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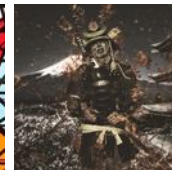
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Google Cardboard is a cheap way to experience virtual reality (VR) on your Apple or Android cell phone. You download apps (many free-- see recs at end), pop them in the ViewMaster-like viewer, and move your head around to see 360 degrees of real or CG stills or video.

Google's first cardboard viewer was iPhone 5-sized and used a pair of magnets as a touchscreen trigger (see the black box above). It was simple to make-- essentially two pieces-- and at this point you can find versions from China for \$3-7 (minus the magnets). Version 2.0 was larger, could be folded into a rectangular box, and used a conductive button to trigger the touchscreen. This Instructable is "1.5," combining the simplicity of 1.0 and the size and button of 2.0. It will take you a bit less than two hours to make and less than \$1 worth of materials. If you're thinking, "Why spend that time when I can pay a few more bucks to buy one?" then you are on the wrong web site, my friend. Welcome fellow Makers!

This Instructable will soon be a YouTube video (link to be posted).

## Step 1: Gather Your Tools and Materials.

### Related



**How to make Google Cardboard | Turn your boring Smartphone into cool VR headset** (/id/How-to-make-Cardboard-VR-Headset/)



**Homemade Google Cardboard for iPhone** (/id/Homemade-Google-Cardboard-for-iphone/)



**Create Your Own VR Experience with DODOcase Virtual Reality Viewer** (/id/Create-Your-Own-VR-Viewer/)



**Make Google cardboard overnight** (/id/Make-Google-cardboard-overnight/) by dinesh kumar c



**Make the DODOcase VR / Google Cardboard Switch Work - Samsung Galaxy S3 Phone** (/id/Make-the-DODOcase-VR-Switch-Work-Samsung-Galaxy-S3-Phone/)



You will need:

1. the thinnest *corrugated* cardboard you can find, like a shoebox or pizza box.
2. a pair of 45mm focal length biconvex plastic lenses, either 25mm in diameter (GC 1.0) or 37mm (GC 2.0). I haven't noticed a real difference, but 25 mm are easier to get and cheaper-- less than a buck a set from China on ebay (<http://www.ebay.com/itm/10-xBiConvex-Lenses-Original-For-Google-Cardboard-Dazzling-Glasses-Ultra-25x45mm-/252093349175?hash=item3ab1ef3d37:g:kRQAAOSwBLIVREbv>) (if you don't mind the 3-4 week shipping times). Expect \$6-8 a pair on Amazon.
3. cutting tools: sharp scissors and/or a razor blade for straight/outside cuts and an Exacto knife for curves.
4. fairly weak velcro (squares or circles, about 1-2 inches across).
5. a rigid metal edged ruler.
6. a cutting board or mat as a work surface.
7. a rubber band (1/8-1/4" wide is best).
8. a glue stick
9. white glue (Elmers)



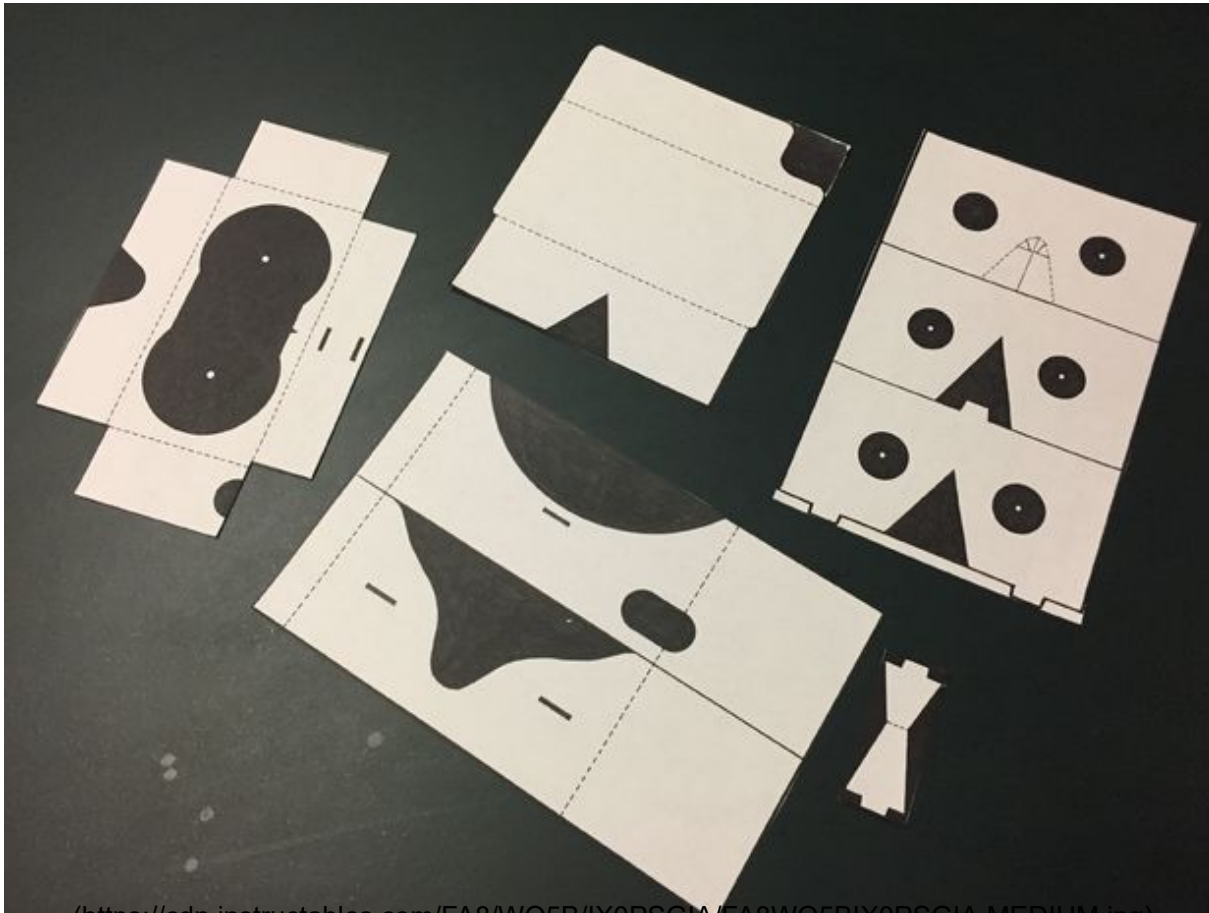
10. copper foil

([http://www.amazon.com/gp/product/B007Y7FV2O/ref=pd\\_lpo\\_sbs\\_dp\\_ss\\_1?pf\\_rd\\_p=1944687682&pf\\_rd\\_s=lpo-top-stripe-1&pf\\_rd\\_t=201&pf\\_rd\\_i=B00JBHZQWK&pf\\_rd\\_m=ATVPDKIKX0DER&pf\\_rd\\_r=0NGD0SHBJC89KCHSXWE1](http://www.amazon.com/gp/product/B007Y7FV2O/ref=pd_lpo_sbs_dp_ss_1?pf_rd_p=1944687682&pf_rd_s=lpo-top-stripe-1&pf_rd_t=201&pf_rd_i=B00JBHZQWK&pf_rd_m=ATVPDKIKX0DER&pf_rd_r=0NGD0SHBJC89KCHSXWE1)) tape for the conductive touch screen button.

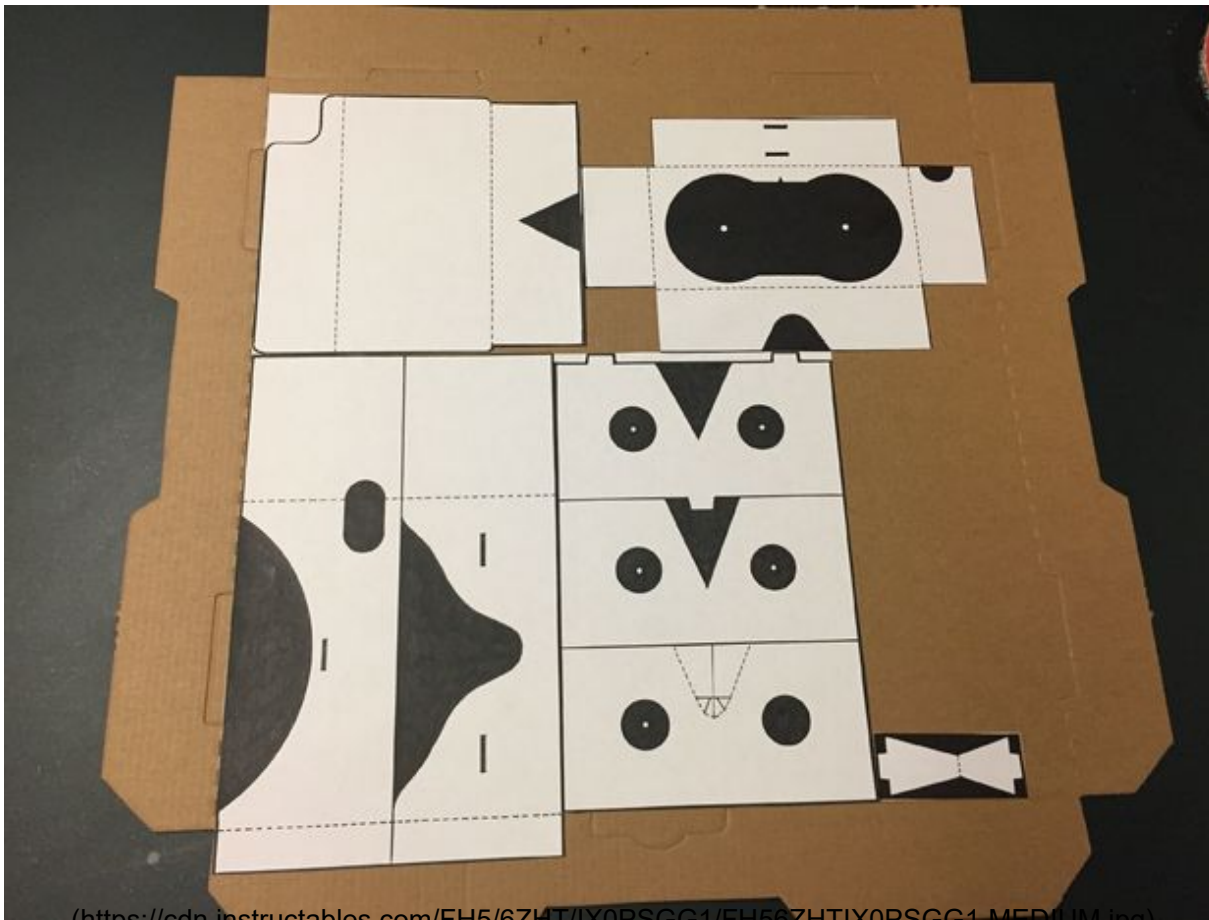
11. a tiny piece of dense foam/sponge (about .25 X .25 X .1 inch), like what some electronics come packed in.

Items 10 and 11 are optional but make the project much cooler.

## Step 2: Cut Out Your Cardboard Using the Template As Your Guide.



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Print the four page template

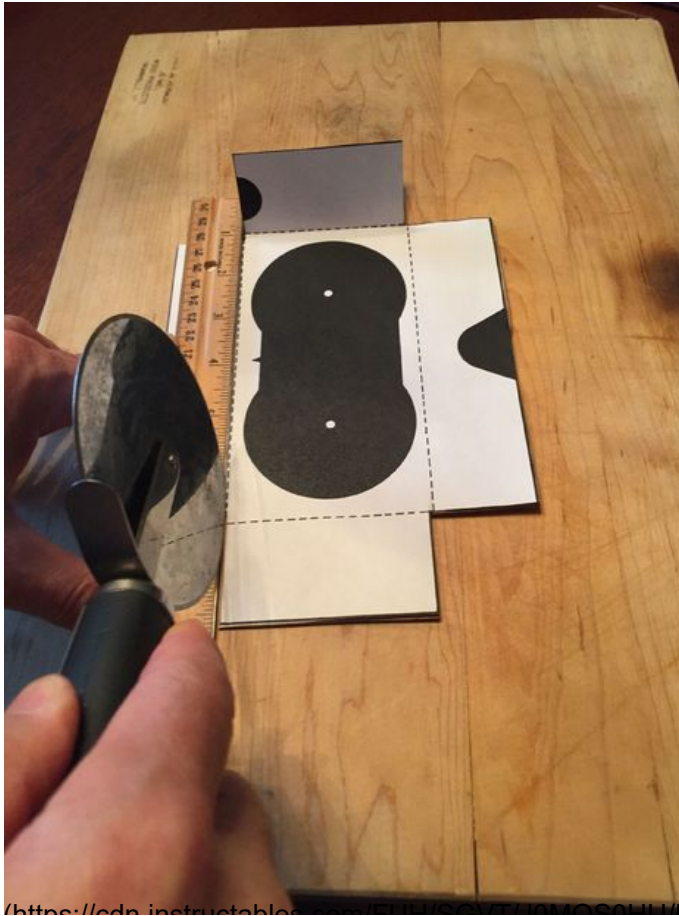
([https://drive.google.com/file/d/0B2LFI\\_y3tl8oMzRadTJpMEJnTk0/view?usp=sharing](https://drive.google.com/file/d/0B2LFI_y3tl8oMzRadTJpMEJnTk0/view?usp=sharing))\* and glue the pieces onto your cardboard using a glue stick, which will allow you to peel the template off when you're done cutting and folding.

Tip 1: the cardboard is strongest if you glue the template with the "grain" running the longest side of each piece.

Tip 2: To reduce the number of cuts and amount of cardboard needed, you can glue the pieces butted up against each other as I show here.

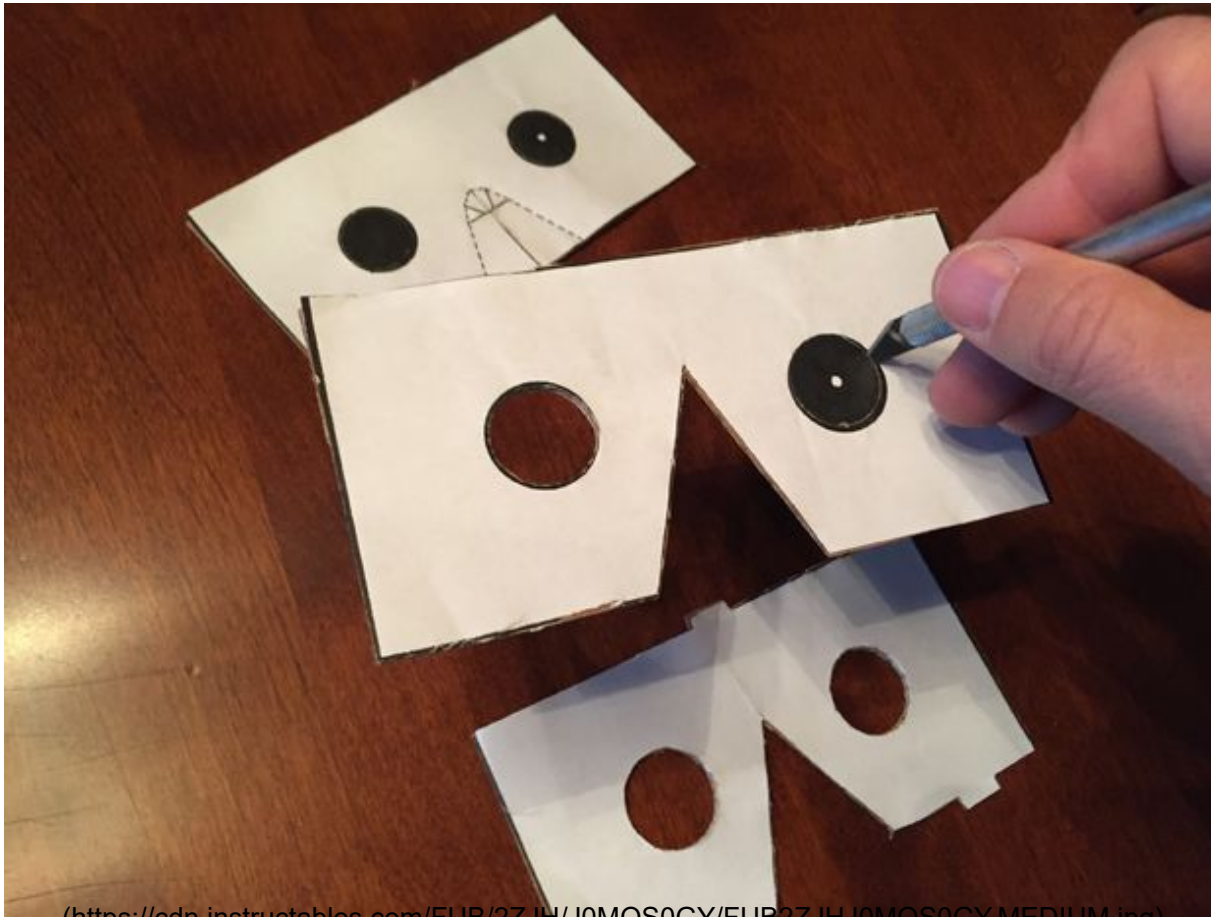
Cut the pieces on the dark solid lines along the perimeters. Hold off on cutting out the inside blackened sections, like the lens holes.

### Step 3: Fold on the Dotted Lines.



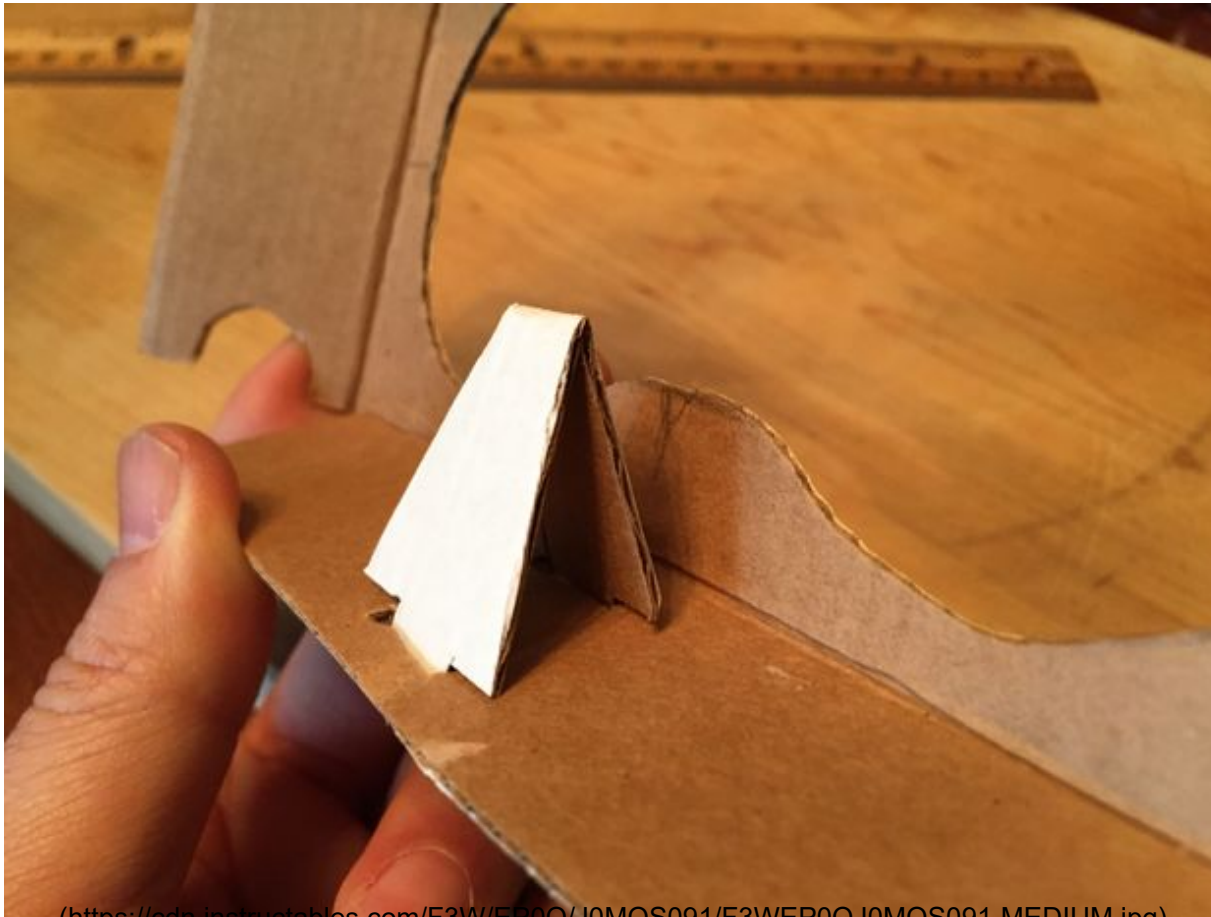
Score on (press a dent into) the dotted lines using a metal edged ruler and a dull pencil, coin or pizza cutter, then, pressing the edge of the ruler into the scored line, fold the cardboard toward you.

### Step 4: Cut Out Black Sections.



The cardboard was stronger and easier to fold without the inside sections removed. Cut out all of the remaining dark areas (lens holes, forehead semicircle, nose indent), including the slots in the outside frame into which the tabs of the lens frame will go.

**Step 5: Optional: Make a Touch Screen Button by First Attaching the Base to the Flap.**

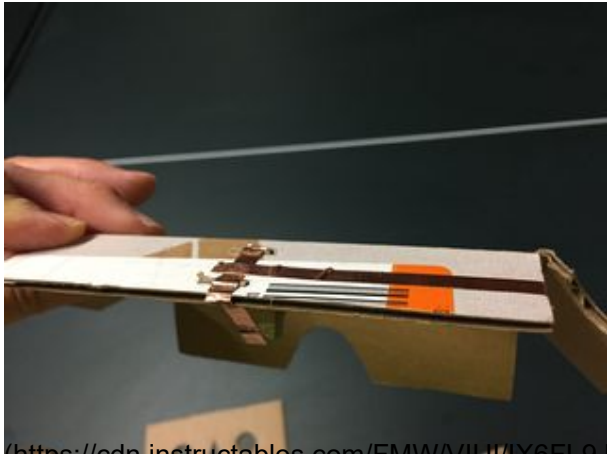
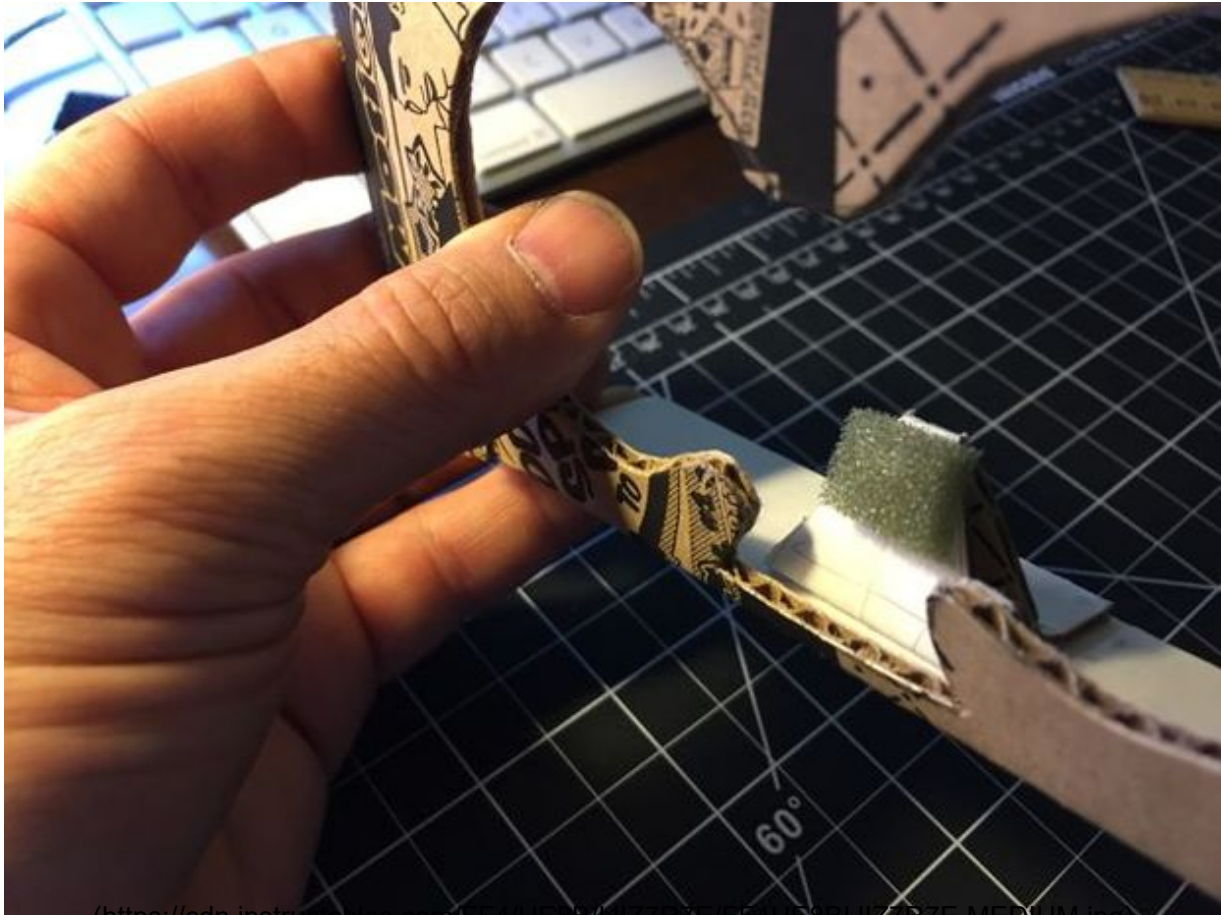


The button is a "pyramid" (optional but way cool), stuck to a moveable flap that you'll be able to press down with your right forefinger once the viewer is complete. You'll glue the small piece of sponge (for a soft touch) and lay it over with conductive copper foil tape to bring the slight electric current from your finger to your screen. If you want to skip making this, you can just reach through the nose hole and touch your screen manually. The side of the pyramid that is shorter faces forward, which makes it stand straight up.

Glue or tape the pyramid into the slots as shown.

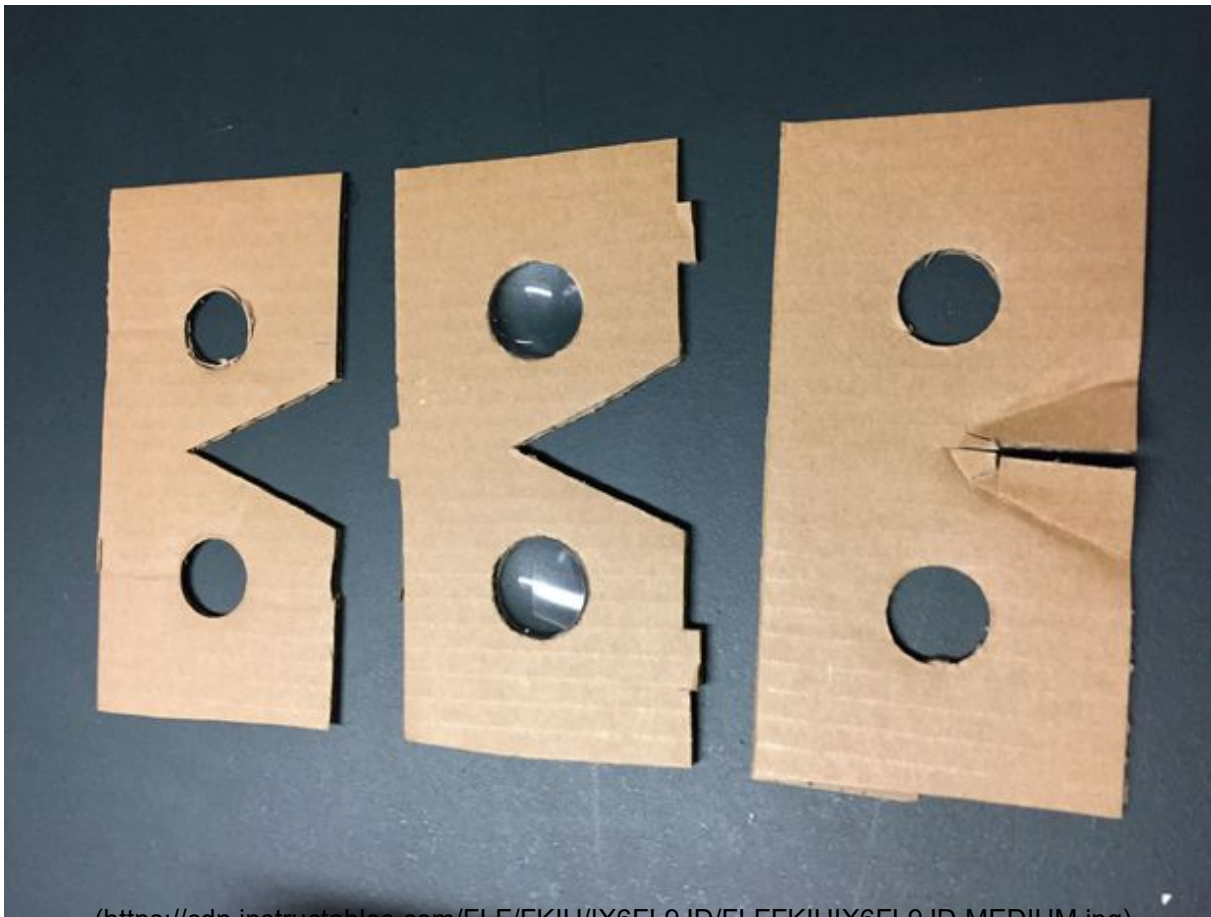


**Step 6: Optional: Complete the Button by Gluing on a Sponge and Attaching Conductive Tape.**

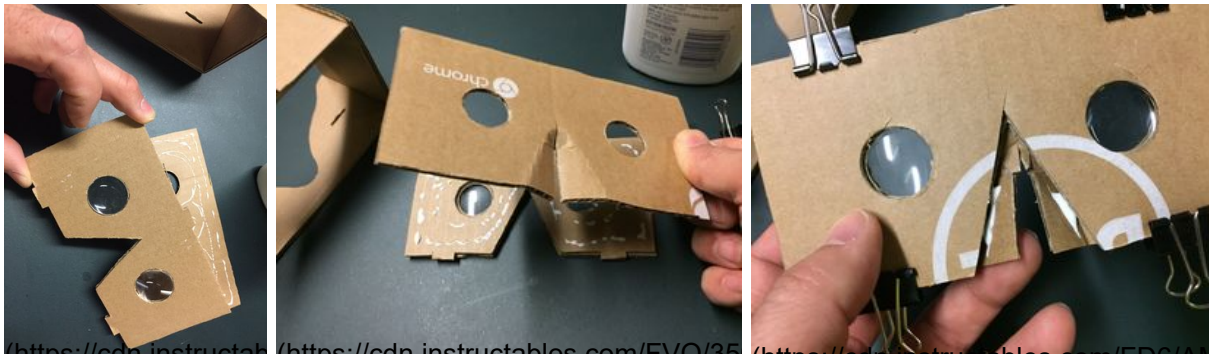


Cut a 2 inch piece of copper foil tape, peel the backing, and wrap it horizontally across the face of the sponge as smoothly as you can. (Tip: Copper tape is best handled by peeling the backing as you need to, rather than all at once. It tends to curl, wrinkle, and stick to itself.) Next cut a 4 inch strip and wrap it from below the sponge, over the top of the pyramid, down past the base, and under the flap. Then cut another 4 inch piece and attach it from the end of the previous piece to the top of your trigger flap, where your finger will touch.

## Step 7: Insert the Pair of Lenses



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... in the middle layer, both curved side forward. Glue the three lens holder pieces together with the curved nose section closest to you, as shown. Clamping the three pieces together is a good idea until the glue dries (less than 5 minutes).

I recommend you put a piece of clear tape above the nose cut out. I don't care how clean you think you or your friends are, you will get a forehead grease stain there in no time at all. The tape keeps it from getting gross looking. Now, if you made this from a used pizza box, the whole thing may have grease stains, so who cares?

## **Step 8: Assemble the Two Pieces to Make the Outside Frame; Fit the Four Sections Together.**



Download


 (/id/Google-Cardboard-15-Best-of-10-20/)

10 Steps



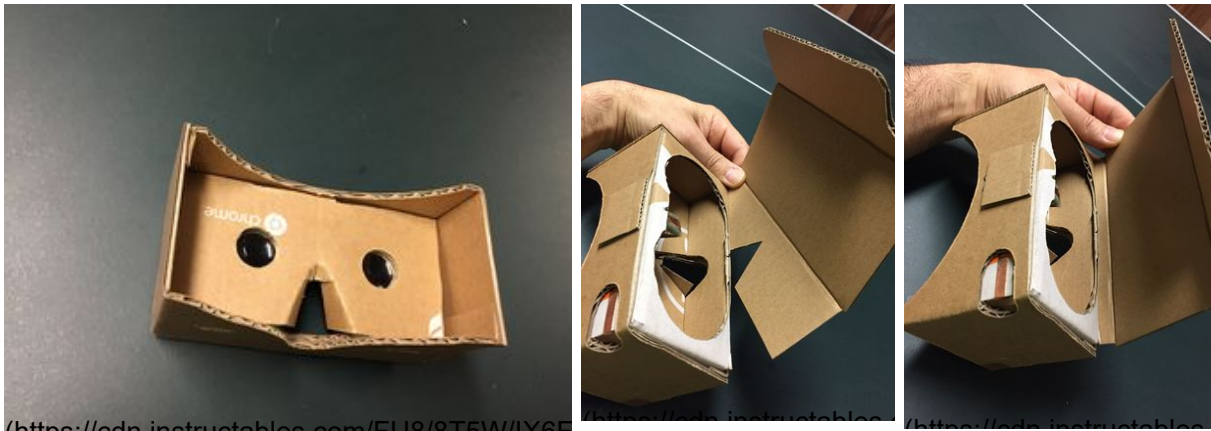
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As you test fit the four sections, adjust folds and trim the cardboard if necessary to make a good fit. It needn't be perfect!

The four sections will stay together without gluing, but feel free to glue or duct tape it if you want. The cover piece inserts below the phone frame section as shown in the 5th and 6th photo. This design makes the cover flap adjustable to different thicknesses of phone; how far you push it in should be based on how fat your phone is.

## Step 9: Install Velcro



Your velcro will last longer if you glue a small piece of cardboard on top (don't put glue in middle of it) to recess one half of the velcro.

1. Trace your velcro piece onto this cardboard rectangle and cut out that section to make it fit the "hook" half of your velcro perfectly. Peel the back of

- the velcro and stick it in the hole you just created.
2. Peel the back of the "eye" half of the velcro and connect it -- hook to eye-- to the piece on top of your viewer.
  3. Close the lid onto the sticky back of the eye velcro half-- making sure that as you close the top there is a gap in front that will fit your phone.

Add a thick rubber band to the base of the cover to provide some traction to prevent your phone from sliding out sideways.

## Step 10: Download a VR App and Insert Your Phone.



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Fire up a Virtual Reality app and insert your phone into the front of the viewer. Fold over the flap to hold it in place. The split in the middle of the screen lines up with the triangular indent(s) in your viewer. If the image looks like you're crossing your eyes, slide the phone slightly left or right.

My favorites apps right now:

1. Jaunt (<https://itunes.apple.com/us/app/jaunt-player/id997996015?mt=8>)
2. NY Times (<http://www.nytimes.com/newsgraphics/2015/nytvr/>)
3. Google Cardboard (<https://www.google.com/get/cardboard/apps/>) (a sampler)

All three keep adding content.

A review of 16 cool apps with pix of old guys using the viewer can be found here (<http://www.businessinsider.com/google-cardboard-coolest-best-weirdest-apps-virtual-reality-diy-headset-2015-12?r=UK&IR=T>). (updated 1/25/16)

Options:

- paint your viewer before step 7
- make your own headstrap out of an elastic or vecro strip
- add headphones-- especially for concert videos like Paul McCartney or Jack White on Jaunt