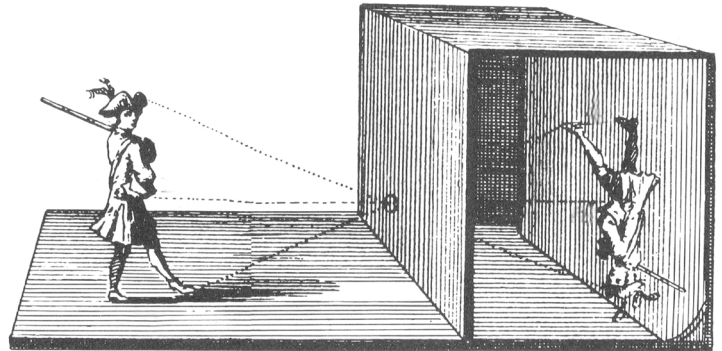


HOW TO TURN A ROOM INTO A CAMERA OBSCURA

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What is a camera obscura?

A **camera obscura** is an optical device that makes a projection from the light entering a darkened space through a small hole (or **aperture**). Inside the camera obscura, viewers will see whatever happens to be in front of the aperture, the only difference is that the projection looks upside down and backwards. Before photography, the camera obscura was used to more perfectly illustrate images, as one could trace what appeared projected on the wall.



You will need:

- a room with a window that lets in a lot of natural light
- material (cardboard, black trash bags, fabric, etc.—something you can poke a hole in) to block out light from all windows
- duct tape or painter's tape
- pin

Optional (see Tips):

- blade or scissors
- washers

Steps

1. Tape your light-blocking material over all windows in the room.
2. Once the room is free of light from outside, use the pin to poke a small hole in the material over one of the windows.
 - a. Start small (a couple millimeters), let your eyes adjust, and see how the image looks.
 - b. The size of the hole will determine how well the image appears. If you make the hole too big, just cover it with tape and start again.
3. Turn off any lights so the room is completely dark.
4. And that's it! The image will not be very bright. Be patient and let your eyes adjust to the dark. You should see the view outside projected onto your walls, upside down and in reverse.

Tips

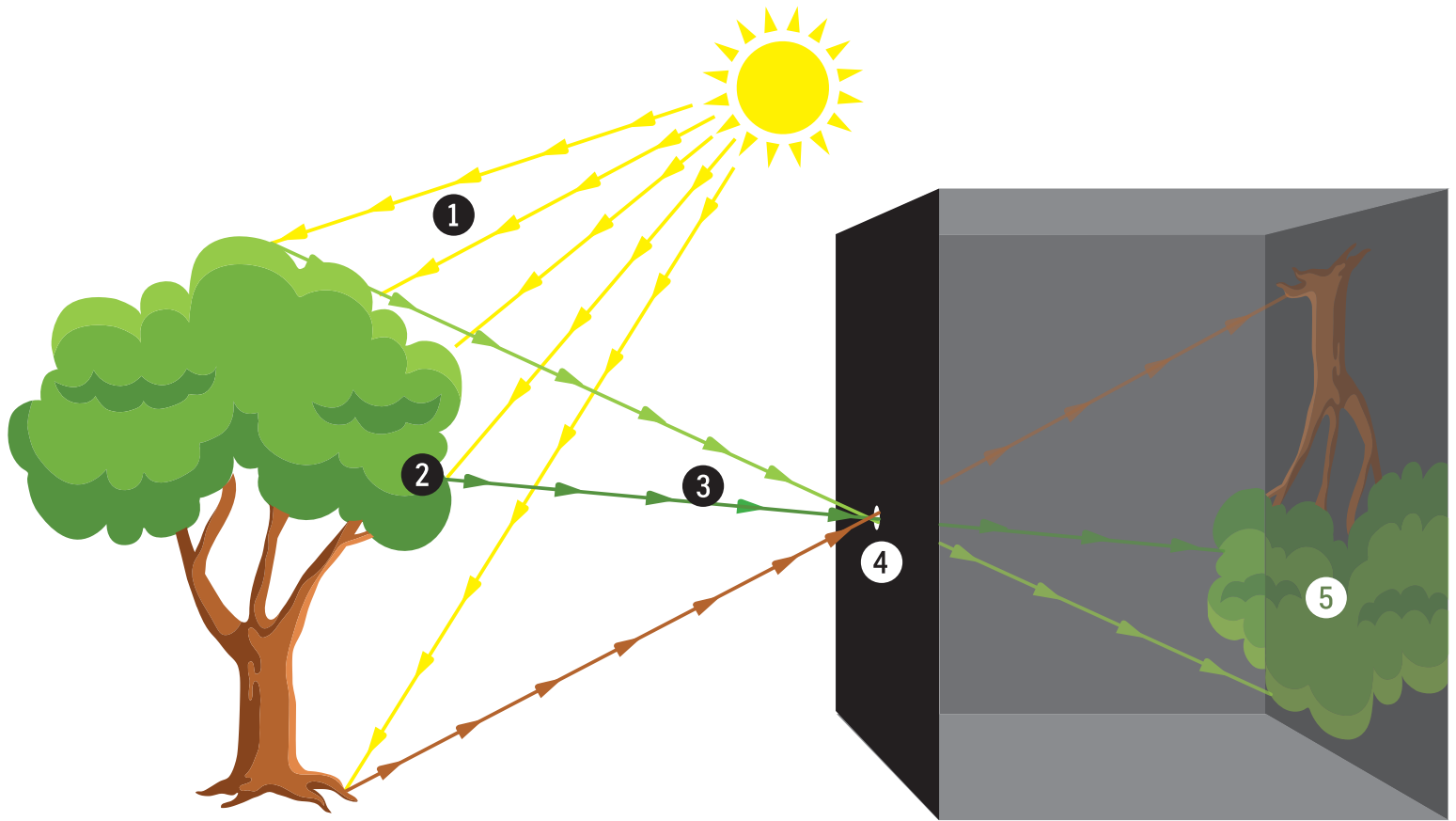
For a clearer image, use a north-facing window and wait for a bright, sunny day.

To make a better aperture, use a washer and cardboard to create a sturdier hole. After Step 2:

1. Trace around the inside and outside of the washer onto a small piece of cardboard.
2. Cut out the inside circle.
3. Tape the washer to where it was traced on the cardboard.
4. Tape this piece over the hole in the material so that the light comes through the washer.

WHAT'S GOING ON INSIDE (AND OUTSIDE) YOUR CAMERA OBSCURA

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1. Light always travels in straight lines (called rays).
2. Light rays change direction when they bounce off an object.
3. The light rays that bounce off the object also move in a straight line.
4. When the rays pass through a small hole (aperture) in the wall of a dark room or box . . .
5. . . they appear as a picture that is upside down and backwards.

Did you know? _____

You see the same way a camera obscura does. Your eyes see things upside down and backwards, too. Your brain flips the picture over for you.