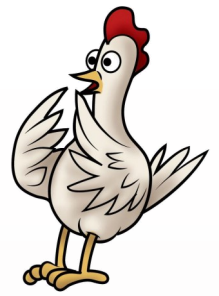




## Pinhole Camera Instructions



### Objective

To discover how a pinhole camera is similar to how human eyes work.

### Materials and Equipment

Remember, when asking your parents about starting this activity, materials are items you are going to use up, or change in some way. Equipment is something you will use and return to where you found it. It's important to always tidy up after yourself!

#### Materials

- Empty cylindrical chip can (i.e. Pringles)
- Masking or duct tape
- Aluminum foil
- Wax paper



#### Equipment

- Ruler
- Felt marker
- Utility knife or scissors
- Thumbtack or pushpin



### Before you Start

Since this activity involves cutting, and the [Safety Wranglers](#) motto is to: **Learn Safe, Work Safe & Play Safe...** Do your parents know what you're making? Do you feel comfortable and confident to use all the equipment required? If not – ask for a training lesson! Your parents would much rather you ask for help first, than come to them later with an injury!

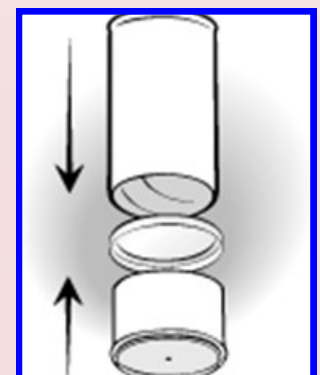
## Let's Get Started!

**Step #1:** Take the plastic lid off the chip can/cylinder and clean it. Save this lid! It will be the screen for your camera.

**Step #2:** Measure 5 cm up from the bottom of the can (starting where the metal is) and draw a line all the way around the can at this point. You may need an adult to help you cut this so that it is relatively straight.

**Step #3:** The shorter bottom piece has the metal end. With the pushpin, make a small hole in the centre of the metal. The smaller the hole, the sharper your images will appear.

**Step #4:** Put the lid onto the shorter piece of tubing. Place the longer tube section back on top and tape all the pieces together. If your lid is clear, you may need to apply a circle of wax paper to act as a screen.



**Step #5:** Use aluminum foil to keep the light out of the tube. Take enough foil to wrap around the tube twice, then tape the loose edges down. If there is extra foil at the top, just tuck it neatly into the tube.

**Step #6:** Go outside on a **sunny** day. Close one eye and hold the tube up to your other eye, looking into the big open end (not the pinhole). You want the inside of the tube to be as dark as possible, so you may need to cup your hands around the opening.

**Great Idea!** Another family discovered that using a soft-drink foam 'coozie' sleeve (not the neoprene) worked really well to keep more light out. It's also helpful for people with glasses!

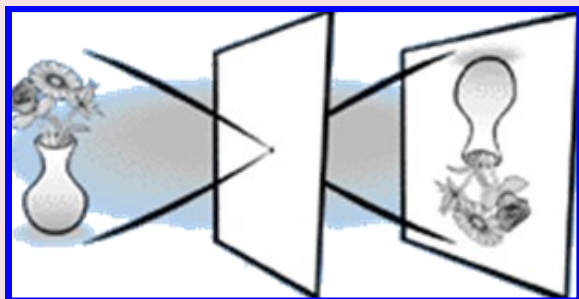


Credit to: [http://www.exploratorium.edu/science\\_explorer/pringles\\_pinhole.html](http://www.exploratorium.edu/science_explorer/pringles_pinhole.html)

**You have just made a camera!** This type of device was an important start to the camera technology we see today. Your camera doesn't have film, but these can be outfitted with film to capture images. Try experimenting with a magnifying glass to see what changes!

Did you know that your pinhole camera mimics what our eyes do? Light reflecting off of the items is formed into an image on the screen/retina. The difference with our eyes is that our optic nerve sends the information to our brain, which basically 'flips' the image once again so it makes sense to us. Thankfully, we also have a cornea, lens, iris and vitreous humor to help us focus on items near and far and to let the right amount of light in. I hope you'll keep learning about how our eyes truly work and why it's important to protect them!

**What your pinhole camera 'sees':**



**What your eyes 'see':**

