

SCIENCE • CLASS 10

CHAPTER 9

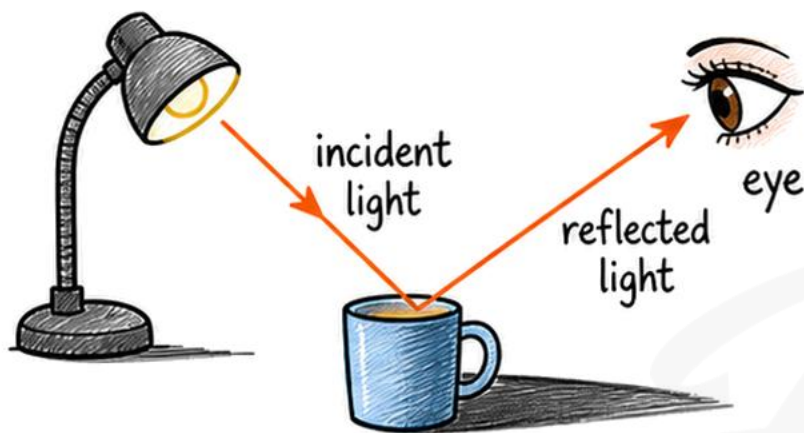
Light - Reflection and Refraction

CHAPTER NOTES

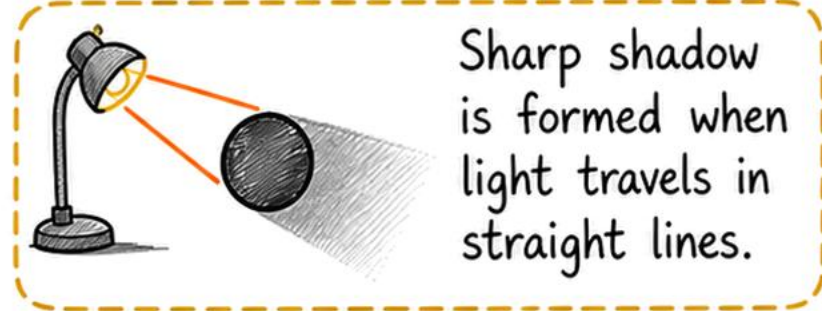


LIGHT RAYS, REFLECTION AND PLANE MIRRORS

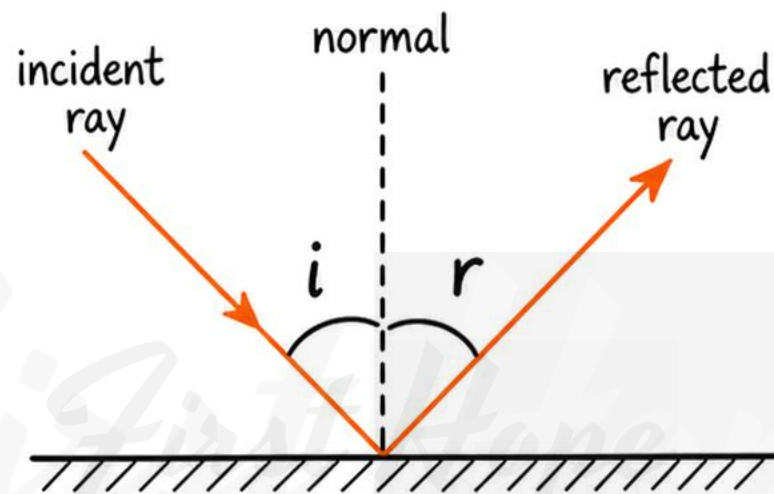
- Light travels in straight lines.



- We see an object when reflected light enters our eyes.



LAWS OF REFLECTION

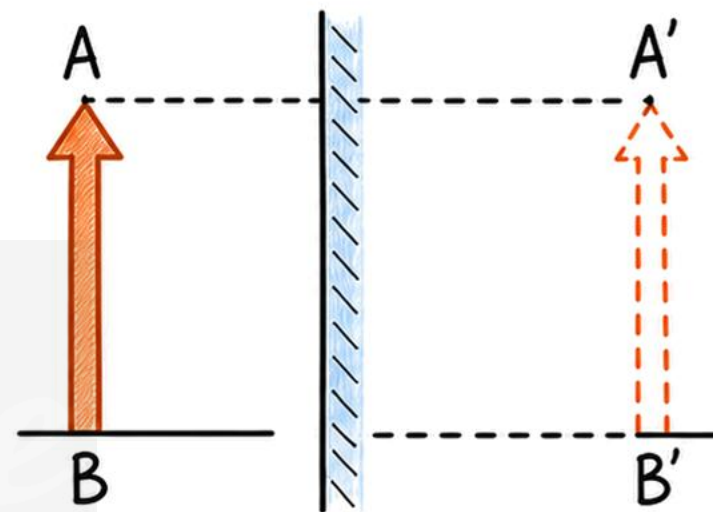


1. Angle of incidence = angle of reflection

$$i = r$$

2. Incident ray, normal and reflected ray lie in the same plane.

PLANE MIRROR



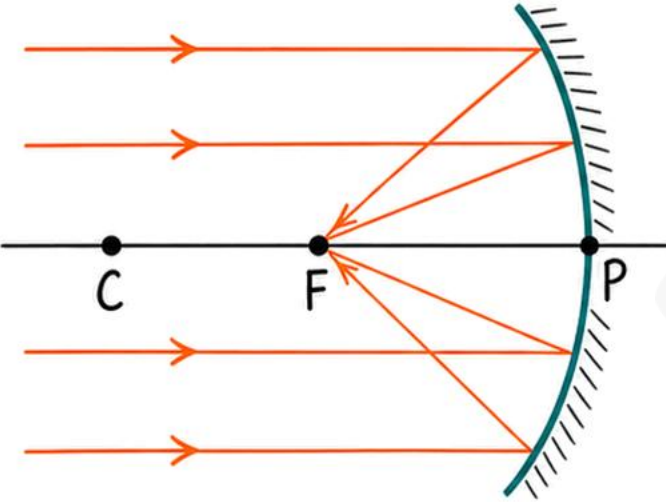
- virtual and erect
- same size
- equal object and image distance
- laterally inverted

RAY MODEL: light paths are represented by straight rays.

SPHERICAL MIRRORS: ANATOMY AND FOCUS

CONCAVE MIRROR

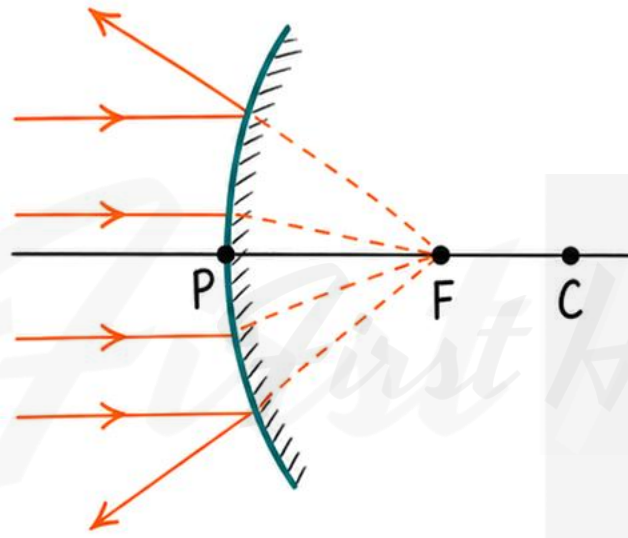
reflecting surface curves inward



real focus

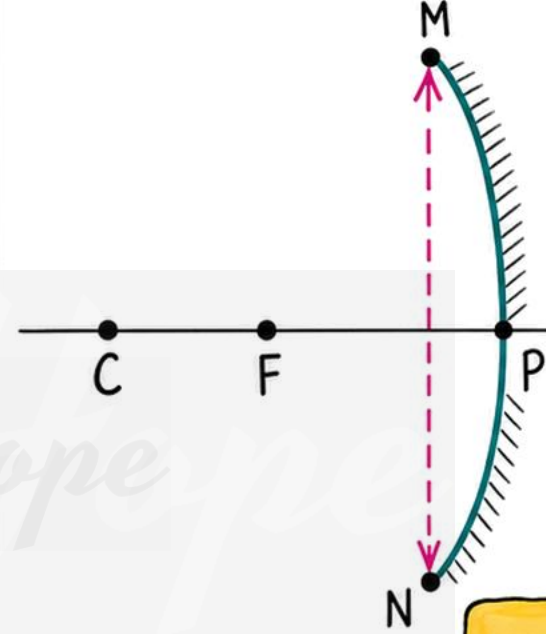
CONVEX MIRROR

reflecting surface bulges outward



virtual focus

KEY TERMS



Pole **P**: centre of reflecting surface

Centre of curvature **C**:
centre of parent sphere

Radius **R** = **PC**

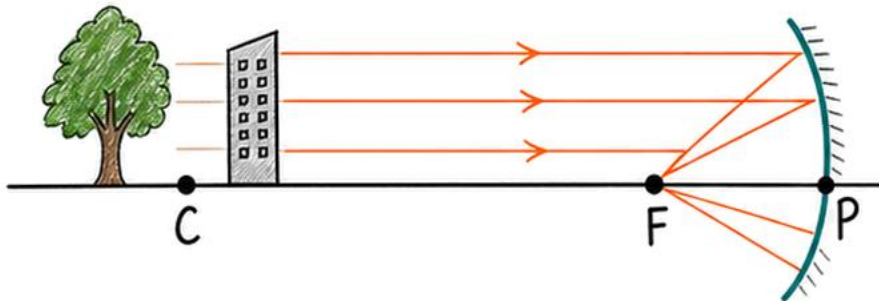
Principal axis: line through
P and **C**

Focal length **f** = **PF**

Aperture **MN**: diameter of
reflecting surface

$$R = 2f$$

F lies midway between **P** and **C**
for a small-aperture spherical mirror.

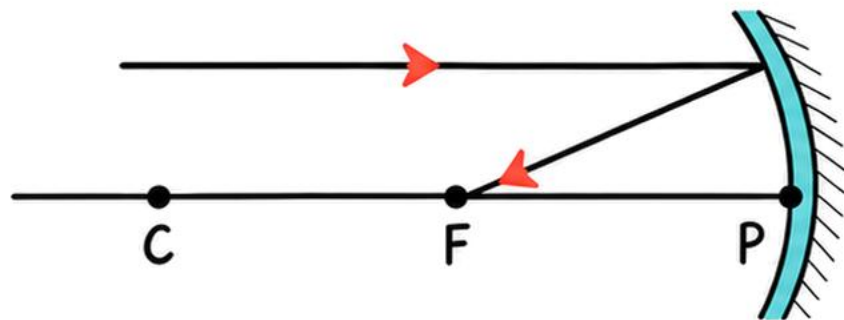


Sharp distant image at **F**;
mirror-to-image distance
approximates **f**.

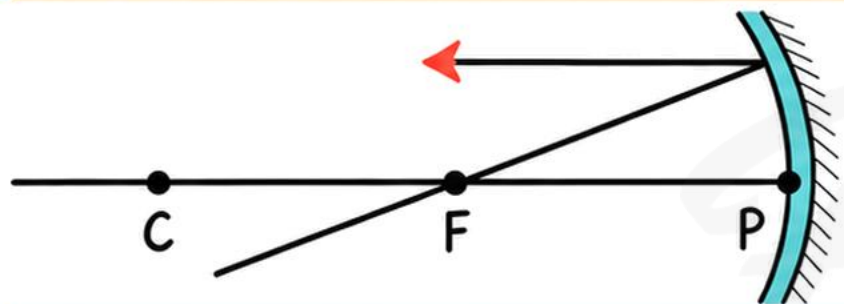
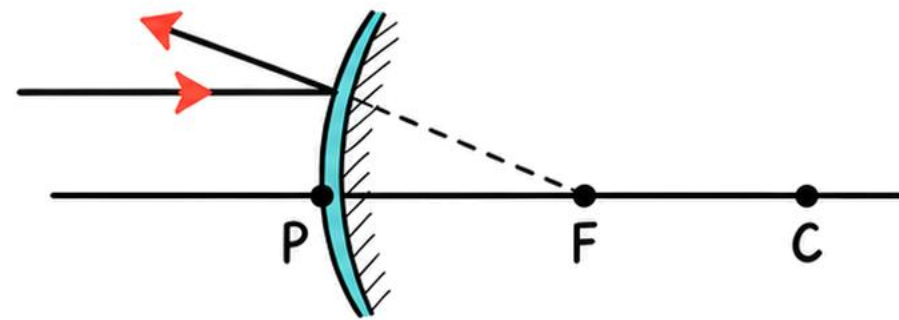


Never look at the Sun
directly or in a mirror.

PRINCIPAL RAYS FOR SPHERICAL MIRRORS

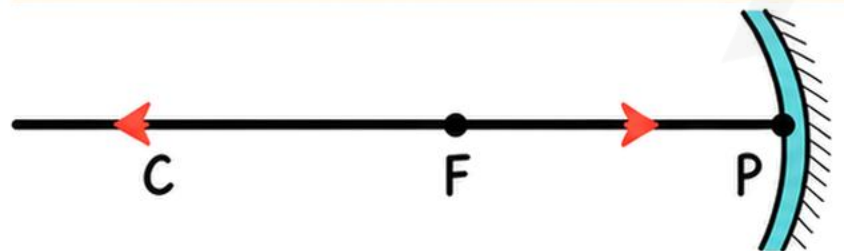


1 Parallel ray $\rightarrow$ focus

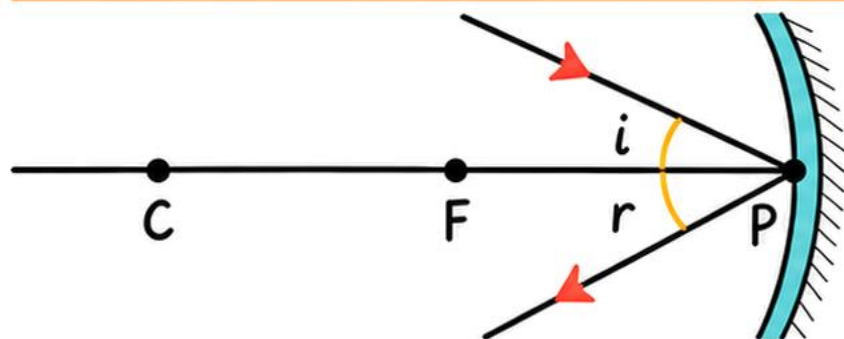
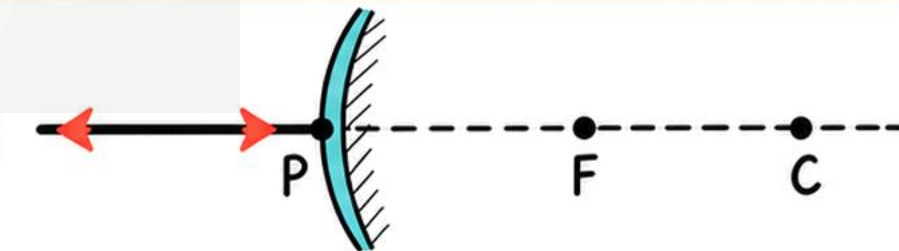


2 Focus ray $\rightarrow$ parallel

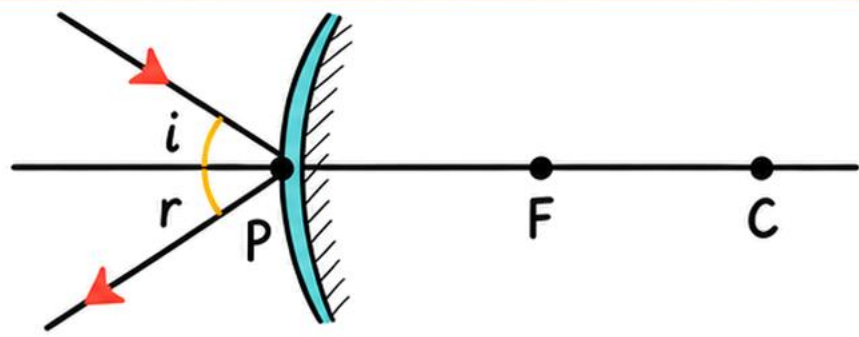
Aim toward virtual focus F $\rightarrow$
reflected ray is parallel to
the principal axis.



3 Centre ray retraces path



4 At pole P: $i = r$



CONCAVE MIRROR: IMAGE-POSITION SUMMARY I

1 OBJECT AT INFINITY

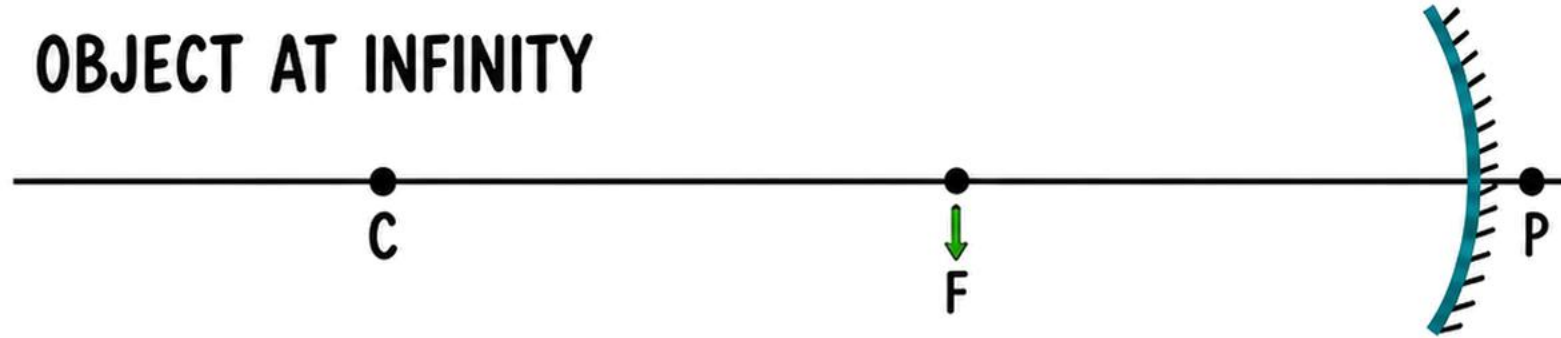


Image: at F
highly diminished, point-sized
real and inverted

2 OBJECT BEYOND C

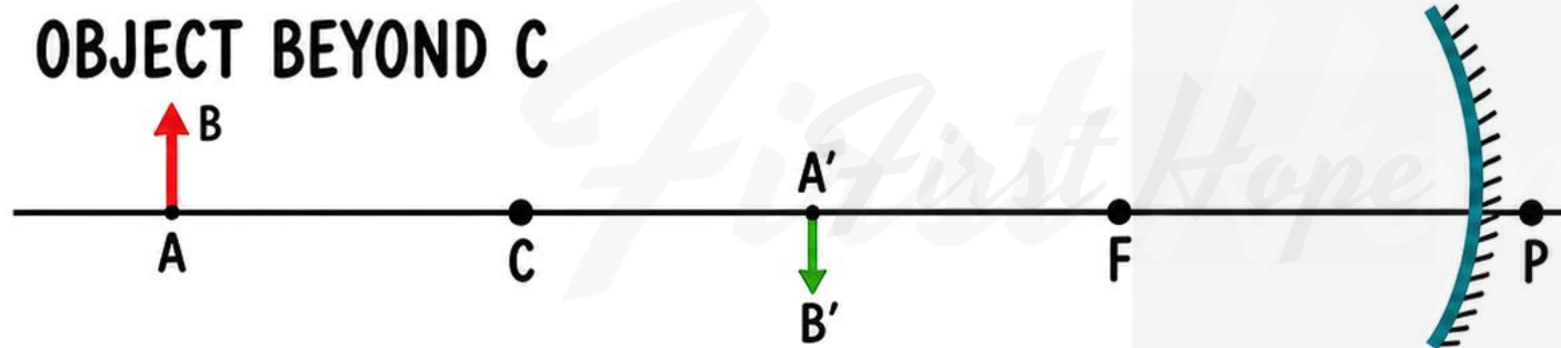


Image: between C and F
diminished
real and inverted

3 OBJECT AT C

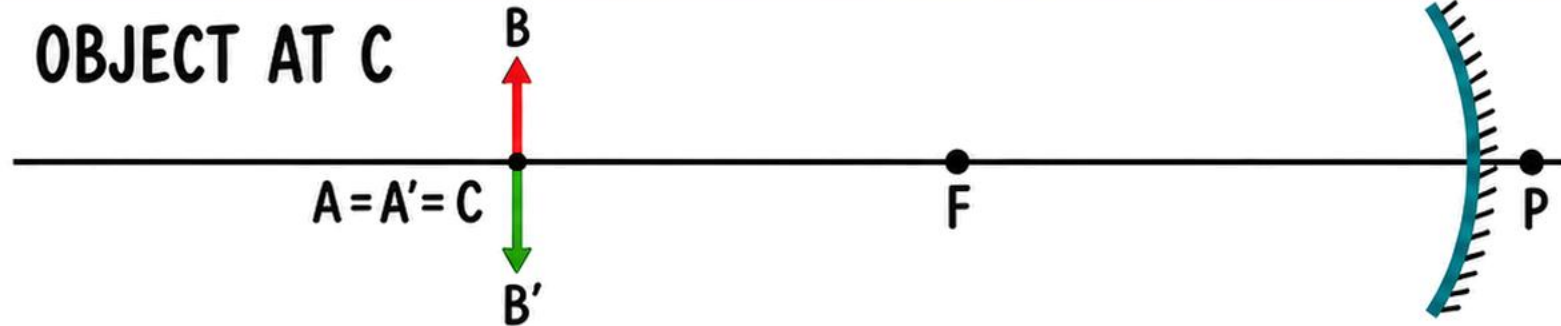


Image: at C
same size
real and inverted

CONSTRUCT RAY DIAGRAMS USING ANY TWO PRINCIPAL-RAY RULES FROM PAGE 03.

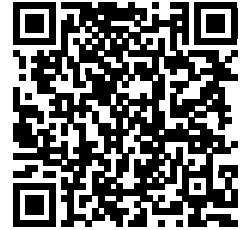


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