Welcome to BPGHS PSG
Photography Workshop 2012

Presented to you by Hans C S Ko

This workshop is brought to you by the
Bukit Panjang Government High School
Parent Support Group
Executive Committee 2012

and

The School Vice Principal Miss Chow

as well as

HOD for Student Development Miss Jean

What is photography?

Photography is the art and science of capturing light or any other electromagnetic radiation to create memorable images either on light-sensitive glass, film or electronic image sensor

There are so far three different types of cameras

1) Twin Lens Reflex (TLR) cameras
2) Range finder (RF) cameras
3) Single Lens Reflex (SLR) cameras

For digital just add a D in front as in DSLR

So many different types of cameras to choose from, so many brands to buy from, and such a large variation in pricing….🕷🕸

Which one should you choose? ☹

Well, first ask yourself a few simple questions like:

1) Am I serious with photography or just want to take photos of family and friends?

2) Do I want a big and heavy camera or something small and light for easy carrying?

3) Will I be changing lenses to cater for different scenes or one lens fits all type?

4) Do I want one with built-in flash or external flash?

5) How many Mega Pixels do I need?

6) Should I buy a camera with full frame (FF) sensor or cropped frame sensor with 1.3, 1.5, 1.6, 2.0, 2.7 crop factor?

7) Should I shoot RAW or JPEG?

8) Should I buy one with different control modes like Auto, Program, Aperture priority, Shutter priority and Manual, or one with auto everything?

9)Finally, how much am I willing to spend on my system? 💰

Types of Sensors

So far there are 3 different type of sensors

1) ***The most common type is the Bayer type of sensors or what we normally call planner RGB type***
2) ***The second type is the Foveon sensors or stacked layers type***
3) **The 3rd type is a modified Bayer type with 2 different *pixel size by FujiFilm***

Full Frame or Cropped Frame?

Different Sensor Size and Crop Factor

Sensor Type		Sensor Size	Crop Factor
35mm Full Frame		36 x 24 mm	1.0
		35.9 x 24 mm	1.0
		36 x 23.9 mm	1.0
APS-H	Canon	28.7 x 19 mm	1.3
APS-C	Nikon	23.6 x 15.7 mm	1.5
	Canon	22.2 x 14.8 mm	1.6
Foveon	Sigma	20.7 x 13.8 mm	1.74
Four Thirds	Olympus	17.3 x 13 mm	2.0
Nikon CX		13.2 x 8.8 mm	2.81
2/3”		8.8 x 6.6 mm	3.93
1/1.7”		7.6 x 5.7 mm	4.55
1/1.8”	Compact Camera	7.18 x 5.32 mm	4.84
1/2.3”		6.16 4.62 mm	5.62
1/2.5”		5.76 x 4.29 mm	6.02
1/3”		4.8 x 3.6 mm	7.21
1/3.6”	Camera Phones	4.0 x 3.0 mm	8.65
1/4”		3.2 x 2.4 mm	10.81
1/10”		1.28 x 0.96 mm	27.04

Is higher Megapixel better than lower Megapixel?

Is smaller pixels better than bigger pixels?

Higher Megapixels is better than lower Megapixel

⊘

But smaller pixels is not better than larger pixels

What am I talking about? ☺

PIXEL SIZE: NOISE LEVELS & DYNAMIC RANGE

Larger sensors generally also have larger pixels, which give them the potential to produce lower image noise and have a higher dynamic range. Dynamic range describes the range of tones which a sensor can capture. Since larger pixels have a greater volume - and thus a greater range of photon capacity - these generally have a higher dynamic range.

Further, larger pixels receive a greater flux of photons during a given exposure time (at the same f-stop), so their light signal is much stronger. For a given amount of background noise, this produces a higher signal to noise ratio - and thus a smoother looking photo.

***Film Speed* or *Sensor Sensitivity* is use to represent the sensitivity of film or sensor to light**

They are represented using either the old American Standard Association (ASA), the Deutsches Institut für Normung (DIN) or the present International Organization for Standardization (ISO) systems

A RAW file format is essentially the uncompressed, unprocessed data file captured by the digital camera's image sensor, with minimal in-camera processing applied. Most cameras record in either 12 or 14 bits of data at this stage.

A JPEG file in comparison is a processed file converted from the 12 or 14 bits RAW file by the camera's software to a 8-bit file.

Aperture is an opening where light travels through

More specifically, the aperture of an optical system is the opening that determines the cone angle of a bundle of rays that come into focus on the image plane

Use Aperture setting to control the depth of field (DOF)
or
the range of subjects falling in focus

Shutter Speed is to time the opening of the shutter curtains or the shutter plates.

Use Shutter Priority Mode to control motional blur

or

to give the picture the sense of motion

As a rule of thumb always use no slower than

$$\frac{1}{focal\ length}$$

for hand held to prevent motional blur

White balance (WB) is the process of removing unrealistic color casts, so that objects which appear white in person are rendered white in your photo. Proper camera white balance has to take into account the "color temperature" of a light source, which refers to the relative warmth or coolness of white light. Our eyes are very good at judging what is white under different light sources, but digital cameras often have great difficulty with auto white balance (AWB) — and can create unsightly blue, orange, or even green color casts.

Understanding digital white balance can help you avoid these color casts, thereby improving your photos under a wider range of lighting conditions.

	*Auto setting*	*Auto White Balance*
	*Manual Setting*	*Custom*
	*Manual Setting*	*Kelvin*
	*2500 – 3000 ºK*	*Tungsten*
	*4000 – 5000 ºK*	*Fluorescent*
	*5000 – 6500 ºK*	*Daylight*
	*5000 – 5500 ºK*	*Flash*
	*6500 – 8000 ºK*	*Cloudy*
	*9000 – 10000 ºK*	*Shade*

Summary

Photography is the art and science of capturing light by selecting the appropriate ISO sensitivity, aperture, shutter speed and white balance on the camera.

Exposure

ISO	Aperture	Shutter Speed	White Balance
More Noise	Narrow DOF	Motion Blur	Bluish
12800	1.0	30	9000 – 10000 ºK
6400	1.4	15	6500 – 8000 ºK
3200	2.8	.	5000 – 6500 ºK
1600	5.6	1 /60	5000 – 5500 ºK
800	8.0	1 / 125	4000 – 5000 ºK
400	11.0	1 / 250	3000 – 4000 ºK
200	16.0	.	2500 – 3500 ºK
100	22.0	1 / 4000	.
50	32.0	1 / 8000	1000 – 2000 ºK
Less Noise	Wide DOF	Freeze Motion	Reddish

Thank You!