



Science

Grade 9



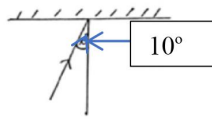


Grade 9 – Unit 14 Science

Reflection and Refraction of waves

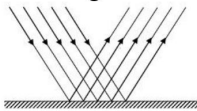
- A characteristic of an image formed by a Plane mirror
 - Real
 - Smaller
 - Upright
 - Image distance is longer than object distance.

- The light ray that falls on a plane mirror at an angle of incidence of 10°



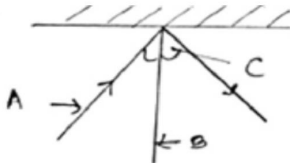
- Reflects back along the same path.
- Refracts.
- Travels parallel to the plane mirror.
- Reflects back at an angle of 10° .

- The figure shows an occasion of reflection on a



- Plane mirror
- Tree
- Wall
- Book

- A, B and C respectively are



- Angle of incidence, angle of refraction, normal line
- Normal line, angle of incidence, angle of refraction
- Angle of incidence, normal line, angle of refraction
- Angle of refraction, normal line, angle of incidence

- The correct statement/s about methods for sound absorption

- Making the ceiling porous 2. Making the walls rough 3. Hanging rough folded curtains
 - 1 only
 - 2 only
 - 2 and 3 only
 - 1,2,3 all

- A phenomenon used in ultra sound scanning is

- Absorption
- Reflection
- Echo
- Resonance
- e.

- Bats use these waves to detect obstacles at night

- Microwaves
- Infra- red waves
- Ultra – violet waves
- Ultra sound waves

- The light makes rainbow by

- Refraction and total internal reflection
- Reflection
- Lateral inversion
- Total internal reflection



9. The sound of the speaker's voice in some lecture halls cannot be heard clearly due to
 a. Reverberation b. Echo c. Resonance d. Reflection
10. The minimum distance between the observer and the barrier to cause the echo
 a. 15.5 m b. 16.5 m
 c. 17.5 m d. 18.5 m

(01) A. Nimal went with his sister to see their new home. His sister had a problem with hearing their voice again when they were talking.

- i. What is the name of this phenomenon?

- ii. What is the reason for hearing the same voice over and over again?

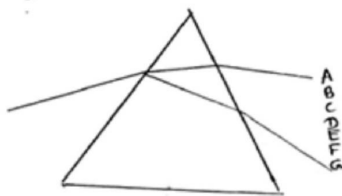
- iii. Why does this phenomenon not occur in your home?

B. The Bat uses reflection of sound to detect obstacles at night.

- i. What type of waves does the bat use for this?

- ii. Write an instance where reflection of sound is used by the man.

(02) A.

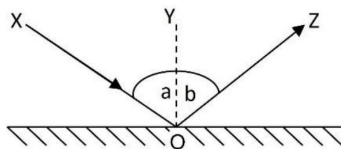


1. What is the name given to the separation of colours as white light travels through the prism?

2. What are the colours A and G?

3. Write an occasion on where you see sunlight separating into colours in the natural environment.

B



1. Name the rays XO and ZO.

2. Comment on the value of angles a and b.

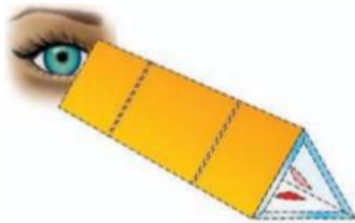
3. What happens when light rays travel through the following directions.
 a. ZO
 b. YO
4. Why does the bottom of a water bowl look raised?



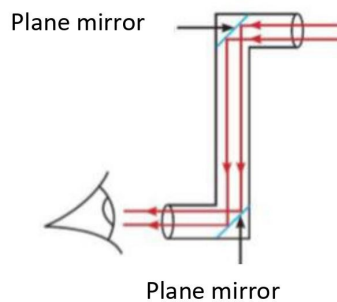
03.

1. Write two uses of plane mirrors.

2. The device shown below can be used to observe various patterns of the things that are inserted (petals of a flower, plant leaves, and pieces of paper) into it. What is the name of this device?



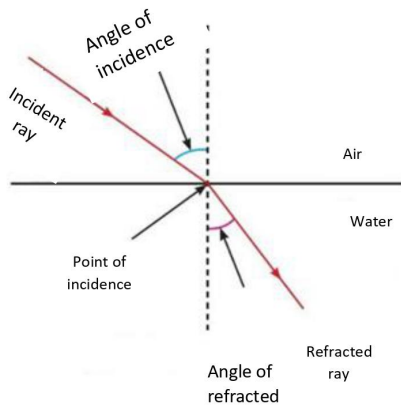
2. Name the apparatus shown below which is used from a bunker or submarine to observe the things that are out of sight.
(01)



3. What is lateral inversion?
4. What is a real image?
5. What is a virtual image?
6. Write 2 characteristics of images formed by a plane mirror.
7. How many rays are sufficient to draw a ray diagram to show how an image is formed by a plane mirror?



1. What is refraction?
2. The ray diagram below shows the way of refraction occurs when a light ray enters from air to water.

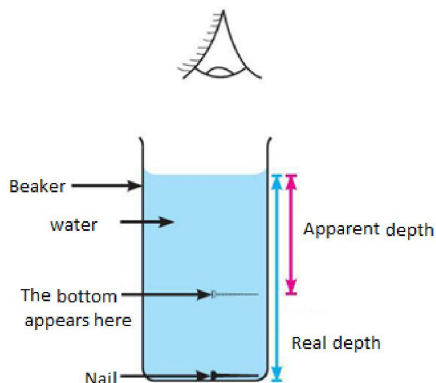


Answer the questions based on the diagram.

- a) During refraction, the ray that is reaching the interface is the ray.
- b) The ray that travels after refraction is theray.
- c) The perpendicular line drawn at the point of incidence is called.....

The way of refraction occurs when a light ray enter from air to water

03. An apparatus used to observe how the bottom of a beaker appears to be raised is shown below.



When observed from above, how do you find the position of the nail where it appears to be?

4. What is real depth?
3. What is apparent depth?
4. Explain why a pencil placed inside a glass of water appears to be broken at the surface of water?

