Beginning Digital Photography Workshop

Presented to you today by the
Fort Collins Digital Camera Club
www.fcdcc.com

Photography:

The art of capturing a moment in time through the use of a camera and its media.

Film Photography:

- Photography using light sensitive chemicals spread over a plastic “film” or paper to capture the image
- Can also refer to light sensitive chemicals spread over a glass plate to capture the image

Digital Photography:

Photography using light-sensitive electronic media to capture the image

Camera

- Think of your digital camera in terms of human anatomy
  - Camera Lens = Eyeball
  - Camera Aperture = Eye Pupil (size changing part of Iris)
  - Camera Shutter = Eyelid
  - Camera Sensor = Retina
  - Camera Memory/film card = Brain

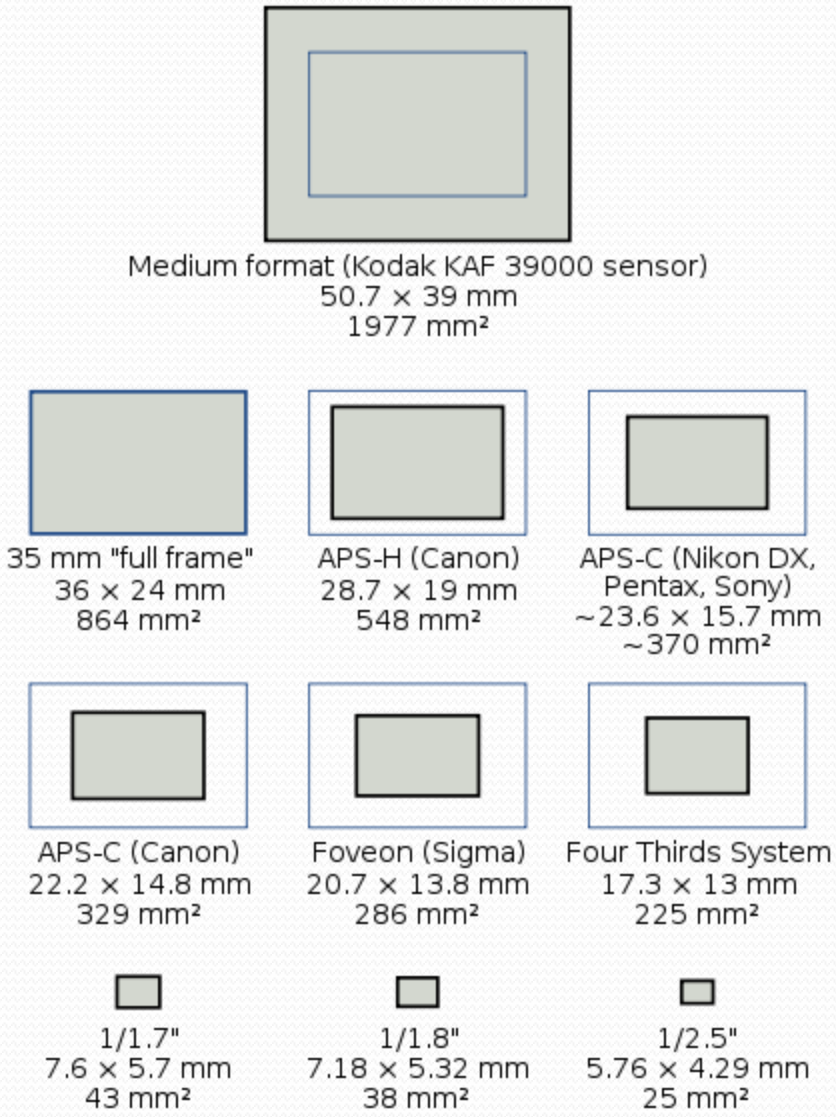
Exercises

Concepts and Definitions

- **Megapixels:** Mega = 1 million, thus a Megapixel is 1 million pixels. In cameras this refers to the number of individual sensors that make up the sensor screen. A 5 megapixel camera will have 5 million of these tiny sensors. Generally speaking, the more megapixels a camera's sensor has, the finer detail the camera can capture and the better the final picture, all things being equal (which of course they never are).

Concepts and Definitions

- **Camera Sensor Screen:**
  - The actual flat screen onto which the image is focused.
  - Point-and-shoot cameras typically have a smaller sensor screen than an SLR.



Concepts and Definitions

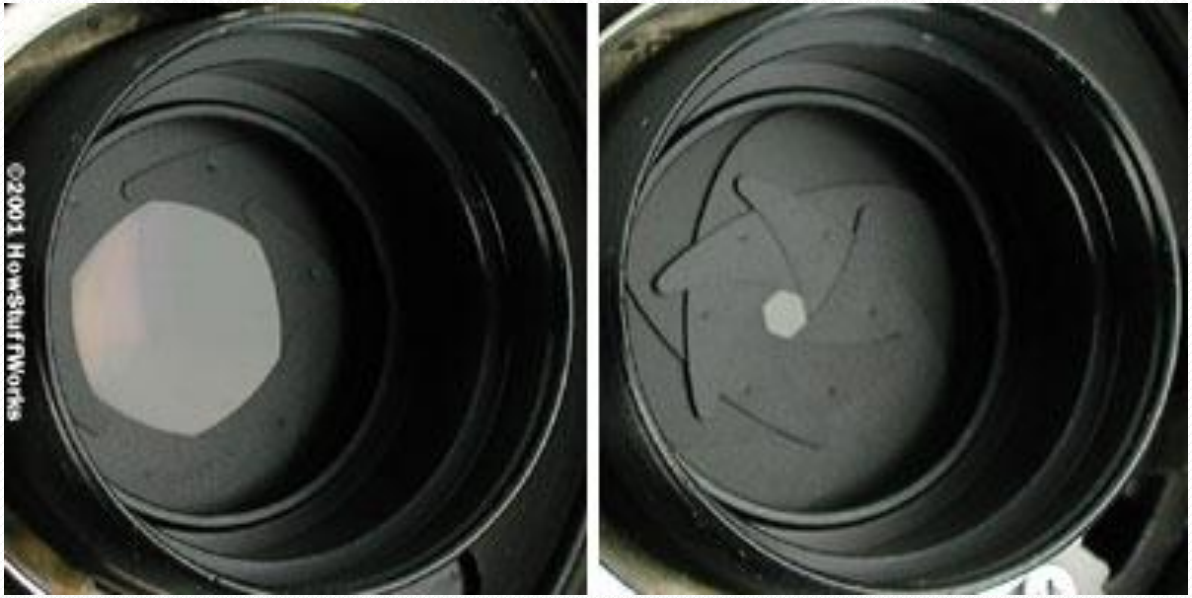
- **JPEG or JPG:**
  - Stands for **J**oint **P**hotographic **E**xperts **G**roup
  - A standardized method of compressing/compacting information about a picture or image so that it takes up less space on electronic storage media.
  - Standard format for storing data from a point-and-shoot camera; compressed within the camera
  - Shown as Picturename.jpg in a file structure
  - Should not be extensively edited
  - Should be set to highest/finest setting in Camera

Concepts and Definitions

- **RAW Image file:** A file format, unique to each camera manufacturer that is not manipulated by the camera at all. It is uncompressed data, unlike a JPG file. It needs to be processed in a photo editing software package on a computer before it can be printed. It is like a "digital negative". It cannot be printed directly, and can be edited extensively without loss of quality in an editing program. It maintains "all" the information the camera captured at the moment of exposure.

Concepts and Definitions

- **f/stop or Aperture:** A term used to indicate the relative size of the opening of the lens aperture (Pupil) when an image is captured in a camera.



Concepts and Definitions

- **f/stop or Aperture**
  - Wider lets in more light but renders less in focus
  - Wider numbers are like f/2.8 or f/3.5
  - Smaller lets in less light but renders more in focus
  - Smaller numbers are like f/16 or f/22
  - A full step in either direction lets in twice as much or half as much light.

Concepts and Definitions

- **Shutter Speed:** how fast the shutter of the camera opens and closes
  - Slower speeds let in more light, but often causes camera shake to become obvious and allows moving subjects to show up blurry (a large fraction or whole number like 1/30th of a second or 2 seconds)
  - Faster speeds lets in less light, but minimize camera/user shake and stop moving subjects (like 1/500th of a second)
  - Each step slower lets in twice as much light
  - Each step faster lets in half as much light

Concepts and Definitions

- **ISO** (International Organization for Standardization)
  - ISO refers to the light sensitivity of the electronic sensor in a camera.
  - A high ISO number means the camera will be more sensitive to light and better in low-light situations.
  - A low ISO number means the camera will be less sensitive to light and better in bright, sunny situations.
  - THERE ARE SOME PROBLEMS HOWEVER!

ISO Problems

- A High ISO number, and thus high sensitivity to light, (meaning you can more easily take pictures in darker situations), also causes electronic distortion to start appearing in the image. (this is somewhat fixable with post processing of the image, but that is an advanced topic) This is called Noise and is equivalent to grain in film.
- An ISO of **100 – 200** is appropriate for most situations and **400** can be used if a subject is dimly lit.

Concepts and Definitions

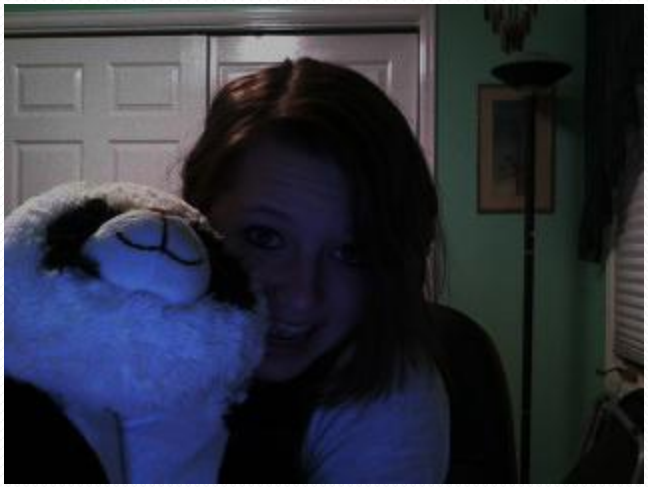
- **Focus**: The ability of the camera to render a clear, crisp, precise, non-fuzzy image onto the recording media. This is accomplished automatically in most cameras by moving the glass elements of a lens, just as your brain tells muscles to adjust the shape of your eyeball.
- **Depth-of-Field:** How much, from front to back, in the image will be in focus.
  - Not everything will be in focus in every picture.
  - This is an advanced topic, but we can answer questions regarding this topic individually.

Concepts and Definitions

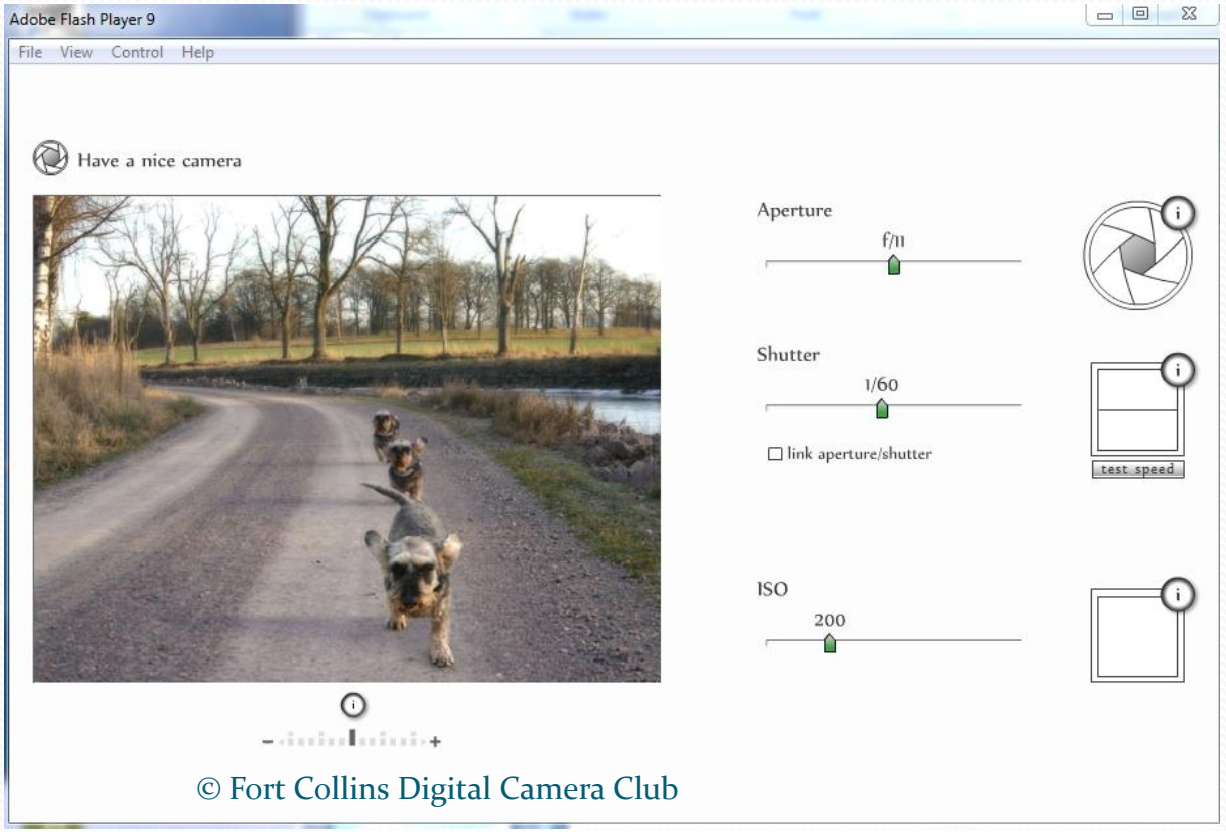
- **Over Exposure:** An in-camera image or printed photograph that is so bright or light that portions of the image are “washed out”, generally colorless and where no detail can be seen. Too much light has been let into the camera.

Concepts and Definitions

- **Under Exposure:** An in-camera image or printed photograph that is so dark in areas that little or no detail can be seen within those areas. Too little light has been let into the camera.



How Aperture, Shutter Speed, ISO, Focus, Depth-of-Field, Over & Under Exposure relate to each other



Concepts and Definitions

- **White Balance:** The type (actually color temperature) of light illuminating the subject. Advanced photographers like to match the camera white balance settings with the type of light being used to illuminate the subject. For instance, sunlight, fluorescent lighting, cloudy sky, etc.
- **Optical Stabilization:** Electronic/Mechanical countermeasures within the camera (or lens in most SLR cameras) to help compensate for movement of the camera by the user. Does not stop the subject from moving!

Concepts and Definitions

- **Point-and-Shoot Camera:** A camera generally designed to be used by beginning to advanced photographers, where most of the thinking is done by the camera. Lenses are non-interchangeable, though on some, auxiliary lenses can be added. These cameras have relatively small sensors, fewer controls and normally only shoot JPG images.

Concepts and Definitions

- **DSLR Camera:** A camera generally designed for more advanced to professional photographers. Can be automatic like a point-and-shoot or manual to allow the photographer greater control. DSLR stands for **D**igital **S**ingle **L**ens **R**eflex where the photographer is actually looking at the scene through the lens. These cameras typically have larger sensors, more controls, interchangeable lenses and normally shoot RAW and/or JPG files.

Concepts and Definitions

- **Bridge Camera:** A camera that "bridges" the gap between Point-and-Shoot cameras and SLR cameras. This gap is becoming smaller and smaller! Normally have smaller sensors than SLR's, but often larger than point-and-shoot and can sometimes shoot RAW files as well as JPG.

Concepts and Definitions

- **Zoom lens:** A lens that allows the photographer to change the **apparent** distance between subject and camera. This makes the subject appear larger or smaller on the sensor. A user control for W (wide angle of view) and T (telephoto; smaller angle of view) allows the photographer to adjust this "magnification" on the fly on most point-and-shoot cameras. Many Cameras have a "Digital Zoom". Turn it off and do not use it unless that's all you've got! Use only the optical zoom of the lens.

Concepts and Definitions

- **Camera Flash:** A light built into the camera that is used to illuminate the subject when there isn't enough natural light to do so. This is often automatic in point-and-shoot Cameras, but most often can be controlled by the photographer. This light produces the same type of light (color temperature) as daylight.

Concepts and Definitions

- **Panorama:** A photograph that shows an unusually wide angle of view. It is usually produced by stitching together multiple pictures to produce one wide short image. Some newer point-and-shoot camera do this with software inside the camera. Most often it is done by post-processing of the multiple images on a computer.

Concepts and Definitions

- **Close-up/Macro Photography:** The discipline of photography that involves capturing images of small to very small objects. To do this, cameras must be able to focus very close. In many cameras the ability to do this is allowed by selecting the Tulip icon on the selector wheel.

Getting Started-Grab your Camera

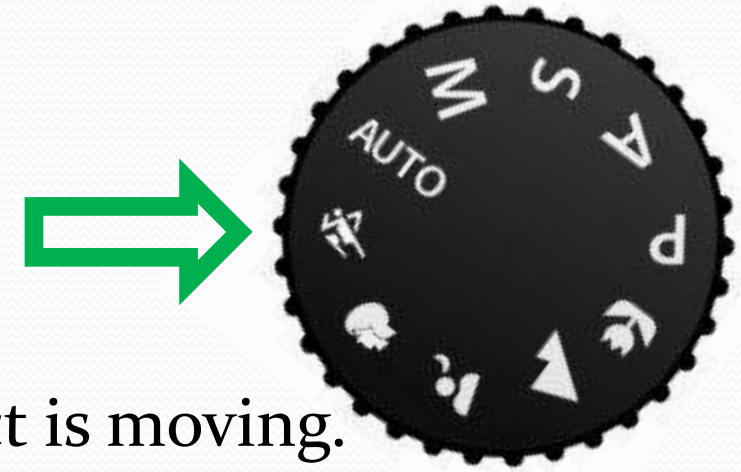
- Out of the Box
- Give it some Juice
- Install a Brain
- Remove its Blindfold
- It's ALIVE !
- Pick a language
- Let it know what, where and when
- Teach it a couple fundamentals
- Open its eyes for the first time

Mode Dial

Auto:

- Lets the camera make adjustments in Aperture, Shutter, and possibly ISO automatically to obtain the best “normal” picture.
- This is probably where you should start and is a good place to leave the camera set to be ready for “anything”.

Mode Dial



Sports:

- This mode is designed for action shots where the subject is moving.
- It sets the camera shutter to the highest speed available for existing conditions.
- You still may need to "Pan" with the moving subject.

Mode Dial

Portrait:

- This mode is designed to minimize depth-of-field to put background objects out of focus.
- It will open the aperture as wide as possible.
- The camera computer may also soften up the focus.

Mode Dial

Night Scene:

- This mode is designed to allow the user to take pictures at night time.
- The camera will, as necessary:
  - Slow the shutter speed down as much as possible
  - Open up the Aperture as wide as possible
  - Raise the ISO as high as necessary
  - Possibly turn on the flash

Mode Dial

Landscape:

- This mode is designed to maximize depth-of-field to make as much of the background and foreground in focus as possible.
- It will stop down the aperture as small as possible.

Mode Dial

Close Up/Macro:

- This mode sets the camera up to focus closer than normal so the user can get very close to small objects to make them appear as large as possible.
- It may also stop down the aperture as small as possible to maximize depth-of-field.

Mode Dial

Program Mode:

- This mode is similar to Auto mode except only the exposure is automated.
- The camera should not turn on the flash or make other adjustments except for aperture and f/stop.
- An error message may appear if there is too little or too much light to achieve a proper exposure, but it should allow the image to be captured regardless.
- In some cameras this mode allows the user to adjust either the f/stop or shutter speed and the other is conversely adjusted to achieve a proper exposure.

Mode Dial

Aperture Priority:

- This mode allows the **user** to set the Aperture or f/stop to control depth-of-field and the camera will then set the shutter speed and/or possibly the ISO to achieve the proper exposure.
- An error message may appear if there is too little or too much light to achieve proper exposure with the selected aperture or f/stop.

Mode Dial

Shutter Priority:

- This mode allows the **user** to set the Shutter speed in order to stop or blur motion. The camera will then select the proper f/stop and possibly ISO rating to achieve proper exposure.
- An error message may appear if there is too little or too much light to achieve proper exposure with the selected shutter speed.

Mode Dial

Full Manual:

- This mode allows the **user** to set both the f/stop and shutter speed to achieve the desired results. This may result in an over or under exposed image.
- An error message may appear if there is too little or too much light to achieve proper exposure with the selected settings, but it should allow the image to be captured regardless.

Other Modes

- There are additional Modes that may be available via the camera's LCD Menu screens. These may be called Scenes or Modes. These may include:
  - Snow or Beach: Camera will actually let in more light than seems necessary by opening up the aperture or slowing down the shutter. This is because the camera is often fooled by the bright reflections from snow and sand.
  - Fireworks:
  - Stars:

Flash

- Most Cameras will allow the user to set the flash to:
  - Auto: Flash will come on when the camera senses there isn't enough light to illuminate the subject focused on.
  - On: Flash will flash on all exposures
  - Off: Flash will not flash regardless of need
  - Red-eye reduction: Flash will briefly flash at low power before the shutter is released so that subjects pupils will close down to prevent the full flash from bouncing off the Retina of the eyeball and back into the camera causing "Red-eye"

Self Timer

- Most Cameras will allow the user to delay the release of the shutter so they can get into the photograph.
  - This is often done through the LCD Menu system, but can also be separate controls on the back of the camera.
  - This will necessitate the use of a Tripod or other suitable means for holding the camera still while the user moves to in front of the camera.

Cameras, what else you need to know

- Holding the camera correctly
- Histograms
- Play back
- Metadata
- Removing the memory card
- Plugging your camera or memory card into a computer
- Viewing the images on a computer
- Where to get the images processed
- Printing your own pictures at home
- Composition
- Camera Maintenance