Constructing a Pin-Hole Viewer

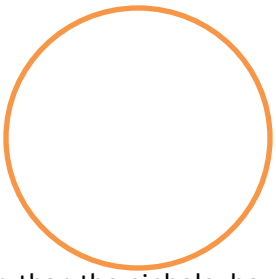
Background Information: Light travels in straight lines. This enables scientists to predict it's behavior during reflection and refraction. Many instruments and devices make use of this property. In this investigation, you will construct such a device.

Problem: How does a pin-hole viewer work?

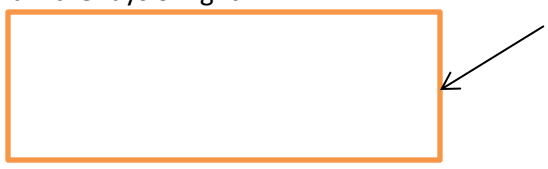
Materials: Small can or mailing tube, Rubber band or masking tape, Piece of waxed paper or tracing paper slightly larger than the open end of the tube or can, small light bulb, Aluminum Foil.

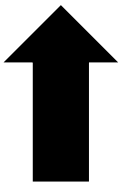
Procedure:

1. Place the piece of translucent waxed or tracing paper over the open end of the can or tube, and use a rubber band or tape-it to fasten it in place.
2. Tape some aluminum foil over the other side of the can or tube. Poke a pinhole in the middle of the foil.
3. Point the tube or can, (pinhole side), toward a brightly illuminated scene, such as a light bulb. Position the viewer so that an image of the light bulb is clearly seen on the translucent paper. Light enters the pinhole and falls on the tracing/wax paper. Observe the image of the scene on the tracing paper.
   a. Is the image on the screen upside down (inverted)?
   b. Is the image on the screen reversed left to right?
   c. Sketch the image in the Circle:



   d. If the lighted image is so much larger than the pinhole, how is it that the image is formed on the translucent screen. Draw what you think is the path the rays of light take from the lighted object to form the image on the translucent screen. (Use a straight edge when you draw the rays of light.





   e. Next to your pinhole, poke another pinhole 2 cm to the right. Observe the images. How are they different? (Use the resolution term in your answer)

   f. Find a group that has a longer tube. How does their image differ from yours?