Lenses

Lenses for cameras are categorized as standard, wide angle and telephoto. The diagonal of the film format determines a standard lens and the focal length closest to this gives the same spatial relationships as we see with the eye. Lenses of a shorter focal length are wide-angle. Focal lengths longer than standard are telephoto. A zoom lens is one that can be adjusted for several different focal lengths.

We refer to a lens by its focal length and maximum aperture, for example, a 200mm ƒ4 lens. When describing a zoom lens, you would tell the range over which it adjusts: e.g., a 28 to 80mm ƒ3.5 zoom lens. Some zoom lenses vary the aperture when zoomed and have two aperture numbers indicating the range of variation: e.g., ƒ3.8~**5.6**.

Standard lenses are relatively inexpensive and are available in the fastest apertures. Some are as fast as ƒ.095. They can focus as close as 18 inches and are very versatile–if overlooked—performers.

Wide -angle lenses show more of the subject from the same distance and emphasize the foreground of the image. They are great tools in restricted spaces and for panoramic views. They are ideal for accentuating depth-of-field. Extreme wide angle lenses can distort shapes near the edges and bend lines that should be straight.

Telephoto lenses extend our reach when a subject can't be approached because of distance or danger. And they are useful for isolating a subject from the background. They can compress the background relationship to the subject when the subject size is kept constant.

Zoom lenses are favored for their versatility. Many cameras come packaged with zooms that cover a range from wide-angle to short telephoto. The trade-off for convenience comes in the lens speed and weight - and price. Zoom lenses are often more expensive than primes.

The camera-to-subject distance controls perspective. Zooming a lens does not change the perspective. Use you feet to change perspective—move closer or further away.

Macro lenses allow close-up photographs of small subjects and can produce images at ½ life size or larger. Some zoom lenses claim a "macro" setting, but most are not capable of lager than ¼ life size reproductions. True macro lenses have a flat field and are excellent for copy work.

The design of the optics, the types of glass used, the strength of the barrel construction, the centering of the elements, the coatings on the optics and other factors determine the quality and price of a lens. Letter codes are used as a shorthand to describe design characteristics of a lens: e.g., ED, IF, LD, AF, S, D, Asph, and so on. Manufacturers often define their codes on their website.

Inexpensive lenses are cheap for a reason. The more complex the design, the harder a lens is to produce and the more costly it becomes. Lenses for specialized photography are made in fewer numbers than lenses for general photography, thus are more expensive. Super telephotos, shift lenses, fisheye lenses, fast aperture lenses and macro lenses fall into the specialized category.

Focal length alone doesn't describe how much subject you capture. A more useful number is the angle of view. But camera and lens makers still refer to the 35mm film format as their standard reference. As fewer photographers have used film, this has meaning only to owners of "full-frame" DSLR's.