

Cardapult the Business Card Catapult

by **clide** on March 3, 2009

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intro: Cardapult the Business Card Catapult

After seeing the business cards with gears a few months back ([normal](#) and [planetary](#)), I started thinking about what else could be made to fit in a business card. I wanted something unique and memorable that could represent me and my creativity. What I came up with was a business card that can convert into a rubber band powered desktop catapult.

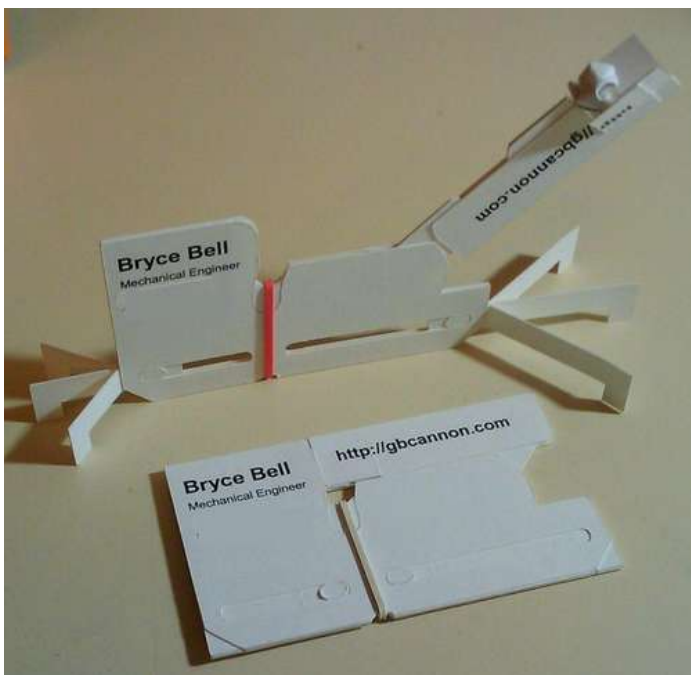
Here is a video that shows how it works.

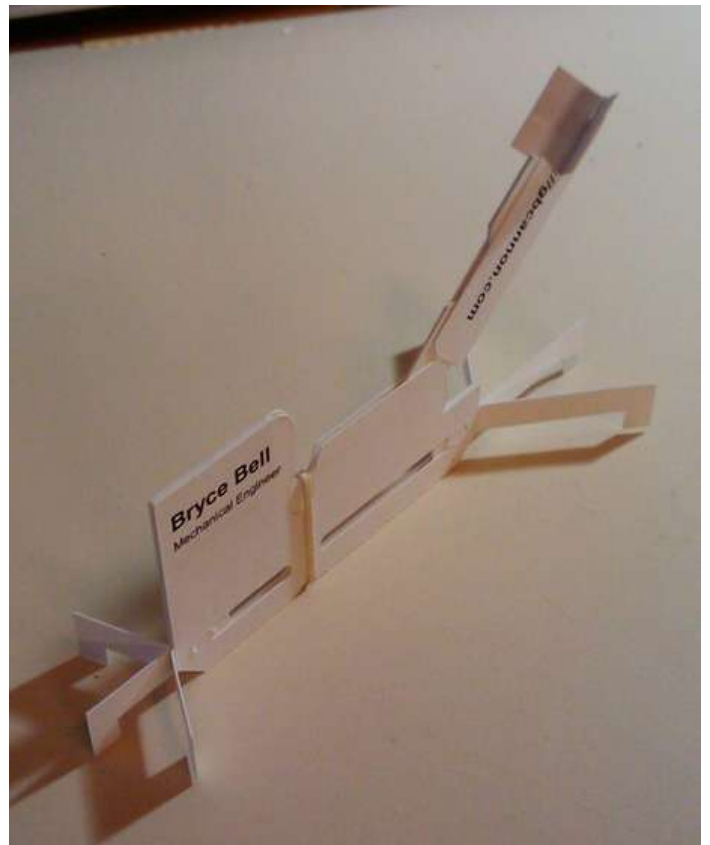
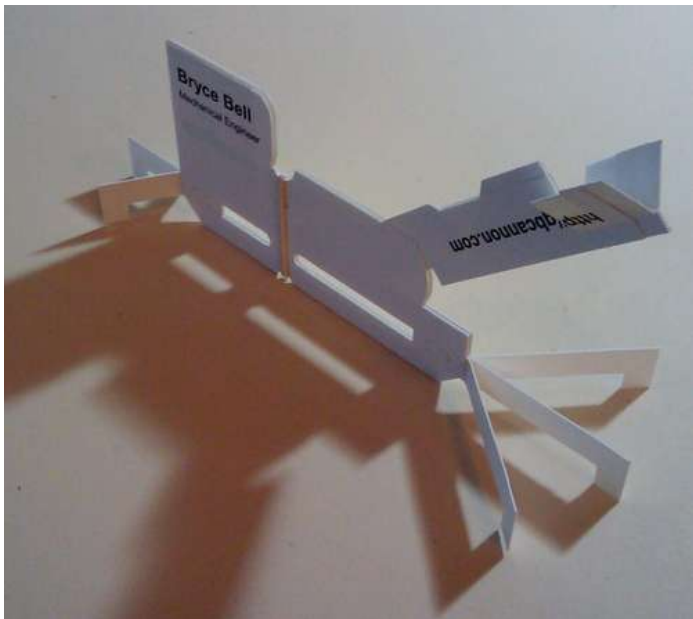
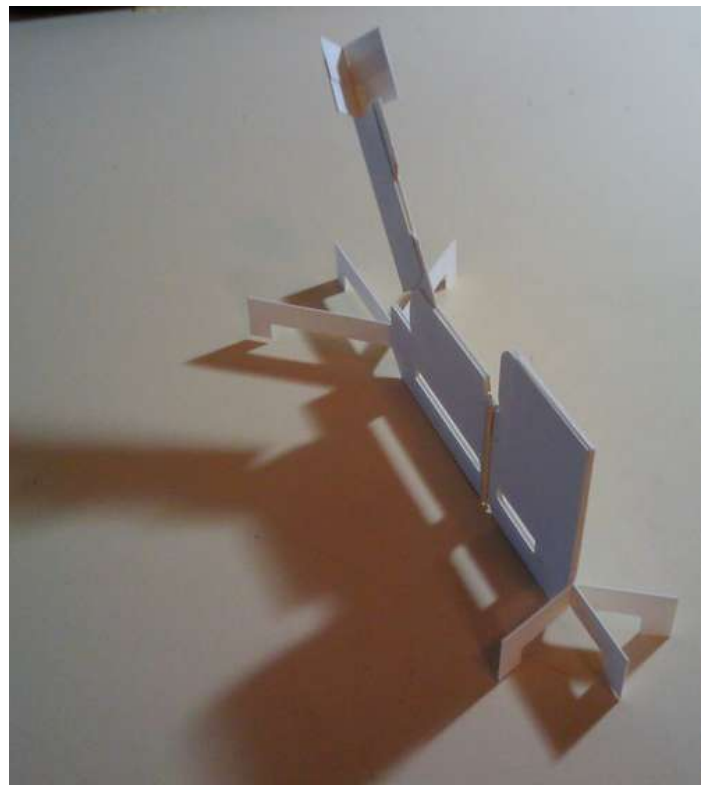
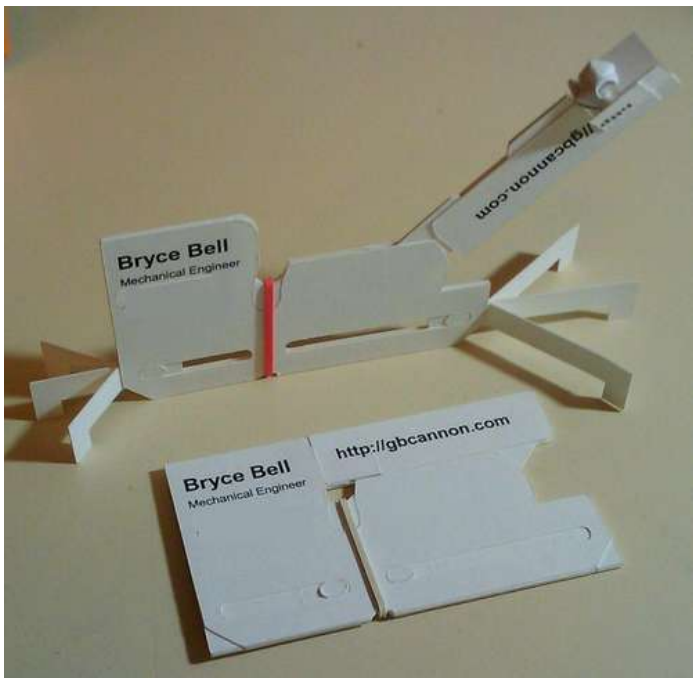


Another video of assembly to help if you are having trouble working out some of the steps.



If you want to build one and don't care as much about the appearance you can try the [quicker and easier method](#).





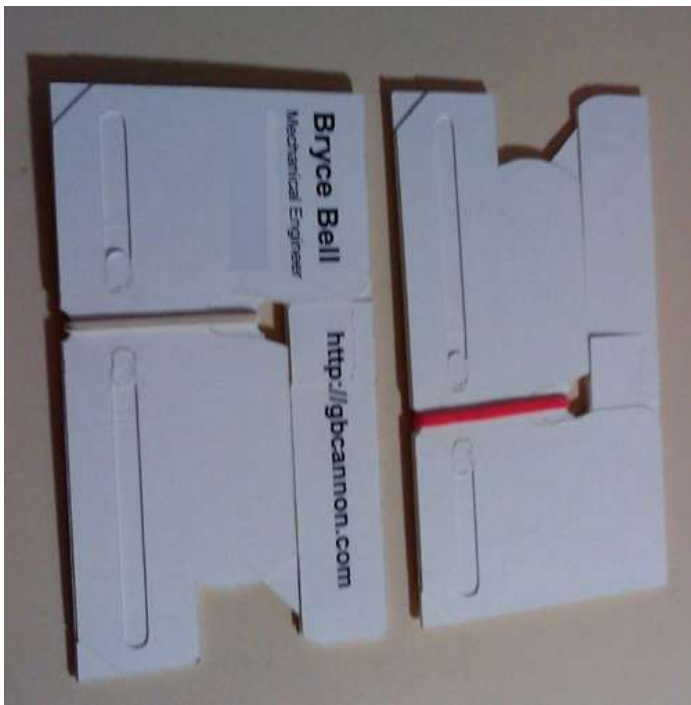


Image Notes

1. Pull down and release to fire
2. Card is not heavy enough to operate without being held down. Use your hand or a weight to steady the card for firing.

step 1: Things You'll Need

Some thick card stock , perforated business card paper, or anything just as stiff that you can cut easily

Hobby knife

Hole punch

Glue

Small rubber bands

Something heavy and flat (like a large book)

Cardapult design (attached in following steps)

Printer

Other stuff that may come in handy:

Scissors

Fingernail clippers

Toothpicks

Something heavy and hard (like a hammer)

For the paper I had a hard time finding anything thick enough locally except for the perforated sheets for DIY business cards. These will work, but alignment is more difficult since the edge of the card is already made. You'll need something about .012" or thicker. Which corresponds to 90 lb Cover and 140 lb Index (card stock). If you are just making these for fun then old folders or thin cardboard product packaging will work great as well.

I tried a few different glues and the best I found for these purposes was an Elmer's Craft Bond Glue Pen



Image Notes

1. Books
2. Thick Cardstock
3. Hole punch. A punch sturdier than this is recommended.
4. Small rubber bands
5. Fingernail clippers
6. Toothpicks
7. Hobby Knife

- 8. Scissors
- 9. Glue

step 2: Print Card Text

Use the word document template as a guide for where the text will line up on the cards. Of course you don't want to print the background image itself so there a few ways you can keep it from printing. (For Office '03 probably similar in others)
Go to Tools>Options>Print and make sure "Drawing Objects" is unchecked.
Or get to the same screen by hitting Options at the bottom of the File>Print dialog
Or just delete the background image after you have things lined up the way you like

Free download link on next step includes this template



File Downloads



TextTemplate.doc (72 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'TextTemplate.doc']

step 3: Cut Card Parts

Well if you are going to do more than a couple of these then you probably don't want to do it by hand. I was considering trying to make my own dies, but then I found the Quickutz Silhouette for \$99 shipped and that was completely worth it. (Found it at ohmycrafts.com, but they are out of stock now)
If you have a similar cutting machine that uses the Robo Master software then you can just grab the attached .gsd files.

If you have a laser cutter or other kind of cutting machine or just want to tweak the design then I'm also attaching the Inkscape .svg files. Inkscape has a lot of output options, so you should be able to get it in whatever format you need from there.

If you are cutting by hand then get out your scissors and hobby knife and figure out the method that is best for you. Here are a few approaches you might consider:
Print designs on sheets and cut along the lines one at a time.
Print it out once and make template pieces that you can either trace or use as a cutting guide.
Glue sections of paper together before cutting them with either of the two methods above

Note that I've purposely made the holes and axles 1/4" so they can be cut with a standard hole punch.

There are three different files

Insides = full sheet of the inside components

Outsides = full sheet of the outside components

Combined = 6 inside components and 4 outside components. Enough to make two cards if you are cutting the parts out individually.

Since Instructables now requires a Pro account to download files, I've uploaded them to my site so you can still download them for free. [Download here](#)

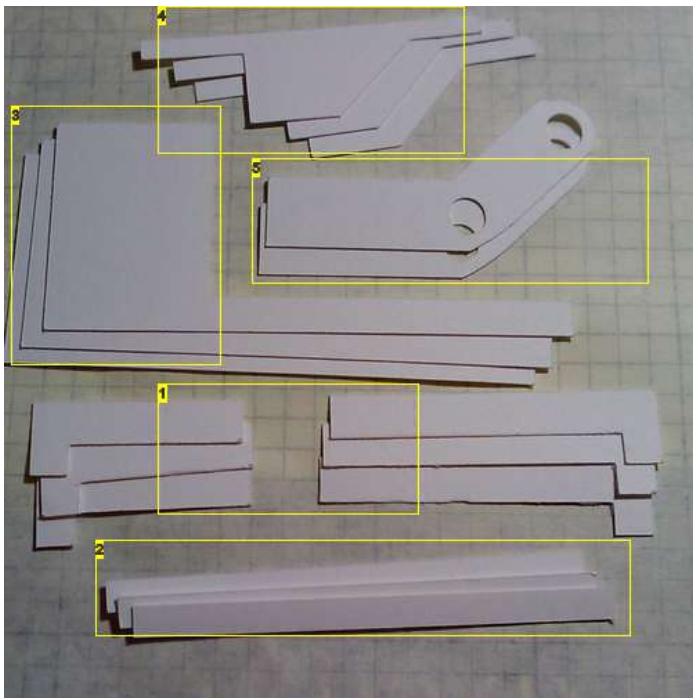


Image Notes

1. 3 layers, only glue the ends
2. 3 layers
3. 3 layers
4. 3 layers
5. 2 layers

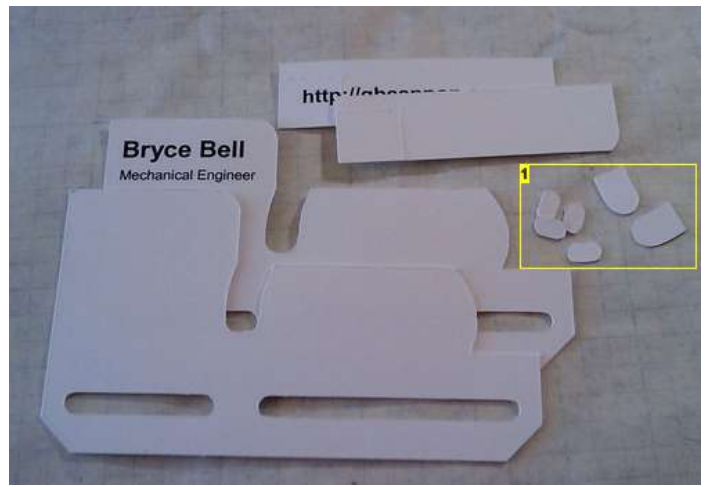


Image Notes

1. small bits, don't lose these



Image Notes

1. Paper cutting machine makes things much easier

File Downloads



outside.svg ((765x990) 122 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'outside.svg']



inside.svg ((765x990) 89 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'inside.svg']



combined.svg ((765x990) 102 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'combined.svg']



outside.pdf ((612x792) 5 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'outside.pdf']



inside.pdf ((612x792) 4 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'inside.pdf']

<http://www.instructables.com/id/Cardapult-the-Business-Card-Catapult/>



combined.pdf ((612x792) 5 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'combined.pdf']



outside.GSD (284 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'outside.GSD']



inside.GSD (259 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'inside.GSD']



combined.GSD (269 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'combined.GSD']



cutting machine gsd.zip (84 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'cutting machine gsd.zip']

step 4: Glue Inside Parts Together

First you'll want to glue the inside components together. Try to line up the edges the best you can. The inside is 3 layers thick except for the arm with the holes in it which is only 2 layers to provide some clearance. The legs are only glued together on the last 1/2" so that they can expand apart after they extend.

Also glue together 3 layers of scrap material that you can cut later use for the axles, don't bother trying to glue the actual little circles you cut out together.

Let the glue dry enough that you are sure they won't slide around anymore.

My gluing technique was to pour out a small puddle of the glue on a piece of scrap material and then use a toothpick to scoop up the glue and spread it evenly over the surface of the part. After you get the layers together then put them under a large book to make sure they dry flat.

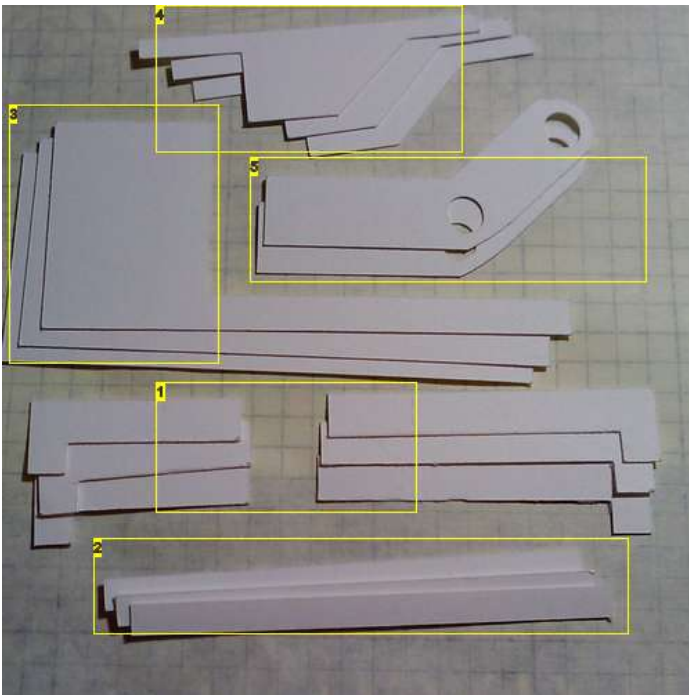


Image Notes

1. 3 layers, only glue the ends
2. 3 layers
3. 3 layers
4. 3 layers
5. 2 layers

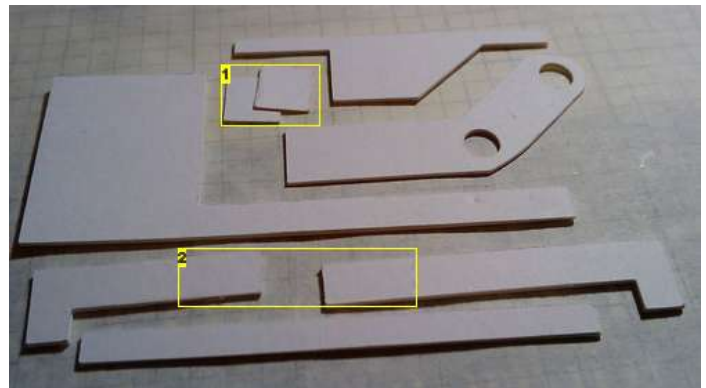


Image Notes

1. Some small bits that you need to keep for later
2. Only the ends of the legs get glued

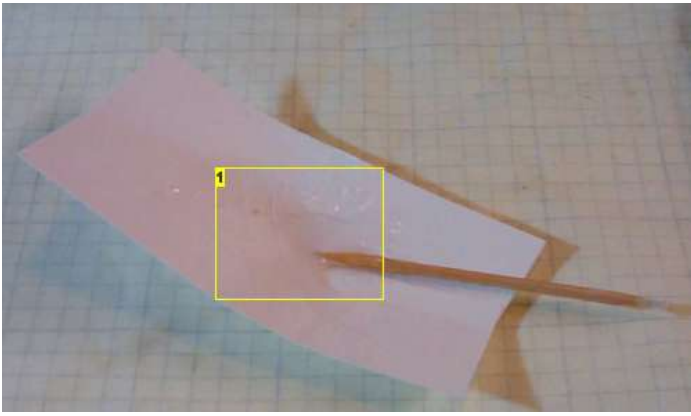


Image Notes
1. glue puddle

step 5: Glue Insides to Back Face

Now you just glue your inside parts to the back part of your card. The alignment locations are straightforward.

The large L piece lines up in the corner and flush against the notch on the other side.

The skinny piece lines up against the bottom edge of the card. Personally I've started trimming about 1/16" off of a short edge so you don't have to be as exact with the side to side alignment.

The odd shape piece goes on the smaller part of the outside face with the long edge aligned against the edge of the card.

Again give the glue some time to dry before proceeding.

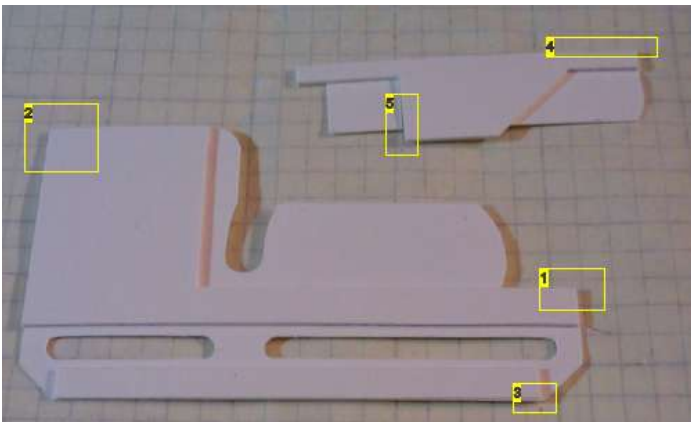


Image Notes

1. Line up these edges
2. Line up these edges
3. Line up bottom edge and center it between the angle cuts
4. line up the top edge
5. Also check that the slit and this edge line up

step 6: Glue on Axles

Use a hole punch to punch circles out of your 3 layer piece of scrap. Test the circles in the holes of your 2 layer arm. If they don't turn freely in the holes then use fingernail clippers to trim around the edges.

Place the arm in the small piece you assembled last step and trace the hole location. Carefully glue the circle over your trace marks and carefully do some double checking that the arm will still line up correctly and also make sure you're not gluing the arm to anything.

Repeat with the lower hole. You'll need the upper component in place to make sure the lateral alignment is correct, but vertically the arm should be against the edge of the large L piece.

Again letting the glue dry some before proceeding is recommended.

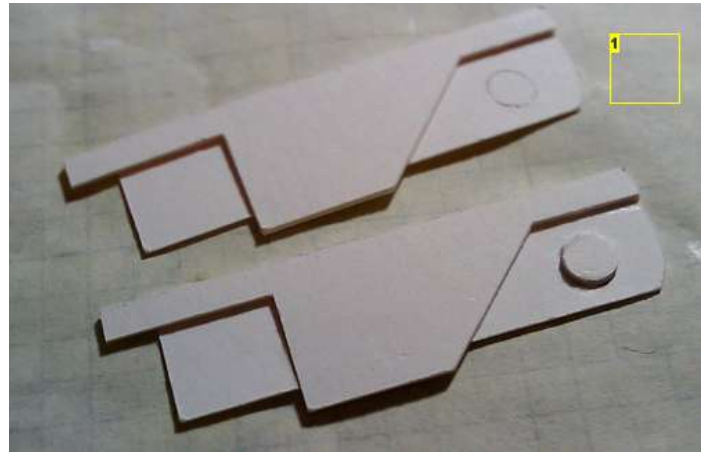
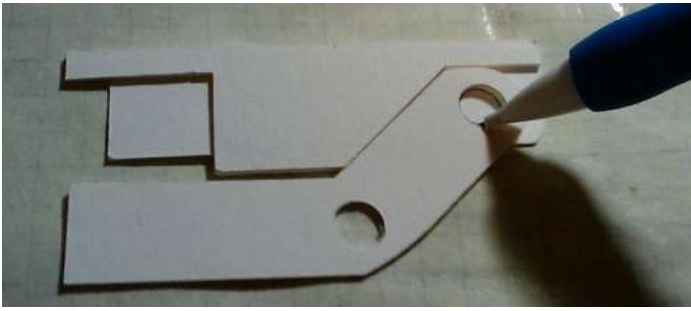


Image Notes

1. Multiple pieces to show different points in the process. Only one of these assemblies is needed per card.

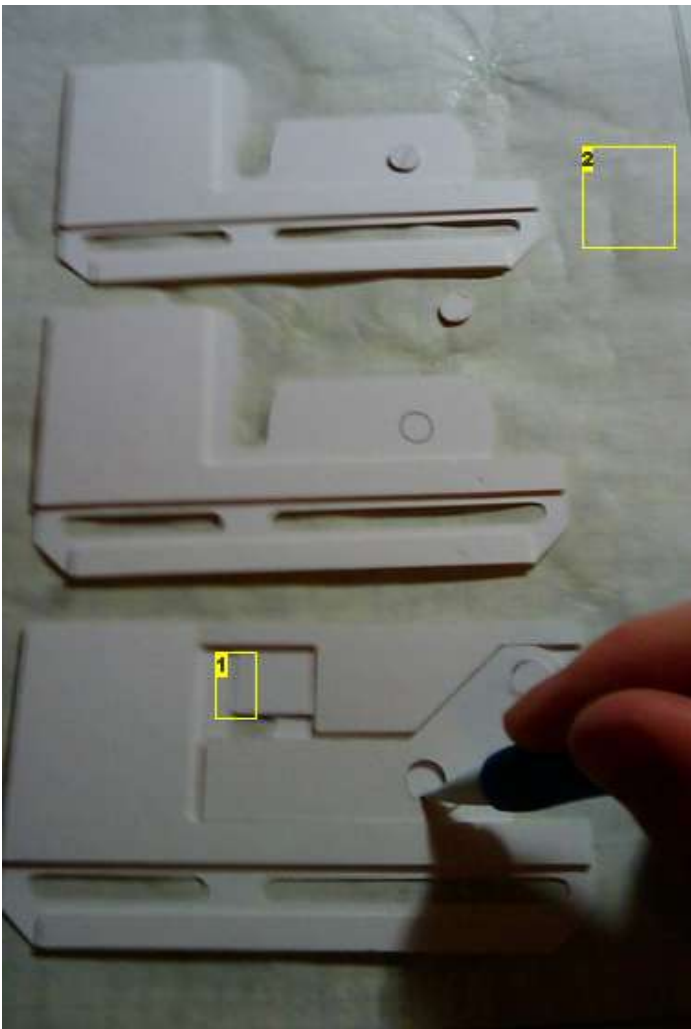


Image Notes

1. Align the back face to get the horizontal hole location
2. Multiple pieces to show different points in the process. Only one of these assemblies is needed per card.

step 7: Glue Front Face

This step is pretty strait-forward. Make sure you get the axles glued well and be careful not to glue the arm to anything. Remember it has to pivot freely.

Glue needs to be applied to every inside component that is glued to the back face. The same things that were glued in steps 5 and 6 are glued all at once in this step. The legs can be slid into place after letting this step dry for a little bit.



Image Notes

1. Make sure the arm can still pivot
2. Make sure the arm can still pivot

step 8: Glue Small Bits

Now for the small bits. The bits on the arm and legs are hard to get on there without some bonding to the edges around them. I just came back with a hobby knife after the part dried and carefully cut around the edges before trying to break the components free.

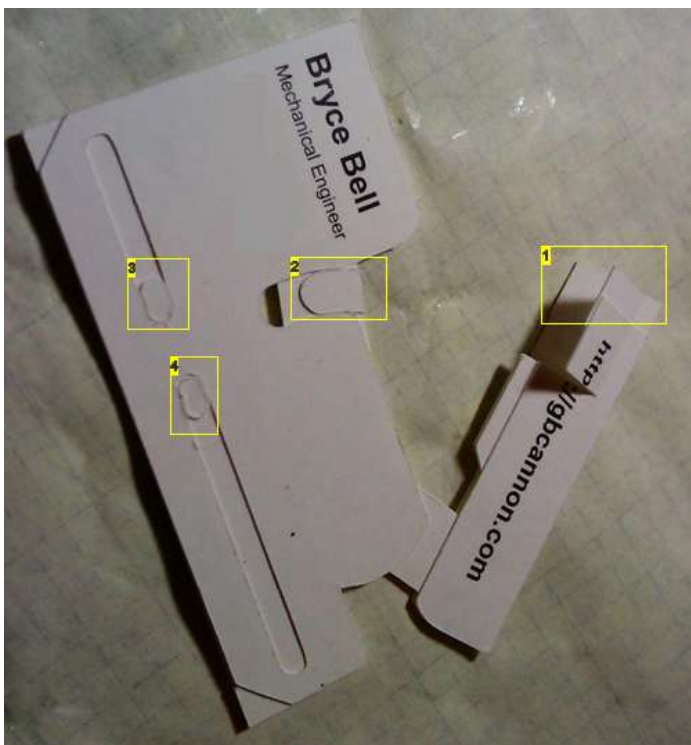


Image Notes

1. Tabs to keep the pocket tucked in. Align with the inner component nub.
2. Align when arm is all the way down
3. Align with legs closed
4. Align with legs closed

step 9: Cut Rubber Band Grooves

Now use a hole punch to cut some small grooves on the arm and bottom edge of the card for the rubber band. This would probably work much smoother with a heavy duty hole punch, but if you are like me and all you have is a hand-held 6 page punch then trying to do this by hand will bend the punch out of alignment. To work around this you can make sure everything is lined up, squeeze the punch firmly to keep it in place, set the end on a hard desk and smack it with a hammer. This seems to cut it OK, but just be sure not to miss.

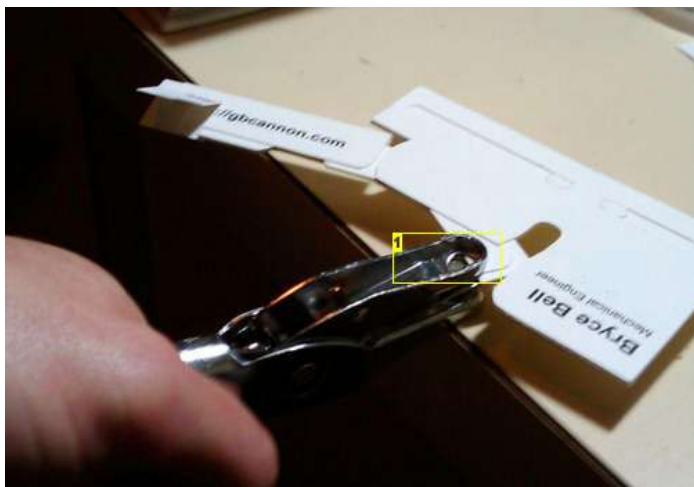
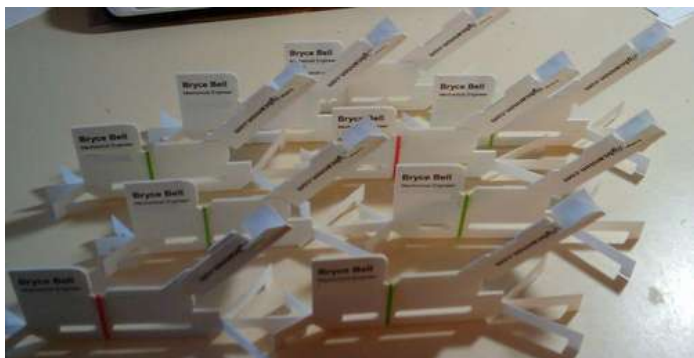


Image Notes

1. Strike here with hammer, or use a stronger hole punch

step 10: Build an Army

If you're going to actually give these out then you need to make more than just one or two. I took about a week to make 10 of them. I built them simultaneously, doing about 1 step each night for all 10 of them as I watched TV.





step 11: Go Green

So many things come in thin cardboard packaging that it is not hard to find materials to recycle into a cardapult. Below is an example of one made out of cereal boxes. I left the images on just for fun, but you can also remove the printed skin (peels off pretty easily) and put the smooth side face out with your own text on it.





step 12: Have Fun

Check out the video in the intro to see it in action.

Thanks to everyone who voted for me in the Epilog Challenge and the Klutz Rubber Band Powered Contest.

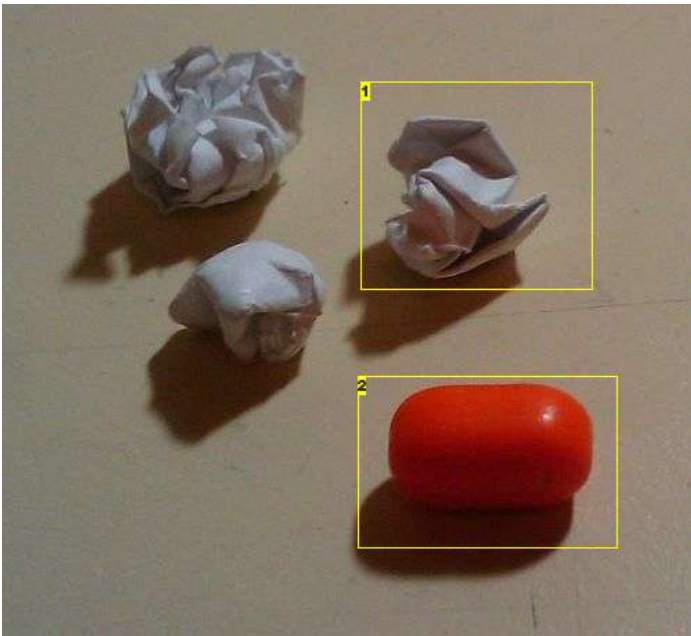


Image Notes
 1. wad of paper
 2. Tic-Tac



Image Notes
 1. Pull up here to deploy the arm

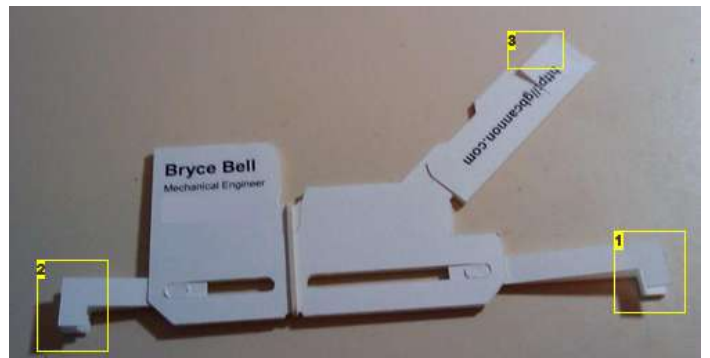


Image Notes
 1. Expand legs out to the sides
 2. Expand legs out to the sides

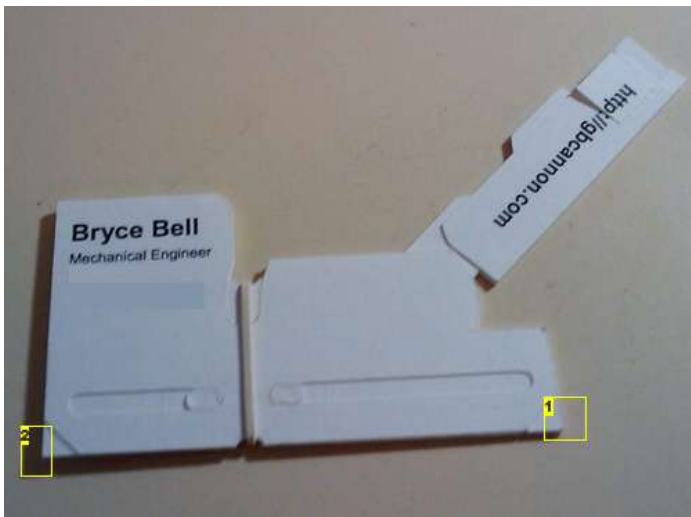
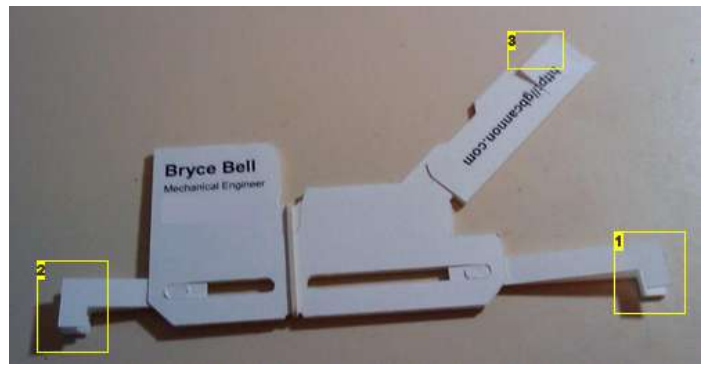


Image Notes

1. Pull here to extend the legs
2. Pull to extend legs



3. Open ammo pocket



Image Notes

1. Pull down and release to fire
2. Card is not heavy enough to operate without being held down. Use your hand or a weight to steady the card for firing.