

# DIY cotton mask with “cupped” satin liner for increased breathability

- Using cloth masks does not reduce the supply of surgical masks available to medical professionals
- Cloth masks are **not at all as good as** surgical, N95, or FFP1/2/3 masks for filtering anything out of the air the wearer would breathe in.
- Satin has “low porosity” which *may* be good for filtering (or may not)
- Making this mask took 60 mins.
- Some satin, a 400 thread count cotton (sheets?), scissors, sharpie, plastic placemat, sewing machine, 1mm wire, pliers, 2mm elastic

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Plastic retainer holding satin liner inside the cotton outer and ready to wear



The retainer gives a cupping effect to increase breathability

As viewed from the front. The elastic can be shortened until it is snug on the wearers face (but not too tight)



# Rules

1. Don't injure yourself making this mask because nobody want to visit a hospital's ER department as a patient these days.
2. Wash your hands before making this mask
3. Wear a mask while you're making this mask
4. Wash the mask pieces after you have finished - before giving it away
5. After wearing the mask outside your home, you should consider it dirty and perhaps hand wash it in hot water.
6. If you are taking out a used liner and putting a clean liner in, you could easily be transferring SARS-CoV-2 virions from the cotton outer to the inner liner - oops!

# First: print three template pages for the fabric & retainer

Print this A4 template - <https://cv-masks.github.io/cv-mask-template-6.1.1.pdf>

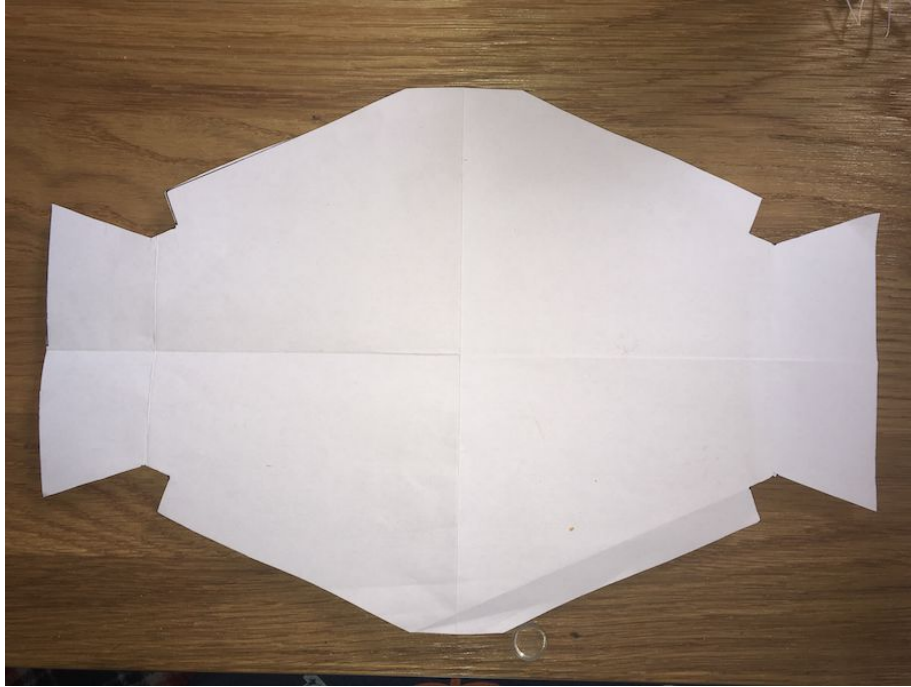
This is too big for US “Letter” and may work on US “Legal” but you’ll have to judge for yourself whether the printer for you Mac/Windows PC mangled the proportions and measurements.

**Two pieces of fabric only:** cotton outer, and satin liner, and a plastic retainer

## Video clip of this facemask

<https://youtu.be/jnAOsD3IVoM>

Maybe your printer cuts off some of the template



That's OK too, as some fabric pieces will be cut off later

# Satin disclaimer

<https://smartairfilters.com/en/blog/best-materials-make-diy-face-mask-virus/>

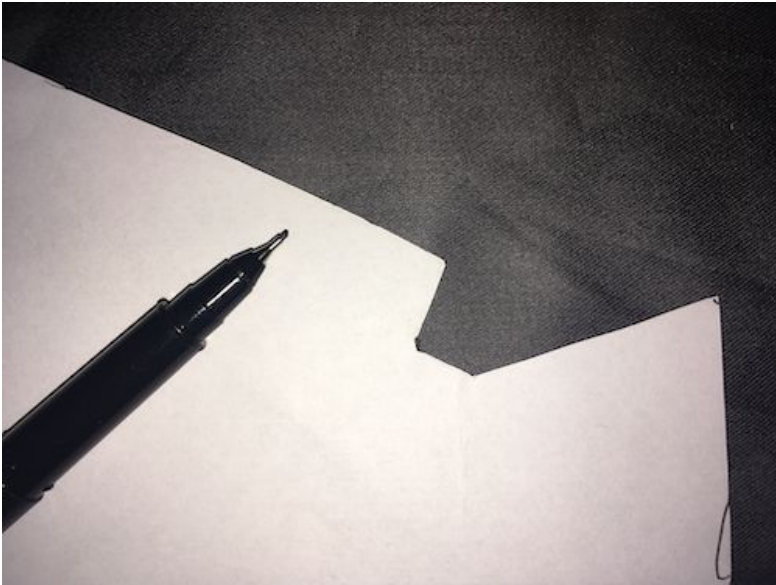
doesn't list **satin** as a choice, and therefore can't grade it.

I do not know how good it is as a filter and where this mask is on a scale of 1-10 (where 10 is classic surgical mask).

You can swap the satin fabric for anything else you may prefer to use. The reasons you're using this design is the cupping of the retainer which holds the fabric away from your nostrils/mouth as you breathe in - and thereby keep a larger surface area of fabric to do the filtering meaning "breathability" isn't trashed as you increase filtering. Just a theory.



Cut the paper template for the cotton outer, and use it to mark the fabric with narrow black sharpie. Then cut it out with sharp scissors (be careful, you don't want an ER trip these days):





Fold it in half vertically, and pin it. Pins should only be used at the two ends like so. Pin holes anywhere else will cause a leak in the mask when in use.

Mark two sew lines -  
30° to 40°



Sew those two lines.

This doesn't have to be too precise.

Then cut off the excess.





After cutting, do a second stitch to reinforce the edge.

This should greatly reduce or eliminate air leakage through the sewn line.



Sew the top hem - a straight line, a turn and another straight line:



Leave room to thread wire through from one end. Also leave a 1cm ( $\frac{3}{8}$  inch) un-sewn gap at each end (note red arrow)

Sew the bottom hem too, but there is no need to leave room for a wire.



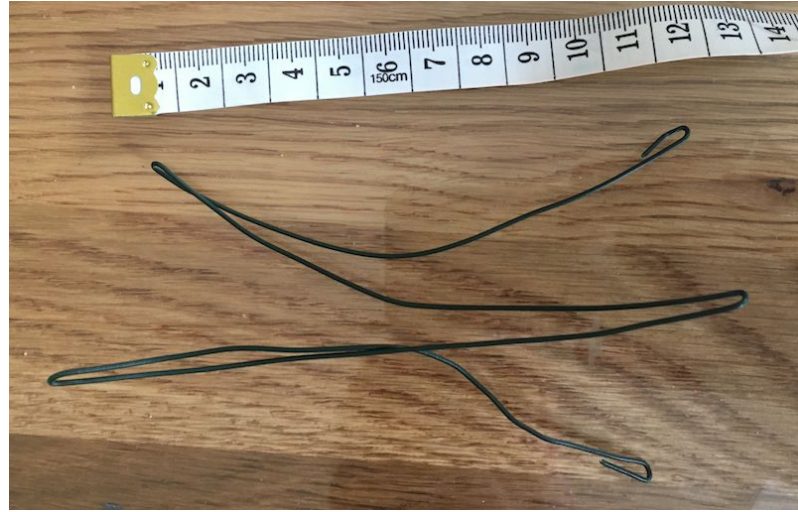
Again, leave a 1cm ( $\frac{3}{8}$  inch) un-sewn gap (note red arrow)

With 1mm plastic coated “garden wire” (or twisty-ties) make a 10cm (4 inch) **twisted** fatter wire.

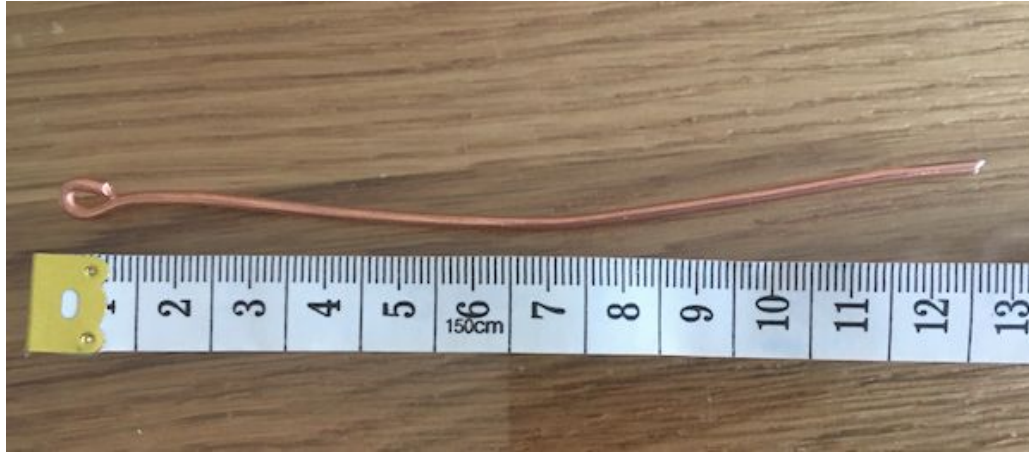
With small pliers, bend the ends over to protect the wearer’s eyes (just in case).

Feed that into the top hem, making sure to center it.

(10cm, not 12cm as shown)



**Or** use a single piece of 2mm copper wire. With small pliers, bend both ends over to protect the wearer's eyes (just in case). Feed that into the top hem, making sure to center it. It should be 10cm (3  $\frac{3}{4}$  inches) when finished.



(10cm, not 12cm as shown)



Fold over the pocket, and iron it to that position leaving room for the elastic to be threaded through later, then sew it into position without encroaching on the path for the elastic through the pocket.



Leave room for the plastic retainer, too.

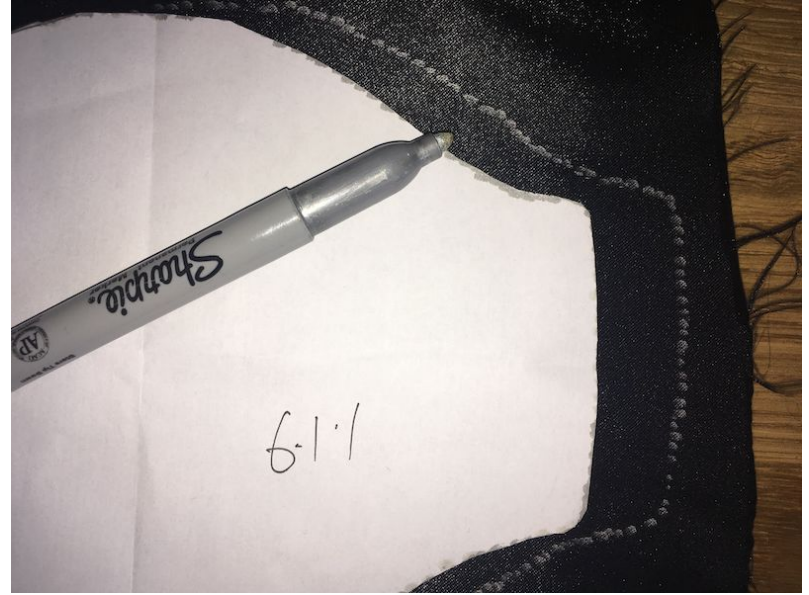
Cut a piece of elastic 86cm (34 inch) long and use some of the 1mm wire to pull it through the end pockets.

Tie a knot to make the two ends into a loop. Cut off and re-tie a piece at a time until it fits your head



Cut paper template for satin liner, and mark the satin with dots as satin “pulls” quite easily when on a flat surface. In fact take time to ensure that the satin is not sheared before you place the template on it.

Then cut that out with scissors - very carefully (no injuries)



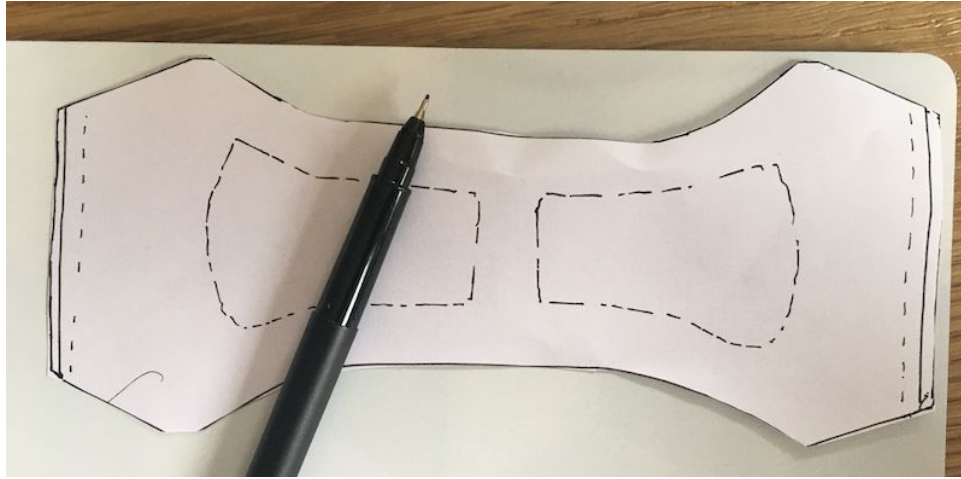
Fold the satin inner in half (left to right) and sew lines at about  $30^\circ$  to  $40^\circ$ . One at the top and one at the bottom. This doesn't have to be too precise.

Then cut off the excess, and do that reinforcing stitch again.



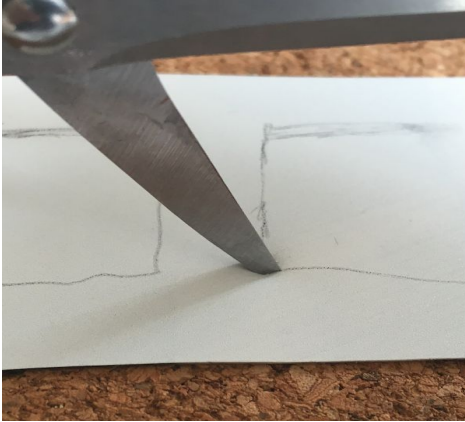


Using a sharpie and the third page of the template on the plastic placemat - mark the outermost cut lines, then cut that carefully with sharp scissors



Be very careful, you do not want an ER trip these days

Cut out two odd shaped holes with scissors. I have pierced through to a cork mat here, then made a small hole, then enlarged that to be the marked final cutouts(s)



Be very careful, you do not want an ER trip these days

Position six self-adhesive velcro dots into the cotton outer





# Velcro dots on the satin liner too



This time **just the top two** for the nose initially (leave the other four until later)

Using the two velcro dots to line everything up, put the liner in the outer and smooth everything out with your fingers



Peeling back one section at a time, put on the right velcro dot so that everything lines up perfectly.

Six dots should now be affixed



The edges of the satin liner should be sealed to prevent fraying - with a little candle flame. Practice on an unimportant offcut first.

Do this outside so you do not accidentally burn your home down.

Do it on a windless day **and very carefully** as you do not want an unplanned ER trip these days.

Lastly wear a mask while you seal these edges - you don't want to be inhaling smoke these days.





Put the  
retainer in -  
ensuring the  
liner is neatly  
inside the  
pockets.

First one end,  
then the other.



You might need to  
trim the retainer to  
make it fit correctly



# Next steps

1. Make a second liner, so you can wash and dry one while wearing the other.
2. Maybe sew the glued velcro dots into position as washing can dislodge them.  
Not too many stitches just enough to hold them.