



INDIAN SCHOOL AL WADI AL KABIR



Class: VI	DEPARTMENT: SCIENCE 2022-2023	DATE: 11-12-2022
WORKSHEET NO.: 13 WITH ANSWERS	TOPIC: LIGHT, SHADOWS AND REFLECTIONS	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

I. VERY SHORT ANSWER TYPE QUESTIONS (1M):

1. What is light? **[Hint- A form of energy which enables us to see things around us]**
2. Name two natural sources of light and two man-made sources of light. **[Hint: Natural- Sun and stars. Man-made- Bulb and candle]**
3. Name the most important source of light for the earth. **[Hint: Sun]**
4. What are the conditions required for the formation of a shadow? **[Hint-source of light, an opaque object and a screen]**
5. Why can you see the table and chair in a room during the daytime? **[Hint- when light falls on the object, gets reflected and reaches our eyes]**
6. What do you mean by the reflection of light? **[Hint- The bouncing back of light with the change in the direction]**
7. Choose transparent, translucent and opaque materials from the following:
Cardboard, Tracing paper, Clear glass, Water, Air, Brick wall, Aluminium sheet
[Hint: Opaque -Cardboard, Brick wall, Aluminium sheet. Translucent -Tracing paper, Transparent - Clear glass, Water, Air]
8. Is the moon a luminous body? **[Hint: No moon is a non-luminous body. It shines by reflecting the sunlight falling on it]**
9. Do the shadows get formed in a completely dark room? **[No, to form a shadow, a source of light is required. A shadow gets formed only when the light is blocked by an object.]**
10. What is a mirror? **[A mirror is a shiny, opaque object that reflects the light well.]**

For questions 11 to 13, two statements are given- one labelled Assertion (A) and the other labelled Reason (R).

Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below

- i) Both A and R are true and R is the correct explanation of the assertion.
- ii) Both A and R are true but R is not the correct explanation of the assertion.
- iii) A is true but R is false.
- iv) A is false but R is true

11. **Assertion (A):** Pinhole camera images do not have the colour of the object.

Reason (R): The image formed in a pinhole camera is small and inverted but shows the exact detail of the object.

iv) A is false but R is true

12. **Assertion (A):** Opaque object forms a shadow when light falls on them.

Reason (R): Opaque objects do not allow light to pass through them.

i) Both A and R are true and R is the correct explanation of the assertion.

13. **Assertion (A):** We can see a non-luminous object.

Reason (R): Non-luminous objects emit their light which reaches our eyes.

iii) A is true but R is false.

II. PASSAGE-BASED QUESTIONS:

An object which emits light is called a source of light. For example, sun, torch, etc. **Non-luminous objects** are objects which do not emit light of their own. Such a body becomes visible when light falls on it. For example, the moon, the planets, etc. An object which comes into the path of the light is called an obstacle. All the opaque objects seem to form a dark shadow of their own. We need a source of light, an opaque object in the way, and a screen to see a shadow. The screen is a surface on which the shadow is formed. It may be butter paper or simply ground. Shadows give us some information about the shapes of objects. The colour of the opaque object does not affect the colour of the shadow.

i. Which of the following is a non-luminous object?

- a) Sun
- c) moon**

- b) Star
- d) Tube light

ii. Which of the following is not always necessary to observe a shadow?

- a) Sun**

- b) Screen

c) Source of light

d) Opaque object

iii. The shadow of a red object will be:

a) Red

b) Black

c) Blue

d) Green

iv. Natural luminous objects among the following is:

a) Tube light

b) Bulb

c) Moon

d) Stars

v. Shadows give us information about:

a) Shape of source

b) Shape of object

c) Surface

d) Size of object

vi. Which of the following can never form a circular shadow?

a) A ball

b) A flat disc

c) A shoe box

d) An ice cream cone

III. CASE STUDY-BASED QUESTIONS:

1. Aditya was provided with butter paper, a clear glass sheet, and paper painted with black acrylic paint by his teacher to study their properties.

Aditya first observed a source of light through three sheets of paper. These were,

Sheet 1: Butter paper

Sheet 2: A clear glass sheet

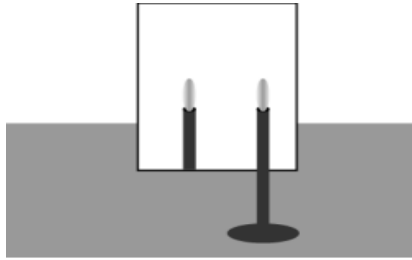
Sheet 3: Paper painted with black acrylic paint.

a. Which of the sheets will allow the light to pass through it completely? [**A clear glass sheet**]

b. Which of the sheets will form the darkest shadow when placed in front of a light source? [**Paper painted with black acrylic paint**].

c. Will a butter paper allow light to pass through it completely? [**No, it is translucent hence will allow only some amount of light to pass through it.**]

2) A student is writing a conclusion about the nature of reflection shown by a plane mirror. The image given below shows the reflection of a candle .



Which statement is correct based on the observation?

- (a) the plane mirror produces an upright image of the same size.
- (b) the plane mirror produces an upright image of a smaller size.
- (c) the plane mirror produces an upside-down image of the same size.
- (d) the plane mirror produces an upside-down image of a smaller size.

IV.a) SHORT ANSWER TYPE QUESTIONS (2 M):

1. Why we cannot see through a ‘T’ shaped or an ‘N’ shaped pipe? [Hint- Light travels in a

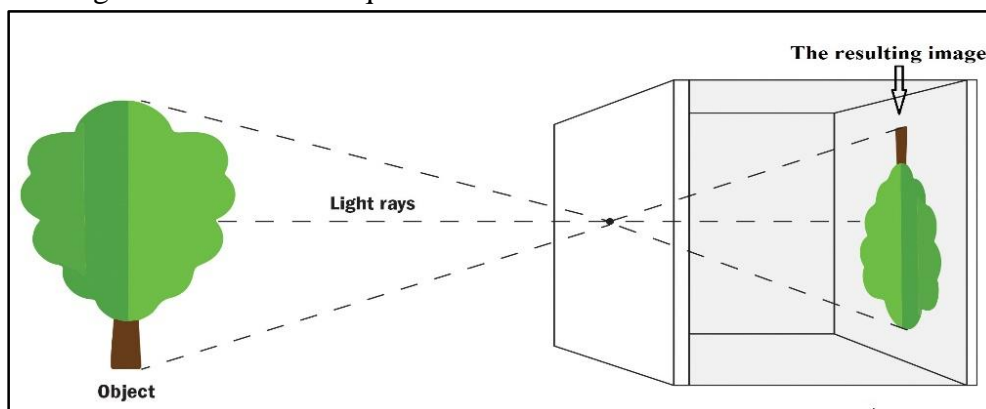
Straight line and cannot bend]

2. Why is it not advised to observe the sun directly during a solar eclipse?

[Hint-The rays from the sun can cause permanent eye damage and blindness]

3. Define eclipse. [Hint- An eclipse occurs when one object in space blocks an observer from seeing another object in space. This happens when one heavenly body cast its shadow on another.]

4. Observe the figure and answer the questions that follow:



- a) Name the device given in the figure. **[Hint: A pinhole camera]**
 - b) On what principle does it work? **[Hint: Light travels in a straight line]**
 - c) What is the nature of the image formed by the given device? **[Hint- Inverted image]**
5. What do you mean by rectilinear propagation of light? **[Hint: The property of light travelling in a straight line]**
 6. Explain why we often see bright circular patches of light on the ground under trees on a sunny day. **[Hint- These circular images are, in fact, pinhole images of the Sun. The gaps between the leaves, act as the pin holes]**

IV.b) SHORT ANSWER TYPE QUESTIONS (3 M):

1. Can an object form two or more shadows at the same time? How? **[Hint: Yes, Multiple shadows will be formed when there are more sources of light]**
2. Could you think of creating a shape that would give a circular shadow if held in one way and a rectangular shadow if held in the other way? **[Hint- When the object is a cylinder]**
3. You are given a transparent glass sheet. Suggest two ways to make it translucent without breaking it. **[Hint: (i) By applying oil, grease, and butter on it or pasting a butter paper on it. (ii) Grinding (rubbing) the surface of the glass with any abrasive material.]**
5. On a sunny day, does a bird or an aeroplane flying high in the sky cast its shadow on the ground? Under what circumstances, can we see their shadow on the ground?
[Hint: No, they do not cast any shadow on the ground because they are very high in the sky. They can cast shadows only if they are at some lower height, i.e. if they are near the ground, we can see their shadows.]
6. Using a pinhole camera, a student observes the image of two of his friends, standing in the sunlight, wearing yellow and red shirts, respectively. What will be the colours of the shirts in the image? **[Hint: Colours of the shirts will remain the same. We see them on the screen because the pinhole camera forms the image of the object having the same colour but upside down. So, the yellow shirt will form a yellow image and the red shirt will form a red image.]**

V.LONG ANSWER TYPE QUESTIONS (5 M):

1. a) A student covered a torch with a red cellophane sheet to obtain red light. Using the red light, she obtains a shadow of an opaque object. She repeats this activity with green and

blue light. Will the colour of the light affect the shadow? Explain. **[Hint: The colour of light will not affect the shadow, because the shadow is the dark patch formed when an opaque object obstructs the path of light and hence no light reaches the shadow region]**

b) A student had a ball, a screen and a torch in working condition. He tried to form a shadow of the ball on the screen by placing them in different positions. Sometimes the shadow was not obtained. Explain. **[Hint: Some of the reasons can be- The screen is away from the ball, the torch is kept away from the ball, and the beam of light from the torch is falling parallel to the screen on the ball]**

2. Distinguish between:

a. Transparent, translucent and opaque objects- **[Hint: Transparent- object through which we can see clearly. Translucent- object through which we can see, but not very clearly. Opaque- object through which we cannot see through.]**

b. Luminous and non-luminous objects - **[Hint: Luminous- objects that produce their light. Non-luminous- objects that do not produce their light]**

c. Image and Shadow- **[Hint: Image- It is formed when the light is reflected from the object and reaches our eyes and gives information about the object like the colour and features.**

Shadow- A shadow is formed when an object blocks the light. It is always black in colour. It does not show the feature or colours of the object. It is always formed on a screen.]

PREPARED BY: Mrs SHRUTI MUKUNDAN	CHECKED BY HOD - SCIENCE
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