UNDERSTANDING WHAT YOUR CAMERA/FLASH DOES

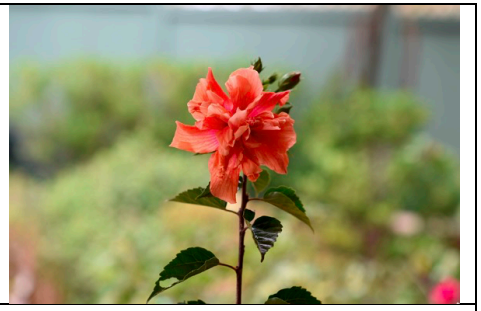
This set of exercises will help you to become familiar with your camera and flash so that you can get consistently results when using flash photography. The exercises should be read in conjunction with the "Basic Flash Photography" tutorial on www.roykillen.com.

These exercises assume you have a DSLR and a flash that can operate in Through The Lens (TTL) mode. You will need to refer to your camera and flash manuals to determine how to make some of the settings I recommend. Before you start, you will need to know:

(a) How to set your camera to various modes (such as aperture priority and manual).
(b) How to change aperture, shutter speed and ISO.
(c) How to set your flash to TTL mode.
(d) How to change the metering mode on your camera (e.g. to "matrix" metering).
(e) The maximum normal flash synchronisation speed of your camera. Some cameras have "high speed flash synchronisation" but we will not be using that in these exercises.
(f) How to change the Flash Exposure Compensation (FEC) on your camera.
(g) How to change the Exposure Compensation (EC) on your camera, and what options are available for EC.

For this exercise you can work inside or outside. If working outside it is best to pick an overcast day so that the direct light is not too strong. The exercise is designed to help you gain familiarity with your camera/flash under the simplest possible conditions. Once you have this familiarity you will be able to adapt to more challenging situations, such as very strong sunlight.

Step	What to do	Why	What you should observe	Notes and Sample images
1	Attach a suitable lens to your camera (something between 35mm and 100mm) or set your zoom lens to around 70mm.	The lens you use is not critical here, but if you use a very wide or very long lens it is not so easy to see the effects of some of the suggested camera/flash settings.	Take a trial image of anything to check that your camera operates normally.	
2	Put your camera on a tripod.	So that you will have consistent framing to make image comparisons easier.		
3	Focus the camera on a stationary object in the foreground and leave a reasonable amount of	So that later you can illuminate the subject with flash and still have the background illuminated with ambient light.	Something in the style of the sample image is a good choice as it has a "subject" that can be easily isolated	

	background in the frame. The background should be far enough away to not be illuminated significantly by the flash).		from the background.	
4	Set the ISO on the camera to a low value (e.g. 200).	This is just a starting point; it will be varied as you experiment.	ISO 200 displayed on camera.	
5	Set your camera's metering mode to "matrix" (or whatever setting takes into account the whole scene – not "spot" metering).	If you "spot" meter on the subject, some of the later adjustments may produce effects that are difficult to see.	"Matrix" or "full scene" metering should be displayed on your camera.	
6	Put your camera on "A" mode (aperture priority), set the aperture to its widest value (e.g. f/2.8 or f/4) and take a test image of your subject. (I will refer to this as Image 1.)	This allows the camera's metering system to determine "correct" exposure (without flash) as a starting point.	Make a note of the aperture and shutter speed.	Note: If your camera sets the shutter speed to something faster than the maximum flash synchronisation speed (typically 1/250 sec) either reduce the ISO or select a small aperture.
7	Put your camera in MANUAL mode.	So that you can control aperture, shutter speed and ISO.	"M" mode should be displayed on the camera.	
8	Adjust your aperture to the value you used for the test image (e.g. f/4) and set the shutter speed to the value your camera determined for your Image 1 (e.g. 1/200 sec). Take another test image (I	To check that you are correctly adjusting the manual settings.	This image should look exactly the same as Image 1.	

	will refer to this as Image 2).			
9	Set the camera to its highest "normal" flash synchronisation speed (typically 1/250sec).	If the camera has a "high speed synchronisation" mode this will make the flash behave differently to the way described in the tutorial presentation.	The chosen flash synchronisation speed should be displayed on the camera menu.	
10	Attach a flash, turn it on and set it to TTL mode.	TTL mode allows the camera to calculate the required flash output.	"TTL" mode should be displayed on the flash.	Note: Some flash units have several different TTL modes. Select one of those modes and stick with it. Later you might want to experiment to see how the different modes change the behaviour of the flash.
11	Without changing any of the camera settings, take another image (Image 3).	So that you can observe how the flash alters the appearance of the image.	You should see that the exposure of the subject (the part illuminated by the flash) has increased but the exposure of the background has not changed.	
12	Change the aperture to f/8 and take another image (Image 4).	So that you can observe the effect of changing the aperture.	In Image 4 the background should be darker than Image 3. The flash illuminated subject should appear the same as Image 3.	Note: If the ambient light is strong you will probably see some minor difference in the illumination of the subject in Images 3 and 4.
13	Change the aperture to f/16 and take another image (Image 5).	So that you can observe the effect of changing the aperture.	The background should be darker than Image 4. The flash illuminated subject should appear the same as	Note: Changing the aperture should have no noticeable effect on the flash illuminated areas of the image, but it does change the

			Image3 and 4.	brightness of the areas illuminated by ambient light.
14	Change the aperture back to f/4. Reduce the shutter speed to 1/125 sec and take Image 6.	So that you can observe the effect of changing shutter speed.	The background should be lighter than Image 3. The flash illuminated subject should appear the same as Image 3.	Note: The shutter speed here is not critical; just make it about half the shutter speed used in Step 8.
15	Change the shutter speed to 1/30 sec or slower.	So that you can observe the effect of very slow shutter speed.	The background should be very much lighter than Image 3. The flash illuminated subject should appear the same as Image 3.	Note: Changing the shutter speed should have no noticeable effect on the flash illuminated areas of the image, but it does change the brightness of the areas illuminated by ambient light.
16	Change the shutter speed back to the value you used at Step 8 (for Image 3). Change the ISO setting to 800 and take Image 7.	So that you can observe the effect of changing the ISO.	The subject in Image 7 should appear the same as in Image 3, but the background should be much lighter.	
17	Change the ISO to 1600 (or whatever high value your camera will allow) and take Image 8.	So that you can observe the effect of very high ISO.	The subject in Image 8 should appear the same as in Image 3, but the background should be very much lighter.	Note: Changing the ISO should have no noticeable effect on the flash illuminated areas of the image, but it does change the brightness of the areas illuminated by ambient light.
18	Set your aperture, shutter speed and ISO back to the values you used at Step 8. Use the Flash Exposure Compensation (FEC) feature on the camera to	To observe the effect of positive FEC.	The subject in Image 9 should appear brighter than in Image 3, but the background should be the same.	Note: Positive values of FEC increase the output of the flash.

	increase the flash output by the maximum possible amount (such as +2ev). Take Image 9.			
19	Change the FEC to the minimum possible value (such as -2ev) and take Image 10.	To observe the effect of negative FEC	The subject in Image 10 should appear darker than in Image 3 and considerably darker than in Image 9), but the background should be the same.	Note: Negative values of FEC decrease the output of the flash.
20	Put the FEC back to "0" and put your camera back on "A" (aperture priority). Set the aperture to f/4 and the ISO to 200. Use your camera controls to set the Exposure Compensation (EC) to +2ev. Take Image 11.	To observe the effect of positive EC.	The brightness of the entire image should increase, but the increase may not be very noticeable on the subject (lit by flash).	Note: Some cameras allow the EC to be set to different methods of operation (such as entire image or just the areas not illuminated by flash). If this option is available on your camera, experiment with it.
20	Change the Exposure Compensation to -2ev. Take image 12.	To observe the effect of negative EC	The brightness of the entire image should decrease, but the decrease may not be very noticeable on the subject (lit by flash).	

You should now be familiar with all the basic methods of controlling how your camera/flash combination allows you to vary the way in which the ambient light areas and flash illuminated areas of an image can be controlled independently. For additional control, you can consider changing the position and direction of the flash, and using various types of diffusers and reflectors.

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21 February, 2015