

Aperture and How To Use It

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Mastering the basics of cameras isn't really as difficult as it seems even for who confront the complexities of cameras for the first time. However, the concept of aperture control seems to elude many of us. The aperture (also called *f*-stop) refers to the size of the hole in the lens.

First, let's get the technical stuff out of the way. (Skip this paragraph if you do not like numbers.) Every photographer knows that all cameras have an opening inside the lens that allows the light to pass through. That opening, or by its technical term *aperture*, is called the *f*-stop. But what does the *f* mean. Could it be focal, or focus, or maybe focal plane? Well, if you said *factor* you win. That is what *f* stands for. The *f*-stop is adjustable to a factor of 1.2, 1.4, 2, 2.8, 4, 5.6, 8, 11, 16, 22, 32 and on. How is that factor determined? Actually it is the ratio between the focal length of the lens and the diameter of the opening at which the aperture is set. A 50mm lens that has an opening of 25mm is set at *f*-2 and a lot of light passes through. The same lens with an opening of approximately 3mm is set at *f*-16 and very little light passes through. That is why the larger the numerical value of the *f*-stop the smaller the opening of the lens. Remember, large number = small opening, small number = large opening. Each increase of one *f*-stop to the next higher (smaller opening) lets in half as much light. Each decrease of one *f*-stop to the next lower (larger opening) lets in twice as much light. But if you allow twice as much light in then the shutter speed has to be twice as fast to compensate for that extra light. The reverse is true if you increase the *f*-stop to a higher number. That is, one stop lets in half as much light so you then must slow down the shutter speed to allow a longer time for the light to pass through.

Okay, now that we have the technical explanation established, here's a simplified version. If the hole is large, a lot of light comes through. If the hole is small, then very little light comes through. It seems as though it is the numbering system that causes the major confusion, so we must reorient our syntax or logic: small number = large opening; large number = small opening. Now, how do we creatively make use of the aperture tool?

To make the proper exposure on film, we need to counterbalance the shutter speed and the aperture. Think of the two of them as ends of a seesaw.

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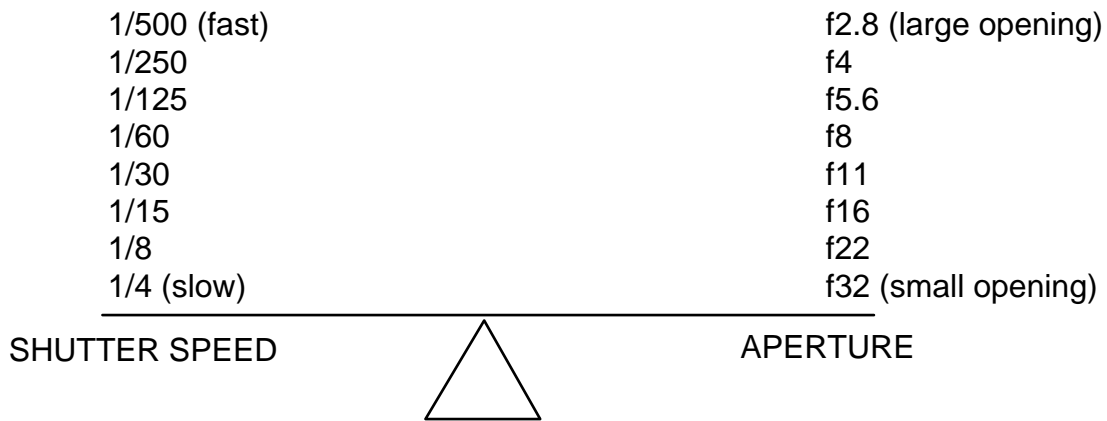


Fig. 1 An example of the relationship between aperture and shutter speed

This is how the shutter and the aperture work together to correctly expose film. However, the aperture does much more. It is one of our most important creative controls and the reason that many photographers shoot on the Aperture Priority setting.

To understand how the aperture works as a creative control, we need to understand more about focus and how a lens affects the final image. Let's take lenses first. Lenses come in a variety of focal lengths and include fixed focal length lenses such as wide-angle lenses, normal lenses, telephoto lenses and zoom lenses that can encompass a range of these options.

A 50mm lens has always been considered to be a "normal lens" since it is commonly believed that it is about the same range our eyes see. A wide-angle lens would be considered to be one in the 20-35mm range, and a "short telephoto," one in the 80-200mm range. Long telephotos are ones whose range is 200mm and longer. Currently, a 300mm is a very popular long telephoto.

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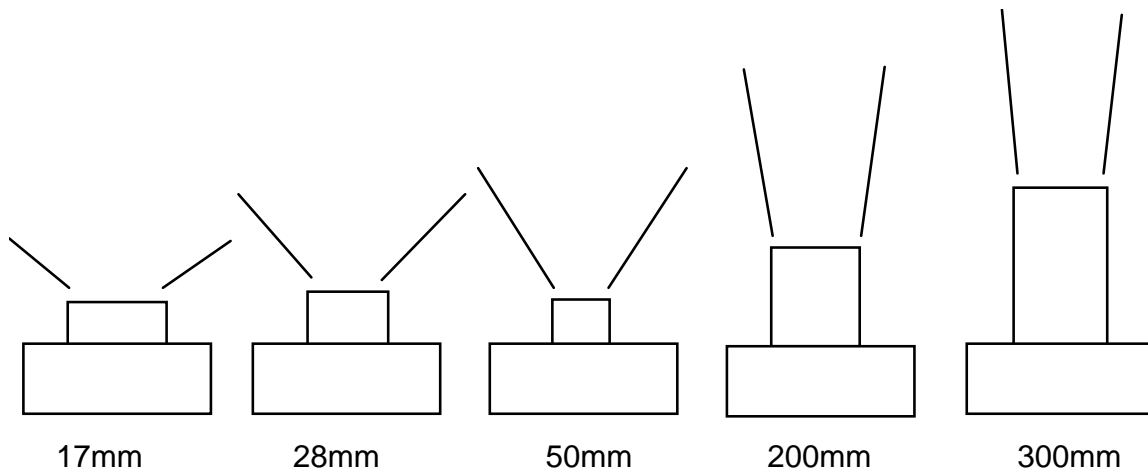


Fig. 2 An example of angle of view of various focal length lenses

Each of these lenses has different characteristics. A wide angle has just what it says, namely, a wide angle of view. This means that we can see an entire mountain vista. At the opposite end of the spectrum, a long telephoto has a very narrow range of view and appears to bring distant objects closer. In other words, we do not see the vista, but we might see one pine tree on the mountain. The tree will appear greatly enlarged and fill the entire frame. Another point to consider about various lenses is the compression factor from front to back. This means that with a wide-angle lens, the distance between the fence, barn, and mountain will be elongated. With the telephoto, they'll be compressed (i.e., the fence, barn and mountain will look very close together).

When we make a creative decision about how we want to focus the camera, keep in mind that we can choose to focus the camera in the foreground, the middle ground, or the background. If we are using a wide-angle lens, we probably will not notice much difference. But if we are using a telephoto, we will see lots of differences. We can immediately see why it's important to understand the mechanics of how lenses work. They can make a major difference in the creative control of our images.

Another creative tool at our disposal is depth of field. Depth of field is the distance that will be sharp from foreground to background in a photograph. The aperture setting controls depth of field. Remember, the larger the opening or aperture, the less depth of field the picture will have. Conversely, the smaller the opening or aperture, the greater the depth of field.

As a simple exercise, look at some photography books and magazines. Can you guess what the photographer's choice was for the depth of field in each photograph? Now, take the next step and see how what you've learned about apertures and lenses can help you creatively. As an exercise, try using each of your lenses and all of your aperture settings. Find a flower field or a scenic and then try photographing a single flower. What difference does depth of field make in your image? What do you prefer? What lens did you like working with? Did you try a variety of aperture settings? Did you remember to balance the aperture and shutter speed to get the proper exposure? Are you making your depth of field or aperture decisions in a variety of ways to reflect what you want to show? If you're photographing a single flower, did you try using your long telephoto lens at a f4 or f5.6? If you focused on the flower, what happened to the background? And if you focused in front of the flower, what happened to the foreground?

Continue photographing various subjects in a variety of ways to show how much control you have over your depth of field and focus. Be sure to take notes because it's important to write down your ideas and what you were trying to do and then how you did it.

Good shooting.