On-Camera Flash Basics

Balancing Flash with Ambient Light

The best way to use on-camera flash is to balance the contribution of flash to the existing ambient light. The most important thing to know about flash is this: the light from your flash is effectively instantaneous, whereas the ambient light accumulates over the entire exposure. Generally, the best flash pictures strike a good balance between flash and ambient light...pictures that let little ambient light in and depend primarily on flash suffer from harsh front lighting, which obliterates all shadows and other visual cues viewers unconsciously use to see a 2D picture as a 3D object--this is called "flat" lighting because it robs the photo of these cues that viewers interpret as depth.

Configuring Your Camera

The best way to take flash pictures is to set your camera mode to manual (M) (and turn off auto ISO mode if your camera has it), and set your flash mode to auto. Pop-up flashes normally don't allow any mode other than auto, and auto is the default setting for external flashes. Configured this way, you have total control over aperture, shutter speed, and ISO, and you're letting the camera control the level of flash output. Once your camera is set up this way...

Step 1 - Remove the main subject from the picture, turn off your flash. Set the aperture, shutter speed, and ISO to expose the background the way you want it according only to the ambient light. If you're in a room with lamps, a good starting point is to dial in settings that will expose the background -1 to -2 stops. This is enough that the background will be clearly visible in the photo, but the viewer's attention will be primarily focused on the more brightly lit main subject.

"Background" refers to any part of the scene that is significantly farther away from your flash than your main subject. Anything that is close to the same distance as your main subject will be just as strongly lit by flash--the best thing to do is position your main subject so that the background is at least 2x as far away, preferably more.

Step 2 - Place your main subject in the frame and turn your flash on (the camera is still in manual mode, the flash is in auto). When you focus on the main subject, the camera will determine how much light is required from the flash to properly expose that subject because the flash is in auto. Since the flash will not make a significant contribution to the background, it will not change. Take the photo.

After you take the photo, look at the main subject and the background. Is the background too dark? If so, you need to increase the contribution of ambient light. You can do this by opening to a wider aperture, taking a longer exposure by decreasing the shutter speed, or increasing ISO. Because the flash is on auto, the camera will still expose the main subject as a middle tone by lowering flash output, but the background will get relatively brighter. If the background was too light, do the opposite of one or more of these things.

Is the subject too dark? Sometimes the subject is not very reflective and it absorbs more of the light from the flash than the camera expects. In this case, dial in positive flash exposure compensation (+FEC). Or, if the subject is too bright, dial in -FEC.

Bouncing Flash

You may find that front lighting is flat and unattractive. In this case, if you have an external flash with a swivel head, you can point it at a ceiling or a nearby wall and bounce it. Now, the contribution from the flash is coming from a different direction and will give shadows and dimensionality. If you position yourself relatively far from the bounce surface and your subject relatively closer to it, the light from your flash will have distance to spread before it hits the bounce surface and it will simulate a large soft box. If you put yourself close to the bounce surface and your subject relatively farther, the opposite is true--you'll simulate a small soft box. The smaller the effective light source, the harder the edge shadows will have. Usually, soft-edge shadows are the most flattering, so try to put your subject closer to the bounce surface than you are. (Also, your flash will pick up any color casts from the bounce surface. If the bounce surface is purple, it's like using a purple-toned soft box.)

Mixed Lighting

Mixed lighting is often a problem with flash. Ambient light will often have a different color than the light emitted your flash. Fluorescent lights are greener than your flash, while tungsten lights are yellower. The best way to deal with this is to place a colored gel over your flash that matches its color to that of the ambient light. If you do this while your camera is set to auto white balance (AWB), it will usually do a pretty good job of correcting for the color cast of the lighting (or, you can dial in a preset WB...if you've matched your flash to tungsten lights, then you could choose the tungsten WB setting, or alternatively set a custom WB if you want it to be really accurate). Another option is to find a bounce surface that is similar to the ambient lighting--if you bounce off of a beige wall, the flash will pick up that yellow color cast and more closely match the ambient tungsten lights in the room.

Definitions

Some definitions that have nothing to do with flash:

- camera - a source of great expense and much frustration

- camera mode (or "camera shooting mode", also called the camera's "exposure program") - the setting on your camera body that determines which aspect(s) of exposure you control: full auto, program (P), shutter priority (S or Tv), aperture priority (A or Av), Manual (M), etc

- exposure compensation (EC) - available when shooting in program, shutter priority, or aperture priority. In aperture priority, for example, you set the aperture and the camera sets the shutter speed for you. The camera will always set the shutter speed to expose the scene for a medium exposure (the luminosity of 18% gray, to be exact). For most scenes, this is about right. However, if you are shooting a polar bear in a snow storm, you need to tell the camera that the overall tone of the scene is actually *brighter* than a medium tone--polar bears in snowstorms are not middle gray, they're near-white--so you would dial in +EC. Likewise, if you shoot a black stallion at night, you dial in -EC to tell the camera meter that the average tone of the scene dark gray or near-black.

  When shooting in manual mode, since you control all aspects of exposure directly,

exposure compensation is meaningless. If you are in manual mode and you want more exposure, just open the aperture or decrease shutter speed. Since the camera isn't setting anything, there's nothing to compensate for; all the camera can do is tell you the exposure that is currently set relative to medium gray.

- exposure bracketing (EB) - a setting that causes your camera to take multiple exposures in sequence that automatically changes EC. If you take a sequence of three images with -/+1 EB, the first exposure will have no EC, the second will have -1 EC, and the third will have +1 EC.

Now some definitions that have to do with flash:

- flash (or "strobe") - that thingy that throws light.

- flash mode - the setting on your flash (also controllable from the camera with some camera bodies) that determines the level of flash output: automatic ("through the lens", or TTL), manual (M), stroboscopic (all sorts of different names, depending on the flash manufacturer), high-speed sync (also called FP or "focal plane" mode). Usually, only external flashes allow you to set different flash modes--the pop-up flash is always in auto for every camera with a pop-up flash that I know about.

- automatic flash mode (E-TTL, auto, A) - also, called "through the lens", or TTL, mode because the camera sets the level of flash output automatically to properly expose the main subject (i.e., what you focused on)...it does this by firing a weak pre-flash and the meter measures the exposure of the main subject "through the lens".

- stroboscopic flash mode - a mode in which you can set your flash to fire multiple times for a single exposure. Use this if you want a single image that shows [different moments of a dancer's leap](), for example.

- manual flash mode - a mode in which you directly set the output of the flash. If you set it to full power, it will pop at full power every time. If you set it to 1/4, it will pop at 1/4 power. (I've also heard this called "dumb light" mode--not sure if that's widely accepted terminology, though...)

- flash exposure compensation (FEC) - When shooting with auto flash, FEC biases the amount of flash output. With no FEC dialed in, the flash will fire with enough output to expose the main subject with a medium tone. If you want to cut the output determined by the camera in half, dial in -1 stop of FEC--to cut it to 1/4th as much, dial in -2 FEC. To cause the flash to emit twice as much light, dial in +1 FEC.

- maximum sync speed (sometimes labeled "x-sync speed") - this is the fastest shutter speed your camera can use with flash. If you set a faster shutter speed, there is no point in time during the exposure where the sensor is completely exposed. The rear curtain obscures part of the sensor before the front curtain has cleared it; if the camera were to allow you to do this, the sensor would be partially obscured by the shutter and those parts of the sensor would not receive any contribution from the flash burst.

- high speed sync (HSS, also called "focal plane sync" or "FP-sync") - if you want to use flash with a shutter speed faster than the x-sync speed, you have to set this flash mode. This causes the flash to fire several bursts, effectively making it behave

like a continuous light source. Avoid this mode if you can--it consumes a lot of power and is hard on the strobe unit inside your flash.

- guide number - a number that describes the most light your flash can emit in a single burst, usually expressed in meters and/or feet at ISO 100. For example, a flash with a guide number of 180 feet is powerful enough to properly expose a subject 10 feet away if the camera is set to an aperture of f/18 and ISO 100 (10 feet times f-number of 18 equals 180, the guide number). If you move the subject closer, open the aperture (to, say, f/11), or increase the ISO, the camera can reduce flash output and still obtain a properly exposed main subject. However, if you move the subject farther away, use a smaller aperture, or decrease the ISO the flash is not powerful enough to illuminate that subject on its own--there would have to be another source of light to make up the difference, or the main subject will be underexposed.

- inverse square law - the law of physics that describes how light dissipates over distance. If you double the distance to a subject, the flash has to emit *four times* ("two squared") as much light to expose that subject the same. If you triple the distance, the flash has to emit *nine times* ("three squared") as much light.

- flash exposure bracketing (FEB) - a setting that causes your camera to take multiple exposures in sequence that automatically varies flash output (which is the same as changing FEC). If you take a sequence of three images with -/+2 FEB, the camera will take the first exposure with no FEC, the second with -2, and the third with +2.