Dissecting a Digital Camera

RIT Center for Imaging Science
WARNING: DO NOT INSTALL BATTERIES IN CAMERA

• Unscrew the four small screws visible on the outside of the camera. Note that there may be one or more under stickers.
• Use a flathead screwdriver, or your hands, to pry apart the two plastic halves of the camera

• Set the front half of the camera aside, and use it to hold the screws and other parts you’ll be removing.
• This diagram shows some of the main components of your digital camera.

- Shutter Release
- Capacitor
- Flash
- Viewfinder
- Battery Compartment
- Lens
- Speaker
- Cable Connection
• We are now going to remove one of the two circuit boards in this camera. First, take the viewfinder with your fingers and pull it gently out of the camera.

• Then find and unscrew the one screw near the center top of the camera as shown in the picture below:
• Now grasp the flash unit or the end of the capacitor and gently lift the circuit board out of the camera.

• This is what will be left in the camera after the flash unit is removed.
WARNING

• A charged capacitor can potentially give off an electric shock. This one shouldn’t be charged if you haven’t put the batteries in. Still, it’s a good idea to use a screwdriver to short out any charge which may be present. You do this by simultaneously touching the screwdriver to the two contacts from the capacitor where they poke through the back of the circuit board. If there is a charge in the capacitor, you’ll hear a loud pop and see a bright spark when you do this.

• Touch metal tip of screwdriver here
• Now we’ll remove the second circuit board from the camera. Do this by unscrewing the three screws shown below:

![Image of the second circuit board being removed](image1.png)

• Use a screwdriver to gently pry out the board. You will likely have to pull out the rubber tab on the side of the camera which is covering the cable connector.

![Image of the removed second circuit board](image2.png)
• The next step is to disconnect the small liquid crystal (LCD) display on the back of the board. Do this by removing the three screws shown below. Note that you’ll have to gently lift the speaker to get access to one of the screws:

![Image of screws being removed]

• Gently turn the circuit board over. The LCD display will still be connected to the circuit board by a thin, flexible “ribbon” connector. Be sure not to break or tear this connector.
• We’re almost done… to remove the lens and reveal the camera’s digital sensor, remove the two screws shown below:
• Turn the circuit board over to reveal the “heart” of the digital camera – the CMOS sensor.

- The CMOS sensor takes the place of film in a conventional camera. This sensor has 1.3 million “pixels” or picture elements. The more pixels, the more detail you’ll have in your pictures.
- To reassemble your camera, just work backwards through the steps in this manual.
Questions

• How does the CMOS sensor distinguish between different colors of light?
• What other kinds of electronic sensors are used in digital cameras?