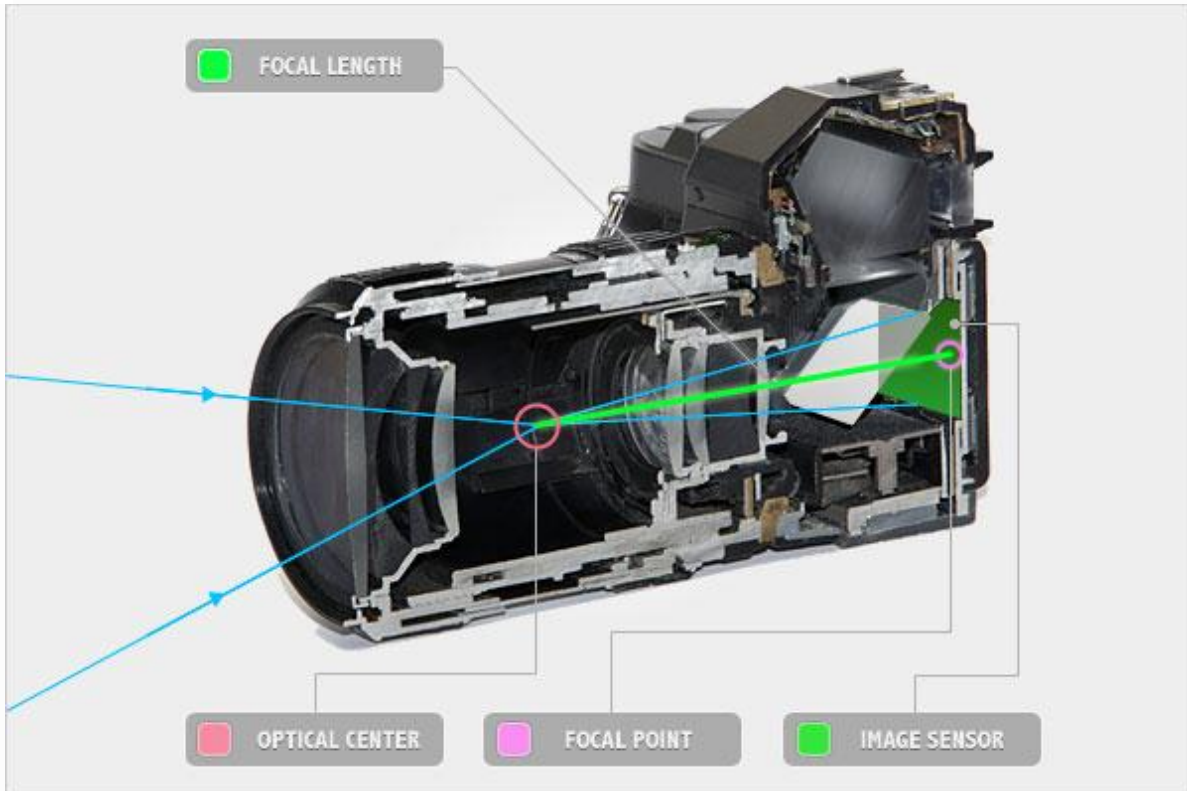


## Topic no. 64

## Lens Factor

## The Focal Length



A primary characteristic of a lens is the focal length. A lens' focal length is defined as the distance between the lens' optical center and the camera's image sensor (or film plane) when focused at infinity. To understand this definition of focal length, we need to define "optical center" as well. A lens' optical center is the point (usually though not always) within a lens, at which the rays of light from two different sources entering the lens are assumed to cross. Shorter focal length lenses provide a wider field of view, but offer less magnification. Conversely, longer focal lengths offer a shorter field of view, but provide greater magnification. On DSLRs, the interchangeable lens' focal length is measured in millimeters. The focal length of a lens is usually displayed on the lens barrel, along with the size of the adaptor ring.

## The Lens Ratio



When you look upon the front end of your lens barrel, you'll see a ratio number (1:2.8, 1:2.8-4, 1:3.5-5.6, etc), which is the maximum aperture of the lens. The aperture determines how much light the lens transmits to the image sensor. The lower the maximum aperture value will indicate the quality of the lens in terms of brightness. High quality zoom lenses deliver a constant f-stop throughout the focal range (i.e. a f/2.8 at 35mm and a f/2.8 at 80mm); whereas on a lower quality lens, the f-stop varies as you travel up the focal range (i.e. a f/3.5 at 28mm, but a f/5.6 at 80mm); you are losing at least one stop of light as you zoom up the focal length from wide angle to telephoto. A lens with a low f-number (wide maximum aperture), is a better quality lens, and allows you to do more with it. For example, such a lens is "brighter", allowing you to take photos in low ambient light conditions, yet still register a quality exposure. In addition these bright lenses allow you to achieve a very shallow depth of field. It is to be noted that any lens that is f/2.8 or lower is considered to be a professional lens, and will have a correspondingly higher price tag.