

CAMERA OBSCURA

Camera obscura is a Latin phrase that means “dark chamber.” People have been using camera obscuras since the second half of the 16th century. They were originally used as aides for drawing and painting and as a way to observe the sun without looking at it directly. Over time, they evolved into modular boxes that could capture the exposed image on light sensitive material. This—as I’m sure you’ve guessed—led to the development of the first photographic cameras in the early 19th century.

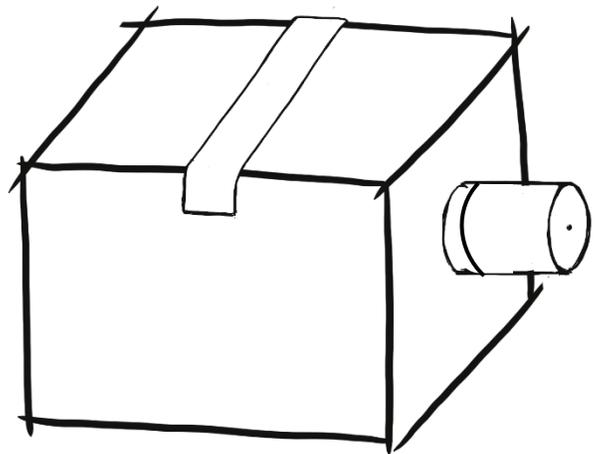
You can build your own camera obscura out of a few simple household materials.

WHAT YOU’LL NEED:

cardboard box
empty can (like a soup or vegetable can)
hammer
nail
piece of tracing paper
tape
scissors

WHAT TO DO:

- Use tape to cover any areas of the cardboard box where light could get in, especially the corners.
- Next, use a hammer and nail to puncture a hole in the bottom of an empty can.
- Trace the open end of the soup can in the middle of one of the smaller sides of the cardboard box.
- Then, cut out the circle along the traced line.
- Cover the open end of the can with a piece of white tracing paper, and use a rubber band to hold it in place.
- This next step is one of the trickiest steps in the construction. Take the tissue paper-covered end of the can and insert it into the hole in the cardboard box. Seal it with tape to make sure it’s a snug fit and no light gets inside.
- Cut a hole on the opposite end of the box large enough for your eyes to easily look in and see the tissue paper.
- As you look inside the box, it should appear dark. If you find that too much light is getting in, you could use some extra cardboard to make a visor around the viewing area.



Now, it’s time to take it outside and try it out. The key to making your camera obscura work to its fullest potential comes in either using it outdoors on a sunny day, or using it to look at something that’s very well-lit, preferably with a lot of natural light!

WHAT'S GOING ON:

The light travels into the camera only through the tiny hole that's in the can. This is similar to how light enters our eyes or a camera. However, both our eyeballs and cameras have lenses covering the openings through which the light enters.

Did you notice that the projection inside your camera obscura was upside down? This is because light rays travel in straight light until they hit something. When they do, some of that light bounces off and is reflected back in the opposite direction and angle from the point of impact.

Reflected light from the top of the object you were looking at passes through the hole in the can, continues in a straight line, and ends up on the bottom of the paper membrane.

The reflected light from the bottom of the object ends up on the top of the paper membrane, flipping the image upside down.

The paper membrane is like the retina of your eye in some ways. They both capture information from the light. However, your brain flips the upside-down image right side up making it appear how we are used to seeing the world.

