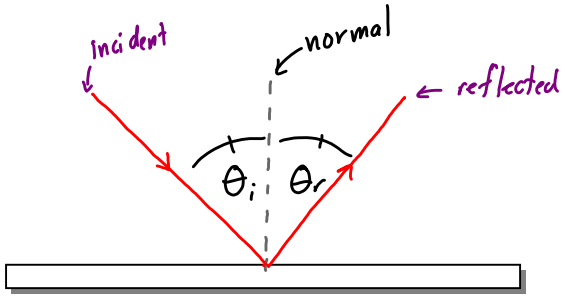
Unit 8: Waves

3 – Reflection



When a wave travels into a new medium some is reflected back.

The amount of reflection depends on…

how different the media are.

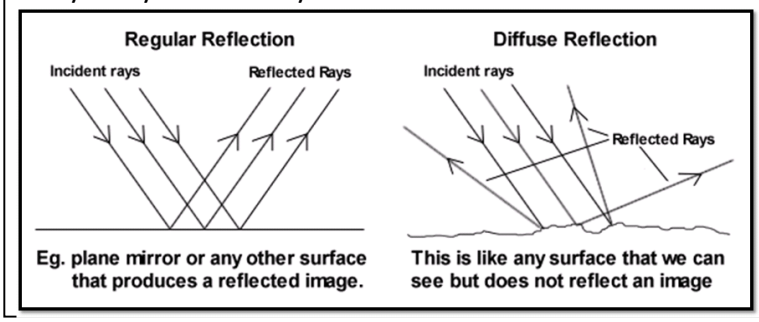
Light reflected from a plane (flat) mirror follows the Law of Reflection

Angle of Incidence = Angle of Reflection

$\theta_i = \theta_r$

These angles are measured from the normal a line perpendicular to the mirror

Why can you not see your reflection in all flat surfaces?

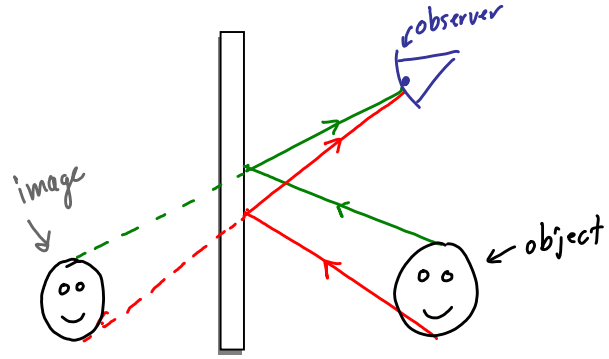


Ray Diagrams

When you look at your image in a plane mirror it is:

- Same size
- The same distance behind the mirror as you are in front of it.
- Right side up and laterally inverted.
- Also, the reflected light has the same speed, wavelength and frequency as the incident light.

When drawing ray diagrams we draw two rays of light coming from the object, reflecting of and heading to the observer.

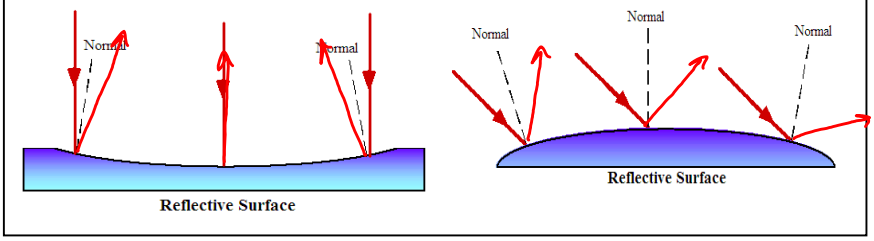


Curved Mirrors:

Concave: curved inwards

Convex: curved outwards

Since the surface is curved the normal is different at each point.



Concave Mirrors:

Principle Axis: line through center of mirror

Centre of Curvature (C): centre of circle that forms mirror

Focal Point (F): point where all light converges

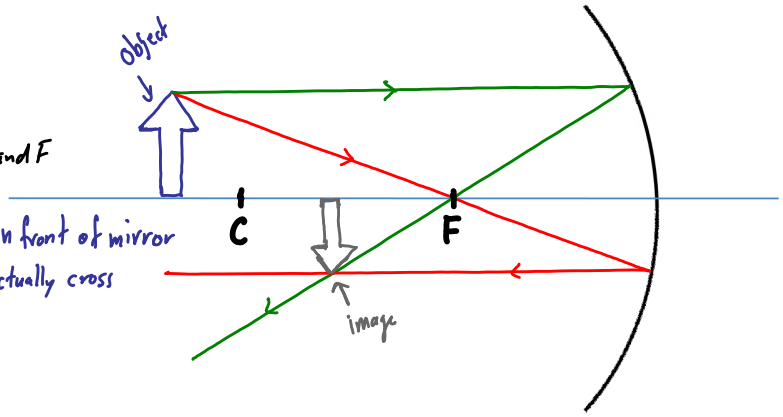
Focal length (f): distance from F to mirror and from C to F

Convex Mirrors:

Consider the situation where an object is beyond the center of curvature:

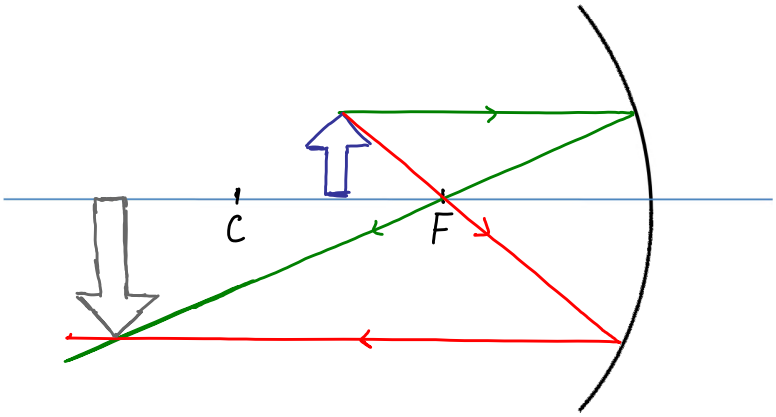
Remember:

Image is:
- Inverted
- Smaller
- Between C and F
- Real
  - image in front of mirror
  - lines actually cross



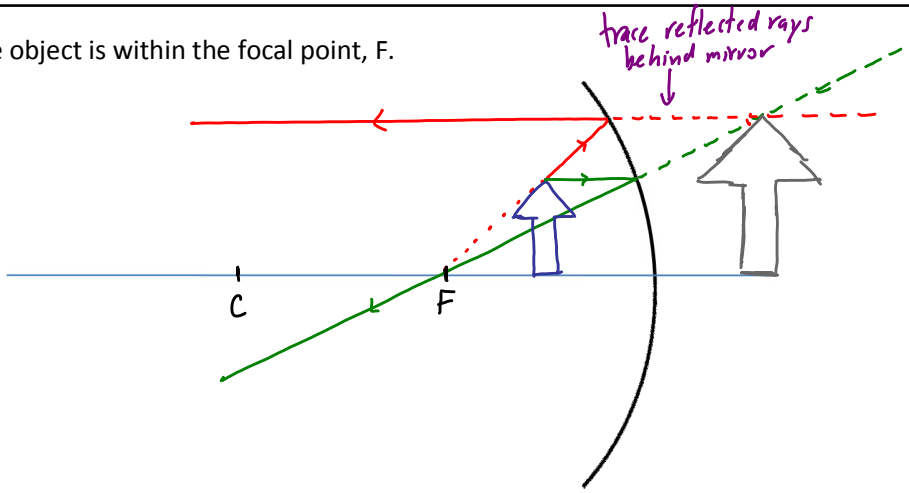
Now consider if the object were between C and F

Image:
- larger
- inverted
- beyond C
- real



Finally consider the case where the object is within the focal point, F.

Image:
- larger
- upright
- virtual



Convex Mirror:

Image:
- upright
- smaller
- virtual