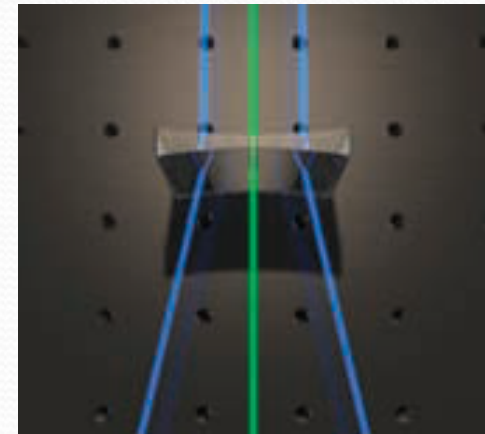
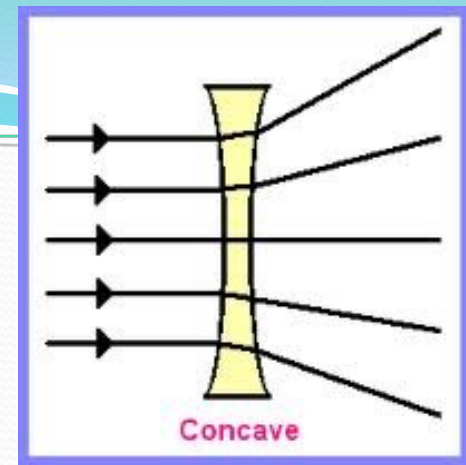


Lenses 2: DIVERGING LENSES



Concave Lenses

- A **diverging lens** is sometimes called a **concave lens** because it is thinner in the centre than at the edges.
- As parallel light rays pass through a concave lens, they are refracted away from the principal axis.
- The light rays diverge and they will never meet on the other side of the lens.
- **The image formed is always upright, virtual and smaller than the object**

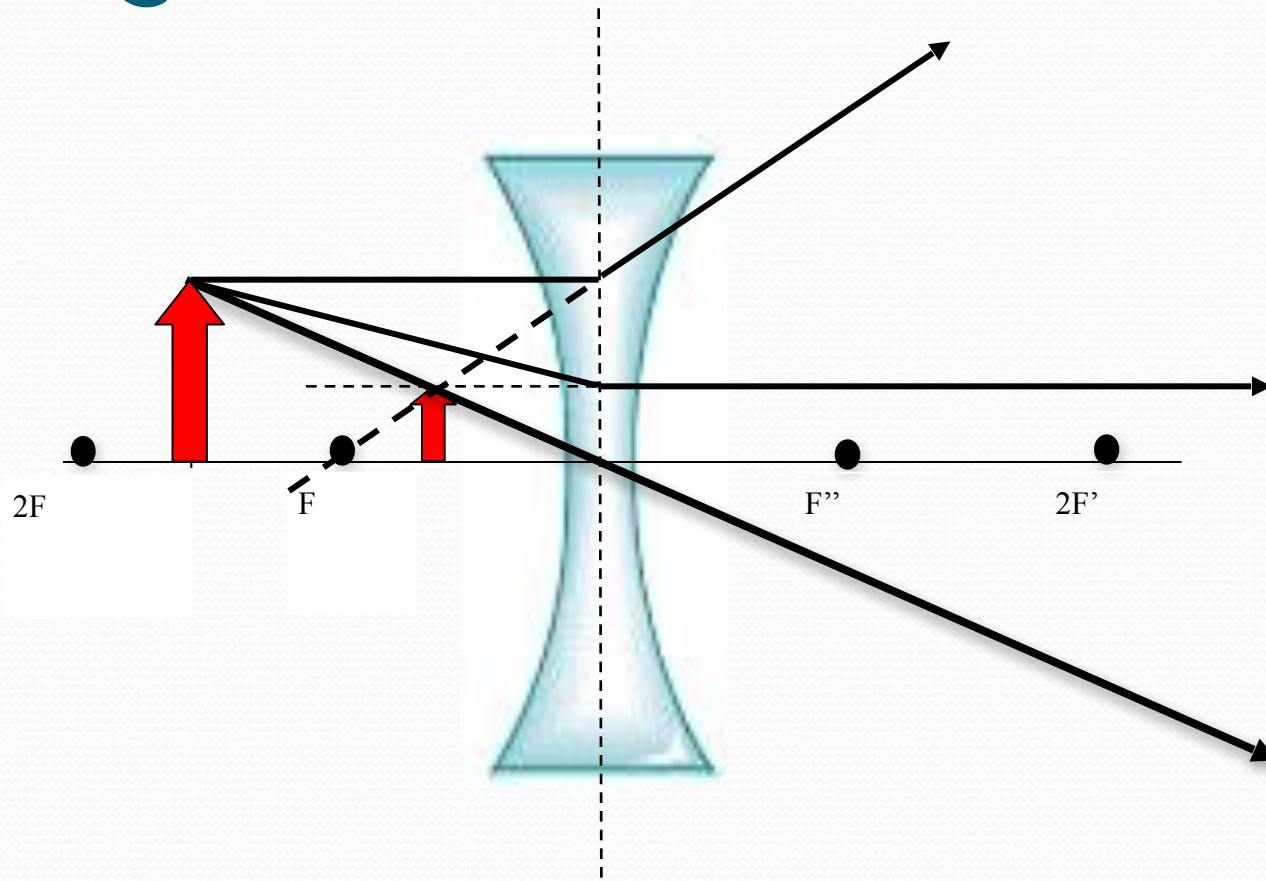


Drawing a Concave Lens Ray Diagram

- Any two of the following rays may be used to locate the image:
 1. A ray parallel to the principal axis will be refracted away from the principal focus (F).
 2. A ray that is directed towards the secondary principal focus (F') will be refracted parallel to the principal axis.
 3. A ray that passes through the optical centre goes straight through without refracting.

Only two of these lines are needed to find the image

Drawing a Concave Lens Ray Diagram



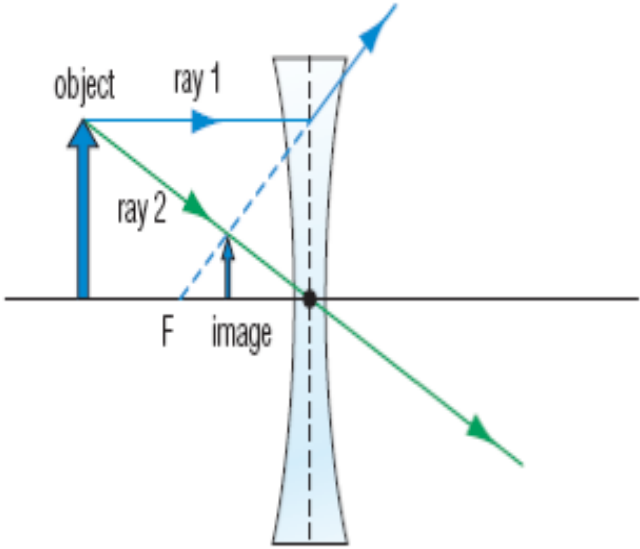
S: Smaller

A: Upright

L: In front of F

T: Virtual

Concave Lenses

Distance of Object from Lens	Type of Image Formed	How the Image Is Used	Ray Diagram
All distances	Smaller, upright	Some types of eyeglasses and telescopes make use of the diverging properties of concave lenses. These lenses are often used in combination with converging lenses.	 <p>The ray diagram illustrates a concave lens (diverging lens) with a vertical dashed line representing the optical axis. A horizontal line represents the principal axis. A blue vertical arrow labeled 'object' is positioned to the left of the lens. A blue horizontal arrow labeled 'ray 1' originates from the top of the object and travels parallel to the principal axis before diverging away from the axis as it passes through the lens. A green arrow labeled 'ray 2' originates from the top of the object and passes through the optical center of the lens without deviation. A dashed blue line is drawn from the top of the object, parallel to the principal axis, and then refracted through the focal point 'F' on the left side of the lens. The intersection of the dashed blue line and the green ray is labeled 'image', which is a smaller, upright virtual image located between the object and the lens.</p>