Clinical Face Masks
Assembly Guide

FAQs

Why are these clinical face masks needed?

Health systems grappling with COVID-19 are running short on critical personal protective equipment such as clinical masks. Many more masks are needed than are currently on hand.

How can I help?

You can help by sewing clinical-grade masks for healthcare workers. Follow the instructions in the following pages carefully. You will also need specialized fabric (see explanation below).

How will these masks be used?

These masks are different from masks made with regular cotton fabric. These are for frontline healthcare workers—those who are closely caring for those who are infected or diagnosed with COVID-19. Hospitals will sterilize the polypropylene masks before they are used, and they will help protect healthcare workers and patients.

Will they protect against disease?

Clinical masks using this pattern made from medical-grade polypropylene offer a similar level of protection as approved surgical masks.
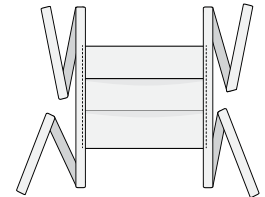
How do I get help while I'm sewing?

In addition to these instructions, visit **project**protect.health for an instructional video and support.

What style of mask does this pattern make?

These instructions are for a pleated mask with either fabric ties or elastic ear loops.
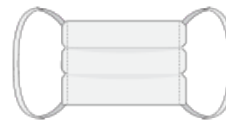
With elastic ear loops   *With ties*

What equipment is needed to sew the masks?

- Sewing machine
- Thread: All-purpose, polyester, or polyester/cotton thread (any color)
- Scissors
- Straight pins or clips

What materials are required?

Clinical face mask guidelines require medical-grade 40-gsm weight polypropylene material. The mask is made of a single layer of fabric.

If ties are used, they are made of the same fabric.

If elastic ear loops are used, a narrow width is recommended (1/8-inch or 3.2 mm).

Before you start making masks…

Before making masks, you must be symptom free and wash your hands thoroughly.

Sanitize your workstation and equipment thoroughly with a disinfectant that indicates it kills viruses per the instructions on the label. Ensure there are no potential contaminants (e.g. pet hair, food, etc.) in the work area.

Review the instructional video on *Project*Protect.health.

Cutting instructions

(for those not using a kit with pre-cut fabric)

About the fabric

- The polypropylene fabric is identical on both sides— there is no "right" or "wrong" side.

- Do not use an iron on this fabric; it will melt.

Use or make a pattern

- The body of the mask is made from one piece of fabric folded over (Figure 1).
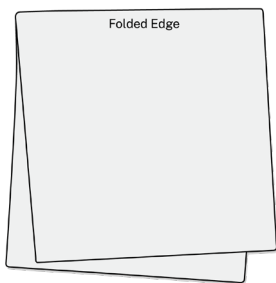
Folded Edge

Figure 1

- Use a pattern to help with cutting and pleating. Print the pattern at the end of these instructions or make your own (Figure 2).

- To make your own pattern, cut a piece of paper 7 inches (18 cm) wide and 7.5 inches (19 cm) long. (Figure 2). Label one 7-inch (18 cm) edge "TOP" and the opposite edge "BOTTOM." Make four dots down each side of your pattern, at these distances from the top:

  - 1 ½ inches (3.8 cm) Dot 1
  - 3 inches (7.6 cm) Dot 2
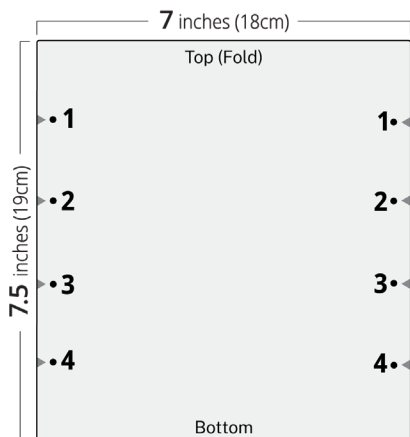 - 4 ¼ inches (10.8 cm) Dot 3
  - 5 ¾ inches (14.5 cm) Dot 4

7 inches (18cm)

Top (Fold)

•1   1•
•2   2•   Figure 2
•3   3•
•4   4•

7.5 inches (19cm)

Bottom

Plan the layout and cut the mask pieces.

- Plan a cutting layout to make the best use of your fabric. If you are making ties out of the fabric (see below), plan for those and the main mask piece.

- To prepare for cutting out the mask piece, fold the fabric so you have a double layer that measures at least 8 inches (20 cm) from the fold. This folded edge will be the top edge of the mask body (Figure 3).
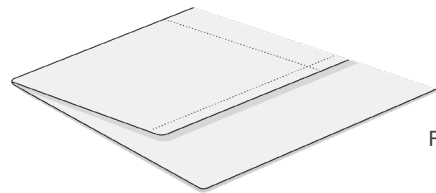
Figure 3

- Use the pattern or a ruler as your cutting guide. Do not mark the fabric with pen or pencil.

- Cut the mask body according to the pattern dimensions. This is 7.5 inches (19 cm) from the fold at the top to the bottom of the mask, and 7 inches (18 cm) from side to side. Be sure not to cut along the folded edge of the fabric.

- Cut out as many pieces as you can fit, then re-fold the remaining fabric as necessary to cut more.

- If using **fabric ties**, for each mask cut two strips of fabric 30--35 inches long x 1 inch wide (76-89 cm x 2.5 cm) (Figure 4).

- If using **elastic**, (Figure 4) wait to cut strips for ear loops until you have prepared the body of one mask. Then you can test and find the best length for your type of elastic.

Fabric ties
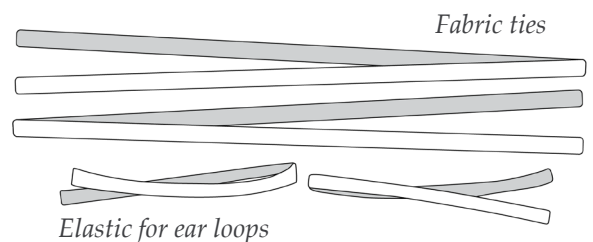
Elastic for ear loops

Figure 4

Assembly Guide
Sewing Instructions

You can go through the following steps to complete one mask at a time, or do one step for a batch of masks before moving on to the next step. Others in the household may help by doing steps such as 1, 3, 4, 5, 9, and 11.

Step 1 – Align corners of main mask piece

- With the main mask piece still folded in half, make sure the corners are lined up square.

Step 2 – Sew the bottom seam

- Sew a seam across the bottom of the mask, stitching ¼ inch (6.3 mm) from the edge (Figure 5). (If desired, this step can be done in batches using "chain sewing." Feed one mask after the other through the sewing machine in one continuous stitching. (There will be a few stitches between pieces.) Then snip threads to cut masks apart.
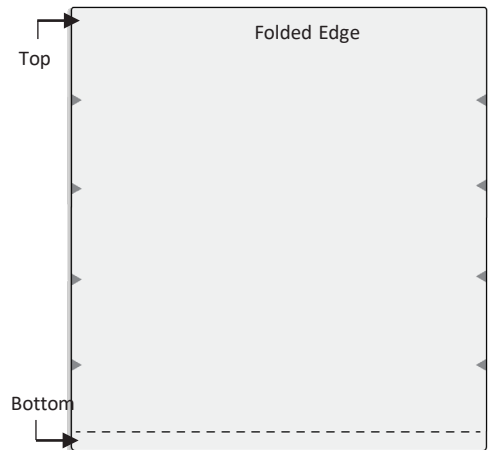
Step 3 – Turn the mask inside out and mark for pleats

- Turn the mask piece inside out. The bottom seam will now be hidden on the inside (Figure 6).

- Flatten the seam with your fingers. Do not use an iron.

- Lay your pattern (the one you printed out or made yourself) next to the mask edge. Do not mark the fabric with pen or pencil. Mark placement of dots #1, 2, 3, and 4 on the mask with a pin, or by cutting notches. Notches should be less than ¼"(6.3 mm) deep into the fabric.
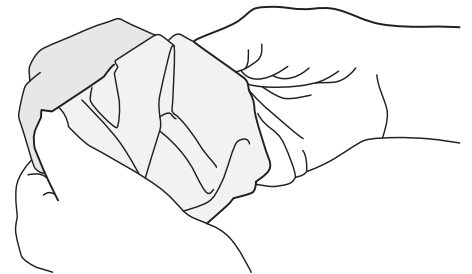
Next: Refer to Figure 7 as a guide to help you visualize how to make the pleats (steps 4 and 5, next page).

Some of the following illustrations show notches instead of pins marking the sides of the mask. Either way of marking is fine.)

You have marked your mask for dots #1, 2, 3, and 4. Imagine that there are lines on your fabric like the lines in Figure 7. Line 1 is the imaginary line between dot #1 on the left and dot #1 on the right, and so on.
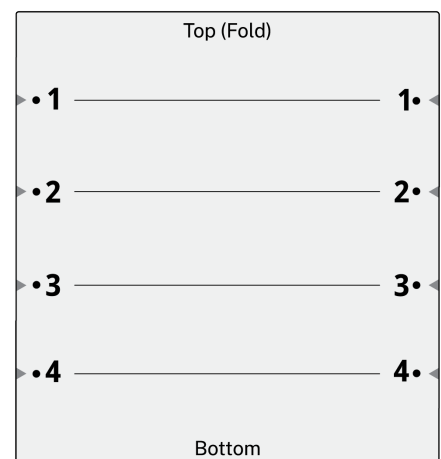

Figure 5

Figure 6

Figure 7

Step 4 – Make the top pleat

- Lay the mask out on a flat surface, with the seamed (bottom) edge toward you. Make the following folds through both mask layers.

- Make a fold along line 1. To do this, place hands on the right and left sides of the mask at dots #1. Pinch the fabric to form a folded edge along line 1. Pull the fabric taut between the two notches. Crease the folded edge.

- Bring the folded edge (line 1) down toward you and place it along line 2 (Figure 9). This makes a downward-facing pleat.

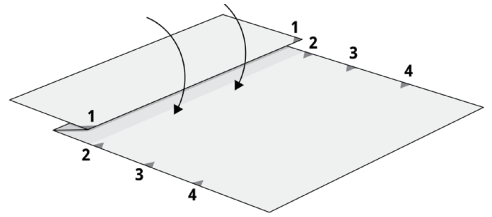- Smooth the pleat so it lays flat and pin or clip in place.

Figure 8

Step 5 – Make the 2nd pleat

- Make a fold along line 3. (Pinch at dots 3; pull taut to form a fold; crease.) Bring the folded edge (line 3) down toward you and place on line 4 (Figure 10). This makes another downward-facing pleat.

- Smooth the pleat flat. Pin or clip the pleat in place.

Figure 9

Step 6 – Select instructions for elastic ear loops or fabric ties

- **Ear loops**: If using elastic ear loops, *continue to Step 7.*
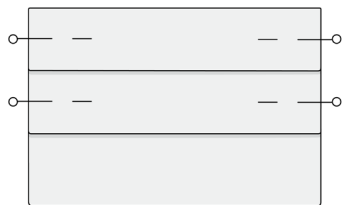
- **Fabric ties:** If using fabric ties, *skip to Step 8.*

Step 7– Add elastic ear loops

(Begin by cutting elastic for one mask—two pieces 9 inches (23 cm) long. Finish all of step 7 with that one mask. Then go ahead and "use up" one mask by trying it on to see if that length of elastic would be right for most users. If not, cut the elastics longer for the rest of the masks. Smaller wearers can adjust by tying a knot in the elastic.)

Figure 10

- Insert 1 inch (2.5 cm) of an elastic strip into the top corner of the mask, between the two layers of fabric. Angle the placement of the elastic strip so that it comes out from the mask diagonally. Pin in place (Figure 11).

- To form an ear loop, insert an inch (2.5 cm) of the other end of the elastic into the bottom corner of the mask between the two layers of fabric. Angle the strip so it comes out from the mask diagonally. Pin in place (Figure 12). Make sure the elastic isn't twisted.

- Stitch along the sides of the mask ¼ inch (6.3 mm) from the edge (Figure 13). Make the seam wide enough to avoid stitching on the notches if your mask has them.

- Stitch again at corners to reinforce where the elastic is attached.

- Repeat to form the second ear loop.

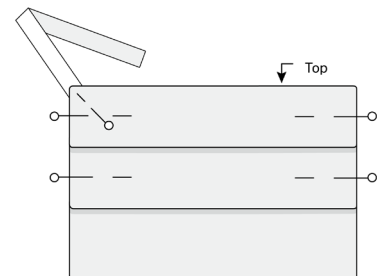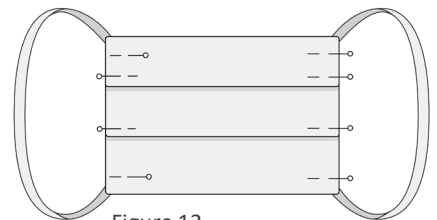- The mask is complete. **Go to Step 11.**

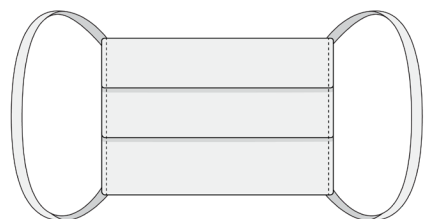

Figure 11

Figure 12

Figure 13

Step 8 – Sew the sides of the mask

- Sew a seam down each side of the mask, just inside the notched edges, approximately ¼ inch (6.3mm) from the edge (Figure 14).

- If desired, use chain-sewing to do a batch at a time for this step. Feed one prepared mask after another into the sewing machine without cutting your thread between masks. Sew left side seams in one continuous stitching, then do the right-side seams. When finished, snip threads to separate the masks.
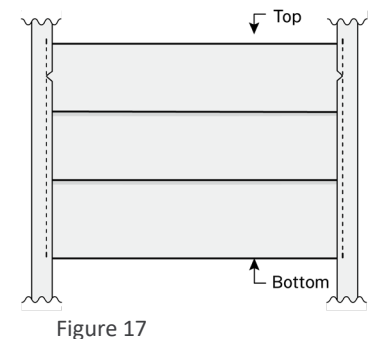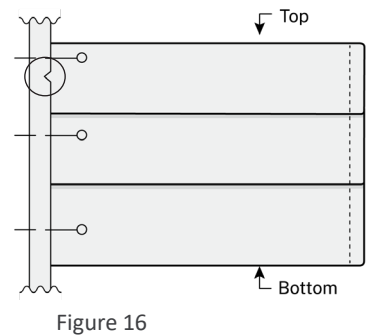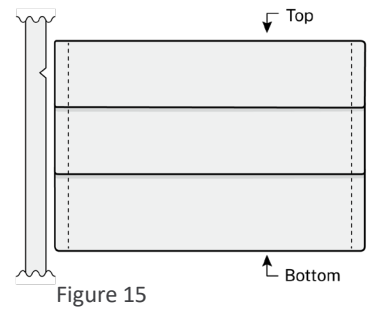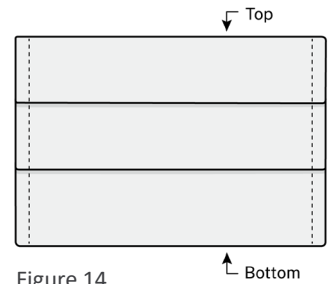
Figure 14

Step 9 – Position the fabric ties

- Mark the lengthwise center of each tie with a pin or small notch. The center 4-inch (10 cm) portion of the ties will encase the side edges of the mask like a binding.

- Fold the center portion of the tie in half lengthwise and crease with your fingers (Figure 15).

- Fit this portion of the tie around the side of the mask. Place the tie's center mark 1 inch (2.54 cm) below the top of the mask (Figure 16). Pin or clip the tie in place along the side of the mask. (There will be about ½ inch (1.3 cm) of the tie fabric running along the front of the mask and the same on the back.)

- Repeat with the other tie.

Figure 15

Step 10 – Sew fabric ties to the mask

- Do not sew the portions of the tie above and below the mask. Only sew where the tie attaches to the mask (Figure 17).

- *If you use a straight stitch*, you will be making two rows of stitching. You can make one line of stitching on the front and a second one on the back. Backstitch at beginning and end. *Or*, you could do it all from the front, like this: Begin with a backstitch and sew a straight line down the side of the tie, close to the raw edge. Then pivot with the needle down and presser foot up, do one stitch across, and sew a second line of stitching close to the first one, in the opposite direction. Backstitch at end.

- *If you use a zig zag stitch* for this step, be sure the stitch is at least medium length and wide enough to secure the tie well. Your stitching should lie on top of the tie, not reaching over the edge onto the body of the mask. Backstitch at beginning and end.

- The mask is complete.
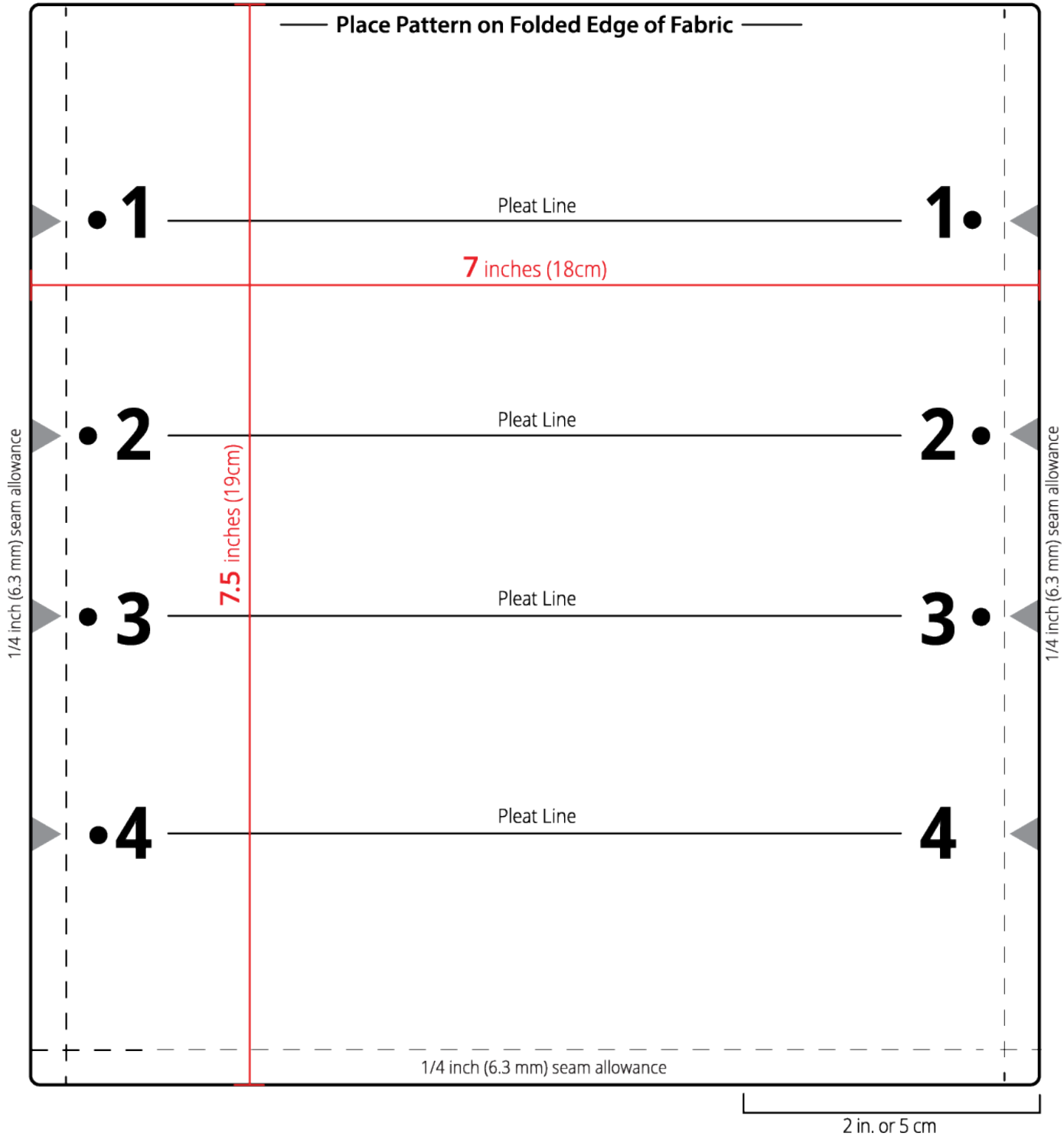
Figure 16

Figure 17

Step 11 – Final Instructions

- Remove all pins from completed masks.

- Ensure all masks are clean and free of potential contaminants such as pet hair, food stains, etc.

- Place completed masks in the bags provided or in clean plastic bags.

- Place any materials you haven't used in a separate, labeled bag.

- Carefully follow the instructions from your project organizers about where and when to return your items.

Clinical Face Mask Pattern

Main Mask Piece

— **Place Pattern on Folded Edge of Fabric** —

1/4 inch (6.3 mm) seam allowance

• **1**   Pleat Line   **1**•

7 inches (18cm)

7.5 inches (19cm)

• **2**   Pleat Line   **2** •

• **3**   Pleat Line   **3** •

•**4**   Pleat Line   **4**

1/4 inch (6.3 mm) seam allowance

1/4 inch (6.3 mm) seam allowance

2 in. or 5 cm

Ties or Ear Loops

- If using fabric ties, cut two strips of fabric 30-35 inches long x 1 inch wide (76-89 cm x 2.5 cm). Mark the center of each strip with a pin or small notch.
- If using elastic, cut two elastic pieces 9-11 inches (23-28 cm) long.

When printed, this line should be 2 inches (5 cm). Enlarge or reduce as necessary to ensure your pattern is accurate.