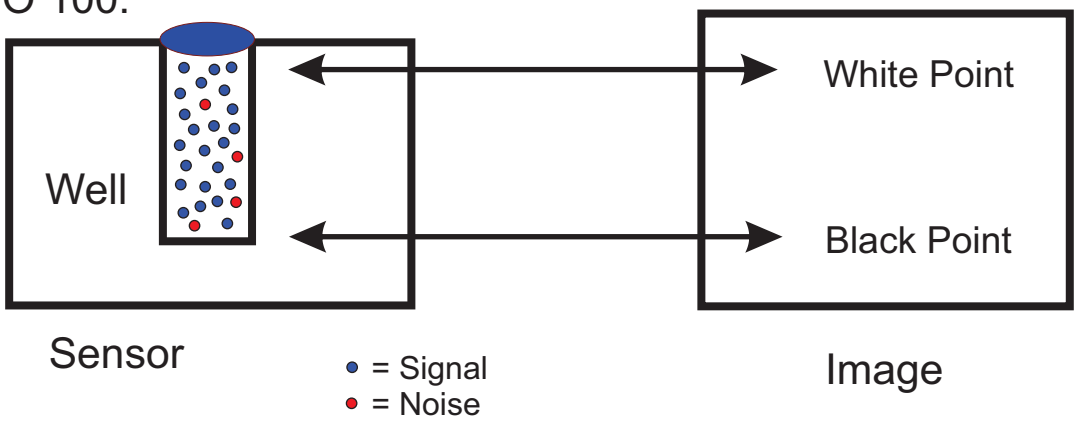
A camera's sensor has little "wells" (photosites, photodiodes or simply diodes) that convert photons into electrons (current). Each well has a red, green, or blue lens on top. This color is part of a formula used for determining the color of the pixel in an image. Each diode has a N1 (negative - valance band) and P2 (Positive - conduction band) silicone layers with an energy gap or band gap in-between. When the well has reached a certain level of electron volts, it has reached full well capacity (FWC). At FWC, there exists capacitance (stored voltage) within the band gap. Three transistors (switch, readout, and reset) manage this voltage. The process produces noise. Consequently, the signal has a signal to noise ratio (SNR). Thus (SNR) = 20*LOG (SQRT (FWC)), where SQRT is square root. As ISO increases, less of the sensor's dynamic range is used, the noise level stays about the same, fewer electrons are required for FWC, and a gain (amplification) is applied to the output signal during analog to digital conversion (A/D). A signal produced using ISO 12,800 is mapped to similar white and black output levels as when ISO 100 (native ISO) is used but the image's dynamic range is lower and the noise level (SNR) is much higher.

ISO 100:



ISO 12,800: