

**BEFORE THE NEXT PHOTOSHOOT**

It might be worthwhile:

1. Understanding the relationship between aperture and depth-of-field. See <https://www.exposureguide.com/focusing-basics/>.
2. Have a rough idea of how to read a histogram and in particular could tell if highlights are burned out and/or if shadows are blocked. Google "How to read a histogram in photography". Understanding histograms isn't difficult but IS important. See: <https://digital-photography-school.com/how-to-read-and-use-histograms/>.

**CAMERA SETTINGS**

1. Use Camera Raw: it gives far better results than JPEGs.  
See <https://photographyconcentrate.com/10-reasons-why-you-should-be-shooting-raw/>  
If you're not persuaded, you could set your camera to shoot RAW and jpegs simultaneously. The camera takes one picture but stores with a RAW file and a jpeg (which is what displays on the camera screen anyway)
2. Use the lowest ISO possible.
3. Remember that lenses aren't perfect. With wide angle-lenses, you'll often find a marked deterioration in quality at the sides

**DEPTH OF FIELD**

You'll encounter the term "Depth of field" which is defined as **"the distance between the nearest and the farthest objects that is acceptably sharp."** Note the word **"acceptably"**. Depth of field tables (<https://www.dofmaster.com/dofjs.html>) can be quite useful. When you focus on a specific point, a certain distance behind and in front of that point will be in focus (*as a very simple rule-of-thumb in a 2:1 ratio*) – but how much depends on a number of things such as distance of the subject, type of lens, the type of camera (*a full-frame camera has a smaller depth of field than a four-thirds camera*) and how much the image will be magnified when viewed.

When you access the website page, simply choose your camera, the focal length, the f-stop and the subject distance. At that point, the values in the right hand box will be automatically calculated. In this case, with a Canon 7D camera and a focal length of 18mm and an f-stop of f-11, if you focus at 10 ft., everything will be in focus from 3.32 feet to infinity. Note: these figures can't be 100% accurate for the reasons explained in the previous paragraph.

Enter these values...

**Depth of Field Calculator**

<p>Camera, film format, or circle of confusion  <input type="text" value="Canon 7D"/></p> <p>Focal length (mm)  <input type="text" value="18"/></p> <p>Selected f-stop  <input type="text" value="f/11"/></p> <p>Subject distance  <input type="text" value="10"/> <input type="text" value="feet"/></p> <p style="text-align: center;"><input type="button" value="Calculate"/></p>	<p>Subject distance    10 ft</p> <p>Depth of field</p> <p>Near limit        3.32 ft</p> <p>Far limit         Infinity</p> <p>Total             Infinite</p> <p>In front of subject 6.7 ft</p> <p>Behind subject    Infinite</p> <p>Hyperfocal distance 5 ft</p> <p>Circle of confusion 0.019 mm</p>
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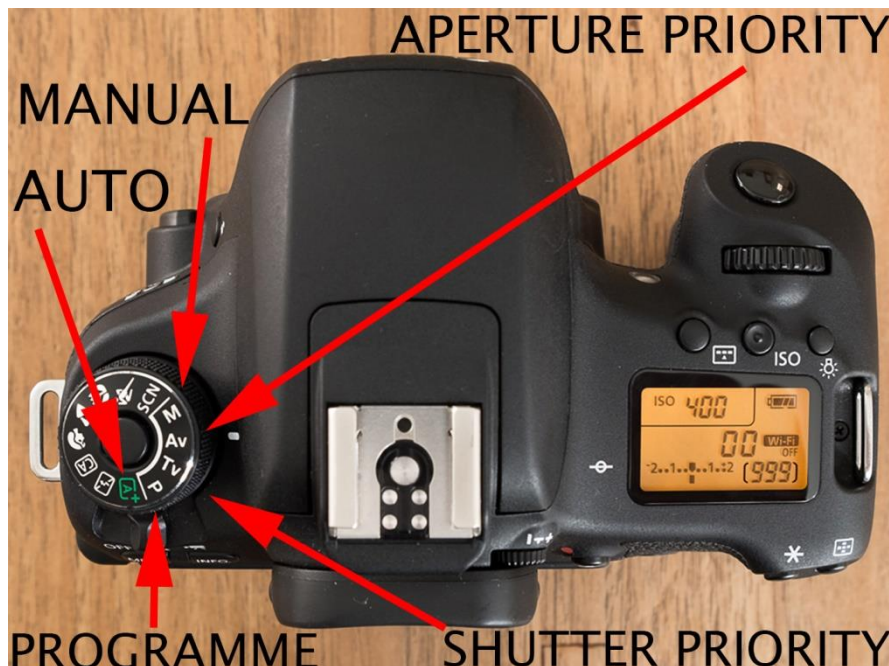
...and the values in this box are automatically calculated.

For close-ups where depth-of-field is limited, consider the use of focus-stacking. There is an article in the Members' Area of the website about this.

[https://82a0f9e9-e7ea-42ab-85f1-27e638e8f0c1.filesusr.com/ugd/946144\\_ce08b423bf454f04a7ffc640e6fb502.pdf](https://82a0f9e9-e7ea-42ab-85f1-27e638e8f0c1.filesusr.com/ugd/946144_ce08b423bf454f04a7ffc640e6fb502.pdf)

**THE RELATIONSHIP BETWEEN APERTURE, SHUTTER SPEED and ISO + AN INTRODUCTION TO STOPS AND BRACKETING**

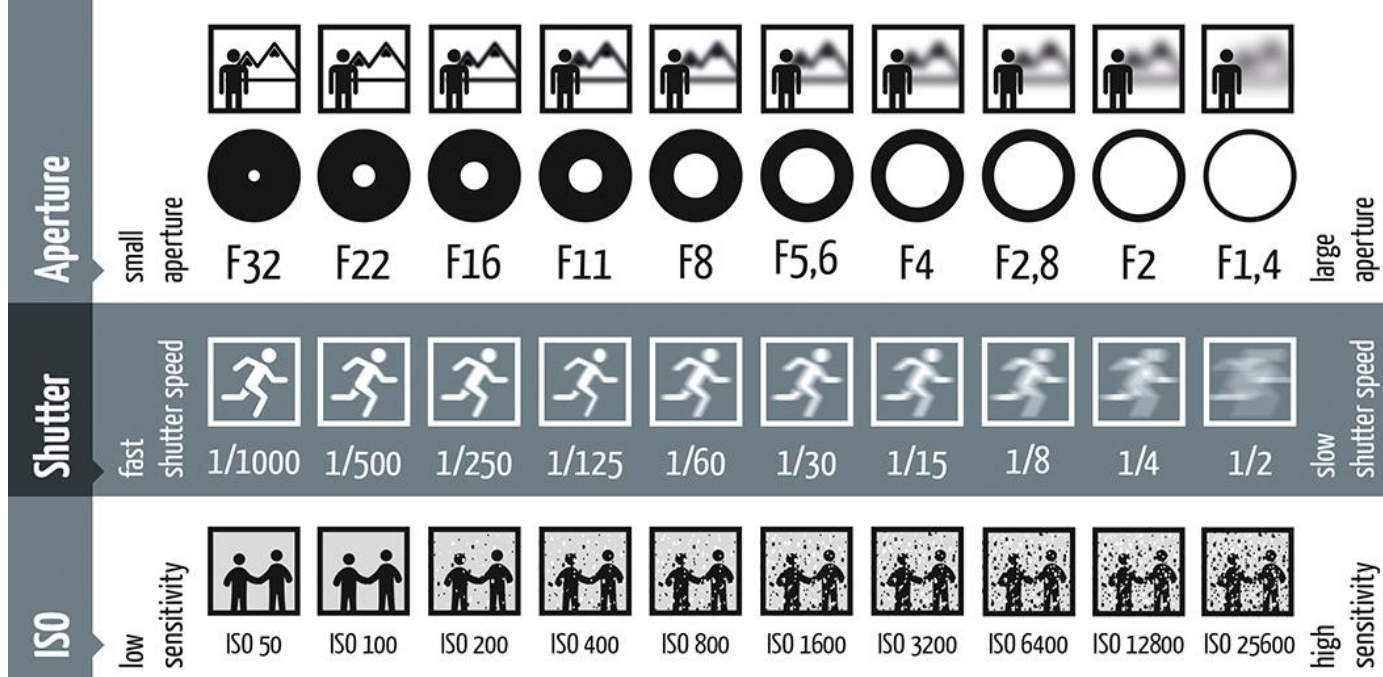
See the next four pages:



All dSLRS, most Bridge cameras and many compacts offer these options.

In “Auto” (A+) you cannot override the settings. You often cannot shoot in RAW either.  
 Programme (P) is similar to “Auto” but you can override all the settings. As you change one setting, the rest change automatically. You can shoot in RAW  
 In “Aperture Priority” (Av), you set the aperture and the camera automatically sets the correct shutter speed.  
 In “Shutter Priority” (Tv), you set the shutter speed and the camera automatically sets the correct aperture.  
 In “Manual” (M), you decide both shutter speed and aperture. You would normally only use this for special reasons.

There are lots of advantages to having “P” (Programme) as the default mode.  
 See: <https://www.photographytalk.com/beginner-photography-tips/why-you-need-to-shoot-in-program-mode>  
 And <http://www.easybasicphotography.com/program-mode.html>



In Aperture Priority, Shutter Priority and Programme, as **you** change the aperture / shutter speed / either (respectively), the other value changes automatically so that the same amount of light hits the sensor.

You can further override the settings by using Exposure Compensation because sometimes the camera doesn’t give exactly the right settings e.g. for very dark, very light or backlit subjects.  
 See <https://photographylife.com/what-is-exposure-compensation>  
 Bracketing allows an additional step in the Exposure Compensation.



From Left to Right:

- 1 Aperture size doubles each time
- 2 Double the amount of light hits the sensor
- 3 Each represents one extra STOP
- 4 Depth of field (amount in focus) decreases\*
- 5 No *simple* numerical values between numbers
- 6 Fractional values easily achievable

\*depends on camera:four-thirds have more than full-frame

(assuming shutter speed and ISO are kept the same)

Depth of field also depends on type of lens (W/A vs telephoto)  
and shooting distance



From Left to Right:

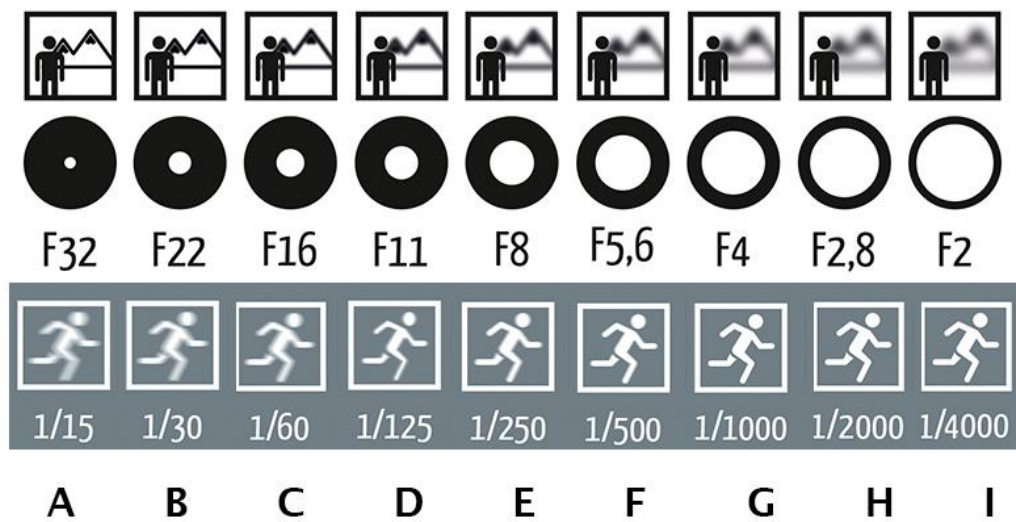
- 1 Shutter speed doubles each time
- 2 Double the amount of light hits the sensor
- 3 Each represent one extra STOP
- 4 Risk of blurring/camera shake increases
- 5 Numerical values almost exactly double
- 6 Fractional values easily achievable

Risk of camera shake reduced by IS, W/A lenses and “support”  
e.g. holding camera correctly, leaning against a wall

(Assuming aperture and ISO are kept the same)

Note: for both the examples on this page, if you change aperture or shutter speed, the other setting is changed automatically by the camera.





On a bright day, a camera on “Auto” or “Programme” might suggest setting “D” or “E”

The same amount of light hits the sensor which ever option you select in “Aperture Priority”, “Shutter Priority” or “Programme”. As one value is set, the other changes automatically to keep the amount of light constant

Any setting might be appropriate: it depends on the subject

Different lighting conditions will require different combinations e.g.  
 Bright Sunshine F16 and 1/1000th s. (or F22 and 1/500th s., etc  
 Inside a church F16 and 15 seconds (or F8 and 30 s, etc)

Most lenses don’t offer all these combinations

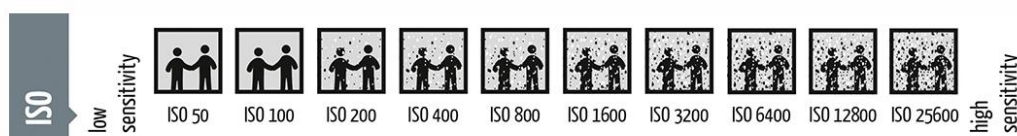
Lenses give their optimum performance at a “sweet spot” of about F11

What happens if you find the lighting is too low to use any of the settings and flash is banned?

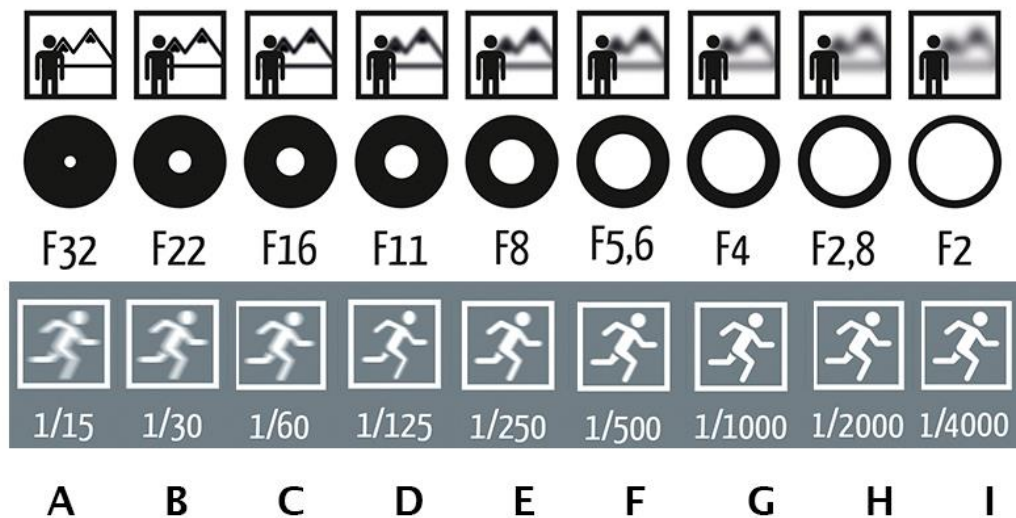
For example, in a night-club, your camera might suggest a shutter speed of 1/8 second at the widest aperture.

You therefore have no choice but to increase the ISO - and increasing the ISO increases the amount of noise.

Noise become noticeable at about ISO 800



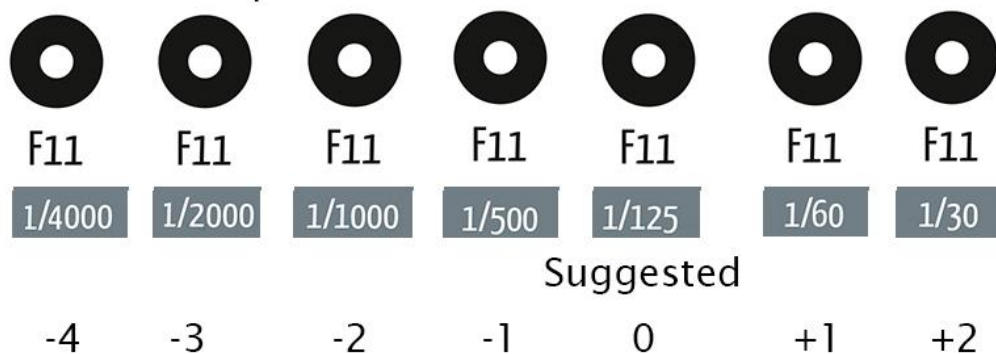
In the following examples, you can see how in Aperture Priority, Shutter Priority and Programme Modes how changing one value causes the camera to automatically change the other.



“Bracketing is to take a series of images at different exposures

This is often done for scenes with too much contrast for a single image to capture (such as interiors). Usually the aperture is fixed and the shutter speed altered (WHY?). Manual (M) exposure is normally used. (WHY?)

The bracketed exposures are combined in software



Sometimes bracketing by 6 stops isn't enough! (WHY?)

I hope this is useful.

Any questions, please email me on [philip.smithies@hotmail.co.uk](mailto:philip.smithies@hotmail.co.uk)

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