ALL-SAFE

Trocar Placement

Simulation Build Instructions

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**Materials Required for Assembly**

- Cardboard piece at least 4 in by 22 in (10.16 cm by 55.24 cm)
- Box cutter & Scissors
- 4 pens
- Plastic cling wrap (Peritoneum)
- Packing tape or masking tape (fascia)
- Red felt (muscle)
- Sponge (adipose tissue)
- White felt or cloth (skin)
- Small Balloon (Umbilicus)
- Modeling Balloon (Bowel)
- Red lipstick
- Rubber band

**Preparation Instructions**

**Preparing the box:**

1. Cut a piece of cardboard to 4 in by 22 in (10.16 cm by 55.24 cm)
   a. It is important to have the cardboard corrugation oriented as shown in the figure below.
2. Following the template in Fig 3, cut two slots 1 inch (2.54 cm) from each edge as shown. The slot length should be half of the original 4-inch (10.16 cm) dimension.

Figure 3. Dimensions are in millimeters
3. Mark the fold points indicated by the dashed lines in the template above. Then fold the cardboard at each red dashed line.

Figure 4
4. For each fold, use scissors to cut two, 1 in (2.54 cm) cuts at the locations indicated by the blue dashed lines in Figure 3.
5. You may find it necessary to use box cutters to cut the blue dashed lines that are not placed over a fold line (red dashed line) as there is no fold in the cardboard at that location. See Figure 7.
6. Next, fold the cardboard into a square as shown below in Figure 8. The two opposing slots should slide together to form a lock as shown in Figure 10.
7. Next, using your finger, push each “pen holder” inward towards the middle of the box as shown below in **Figure 11**.

![Figure 11](image)

8. Push a pen through each of the “pen holders” as shown below.

![Figures 12](image) ![Figure 13](image)
Preparing the model:

1. Cut a square of plastic wrap approximately 6 inches by 6 inches (15.25 cm by 15.25 cm). Cut small holes in each corner so that the pens impale the plastic wrap through each hole in order to be tightly held in place as shown below.

*Figure 14*  
*Figure 15*
2. Cut a square of white felt or cloth to approximately 6 inches by 6 inches (15.25 cm by 15.25 cm). Take packing tape or masking tape and adhere the tape in strips in order to cover the entirety of the cloth on both sides. Then cut holes in each corner and impale the felt or cloth in the same way as you did in the previous step as shown below.

*Figure 16*  
*Figure 17*
3. Take the red felt material (muscle) and cut two rectangular pieces to approximately 6 inches by 2 inches (15.25 cm by 5 cm). Then cut holes in each side allowing for the felt to be impaled and held by the protruding pens. Make sure the holes are cut at the right locations so that adequate tension is applied to the material like the last steps as shown below.

![Figure 18](image1)

![Figure 19](image2)
4. Cut a square of the sponge material to 6 inches by 6 inches (15.25 cm by 15.25 cm). Again cut 4 holes into the sponge material, to allow the pens to hold the sponge in place. Make sure the holes are cut at the right locations so that adequate tension is applied to the material as shown below.

![Figure 20](image1)

![Figure 21](image2)
5. Cut another square of white cloth or felt to the same size as in the previous steps and cut an additional hole to allow for the balloon to stick through in the middle as shown below. Notice that the balloon has been cut, and includes just the neck of the balloon, which is oriented away from the center of the square as shown in Figure 22 below.

*NOTE: Do not add tape to the cloth like what was done in Step 2.*
6. Inflate a modeling balloon to simulate the bowel. Take a small piece of tape and adhere it to the bottom of the plastic wrap (peritoneum) as shown in Figure 23 below.
   a. Next place a small amount of red lipstick on both sides of the modeling balloon (bowel) as shown in Figure 24.

![Figure 23](image1)

![Figure 24](image2)
Assembly Instructions

Installing Model Inside Box:

1. Rotate your laparoscopic box trainer on its side and orient the trocar module as shown in Figure 25 below.

Figure 25
2. Next, take a pen and make two lines that line up with the top window of the trainer box. The spacing of the two lines does not need to be perfect, as you will see in the following steps. Using scissors, make 3-inch (7.6 cm) cuts at both marked locations as shown in Figure 26 and 27.
3. The cuts should be long enough to produce a cardboard flap that can slide over the trainer box window as shown in **Figure 28 and 29** below. The trocar module should now be securely attached to the trainer box and be flat on the surface of the table as shown in **Figure 30**.
Figure 30
4. The last step is performed in order to provide a way to securely attach a cell phone to the top of the box (with camera pointed down at the trocar module). Cut two slits into the cardboard as shown in Figure 31. These slits should be wide enough to hold a rubber band between them in order to hold the user’s phone in place. The length of the slits only needs to be ½ inches (1.3 cm in length). The phone should be placed directly above the trocar module to provide a view similar to that of Figure 31.
5. The final product should look like Figure 32. The weights can be added to the inside of the trainer box for stabilization. Textbooks work well. Figure 33 shows how to attach your cell phone to the top of the box using the rubber band, with the camera directly above the model.

![Figure 32](image1)

![Figure 33](image2)