DIGITAL CAMERAS

There are hundreds of cameras available ranging from those that will easily fit a shirt pocket to very large complex cameras. Often times, these cameras are advertised with abbreviations that can be confusing for the novice consumer.

Film Camera vs. Digital Camera

Here is a quick, basic comparison so you can understand the difference between the two types of technology (film vs. digital). With a film camera, an image is formed by collecting light from a particular scene or subject and focusing on film, which reacts chemically when struck by light and is said to "capture" the image. What makes a camera "digital" is that, instead of film, it has an image sensor that reacts to light by sending out electrical signals. The camera takes the information from the image sensor and processes and stores it as a collection of pixels in a digital file, usually on a memory card inside the camera.

Terminology

- **Pixel** – (short for picture element) tiny dots that make up an image. Each pixel can only be one color at a time; however, since they are so small, pixels often blend together to form various shades and blends of color.
- **Megapixels** – when you collect a million pixels, you have a megapixel. The number of megapixels tells you how may pixels the image file has. A camera that captures 8 million pixels, for example, is called an 8 megapixel camera.
- **SLR Camera** - A single-lens reflex (SLR) camera is a camera that typically uses a semi-automatic moving mirror system that permits the photographer to see exactly what will be captured by the film or digital imaging system (after a very small delay), as opposed to pre-SLR cameras where the view through the viewfinder could be significantly different from what was captured on film.
- **Viewfinder** - what the photographer looks through to compose, and in many cases to focus, the picture
- **Shutter Speed** – controls light and motion. Slower shutter speeds make the image lighter. Faster shutter speeds make the image darker. Faster shutter speeds also means the more a moving subject will be blurred in the picture.
- **Aperture** – (also called f-number or f-stops) a hole or an opening through which light travels; controls both light and depth of field. The larger the aperture opening, the more light affects the image and the lighter the image. The smaller the aperture, the greater the area of sharpness.
- **Compression** - the process of making larger image files smaller and more manageable. The less compression produces better image quality (higher resolution) which results in larger prints. However, less compression also means that you cannot store as many images. More compression produces lower quality images. These are fine for small prints, email or websites. By using more compression, you can store more images.
- **Hot Shoe** – a mounting point on the top of a camera to attach a flash unit
- **RAW files** – collection of unprocessed data. This means the file has not been altered, compressed, or manipulated in any way by the computer. This file type is often used by professional photographers.

Types of Digital Cameras

Basic Cameras – simple point-and-shoots with just the features needed for routine shots

- Subcompacts: small cameras that fit in a pocket, weight a few ounces, and can be carried everywhere. Most do not have manual controls or viewfinders, but some include a variety of useful features, such as touch-screen LCDs (liquid crystal display). Some have zoom lenses as long as 14x.
- Compacts: mainstream compacts are too big for pockets but small enough for most handbags. Many are simple to use and best for everyday events. Some don't have manual controls for exposure and composition, limiting you to the camera's assortment of preset scene modes, as with subcompacts.
- Superzooms: characterized be a very long zoom rang – 15x or greater, which is good for sports, travel, or nature shooting. They are generally bulkier ad heavier than compacts and subcompacts. Some models have zooms as great as 30x.

Advanced Cameras – feature-laden models that include sophisticated point-and-shoots and models that let you change

lenses.

- Advanced Point-and Shoots: these cameras have a non-detachable lens but differ from basic models in that they have lots of manual controls, a hot shoe for an external flash, and support for RAW files. It is the lightest advanced type of digital camera.
- SLR-likes: these cameras accept interchangeable lenses but they lack a through-the-lens viewfinder (in fact, most has no viewfinder). They are smaller and lighter than an SLR but usually larger than a point-and-shoot.
- SLRs: have the most features, with interchangeable lenses and the largest sensors for the best image quality in low light, and a through-the-lens viewfinder. Controls are extensive. They are also the heaviest, most expensive cameras. Most SLR's are now able to capture HD-resolution video.

Digital Cameras Features

Digital camera features vary greatly model to model. Some might be essential to you, while others might be of use only for highly specialized applications.

- **Exposure modes** – most digital cameras are highly automated with features such as automatic exposure control, which manages the shutter speed and aperture according to the available light. In that mode, the camera generally handles setting ISO and autofocus too. But there are other program modes that allow you to control specific settings, including shutter priority, aperture priority, and special scene modes. Some cameras include full manual controls, which let you set shutter speed and aperture.
- **Zoom lenses** – this type of lens, which is actually made up several different lenses or lens elements, allows you to vary the focal length. That provides you with flexibility in framing shots and closes the distance between you and your subject, which is ideal if you want to quickly switch to a close shot. One common feature of zoom lenses is that they generally protrude from the camera when you turn it on. But some subcompacts and a few compacts and superzooms have non-telescoping lenses.
- **Image Stabilization** – more and more cameras now come with an image stabilizer, a device that compensates for handheld camera shake. Often, the IS device lets you shoot with a slower shutter speed than you otherwise could without producing blur due to hand shake. Image stabilization is something that you should look for, especially if the camera has an optical zoom greater than 3x.
- **Face Detection & Smart Camera features** – feature that attempts to find a face in the image to set focus, exposure, and color balance so that faces appear in focus and well exposed. In some cameras, you have to turn the feature on, in others, it is automatic. Other types of smart features that are starting to be available are smile shutter mode, which shoots a photo of the subject when a subject smiles and blink warnings, alerting you to shots in which a subject might have blinked.
- **Focus** – some cameras automatically adjust the focus of the lens with autofocus features. Most advanced cameras include additional focusing functions. Be sure to look carefully at the types of additional features available on your camera, including manual focus.
- **Shooting Modes** – Most cameras have three options for shooting still images: single image, burst mode, and self-timer. The burst mode allows you to fire off a series of shots quickly, for several, dozens, and sometimes scores of shots. The self-timer mode provides a delay between the moment the shutter button is pressed and the photo is captured.
- **Playback Modes** – all digital cameras can review images on the LCD, along with exposure and other information embedded in the image file. This allows you to quickly see what the image actually looks like, and delete it if you don't like it. Many cameras have automatic orientation features that run the photo vertically or horizontally to correspond to how you shot the photo.
- **LCD Viewers** – displays on cameras that accurately display the image you will get when taking photo. Sometimes these viewers are hard to see in bright sunlight. These LCD viewers have often replaced the optical viewer on many subcompact and compact cameras. A camera with an optical and an LCD viewfinder is more versatile, especially when you shoot in bright light or need to conserve battery power. Also, some point-and-shoot and SLRs include swiveling displays, which are helpful for taking hard-to-reach shots.
- **Flash** – available on almost every digital camera, a flash allows you to illuminate subjects by using a short burst of light. Nearly all have auto-flash modes, a setting that will automatically fire a flash whenever the camera senses there isn't enough illumination for a correct exposure. Most include other flash modes, including red-eye

reduction mode.

- **Image File Formats** – the most commonly used file format is the JPEG, a compressed image format that allows you to use the file for a number of different applications. Advanced point-and-shoots and all SLR-Likes and SLRs can also capture images in a file format commonly known as RAW. RAW files can yield the best quality images and give you the most flexibility when manipulating photos with software.
- **Memory Cards** - Instead of film, nearly all digital cameras record their shots and store them on flash-memory cards. SecureDigital (SD) is the most widely used format. Other memory cards used include Compact Flash (CF), Memory Stick Duo and xD.
- **Connections** – to save images, you transfer them to a computer, typically by connecting the camera to the computer's USB port, or inserting the memory card into a special reader. Cameras can also be connected to printers, or you can insert the memory cards directly into select printers. Most cameras also include a video output that lets you view images on your TV.
- **Video** – Basic point-and-shoots have been able to capture video for many years, but SLRs have only recently included this feature. Most cameras include HD-resolution video, although some still capture standard definition, which may not look as sharp on an HDTV. Some models with HD video quality are good enough to avoid the cost and inconvenience of a separate camcorder. One convenient video feature many cameras now include is a dedicated video button, which lets you quickly record video when you are shooting still images. Also, in you are buying a basic or advanced point-and shoot, check to see whether the camera can zoom while capturing video. Not all models can.

References and Resources

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