

Academic Innovation and Distance Education

Overview

How Does a Camera Capture an Image?

The word "photography" literally means "writing with light." A camera is essentially a light-proof box. The purpose of the box of the camera is to keep all light out until you want to make an image. When light is needed to make an image, the camera is designed to let a controlled amount in through the lens. That image is called the exposure. Each time you click the shutter button on the camera, you are exposing the digital sensor to light. If too much light enters the camera, your picture will be too bright. If not enough light enters the camera, your picture will be too dark.

Anatomy of a Camera

Now that we know a little bit about how a camera works, let's look at some of its parts. The part of the camera that you hold in your hand is called the camera body. It is the shell of the camera and what blocks the insides from light.

The lens is the piece of glass or clear plastic on the front of the camera. It focuses the light so that it can be recorded as an image. Some lenses can be

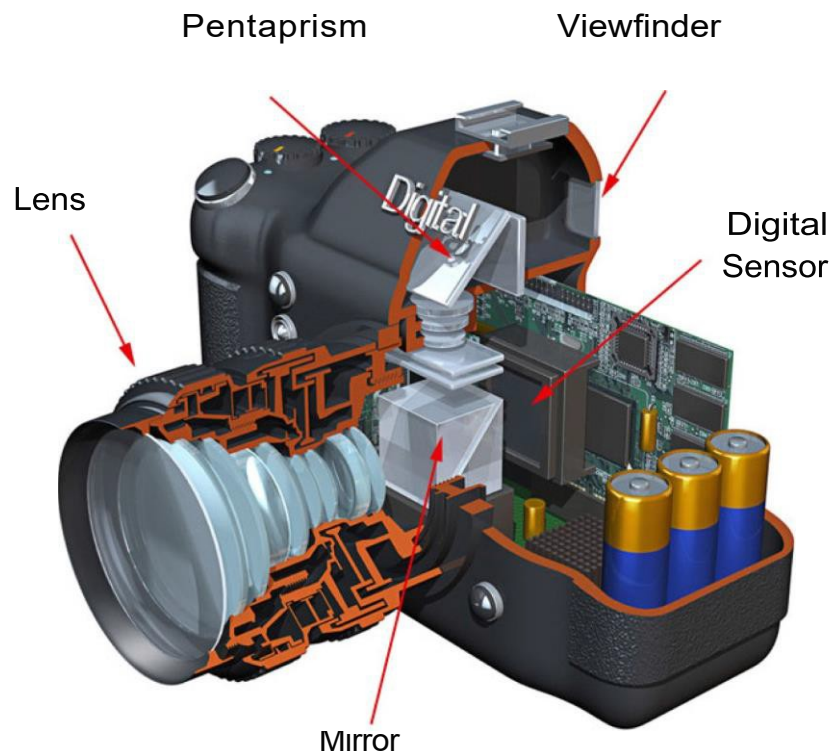


Image from
<http://www.digitalcamerareviews.us/digital-camera.htm>



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very long and heavy and contain a lot of glass. Some lenses are very short. They work differently to produce different effects. If you have a point-and-shoot camera, your lens is probably stored inside the body of the camera. When you turn it on, a motor pushes the lens out and into place.

The **viewfinder** is the small window located on the back of the camera. It allows you to see the image before you take the picture.

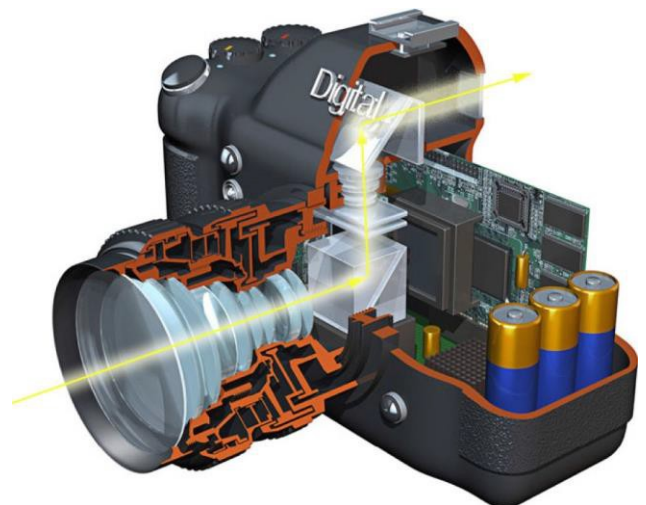
The **mirror** and the **pentaprism** are pieces of glass inside the camera that bounce the light from the lens, up to your eye, so that you can see the image when you look into the viewfinder. When you take a picture, the mirror moves so that the light can go straight from the lens to the digital sensor to record the image.

The digital **sensor** is a device that converts the light into an electrical signal. It is where the image is captured.

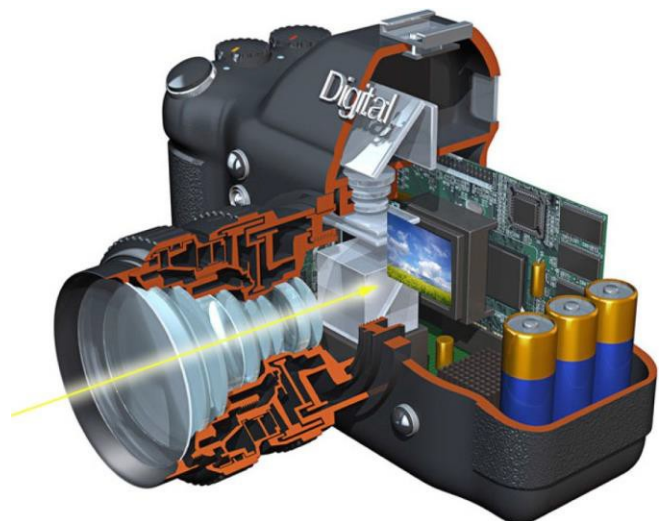
So how does it actually capture an image? Let's recap. Let's say you're ready to take a picture. First, light bouncing off the scene passes into the camera, through a set of lenses, and onto a mirror, up into the pentaprism and to the viewfinder. Now you can aim the camera and focus.

When you press the button on the camera, the mirror flips up out of the way, the shutter opens for a fraction of a second and the light from the scene enters the lens and passes directly to the back of the camera and onto the digital sensor. You've captured its image.

There are three ways to control the amount of light that enters the camera. Shutter speed (the length of time the shutter is open), aperture (the size of the hole in the lens), and ISO (how sensitive the digital sensor is). We will be looking at each of these ways in depth in the coming weeks. This week, we will use our cameras in auto mode. When you set your camera to auto mode, you allow the camera to make all the decisions about shutter speed, aperture and ISO for you, so you'll probably get a pretty good exposure every time.



Light enters through the lens and reflects into the viewfinder so you can see the image



When you press the shutter button the mirror flips up and the image is recorded on the digital sensor

Pixels

The word **pixel** comes from the words Picture Element. Digital images are made up of small squares, just like a tile mosaic on your kitchen or bathroom wall. They are the smallest element of a photograph. Though a digital photograph looks smooth and continuous just like a regular photograph, it's actually composed of millions of tiny squares as shown below. The more pixels in the image, the finer the detail. For example, if you have an 5 inch x 5 inch image that is made of 1000 squares (or pixels) it will have more detail than a picture of the same dimensions that is made up of 100 squares. We'll take a closer look at pixels next week.

