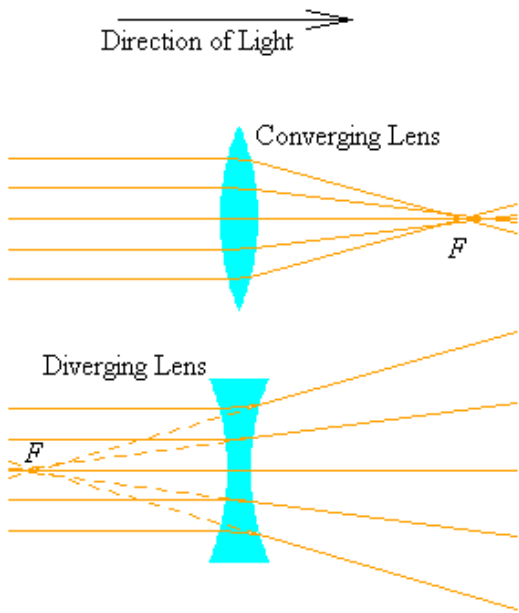


### Lenses and the Formation of Images

What are lenses?



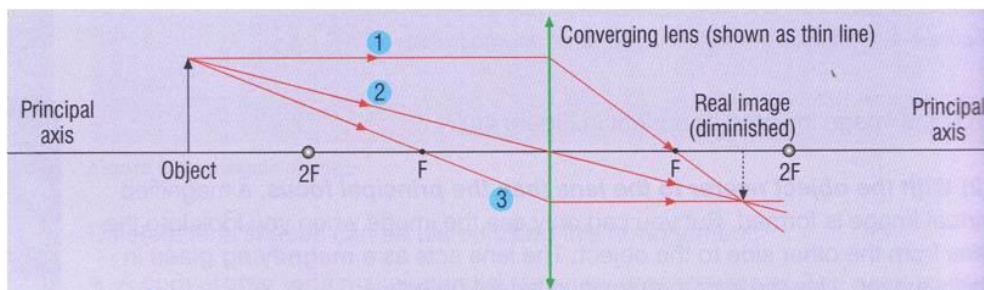
Converging Lens –

Diverging Lens –

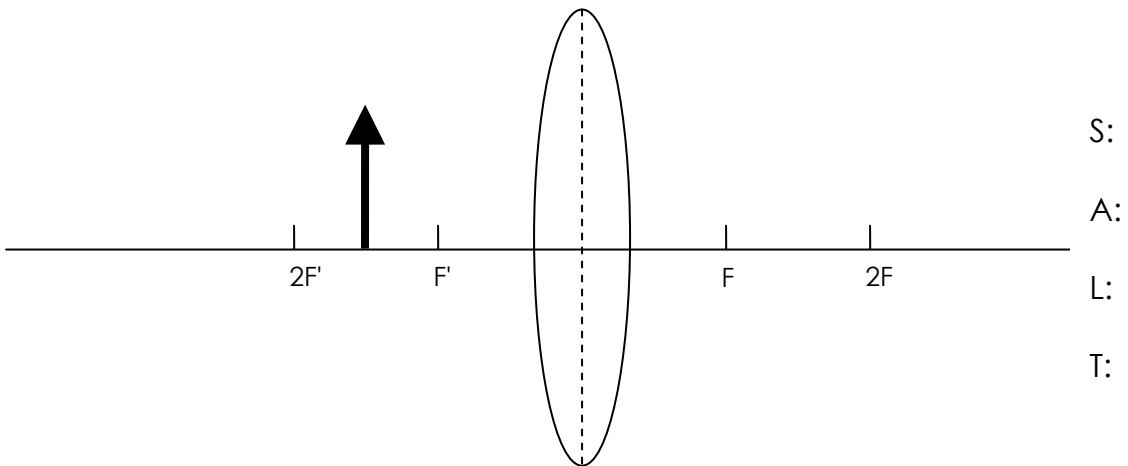
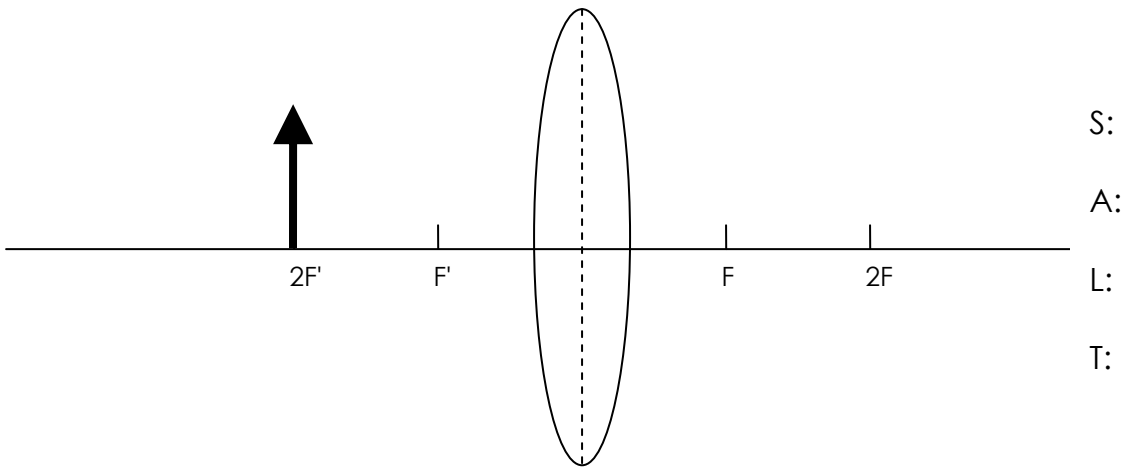
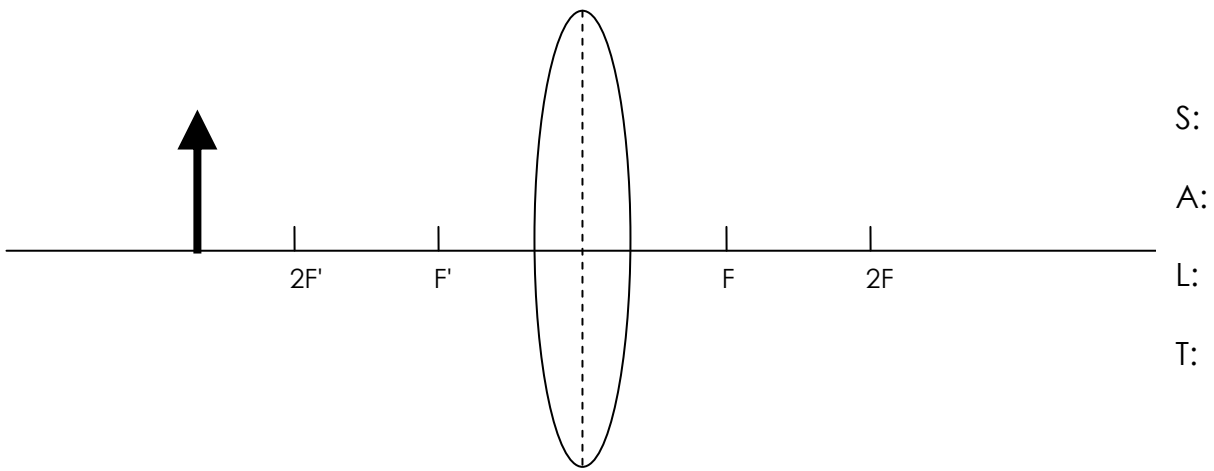
#### Images Formed By a Converging Lens

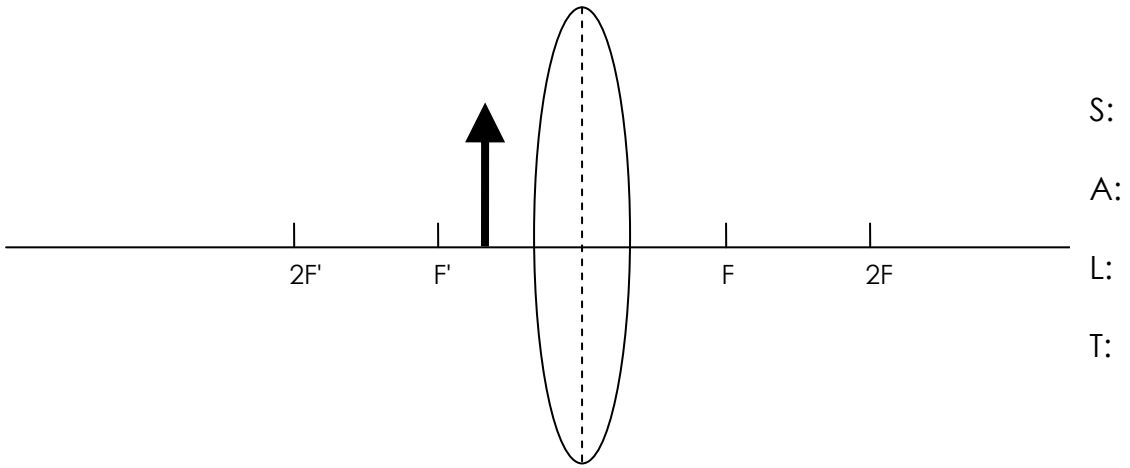
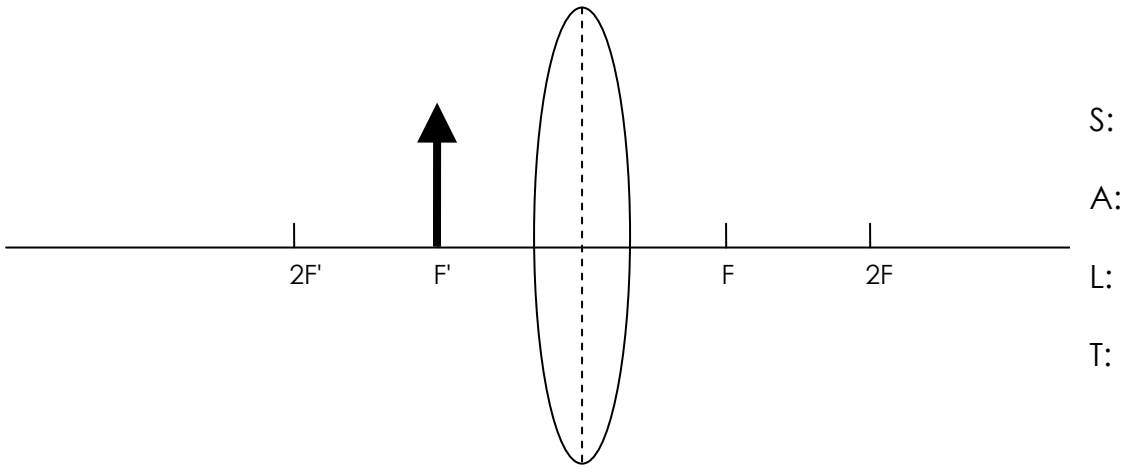
Three rays may be used when locating an image in a converging (convex) lens:

- 1.
- 2.
- 3.



Images Formed by a Converging Lens





### Image Characteristics of a Converging Lens

Object	Image			
	Location	Size	Attitude	Type
Beyond 2F				
At 2F				
Between 2F and F				
At F				
Inside F				

### Optical Devices – Uses of Lenses

Optical Device	Where must the lens be placed?
A copy camera produces an image that is real and the same size	
A hand magnifier produces an image that is virtual and larger	
A slide projector produces an image that is real and larger	
A 35-mm camera produces an image that is real and smaller	
A spotlight produces parallel light: there is no image	
A photographic enlarger produces an image that is real and larger	