

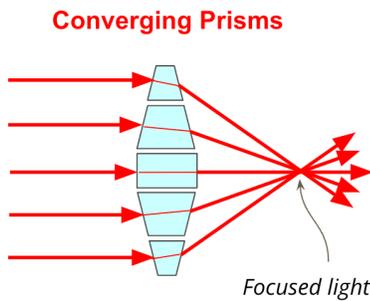
Refraction and Lenses Lesson Notes

Learning Outcomes

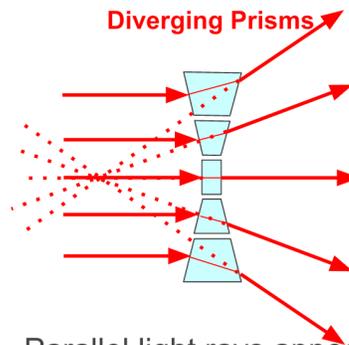
- How can a lens be described?
- In what manner does a converging and a diverging lens refract light?

What is a Lens?

A lens can be thought of as a collection of refracting prisms that act together to refract and focus light and produce discernable images of objects.



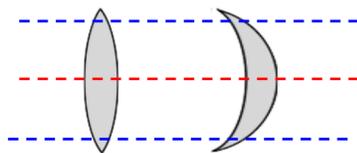
Parallel light rays are converged to a point.



Parallel light rays appear to diverge from a point.

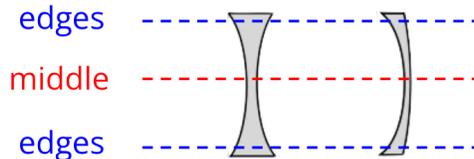
Types of Lenses

Converging Lenses



Thicker across the middle;
thinner at its edges.

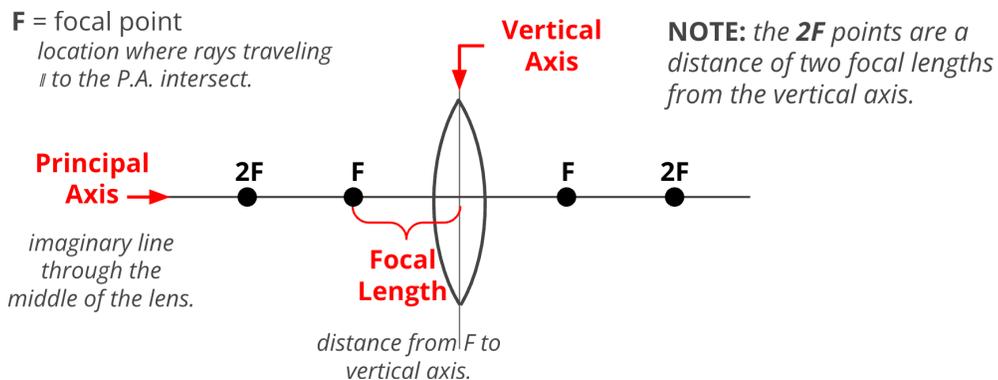
Diverging Lenses



Thinner across the middle;
thicker at its edges.

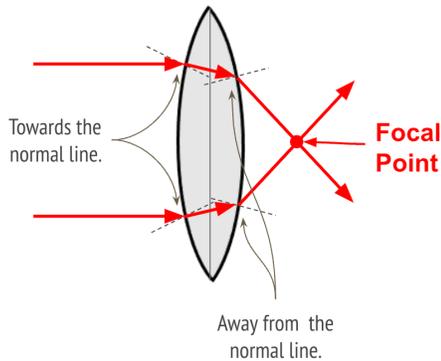
Anatomy of a Lens

An understanding of the anatomy of a lens (and the associated vocabulary) is essential to understanding discussions of all topics related to lenses.

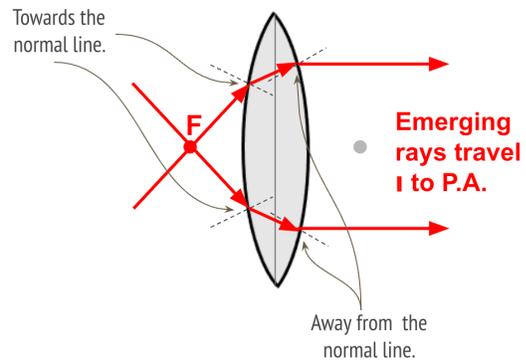


How a Converging Lens Refracts Light

Consider light rays incident on the lens, traveling \parallel to the P.A.

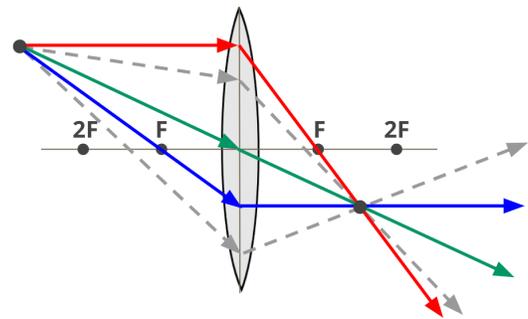


Consider light rays traveling through F on its way to the lens.



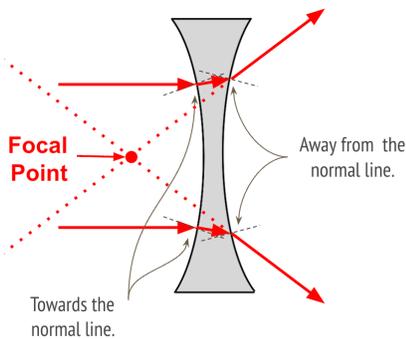
Converging Lenses – Three Refraction “Rules”

1. An incident ray traveling \parallel to the P.A. will refract and pass through F. (Red)
2. An incident ray traveling through F will refract and travel \parallel to the P.A. (Blue)
3. An incident ray traveling towards the exact center of the lens will continue along its original path. (Green)

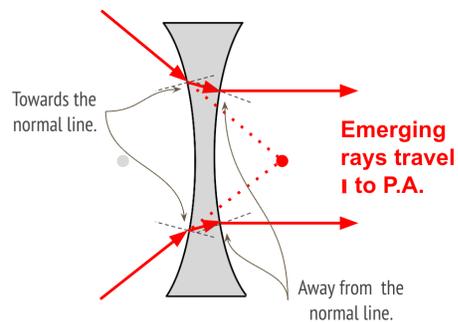


How a Diverging Lens Refracts Light

Consider light rays incident on the lens, traveling \parallel to the P.A.



Consider light rays traveling towards F on its way to the lens.



Diverging Lenses – Three Refraction “Rules”

1. In incident ray traveling \parallel to the P.A. will refract inline with F. (Red)
2. In incident ray traveling towards F will refract and travel \parallel to the P.A. (Blue)
3. In incident ray traveling towards the exact center of the lens will continue along its original path. (Green)

