



3055 BA SANGAM COLLEGE

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Worksheet 18

School: Ba Sangam College

Year/Level: 11

Subject: Physics

Strand	4 -Light
Sub-strand	Refraction
Content Learning Outcome	Objective: <ul style="list-style-type: none"> Demonstrate by drawing scaled ray diagrams an understanding of the formation and nature of the images due to convex mirrors State and understand the application of snell's law.

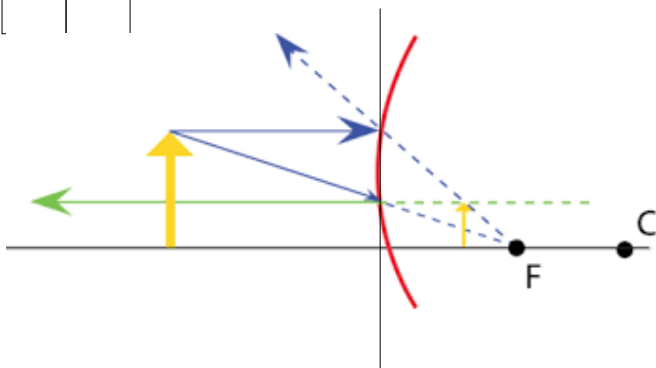
CONVEX MIRRORS

- Pick a point on the top of the object and draw two incident rays travelling towards the mirror.
- Once these incident rays strike the mirror, reflect them according to the two rules of reflection for convex mirrors.
- Locate and mark the image of the top of the object.

EXAMPLE

Draw using a ray diagram to locate image formed by the convex mirror and state the nature of image formed.

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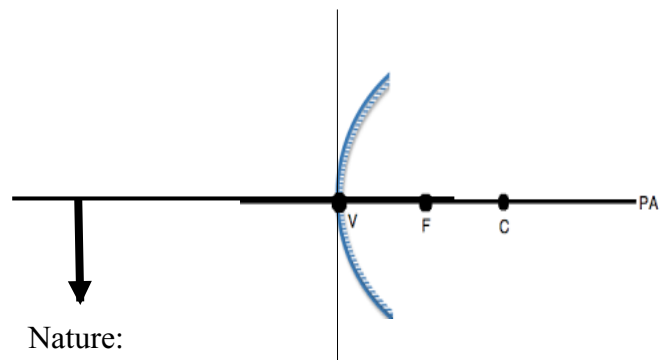
Nature of image: Virtual, Upright, Diminished



ACTIVITY

(3 marks)

Draw ray diagrams to locate image formed by the following convex mirror and state the nature of image formed.



Nature:

Note: No matter where the object is placed in front of convex mirror, the image is always virtual, upright and diminished.

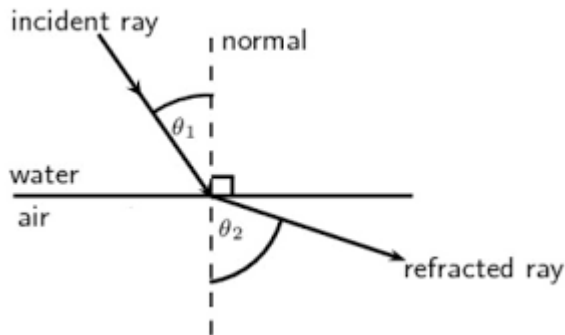
REFRACTION

Is the bending of light when light goes from one medium to another due to its change in speed.

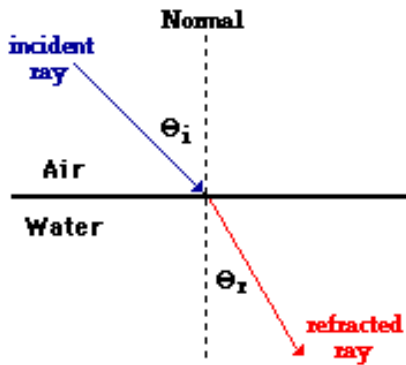
LAW OF REFRACTION

The incident ray, the refracted ray, and the normal all lie on the same plane.

1. When light goes from more dense medium (water) to less dense medium (air), it bends away from the normal



2. When light goes from more dense medium to less dense medium, it bends away from the normal



Note: $n_{air} = 1.33$, $n_{water} = 1.33$, $n_{glass} = 1.5$

The amount of bending is found using Snell's Law:

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

Where:

n_1 = refractive index in medium 1

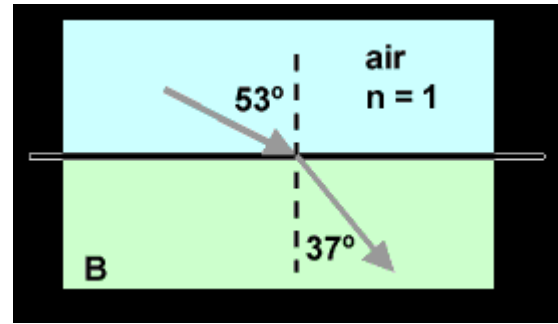
n_2 = refractive index in medium 2

θ_1 = angle of incidence

θ_2 = angle of refraction

EXAMPLE

A laser light bends when entering another medium from air as shown below.



- a) Find the refractive index for medium 2.

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

$$1 \sin 53^\circ = n_2 \sin 37^\circ$$

$$n_2 = 1 \sin 53^\circ / \sin 37^\circ$$

$$n_2 = 1.33$$

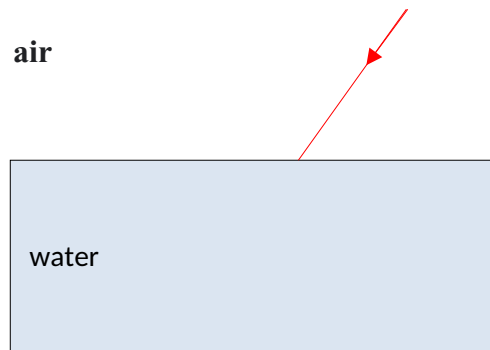
- b) Identify the second medium through which laser light passed through.

Water

ACTIVITY

(3 marks each)

1. Complete the ray diagram



air

- 2.

When light passes from air into water at an angle of 45° to the normal, what is the angle of incidence in water?

THE END