Poster Board Pinhole Camera Template
Instructions
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IMPORTANT:
This template is for Letter sized paper (8.5" x 11"). It's also for poster board which is around 21 7/8" x 28", but can be off by around 1/4" in either dimension.

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What's a pinhole camera?

A pinhole camera is a box in which images of the outside world are projected onto a screen.
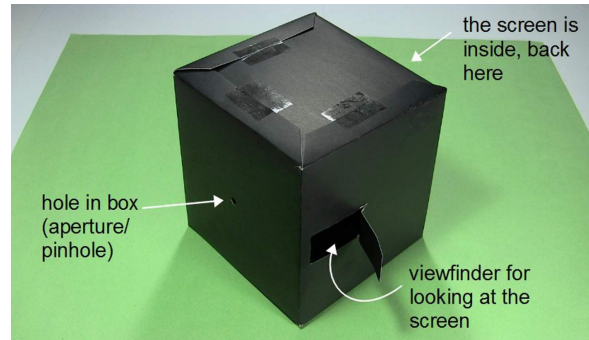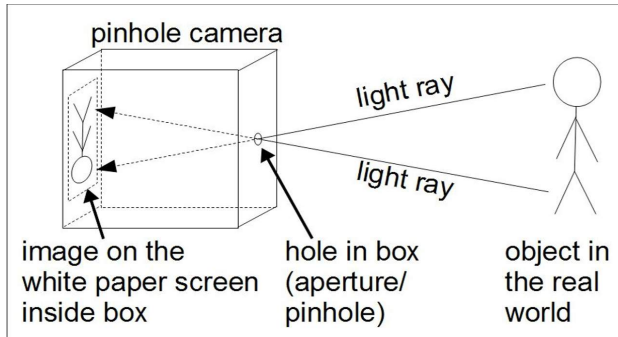
The images enter the box from a small, round hole. In camera terminology, this hole is called an aperture but here it's also called the pinhole. However, the hole is only the size of a pin if the object which you're looking at is very, very brightly lit, like the sun. Otherwise, a good size hole is around 1/4" (6mm) in diameter.

What's a poster board pinhole camera?

The poster board pinhole camera is a pinhole camera made from a single, inexpensive sheet of poster board (also known as bristol board). Poster board can be found in art stores, or in many stores which have school or art supplies such as dollar stores, discount stores and stores like Walmart, Staples, ... They usually cost around $1 (USD).

Make sure they are around 21 7/8" x 28". I found that the sizes may differ if you buy them in different stores or at different times. If they differ by only around 1/4" then you should be okay. If possible **get black poster boards** -- the image on the screen will be brighter.

This low price is great if you're making a lot of them for teaching a class or giving a workshop for kids. They're affordable enough that everyone can make their own! Whereas other ways would involve finding enough shoeboxes or other premade boxes for everyone, not always easy to do. In fact, I had to teach just such a class and so had to come up with this inexpensive approach.

Why have a template?

My class was projected to have up to 50 kids aged 8-15 and the pinhole camera portion of the class was only 1 1/2 hours long. So they had to be easy and fast for the kids to make. I figured that I could at least have all the lines drawn on the poster board and the kids could then cut them out and fold and tape them together. You might also want to cut the aperture hole and viewfinder ahead of time since they may be too hard or dangerous for younger kids to cut.

But measuring out the lines on all 50 would have taken forever. So I came up with this template which I could just trace out.

What you get: template and screen

The template is in the file:

      poster-board-pinhole-camera-template-v1.pdf

You'll need to print it out. It's intended for Letter sized paper (8.5" x 11"). If you're going to be doing all the drawing onto the poster board then you'll need to print only one of these.

The screen is in the file:

      poster-board-pinhole-camera-screen-v1.pdf

You'll need to print it out. It's intended for Letter sized paper (8.5" x 11"). There are two screens per paper so enough for two pinhole cameras. That means you'll need to print out only half as many as the number of pinhole cameras you and the kids will be making (if you're making 50, then print out 25 of these, though maybe a few extra just in case some get wasted). If you're printing them at a store or printing shop then look around for a cutting board to cut them out. That's faster than using scissors later.

Cutting out the template

The following is what the template looks like when finished.
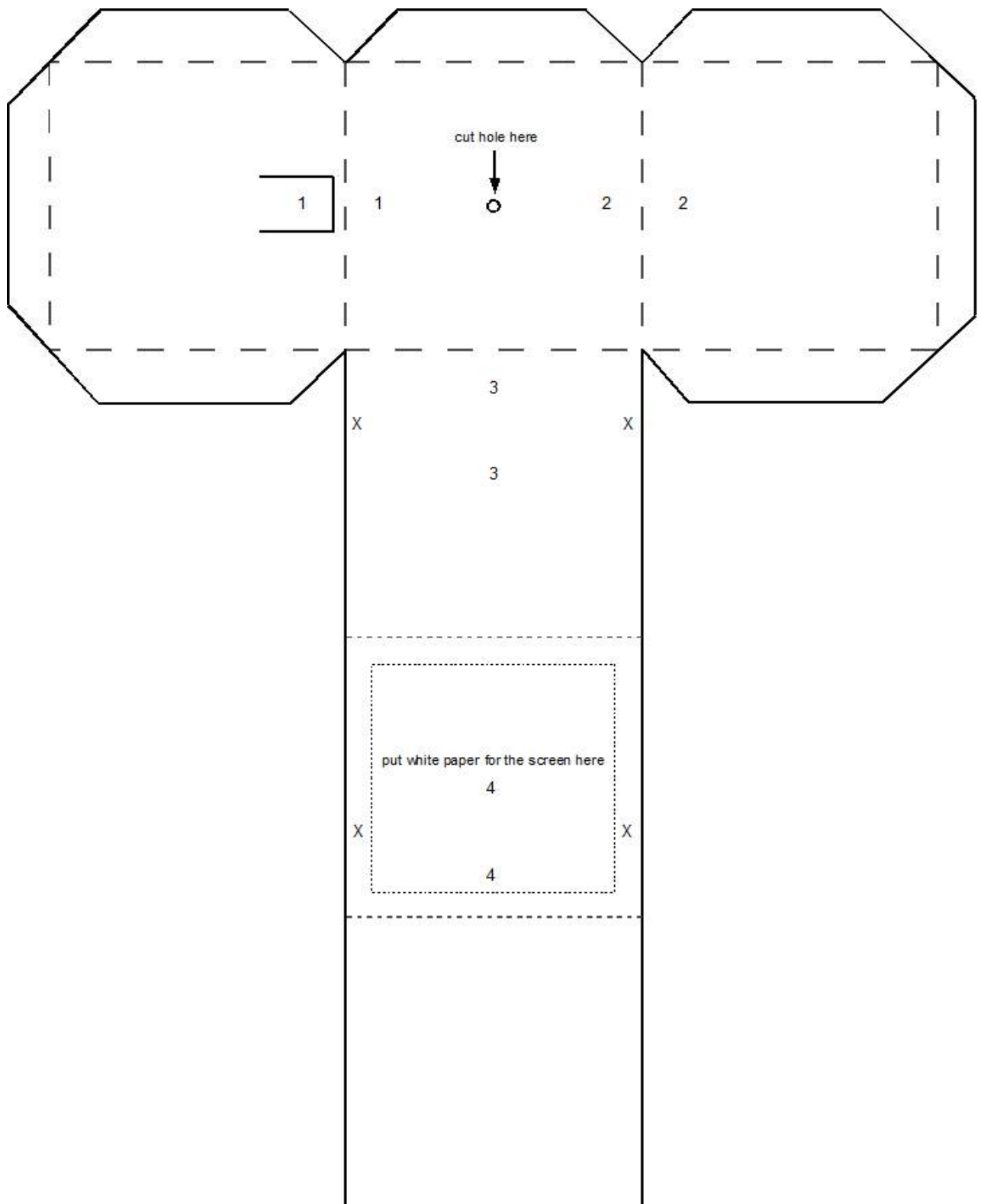
You'll be cutting the solid lines and folding on the dashed lines, but don't do that yet.

Step 1. Do the following trimming of the two pages shown here. Cut where the red lines are shown and throw away the sections that are colored in green.

For the cuts that go through the X's the idea is to cut across the middle of the X's. Everywhere else, the cuts don't have to be precise. The reason for cutting precisely across the middle of the two X's is that you'll be lining their centers up with the centers of some other X's when taping it all together.

The remaining cuts don't have to be precise. Just make sure that where there are solid black lines, that you cut at or across them. There's plenty of black line to spare since there is plenty of redundant drawing on all the sheets.
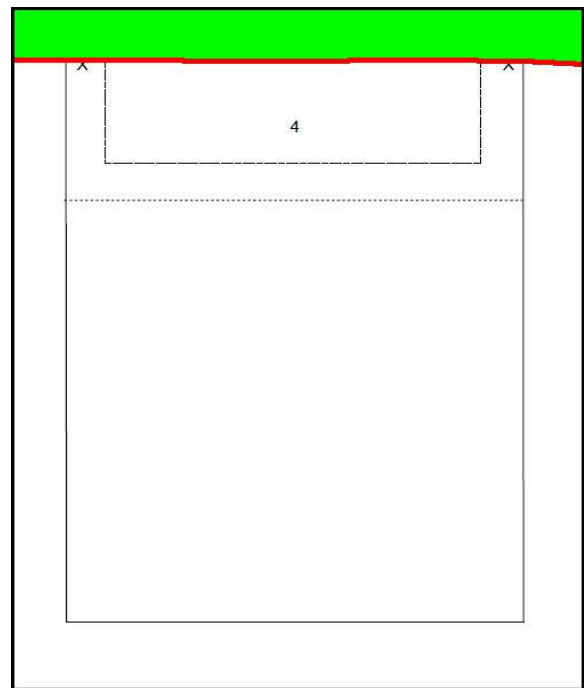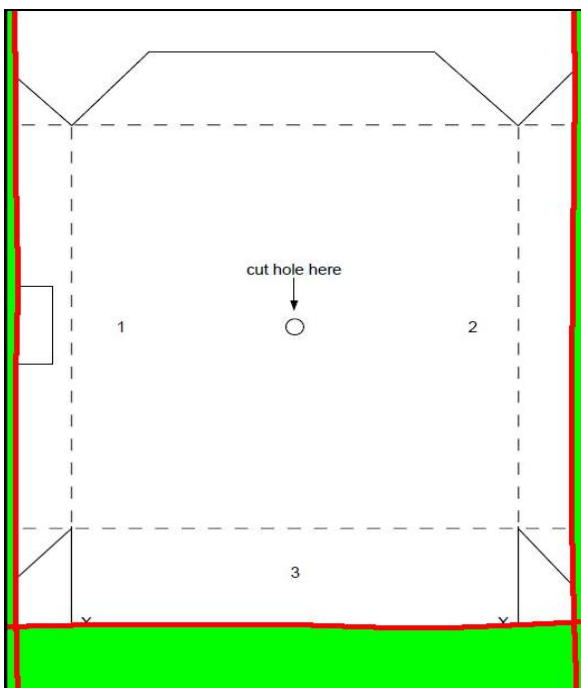
Step 2. Overlap and tape the pages together as shown below. You'll basically be placing the two which you trimmed in step 1 (shown in blue and purple below) onto the others, lining them up using the various lines and X's.

cut hole here

1   1   2   2

3

X   X

3

put white paper for the screen here
4

X   X

4
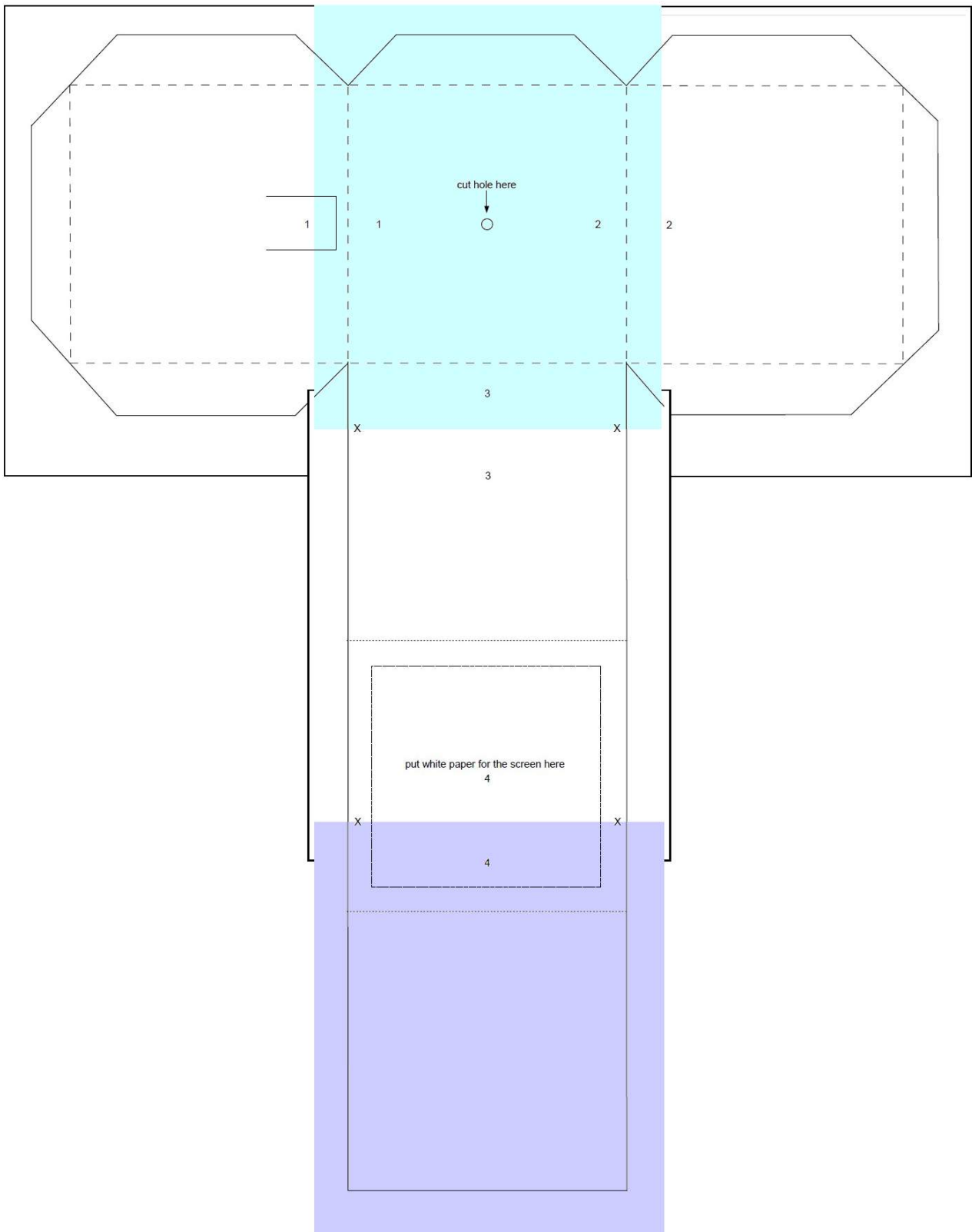
Step 3. Cut out along the solid lines. Also cut out the circle pointed to by the text "cut hole here".

And cut out the three lines for the viewfinder which are on the top left page. Make those cuts wide so that you'll be able to fit the tip of a pencil in the cuts for tracing out where the viewfinder should go.

The result should look like this:
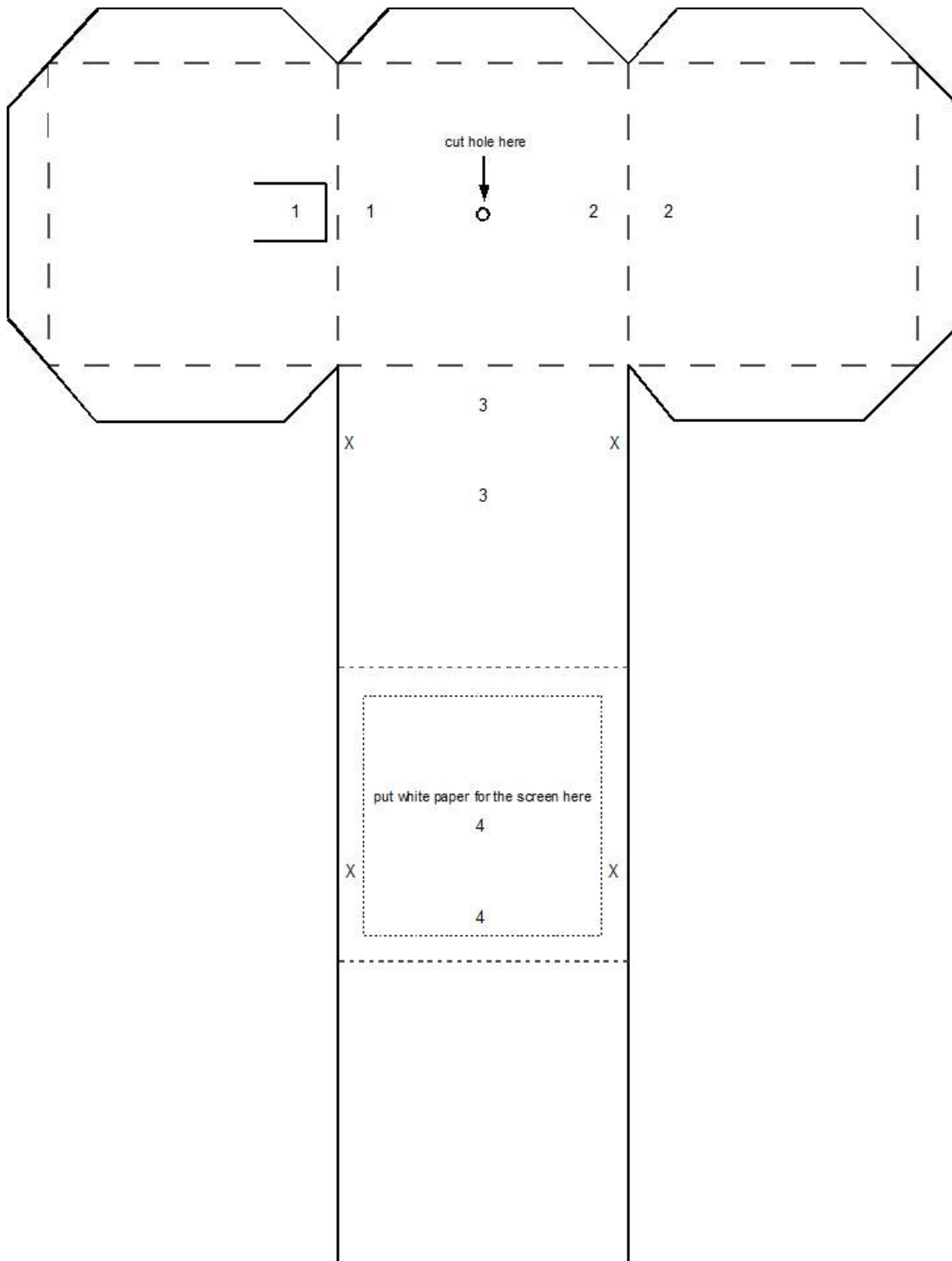
Step 4. Put the template on the poster board. Note that I've found that the poster boards are not always the same dimensions (21 7/8" x 28"). Luckily the dimensions of the tabs aren't important. So it's okay is the tabs extend past the poster board.
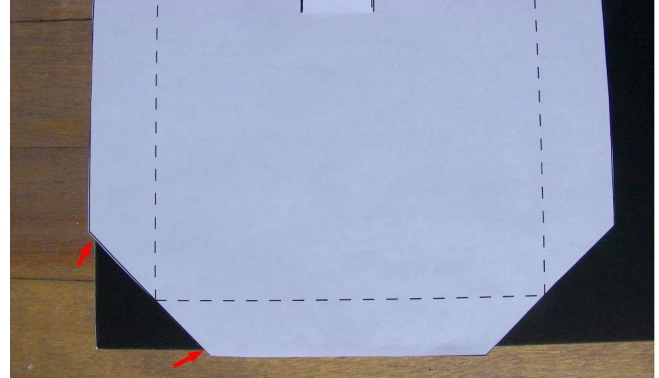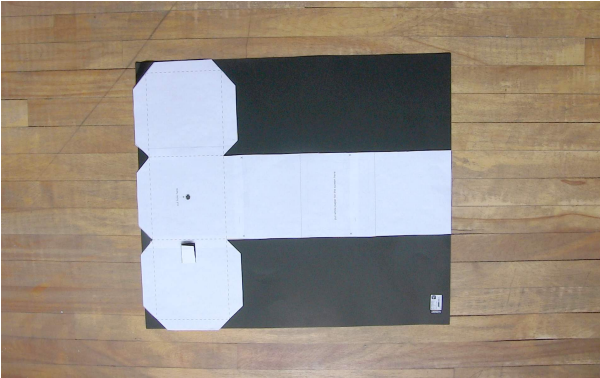

Step 5. Use the template to trace onto a black (preferably) poster board. I use a white colored pencil for this since it shows up well on the black poster board but anything will do, it just may be harder to see.
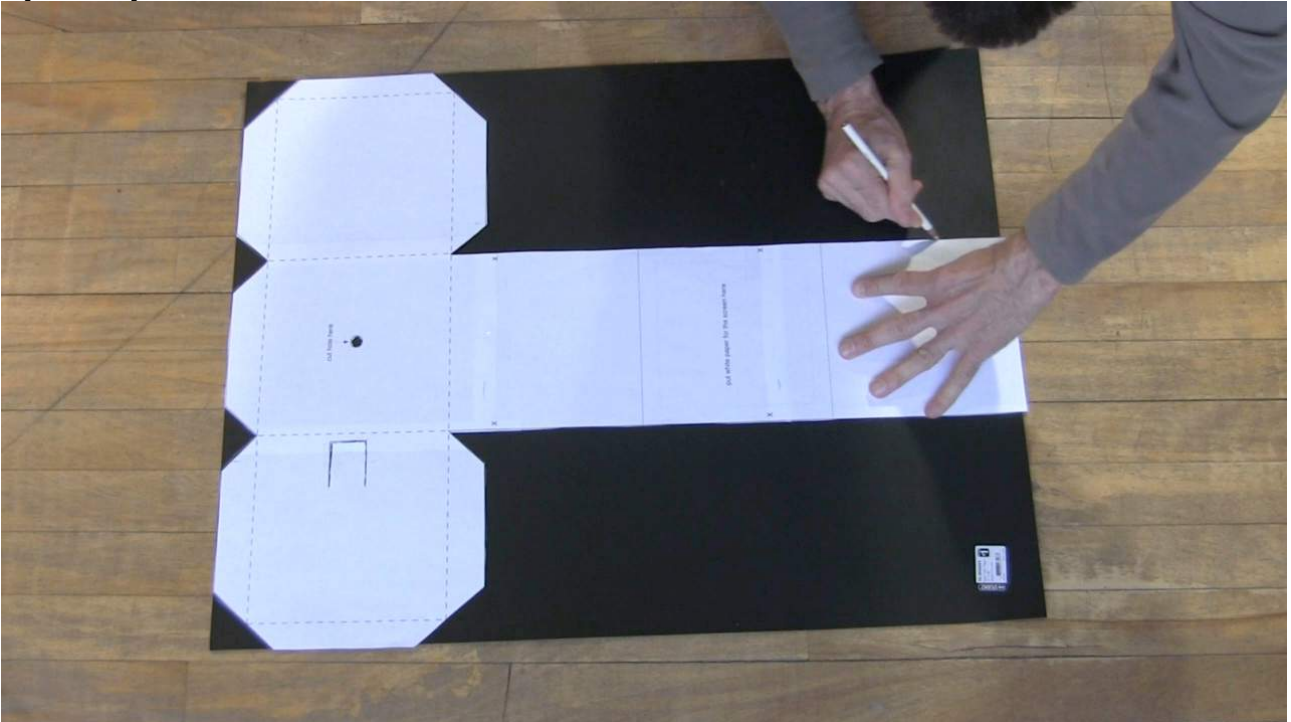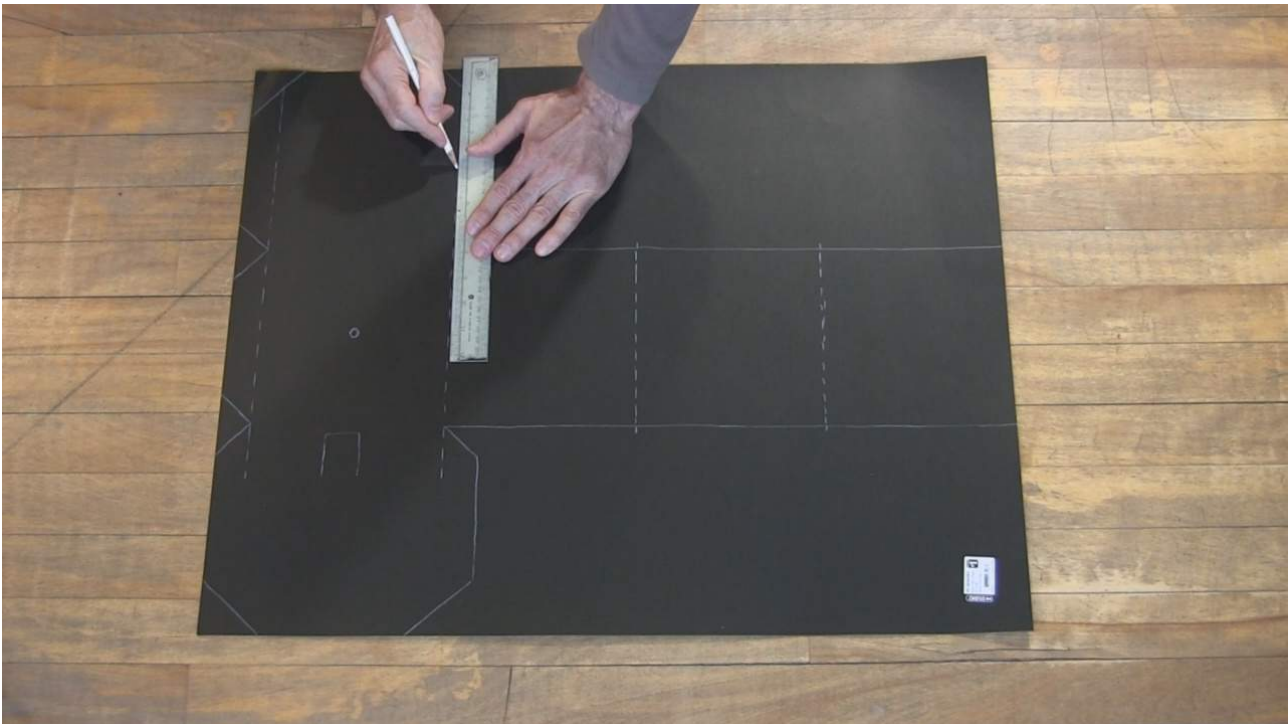

After tracing the outline, don't forget to trace the hole (aperature/pinhole) and viewfinder.
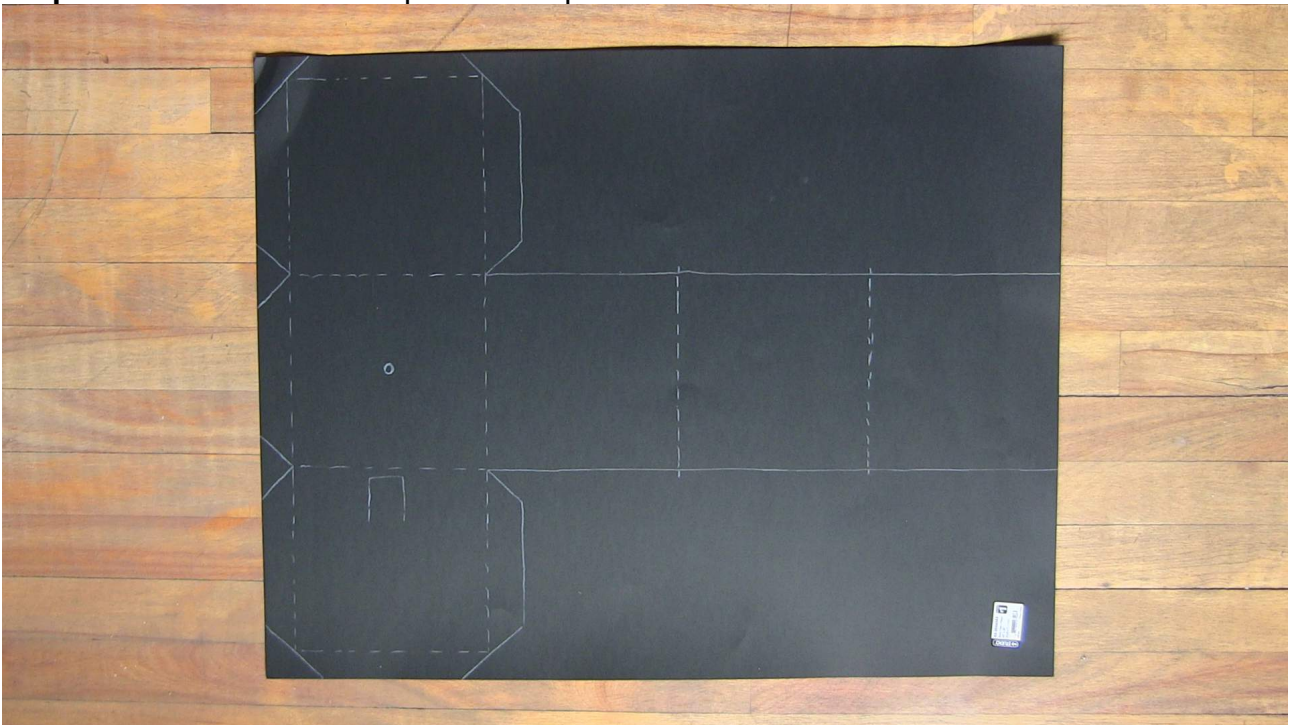
Also, make marks at the locations shown in order to make it easy to draw the dashed lines.
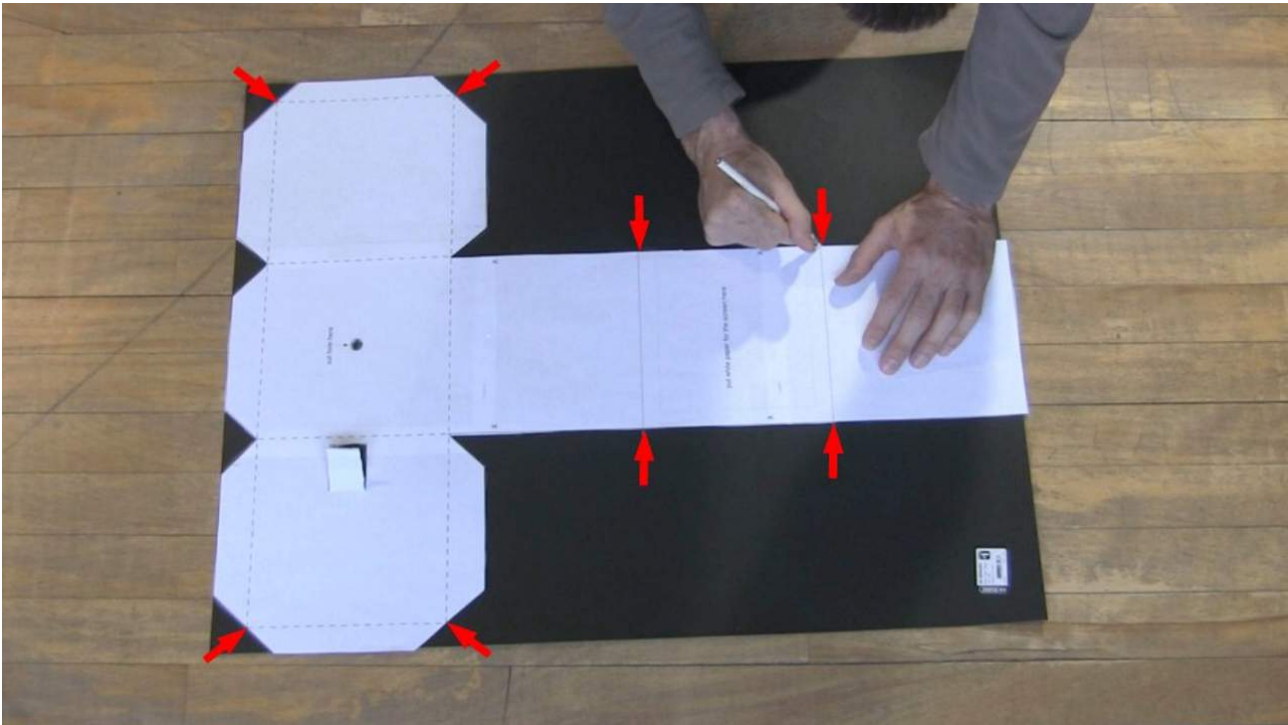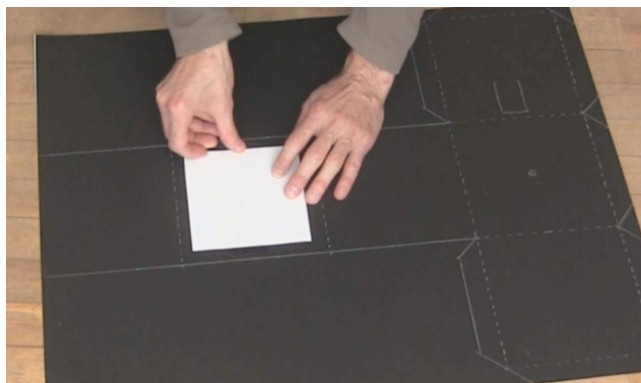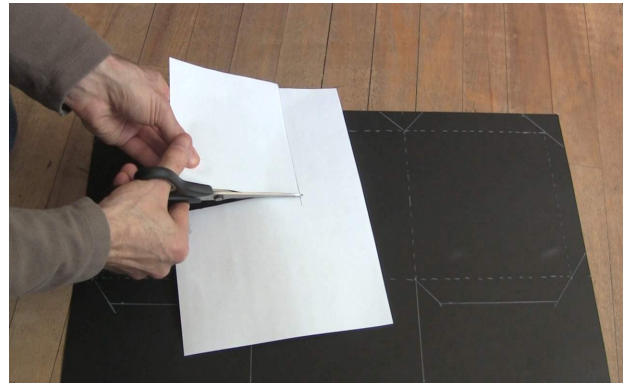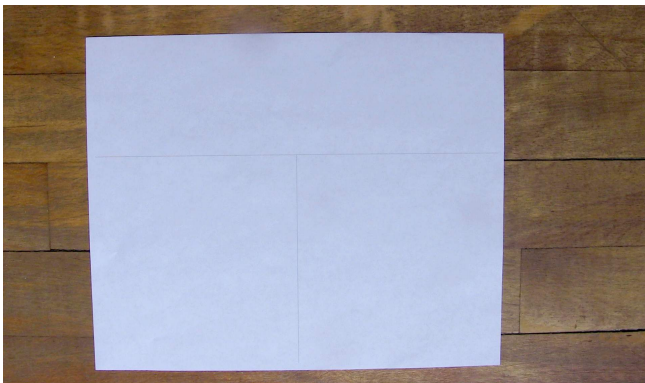

Then draw all the dashed lines. I use a ruler for that but anything with a straight edge will do.

Step 6. That's all for the template! Your poster board should now look like this.

Step 7. The pages you printed also included a page with two screens on it. That's enough for two pinhole cameras. Cut one out and tape it to the middle of the square where the template tells you to.

Step 8. The next step is to cut it all out, fold it, and tape it together as a box. For that I have a webpage and a video that both show how to do all that and also show how to use the pinhole camera. Here's a short version of the link:

https://tinyurl.com/y9bpwyps

and here's the original longer one:

https://rimstar.org/science_electronics_projects/how-to-make-pinhole-camera-from-poster-board.htm

NOTE: In step 4, I showed what to do if the poster board is slightly off in its dimensions. In the video and on the webpage I give a different solution to that problem. But that's because the video and webpage don't start with a template for drawing onto the poster board. Instead, they measure everything. A template makes handling this problem much easier.