



Worksheet 17

School: Ba Sangam College

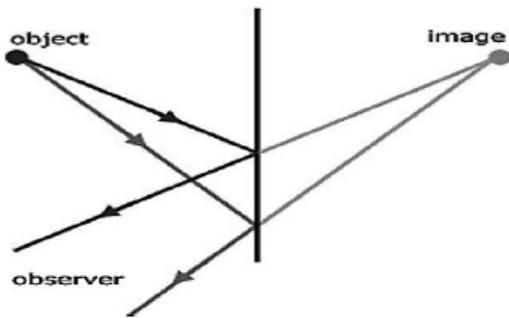
Year/Level: 11

Subject: Physics

Strand	4 -Light
Sub-strand	Reflection
Content Learning Outcome	Objective: <ul style="list-style-type: none">• Understand laws of reflection• Demonstrate by drawing scaled ray diagrams an understanding of the formation and nature of the images due to concave mirrors

REFLECTION

- The **Law of reflection** states that the angle of incidence equals the angle of reflection ie $i = r$.

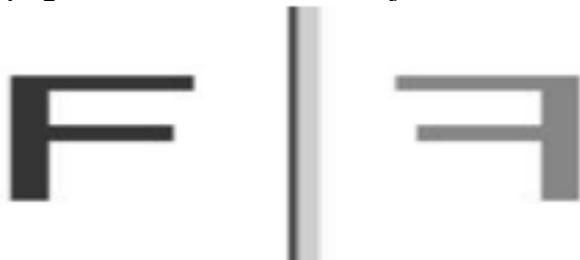


The incident ray and the reflected ray and the normal are all in the same plane.

- The **angle of incidence** is the angle between the normal and the incident ray.
- The **angle of reflection** is the angle between the normal and the reflected ray.

THE IMAGE IN A PLANE MIRROR

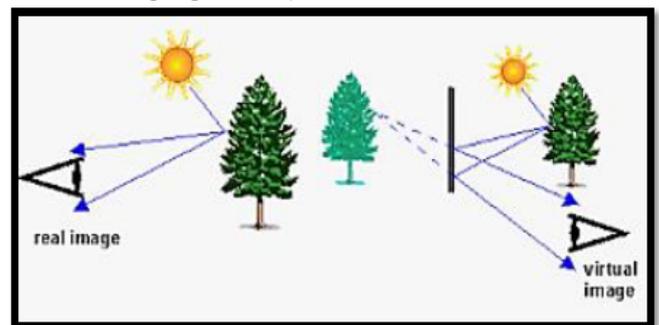
Nature of image: virtual image (behind mirror), upright and same size as the object.



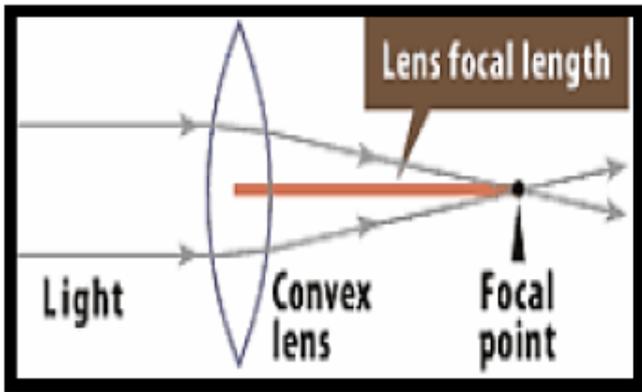
The image in a plane mirror also looks as though it is **reversed from left to right** (sideways). This property is called **LATERAL INVERSION**.

TERMS

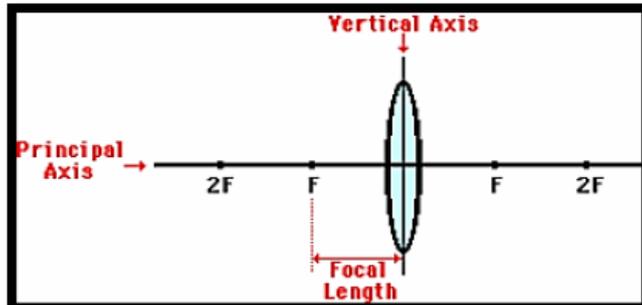
1. Incident ray - is a **ray** of light that strikes a surface.
2. Reflected ray - is the **ray** that represents the light **reflected** by the surface.
3. Normal – perpendicular line to the surface of mirror (divides the angle between the incident ray and the reflected ray into two equal angles)
4. Image - is a visual representation of something (picture that has been created or copied and stored)
5. Virtual image – occurs where rays only appear to converge but do not pass through (image not formed on screen)
6. Real image - occurs where rays converge and produced on screen (produced by concave mirrors and converging lenses)



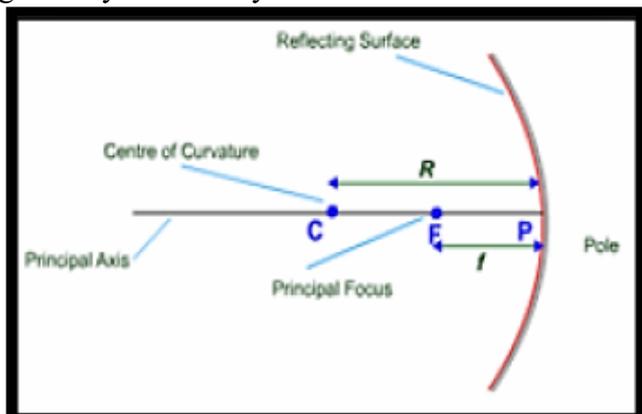
7. Focus - is the point where light rays originating from a point on the object converge (A point at which rays (as of light, heat, or sound) meet after being reflected or bent or the point at which an image is formed)
8. Focal length - is the **distance** between the centre of a convex lens or a concave mirror



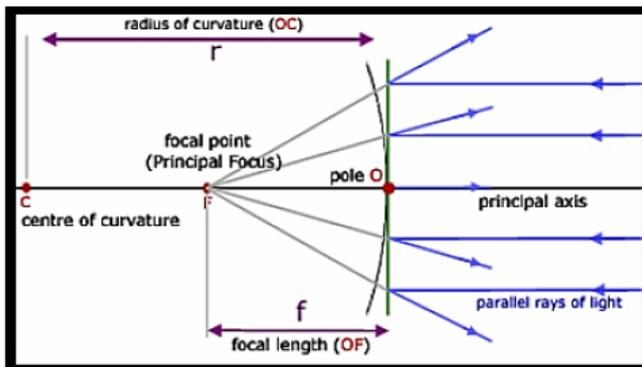
9. Principle axis - the line passing through the optical centre and centres of curvature of the faces of a lens or a curved mirror.



10. Pole - is the centre of the reflecting surface generally denoted by letter 'P'.



11. Radius of curvature - the distance from the vertex to the centre of curvature.



CONVERGING MIRRORS

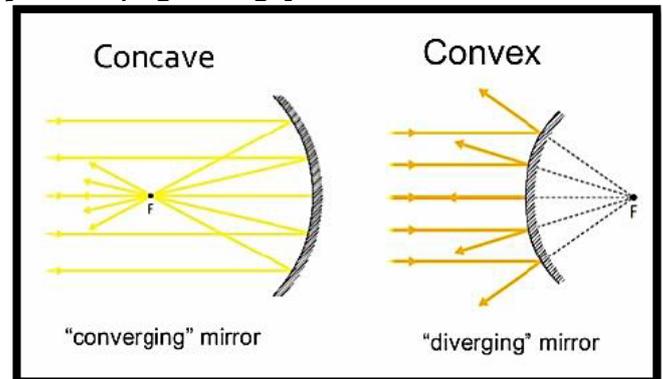
A **concave mirror** is a **converging mirror**, as when a parallel light beam falls on the **mirror**;

they reflect and **converge (meets)** at a point. (form real, inverted and upright image)

DIVERGING MIRRORS

A convex mirror is a diverging mirror, as the light beam arising from the same source **will** reflect light outwards and **diverge (spreads)**.

[Forms upright image].



CURVED MIRRORS

• The side that *curves inwards* is called **CONCAVE** and the side that *curves outwards* is called **CONVEX**.

1. CONCAVE MIRRORS

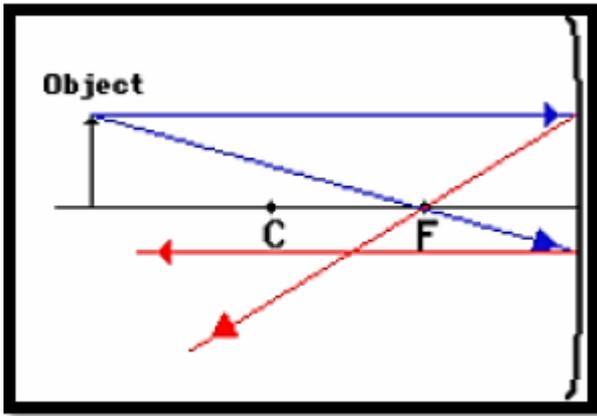
• A *concave mirror* will converge a beam of light and it gives a real image.

NOTE:

The image produced is upright, virtual and magnified if the object is closer to the mirror than its focal length but inverted and real if it is further away.

STEPS TO DRAW IMAGE FORMED BY CONCAVE MIRROR

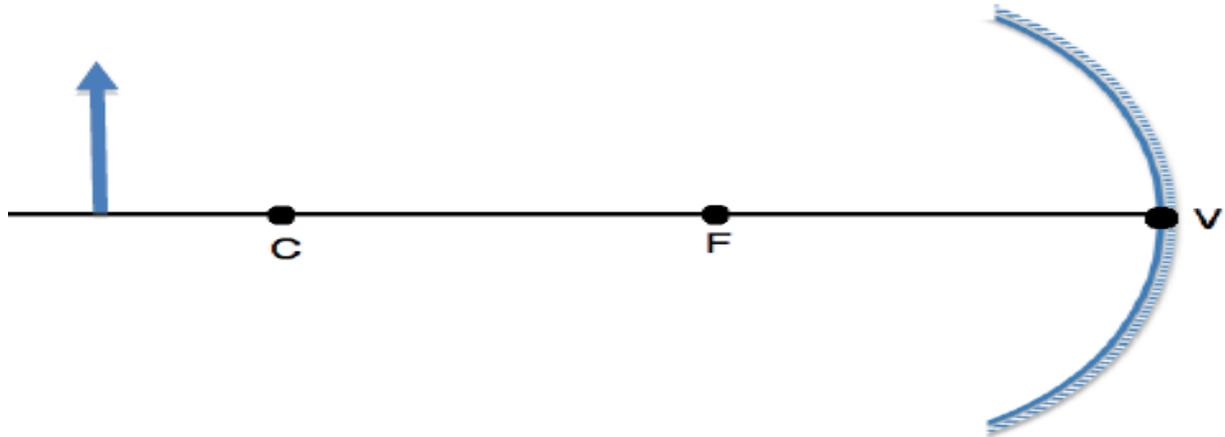
1. Pick a point on the top of the object and **draw** two incident rays traveling towards the **mirror**. ...
2. Once these incident rays strike the **mirror**, reflect them according to the two rules of reflection for **concave mirrors**. ...
3. Mark the **image** of the top of the object.



ACTIVITY (15 MARKS)

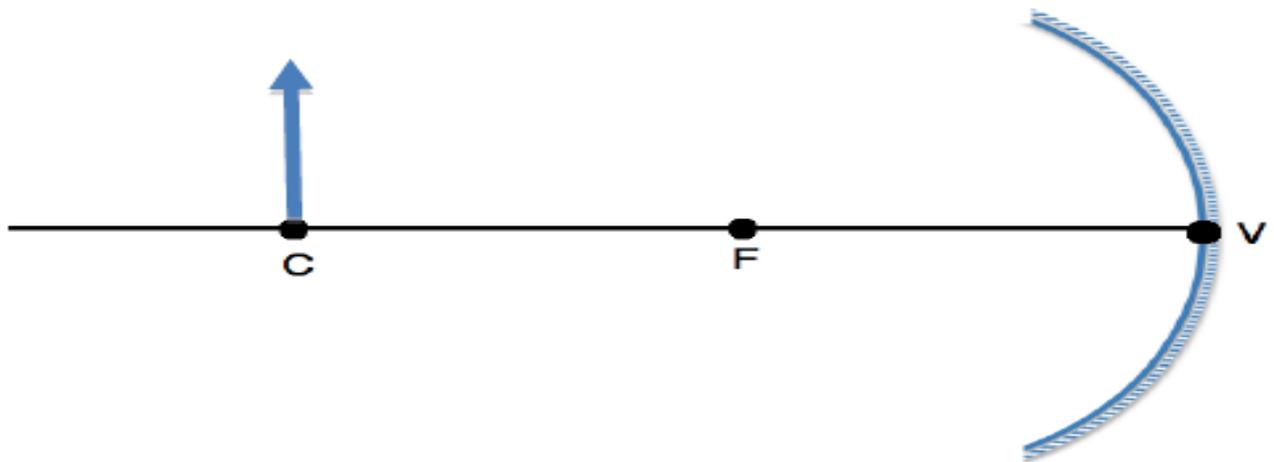
1. Object beyond C

(3 MARKS EACH)



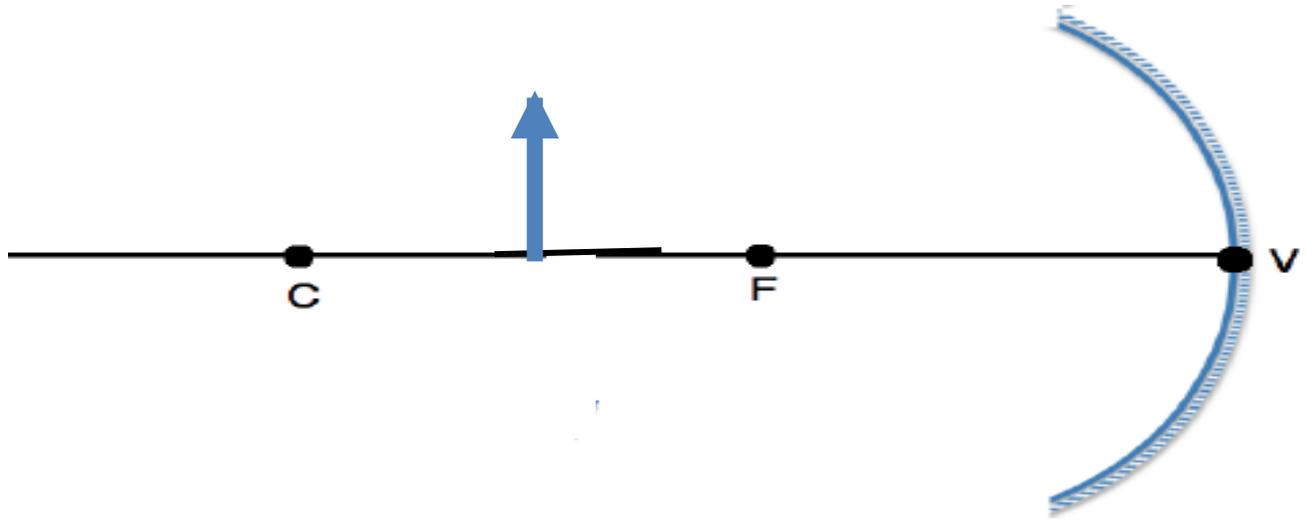
Nature of image:

2. Object at C

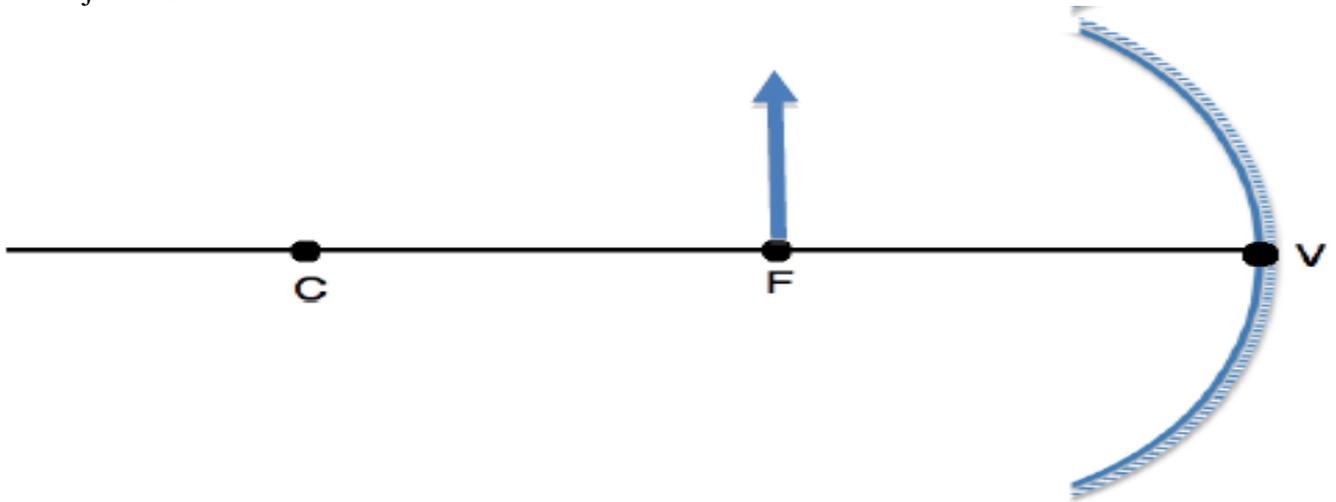


Nature of image:

3. Object between F and C

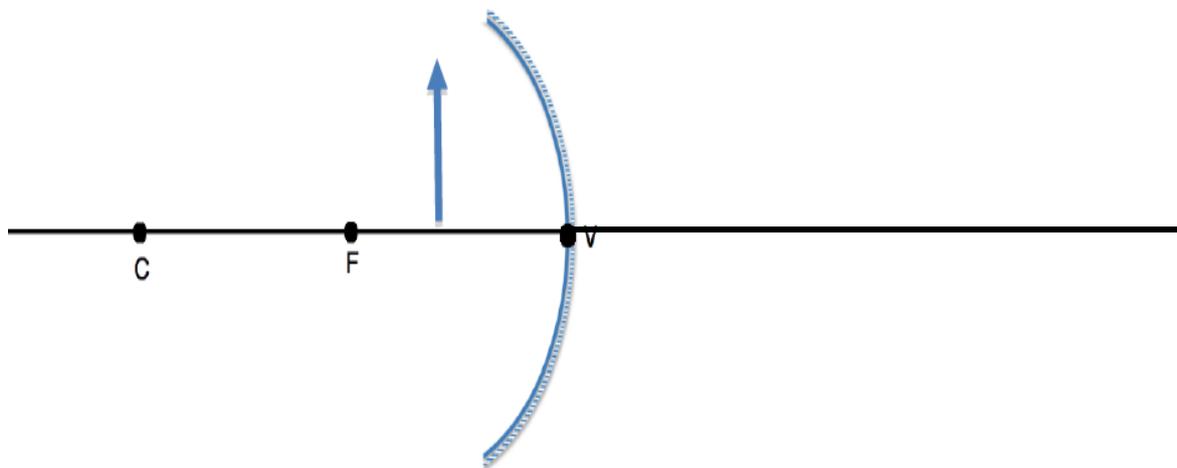


4. Object at F



Nature of image:

5. Object between pole and F



Nature of image:



