PRISM WORLD

Std.: 8 (English) General Science

Chapter: 16

Q.1 Fill in the blank and rewrite the completed statements 3

1 The reflection of light from a wooden surface is …… reflection.

Ans The reflection of light from a wooden surface is **irregular** reflection.

2 The working of Kaleidoscope is based on the properties of …… .

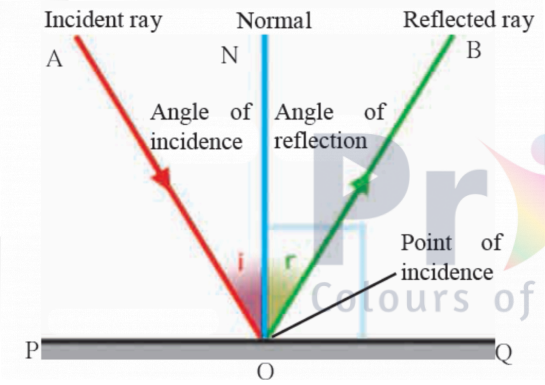
Ans The working of Kaleidoscope is based on the properties of **reflection**.

3 The perpendicular to the mirror at the point of incidence is called …….

Ans The perpendicular to the mirror at the point of incidence is called **normal**.

Q.2 Solve Numerical problems: 4

1 If the angle between the mirror and reflected ray is 23^o, what is the angle of incidence of the incident ray ?



Ans Given : Angle between the reflected ray and the plane mirror is 23^o, $\angle BOQ = 23^o$

To Find : $\angle i = \angle r = ?$

Formula : $\angle i = \angle r$

Solution : From the figure, $\angle BON = 40^o$, $\angle QON = 90$ (normal)

$\angle BON + \angle BOQ = \angle QON$

$23 + \angle BOQ = 90$

$\angle BOQ = 90 - 23 = 67^o$

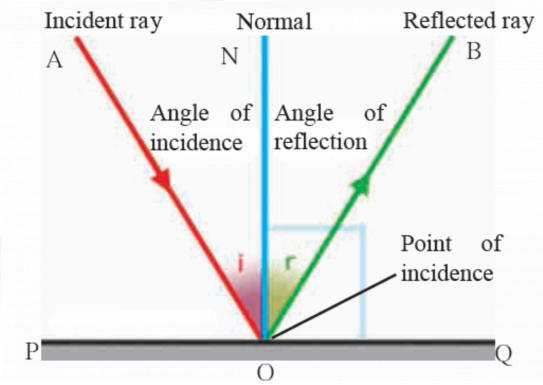
Answer : Thus, the angle of reflection = $\angle r = 67^o$

According to the law of reflection, $\angle i = \angle r$

The angle of incidence = $\angle i = 67^o$

The angle of incidence and angle of reflection are 67^o.

2 If the angle between the plane mirror and the incident ray is 40^0, what are the angles of incidence and the reflection ?



Ans Given : Angle between the incident ray and the plane mirror is 40°, POA = 40°
To Find : Angle of incidence = ∠i = ∠r = ?
Formula : ∠i = ∠r
From the figure,
POA = 40°, PON = 90 (normal)
Solution : ∠POA + ∠AON + ∠PON
40 + ∠AON = 90
∠AON = 90 - 40 = 50°
Thus, the angle of incidence = ∠i = 50°
Ans : According to the law of reflection, ∠i = ∠r
The angle of reflection = ∠r = 50°
The angle of incidence and angle of reflection are 50°.

Q.3 Distinguish between **2**

1 Regular reflection and Irregular reflection.

Ans

	Regular Reflection		Irregular Reflection
i.	The reflection of light from a plane and smooth surface is called regular reflection of light.	i.	The Reflection of light from a rough surface is called irregular reflection of light.
ii.	It takes place on a smooth highly polished surface.	ii.	It takes place on a rough and uneven surface.
iii.	Reflects over limited area.	iii.	Reflects over large area.
iv.	This property is used in search lights.	iv.	Due to irregular reflection, we are able to see things around us.

Q.4 Give scientific reasons **2**

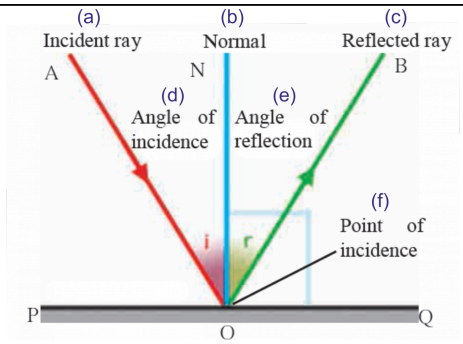
1 We cannot see the objects in a dark room.

Ans i. Objects can be seen only when the light coming from the objects enter our eyes.
ii. The light entering our eyes may be emitted by the object or may be reflected by it.
iii. When the light rays fall on the object their direction changes and they turn back. This is called reflection of light.
iv. Hence, when we switch off the light, we cannot see the object as there is no light that can be reflected from the object.

Q.5 Draw / Label the diagram **2**

1 Draw 'Reflection of Light" showing the following.
a. Incident ray b. Normal c. Reflected ray
d. Angle of incidence e. Angle of reflection f. Point of incidence

Ans



Q.6 **Write answers based on given diagram/paragraph** **3**

1 Swara and Yash were looking in a water filled vessel. They could see their images clearly in the still water. At that instant, Yash threw a stone in the water. Now their images were blurred. Swara could not understand the reason for the blurring of the images. Explain the reason for blurring of the images to Swara by answering the following questions.

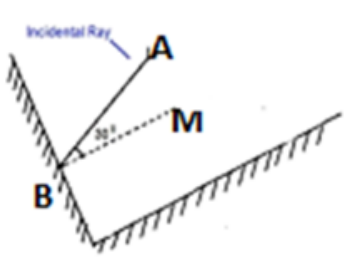
i. Is there a relation between the reflection of light and the blurring of the images?
ii. Are laws of reflection followed in these types of reflection?
iii. Which type of reflection of light can you notice from this?

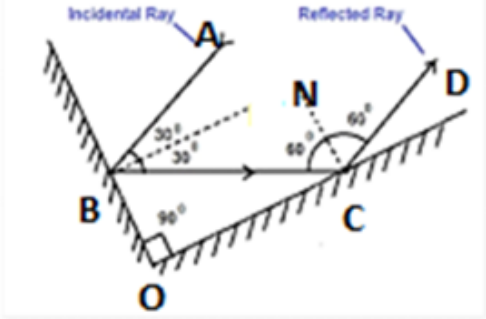
Ans i. Yes, there is a relation between the reflection of light and the blurring of the images. Initially, the water was steady and regular reflection was obtained from the smooth water surface. But when the stone was thrown in the water, ripples were created thus giving rise to irregular reflection creating blurred images.
ii. Yes, the laws of reflection are followed in both regular and irregular reflection.
iii. At first, regular reflection was obtained and later after the stone was thrown, irregular reflection was obtained.

Q.7 **Extra data** **2**

1 **Draw a figure describing the following.**
The reflecting surfaces of two mirrors make an angle of 90^0 with each other. If a ray incident of one mirror has an angle of incidence of 30^0, draw the ray reflected from the second mirror. What will be its angle of reflection ?

Ans





Let two mirrors M1 and M2 be placed at 90^o with each other.
Let ray AB be incident ray which makes an angle 30^o with the normal MB.
According to the laws of reflection,
$\angle ABM = \angle MBC$
$\therefore \quad \angle MBC = 30^0$ ($\angle i = \angle r$)
But, $\angle MBC$ and $\angle CBO$ are complementary angles, $\angle CBO = 30^o$
And $\angle CBO$ and $\angle BCN$ are alternate angles, $\angle BCN = 60^o$
$\angle BCN$ is the angle of incidence for the mirror M2 at point C
$\therefore \quad \angle BCN = \angle NCD$ (according to laws of reflection, $\angle i = \angle r$)
$\therefore \quad \angle NCD = 60^o$
$\therefore$ Angle of reflection at the second mirror will be 60^0.

2 Regular reflection and Irregular reflection

Ans

Regular Reflection	Irregular Reflection
The Reflection of light from a plane and smooth	The Reflection of light from a rough surface is

surface is called regular reflection of light.	called irregular reflection of light.