



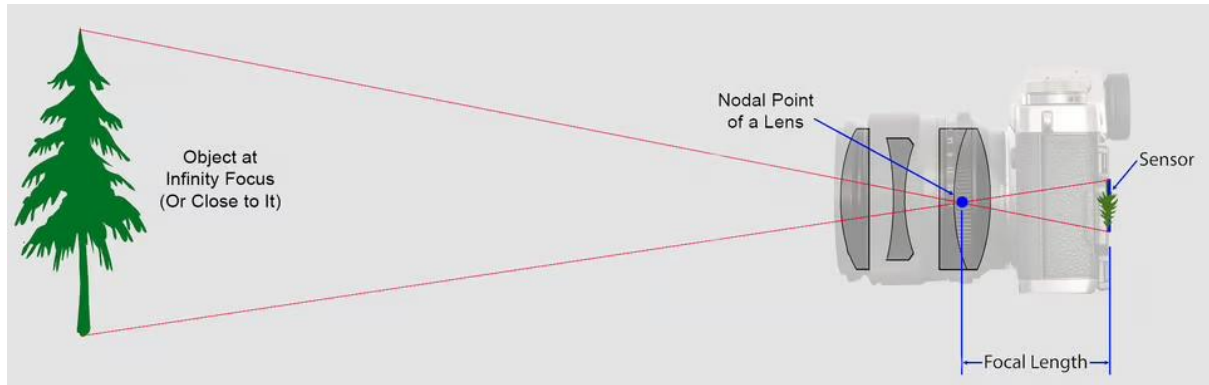
Lenses and Focal Length

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1. Focal Length

Focal length put simply, refers to the lenses field of view.

The exact definition is: Focal length measures the distance, in millimetres, between the “nodal point” of the lens and the camera’s sensor.



Lenses will have the focal length printed near the top of the lens and often elsewhere on the body as well.

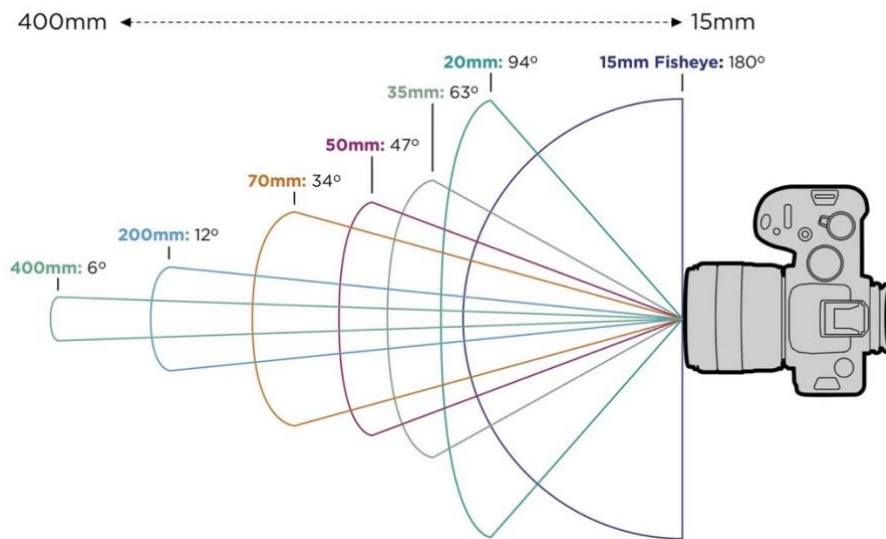
Lenses come in two varieties. A fixed lens or “Prime” is a lens that has a single focal length where a varifocal lens or “Zoom” is a lens that allows you to adjust the focal length between a wider and a longer focal length.

While zoom lenses can be very sharp and can produce exceptional images, it is generally the case that Prime lenses are generally known for offering super quality.



1.1. Field of View

The primary purpose that focal length defines is a lenses field of view.



Wider lenses starting around the 12mm mark provide a field of view that encompasses a very wide point of view.

As the focal length gets longer, the field of view begins to decrease.

A focal length of 50mm is what many consider to be the field of view we normally see the world. This however should be taken as a guide as there is much debate around this considering that the human eye, or two of them working together has a wider field of view. Our focus however doesn't take in the whole field of view but even still, even though a lens is round, it's being recorded on a rectangular sensor. So essentially, 50mm is kind of close to our field of view with all things taken into consideration.

As we pass 50mm and the field of view continues to decrease, we begin moving towards a magnified view and eventually as we pass 70mm begin to enter the telephoto range.

1.2. LENS PERSPECTIVE

When we discuss Lens Perspective, we are really discussing two phenomena at work and both occur as a direct result of your physical distance from your subject.

The first being that the closer you are to your subject, the more "distorted" or unnatural your subject will appear.

The second is that the closer you are to your subject, the smaller the background elements behind your subject will appear. Conversely, the further away the larger the background will appear relative to your subject.

With portraiture for example, we are often composing our image with just a face or head or even torso. This would mean that with a wide-angle lens (a lens with a focal length of 16mm, 24mm or even 35mm), to just frame a person's head, you would need to get physically close to your subject.

If you were using a lens with a focal length of 85mm, 135mm or 200mm, you would need to stand further away from your subject to frame the exact same composition. So how does your image look when you are standing close vs back from your subject?

The images below were taken using the same lens (50mm) however, the image on the right has been cropped (zoomed in) to show you that the phenomenon has nothing to do with your lens as such, just the distance your lens puts you from your subject.



In the image to the left we can see that being physically closer to the subject, the subject's nose appears larger, her face narrower and her ears further back. In the image to the right, the subject's face appears much more natural and much more pleasing.

1.3. Background Compression

What is also noticeable between both the previous images is that in the left image, the door is visible as is the LED windows on either side of the subject's head. Other elements such as another doorway to the right of the subject is also in view. In the image on the right, the background appears much, much larger over emphasising the LED windows.

Background compression can be very useful for portraiture when using backdrops. By placing your subject away from the backdrop and shooting with a lens with a focal length of 85mm or longer (which forces you to stand back further), you can ensure the backdrop becomes large enough to fill the frame behind your subject.

In the photo on the right, we can also see the same technique used to increase the size of the city behind the subject.



2. Lenses

While the camera body is important to the quality of a photo, the lens is arguably more important. While you may change your camera body every few years, a lens will stay with you through those upgrades.

A poor-quality lens or using a lens with the wrong focal length for the intended photo can ruin an otherwise well-lit and well composed image.

There are so many lenses with different qualities that any attempt to provide a comprehensive run down of what is available would be a futile attempt. This section aims to only cover the common types of lenses and what they are **traditionally** used for.

Most lens manufacturers have two tiers of lens quality: ‘consumer’ and ‘professional’ ranges. Some of the major differences between the ranges include:

- Consumer lenses tend to be made using more plastic, even for some of the optics, while higher grade lenses incorporate metal for sturdier construction.
- The optics in the professional lenses are much higher quality, often using expensive materials which result in sharper lenses that can resolve finer details and exhibit better contrast.
- Higher grade lenses often have weather sealing to protect them from rain and dust.
- Consumer zoom lenses usually have variable apertures while professional zooms most often have a constant aperture.
- Finally, as you might have guessed, these better-quality lenses cost a lot more!

2.1. To Zoom or Not to Zoom

While this section will talk about lenses of a certain focal length, there are of course lenses that cover a range of focal lengths (zoom lenses).



Having a lens cover a range of focal lengths is, on the surface, quite desirable. Being able to pull back wide (a short focal range) and then being able to twist the lens to zoom in nice and tight sounds great and there are some good quality lenses that can do this, however, be aware that something that is “too good to be true” usually is.

Often there will be a drop in quality in a zoom lens compared to a Prime lens (a lens with only one focal length) however, depending on the lens it may not even be noticeable. What is often the case though is that a lens that has a greater zoom range (going from ultra-wide to a long focal length) should be regarded sceptically and it would be worth your while to research reviews before purchasing.

2.2. Wide Angle Lens (short focal length)

Wide angle lenses start at around the 8mm to 20mm mark (Ultra-Wide) and continue from 20mm to 35mm.

Wide angle lenses are traditionally used for landscapes or nightscapes as they encompass a large area however, at the 35mm mark you start to get into street photography or portraiture where you want to include more of scenery and the subject isn't filling the frame.



2.3. Standard Lens

Above 35mm to 70mm focal lengths are considered a “standard” lens.

The most common lens is the 50mm which is argued as a focal range that best corresponds to the human eye in its field of vision. Each manufacturer offers a 50mm prime lens with some offering a cheap “plastic” variety which are still regarded as being a very good lens.

A standard lens is popular for street photography and portraiture when looking for a wider angle to take in a setting or background.



2.4. Telephoto/ Zoom Lens

While you can find lenses in the wider categories that “zoom” as such, a telephoto lens usually refers to focal lengths above 70mm irrespective if they are a prime lens or cover a range of focal lengths.

At the wider end, lenses such as an 85mm are considered great portrait lenses while moving above 135mm you begin finding lenses targeted to wildlife or sports.



A common lens in this category is a 70-200mm zoom lens. Popular with portrait, wildlife, and sports photographers for covering a very useful focal range.

2.5. Macro Lenses

Every lens has what is known as a “minimum focussing distance” in that, there is only so close to your subject a lens can get before it can no longer focus.

A macro lens generally allows you to get much closer to your subject than a conventional lens allowing you to capture tiny subjects or minute details. Insects, flowers, and jewellery are subjects that a macro lens would be used for.

Macro lenses also traditionally have a flat field design. Where normal lenses exhibit a curved type of focussing plane, a flat field design has a flat focussing plane meaning from centre to edge on a straight line, the focussing plane is the same.

If you think about Depth of Field and how being closer to your subject creates a shallower depth of field, having the centre of your lens focus differently from the edges would become noticeable where another other type of photography, your distance would mean that there would be enough Depth of Field no matter how wide the aperture for you to never notice.

Having a flat field design is important when photographing flat objects like artwork, coins, or postage stamps where edge to edge sharpness is critical.

