A. **Lens**- The lens is the clear plastic on the front of the camera that light travels through to reach the film. When the shutter is closed no light actually travels through the lens to the film and this only happens when you press the button and the shutter opens.

**Shutter Mechanism**- The shutter mechanism is inside of the lens and when the button is pressed to take a picture the shutter mechanism opens and allows light to reach the film and that is how a picture is formed. Most cameras have different shutter speeds which will allow light to be exposed to the film in different time intervals.

**Film**- Black and white cylindrical tube on the right side of the camera.

**Viewfinder**- Clear lens at the top of the camera that is a small circle to look through and on the other side is a clear lens.

**Film transport & counter mechanism**- After a picture is taken a wheel on the top of the camera can be turned and this rolls the film into the film tube and simultaneously rolls a new section of film into the middle of the camera to be ready for another picture to be taken.

**Electronic flash**- Located on the front right of the camera. A button charges the flash and releases the energy when the button to take a picture is flashed.

**Energy cell**- A AA battery and a circuit board are used for the power of the camera. The battery is used to provide energy for the flash.

**Housing shell**- Black outer shell on the outside that is covered in yellow tape. Used to protect and house all inner components of the camera.

B. The film is around a black spool on the inside of the camera and the casing blocks out all light that would ruin the camera. When the button is pressed the shutter opens and allowed the light to reach the section of film and create an image on the film. The dial on top is then turned and that section of film rolls inside of the film tube and a new section is replaced and ready for another picture to be taken. A button on the top can be pressed which uses energy from a AA battery and charges up a flash. Then when the picture is taken a flash goes off which would provide more light to the area that you want to expose the film. This results in a brighter and clearer picture in dark areas.

C. The most important material for the parts on the camera would be plastic. A large portion of the camera is made of only plastic and only a small amount of the components are made of metal. The metal components seem to be mainly used in the power section of the camera (used to hold battery, circuit board, and as connectors for the flash at the top of the camera). The assembly and disassembly appears to be most efficient if it were done in stages where one station would take off the most of the metal pieces and it would be sent down a line where another station takes off the plastic components. This would also be a useful method for the pieces that are recycled because then all of the same plastic pieces would be together and the metal pieces together in case they are recycled. The assembly would be done the same way just in the opposite direction where a certain station puts on certain parts and then it continues to
move down a line where other stations add the different parts. This would be the most efficient method because the workers can be skilled in their assembly process while other workers are skilled in the next assembly process.

D.

The main systems within the camera are the electric system and the film exposure system. The electric system is composed of the circuit board, a AA battery, and a few metal connectors that are in the picture above. The electric system is used for the flash on the camera which is a necessary component for taking pictures in a low-light environment. The system to expose the film and actually produce the picture is composed of the film (cylindrical black and white tube), film transport (grey circle wheel), and many of the little plastic components. The process is done by the grey wheel being turned and pulling film in front of the shutter and lens and when you press the button the shutter opens and exposes the film. The grey wheel is then turned which rolls the used section of film into the tube to be protected from further light while a new section of filmed is pulled over the lens and shutter section again.

E. According to Kodak, about 90% by weight of a disposable camera is recycled and the average parts are reused about 3 times. Circuitry boards were reported to have been reused up to ten times however which is a great recycling rate. Plastic components with any damage are usually ground into pellets and then can be melted and formed into new components for the cameras. Disposable cameras have actually one of the highest total recycling rate of about 75% which even beats out the recycling of aluminum cans. All of the recycled parts are tested to ensure that they would withstand the same amount of use as a brand new component. This ensures that cameras with recycled parts are no weaker than brand new cameras.
The main functions of the camera can be broken up into the electronic system and exposure system. This flow chart shows the components of each. The electronic system is mainly for the flash of the camera to provide enough light to the surrounding area in order for the exposure system to work properly. All of the components are necessary and all of the components have to work together in order for the camera to work properly. Connecting all of the components with lines connecting all of the components was difficult but what is to be understood from the flow chart overall is that all of the components function together in a complete and efficient system.

**Redesign.** An aspect of the camera that would be very easy to minimalize waste would be the plastic covering on the outside of the camera. The plastic could be made thinner for the shell which would greatly reduce the overall use of plastic for this. Of course, the plastic would still
have to be thick enough however to not compromise the strength and durability of the camera. One possible way would be to use a “lattice” design underneath the sticker where the plastic is just as rigid but it is not completely solid so some plastic is saved. Also because the outer sticker covers this section the film will not be ruined by light entering the camera.