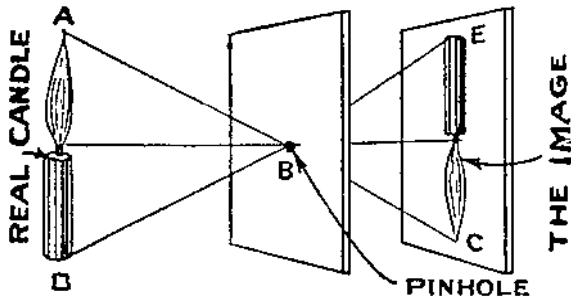


## Instructions for Making a Pinhole Camera

(Guided with adult supervision)

### How It Works:



Light always travels in straight lines. When light bounces off an object and passes through a small hole into a dark space, it creates a projected image of the object that is upside down and backward. A light sensitive sheet of paper or film can capture the projection creating an inverted image. This same principle is used in all cameras, but most use a lens that focuses the image and reduces the exposure time. A pinhole camera is more basic, and tends to have longer exposure times with softer looking images. They can produce interesting effects both because of the long exposures and because the tiny aperture produces a greater depth of field (meaning that objects at different distances are in equal focus). If using a round tin or container, there will also be an interesting effect of straight lines appearing curved because they have been projected onto a curved image plane.

### What You Will Need:

- Box or tin with a tightly-fitted lid
- Scissors and/or utility knife
- Aluminum foil
- Pushpin or sewing pin
- Black masking tape
- Black paint
- RC black and white photo paper
- Darkroom with sink, trays, and chemistry for processes black and white photo paper
- Sheet of glass or contact printing frame



**Step 1:** Seal up any gaps or loose seams on your box with tape.



**Step 2:** Paint interior with black paint.



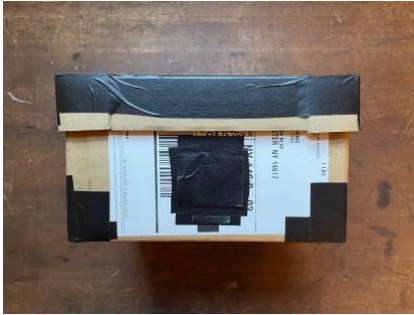
**Step 3:** Cut a small hole on one end of the box. (Skip this step if using a tin.)



**Step 4:** Make a hole in the aluminum foil with a pushpin. If using a tin, hammer or firmly press a small hole into the metal and sand the inside smooth. The smaller the hole, the sharper the image!



**Step 5:** Tape the foil with the pinhole over the small opening in your box. (Skip this step if using a tin.)



**Step 6:** Make a shutter for your camera from a flap of foil or board.

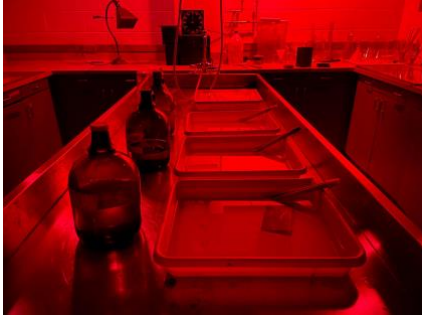


**Step 7:** In a darkroom under safe lights, tape photo paper into the box across from the pinhole. Make sure the shutter and camera are closed before leaving the darkroom.

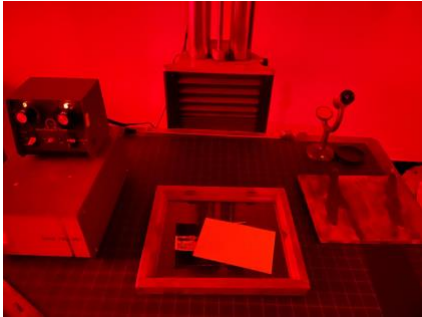


**Step 8:** Make your exposure by opening and closing the shutter. Because the size of the pinhole and camera change exposure times, it will take some experimentation to find the amount of time that works best for your camera under different lighting conditions. You can use this table as a starting point, adding more time if your negative is too light and less time if your negative is too dark.

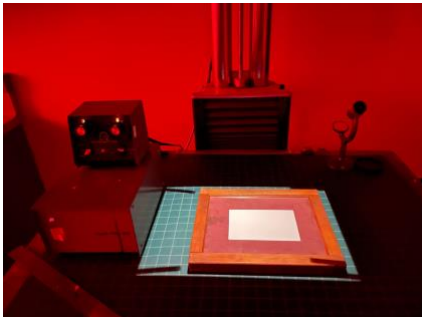
Lighting Conditions	Exposure Time
Outdoor: Very bright, full sun	10–30 Seconds
Outdoor: Bright, slightly overcast	1–5 Minutes
Outdoor: Very cloudy or in shade	5–15 Minutes
Indoor: Very bright	10–30 Minutes
Indoor: Average	30 Minutes–2 Hours
Indoor: Low light	Several Hours



**Step 9:** Process your paper negative in the darkroom following instructions for your chosen paper and chemistry.



**Step 10:** After the negative has dried, place the image side against unexposed photo paper. Use a contact printing frame or sheet of glass to keep them in close contact.



**Step 11:** Make a test strip to figure out your exposure time, and then make a positive print. We're using an enlarger, but other even light sources would work as well.

