Why Shoot in Raw?

From light to digital

The CCD or CMOS chip in your camera converts the light hitting the sensor into a digital image. In order to digitize the information, the signal must be processed through an analog-to-digital converter (ADC). The ADC measures the amount of light hitting the sensor at each photosite and converts the analog signal into a binary form. At this point, the raw data simply consists of image brightness information coming from the camera sensor. The raw data must somehow be converted and it is here that the raw conversion method used can make a huge difference to the quality of the final image output. Digital cameras have an on-board microprocessor that is able to convert the raw data into a readable image file, which in most cases will be in a JPEG file format. The quality of a digital image is therefore primarily dependent on the lens optics used to take the photograph, the recording capabilities of the CCD or CMOS chip and the analog-to-digital converter, but it is the raw conversion process that matters most. If you instead choose to process the raw data on your computer, you have much greater control than is the case if you had let your camera automatically guess the best raw conversion settings to use.

Camera Raw Advantages

Camera Raw allows you to work non-destructively and anything you do to process an image in Camera Raw is saved as an instruction edit and the pixels in the original file are never altered. In this respect, Camera Raw treats your master files as if they were your negatives and you can use Camera Raw to process an image in any way that you like without ever altering the original.

Raw capture

The advantages of shooting in raw as opposed to JPEG mode are not always well understood. If you shoot using JPEG, the files are compressed by varying amounts and this file compression enables you to fit more captures on a single card. Some photographers assume that shooting in raw mode simply provides you with uncompressed images without JPEG artifacts and the trade-off with this is that fewer captures can be stored. But there are some more important reasons why capturing in raw mode is better than shooting with JPEG.

The main benefit is the flexibility raw gives you. The raw file is like a digital negative, waiting to be interpreted any way you like. It does not matter about the color space or white balance setting that was used at the time of capture, since these can all be set later in the raw processing. You can also liken capturing in raw mode to shooting with negative film, since when you shoot raw you are recording a master file that contains all the color information that was captured at the time of shooting. To carry the analogy further, shooting in JPEG mode is like taking your film to a high street photo lab, throwing away the negatives and then making scans from the prints. If you shoot using JPEG, the camera is deciding automatically at the time of shooting how to set the white balance and the tonal corrections, often clipping the highlights and shadow detail in the process.

When shooting raw, all you need to consider is the ISO setting and camera exposure.

JPEG capture

When you shoot in JPEG mode, your options are more limited since the camera's on-board

computer makes its own automated decisions about how to optimize for tone, color, noise and sharpness. When you shoot using JPEG or TIFF image, the camera is immediately discarding up to 88% of the image information that's been captured by the sensor. This is not as alarming as it sounds, because as you'll know from experience, you don't always get a bad photograph from a JPEG capture. But consider the alternative of what happens if you shoot using raw mode. The raw file is saved to the memory card without being altered by the camera. This allows you to work with all 100% of the image data that was captured by the sensor. If you choose to shoot in JPEG capture mode you have to make sure that the camera settings are absolutely correct for things like the white balance and exposure. There is some room for maneuver when editing JPEGs, but not as much as you get when editing raw files. In JPEG mode, your camera will be able to fit more captures onto a card, and this will depend obviously on the capture file size and compression settings used. However, it is worth noting that at the highest quality settings, JPEG capture files are sometimes not that much smaller than those stored using the native raw format.

Martin Evening, *Adobe Photoshop CC for Photographers,* Focal Press, 2014 (pp. 90-3).