Disassembly and study of a Single Use Camera

a) The functional components are a spring, a shutter, winding gears, circuit board, capacitor, battery, and a light bulb.

b) The film on the back is surrounded by casing to protect it from light. The casing is also black, to keep light out. The flash is attached to the circuit board, with the actual flash mechanism containing a light bulb in the upper right corner. The winding gears once activated by the push of the button allows for the spring to open the shutter and if the capacitor is charged allow for a flash. This is all activated by a series of plastic mechanisms moved by an underlying spring below them. The winding gear will move the film strip along by a series of connecting gears.

c) The materials used in this camera are a durable plastic for the outer shell of the camera as well as the interior frame holding the parts in place. The lens is made of a clear plastic, and the shutter that allows for light to enter is made of aluminum attached to a copper spring for quick movement. All of the mechanisms are made of plastic, and under the mechanisms is an aluminum coiled spring. The gears within the camera are also plastic. The circuit board is made of silicon with metal components attached. The light bulb is made of glass. To disassemble and reassemble the camera there are four easy access tabs located on the outer shell of the camera that allow for film, battery, and light bulb replacement.
e) 75% of all disposable cameras are recycled. The camera’s outer shell is reused up to 3 times before it is no longer fit for reuse and is melted down and reformed into other material or shells. The circuit board is used up to 10 times before it is disassembled and precious metals are collected and recycled. Also, after developing the film inside the camera, it is sent for silver recovery and recycled.

f) Processes of Camera:

Intent to take picture

Need for Flash?

Yes

Hold Flash button on front of camera until the red light appears

No

Wind up gear on camera until the gear clicks and stops

Moves film over one frame

Grey button pops up

Capacitor discharged

Flash goes off if charged

Look through view finder and aim camera

Press Button

Spring disengaged

Shutter opens

Light hits the film

Image captured on film

Shutter closed
g) **Redesign of Camera:**

In order to reduce the waste output of the camera and e-waste production, the camera can be designed and manufactured using lighter materials, less plastic materials, and smaller design. The use of biodegradable materials can also be implemented as this would greatly reduce the e-waste output.
Decomposition Diagram

Single Use Camera

Energy Processing
- Light
- Lens
- Image Projected on film plane

Material Processing
- Electrical
- Mechanical
- Viewfinder
- Select View
- Battery
- Flash Charging
- Flash Discharge

Signal Processing
- Advance Film & wind up shutter
- Trigger shutter Open
- Frame Counting
- Turn on Flash Charging
- Trigger Flash Discharge
- Flash Ready Signal

Material Processing
- Cock Shutter
- Advance film by one frame
- Open Shutter

Signal Processing
- Image Stored
- Viewfinder
- Light sensitive film