

Introduction to Digital Photography

An Overview of digital camera technology, basic photographic techniques.

Oh the Technology!

DSLR, Megapixels, Image Stabilization, Dust Reduction, Live View, Sensors, facial recognition.....

What does it all mean?

Types of Digital Cameras

3 Main classifications

- Point and Shoot***
- Prosumer****
- Digital SLR***



Point and Shoot digital Cameras (P&S)

- Commonly referred to as “consumer” digital cameras.
- Represent probably 90% of all digital cameras on the market
- Typically small, compact and lightweight
- Targeted at broad majority
- Typically very User-Friendly
- Image Quality has improved drastically



Prosumer Digital Cameras

- Not technically its own specification
- Common term used to describe advanced models of P&S (now also used to describe many entry level DSLR's)
- Similar in shape and appearance to Digital SLR's
- Typically have extended zoom range (8-12X Optical Equiv)
- Typically combine user friendly P&S features with more advanced manual features.



Digital SLR (DSLR)

SLR Stands for Single Lens Reflex

- Have larger sensors, resulting in greater image quality
- Tend to favor manual control, lacking many automatic settings found on P&S
- Much larger and heavier
- Ability to interchange system lenses



***So What is the REAL difference between a digital SLR and a point and shoot camera?
Image Quality***



How the digital sensor works

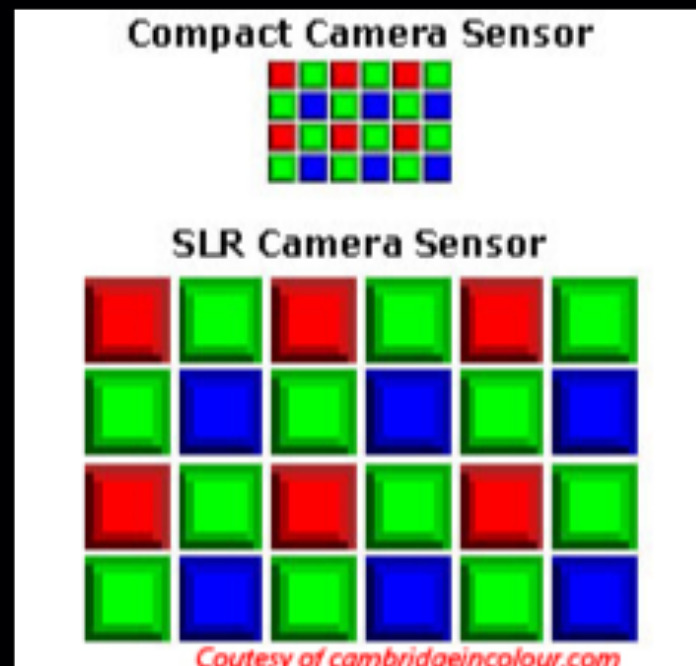
- Each digital image is made from millions of tiny squares, known as pixels.



- Essentially, an image is recorded by tiny pixels which make up the camera's sensor

All Pixels are not created equal!

- A digital sensor is essentially made up of millions of tiny pixels (micro-lenses)
- Pixels are analog devices which record light and color data
- Larger Sensors contain larger pixels, which are much better at collecting this data



Digital Camera Features and Technologies

Megapixels – Determine the total size (Dimensions) of the image recorded by camera

- More MP does not always mean a better picture

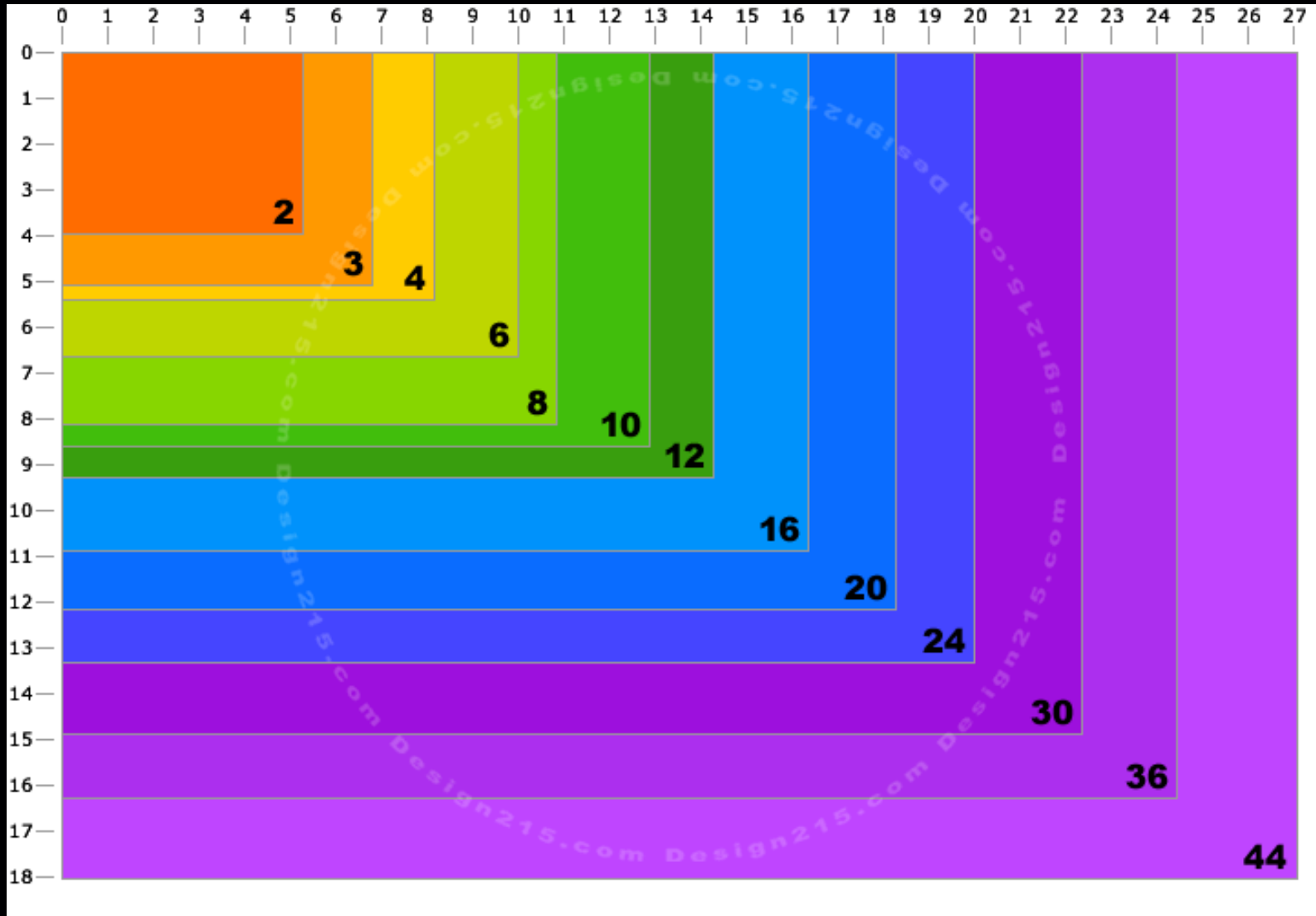
- Digital Image dimensions do not equal print dimensions

- For example:

 - a full quality image from an 8 megapixel camera will produce a digital image measuring approximately 9X14 inches

 - but printing standards say that you should not print to “Photo Quality” any larger than 8X10

Megapixels Vs. Print Size



Movement Compensation: Image Stabilization

- Refers to the camera's ability to correct small movements by the user while taking a picture
 - reduce the blur caused by camera shake.
- Very Useful in low-light or telephoto situations

Movement Compensation

Represented differently by different companies:

Nikon – VR – Vibration Reduction

Canon – IS – Image Stabilization

Pentax – SR – Shake Reduction

Sony – SSS – Super Steady-Shot

Dust Reduction

Dust is more of a problem in DSLR's due to changing lenses

Once dust gets on your sensor, it can be difficult to remove

Dust reduction is essentially a mechanism which shakes the cameras sensor to free any clinging dust particles

Special anti-static coatings or filters may also be used

Live View

- Refers to the ability to use the LCD screen on the camera the same way you would use the viewfinder
- Shots can be composed even while holding the camera away from your face
- Originally only a feature in P&S, DSLR's now use Live View also

Facial Recognition

- Camera detects faces in your frame based on color, contrast change, etc.
- Focus is automatically adjusted so detail in faces is high
- Color and contrast are automatically adjusted to create pleasing skin tones

Exposure

A “correct” or “good” exposure occurs when you maintain as much detail as possible in both:

- the very bright parts (highlights)
- And the very dark parts (shadows) of an image.

- How much of a range in which you can capture detail from light to dark is referred to as the Dynamic Range.

There are three factors which influence the exposure of your image:

- Shutter Speed
- Aperture
- ISO

Shutter Speed

Refers to how long the shutter is open, exposing the image sensor to light.

(how long the camera “sees” the picture)

Measured in Seconds, from 30 down to 1/8000

Shutter Speed

Fast Shutter Speeds (600 and up) are used to stop motion and will freeze the subject.



Shutter Speed

Slow Shutter Speeds (1/60 or slower) can be used to portray movement or speed



Shutter Speed

Very Slow Shutter Speeds (5 sec. or slower) can be used in very low light situations to obtain correct exposure, or achieve dramatic effects.



Shutter Speed

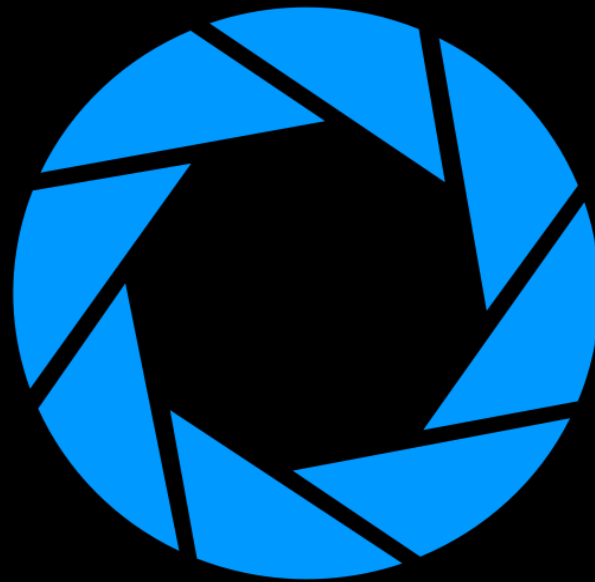
Beware!

As your shutter speed decreases, your chances of getting a blurry image increase because you must hold the camera steady for a longer period.

Aperture

An aperture is defined as a hole or opening through which light is admitted.

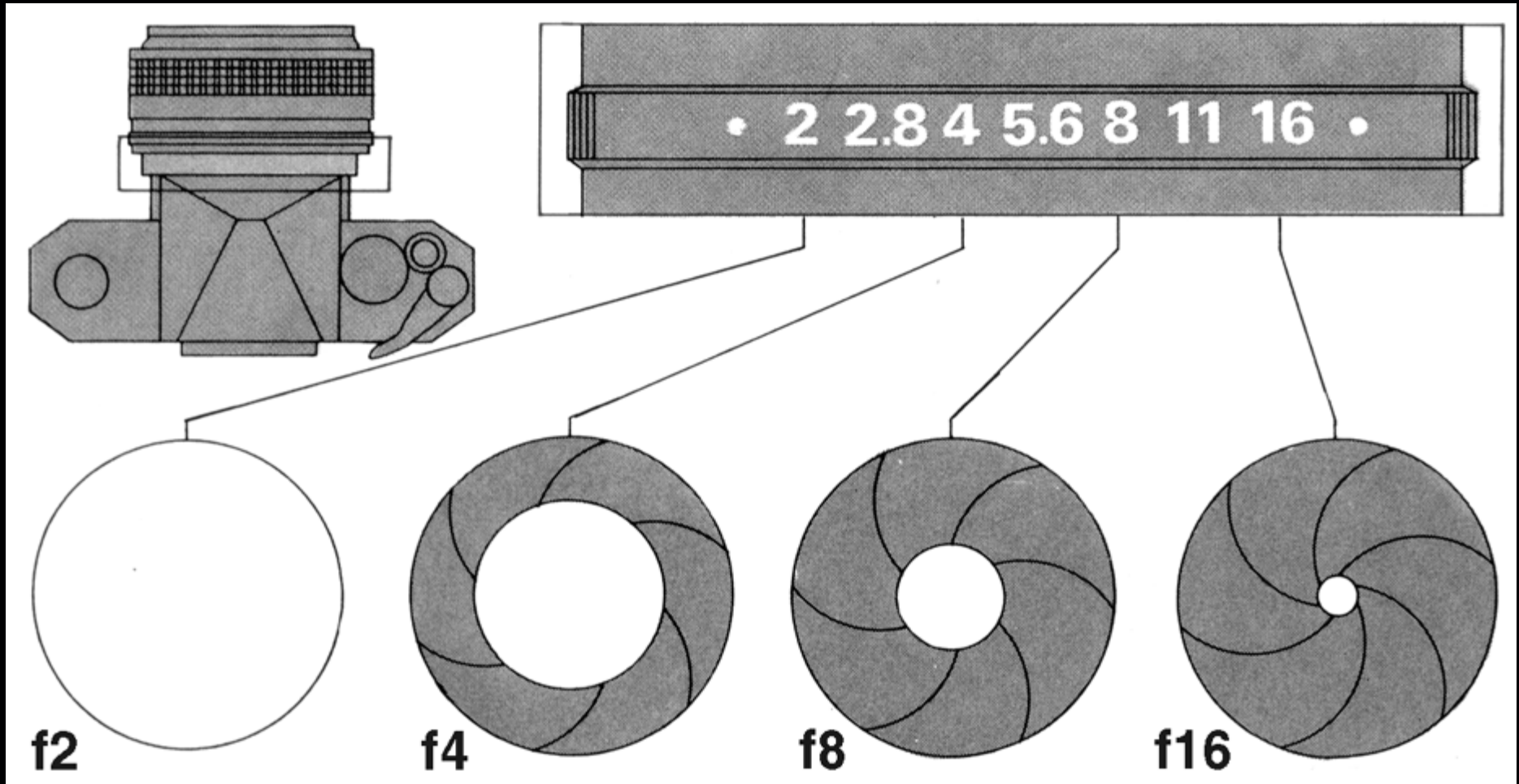
Inside the camera lens is a system of blades which open and close to increase or decrease the opening through which light passes into the camera



Aperture

- Referred to as an f-stop
- aperture is usually represented by: f/1.8, or f/5.6
 - A Smaller # means a wider opening, a larger # means a smaller opening
 - (ex. A large aperture of 2.0, a small aperture of 22)
- The wider the lens is open, the more light gets in (you can use faster shutter speeds)

Aperture



Depth of Field

Aperture also controls depth of field (DOF), which refers to how much of your image is in focus.

A wide aperture (small #) will give a shallow DOF and can be used to isolate a subject.

Depth of Field



Shallow Depth of
Field (F2.8)



Wide Depth
of Field (F32)

ISO

Refers to the light sensitivity of the sensor

HIGH ISO value means the sensor will be MORE sensitive to light, meaning it will take LESS LIGHT to get the right exposure

ISO

Typically ranges from 100-1600

Newer Digital cameras have a higher range
(up to 64000)

Using High ISO values causes the sensor to produce much more heat, which creates digital “noise” in images.

ISO

- Noise is similar to film grain and causes loss of fine detail in images
 - It is more visible in dark parts of an image and is generally more noticeable when displayed on screen than in print

ISO

- Some cameras claim to have “Digital Image Stabilization”
- This just means that the camera will automatically increase the ISO in order to allow a faster shutter speed
- Faster Shutter Speed will reduce the likelihood of camera shake, but high ISO will most likely result in a grainy image.