect**
6. **lateral inversion**
7. **Transparent**
8. **big, small**
9. **straight line**
10. **three dimensional**

**Question 2.
State whether the statements given helow are True or False:**

1. **A torch bulb is a luminous object.**
2. **Light travels in a straight line.**
3. **Image formed by a plane mirror is inverted.**
4. **Light gets reflected when strikes a shiny surface.**
5. **Transparent substances reflect all the light falling on them.**
6. **All the shining bodies in sky have their own light.**
7. **Jugnu (Firefly) is a living luminous body.**
8. **When screen is far away from the objects, the shadow will have no penumbra.**
9. **A reflected image gives us more information about the object than a shadow.**
10. **In a mirror, if A is able to see B, B also can see A.**
11. **Objects around us seem to have different ways in which they interact with light.**

**Answers:**

1. **True**
2. **True**
3. **False**
4. **True**
5. **False**
6. **False**
7. **True**
8. **False**
9. **True**
10. **True**
11. **True**

**Question 3.
Choose the correct option in the following questions:**

**(i) Light travels in
(a) straight line
(b) curved line
(c) zig-zag line
(d) randomly
Answer:
(a) Light travels in straight line.**

**(ii) When an opaque object comes in the path of light it forms
(a) an image with colours
(b) shadow
(c) black and white image
(d) depends on the colour of the light
Answer:
(b) A shadow is formed when an opaque object comes in the way of light.**

**(iii) Which types of objects do not allow light to pass through them?
(a) Translucent
(b) Opaque
(c) Transparent
(d) Penumbra
Answer:
(b) Opaque objects do not allow the light to pass through them while translucent objects allow only a part of light to pass through them.**

**(iv) Which is an example of a translucent object?
(a) A thin sheet of paper
(b) A thin glass slab
(c) A thin iron sheet
(d) All of these
Answer:
(a) A thin sheet of paper is translucent.**

**(v) Bouncing back of light from shining surfaces is called
(a) Reflection
(b) Refraction
(c) Bending
(d) Dispersion
Answer:
(a) When a ray of light falls on a smooth and polished surface, whole of light is returned back in the same medium. It is called reflection of light.**

**(vi) What is lateral inversion?
(a) Image becomes inverted
(b) Image bends laterally
(c) Right of the object appears left of the image
(d) All of these happen
Answer:
(c) Right side of the object appears as left side in the image formed by a plane mirror.**

**(vii) Which letters of English alphabet will not show lateral inversion?
(a) I, O, U
(b) N, Z, X
(c) I, X, E
(d) A, E, I
Answer:
(a) I, O, U will not show lateral inversion.**

**(viii) Which is a device to image the sun?
(a) Plane mirror
(b) Pinhole camera
(c) A straight pipe
(d) Glass slab
Answer:
(b) Sun can be imaged by using a pinhole camera.**

**(ix) Which of the following is a cold source of light?
(a) Firefly (Jugnu)
(b) Tube light
(c) The sun
(d) Electric bulb
Answer:
(a) Firefly (Jugnu) emits short bursts of light.**

**(x) Out of these, which one is not a man-made luminous body?
(a) Electric bulb
(b) Burning candle
(c) Firefly (Jugnu)
(d) Oil lamp
Answer:
(d) Firefly (Jugnu) is a natural luminous body.**