



# Using Digital Cameras: Tools & Techniques for Beginners

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Partial, 35 pgs

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## **OBJECTIVES**

### **Assemble the Digital Darkroom**

- How digital cameras work
- Selecting the tools for the job
- Plug it in and turn it on (demo)
- Resources to consider

### **Introduction to Digital Editing**

- Digital photo characteristics
  - Trimming or cropping images
  - Sizing, saving and storing issues
  - Sharpen, balance and other tips
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## **WORKSHOP STRUCTURE**

- Topic presentations
- Camera demonstrations
- Small group exercise
- Digital editing exercise
- One break and refreshments(!)

## **DISK RESOURCES**

- Example jpeg file for the exercise
  - Internet Resources: Word file
  - Camera comparison chart: PDF file
  - Trial versions of PE2.0 (Mac & PC)
  - Browser-Safe Color Chart: Gif file
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## **INSTRUCTOR'S NOTE**

*The goal of this workshop is to offer a practical introduction to digital photography by covering the mechanics and selection of the tools of the trade along with demonstrations and exercises to illustrate the material. In addition, participants will learn how to edit a digital photo using **Adobe Photoshop Elements 2.0**, software included with the fourth edition of the book, **Digital Photography for Dummies**, and packaged with some digital camera models. The **Digital Editing** section focuses on modifications to photographic material, however, the issues covered are relevant to a range of images created for Web and print production. The **Appendix** contains additional information for future reference; the **Internet Resources** Microsoft Word file on the disk is an interactive copy of Web resources to peruse, available in print in this booklet. Computer techniques described are based on the Windows 2000 operating system and may vary on other systems. A free 30-day trial version of Photoshop Elements 2.0 is available on the CD provided, and the new 3.0 trial version is available from Adobe's Web site at: <http://www.adobe.com/products/tryadobe/main.jsp>*

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### About Digital Photography

We've come a long way since Kodak created the sensor technology for the first professional model digital camera aimed at photojournalists and released in 1991, to be followed by the first consumer-level digital cameras in the mid 1990's. The breadth of choices available today is both exciting and challenging for someone taking their first steps into this ever-expanding medium. In fact, there are dozens of brands of cameras on the market, offering a range of features with price tags that make it easier than ever to jump in and produce quality digital photographs for a wide range of projects. In the **Appendix** there's a Web address to see a digital camera timeline of new product releases and their corresponding specifications; this gives you a sense of how features have changed over the last ten years. There's also a link to a brief history of the digital camera. It's never been a better time to be an amateur photographer, designer, or producer. However, as for regular film photography, you need the right tools and a basic introduction to get you started in the right direction; that's the objective for this booklet and workshop, an overview of the basics. There is a plethora of good information out there, and this workshop is a springboard to get you started. Moreover, I encourage exploration of these topics beyond the basics presented here. Before launching into the remaining topics of this booklet, let's start with some reasons for taking the plunge into digital photography to encourage us on our digital journey.

### *Why Use Digital Photos? -lots of great reasons...*

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- No film needed; this is money saved for other purposes and time not spent waiting for film development! In fact, if you have a camera with a viewing screen (LCD or *liquid crystal display*), you can tell right away if you got the goods or need to discard that image and try again. No unwanted images anymore!
- You gain more control over your images; you can edit the pictures yourself to suit your tastes and needs.
- You can use the power of the Internet to share and send your photos around almost effortlessly; generate a Web site and put up your own gallery of last Summer's vacation, or a wedding or other special occasion, send photos off as attachments to email to all your friends and family instantaneously, even work on files with clients or co-workers without leaving your office at home or work.
- Add photos to multimedia presentations yourself; many people create slide shows with software such as MS Power-Point for work and home using photos they took and edited themselves. No need to scan pictures to digitize them.
- Explore your artistic side with digital images; edit them into intricate collages using software like Adobe Photoshop or Photoshop Elements. Create personalized stationery, cards, calendars, posters, etc.; the possibilities are endless!

### *Are There Downsides? -there's a few to consider...*

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- Print quality; depending on the type of camera you buy, and the printer you have access to, you may find it difficult to get really high quality prints of your photos. It's getting better; we'll cover this issue in later sections of the booklet.
- There's a delay time with cameras as they capture and process the image into memory, in which time you can't take another picture. This is more of an issue with action-oriented activities and is less of an issue with the more expensive cameras. See page 8 under **Miscellany** for more information about this issue.
- Digital photography requires learning some new skills that the film cameras don't call for. You need access to a computer to retrieve the images and edit them yourself, adding both time and expense to learn and utilize these cameras. Some cameras do come with basic editing features, but they are not as robust as those features available in standard editing software like the ones mentioned in this booklet beginning on page 17. You could instead have your images processed for you, but you wouldn't be reading this booklet if you weren't interested in trying it yourself.

**Final Note:** Like other computer technologies, digital cameras are evolving rather rapidly; this is both a plus and a minus. What I present here will likely change, but for the better, since manufacturers are always adding product improvements to make it easier to do great digital photography. So when you buy, make informed choices and only upgrade when you need something **essential** to your goals. Don't get too caught up in buying the latest and greatest; it'll drive you crazy.

# ASSEMBLE THE DIGITAL DARKROOM

## HOW THEY WORK

### The Fundamentals\*

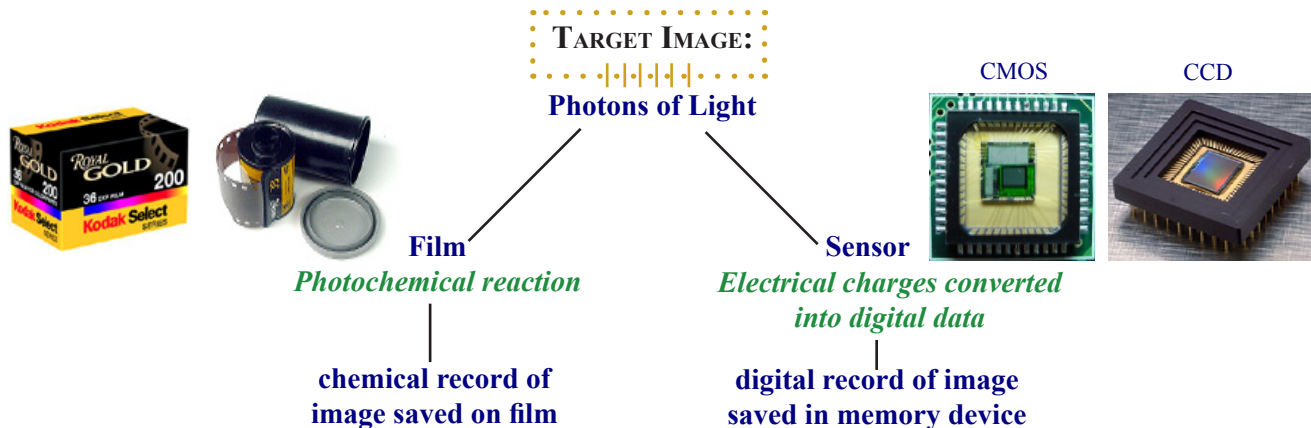
Understanding the basics of how digital cameras work will help make you a better digital photographer, primarily because you'll have a better idea how to shop for a decent camera and best use the features. However, cameras come with a range of features, especially the higher-end more expensive models. Therefore, in this section I present an overview of the following features to explain how a range of digital cameras on the market operate:

- Lights, camera, action!
- Color schemes
- Resolution and pixels
- Lenses and focal length
- Focus and zoom
- Shoot and view
- Compression
- Memory matters
- Batteries, software and other peripherals



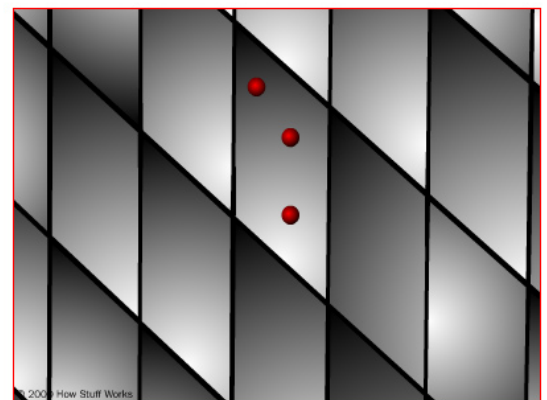
### Lights, Camera, Action! -a filmless camera

Like conventional film cameras, digital cameras also use light to capture images. However, unlike film cameras, digital cameras use a *sensor* to convert light (photons) into electrical charges (electrons), i.e. the image is not recorded onto film, it is recorded in digital form and stored in memory. Both types of cameras capture the light, but film cameras create a *chemical record* of light and digital cameras create a *digital record*, as schematically represented here:



### How does a sensor work?

The schematic above is very simplistic, since there are many embedded steps taking place to capture the target image. In fact, the terminology can be tricky, but let's look closer. Digital cameras come with CCD or CMOS sensors; these are *charge coupled device* and *complementary metal oxide semiconductor* respectively, and they work much the same. Essentially, they are *light-sensitive computer chips* made up of a collection of *photosites*. Think of photosites as lots of tiny *solar cells*, with each cell capturing light (photons) reflected off part of the target image and converting that energy into electrons (electrical charge). The brighter the light hitting a single photosite, the greater the electrical charge that accumulates there. But the sensor isn't done yet. The sensor is also capturing information about color using filters (see next section) and is converting the accumulated charge from photosites into *digital data*. All this information is saved to the camera's memory (see section on memory). For an extended explanation, check out the resources in the **Appendix**.



Photons hitting a photosite (square regions) in a sensor and creating electrons (red dots)

### \*Portions of this section adapted from:

Nice, K., & Gurevich, G. J. (2004). *How Digital Cameras Work* [On-line]. Available: <http://www.howstuffworks.com/digital-camera.htm>