Lesson 4 – DSLR Basics – Transcripts

Introduction:

* This begins an introduction to our Tier 3 lessons focused on the different functions made available to us on a DSLR Camera.
* As before I will be using a Canon 80D camera, as that is what I own, although, most if not all of the functionality we will talk about can easily be translated over to another camera.
* Along the way we will be simulating these options on a camera simulator as well.
* Let’s get started.

Lesson 4.1.1 – Focal Lengths and Field of View – Transcripts

* As I already mentioned in our lesson on lenses, camera lenses are complex lens systems.
* There are multiple lenses that work in unison to create a single focal length value that is obtained by us rotating the focal length ring.
* Depending on the lens that you are using, you can easily check what the extreme ranges of your focal lengths are.
* For this lens I am using, it goes from 18 millimeters to 135 millimeters.
* You might remember that focal length is how far the image is formed from the center of the lens. In this case it indicates the distance between your camera lens and it’s image sensor.
* A shorter focal length will indicate that the object you are trying to photograph will appear smaller in the scene.
* A larger focal length means the subject of your scene will be bigger.
* This concept is illustrated in the images here. We are trying to maintain \*\*\*\* as our subject.
* Observe as I change the focal length how the subject becomes bigger and occupies more and more of the scene.
* At this point you are probably beginning to notice that as the subject becomes bigger it is occupying more and more of the scene.
* This ties nicely into the idea of a field of view. Field of view is dependent on your camera’s sensor but is tied to the focal length of your lens.
* Field of view if basically the portion of the scene actually formed on the image sensor, alternatively it is the part of the scene that is actually recorded in the photograph.
* All things such as the sensor sized kept equal, a larger focal length will have a narrower field of view and vice versa.
* Let’s look at an exercise to review focal lengths with the free web version of camerasim.

Lesson 4.1.2 – Camerasim Focal Length Exercise – Transcripts

* Go to <http://camerasim.com/apps/original-camerasim/web/>
* The web app should start us off with a looping shot of a subject.
* For this lesson leave the center dials to Aperture Priority.
* Leave Lighting to mostly sunny.
* Pay attention to the Focal Length slider.
* The Focal Length slider goes from 18mm to 55mm.
* The 18-55 mm lens is an extremely popular kit or introductory lens.
* Try slowly sliding the knob from one end to the other and take a couple photographs with the Snap photo button.
* Recognize that the object of this scene is the girl with her pinwheel. Observe how the subject occupied more and more of the scene as you increase the focal length.

Lesson 4.2.1 – ISO – Transcripts

* Let’s talk a little about your camera’s ISO settings.
* First off the ISO on my camera is set via the touchscreen but your might be done differently while shooting.
* Secondly ISO stands for International Standards Organization, but almost nobody refers to is by its expanded name. As a standard it is just a standard way of measuring light sensitivity.
* It applies to the sensor in your camera and it has a direct impact on how exposed and image created by your camera image sensor will be.
* As a general rule, lower ISO will yield dimmer and less exposed photographs.
* High levels of ISO on the other hand will yield more exposed brighter photographs.
* Please keep in mind that this is not a guarantee and depends heavily on the camera’s other settings.
* Lastly, a high ISO will usually yield more grainy photographs. For best results you really need to play around with the settings when setting up your photograph. It will vary with the ambient lighting and the scene overall.
* Let’s do an exercise.

Lesson 4.2.2 – Camerasim ISO Exercise – Transcripts

* Go to <http://camerasim.com/apps/original-camerasim/web/>
* The web app should start us of with a looping shot of a subject.
* For this lesson leave the center dials to Aperture Priority.
* We are going to focus on two sliders – the Lighting and ISO.
* Lighting controls our ambient lighting. The ISO controls sensor sensitivity to light exposure.
* Try different combinations of these options to get a well exposed photograph.
* Camerasim is nice enough where it will tell you with a smiley face whether you had the right exposure settings when you take a photograph.
* Note the photographic result when you have lighting on Mostly sunny and ISO at 6400.
* The image is extremely grainy and over exposed. There is too much light and you can observe unwanted pixilation.

Lesson 4.3.1 – Shutter Speed – Transcripts

* The shutter is a small exposure device in the camera. In the past with film cameras it used to cover the actual film and now it sits in front of the image sensor.
* For normal operation the shutter is closed and the image sensor is not exposed.
* When you click the shoot button. The shutter opens for a certain time frame and then rapidly closes.
* If your camera has a manual or shutter priority mode then you have the ability to control how long the shutter is open for.
* This is called the exposure time and it controls how motion is captured in your photograph.
* If you have a moving subject, the shutter speed will determine how blurry or sharp the motion appears.
* A longer exposure time for the shutter will result in more streak-like motion. All the night sky photos or the photos with people writing letters with sparklers are actually long exposure photographs.
* Short exposure times lead to a more still photograph. When you want to remove motion blur from your photographs. Stick with a smaller exposure time.
* Shutter speeds vary drastically based on your camera. This camera can handle up to 30 seconds on one end and 1/8000th of a second.
* The best way to showcase this are the following set of photos and also, exercises.
* These photographs of a water filter in my aquarium taken at different speeds.
  + The blurry image is taken at 1/6 second
  + It gets less blurry as you progress and the final image is at 1/400 second.
  + Please not how the bubbles go from being a blurry mess to you being able to clearly see each one of them.
  + Also note the image is now much duller than in the beginning. This is due to less light making it through. If we increased the ISO here, we might actually get better images.

Lesson 4.3.2 – Camerasim Shutter Speed Exercise – Transcripts

* Go to <http://camerasim.com/apps/original-camerasim/web/>
* The web app should start us off with a looping shot of a subject.
* For this lesson move the center dials to Shutter Priority.
* Try the following settings:
  + Move the Lighting: Mostly Sunny
  + Set ISO: 400
  + Shutter: 1/4000 sec
* The photograph you receive should have a stationary pinwheel.
* Now, try the following settings:
  + Move Shutter: 1/80 sec
* The new photograph should have a blurred motion for the pinwheel.
* The time the camera sensor was exposed has increased between the two images and it is much easier to make out the motion now.
* Feel free to play around with different combinations.

Lesson 4.4.1 – Aperture – Transcripts

* Let’s talk about aperture.
* Aperture is just the opening in the lens that lets the light through.
* Whereas Shutter is always closed, and opens for a short time period, Aperture is actually a diaphragm in front of the lens that can either be closed in or expanded out to let in less or more light.
* The amount of light that passes in through the aperture and is captured by the sensor is actually proportional to the area of the opening.
* Aperture is most often represented in F-stop numbers.
* The Aperture number is independent of the lens attached to your camera.
* You can put a 50mm lens or a 18-135 mm lens. The F-stop value might indicate a smaller overall diameter but the exact idea is translatable.
  + On a 50mm lens, F 2.0 basically says, that the diameter of the opening is 25mm
  + On a 18-135mm lens, set to 100mm, F 2.0 says the diameter is 50mm.
* Overall, a higher F-stop number means a smaller opening. This also indicates less light passing in through the opening and thus a darker image.
* A smaller F-stop number indicates a much larger opening and thus more light, and a more exposed image.
* This figure shows a good example of how the f-stop number translates to the diameter of the opening.
* F-stop is a hard concept to master even though it is not technically complicated. The reason for this is the number you pick is extremely tied to the scene you are capturing.
* If it is very bright outside, a larger f-stop number is liable to give you much better results than a smaller f-stop number. However, it is also hard to keep in mind the number works backwards, a larger f-stop is a smaller opening, and a smaller f-stop is a larger opening.
* The other crucial thing about aperture is depth of field. Depth of field indicates the distance to which the subjects in your scene are in focus.
  + If you have multiple subjects in your scene at different distances from each other back to back, not sideways. You can focus on one of them, some of them, or all of them.
  + This is achieved by altering the F-stop numbers and allows for a greater depth of field making sure all your subjects are actually in focus, or the background outside your main subject is blurred sufficiently.
* Photographers like to refer to this concept of a blurred out of focus background and a sharp focus on the main subject as bokeh. This isn’t a scientific term, so if you hear it, just understand that they are referring to a shallow depth of field – closer subject in focus, background blurred.
* Let’s take a look at these photographs. There are two subjects in these pictures. First is the mug that is closer and then is the further in glass lamp.
* In these photographs I am able to demonstrate that by changing the f-stop of the lens, I can achieve a better focus on one, or subjects.
* The first one is taken at f 3.5 where the mug is in clear sharp focus but the lamp is blurred out.
* The next photograph is at the other end of the spectrum at f 22. The lamp here is in sharp focus. The mug is still in focus but it is a little less sharp this time around.
* If there was a third object midway between the two, you could have a different f-13 or f-14 setting that would have all three objects in decent focus.
* Let’s do an exercise.

Lesson 4.4.2 – Camerasim Aperture Exercise – Transcripts

* Go to <http://camerasim.com/apps/original-camerasim/web/>
* The web app should start us off with a looping shot of a subject.
* For this lesson move the center dials to Aperture Priority.
* Try the following settings:
  + Move the Lighting: Mostly Sunny
  + Set ISO: 200
  + Distance: 7.5 ft
  + Focal Length: 43mm
  + Now move the aperture to f/2.8
  + Take a photograph.
* Now take a close look at the photograph you just took. Notice how the pinwheel looks stationary, the girls is in very sharp focus and the slide in the background is nicely blurred and does not detract from the subject.
* Now let’s modify it just a bit.
* Try the following setting:
  + Now move the aperture to f/10
  + Take a photograph.
* This new photograph also looks good, and on the surface there aren’t many remarkable differences.
* Look closely though.
* The pinwheel is blurry, the subject – the girl is still in focus but now the slide in the background is also in focus. All of a sudden, the background blur is disappearing and your depth of field just increased. You can now make out objects further into the scene.
* Feel free to play around with different combinations.

Appendix:

* Camera Simulator: <http://camerasim.com/apps/original-camerasim/web/>
* F-Stop, Shutter, and ISO Explained: <https://www.youtube.com/watch?v=kD8nXGt91yo>
* Camera Lens: <https://www.thespruce.com/what-to-know-about-camera-lenses-2688631>
* ISO: <http://www.brighthub.com/multimedia/photography/articles/72927.aspx>