

## Vocabulary: Ray Tracing (Lenses)



### Vocabulary

- Concave lens – a lens that curves inward on both sides.
  - A concave lens also is called a “diverging lens” because it causes light rays to spread out.
- Convex lens – a lens that curves outward on both sides.
  - A convex lens also is called a “converging lens” because it causes light rays to converge at a point.
- Focal point – the point at which parallel light rays converge after passing through a lens.
  - Because light can pass through a lens in either direction, a lens has two focal points.
  - The *focal length* of a lens is the distance between the focal point and the middle of the lens.
  - A concave lens does not focus light but it does have a focal point. The focal point of a concave lens is the point from which originally parallel light rays appear to be emanating after passing through the lens.
- Image – a reproduction or likeness of an object.
  - Images formed by lenses can be either *real* or *virtual*. See below for definitions of these images.
- Magnification – the ratio of image size to object size.
  - For example, if an image is 5.6 cm high and the object is 2.8 cm high, the magnification is 2.
- Real image – an image that forms where light rays are focused.
  - If a screen is placed at the location of the real image, a focused image will be visible on the screen.
  - Real images are inverted and located on the opposite side of the lens from the object.
- Refraction – the change in direction of a wave caused by a change in speed.
  - When light passes from air through glass, it slows down and is bent.
- Virtual image – an image that is visible to an observer only when the observer looks through the lens.
  - No light rays are focused onto the virtual image. Therefore, a virtual image cannot be projected onto a screen as a real image could be.
  - Virtual images are upright and located on the same side of the lens as the object.