

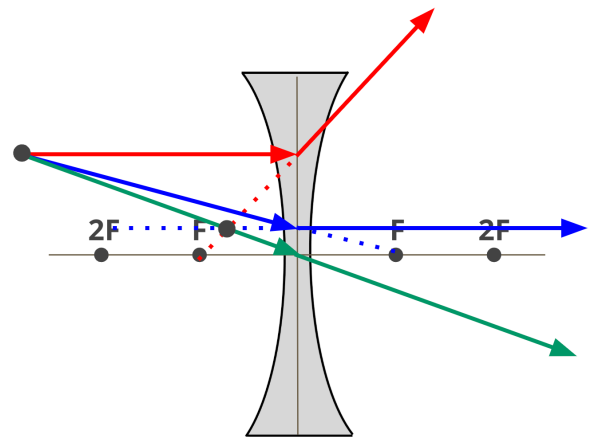
Diverging Lenses Ray Diagrams and Image Characteristics Lesson Notes

Learning Outcomes

- How do you draw ray diagrams for diverging lenses?
- How do you describe the image characteristics for diverging lenses?

Diverging Lenses: Three Refraction Rules

- An incident ray traveling \parallel to the P.A. will refract in line with F. (Red)
- An incident ray traveling towards F will refract and travel \parallel to the P.A. (Blue)
- An incident ray traveling towards the exact center of the lens will continue along its original path. (Green)



Ray Diagram (Object at a Distant Location)

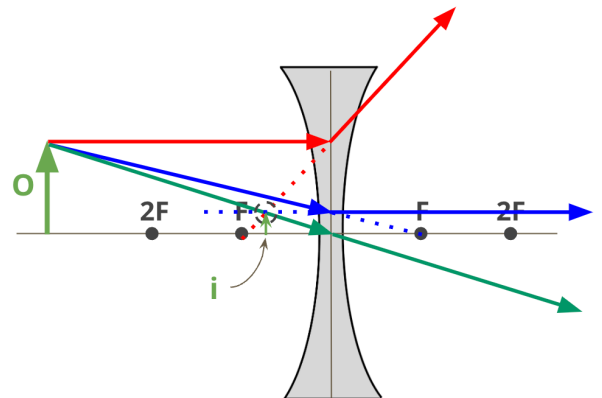
Start on the top of the object.

Draw two sets of incident and refracted rays.

- Parallel to the PA and refracting in line with F.
- Through exact center of lens and continue along original path.

The image is the location where the refracted rays intersect.

Repeat for the bottom of the object.



Ray Diagram (Object at a Nearby Location)

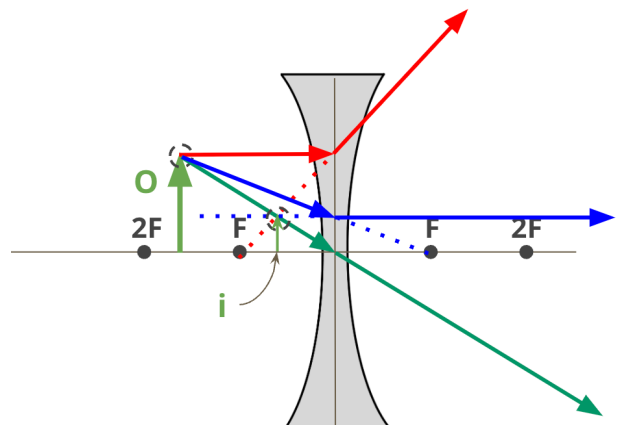
Start on the top of the object.

Draw two sets of incident and refracted rays.

- Parallel to the PA and refracting in line with F.
- Through exact center of lens and continue along original path.

The image is the location where the refracted rays intersect.

Repeat for the bottom of the object.



L·O·S·T Art of Image Description

The **L·O·S·T Art of Image Description** is used to describe the characteristics of diverging lens images.

Location:

Beyond $2F$, at $2F$, between $2F$ and F , object side of lens

Orientation:

Upright (same as object) or Inverted (flipped)

Size:

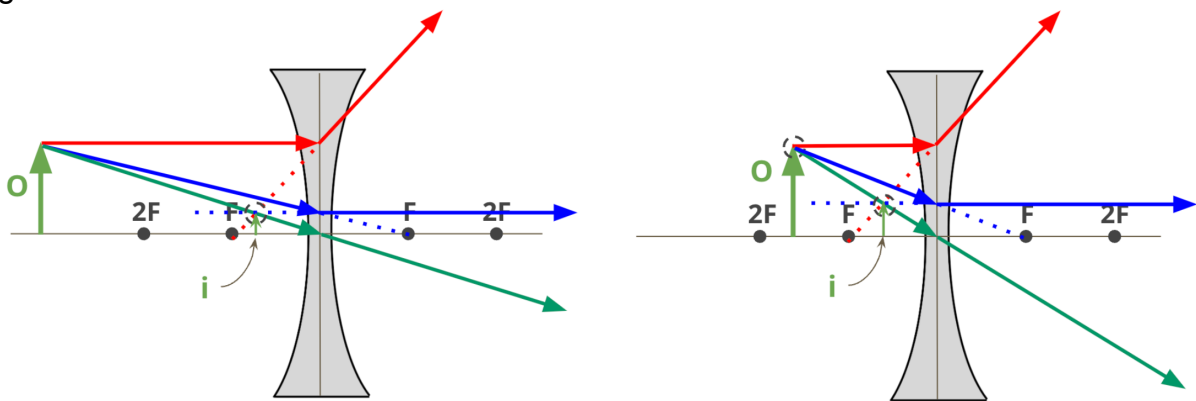
Magnified in size, reduced in size, or same size

Type:

Real or Virtual

Diverging Lens Image Characteristics

The characteristics of images produced by diverging lenses is **NOT** dependent upon the image location.



Location: Object side of lens
Size: Reduced in size

Orientation: Upright
Type: Virtual

Optics Bench Animation

URL: <https://www.physicsclassroom.com/Physics-Interactives/Refraction-and-Lenses/Optics-Bench/>

As the object gets closer to the diverging lens, the image moves closer to the lens and gets larger. But the image is always on the object's side of the lens, reduced in size, upright and virtual.

