



## INDIAN SCHOOL AL WADI AL KABIR

<b>CLASS: VII</b>	<b>DEPARTMENT: SCIENCE 2020 -21</b>	<b>DATE: 20.12.2020</b>
<b>WORKSHEET NO.: 13 WITH ANSWERS</b>	<b>TOPIC: LIGHT</b>	<b>NOTE: A4 FILE FORMAT</b>
<b>NAME OF THE STUDENT:</b>	<b>CLASS &amp; SEC:</b>	<b>ROLL NO.</b>

### I. OBJECTIVE TYPE QUESTIONS:

1. Surfaces used in study of reflection of light are -

- a] rough
- b] polished
- c] black painted
- d] None of these

2. Lens -

- a] refers to a magnifying glass
- b] is a piece transparent medium bounded by at least one spherical surface
- c] Both A and B are correct
- d] None of these

3. Rectilinear propagation of light is -

- a] mode of travelling in straight lines
- b] mode of travelling in curved lines
- c] ability to bend around obstacles
- d] displaying the phenomenon of diffraction

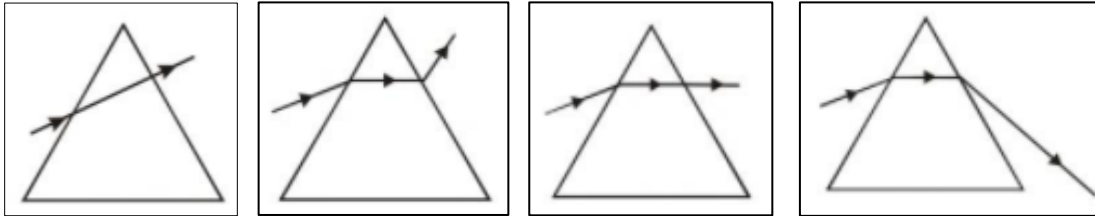
4. We can see the objects only when:

- a] reflected light reaches our eyes
- b] the objects absorb all the light
- c] the objects allow all the light to pass through them
- d] None of the above

5. Swapnil and Pratiksha were given one mirror each by their teacher. Swapnil found his image to be erect and of the same size whereas Pratiksha found her image erect and smaller in size. This means that the mirrors of Swapnil and pratiksha are respectively -

- a] plane mirror and concave mirror
- b] concave mirror and convex mirror
- c] plane mirror and convex mirror
- d] convex mirror and plane mirror

6. Which of the following figures correctly shows the bending of a ray of light inside the prism?



a]

b]

c]

**d]**

7. Which one does not utilise spherical mirrors?

a] Car headlights

b] Looking glass

c] Rear view glass

**d] Spectacles**

For question numbers 8 to 10, 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

8. **Assertion (A):** The white light of sun is composed of seven colours.

**Reason (R):** When white light passes through a glass prism it splits the white light into seven colours.

**ii) Both A and R are true but R is not the correct explanation of the assertion.**

9. **Assertion (A):** In the side mirror of a car, the images of all objects appear smaller than the objects.

**Reason (R):** Side mirrors are concave mirrors.

**iii) A is true but R is false.**

10. **Assertion (A):** The inner surface of spoon acts like a concave mirror.

**Reason (R):** A concave mirror has reflecting surface curved inwards.

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

## **II. BASIC CONCEPTS LEVEL:**

1. Give the names of four different sources of light. [Hint: sun, stars, an electric bulb and a candle]
2. What is a mirror? [HINT: Any polished or smooth surface which can reflect light.]
3. Name the device which is used to split white light into seven colours. [Hint: A prism]
4. What do you mean by rectilinear propagation of light? [Hint: The property of light travelling in a straight line]
5. Name the phenomenon responsible for-
  - a) The formation of rainbow. [HINT: dispersion of light]
  - b) The formation of image of an object by a plane mirror. [HINT: reflection of light]
6. What type of image is formed – (real or virtual)
  - a) In a plane mirror [Hint: Virtual]
  - b) on a cinema screen [Hint: Real]
7. What type of mirror is used:
  - a) In a searchlight (HINT: concave)
  - b) As a side-view mirror in a car (HINT: convex)
  - c) As a shaving mirror (HINT: concave)
  - d) Vigilance-mirror in a big shop (HINT: convex)
8. What do you mean by reflection of light? [Hint- The bouncing back of light with the change in direction.]
9. What do you understand by dispersion of light? [HINT: The splitting of white light into seven different colours.]
10. What are spherical mirrors? [Hint: Mirrors having curved surfaces are known as spherical mirrors.]
11. Name any two letters of English alphabet in which the image formed in a plane mirror appears exactly like the letters. [Hint: A, H, I, M, O, T, U, V, W, X, Y]

## **III. INTERMEDIATE LEVEL:**

1. State four characteristics of the image formed by a plane mirror. [Hint: Image is upright, virtual, same size as size of the object, image formed is at same distance behind the mirror as the object is in front of it]

2. What is lateral inversion? [Hint: A mirror forms an image such that its left side is object's right side and its right side is object's left side]
3. Give two uses each of a concave and convex mirror.  
[Hint: Concave mirror – shaving mirror, dentist, telescopes;  
Convex mirror – rear view mirror, shopping security mirror]
4. Why does a Newton's disc appear white when rotated? [HINT: All the seven colours combine to make white.]
5. Write the difference between concave and convex mirror.  
[Hint: Concave - Whose reflecting surface is curved inwards,  
Convex - Whose reflecting surface is curved outwards]
6. Differentiate between -
  - a) Real image and virtual image -

REAL IMAGE	VIRTUAL IMAGE
i) Image that can be obtained on a screen is called real image	i) Image that cannot be obtained on a screen is called virtual image
ii) Image is always inverted	ii) Image is always erect
iii) e.g. Image formed on the retina of the eye	iii) e.g. Image formed by a plane mirror.

- b) Concave lens and convex lens –

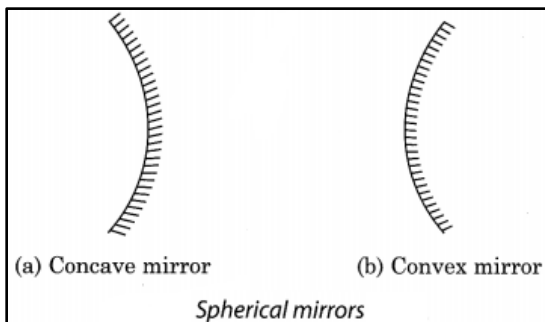
CONCAVE LENS	CONVEX LENS
1. A concave lens is thin in the middle and thicker at the edges	1. A convex lens is thicker in the middle and thin at the edges
2. It is also known as divergent lens	2. It is also known as convergent lens
3. Objects look smaller through concave lens	3. A convex lens usually magnifies images

7. Mention the two laws of reflection of light.  
[Hint: i] The angle of incidence is always equal to the angle of reflection.  
ii] The incident ray, the reflected ray and the normal at the point of incident lie on the same plane]

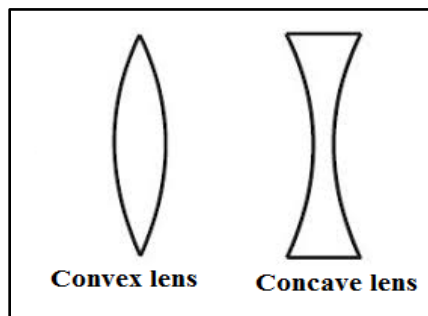
8. Explain why, concave mirrors are used as shaving mirrors. [Hint: When the face is held close to a concave mirror, then an enlarged image of the face is seen in the concave mirror, this helps a man in making a smooth shave]

9. Draw diagrams to differentiate between-

a) Concave and convex mirror



b) Concave and convex lens



10. In what way is the word “AMBULANCE” painted in front of the hospital vans? Why is it painted in this way? [The word AMBULANCE on the hospital vans is written in the form of its mirror image, because any vehicle which is ahead of ambulance van can see the laterally inverted alphabets correctly from his rear-view mirror and make way for it to pass through and enable it to reach the hospital quickly.]

11. State one way in which the image formed in a convex mirror is similar to that in a plane mirror and one way in which it is different.

[Hint: similarity -virtual and erect, difference –smaller than the object]

12. What happens when a beam of sunlight is passed through a glass prism?

[Hint: When a beam of light is passed through a prism it splits into seven different colours (VIBGYOR). The band of seven colours is called spectrum]

#### **IV. ADVANCED LEVEL:**

1. Rear view mirrors of cars carry a warning message “objects in the rear-view mirror are closer than they appear”. Why? [HINT: convex mirror is used which forms smaller image which appears farther away and it covers a larger area of view]
2. How are rainbows formed? [Hint: Rainbows are formed by the splitting of white light of the sun through transparent water droplets present in the air. The sunlight splits into seven colours of the rainbow.]

3. Two different types of lenses are placed on a sheet of newspaper. How will you identify them without touching? [Hint: On observing the letters of newspaper, we can differentiate the two types of lenses. If image is larger or magnified then the lens is a convex lens and if the image is smaller or diminished in size for all positions of the object, then the lens is concave.]

#### **V. EXEMPLAR QUESTIONS:**

1. Farzin is observing her image in a plane mirror. The distance between the mirror and her image is 5 m. If she moves 2 m towards the mirror, then what would be the distance between Farzin and her image? [Solution:  $5 - 2 = 3$  m  
 $= 3 + 3 = 6$  m]
2. Rahul suffers from toothache and goes to the dentist. He becomes afraid when he sees different instruments in doctor's hand. But he becomes surprised when he observes some reflecting shiny surface fitted on the doctor's forehead -
- a) What is the shiny surface and what is its function?  
[Hint: Concave mirror. To see an enlarged image of the teeth.]
- b) Mention some other devices where such kind of mirror can be used?  
[Hint: Reflectors of torch, headlights of car.]
3. The side mirror of a scooter got broken. The mechanic replaced it with a plane mirror. Mention any inconvenience that the driver of the scooter will face while using it?  
[Hint: Driver cannot see the traffic spread over large area behind him.]

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