



The Adventure of Photography

Instructions for Making a 4x5 inch Cardboard Pinhole Camera

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Tools

You need these tools:

- 1/16" ruler
- cutting knife
- sharp #2 pencil
- cutting board



Material

You need this material:

- 4 pieces of matboard, **black on one side, gray on other**

They should be cut to the following measurements:

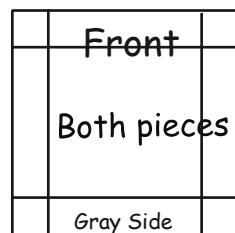
- 1 piece: 5"x18 1/4"
- 2 pieces: 8 1/4" x 9 1/4"
- 1 piece: 4"x5"
- 2 pieces of cardboard, 1/2" x 24"

FIRST STEP: Measure and Draw Pencil lines on *GRAY* side of each Mat board



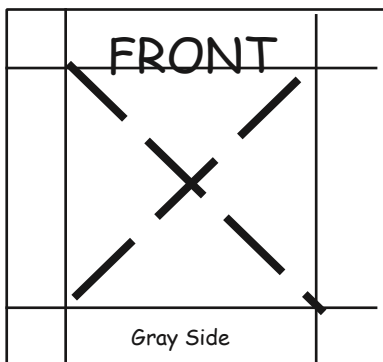
Measure

Draw a 2" border around each 8 1/4" x 9 1/4" board



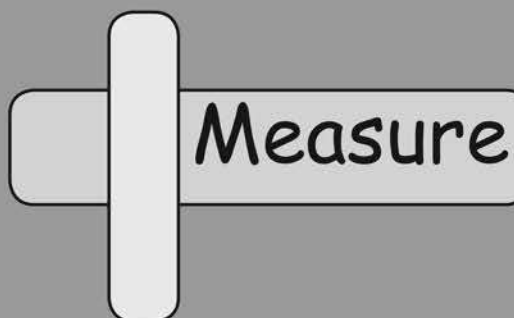
Mark one piece the "FRONT", the other the "BACK"

Use a very sharp pencil



On the FRONT board draw diagonal lines from corner to corner

Your board should look like this

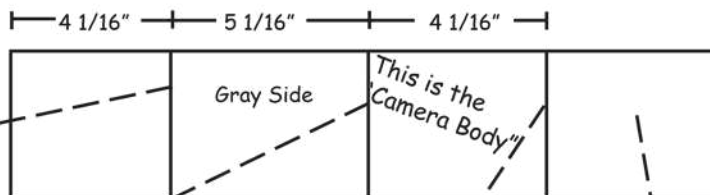


This piece is the CAMERA BODY



Take the 5" x 18 1/4" piece and draw three lines:

Use a VERY SHARP Pencil



Line #1:

From the left side of board, measure and place a mark at

4 1/16"

Do this at the top and bottom of the board.

Draw a pencil line connecting the two dots.

Line #2:

Start another measure from the 4 1/16" line. Go left to right. Measure and place a mark at

5 1/16"

Do this at the top and bottom of the board.

Draw a pencil line connecting the two dots.

Line #3:

Start another measure from the 5 1/16" line. Go left to right. Measure and place a mark at

4 1/16"

Do this at the top and bottom of the board. **Draw a pencil line connecting the two dots.**

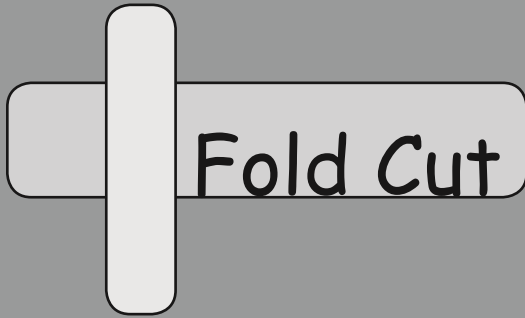
Last area should measure approximately 5 1/16".

If not, then check other measures, or shorten end piece



Your board should look like this

- Take the 5" x 18 1/4" piece.
- Measure in 1/8" on the horizontal Black Side.
- **Draw a pencil line between the two dots.**



You will need:

- three board pieces
- ruler
- sharp cutting knife
- cutting board

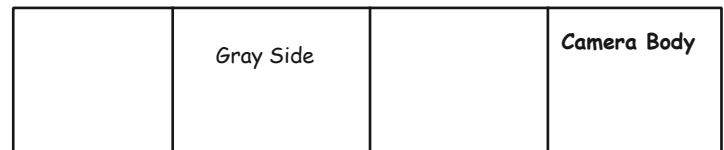
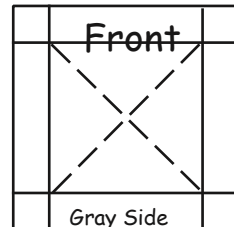
You are going to make **two different types of cuts**:

Fold Cut:

- score **partly through** board to create a fold

Complete Cut:

- cut **all the way through** the board to remove a section



FIRST STEP: Lay one of the boards gray side up on the cutting board.

SECOND STEP: Line up the ruler along one of the penciled lines.

THIRD STEP: FOLD CUT: Using medium pressure, slowly begin to score along the ruler edge. Remember--do not try to score through in one pass of the knife. Try to make at least three passes, each time going a little deeper into the



board.

FOURTH STEP: Pick up the board and flex the side you just cut. If it flexes easily, then go to the next line. If still stiff, then



Complete Cut

You are now going to **remove** the corner sections from the Front and Back Pieces

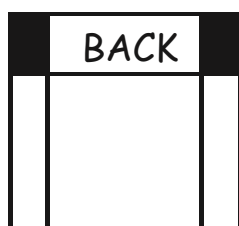
Do this with all the remaining lines (except the horizontal line on the Black Side "Camera Body" part)

Use the **Complete Cut Technique** to remove corner sections

FIRST STEP: Lay the Front or Back piece (Gray Side UP) on the Cutting Board.

SECOND STEP: Line up the ruler along one of the penciled lines.

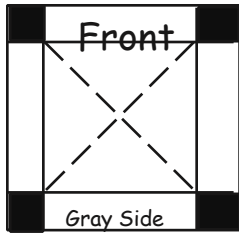
THIRD STEP: Take your knife and slowly cut into the 2 inch line on the corner. Remember: **DO NOT CUT THE WHOLE LENGTH OF THE LINE--CUT ONLY THE CORNER LINE!!** Make several passes with knife.



Cut through
remove ALL pieces

Gray Side

CORNER SECTIONS and



Save one of these Sections

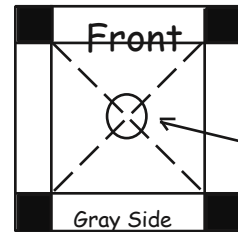
ONLY the Shade



Drill

You will now drill a 1/4" hole in the piece marked FRONT.

Go to your instructor and ask for a demonstration of the "Paper Drill Press"



Drill a hole here

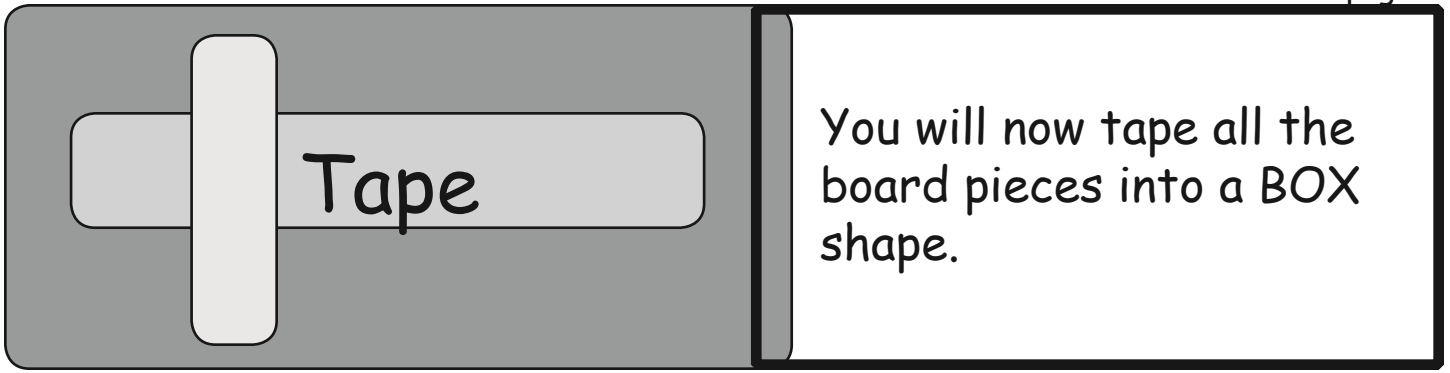


Tape

You will need:
 --all three board pieces
 --1" square of foil
 --black Photo tape

FIRST STEP: Take the "FRONT" piece. Lay it down with the BLACK side facing up. Place foil over hole. Tape along the edge of foil, securing it to board. DO NOT TAPE OVER THE HOLE!!

SECOND STEP: Have the instructor punch a pinhole in the foil



Tape

You will now tape all the
board pieces into a BOX
shape.

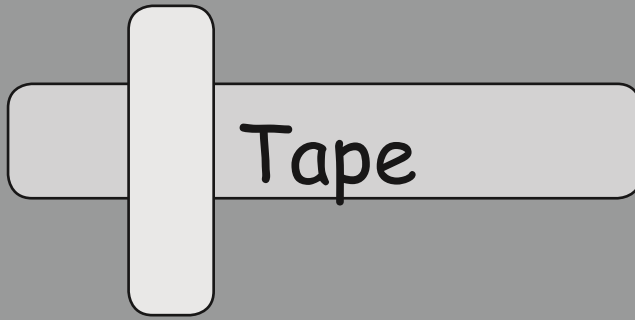
FIRST STEP: Take the "FRONT" piece. Fold the sides together. BLACK to the inside!! It now looks like a BOX. Tape the four corners together.



Do the same for
the "BACK" piece

SECOND STEP: Take the CAMERA BODY piece. Fold it with the BLACK on the inside. Tape the two ends together. It will form a box.



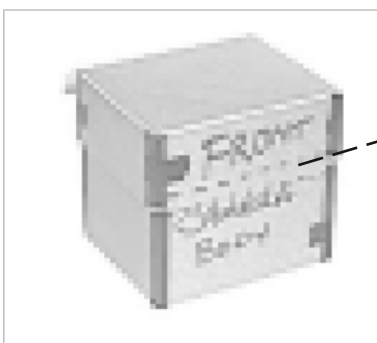


You will now tape all the board pieces into a BOX shape.

THIRD STEP: You now have three box shapes. Tape all the folded edges with a layer of black Photo tape. EVERY edge that was cut and folded should be taped.



FOURTH STEP: To complete the box, take the CAMERA BODY and the FRONT piece. Insert the CAMERA BODY box into the FRONT box. Now, tape around the entire box, securing the CAMERA BODY to the FRONT.



Tape around box. Joining the FRONT and the CAMERA BODY together



Cut & Glue

You will now cut and glue two layers of cardboard to the inside of the CAMERA BODY.

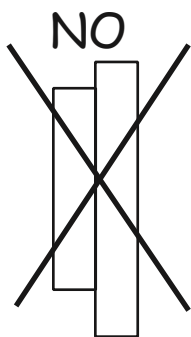
You will need:

- pair of scissors
- 2 lengths of 1/2" x 24" cardboard
- bottle of white glue

FIRST STEP: Lay one of the cardboard strips on the table. Spread white glue along its entire length.

SECOND STEP: Carefully lay the 2nd strip of cardboard over the first. Line up the edges. Press together to form a glue joint

Don't worry if the two pieces are not the same size. Only one edge needs to be aligned.



Set the cardboard pieces aside to dry



Cut & Fit

You will now measure and cut the cardboard pieces to fit into the back of the camera

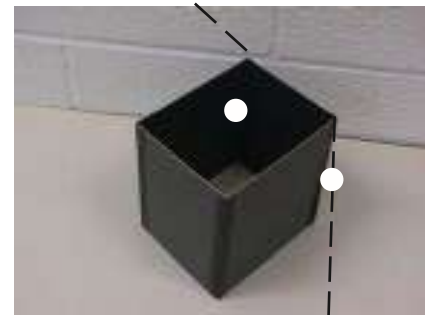
You will need:

- pair of scissors
- length of 1/2" x 24" glued cardboard
- bottle of white glue
- ruler

FIRST STEP: Place the assembled CAMERA BODY on its face. The open end should be facing up.

SECOND STEP: With your ruler measure one side of the opening

Measure from
this corner



To this corner

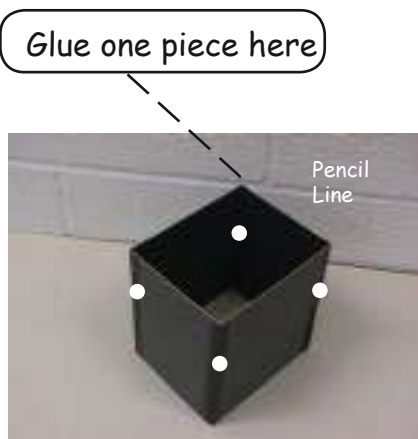
THIRD STEP: Take your ruler and mark this measure on the cardboard strip. Cut TWO pieces the same length with your scissors.

Glue & Fit

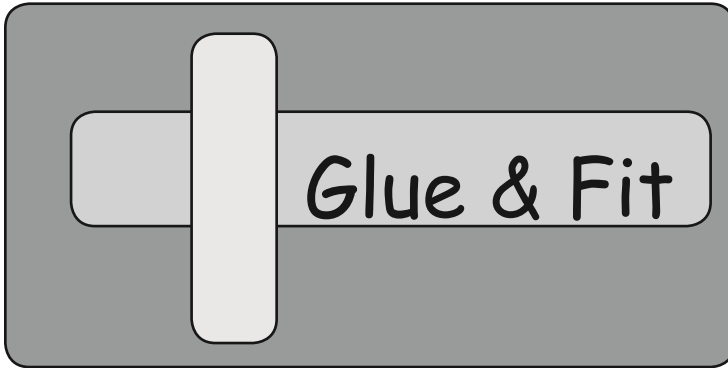
You will now glue the cardboard pieces into the back opening of the camera

SECOND STEP: Look inside the box. On **page 2** you drew a pencil line $\frac{1}{8}$ " in from the edge of the **CAMERA BODY**. Find the line, and rest the cardboard just **UNDER** the pencil line. There should be $\frac{1}{8}$ " of black board showing **ABOVE** the line.

THIRD STEP: Glue the pieces on either side of the box.



Glue one piece here

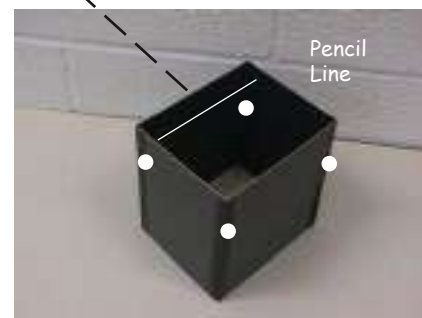


You will now measure, cut and glue the last two pieces of cardboard to the camera

FIRST STEP: Measure the remaining sides of the box. Use your ruler to mark this on the cardboard strip. Cut **TWO** pieces the same length with your scissors.

SECOND STEP: Glue these strips inside the opening. Remember, to match the alignment of the other pieces.

Glue one piece here



Glue one piece here

Make sure all the glued joints are **DRY** and in joints for loose fit or their proper place. taped edges popping up.

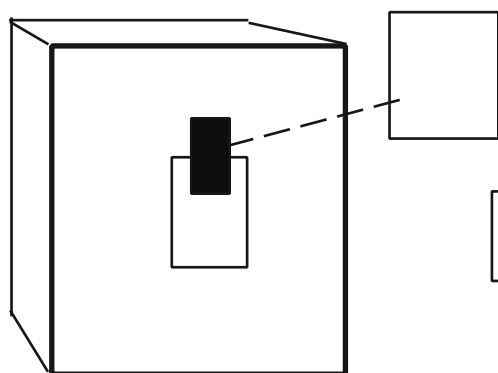
Check all the taped parts are

Your Pinhole Camera is

Final Steps

almost finished!

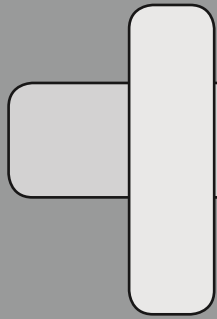
FIRST STEP: Remember those corner sections you saved back on page 4? Take one of them and place it over the pinhole opening on the front of the camera. Cut about 1" of black photo tape and tape the section to the camera body. It must cover the opening.



Make sure this section can swing freely when taped to the body.

SECOND STEP: Take the last piece of Black and Grey matboard. It measure 4" x 5". This is your Dark Slide. It helps keep stray light from destroying your negative. Take your scissors and cut a very small triangle off of any corner. Cut just enough to get your fingernail underneath when removing from camera.

THIRD STEP: Assemble the pieces of the camera. Place the dark slide on top of the cardboard ledge. Close the back. Get a rubber band from your instructor. **YOU ARE FINISHED!!**



Load Camera

How to Load Your Camera

FIRST STEP: Be sure you are in the Darkroom. SAFELIGHT CONDITIONS ONLY!! This will not work in room or daylight conditions!

SECOND STEP: Take the Rubber Band off the Camera. Open the BACK of your Camera. Remove the Dark Slide from the Camera Back.

THIRD STEP: Take a fresh piece of Photo Paper. Locate the Emulsion Side (It's SHINY). Now, put the SHINY SIDE of paper towards the lens (inside of camera). Paper rests on top of Cardboard Ledge (Film Plane)

FOURTH STEP: Once the paper is secure, put the Camera Back into place. Wrap your rubber band around the Camera, front to back. Make sure your Shutter and Back are captured by Rubber Band.

FOURTH STEP: Now, LET'S MOVE SOME IMAGES!!!

The Rules

Set Camera on ground, table or stool. Place a heavy book on top.

Make sure camera is stable. If it wiggles--put a coin or small stone underneath.

Do not try to stabilize with your hand. It will not work! Too much vibration.

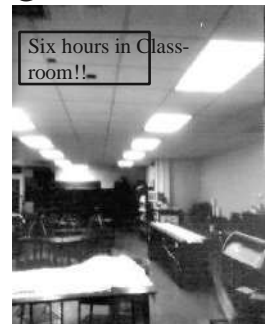
Make sure camera is pointed AWAY from the sun. When you first put camera on ground, stand behind it. Your shadow should fall over the camera body, back of camera to front. **This is true even on cloudy days!**

Once stabilized, pull tape sideways to expose opening.

Sunny days: 30 seconds to 1 minute

Cloudy days or heavy shadow: 2 minutes

Indoors (with room light): 4 to 6 HOURS!!



Pinhole Cameras have Infinite Depth of Field. EVERYTHING will be in focus.

VERY IMPORTANT: If you take a picture of a person, then that person must stay ABSOLUTELY STILL for the entire exposure. If they move or wiggle, the portrait will be blurred.

The Can

This is a paint can with a 1/64" hole drilled into one side. There is a piece of black Photographic Tape covering the opening. This is the shutter. **DO NOT REMOVE TAPE UNTIL YOU ARE READY TO TAKE THE PICTURE.**

Pinhole Cameras work the same way as regular cameras.

They both have:

- a lens
- a shutter
- a film plane
- a light tight container for the film.

When you take a picture you create a Negative. It looks like this:



In the Darkroom you will turn it into a positive. It will look like this:



A peculiar thing about Paint Can Pinholes.

This is a picture of the parking lot's chain link fence. We all know the fence is straight, but the camera makes it look bent. Why?

Exposure Times:

On a sunny day your average

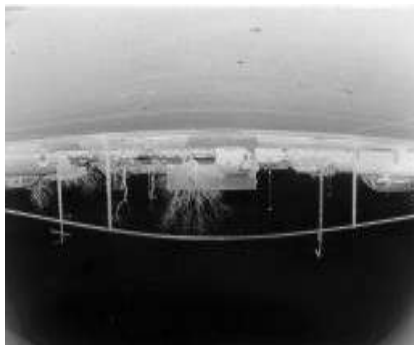


Expose longer, your picture will be darker.



exposure time should be about 60 seconds.

Actually, it will be upside down in the camera looking like this:



Because the “film plane” (the back of the paint can) is rounded. Thus, your picture will look rounded, or bent.

Fun

Pictures



Expose shorter , your picture will be lighter.

To create a ghost:

Two people stand abso-

Close ups of people or archi-

lutely still. One stands for full exposure. The other leaves 2/3rds of way into exposure: eg., 60 second exposure: one leaves at



about 45 seconds.



Or, do one by yourself!

Self Portrait by John Troughton, 2002
Check out www.pinholeday.org

tectural details



Lose an arm or leg!

If a person keeps completely still but waves one part of their body (arms, legs, foot) for the whole exposure, that body part will disappear!

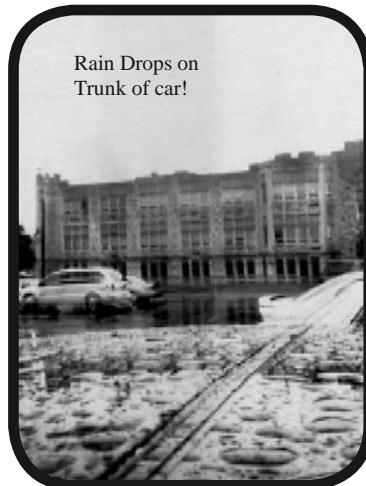
Too many people walking by?

No problem. With a 60 second exposure you won't see them at all.



"Ghost", by Laura Fiske, '04

Remember:
Everything
must be
stable: the
camera and
the photo
subject!



Looking for Ideas?

Neat Pinholes



Pictures taken by Photo Students
at Joliet Central High School

Neat Pinholes



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at Joliet Central High School