

# The *f*-Stop

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During our recent photo evaluation seminars I have mentioned depth of field when commenting about the degree of sharpness throughout a particular image. Specifically I asked, "Did you intend the entire image to be sharp or were you using selective focus?" After a few moments of pregnant silence and a blank stare or two, we collectively delved into the sometimes confusing matter of the infamous *f*-stop – you know, those ever-present numbers on your lenses that seem to be the antithesis of non-technical logic.

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? How about frustrated. No, that can't be right. 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.

Now, does the above make any sense at all? No? Okay, let's try a simpler way. As my friend Noella Ballenger states in her book, *Nature by Design*, "The aperture or *f*-stop setting controls the size of the opening in the lens. An *f*-4 is a very large (**fat**) opening and allows a lot of light to enter the camera. An *f*-16 is a very small (**skinny**) opening and allows very little light through. Creatively, your choice of *f*-stop will make a big difference in your photograph." So when thinking of the range of sharpness of your resulting image (technically called *depth of field*) remember **fat = fuzzy** and **skinny = sharp**.