

Pinhole Cameras: Exploring Light and Darkness, *Elective 2*

AUTHOR:	Daniel Abramson
SUMMARY:	Participants will learn about the science of seeing and miracle of light by making a simple camera from an empty paint can. - <i>Submitted by Daniel Abramson</i>
TOPICS:	Science, Visual Arts
LEARNING OBJECTIVE:	This program aims to show counsellors how they can bring a bit of magic to camp through a really cool mix of science and some retro photography. Campers will experience awe and wonder as they watch images appear on the paper in the darkroom.
AUDIENCE:	This workshop is best with a small group of older campers. The amount of participants will depend on the space available in the darkroom.
LENGTH:	75-90 Minutes
MATERIALS:	<ul style="list-style-type: none"> • Ilford Black and White Miltigrade paper, 3x5 100 sheets • 500ml developer • 500ml stop bath • 500ml fixer • 8 developing trays • 6 tongs • Red safelight • empty paintcans - 1 per participant • string • clothespins for hanging prints to dry • 1 roll black electrical tape • 1 box of plastic pushpins

Session Description:

For this program, you'll need to know a bit about black and white photo processing. It is surprisingly easy once you know what to do. They chemistry and paper are widely available at specialty photography stores. Ask around to find someone who can show you what to do. If you can't find anyone, there are many great sites online that can help. It will take a little experimenting at camp, but once you get the hang of it you'll be able to estimate the exposure times fairly well.

**Note that in this workshop participants will be making paper negatives. If you have time, it is amazing to take these images and make contact prints of them to create positive images. Alternately, when the prints are dry you can scan them and use photoshop to invert the images and then print them for participants. You can download a PDF with many helpful tips here:

<http://www.ilfordphoto.com/webfiles/200629187211322.pdf>

Ahead of time:

Prepare the developer, stop bath and fixer solutions according to the labeled instructions.

5 Mintues (Miracles and the scientific method)

Facilitator will introduce Einstein's quotes:

"There are only two ways to live your life.

One is as though nothing is a miracle.

The other is as though everything is a miracle." -Albert Einstein

“The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when one contemplates the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity.” -Albert Einstein

Facilitator will ask participants to think of something outside that they can take a picture of that they are curious about. Facilitator explains that the scientific method is a process of approaching our curiosity and seeing the world with more clarity and focus...just like photography.

15 minutes (Making the camera and exposing the image)

Make a tiny hole in the empty paint can with a small drill bit or with a pushpin.

Cover the hole with a small piece of black electrical tape

In a darkroom, or in a darkbag use painters tape to stick the photo paper to the inside of the camera, directly opposite from the hole.

Put the lid back onto the paint can securely

Bring the loaded camera outside and place it on a sturdy surface pointed towards something you want to capture on film.

Peel back the electrical tape to expose the pinhole and expose the film for 30 seconds to 2 minutes.

5 minutes (Introducing Jewish text)

In the dark, the facilitator explains a prayer that we recite in the morning as the sun rises, “Yotzer Or”.

חֲשֵׁךְ וּבֹרָא אֹר יוֹצֵר, הָעוֹלָם מֶלֶךְ אֱלֹהֵינוּ. אֵתְּהָ בְרוּךְ,
הַמְּאֹרֹת יוֹצֵר, אֵתְּהָ בְרוּךְ. הַכֹּל אֵת וּבֹרָא שְׁלוֹם עֲשָׂה

Translation: Blessed are you, LORD our God, King of the universe, who forms light and creates darkness, who makes peace and creates all things. Blessed are you LORD, who forms light.

20 minutes (Developing the film)

In the darkroom, with a red safelight, open the can and remove the exposed paper.

Put the paper into the developer for about 90 seconds.

Remove it from the developer and place it in the stop bath.

Move the image from the stop bath into the fixer and let it soak for 3 minutes.

Rinse the print in running water for 5-10 minutes

10 minutes (Gallery walk and wrap-up)

Participants line up their prints and take turns telling the other participants about them. Facilitator asks participants to consider Einstein’s quote about miracles and asks participants if there were any miracles during this program.

Additional Notes for Bringing it Back to Camp: This program requires some knowledge of black and white photography, and access to a space that can be used as a dark room.