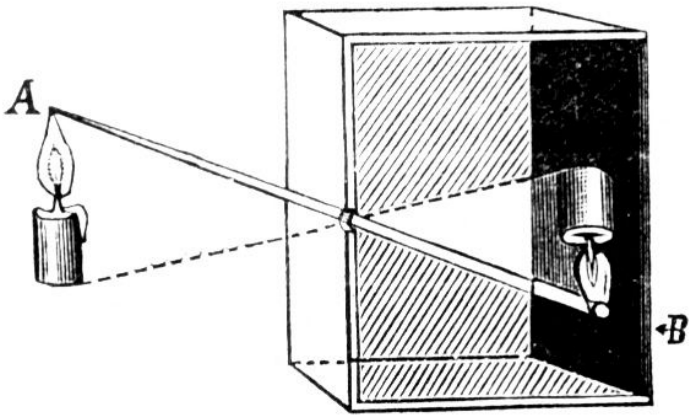
How Film Cameras Work: The Basic Mechanics

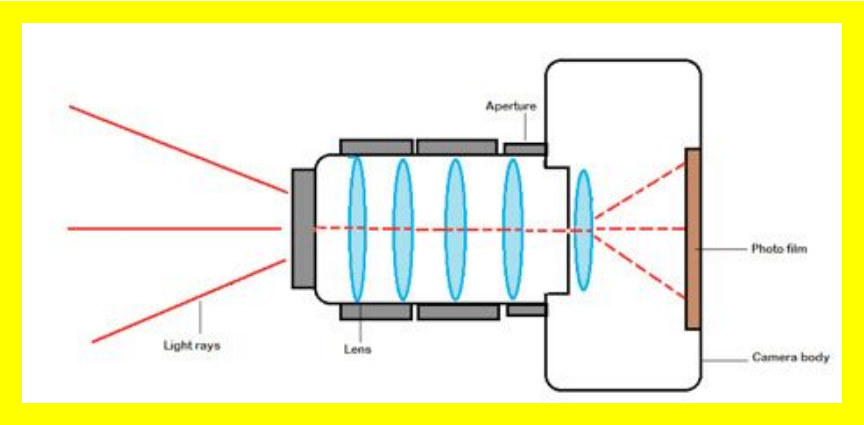


A camera is essentially a light-proof box, with a tiny hole in the front end to allow light from an external scene to enter at the right time. The light enters through a single point hole in the box, and forms an upside-down image on the back wall of the box – just like a camera obscura.

The optical component of your camera – the lens – is attached in front of the hole. A lens basically consists of multiple pieces of glass – which help concentrate the light rays on a single point, for a more accurate image.

Meanwhile, a negative film – the chemical component of your camera - rests along the back wall of your camera, waiting to be exposed. When light passes through the lens and hits the negative, it creates an image as a result of a chemical reaction onto the film. Then, off course, you need to develop it in the darkroom to get the final print.

That's basically how a camera forms an image, but there are many other components and layers to fine-tune the process.



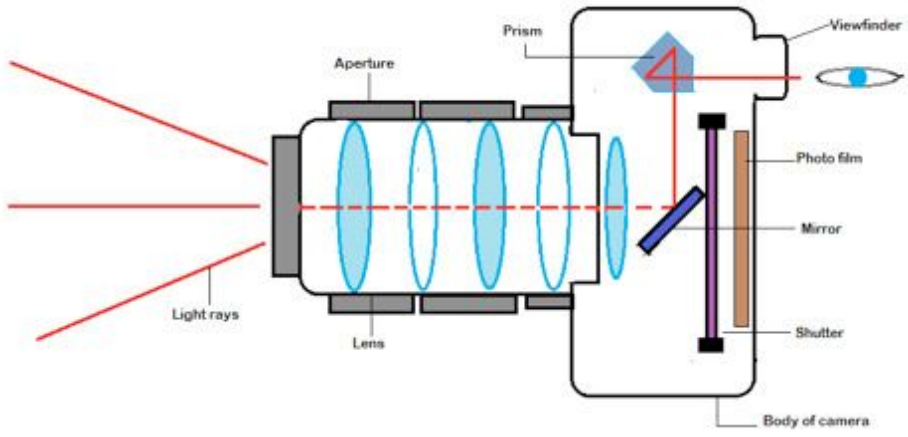
The Viewfinder

The viewfinder lets you preview the scene before you actually take a snapshot. It works by placing a mirror diagonally in front of the hole or lens through which light enters into the camera. The light bounces off the mirror onto a complex prism, which then redirects the light towards the eyepiece. If you look through the eyepiece, you now see exactly what the lens is seeing.

When you are ready to take a snap, simply push the button on your camera, and the mirror would pop up, allowing the light to pass onto the photo film in the back wall.

The Shutter

In most cameras, the shutter is placed right in front of the photo film to avoid any unwanted exposure to the light. The shutter is basically a case with multiple doors in front of it. When you push the shutter-release button, the doors open up, exposing the negative to light. You can control the shutter speed, depending on how long you want to expose the film to the light. The shutter speed can vary widely – from 30 sec. to 1/4000 sec.



The Aperture

The aperture is used to control the amount of light coming into your camera through the lens. It is basically an opening in the lens to control how much light you want to let in. The value of aperture is measured in f-number. The larger the f-stop the smaller the aperture.

Steps for taking a picture using a film camera:

- Light reflects off of an object and enters into the lens of your camera
- The light passes through the lens aperture, allowing you to control the amount of light you want to let in
- Once the light passes through the lens, it hits a diagonally placed mirror
  The light then bounces off the mirror and moves upward to hit a complex prism, which redirects the light towards the eyepiece
- The light now passes through the eyepiece to reach your eyes, allowing you to preview the scene
- Once you click the button on your camera to take a snapshot, the mirror pops up, allowing the light to come straight inside the camera.
- As you push the shutter release button, the shutter opens up to uncover the photo film attached to the back wall of your camera
- The light hits the negative and a chemical reaction starts
- The film made up of silver halide crystals forms an image
- Once the process completes, the shutter closes, and all other components of the camera, including the mirror, move back to their normal position.

Response Questions:

1. **Which parts of the camera control how much light ends up hitting the film?**

2. **How does light reach your eye through the viewfinder to show you a preview of the image?**

3. **Where is the film placed inside the camera?**