Tips for better photos

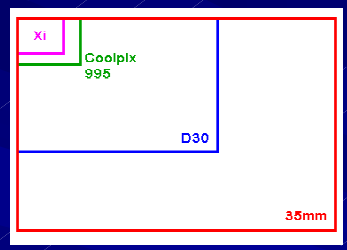
Lunchbite series

Difference between Digital and Film Camera

- Image Sensor
  - DC: Image Sensor (CCD, CMOS)
  - FC: Negative Film, Slide, etc…
- Storage
  - DC: Memory Card (CF, SD, Memory Stick)
  - FC: Film roll
- Instant Display
  - DC: Can view the photo from the LCD immediately
  - FC: You should develop the film first

Difference between Digital and Film Camera (cont')

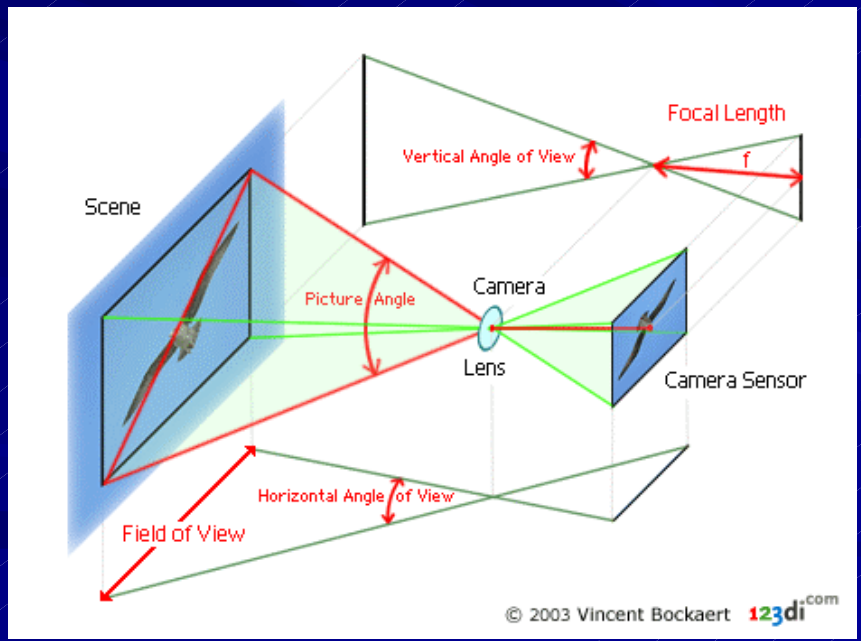
- Sensor Size
  - DC: usually smaller (e.g. 7.2mm * 5.3 mm)
  - FC: 35mm film (35mm * 26mm)



- Film (Sensor) Speed (i.e. ISO 100, 200, 400, …)
  - DC: can change ISO anytime
  - FC: depends on the film used

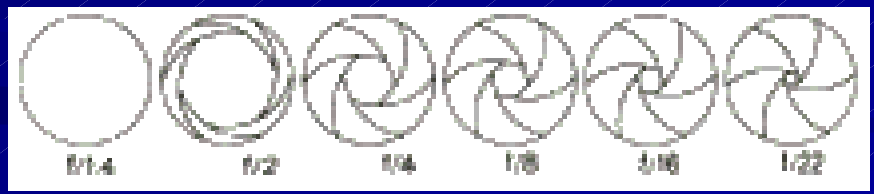
Difference between Digital and Film Camera (cont')

- Lens
  - DC: smaller focal length (e.g. 7mm – 21 mm)
  - FC: larger focal length (e.g. 34mm – 102mm)

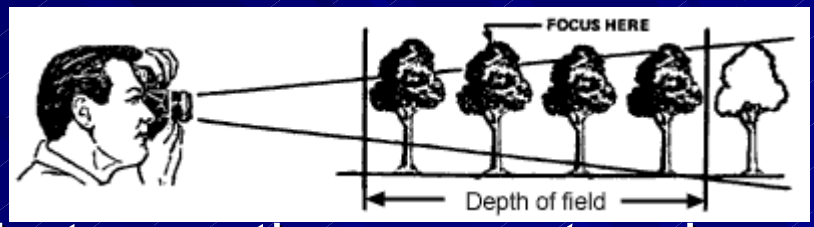


Shutter / Aperture

- Shutter Speed
  - is the amount of time that light is allowed to pass through the aperture (e.g. 15s, 1s, 1/30s, 1/60s, 1/1000s, etc…)
- Aperture
  - controls the amount of light that reaches the sensor
  - Diameter of an aperture is measured in f-stops (i.e. smaller the f-stop, larger the diameter)



Depth of Field



- Depth of field (DOF)
  - The amount of distance between the *nearest* and *farthest* objects that appear in acceptably sharp focus in a photo

  - Aperture, focal length, sensor size and subject distance also affect the DOF
    - Smaller the aperture (i.e. larger f-number, e.g. f/8, f/16) gives a larger DOF
    - Shorter focal length of lens gives larger DOF

Depth of Field (Aperture Size)

- Example 1 (fixed focal length - 50mm):

Depth of Field (Focal Length)

- Example 2 (fixed aperture size)

50mm f/2.8

300mm f/2.8

- You can see that shorter the focal length of the lens, larger the DOF

Depth of Field (cont')

- However, the DOF of compact digital camera is significantly greater than 35mm film camera
  - if the field of view of DC lens focal length of 21mm is equivalence to lens with focal length of 102mm in 35mm film camera, then

    $$N = 102 / 21 \cong 5$$

    is the focal length equivalence factor
  - The DOF of a DC with focal length equivalence factor N at a given F-number is the same as that of a 35mm film camera with aperture number of F * N

    (i.e. the DOF of DC at f/2 ≅ DOF of FC at f/11) !!!

Depth of Field (cont')

- Example

DC with focal length equivalence factor ≅ 5

Angle of View

- Angle of View depends on the focal length of the lens
  - Focal length 50mm gives wider angle of view
    - Also expand distance
  - Focal length 300mm gives narrower angle of view
    - Also compress distance

20mm f/2.8
(Buildings look far away)
Distance Expanded!

50mm f/2.8
(Similar to what human see)

300mm f/2.8
(Buildings look very close!)
Distance Compressed

Let's shoot!

- Outdoor (sunny day)
  - No problem, even AUTO mode works fine
- Outdoor portrait (at night) / Indoor (dim light)
  - Shutter speed becomes slower
  - Can use flash to get a faster shutter speed 1/60 second (Be aware that flash will make cool atmosphere)
  - However, the background usually becomes very dark

    Solution: use slower shutter speed (i.e. 1/20 s shutter speed + fill flash)

    Result: the background becomes brighter and color is more natural

Examples (At night)

Shutter: 1/60 seconds
Aperture: f/4
Flash Light: ON

Shutter: 1/15 seconds
Aperture: f/4
Flash Light: ON (-1/3 flash power)

Examples (Indoor)

Shutter: 1/60 seconds
Aperture: f/2.8
Flash Light: ON

Shutter: 1/15 seconds
Aperture: f/2.8
Flash Light: ON

Be aware~~!

- Hand-holding rule of thumb
  - The slowest shutter speed that you can still hand-holding your camera and still achieve a sharp image is:

    Minimum shutter speed = 1 / lens focal length

    e.g. if using your wide-end (7mm), the minimum shutter speed = 1/7 second

    if using your tele-end (21mm), the minimum shutter speed = 1/21 second
  - Slower shutter speed will result in blurred image due to hand shake…

Let's shoot (cont')

- Portrait + Far away scenery

How to make the building behind looks closer?

Solution: use larger focal length (Zoom) to compress the distance! (e.g. 300mm)

Result: The building looks closer! But blurred?! Why? (Tips: DOF)

Solution2: use larger focal length as well as smaller aperture! (i.e. 300mm, f/22)

Result: The building looks closer and sharp!

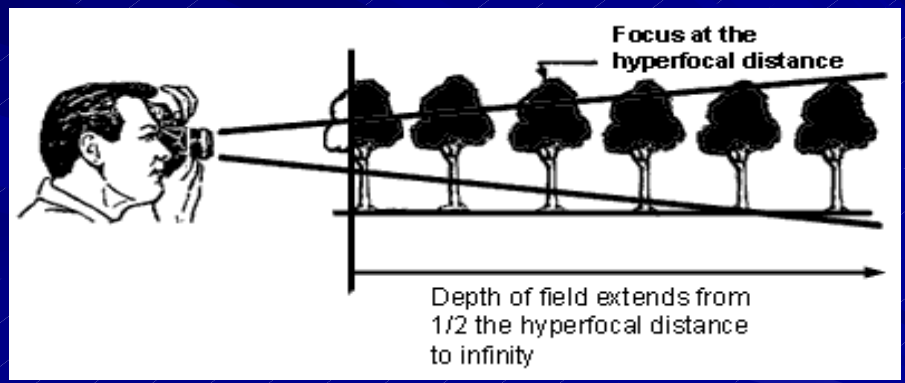
To make everything in focus, you should know what is ***hyperfocal distance***!

Hyperfocal distance

- If the lens focuses at infinity, the depth of field starts at somewhere in front of the lens and extends to infinity.
- Focuses at infinity to take the scene far away can make the scene appears sharp
- However, the subjects near to the lens are out of focus.
- The distance from the lens to the points that make out-of-focus image is referred to as the ***hyperfocal distance***

Hyperfocal Distance

- To make the subjects near the lens and the scene far away both in focus, the lens should focus at the hyperfocal distance (H)! Then subjects located inside the H/2 to infinity will look sharp.



- How to find it?

Hyperfocal Distance

- Hyperfocal distance (H) = $f^2/(N*c) + f$

  where:

  f – the lens focal length, mm

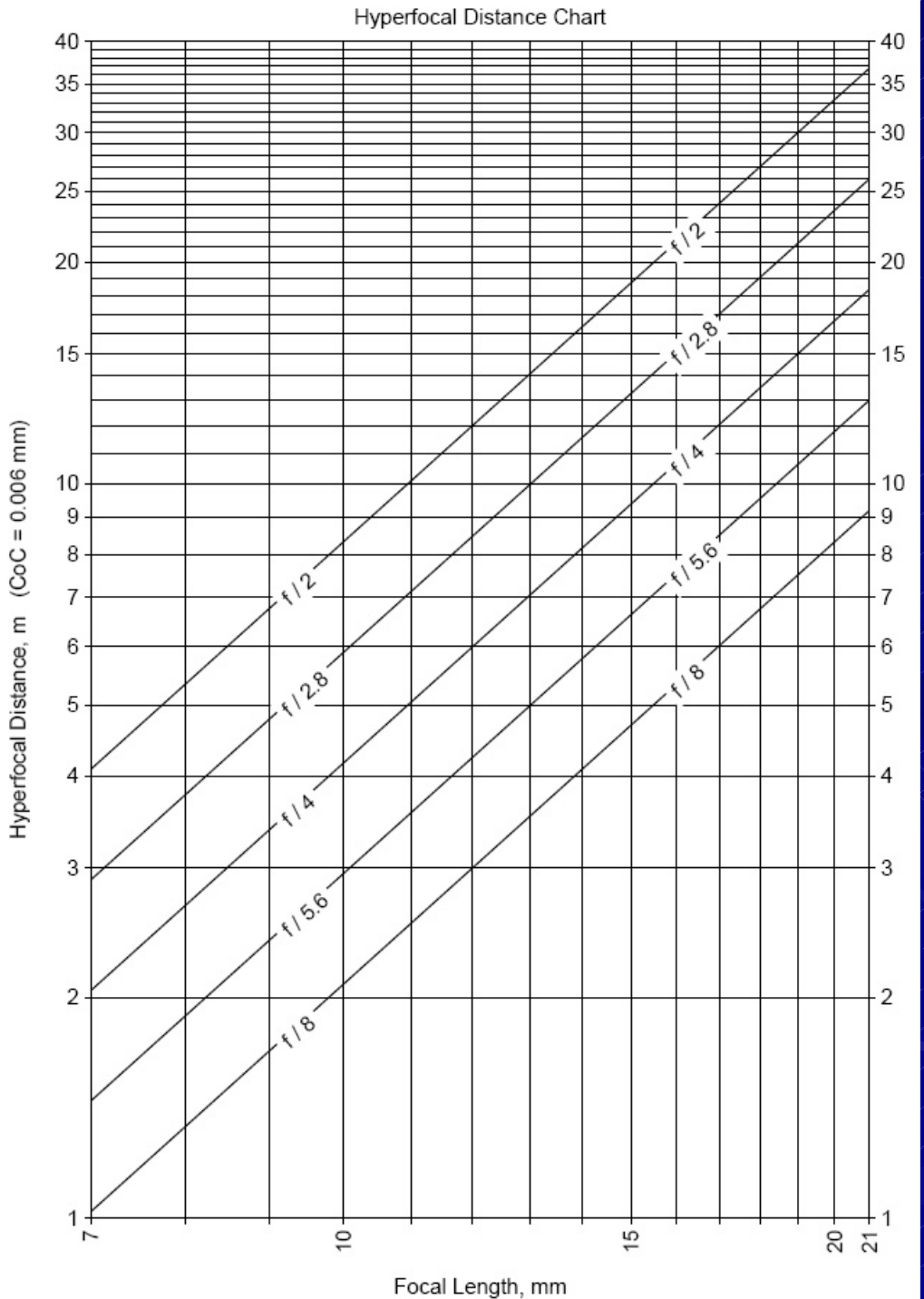
  N – the f-number (aperture)

  c – the circle of confusion, mm
- The circle of confusion (c) depends on the size of the sensor (e.g. compact digital camera have c = 0.005 to 0.007)

Hyperfocal Distance

- Digital Camera: Canon G2
- Lens: 7mm-21mm
- Aperture: f/2 – f/8
- Circle of Confusion = 0.006mm

You can go to
http://www.dofmaster.com
to get the chart for your camera



General tips to good photos

- Shoot at the eye level of your model

Good…

Much Better…

General tips to good photos

- Focus on model's eye

Bad…

Much Better…

General tips to good photos

- Rule of Third
  - Instead of placing the main focus of interest in the centre of the frame, which gets a little boring, that you look to position it on an intersection of the thirds

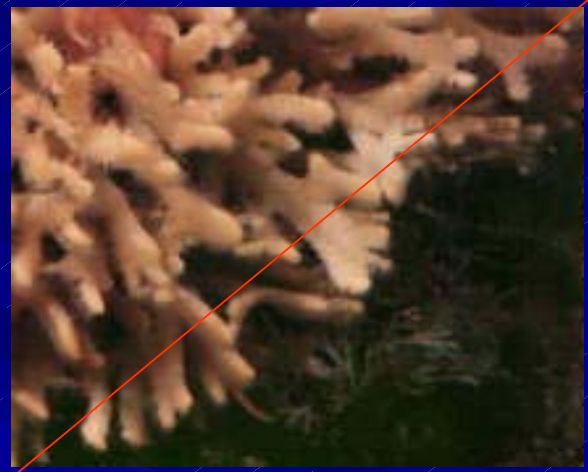
Good….

Much Better!!

  - This is a principle taught in graphic design and photography and is based on the theory that the eye goes naturally to a point about two-thirds up the page

General tips to good photos

- Using Diagonals



General tips to good photos

- Open up a path
  - Anything that moves needs a path to continue its action
  - Anything with eyes needs some open space to look at

Bad..

Better!

Bad..

Better!

Panorama

- Sometimes, your lens is not wide enough to capture the whole scenery within a photo
- Or you want to make a 360 degree view, you can use some software tools to help to combine multiple photos into one

Panorama (cont')

- Panorama Factory
  - http://www.panoramafactory.com/
- Tips
  - Capture the photos vertically (allow more space up and down)
  - Allow 1/3 overlapping between images
  - Lock the exposure (make consistent exposure in all images)
  - Use focus on hyperfocal distance (avoid inconsistence sharpness between images)
  - Use Tripod!

The END