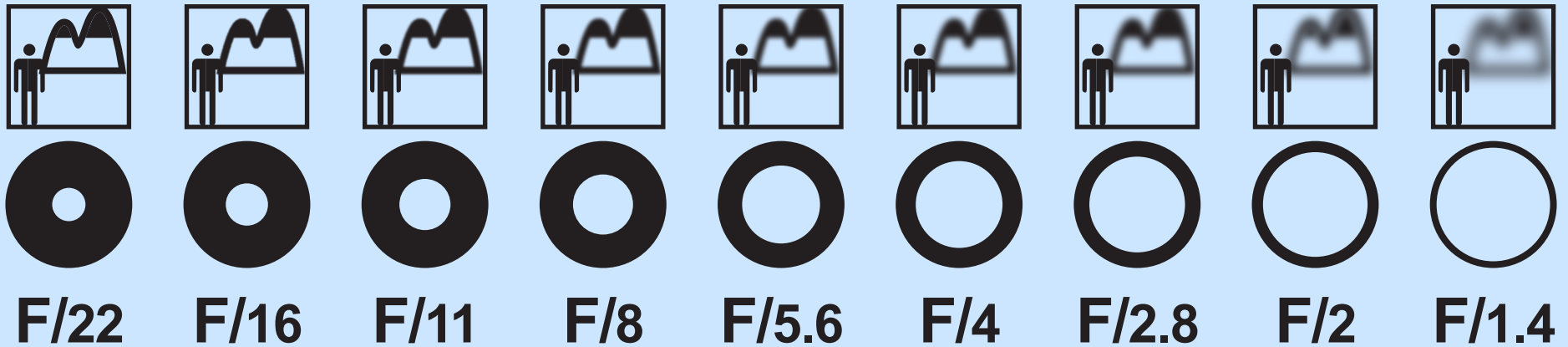


# Aperture “Trade Off” Chart



**Smallest Aperture**

**Largest Aperture**

**Least Amount of Light**

**Most Amount of Light**

**Largest Depth of Field**

**Least Depth of Field**

**Most Objects in Focus**

**Least Objects in Focus**

# Shutter Speed “Trade Off” Chart

								
1/1000	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4

**Fastest  
Shutter Speed**

**Slowest  
Shutter Speed**

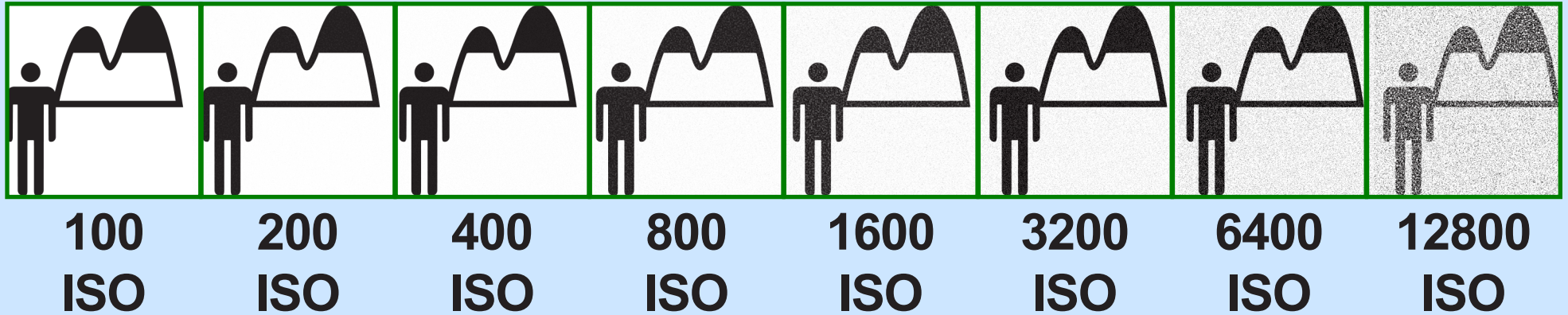
**Least Amount  
of Light**

**Most Amount  
of Light**

**Freezes  
Motion**

**Shows  
Motion**

# ISO "Trade Off" Chart



**Cleanest  
ISO**

**Noisiest  
ISO**

**Least Amount  
of Light**

**Most Amount  
of Light**

**No Light  
Amplification**

**High Light  
Amplification**

# Shutter Speed & Hand Shake

When shooting hand-held, any camera motion can blur your photos. Motion caused by holding the camera is called Hand Shake. To prevent blurriness caused by Hand Shake we should increase our shutter speed. Just like freezing motion in a moving subject, shutter speed can freeze the motion of Hand Shake.

Lenses can have different Focal Lengths. Small Focal Lengths like 18mm have very little magnification, and large Focal Lengths like 300mm add a lot of magnification. Lens magnification increases the effect of Hand Shake, and the higher the magnification, the faster we should set the Shutter Speed to prevent Hand Shake blur in our photos.

The following charts show the recommended Shutter Speeds at various Focal Lengths. There are two charts because crop sensor cameras or APS-C cameras use smaller sensors than full frame cameras. Then smaller sensors add some magnification, so slightly faster shutter speeds are needed.

## APS-C/Crop Sensor Camera Recommend Shutter Speeds for Different Focal Lengths

<b>Focal Length</b>	<b>Safe Shutter Speed</b>
18	1/60
24	1/80
30	1/100
35	1/125
50	1/160
55	1/200
58	1/200
70	1/250
85	1/320
100	1/320
105	1/400
135	1/500
140	1/500
200	1/640
240	1/800
270	1/1000
300	1/1000

## Full Frame Camera Recommend Shutter Speeds for Different Focal Lengths

<b>Focal Length</b>	<b>Safe Shutter Speed</b>
18	1/60
24	1/60
30	1/60
35	1/80
50	1/100
55	1/125
58	1/125
70	1/160
85	1/200
100	1/200
105	1/250
135	1/320
140	1/320
200	1/400
240	1/500
270	1/640
300	1/640

# F-Stop Chart

In photography light is measured in F-Stops.

F/1.0 will let in much more light than F/64.

In photography terms, F/64 is 13 stops darker than F/1.0. If you look at the chart, in the Full Stops column, you can count the number of F-Stop values, F/64 is 13 values away from F/1.0.



F/1.0  
Lighter

Double the amount  
of light compared  
to F/1.4

F/1.4  
Darker

Half the amount  
of light compared  
to F/1.0

If we start at F/1.0 and go down the list one full F-Stop to F/1.4, then we've reduced the amount of light going through the lens by half.

Each time we move down the first column we're reducing the amount of light by half. As we move up column by one we are doubling the amount of light.

Most camera lenses have F-Stops between F/3.5 to F/22, and most modern digital cameras will allow you to adjust your F-Stops by Half-Stops (1/2) or Third-Stops (1/3).

In this chart the colors used indicate full stops. For example, in column two all the green numbers are one full stop different.

Full-Stops	1/2-Stops	1/3-Stops
F/1.0	F/1.0	F/1.0
F/1.4	F/1.2	F/1.1
	F/1.4	F/1.2
	F/1.7	F/1.4
F/2	F/2	F/1.6
		F/1.8
		F/2
		F/2.2
	F/2.4	
F/2.8	F/2.8	F/2.5
		F/2.8
		F/3.2
	F/3.3	
F/4	F/4	F/3.5
		F/4
		F/4.5
	F/4.8	
F/5.6	F/5.6	F/5
		F/5.6
		F/6.3
	F/6.7	
F/8	F/8	F/7.1
		F/8
		F/9
	F/9.5	
F/11	F/11	F/10
		F/11
		F/13
	F/13	
F/16	F/16	F/14
		F/16
		F/18
	F/19	
F/22	F/22	F/20
		F/22
		F/25
	F/27	
F/32	F/32	F/29
		F/32
		F/36
	F/38	
F/45	F/45	F/40
		F/45
		F/51
	F/54	
F/64	F/64	F/57
		F/64