

Considerations for making face masks

1. **Fit is highly important** – if there are gaps between the mask and the face, particles can be directly breathed in.
 - a. If you can get ACCO fasteners to make it form-fitting around the nose, it should help reduce gaps. I ripped some off of a file folder sent home with our kids, but you can order them. I used a 2" capacity which works well for an adult mask.



- b. If you have any type of stretchy fabric, loom loops or elastic that you can stitch along the bottom, that will reduce gaps along the underside of the chin.



2. **Fabric type** can make a big difference in the amount and size of particles that pass through it as well as how comfortable it is to wear for long periods. **Tightly woven cotton fabric** seems to hit the sweet spot of blocking particles while being comfortable to wear. Tea towels or dish towels were too thick to breathe through, for instance. Pillow cases and 100% cotton t-shirt fabric were recommended.

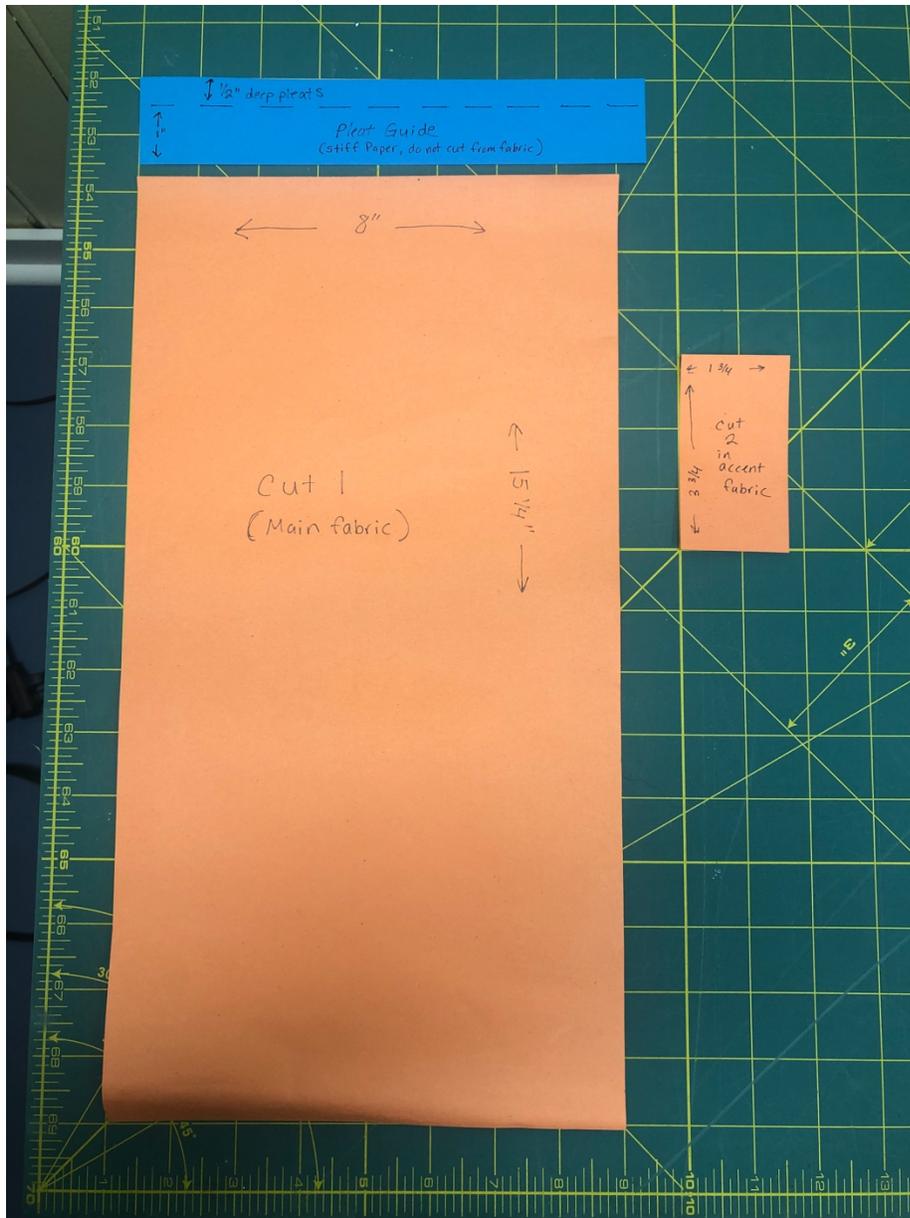
- a. <https://smartairfilters.com/en/blog/best-materials-make-diy-face-mask-virus/>
- b. If you can combine woven and non-woven fabrics, that is likely to provide an even better block, so I've made a pouch of cotton fabric that can be opened to insert a tissue. Keep in mind that removing and replacing the tissue would likely transfer particles to the inside of the mask where the wearer would breathe them in, so the mask should be washed when replacing the inner non-woven material.

Supplies Needed (you don't need to order from Amazon, I put those links in so you could see what materials I'm referring to)

1. 100% cotton fabric – pillow cases or tshirts (I'm using bolts of cotton fabric and bedsheets that are 100% cotton because they are the same fabric just less expensive than bolts of fabric)
2. *Ear securing options:* [Elastic bands](#) (no metal, but still possibly uncomfortable) or these [elastic bands](#) (softer, untested, ordered some to arrive on Monday) or plain old elastic or loom loops for securing on the ears
 - a. Alternatively, you could use ribbon or stitch straps for securing behind the head.
 - b. If you use loom loops, you can tie a knot in them to adjust their length.
3. [Loom loops](#) or other elastic for a tight fit under the chin
4. [Metal Fasteners](#), 1-2" capacity
5. Sewing machine
6. Ruler
7. Pins
8. Iron
9. Scissors

Cut fabric

1. 1 piece of fabric measuring 8" x 15 1/4".
Until you get familiar with this tutorial, I would suggest a non-directional print. One that has a scattered image printed on the surface so you don't end up with an upside down pattern!
2. 2 strips of fabric measuring 1.75" (1 3/4") x 4 1/2". This will be the accent edge piece. It can be the same fabric as the main piece or a small-scale print or solid. *Note:* It is important that the accent piece, when stitched to the sides of the mask, goes all the way to the top and bottom of the mask to create a tight seal, so you do NOT want the accent pieces to be too short. You can wait to cut these until you have the pleats folded, pressed and stitched to make sure you have the measurements right.
3. **Optional:** Pleat Guide – Cut a strip of stiff paper or very thin cardboard 9" x 1.5". Draw a line dividing the 1.5" edge into a 1" and 1/2" section. (see photo below)



Sewing Instructions

1. Press and sew a $\frac{1}{4}$ " hem on each of the narrow ends (8") of the main fabric (8" x 15 $\frac{3}{4}$ ")



2. Fold over one of the hemmed ends to make a 1" wide hem for the metal nose piece



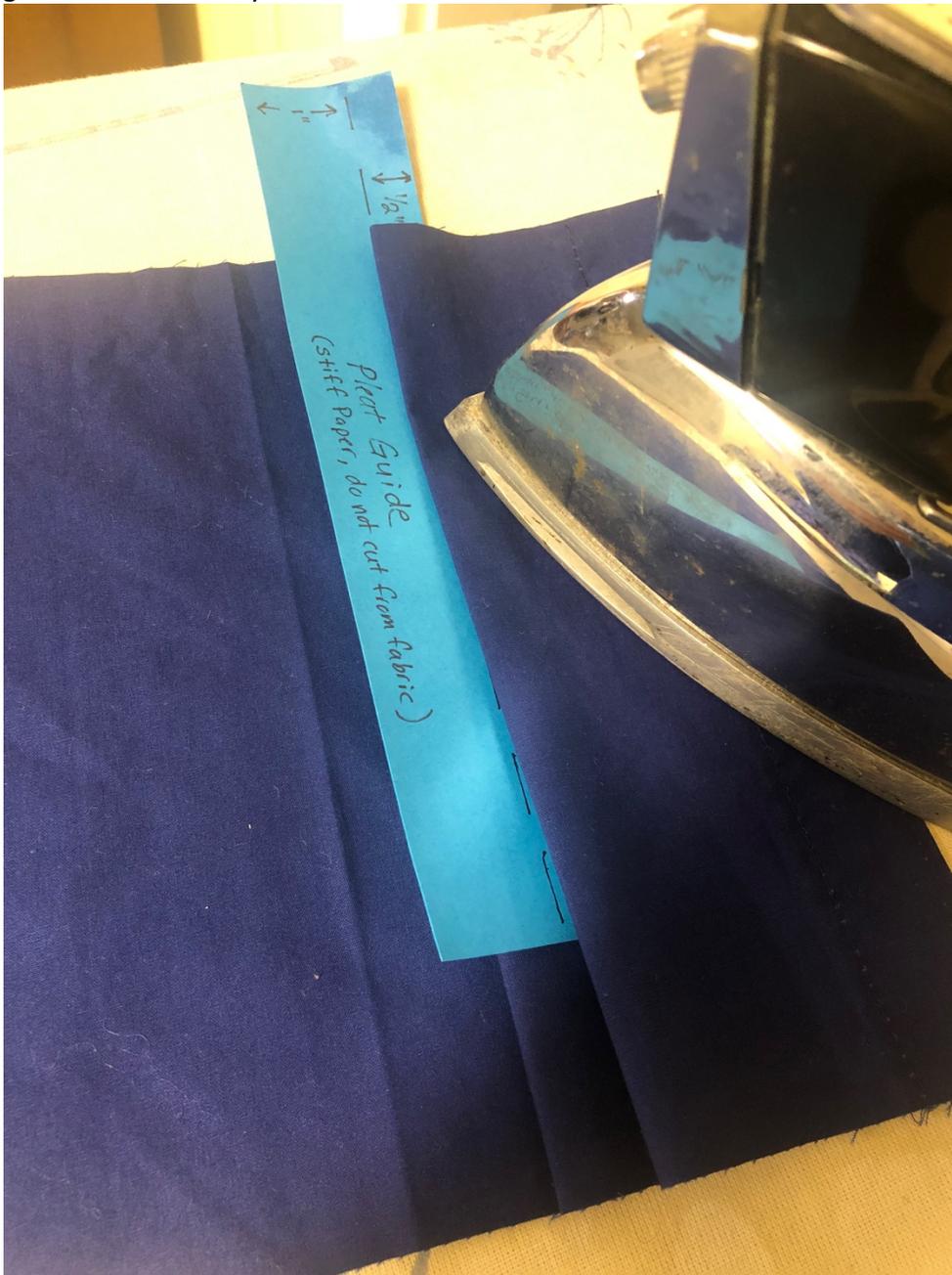


3. Cut a slit large enough for the metal nose piece to pass through (you don't need to insert the metal now, save that for later so you don't break a needle on the metal)
4. Fold the mask in half, wrong sides together and iron.



5. Press three pleats in each side – I think the pleats should have their opening facing downward so they don't trap aerosols settling out of the air into their creases. I don't think it makes a big difference, though, just as long as you have 3 pleats where the first crease is 1.5 inches from the edge and the pleat fold is $\frac{1}{2}$ " deep. This is where a pleat

guide came in handy.





6. Fold the mask in half with the pleats facing outward and pin or stitch the sides together



7. Stitch some elastic or a loom loop along the bottom crease of the mask where the chin will be. I used about 5" of a loom loop, just enough to make the mask pucker. You do want a fairly good pucker here to make a nice tight seal.



8. Check to see if your small accent pieces are a good size for the sides of your mask now. Press $\frac{1}{4}$ inch seams on all the edges of the small accent pieces (1.75" x 4")



9. Press the accent pieces in half



10. Stitch the accent piece to one side of the mask along the pleats (on my first mask, I just folded the accent piece in half, shoved a loom loop inside of it and stitched it to the edge of the mask all in one go. It turned out ok, but not great. Stitching one side at a time should let you make a nicer looking seam between the accent and the mask)



11. Place a loom loop, elastic band or other method of securing the mask to the ear inside of the accent piece, fold the accent piece over the top and stitch the accent piece to the

mask.



12. Insert the metal nose band.



13. Stitch the top partially closed on each end, 1 to 1.5 inches, leaving a large gap in the center for inserting a tissue from the top. You may also want to be able to remove the metal nose band from the top for washing. (I currently have two in the washing

machine to see if removal is necessary!)



14. Check that all threads are trimmed, and you're done! Get them to your local medical facility (hopefully you checked if they actually want them first).

I started with these directions (link below), but modified them to have (1) a pouch for inserting non-woven fabric (2) elastic along the bottom and (3) a slot for a metal nose band. But, if all of these modifications are too much for you, the CDC approved a mask pattern just like the one below that has none of these changes--something is better than nothing.

<https://buttoncounter.com/2018/01/14/face-mask-a-picture-tutorial/?fbclid=IwAR2-Ht8KW-dld42Ehk9gzs9di6lqSVUiTPojZZUY-u6liFxddAcr2hh9ags>

Links to scientific studies I read when coming up with this design:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2440799/pdf/pone.0002618.pdf> (masks made with tea towels do something, something is better than nothing)

https://www.researchgate.net/publication/258525804_Testing_the_Efficacy_of_Homemade_Masks_Would_They_Protect_in_an_Influenza_Pandemic#pf7 (surgical masks are 3x more effective than masks made of cotton t-shirts or pillow cases, tea towels doubled over block many particles but are too hard to breathe through for long periods, fit factor is important) – This website made an easier-to-understand summary with great figures from this research article

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

<http://www.koreascience.or.kr/article/JAKO201721241153096.page> (washing face masks increases efficacy at 4 washes)