

LAB: Making a 126 Pinhole Camera

PRACTICAL PHYSICS

Background: Pinhole cameras are a lot of fun, but the typical design require you to use cut sheets of film, load and unload in a darkroom, shoot one picture at a time, and develop and print your pictures in a darkroom. A 126 cartridge pinhole camera is different. You can load and unload the camera in daylight, make up to 24 pictures without changing the cartridge, and have a photo lab develop and print the film. Any photo lab that is equipped for 35mm film can normally develop 126 film, since both are 35mm wide.

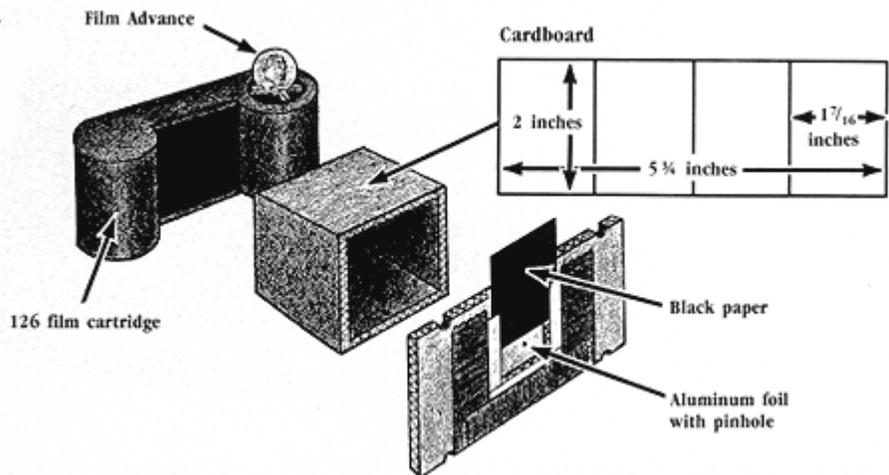
Materials: Here are the materials you will need to make a 126 cartridge pinhole camera:

- ▶ 1 cartridge of 126 "Instamatic" color print film
- ▶ 1 piece of thin black matboard, 1 1/4 x 5 3/4 inches
- ▶ 1 piece of rigid black matboard, 1 1/2 x 2 3/4 inches, with a 1/2-inch-square opening cut in the center
- ▶ 1 piece of aluminum from soda can (1-inch square)
- ▶ 2 strong rubber bands
- ▶ 1 No. 10 sewing needle, black masking tape, and a coin.

Assembling the Camera:

The diagram shows the basic construction of a pinhole camera. The body of the camera is a cardboard box that is open at both ends. To make this box, cut a rectangle of black matboard that measures **5 3/4 inches** by **2 inches**.

Divide the long edge of the rectangle into four equal sections (**1 7/16" each**), as shown. Use your knife to score the cardboard along each of the lines. Fold the cardboard along the scores to make an open-ended box.



Now tape the edges together to make a box, and tape all the box's edges and corners to prevent light from leaking into the camera.

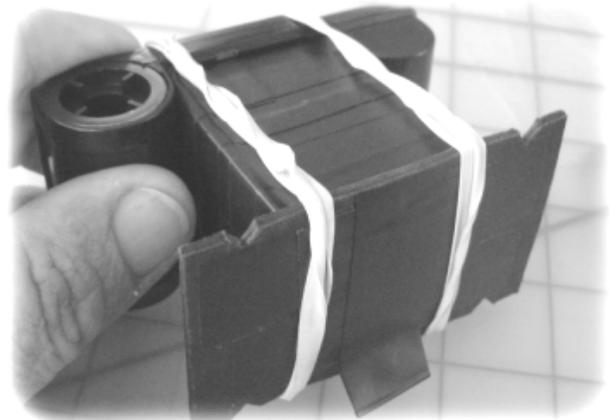
Insert the box into the film cartridge as shown. It should fit tightly. When you hold the open end of the box up to your eye, you shouldn't see any light leaking in where the box fits into the cartridge.

To make the front of the camera, cut a rectangle of cardboard that measures about 1 3/4 by 3 inches. Cut a square hole that measures about 1/2 inch by 1/2 inch in the center of the rectangle.

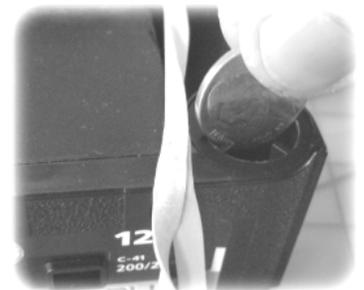


Making the pinhole lens: You will need to cut a 1” square piece of aluminum from an old soda can. Carefully sand both sides of the aluminum until it becomes almost as thin as aluminum foil (this will make the best pinhole lens!)

1. Position the aluminum on a hard flat surface. Get a thin sharp needle and place it on the central area of the aluminum. (*the thinnest point if filed down.*) Holding the pin still and vertical, turn the metal under the pin in one direction until the metal is just punctured. Apply only light pressure to the pin. At this point you will want to use a very fine sandpaper and sand down both sides of the aluminum very lightly to get rid of any ridges.
2. Carefully place the needle into the pinhole you have previously made and rotate it in one direction using the slightest amount of pressure (*you are trying to “clean-up” the pinhole.....do not make it any larger*)
3. Securely tape (using electrical tape) the aluminum pinhole onto the front cover of your camera over the ½” hole you previously cut.
4. Fix a lens cap/shutter over the pinhole made up of some more electrical tape with a tab at the end folded onto itself for easy removal.
5. Use two rubber bands to hold the camera in place.

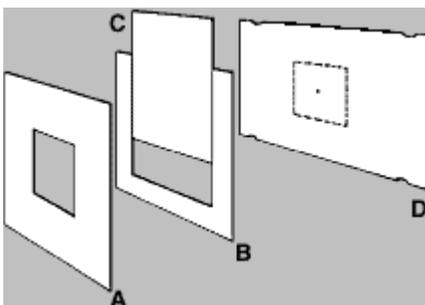


Winding Film: Insert the edge of a coin in the round opening on the top of the film cartridge. To advance the film in the cartridge, turn the coin counterclockwise. The yellow paper (visible in the small window on the label side of the film cartridge) should move. The film has borders and numbers printed on it. Turn the coin slowly until the third and fourth numbers in each series on the yellow paper show in the window. The film will then be in the proper position for picture-taking.



Alternate Shutter: You can make a “more light tight” shutter using the diagram and instructions below.

1. Cut two 1 1/2-inch-square pieces of thin black cardboard. In one piece, cut a 1/2-inch square hole in the center (A). The other piece should be cut to leave a 1/4-inch border on 3 sides (B). This is your spacer.



2. Cut a 1 x 1 1/2-inch piece of thin black cardboard (C). This is your shutter, which should easily slide into and out of the spacer (B).
3. Tape or glue parts A, B, and D together. (Part D is the 2 3/4 x 1 1/2-inch piece of cardboard cut previously to make the lens.)



Taking a Picture: Your camera must be very still while you are taking a picture. Try taping your camera to a table, windowsill, chair, rock, or other rigid surface. Or you can use a lump of modeling clay to mount the camera firmly on a steady support, such as a kitchen stool. Aim your camera by sighting over the top surface. The exposure will start when you peel off the electrical tape lens cover. Exposure times. Sunlight = 4 seconds. Cloudy = 10 seconds. Indoors = 1 minute+.