



How to Make and Use a Pinhole Camera

Can Or Box Pinhole Camera

When you make a pinhole camera to accept roll or sheet film, use a small, light-tight can or box as the camera body.

You can use any can that has a tight-fitting top. A 2-pound coffee can makes a good pinhole camera. You can use a clean paint can, a vegetable shortening can, a peanut can, or even a cylindrical oatmeal box. If the can you use has a plastic lid, you can paint the lid black. Be sure to paint it inside and out; then before using it, check to make sure no paint has chipped off. Chipped or peeling paint on the lid will allow light to enter the camera and ruin your pictures.

Paint the inside of the camera body with dull black paint or line it with black paper to prevent light reflections.



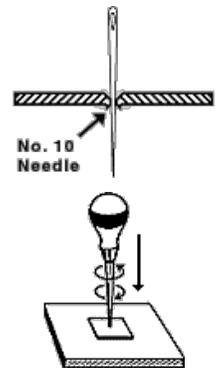
Pinhole camera made from a can.

The Pinhole

With a noncartridge camera, make the pinhole in the end opposite the removable end. It's easier to attach the film to the removable end. You can make the pinhole in the box or the can itself, but it's much easier to make it in a separate piece of heavy black paper or thin metal. Then fasten this piece over a larger hole cut in the center of the permanent end of the can or box. Heavy-duty aluminum foil or the backing paper from Kodak roll film is good for this purpose.

For a camera with the pinhole 3 to 6 inches from the film, you'll get the best results if the pinhole is about 1/75 inch in diameter. You can make a hole this size by pushing a No. 10 sewing needle through the paper or metal to a point halfway up the needle shank. See illustration. You'll get a smoother hole if you rotate the needle as you push it through. If you're using aluminum foil or paper, sandwich it between two lightweight cards while you make the pinhole. This will help you make a smoother, rounder hole.

You can also make a good pinhole in soft aluminum sheet metal. Place the aluminum on a hard surface (such as tempered hardboard). Make a small hole in the aluminum with an awl or an ice pick. Don't press too hard--the tip should just barely break through the surface. See illustration. The hole will be ragged. Enlarge and smooth it by pushing a No. 10 needle into it from the indented side. You can smooth the rough edges with very fine sandpaper and then open the hole with the tip of the needle. You can use the same method to make the pinhole directly in the metal of the can by working the hole through from inside the bottom of the can.



If you make the pinhole in a separate piece of black paper or metal, you should now make a hole 1/4 inch or more in diameter in the center of one end of the camera body. Then tape your pinhole in position over the center of the hole.

You can check your pinhole to make sure it's perfectly round by looking through the back of the camera. To see if the image is clearly visible, aim the camera toward a printed page to determine if you can see the letters clearly.

The Shutter and Viewfinder

The shutter for the camera can be a flap of opaque dark paper hinged with a piece of tape. You can use a small piece of tape to hold the shutter closed while you aren't taking a picture.

A viewfinder for a pinhole camera, while usually not necessary, can be made of cardboard or wire. The larger frame should be slightly smaller than the film size and located directly above the pinhole at the front of the camera. If the film isn't square, the viewfinder should have its longer dimension parallel to the longer dimension of the film. The small frame is a sighting peephole directly above the film and squarely behind the center of the large frame.

When you aim your camera at subjects closer than 5 feet, tip the camera up slightly to allow for parallax--the difference between the view you see through the viewfinder and the image recorded on the film. This effect is caused by the separation between the viewfinder and the pinhole.

Loading a Can or Box Pinhole Camera

You can load the camera either with film or fast photographic paper. Paper is easier to handle since you can load it into the camera under a safelight. If you don't have a safelight, you can work by the light of a flashlight covered with several thicknesses of red cellophane paper placed 6 to 8 feet away. Most film, on the other hand, must be handled in total darkness.

Your choice of film or paper may depend in part on the exposure times. Paper, because it is less sensitive to light than film, will probably require an exposure of about 2 minutes for sunlit subjects. Film may require only 1 or 2 seconds for subjects in sunlight.

If you decide to use paper, try KODABROMIDE Paper F (glossy), No. 2, Single Weight. You can obtain this paper in the 4 x 5-inch size available in 100-sheet packages, or 5 x 7-inch size in 25-sheet packages from your photo dealer (corners may have to be trimmed to fit a cylindrical camera). If you use film, you can cut up a roll of KODAK TRI-X Pan Film or KODAK T-MAX 400 Professional Film, 120 size, into 2 3/8-inch squares or 2 3/8 x 3 1/2-inch pieces. This must be done in total darkness, of course. At night a closet will probably be dark enough if lights in adjoining rooms are turned off. Sheet film, such as KODAK Tri-X Pan Professional Film, is easier to use because it's flat.

A camera made from a 2-pound coffee can will take a 2 1/4 x 3 1/4-inch piece of film or photographic paper. You can use a 3 1/4 x 4 1/4-inch piece if about 1/2 inch is clipped from each corner of the film or paper. A camera made from a 1-gallon paint can will take a 4 x 5-inch piece of film or paper.

When you have the size of paper or film you need, tape it firmly to the inside of the end of your camera opposite the pinhole. The emulsion should face the pinhole. The emulsion side of photographic paper is the shiny side. The emulsion on roll film is on the inside of the curl. Sheet film is identified by notches cut into one of the shorter sides. When you hold the film in a vertical position with the notches in the top edge toward the right side, the emulsion is facing you. Another way to determine the emulsion side of either paper or film is to touch both sides with a moistened finger. The emulsion side will feel slightly tacky. Test near the edge to avoid a fingerprint in the center of the picture. You will need to tape down the four corners if you use cut-up roll film or paper. Taping two diagonal corners will work for sheet film. Close the camera, making sure the shutter is closed.

Exposure

To get clear, sharp pictures, you must keep your camera very still while the shutter is open. Use tape or a lump of modeling clay to hold your camera to a table, windowsill, chair, rock, or other firm support. Lift the black paper to uncover the pinhole and keep the pinhole uncovered for the recommended time. Cover the pinhole with the black paper between exposures.

The following table gives exposure recommendations for a can or box pinhole camera. These recommendations are approximate. It's a good idea to make three different exposures for each scene, as explained above, to be sure you'll get a good picture.

KODAK Film or Paper	Bright Sun	Cloudy Bright
TRI-X Pan, T-MAX 400, or ROYAL Pan Film 4141 (ESTAR Thick Base)	1 or 2 seconds	4 to 8 seconds
T-MAX 100 Film	2 to 4 seconds	8 to 16 seconds
KODABROMIDE Paper, F2	2 minutes	8 minutes

Processing and Printing

Print film negatives in the usual way. If you use KODABROMIDE Paper to make your picture, make the camera exposure long enough to allow the resulting paper negative to be a little darker than an ordinary photographic print. Dry the paper negative and make a contact print from it in the normal way, with the emulsion (picture) side of the paper negative toward the emulsion (shiny) side of the printing paper.

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