

ALL-SAFE

Penetrating Trauma Simulation

Build Instructions



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ALL-SAFE Consortium: Pan-African Academy of Christian Surgeons, University of Michigan, Southern Illinois University, Soddo Christian Hospital, AIC Kijabe Hospital, and Mbingo Baptist Hospital

Materials Required for Assembly

- 1 sheet cardboard - minimum 17" x 1.5" (or 431.8.4mm x 38.1mm)
- Ruler
- Pencil/writing utensil
- Box cutter/utility knife, and/or scalpel (#11 is ideal)
- Tape
- Two regular sized rubber bands
- Cloth (For simulating vital organs)
- 2 disposable masks
 - Must have metal noseband

Preparation Instructions

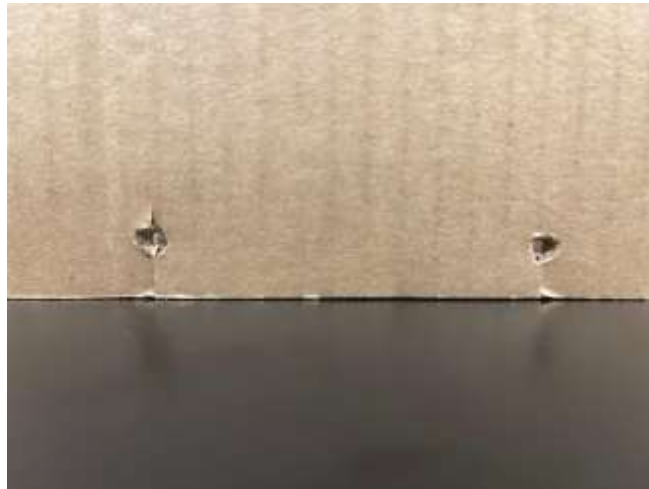
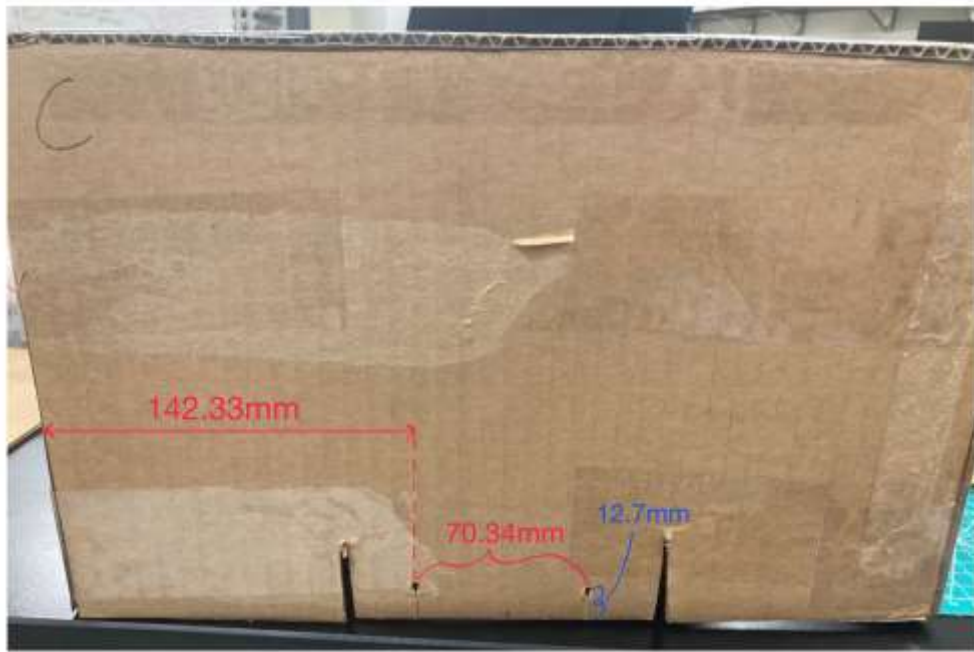
Preparing the box:

Note: It is helpful to temporarily remove the two stabilizing flaps (front and back) when installing this module.

- A. Cut a straight strip of cardboard to be 17" x 1.5" (431.8.4mm x 38.1mm). It is helpful, but not necessary to have the corrugation direction oriented in the 1.5' direction. This component will be referred to as the "base strut". Next loop two rubber bands together as shown.
 - a. Pay attention to the corrugation direction of the base strut. It is helpful to have the corrugation oriented as shown in the picture below.



- B. Cut two slits in the back of the box (part C), each 0.5" (12.7 mm), and poke a hole at the end of the slit. The slits should be about 2.75" (70.34 mm) apart at the base of side C, around the center. These dimensions do not need to be replicated exactly, just well enough to secure the rubber band to the back of the box in the upcoming steps.



- C. Tie two rubber bands together and tie one end around the strip of cardboard near the middle.



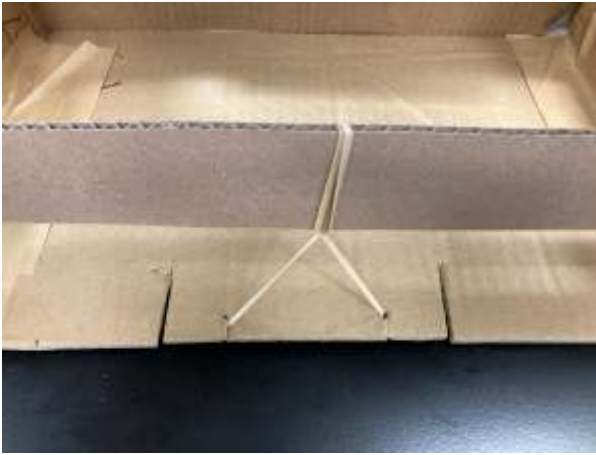
- D. Cut a slit into the side of the box (part A), each 0.8" (20 mm). Do this for both sides of the box (both parts A). Next, slide the base strut, made earlier, into the two slits as shown below.



E. Fold the ends of the cardboard strip down, and tape.



F. Place the rubber band that is tied around the cardboard strip around the slits from step B. This puts downward pressure on the base strut which will be important later when adjusting the tension on the simulated diaphragm.



Bottom View



Back View

At this point the box should look like this:



Preparing the mask:

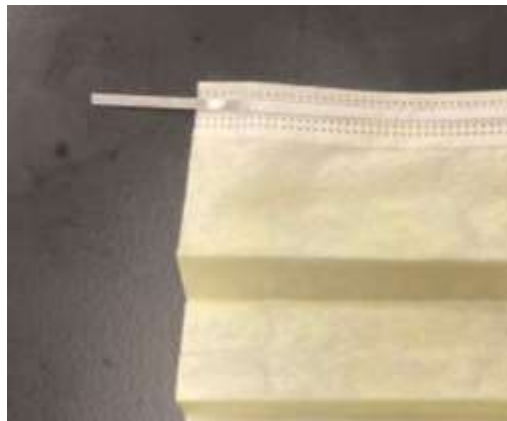
- A. Cut off the string ends as shown, making sure the section where the mask folds are glued are properly cut off.



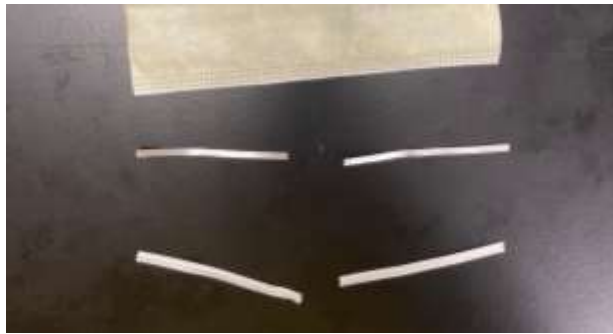
- B. Extend the mask by pulling on the top and bottom, resulting in a flat rectangle.



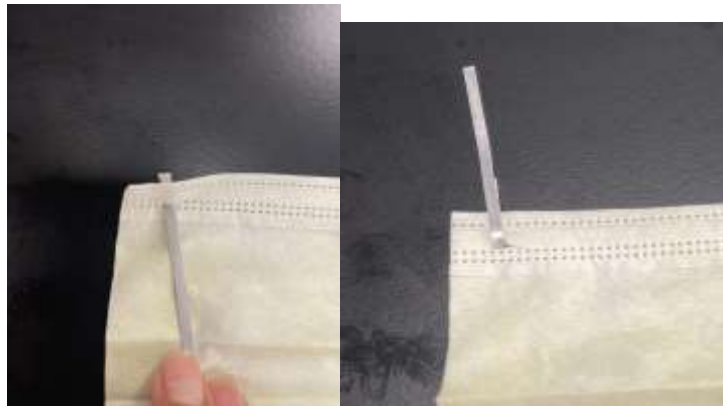
- C. Remove the metal band from the nose of 2 masks.



- D. Cut the two metal bands in half as shown. These bands are reusable for multiple trials of Module 3. You may encounter different metal bands depending on what brand of mask you are using; however, most metal bands will work.



- E. Poke each metal piece through the four corners of the mask, 0.59" (1.5 cm) from the edge, and fold the metal band on itself.



- F. Repeat for all 4 corners



Assembly Instructions

Installing Mask Inside Box:

- A. Push the metal band mask attachments into the corrugation of the cardboard. Ensure it is taut between the two top metal bands.



- B. Bend the metal bands back into the corrugation on the top side to secure the mask to the cardboard*



- C. Repeat for all 4 corners
 - a. Note: If the mask is not sufficiently taut in the vertical direction, the two lower metal bands can be inserted higher up through the mask material in order to apply more tension. Similarly, if tension is not sufficient in the horizontal direction, tape can be used to better secure the metal bands where needed.



D. Create a defect as shown.



E. Add towels/other cloth material at the appropriate height on the bottom of the box to model vital organs. After multiple runs of the module, the discarded masks can be used for this purpose as well.



Pictures of end product:



Side View



Bottom View