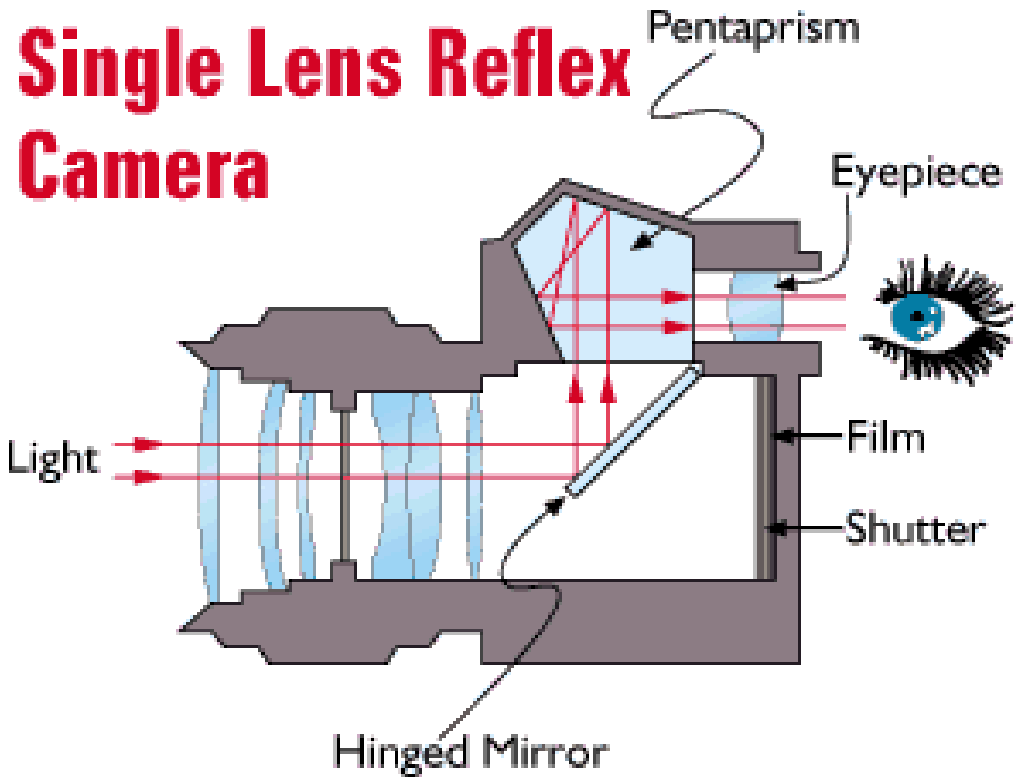
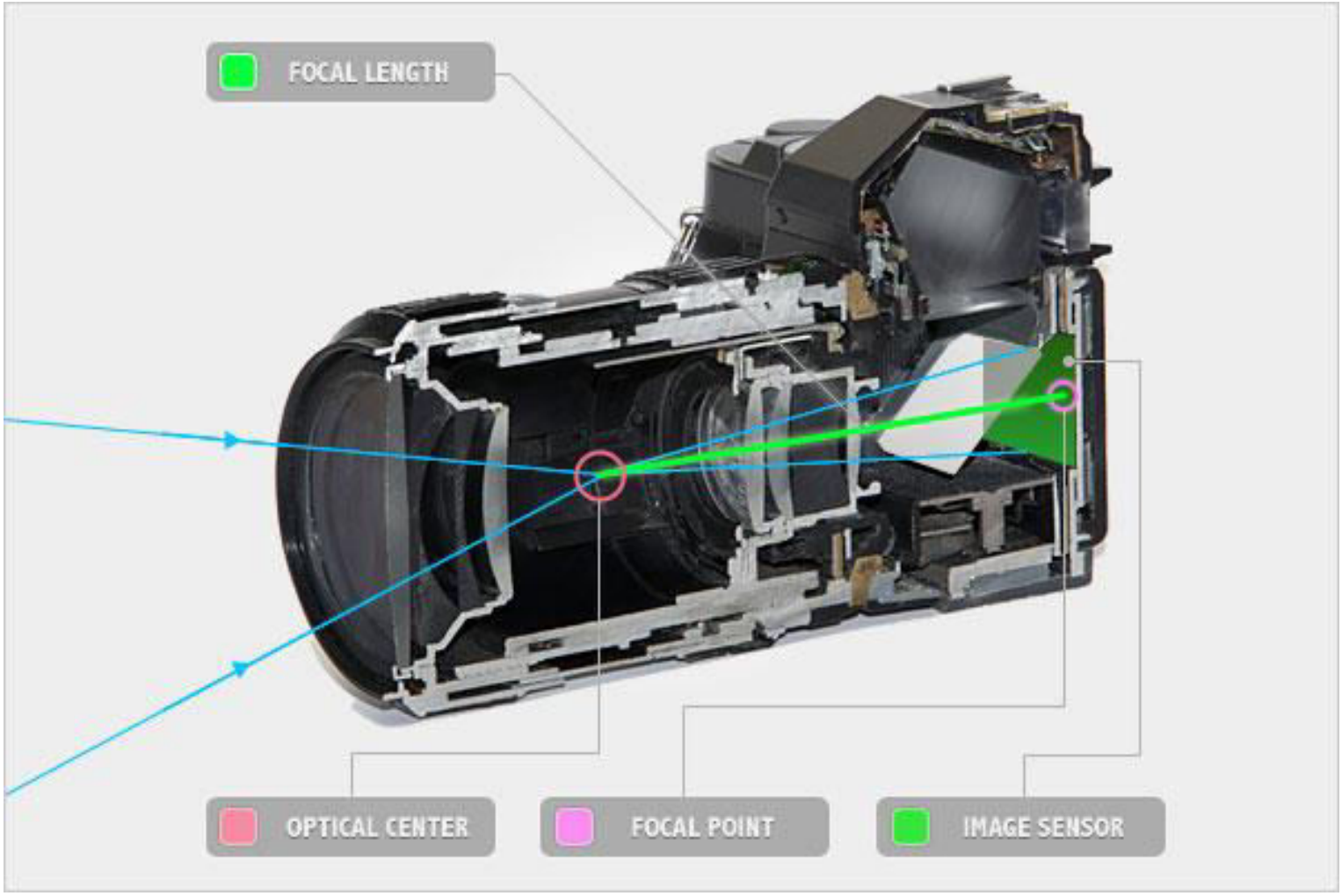
LENS

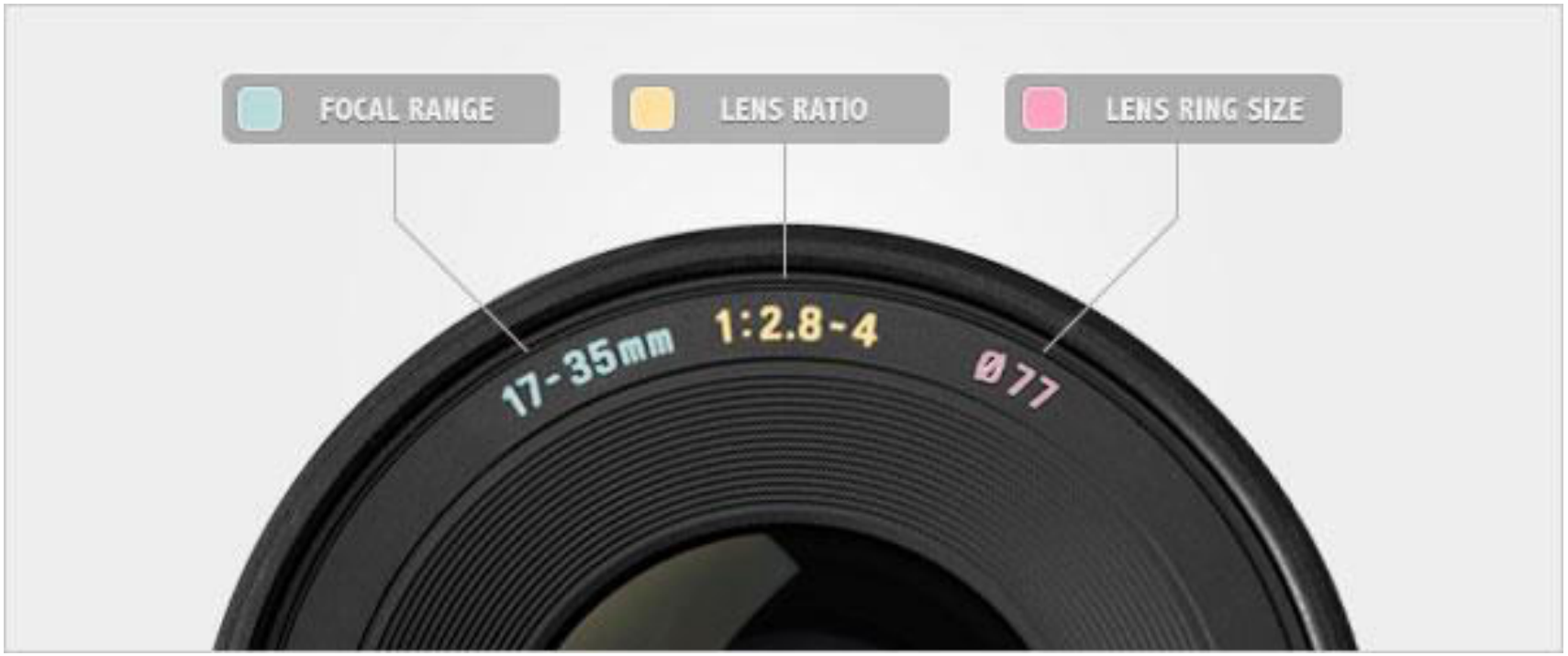
Lens


Single Lens Reflex Camera
Pentaprism
Eyepiece
Light
Film
Shutter
Hinged Mirror

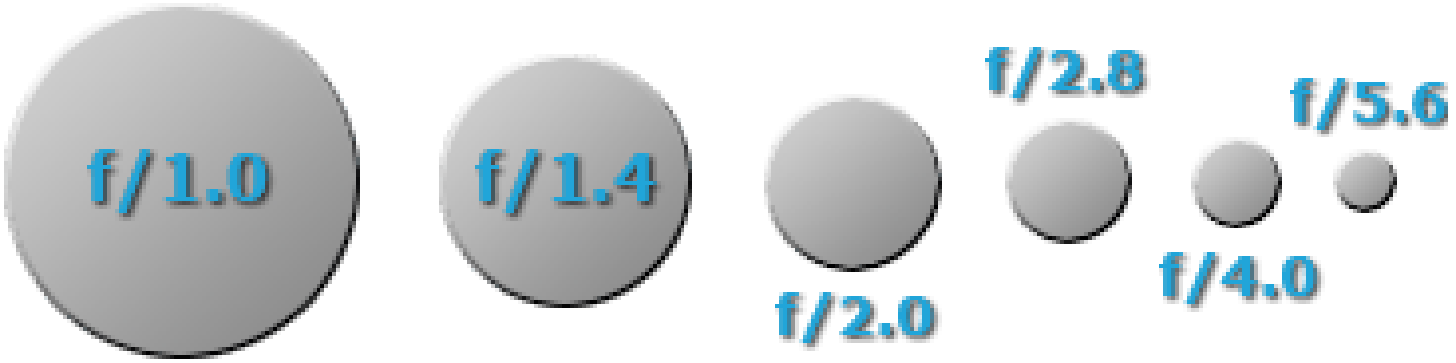
The Focal Length



The Lens Ratio

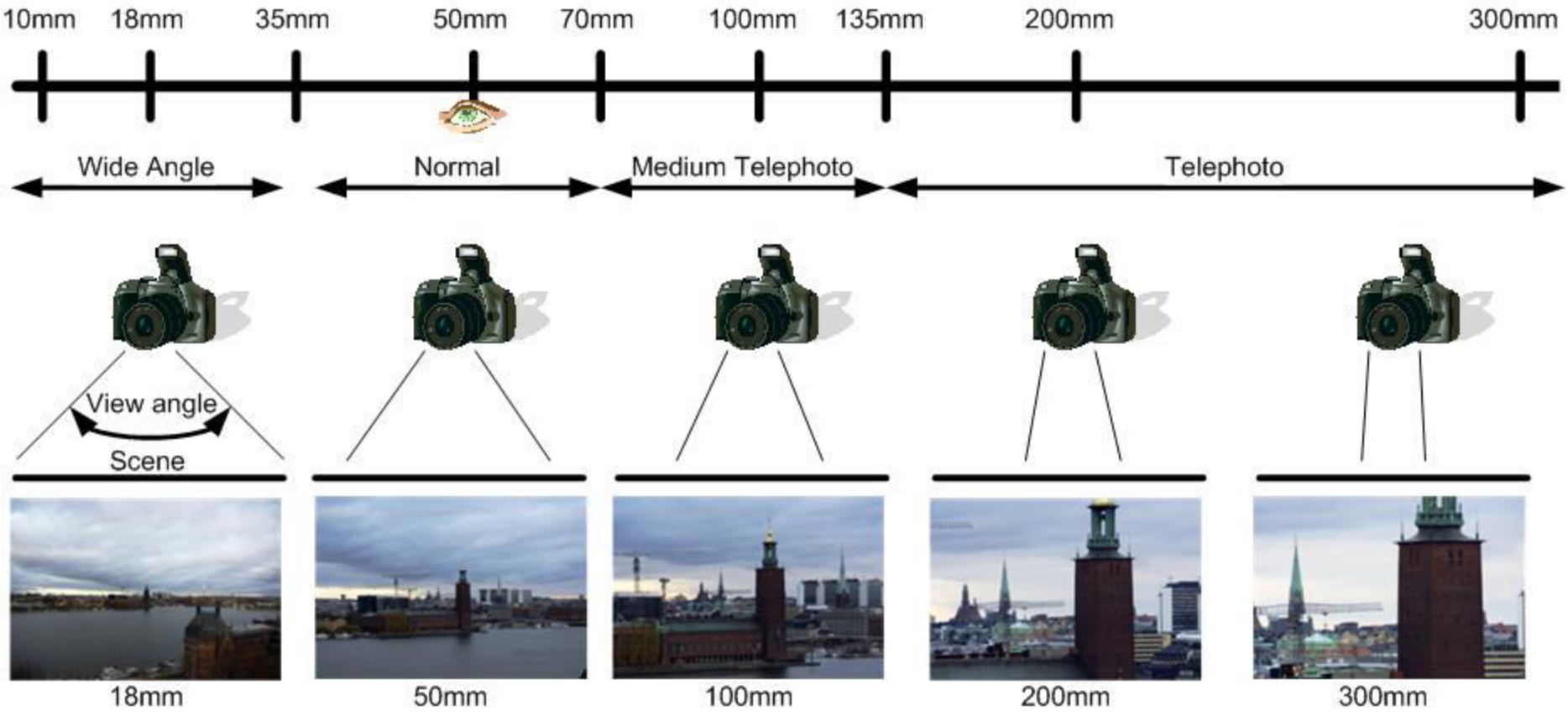


An f-number of X may also be displayed as 1:X (instead of f/X), as shown below for the Canon 70-200 f/2.8 lens.



Note: Aperture opening (iris) is rarely a perfect circle, due to the presence of 5-8 blade-like lens diaphragms.

Focal length



Suitable for:

Architecture, Landscape	Street, Documentary	Portraiture	Sports, Birds, Wildlife

Standard/Normal Lens

The standard lens has a fixed focal length (50mm, 85mm, 100mm), and reproduces fairly accurately what the human eye sees – in terms of perspective and angle of view. For a 35mm film camera or a full-frame DSLR, the 50mm lens is considered standard. At higher focal lengths (85mm or 100mm) you have an ideal lens for portraiture, because when coupled with a wide aperture they thoroughly soften any background detail, thus making it less likely to distract from the main subject.

Wide Angle Lens

A wide-angle has a shorter focal length (10 thru 42mm) when compared to a standard lens. This enables you to capture a comparatively wider angle of view. A wide-angle lens is a natural choice for capturing outdoor landscapes and group portraits. In fact, wide angle can be the only way to capture the complete setting without omitting any important elements in the image. In this manner, you can use wide-angle lenses to capture a deep DOF.

Zoom Lens

Zoom lenses have variable focal lengths, and are extremely useful. Some can range between a wide-angle and a telephoto (i.e. 24 to 300mm) so you have extensive versatility for composition. The trade off with zoom lenses is the aperture. Because of the number of elements required in constructing these lenses, they have a limited ability to open up and allow in light. So unless you're prepared to outlay a lot of money, you will give up lens speed.

Telephoto Lens

Telephoto lenses (100mm - 800mm) can provide you with a narrow field of view. These long lenses enable you to compress a distance (and compress the sense of depth, as well) and pick out specific objects from far off. They have a strong resolving power and an inherent shallow DOF, where the slightest lateral moment can take a subject out of view. Telephoto lenses are great for wildlife, portrait, sports, and documentary types of photography. They enable you to capture subjects from hundreds of feet away.

Fisheye Lens

A fisheye lens is a specialized, wide-angle lens that provides extremely wide images by changing straight lines into curves. It can sometimes produce circular, convex, or oval images by distorting the perspective and creating a 180° image. The range of focal length varies between 7~16mm in a fish-eye lens.

Macro Lens

Macro lenses are used for close-up or “macro” photography. They range in focal lengths of between 50-200mm. These lenses obtain razor-sharp focus for subjects within the macro focus distance, but lose their ability for sharp focus at other distances. These lenses enable the photographer to obtain life-size or larger images of subjects like wasps, butterflies, and flowers.

Tilt-Shift Lens

The Tilt-Shift lens enables you to manipulate the vanishing points, so when you're shooting buildings you can alter the perspective of an image so the parallel lines don't converge, thus eliminating the distorting quality of the lens. The tilt-shift lens also enables you to selectively focus an image; where only specific portions of the image are in focus and out of focus within the same plane.

Image-Stabilization Lens

These lenses contain small gyro stabilizer sensors and servo-actuated lens elements, which purportedly correct for camera shake that occurs with longer focal length lens or in low-light conditions when you need to have slower shutter speeds to achieve an effective EV (Exposure Value). It is claimed that these lenses enable the user to shoot handheld at 2 to 4 stop slower shutter speeds (exposure 4 to 16 times longer) than the minimum required for a sharp image.

Optical Image Stabilizer Units

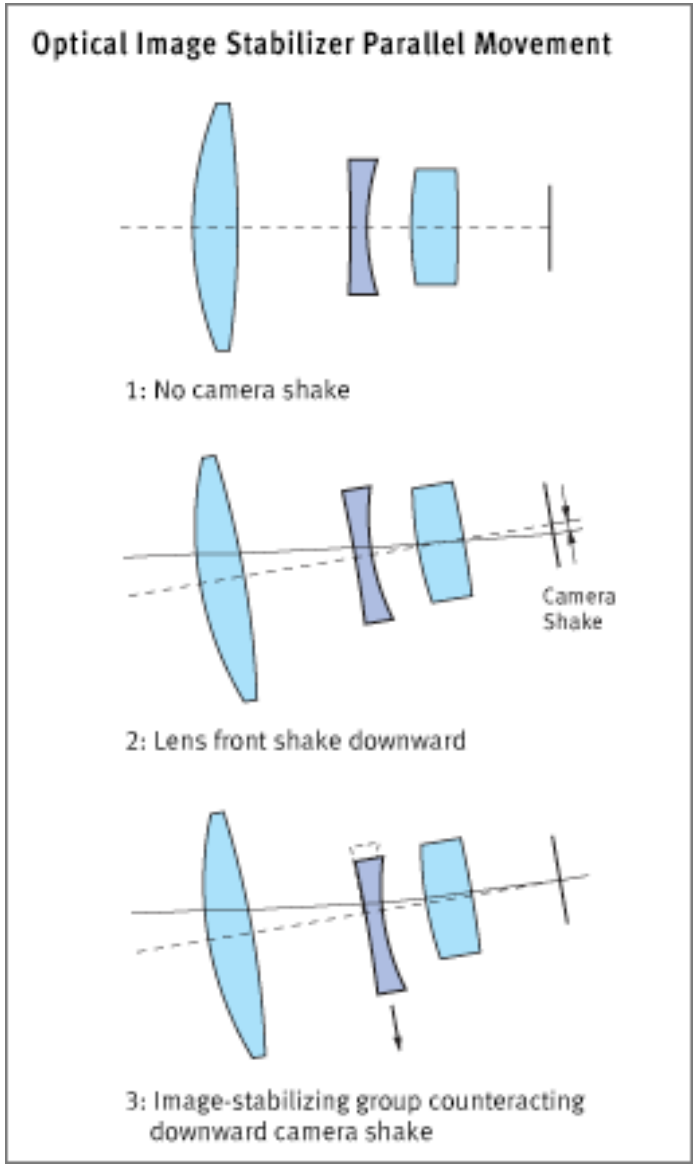
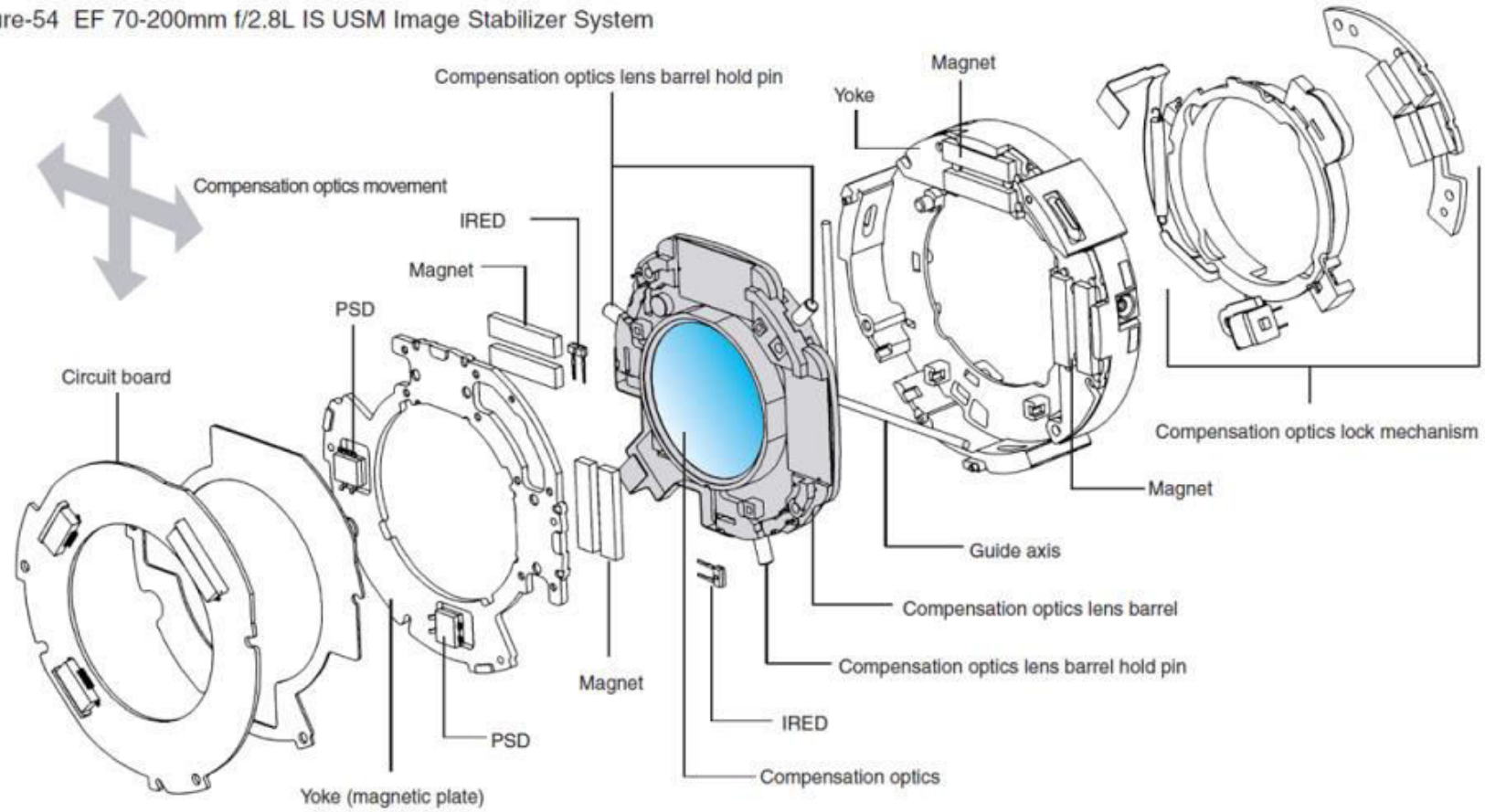


Figure-54 EF 70-200mm f/2.8L IS USM Image Stabilizer System



Lens Focal Length*	Terminology	Typical Photography
Less than 21 mm	Extreme Wide Angle	Architecture
21-35 mm	Wide Angle	Landscape
35-70 mm	Normal	Street & Documentary
70-135 mm	Medium Telephoto	Portraiture
135-300+ mm	Telephoto	Sports, Bird & Wildlife

f-#	Corresponding Impact on Other Properties:		
	Light-Gathering Area (Aperture Size)	Required Shutter Speed	Depth of Field
Higher	Smaller	Slower	Wider
Lower	Larger	Faster	Narrower

Typical Maximum Apertures	Relative Light-Gathering Ability	Typical Lens Types
f/1.0	32X	Fastest Available Prime Lenses (for Consumer Use)
f/1.4	16X	Fast Prime Lenses
f/2.0	8X	
f/2.8	4X	Fastest Zoom Lenses (for Constant Aperture)
f/4.0	2X	Light Weight Zoom Lenses or Extreme Telephoto Primes
f/5.6	1X	

Conclusion

There are many possible lens choices and all will give you a different and distinct image. Part of the creativity of the photographer is in selecting the right lens to capture the vision of the world the way she or he sees it, or wants to present it.