

Selecting a Telephoto Lens

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Telephoto lenses are long-focal-length optics designed to do one thing: decrease the angle of view of the scene in front of you. For example, on a full-frame image sensor, a 50mm normal lens has a 46-degree horizontal angle of view, while a 105mm medium-telephoto lens captures 19-degrees and a 20mm ultra-wide-angle lens, 84-degrees. Since telephoto lenses capture a proportionally smaller percentage of the image on your sensor as compared to a normal or wide-angle optic, the subject matter being recorded is “magnified.” This has the visual effect of *pulling* the subject closer and, thus, into greater prominence while some of the background and foreground is proportionally eliminated.

Most people purchase telephoto lenses because they want to bring their subjects, such as wildlife or sports subjects, in closer so they appear larger on their sensor. Unfortunately, you are often physically restricted from getting as close to your subject as you desire. You may also need to *increase* the working distance between the camera and the subject when photographing wildlife predators (i.e. bears, cougars, etc.). Much telephoto photography is often about isolating and simplifying a subject within a scene. While magnification plays an obvious role in this, so can the reduced depth of field, which works to isolate a subject against a pleasant, blurred, out-of-focus background.

The trade-off for this is that you are also

magnifying any subject movement and, especially, the effects of camera movement. You can counteract subject movement by using a fast shutter speed, giving slight movement only a minimal chance to blur. Camera shake is by far the most frequent cause of soft images in telephoto photography, and as the focal length increases the problems of controlling camera motion becomes more and more critical. To compensate for camera movement, faster shutter speeds are necessary to get sharp pictures with long focal-length-lenses.

A good rule of thumb for handheld long-lens photography (on a full-frame sensor camera body) is to shoot at a shutter speed of at least 1/lens focal length. If a sub-full frame sensor is being utilized, then add 1.5x to the minimum hand-held shutter speed.

If shooting with a 70-200mm zoom lens on a full-frame sensor camera body, shoot at a minimum shutter speed of 1/250-sec or faster. In the case of a 105mm macro lens, shoot at 1/125-sec. In practice, many seasoned photographers will even opt for the next-higher shutter speed, conditions permitting. As magnification becomes greater, the narrower the depth of field will be.

There is a shortcoming with telephoto-lens photography. You need to use those faster shutter speeds to circumvent the results of subject movement and camera shake. This is often accomplished by opening up the aperture to achieve that faster shutter speed; but by opening up the aperture to increase shutter speed, proportionally less depth of field will result as you are already losing precious depth of field due to increased magnification.



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The solution to avoiding camera shake is to use a tripod! The advantage of the tripod is that it lets you use a slower, hence sharper, (low) ISO while at the same time it lets you compose your image more accurately (since the camera's position is fixed). Also, using a tripod is the only practical means of locking up your camera's reflex mirror to eliminate any other source of vibration.

New telephoto lens owners are often heard complaining that their new, so-called marvel-of-lens technology just doesn't appear sharp. Chances are, they are either failing to use a fast enough shutter speed to offset camera shake when hand-holding their camera/lens rig, or the shallower depth of field is being interpreted as poor lens resolution.

In addition to pulling in distant subjects and increasing working distances, there are two other reasons for using telephoto lenses. One is to avoid the slight distortion that occurs when shooting tight close-ups, such as head shots, with a normal lens. While normal focal lengths give a natural rendering to subject matter, they have their limitations when used very close to a three-dimensional subject—they produce a slightly convex effect. A moderate telephoto will eliminate this unwanted result by producing the same head size from a more comfortable working distance. Many fashion photographers favour a 105mm or 135mm lens or even a 200mm for a full-figure photograph to prevent the exaggeration of features.

There is also telephoto "compression" which is obvious in longer focal lengths, such as a 200mm, 300mm or longer; this is the merging together of foreground, subject and background, which occurs as a result of pronounced magnification. This effect can be extremely useful for organizing subject matter that is somewhat too spread out. The biggest problem with this phenomenon is the loss of depth of field at such magnification.

Telephoto lenses are excellent optics for portraiture from a distance, wildlife subjects and sports/action photography. As to which focal length works best, there is a general rule among

telephoto users. Whenever possible, move closer to your subject rather than relying on a longer focal length. The idea here is to try and avoid, whenever possible, the problem of camera shake. Moreover, shorter focal lengths are generally sharper optically, and the closer you get, the less you have to deal with other complicating factors, such as atmospheric haze. You should select the smallest aperture size when wanting to stress both faraway and nearby objects.

A few words about image stabilization; image stabilization (such as Canon's IS or Nikon's VR) is a variety of techniques used by camera manufacturers to reduce blurring associated with the motion of a camera/lens during an exposure. Camera shake is particularly problematic at slow shutter speeds, and especially with long focal length lenses. It can either be built into the camera body or into the lens. It helps you take clearer photos of *non-moving* subjects in dim light when you're not using a flash and it helps you take clearer photos when the camera is moving around somewhat. It also helps you take clearer photos when using lenses with long focal lengths. It does *not* help when you're trying to capture photos of fast-moving subjects; this last point is fundamental and a common misunderstanding about just how much image stabilization can accomplish. When you're dealing with a fast-moving subject, the *only* thing that is going to make your photo turn out clear is a fast shutter speed. Image stabilization can often permit the use of shutter speeds 2 to 4 stops slower than usually permitted. When your gear is mounted on a tripod, it should be turned off. There are some lenses (usually long, fast prime telephoto lenses) that are said to be unaffected by this issue, and they produce sharp pictures whether the stabilization feature is left on or turned off.

For those interested in purchasing a new telephoto lens or bringing out and dusting off that old lens, if you heed the above advice and precautions, you shouldn't be disappointed in using telephoto lenses!