Academic Innovation and Distance Education

Overview

This week, we are beginning a three-part lesson in the three parameters of photography. Each week we will explore one parameter in depth. This week we will look at ISO. Remember that when you shoot in Auto mode, your camera will choose the correct setting for you. You will not need to change your ISO — the information this week is provided so that you understand how digital photography works. If you would like to experiment with your camera's ISO, there is an optional assignment at the end of this week's lesson.

If this lesson is confusing for you, don't worry, it will all come together in the next two weeks.
Adapted from: http://www.digital-photography-school.com/iso-settings

ISO SETTINGS IN DIGITAL PHOTOGRAPHY

In traditional (film) photography ISO (or ASA) was the indication of how sensitive a film is to light. It is measured in numbers. You've probably seen them on films or in your camera's menu. They look like this: 100, 200, 400, 800, etc. **The lower the number, the lower the sensitivity of the film, and the finer the grain.** Grain, or noise, is the speckly, annoying texture that we sometimes see in both film and digital photography.

Film is composed of lots of little circles that make up the GRAIN of the film. Digital photography is similar, except for that our little circles aren't circles at all, they're squares. . . a gazillion little squares (pixels) that come together to create an image. Sometimes those little squares in the image become slightly visible and this is referred to as NOISE.

So the rule is: The higher the ISO, the more sensitive to light (good), the more noise (bad).

Bunker Hill Community College
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Academic Innovation and Distance Education (AIDE)
The Innovation Lab
617-228-3427
aide@bhcc.edu
bhcc.edu

Charlestown Campus 250 New Rutherford Avenue, Boston, MA 02129
617-228-2000 TTY: 617-242-2365
Chelsea Campus 70 Everett Avenue, Chelsea, MA 02150
617-228-2101 TTY: 617-884-3293
Locations Chinatown | East Boston | Everett | Malden | South End | Quincy

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In Digital Photography, ISO measures the sensitivity of the image sensor. The same principles apply as in film photography – the lower the number the less sensitive your camera is to light and the finer the grain. Higher ISO settings are used in darker situations. However, the image will be noisy. I'll illustrate this with two enlargements of shots that I just took – the one on the left is taken at 100 ISO and the one of the right at 3200 ISO.

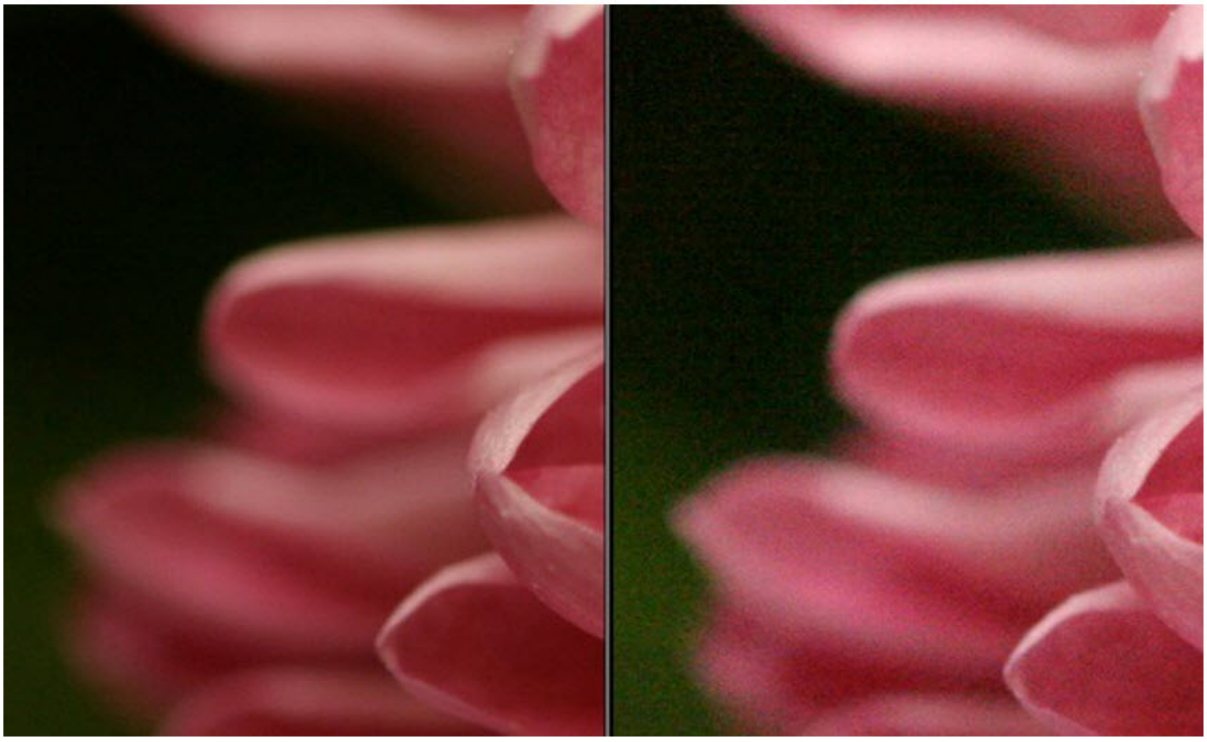

Image taken at 100 ISO.
Very little digital noise; looks clear. Good!

The same image taken at 3200 ISO. Notice the digital noise.
This image does not look at clear. Bad.

100 ISO is generally accepted as 'normal' and will give you lovely crisp shots (little noise/grain).

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Most people tend to keep their digital cameras in 'Auto Mode' where the camera selects the appropriate ISO setting depending upon the conditions you're shooting in (it will try to keep it as low as possible) but most cameras also give you the opportunity to select your own ISO also.

When you do override your camera and choose a specific ISO you'll notice that it impacts the aperture and shutter speed needed for a well-exposed shot. For example — if you changed your ISO up from 100 to 400 you'll notice that you can shoot at higher shutter speeds and/or smaller apertures.

When choosing the ISO setting I generally ask myself the following four questions:

1. Light – Is the subject well lit?
2. Grain – Do I want a grainy shot or one without noise?
3. Tripod – Am I using a tripod?
4. Moving Subject – Is my subject moving or stationary?

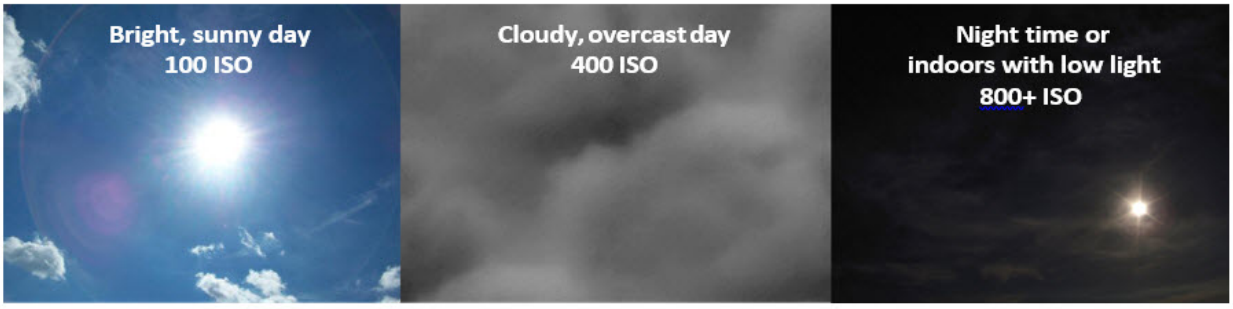
If there is plenty of light, I want little grain, I'm using a tripod and my subject is stationary I will generally use a pretty low ISO rating (100-200).

However if it's dark, I purposely want grain, I don't have a tripod and/or my subject is moving I might consider increasing the ISO as it will enable me to shoot with a faster shutter speed and still expose the shot well. Of course the trade off of this increase in ISO will be noisier shots.

Situations where you might need to push ISO to higher settings include:

- Indoor Sports Events – where your subject is moving fast yet you may have limited light available. Concerts – also low in light and often 'no-flash' zones
- Art Galleries, Churches etc- many galleries have rules against using a flash and of course being indoors are not well lit.
- Birthday Parties – blowing out the candles in a dark room can give you a nice moody shot which would be ruined by a bright flash. Increasing the ISO can help capture the scene.
- ISO is an important aspect of digital photography to have an understanding of if you want to gain more control of your digital camera. Experiment with different settings and how they impact your images.

- You can predict which setting you will need based on the available light.



If you're shooting in bright, full sunlight, you will probably want an ISO of 100. This means that the sensor will not be very sensitive to light, and there will be little to no grain, producing a nice, clear image.

If you're shooting on a cloudy overcast day, you'll need to bump up the sensitivity of your camera's sensor. You may want to change the ISO rating to 400. You may find that your image is a little bit noisy.

If you're shooting outside at night time, or inside a building with very little light, such as a church, you will need to raise the sensitivity of the camera's sensor a lot. You'll need an ISO of at least 800. However, with a high ISO such as this, you will see lots of noise.