

Dear Beakman,  
How does a camera work?  
Bill Clinton  
Washington, D.C.

Beakman or Jax,  
P.O. Box 30177  
Kansas City, MO 64112  
Send your question & address.

Dear Mr. President,  
Thanks for the question. When we don't know something, it's a good thing to ask. It's nice to see that big shots do it, too. With all the cameras stuck in your face all the time, I guess you'd have to wonder how these things work. The best way to learn about cameras is to make one big enough to put your head inside of. You'll have such a good time being inside the camera, you'll want to share it with Hillary, Al and Tipper. Really.

*Beakman*  
Beakman Place

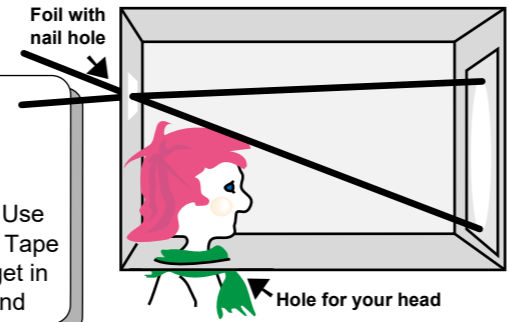


Niépce spent all of his money on his camera experiments and died flat broke.

**▲ Little History**  
**World's First Photograph**  
In 1824 a man in France took this picture. His name was Joseph Niépce. The picture is hard to see. It's a photo of a rooftop.  
*You Can* see other rooftops as well. It was taken from an attic window.  
People were not impressed, and the new invention flopped.

**experiment #1**  
**Get Inside A Camera**

**WHAT YOU NEED:** Large cardboard box - masking tape - aluminum foil - nail - white paper - large bath towel  
**WHAT TO DO:** Find the big box at a supermarket. Tape the white paper inside like in the drawing. Cut a 1-inch-by-1-inch hole in the opposite side of the box and tape a piece of foil over it. Use the nail to punch a hole in the foil. Close the box and tape it all up. Tape down foil to seal the cracks. It is very important that no light at all get in the box - except through the little hole in the foil. Seal all corners and cracks. The darker the box is, the better this experiment works!



**● MORE STUFF TO DO:** Look at the drawing and notice where the hole for your head is. Cut one in your box. Peek inside to see if there are light leaks. *Seal up all light leaks.* Take your box outside and wrap a big towel around your neck. This will keep out light. Now put the box over your head and look at the white paper. Move around and point the back of the box in different directions. You'll have a real light show inside. Give your friends a turn inside the box. The whole thing is too radical and crunchy to keep for yourself.

**WHAT IS GOING ON:** You just made a kind of camera. It is called a camera obscura (ob-SCUR-ah). The images you saw on the paper were upside down. That's how it is in all cameras. In a photographic camera, the white paper would be a piece of film that changes its chemistry when light hits it. In a video camera the white paper would be a device called a CCD - which stands for Charged Coupled Device. It turns light into an electrical signal.  
The nail hole in the foil is your lens. If you had Al cover it with his finger, that would be the shutter.

P.S. from Jax: A movie camera takes 24 different pictures every second. Thomas Edison figured out the best way to move the film that fast. He punched holes on the edge of the film. They are called sprocket holes.