

St. Andrews Scots Sr. Sec. School

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Session: 2024-2025 – Answer Key

Class: VIII

Subject: Science

Topic: Light

CHECK POINT 1

1. plane
2. a straight line
3. giving their own light
4. equal
5. falling of rays of light on a rough and uneven surface.

CHECK POINT 2

1. (F) 2. (F) 3. (T) 4. (T) 5. (F)

CHECK POINT 3

1. Cornea
2. Ciliary muscles
3. Retina
4. 25 cm
5. Owl
6. Braille

PRACTICE TIME

A. Tick (✓) the correct answer:

1. (c) 2. (a) 3. (d) 4. (a) 5. (b)

B. Say True or False:

1. (T) 2. (T) 3. (T) 4. (T) 5. (F)

C. Very Short Answer Type Questions:

1. Diffused reflection.
2. Periscope
3. Braille.

4. Plane mirror.

5. Optic nerve.

D. Short Answer Type Questions:

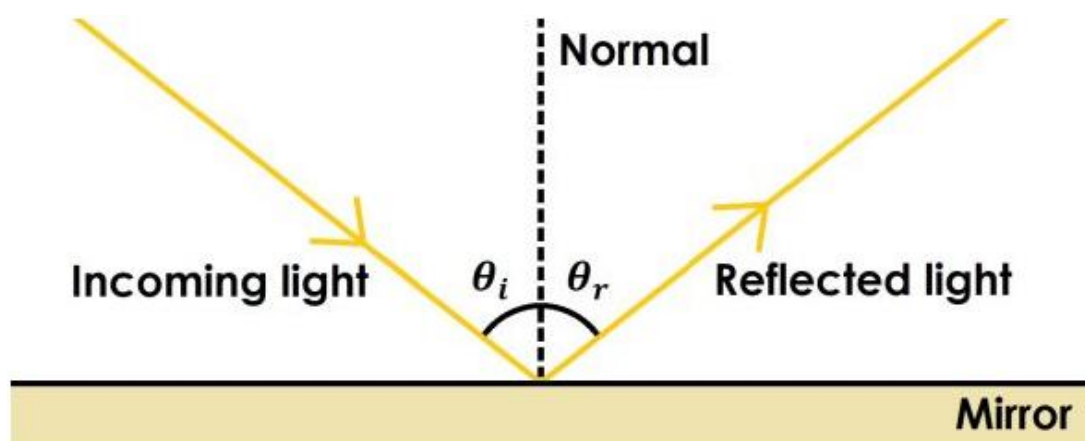
1. The objects which shine by giving their own light are called luminous objects. The examples of luminous objects are the sun, stars, fire, candle flame, bulb, tube light, etc. The objects which shine by reflecting the light falling on them are called illuminated objects. For example, the moon shines due to reflecting the light falling from the sun.

2. When light falls on a plane smooth surface, it follows the laws of reflection.

These laws are:

(a) When a ray of light (incident ray) falls on a plane smooth surface, it is reflected in the same medium in such a way that the angle of incidence is equal to the angle of reflection.

(b) The incident ray, the reflected ray and the normal always lie in the same plane.

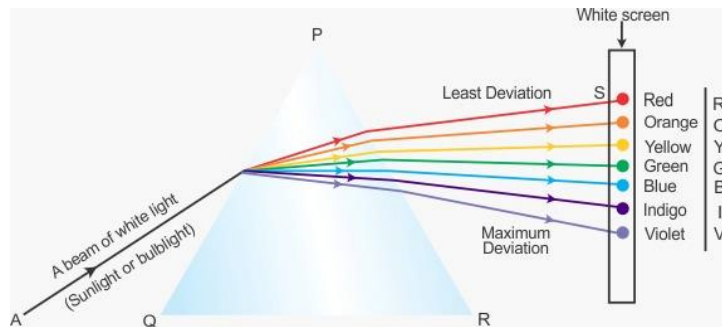


Reflection of Light

3.

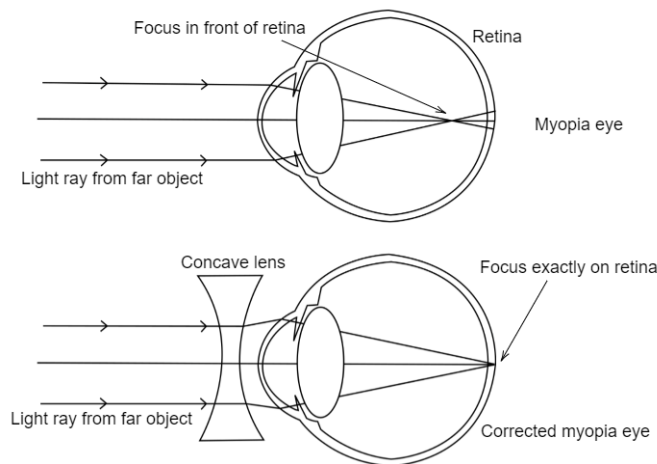
Regular Reflection	Irregular Reflection
1. When a beam of light falls on a smooth and highly polished surface, almost entire light gets reflected in the same.	1. When a beam of light falls on a rough and uneven surface, the light gets reflected in different directions, i.e., medium in a definite direction. This kind of reflection is called regular reflection.
2. We can see our image formed by a mirror due to the phenomenon of regular reflection. light rays do not follow uniformity of direction. This kind of reflection is known as irregular or diffused reflection.	2. In case of diffused reflection from rough surfaces, either there is no image formed or a blurred (hazy) image is formed.
3. Regular reflection creates glare and we cannot see the things clearly and comfortably.	3. We are able to see things comfortably because of irregular reflection.

4. The splitting of light into its seven colours after passing through a prism is called dispersion of light.



Dispersion of Light

5. Inability to see the distant objects clearly but ability to see the nearby (at 25 cm from eyes) objects clearly is known as myopia. It can be corrected by using spectacles with concave lenses.



Myopia and it's correction using concave mirror

E. Long Answer Type Questions:

1. The characteristics of light are:

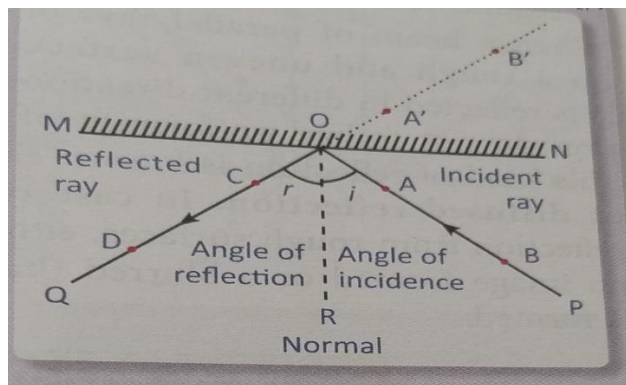
- (a) Light is a form of energy.
- (b) Light is one of the fastest travelling forms of energy. It travels with a speed of 3,00,000 kilometres per second in vacuum and almost with the same speed in air.
- (c) Light needs no medium to travel, i.e., it can travel in vacuum also.
- (d) Light travels in a straight line.
- (e) Light, as it comes from the sun, consists of seven different colours, namely, Violet, Indigo, Blue, Green, Yellow, Orange and Red. The sequence of this colour band is known as VIBGYOR.

2. The laws of reflection can be verified as follows:

Procedure: Place a white sheet of paper on a drawing board. Take a plane mirror, put it vertically and draw a line MN along the margin of the mirror. Fix two pins A and B at a gap of a few cm apart. They should appear in one line in the mirror. Now, by looking at the reflection of these two pins, fix two pins C and D on the other side in such a way that images of all four pins appear in a straight line. Remove the pins and draw a straight line along the path of AB and CD. The point where these two lines meet, mark R Normal it as O. Draw a perpendicular OR. This is called normal. The angle formed by the incident ray (OP) and the normal is called angle of incidence. and angle formed by the normal and reflected ray (OQ) is called angle of reflection (r).

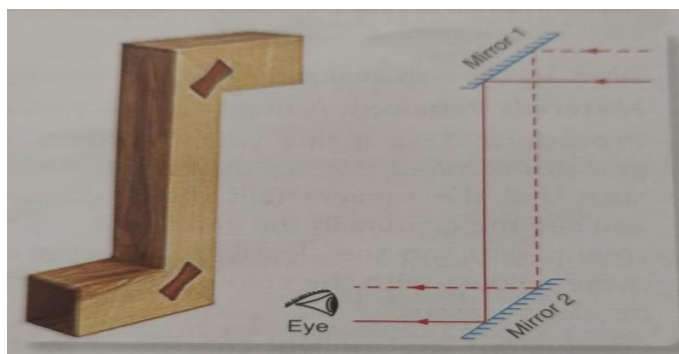
Conclusion:

- The equal measures of the angle of incidence and angle of reflection verify the first law of reflection.
- The drawing of incident ray, normal and the reflected ray on the same sheet of paper, verifies the second law of reflection.



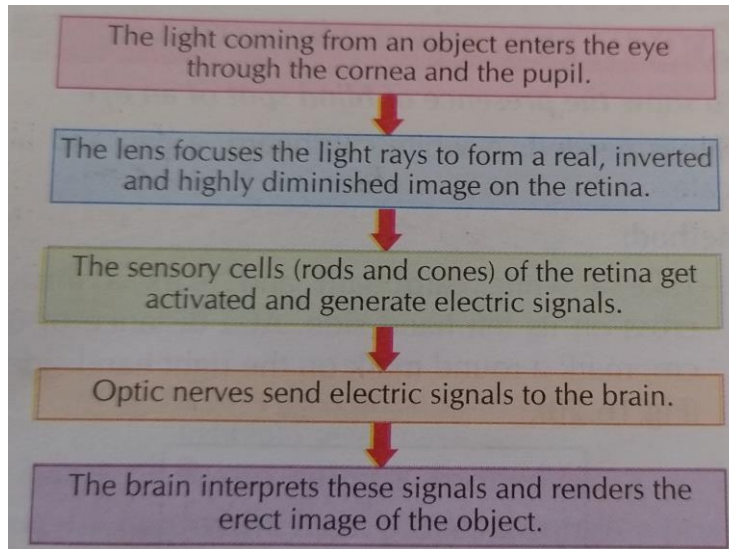
Verification of laws of reflection

3. A periscope is a rectangular tube, bent twice at an angle of 90° at its two ends. In it, two plane mirrors are fitted at an angle of 45° . The rays of light travelling from the object to be seen, fall on the first mirror, from where they are reflected and sent to the second mirror. The reflected light from the second mirror is received by the eyes of the observer, who is able to see the object. A periscope is used to detect submarines or other objects at different heights from that of the viewer.

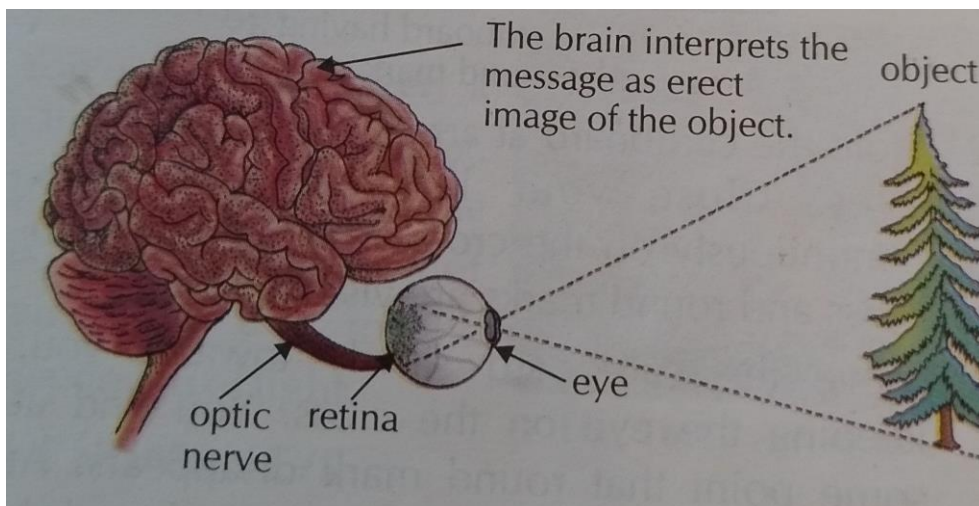


Periscope

4. Working of the Eye: The reflected light from an object enters the eye through cornea. Its amount is controlled by the iris and the pupil. This light passes through the aqueous humour, the eye lens and the vitreous humour in such a manner that an inverted image of the object is formed at the retina. The photoreceptors in the retina detect the brightness and the colours of the object. The message of the image formed at retina is picked up by the optic nerve and taken to the brain, so that we can actually see.



Working of the Human eye



Working of the Human eye

5. Ways to take care of the eye.

- (a) The eyes should be washed every day with fresh and clean water at normal temperature.
- (b) Never rub the eyes.

(c) In case of dust particles get into the eyes, splash a lot of clean and cold water into the eyes so as to wash away the dust.

(d) If a foreign particle like a splinter or a metal particle got into the eyes, wash with clean and cold water immediately. If it does not come out with water, rush to the doctor.

(e) Never look at very bright sources of light like the sun or a welding spark directly.

(f) Do not read or write in dim or very bright light and also in a moving vehicle.

(g) While reading or writing, keep your books or notebooks at a distance of distinct vision (25 cm) from the eyes.

(h) Do not spend much time looking at computer screen or a television screen.

6. (a) 1—Eye lens 2—Pupil, 3—Iris, 4—Retina, 5—Blind spot

(b) Lens

(c) Retina

(d) Pupil

(e) At this place, the optic nerve is connected to the retina, so it lacks photoreceptors and hence, the image formed at this point is not sensed by the eye. Therefore, it is called blind spot.

F. HOTS Questions:

1. A rainbow cannot be seen after the rain if the sun does not shine because there would be no sunlight and hence splitting of light into seven colours will not take place.

2. An owl can see very well in complete darkness because it has a large number of rods and very few cones in its eyes. Besides this, it has a large cornea and a large pupil which allow more light to enter its eyes.