

DISCUSSION GROUP

11.9.19

LENS AND FILTERS

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TERRY CLARK

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This discussion group topic focused (pun intended) on lenses and filters. It was quite informative, and the discussion was lively. Hard to imagine that there are so many aspects to the camera's key feature in taking images: the lens.

Jay Petersen began the discussion with a very enlightening educational introduction. We all think we know how a lens works and features of the lens but Jay gave us new insight. Jay recommended the CAMBRIDGE COLOUR web site:

www.cambridgeincolour.com

At this site, under Tutorial, you'll find a half dozen features on various types of lens and how to use them. Jay used some of these pages in his talk (see links below)

Jay took us through a great explanation of the workings of a lens as a refresher. Key elements in the workings of a lens are focal length and how that factors into your settings for desired outcome. These links have good overview of lens:

Understanding Camera Lenses <https://www.cambridgeincolour.com/tutorials/camera-lenses.htm>

Focal Lengths <https://expertphotography.com/understand-focal-length-4-easy-steps/>

Jay showed some very interesting photos taken to demonstrate the capability of the lens and how changes in the zoom affect the shot. This would seem to be easy to know and understand but seeing the visuals one after another really enhanced one's understanding. As they say, "A picture is worth a thousand words" and Jay's photos using a ruler really did show very clearly the multiple changes that occur in a photographic as the focal length is changed.

Changing the aperture of a lens changes the amount of light that hits the camera sensor. This is done by changing the area of the aperture: the incoming light changes by the ratio of the aperture areas (which is also the square of the ratio of the aperture diameters). In the standard sequence of f stops, each setting results in a change of a factor of two from the neighboring f stops. For example, going from f/2.8 to f/4 decreases the light coming to the sensor by a factor of two. Going from F/8 to F/5.6

increased the amount of light by a factor of two. The standard aperture settings are: f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22. Many lenses also have additional stops in addition to the above (e.g., f/4.5, f/5) and these provide intermediate steps of the aperture size. Experienced and professional photographers have embedded the use of apertures in their techniques but revisiting the science of the lens can teach and/or remind everyone of the nuances of taking the photographic image.

Here are a couple of links about apertures:

Understanding Aperture <https://expertphotography.com/how-to-understand-aperture-5-simple-steps/>

Relative and absolute apertures <https://www.nayuki.io/page/absolute-and-relative-lens-apertures>

Changing the focal length and the aperture of a lens has a big effect on the depth of field in the resulting exposure. Here is a link about DOF:

Depth of Field Calculator <https://www.cambridgeincolour.com/tutorials/dof-calculator.htm>

The depth of field is most often noticed in macro shots, but it also can be important for other scenes, for example landscape. A related topic is the hyper-focal distance for a given aperture, focal length and camera body. If you set your focus at the hyper-focal distance, then you will get acceptable sharpness in your image all the way from half the hyper-focal distance to infinity. This is often desirable for landscape images with objects of interest in both the foreground, middle ground and distant. There are many mobile and online apps that will calculate the hyperfocal distance for a given lens setting.

The next two links explain hyper-focal distance. They also describe some of the shortcuts that can help you approximate the hyper-focal distance if you don't have an app handy.

Hyperfocal distance <https://www.cambridgeincolour.com/tutorials/hyperfocal-distance.htm>

Hyperfocal distance explained <https://photographylife.com/landscapes/hyperfocal-distance-explained>

Jay also talked about filters and the effect of various types of filters in controlling light.

Polarizers; ND (Neutral Density) Graduated ND filter where the coating on the filter is reduces the intake of glare or light in the image as the photographer chooses. For example, ND filters are the key to slowing down exposures of moving water.

There are also UV (Ultraviolet) and Warming and Cooling filters. The point was made that these filters perform functions that can now be addressed in post processing,

however, they can give the photographer control at the image source if desired. UV filters are also used to provide protection for the lens.

Here are a couple of links about filters:

Lens filters <https://www.cambridgeincolour.com/tutorials/camera-lens-filters.htm>

Polarizing Filters <https://www.cambridgeincolour.com/tutorials/polarizing-filters.htm>

Jay showed us the XUME system that he uses for his filters. XUME uses magnets to mount filters and lens covers. This is a faster and safer alternative to screwing on and unscrewing filters.

XUME filter holders:

https://www.bhphotovideo.com/c/product/1129206-REG/xume_1_x_62mm_lens.html

Lastly, Jay talked about his current favorite lenses that he uses with his new Canon RP full frame camera. The first lens was a Canon 24mm-105mm L series zoom lens. This lens used on the RP can produce incredible detail and using the hyper-focal distance it can give great detail throughout the entire distance range of the image. It is sometimes useful to have a longer focal length (wildlife shots for example). There are many different long focal length lenses, but Jay particularly likes his Tamron 18mm-400mm. This is an usually large zoom range, but the lens is also fairly light and compact. The lens cannot produce images as sharp as the 24mm-105mm lens, it does offer much longer focal lengths and the results are often very acceptable.

Terry Clark provided a very informative slide show using his collection of lenses.

Terry had set up a model which he shot at varying distances within his home. This too was a “you had to be there” moment. Great visuals on the changes in the focus, depth of field and perspective of the images as the focal length and f/stop changed over the course of pictures. This was well worth it to see. Clear explanations and clear visuals.

In the course of discussion, Terry showed shots using his fisheye lens; Rokinon 85mm 1.4 lens which he described as a fun lens at a reasonable price. A fisheye lens is an ultra wide lens that produces strong visual distortion creating a panoramic or hemispheric image. It can be a lot of fun to use to create images that convey new perspectives.

Peter Melcarek showed us his Rokinon 100mm F 2.8 macro lens. Peter does a lot of macro and ultraviolet photography which is amazing. These techniques really open up new avenues in the photographic art. Peter makes also uses special filters in his ultraviolet macro. He can capture the fluorescent light emitted by some flowers when they are illuminated with other wavelengths of light. Peter also showed the group a variety of his filters including a long pass filter which is a yellow light filter that he uses

for ultraviolet shots. These filters help Peter eliminate the light from the illuminating wavelengths which would otherwise obscure or overpower the fluorescent light in a camera image.

Peter uses an Olympus 4/3rd camera with internal focus stacking. Again, ideally suited for his macro photography interest.

He also uses a Sony APS series camera that has capabilities to shoot ISO at 600,000. It has a relatively low 12 mp sensor but the high ISO range is amazing. . He uses this camera it for his ultraviolet shooting of low light fluorescent emissions from flowers.. The camera also has very impressive low light video capabilities

Peter finished by showing us his latest dedicated time lapse camera. He uses a Afidus ATL 200 <https://www.afiduscam.com/> to accomplish some amazing results. The camera can take a time lapse sequence of images and then use them to produce a video. The camera saves battery power by turning itself on and off between images. It can be set up to run unattended for days or even weeks. The highlight of the presentation was his slide show of flowers unfolding over a week or so The flowers were captured using still frames.

He also used the camera to capture day to night images of the California sunrise to sunset with traffic travelling on one of California's ubiquitous highways. It was fun to see and gave rise to some creative ideas.

As always, the discussion group provides a lot of interesting and educational information. Consider coming out to see and hear about the tools, cameras and techniques that our members are using.