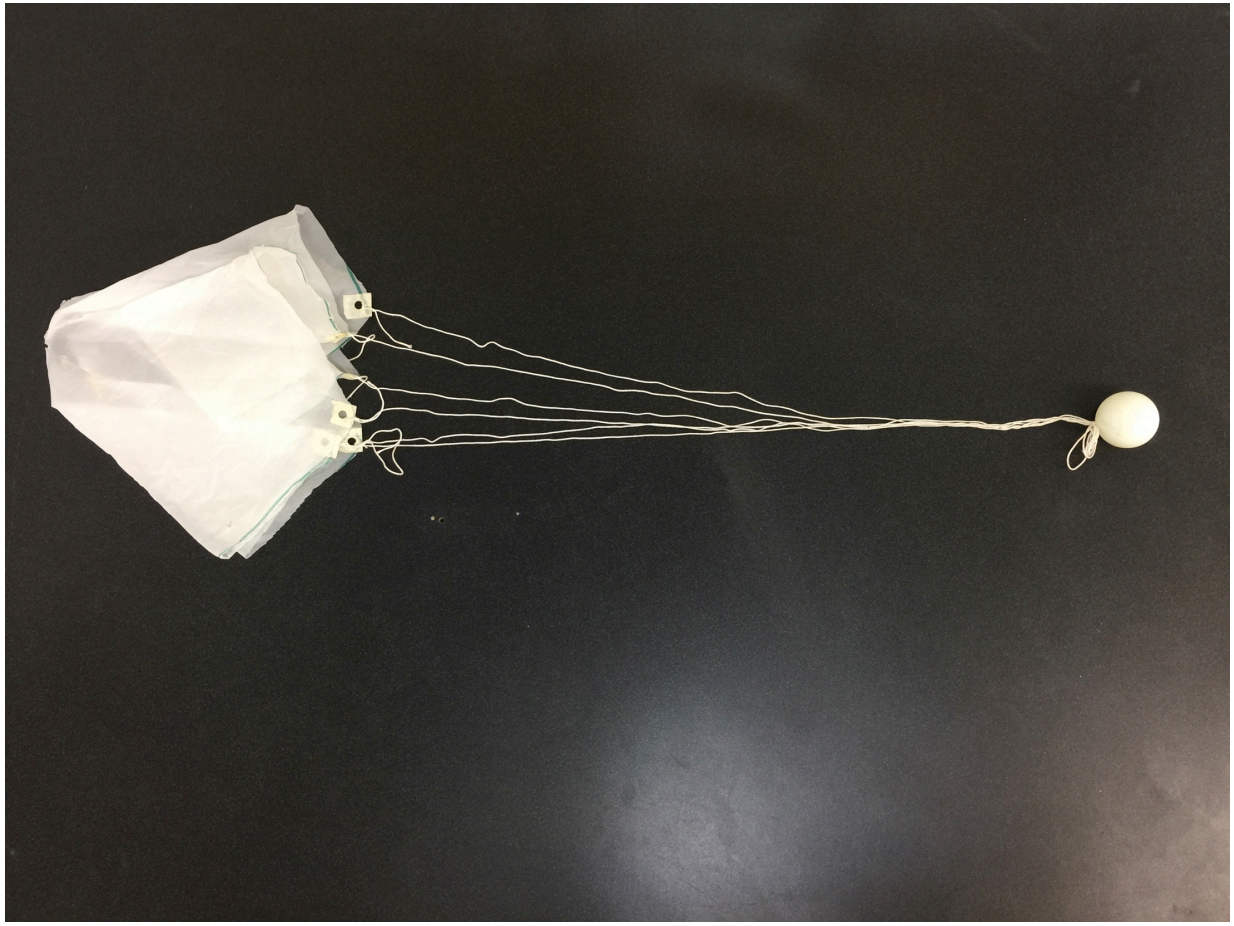
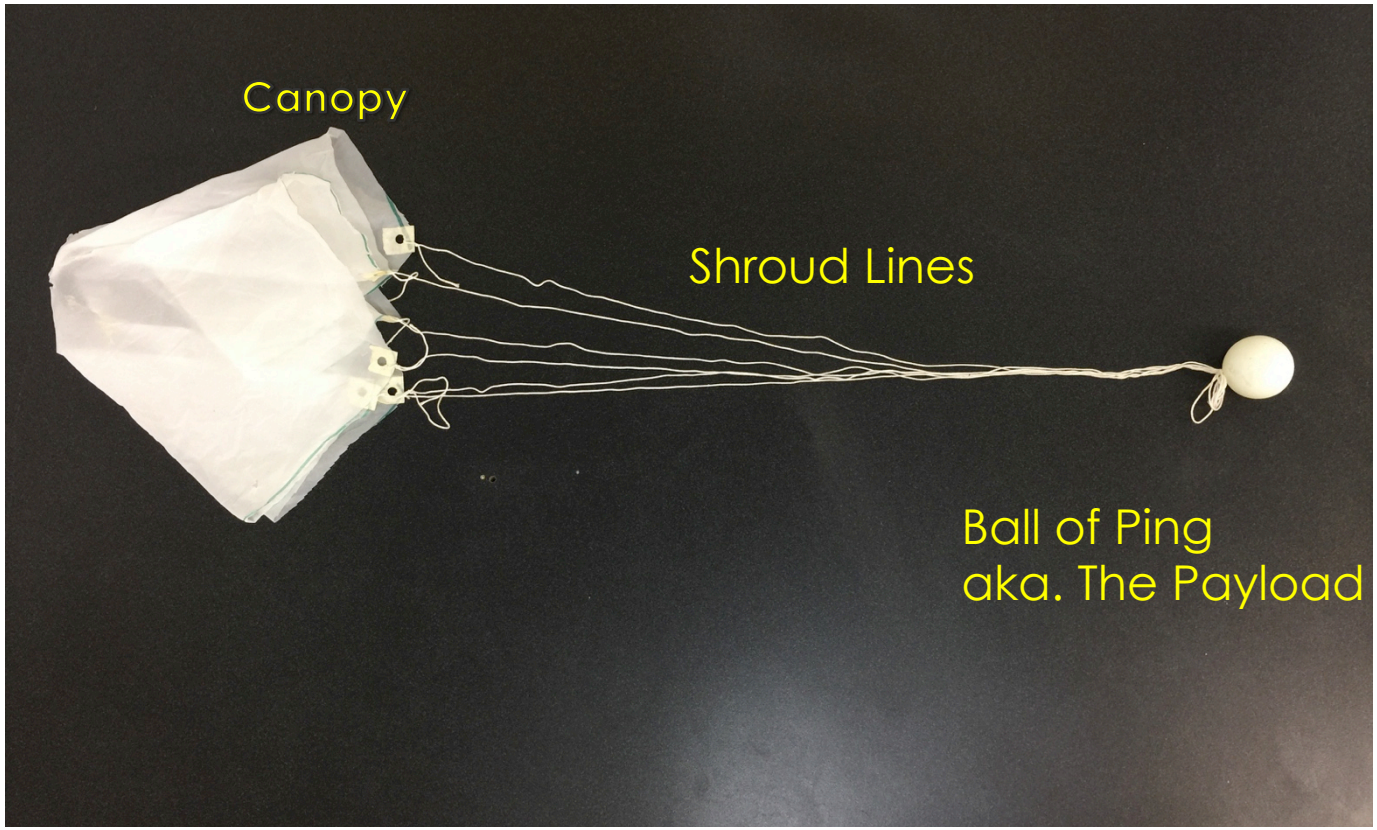


NERDS INC

Parachutes

Part 1 How to make parachutes of two different designs.

Parts of a Parachute



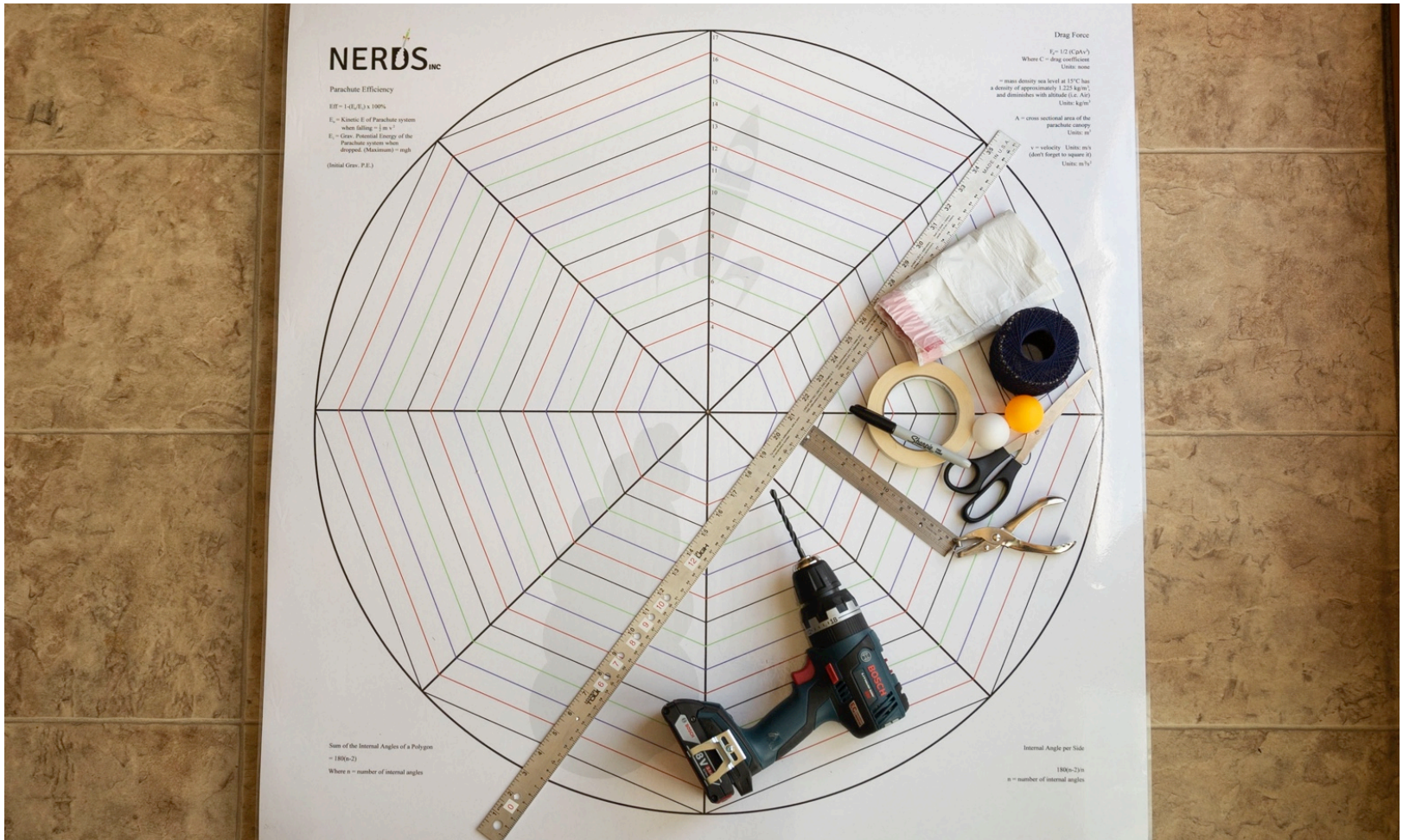
Making a Parachute

Materials Needed

- **Plastic Bags** (1 / group of 2 students. Ultra thin dry cleaning bags work great!)
- **Masking Tape** (1 foot per group of 2 students)
- Thin **yarn** (kite string or thinner) (Students remove needed lengths from string supply located on ring stand. (Shown in later slide)
- **Ping Pong Ball** (1 per parachute made. Usually 2 per group of 2 students.)
- **Meter Stick** (One per group of 2 students.)
- **Ruler** (One per group of 2 students.)
- **Razor Blade** (The Teacher is the only one who uses it.) **Scissors** 1 pair per group

Making a Parachute

Materials Needed



Making a Parachute

Marking the Dry Cleaning Bag

- Using a marker and a meter stick draw lines on the bag. Make a symmetrical shape (a square works nicely)

Making a Parachute

Cut out the square

Making a Parachute

Now you have two canopies.

Making a Parachute

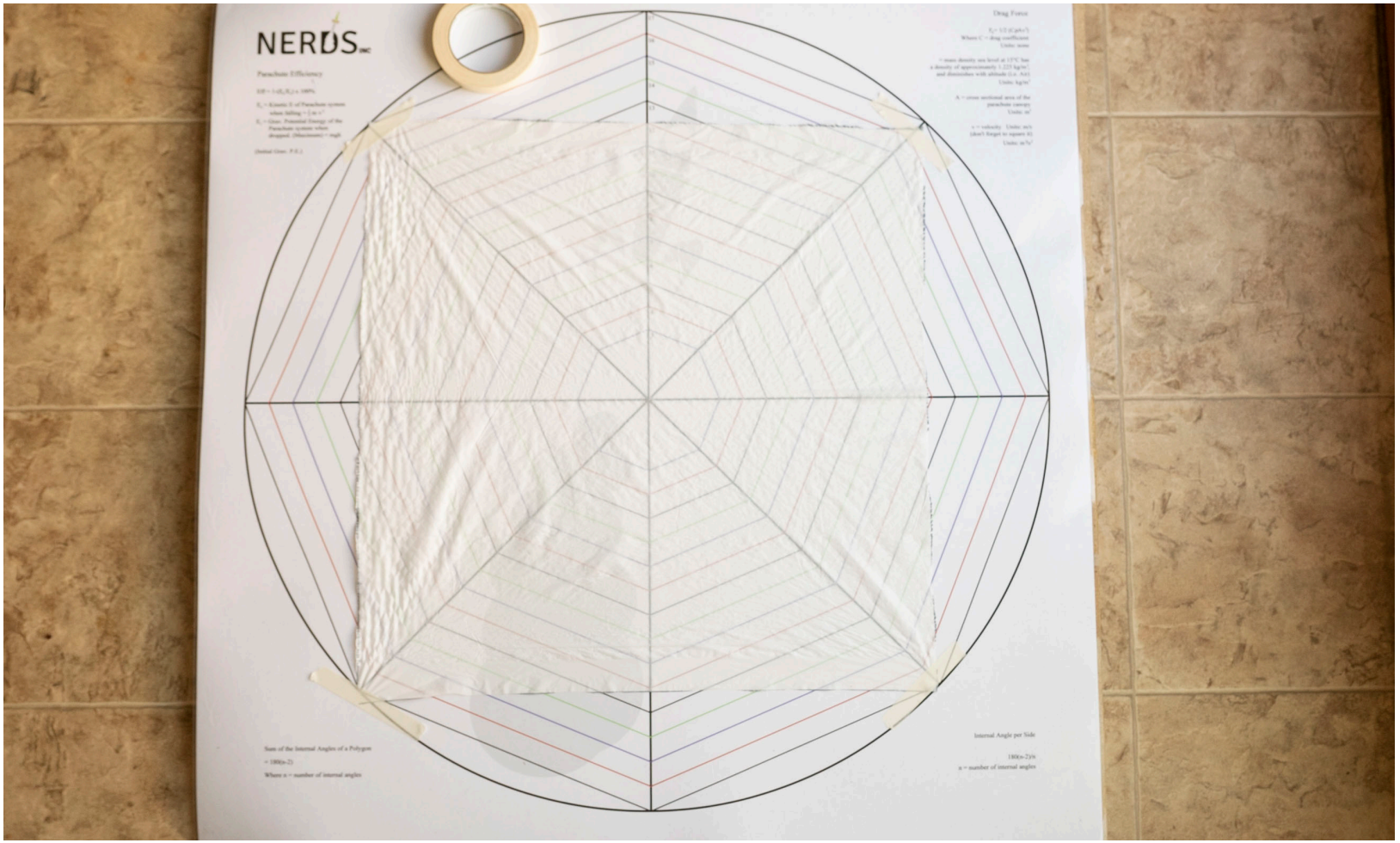
Put the canopy on the Parachute Template as shown.

Making a Parachute

Tape the canopy to the Template.

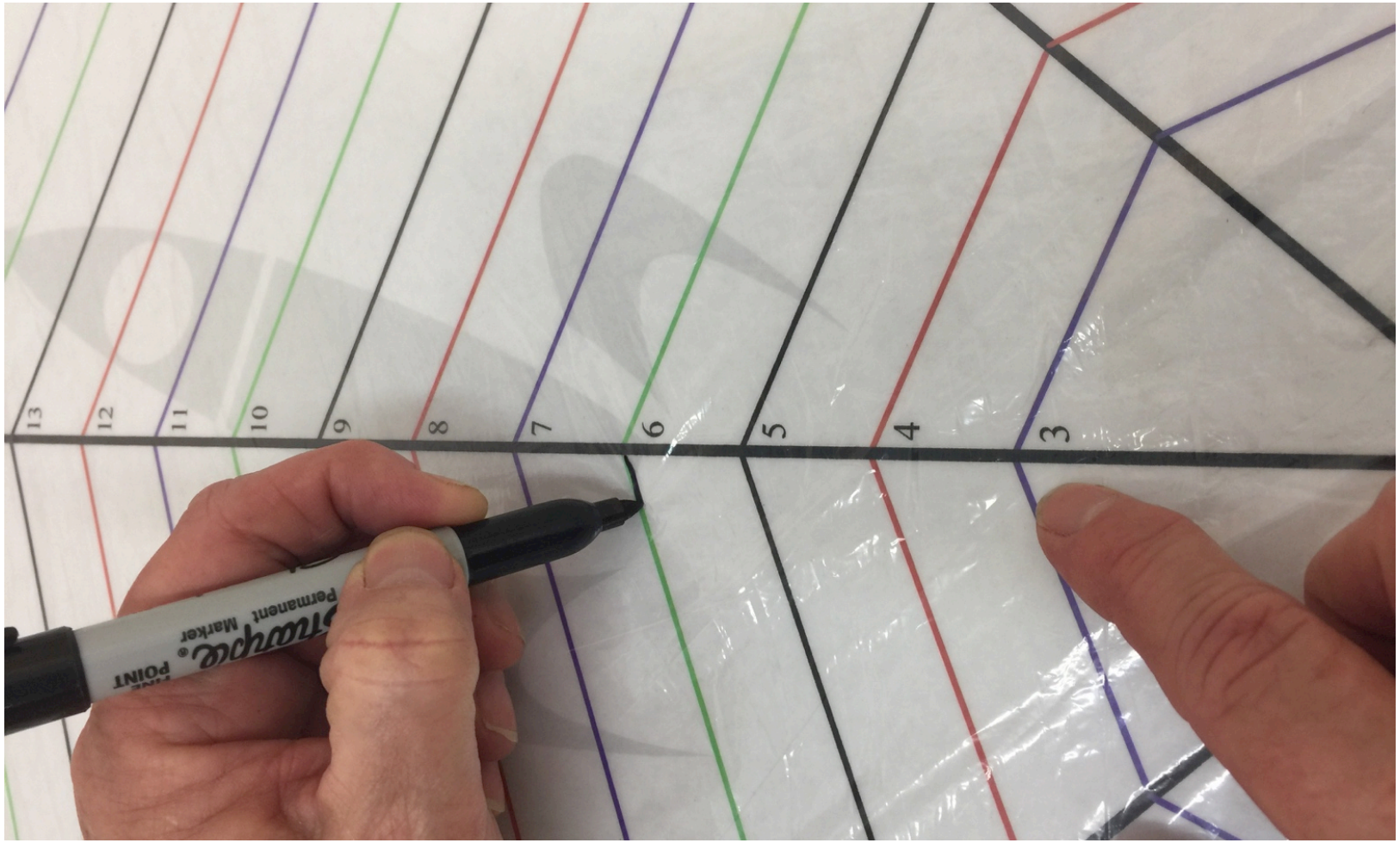
Making a Parachute

The canopy is taped to the template.



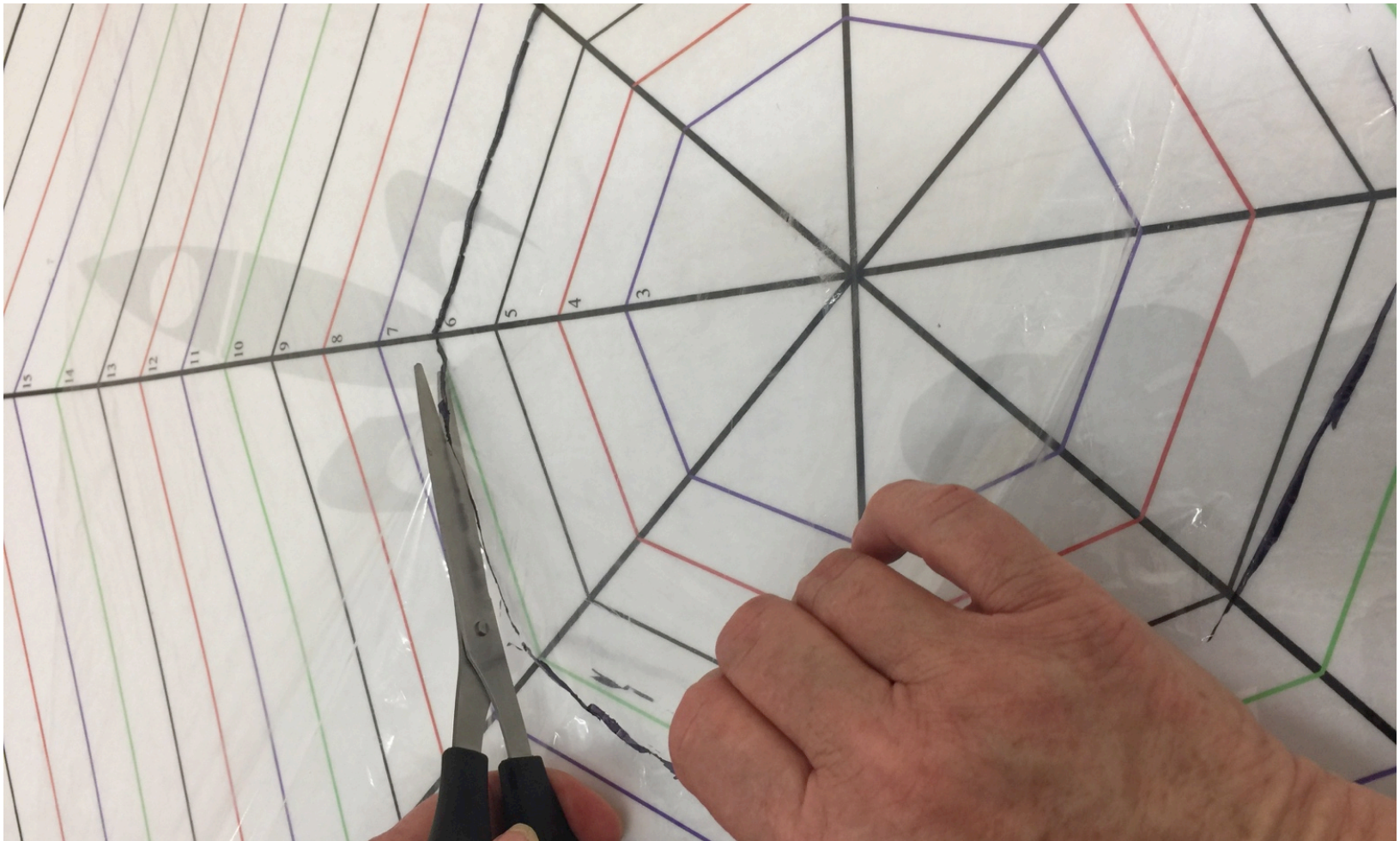
Making a Parachute

Use the Parachute Template to *Trace lines on the canopy* (Tracing along line 6 makes a 12 inch hexagonal shaped canopy.) **Use the Parachute Template to draw all of the straight lines on the canopy as well.**



Making a Parachute

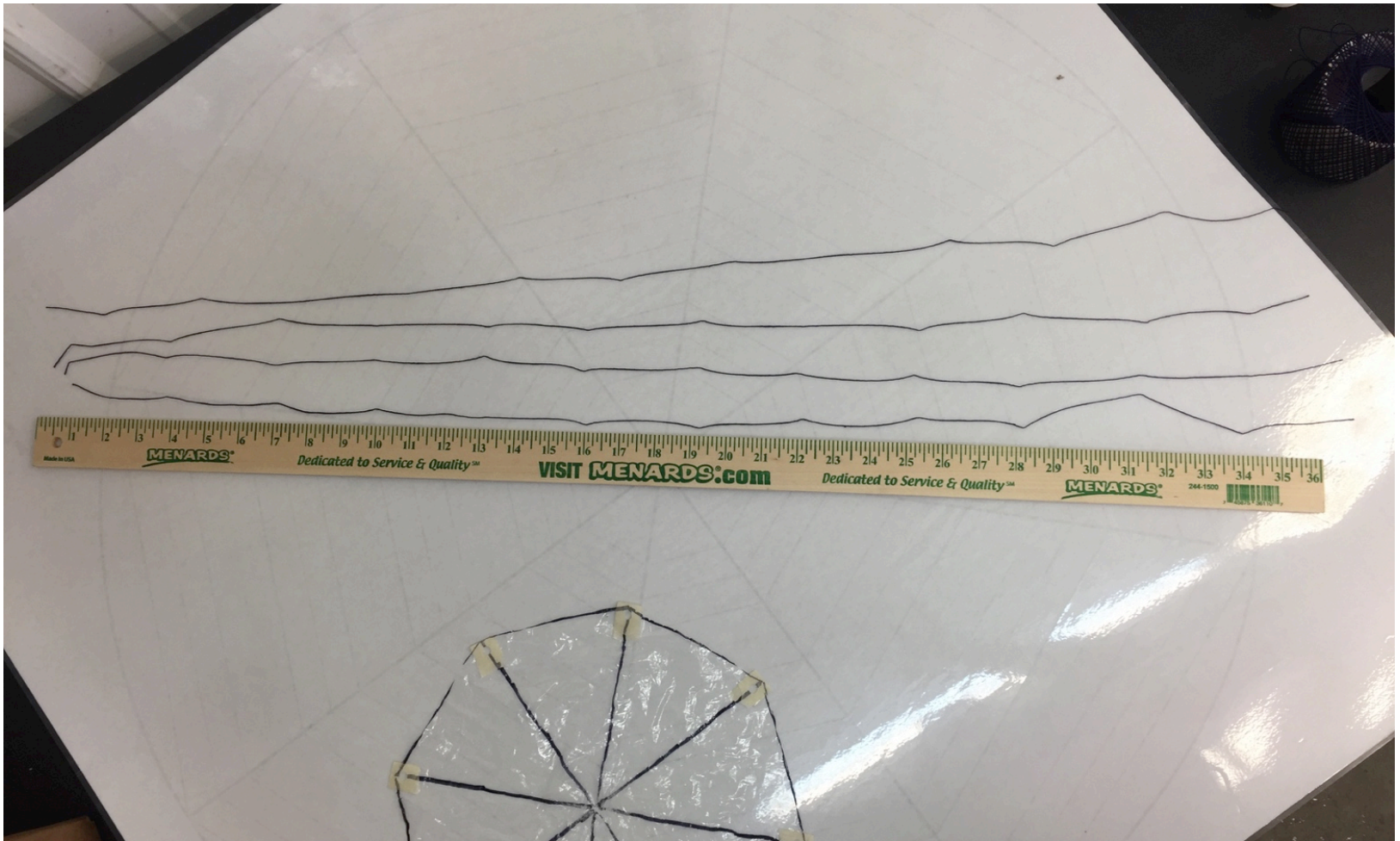
Cut out the octagonal parachute canopy



Making a Parachute

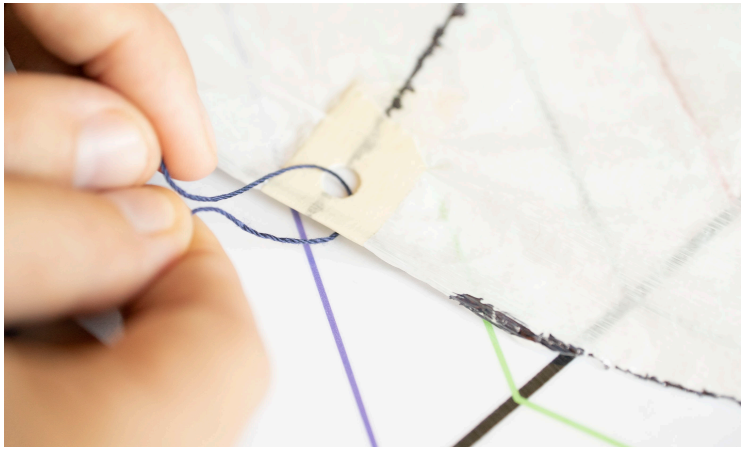
Shroud line length ≥*1 diameter*

The octagonal canopy has eight sides so 4 strings will be made. Each string is two shroud lines, so each string goes to the next adjacent side. This canopy is 12 inches across so we make 4 strings-36 inches long.



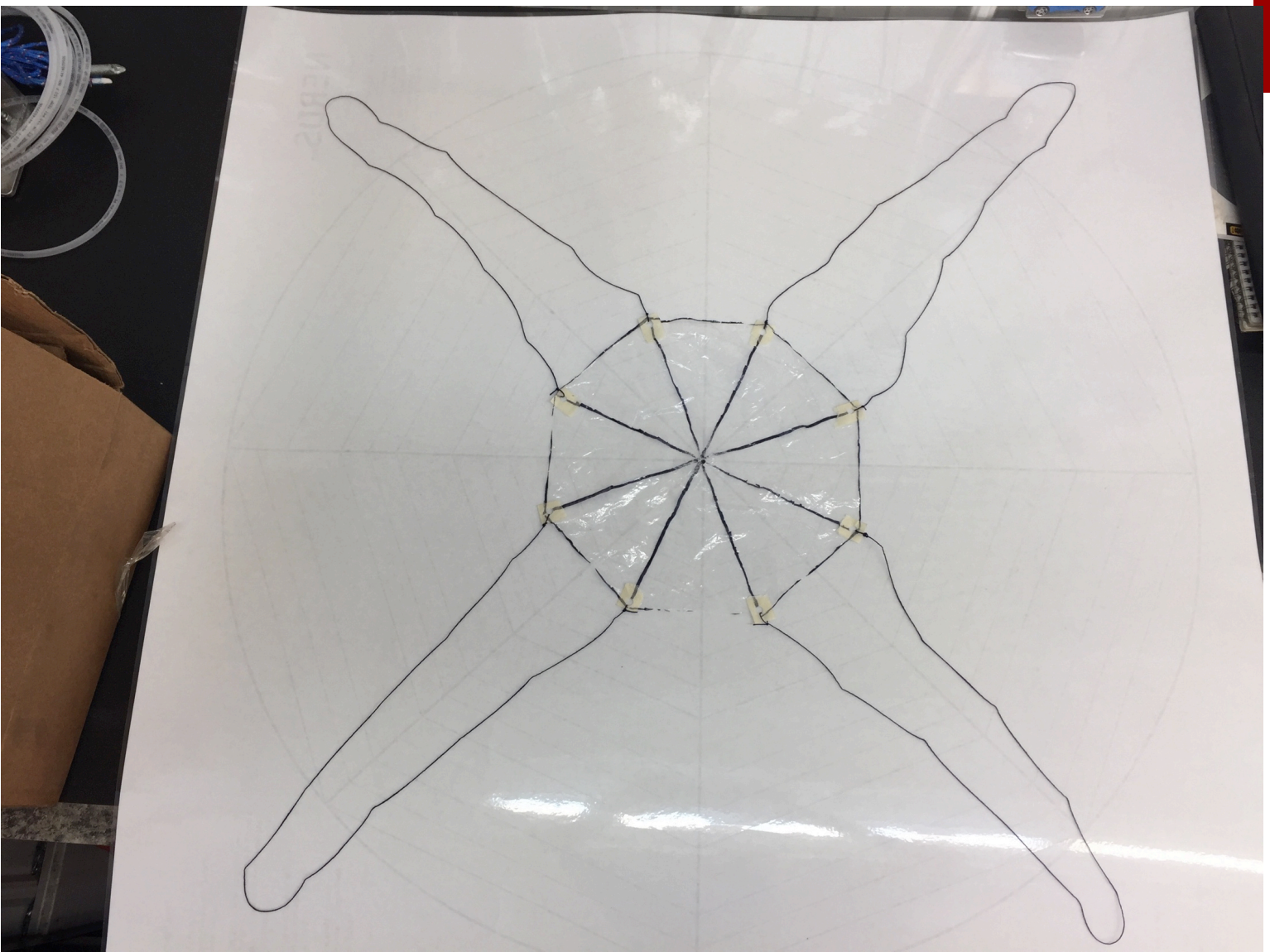
Making a Parachute

Tying the strings to the canopy



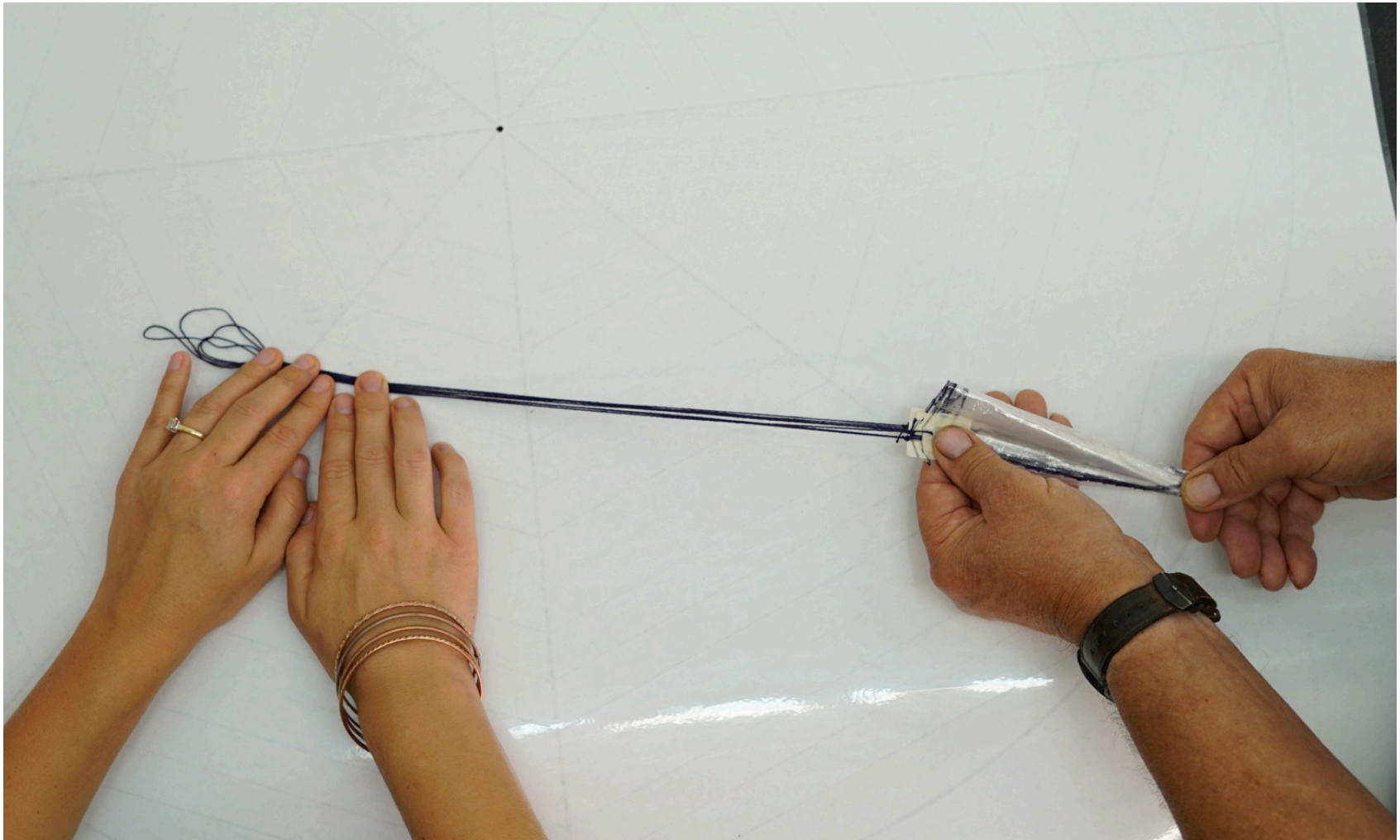
Making a Parachute

Tie the 4 strings.



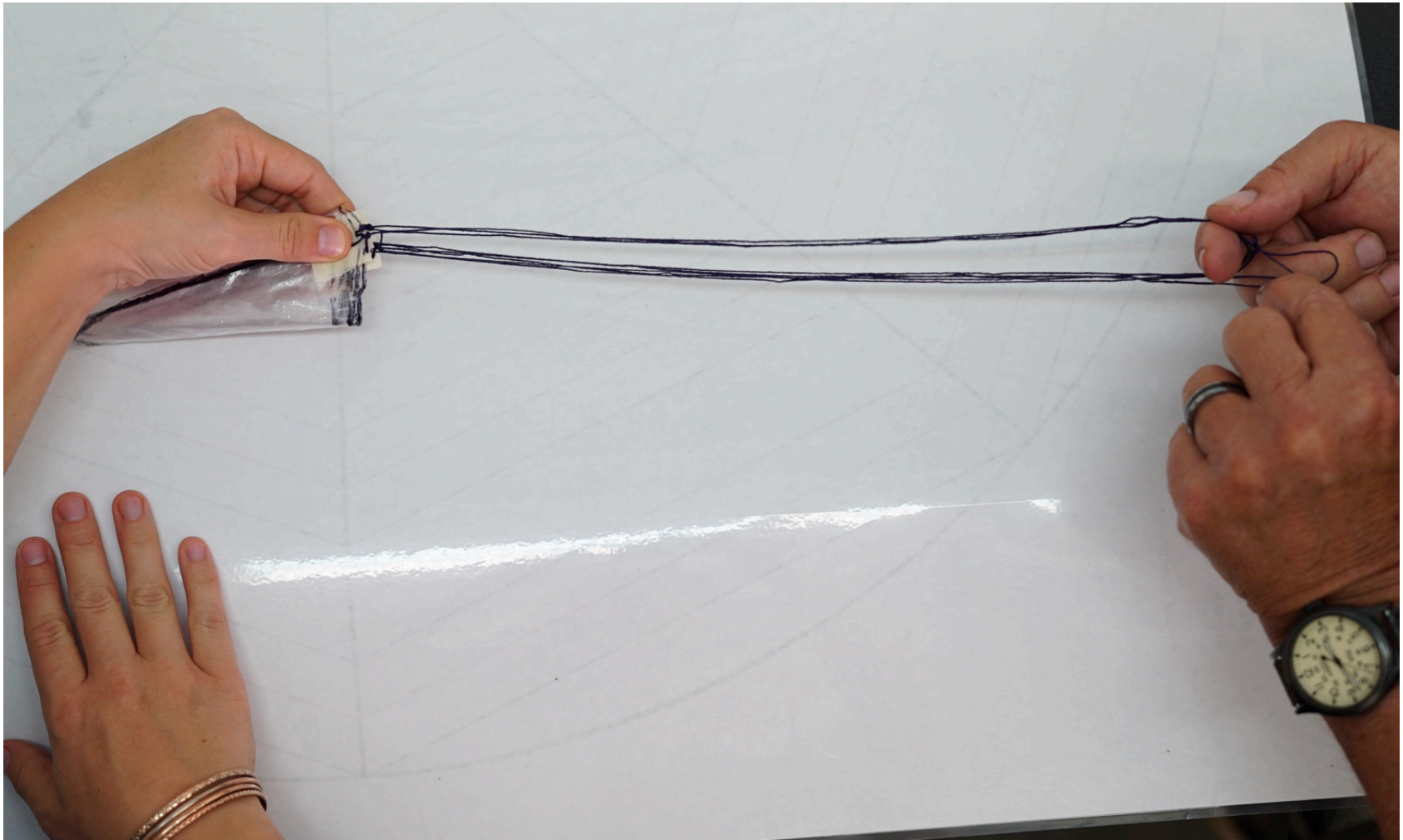
Making a Parachute

Insure that all Shroud Lines are the same length. Fold the Canopy in halves until all of the attachment points line up.

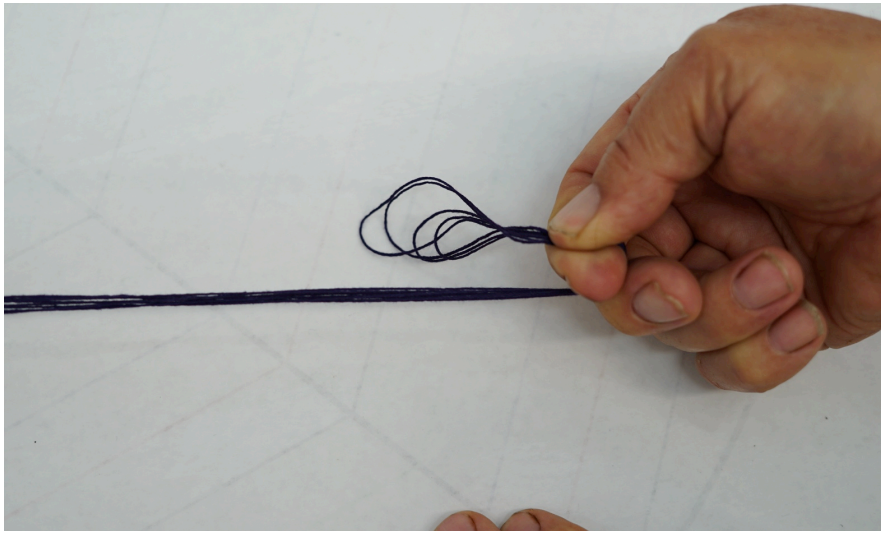


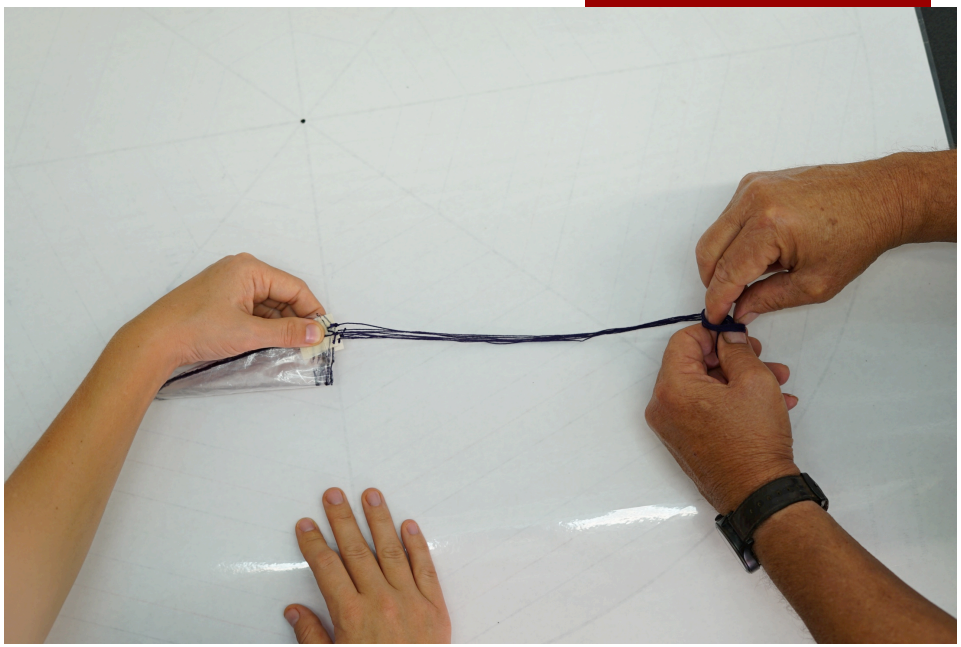
Making a Parachute

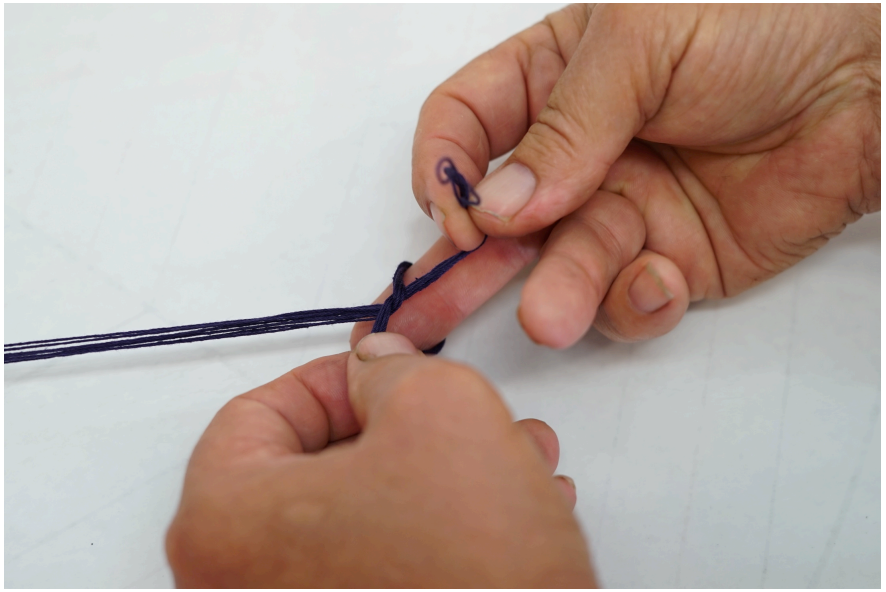
While your partner holds the tip of the canopy pull on the shroud lines and tie a knot. The S.L.s lengths are limited to the shortest line.

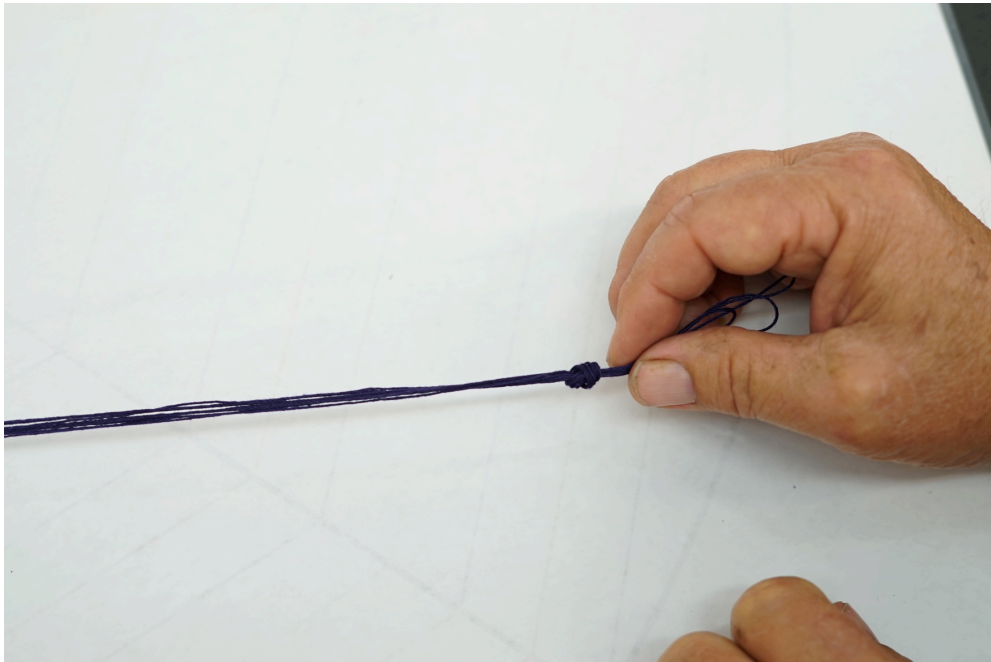


Making the Parachute
Tie the knot



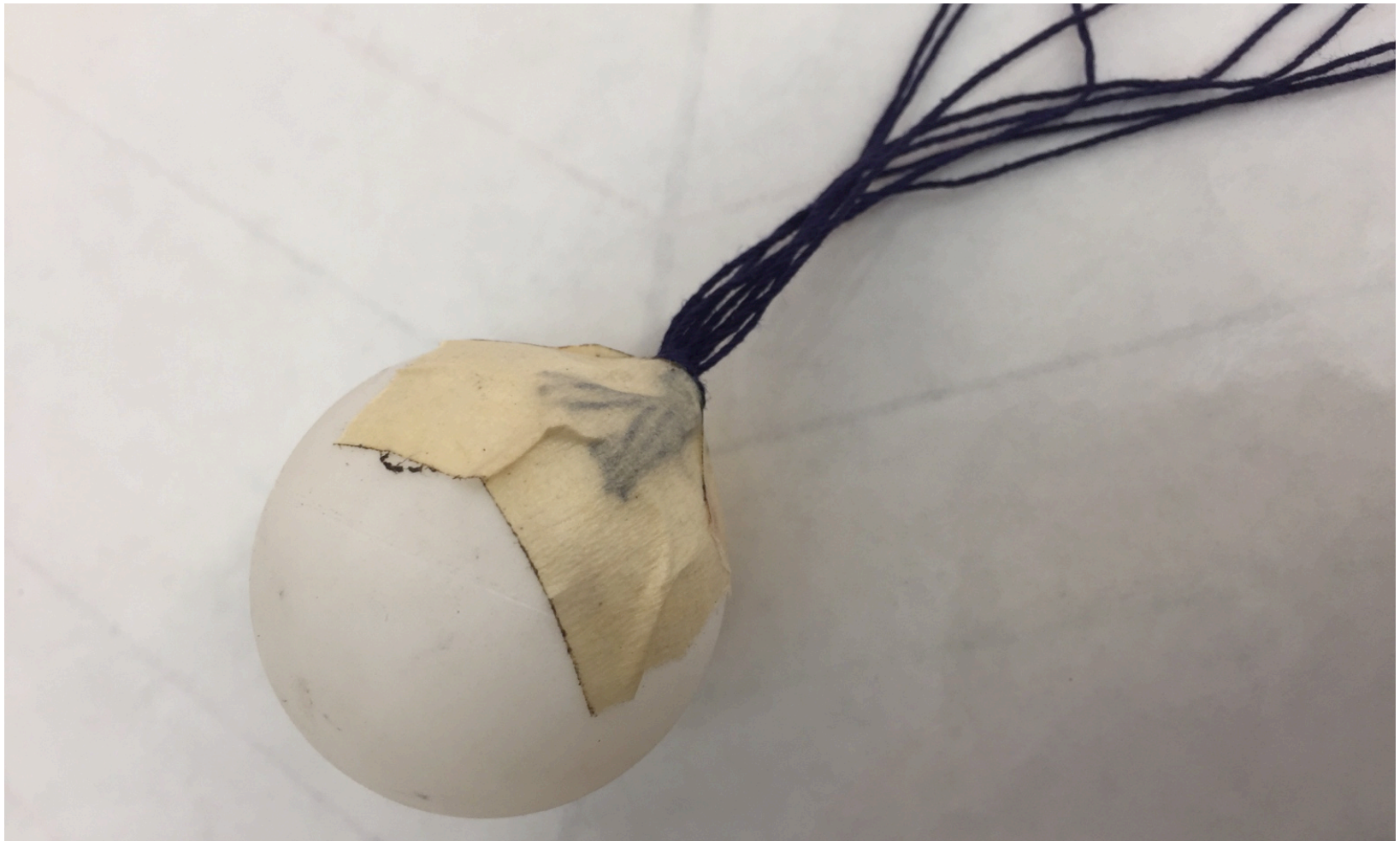






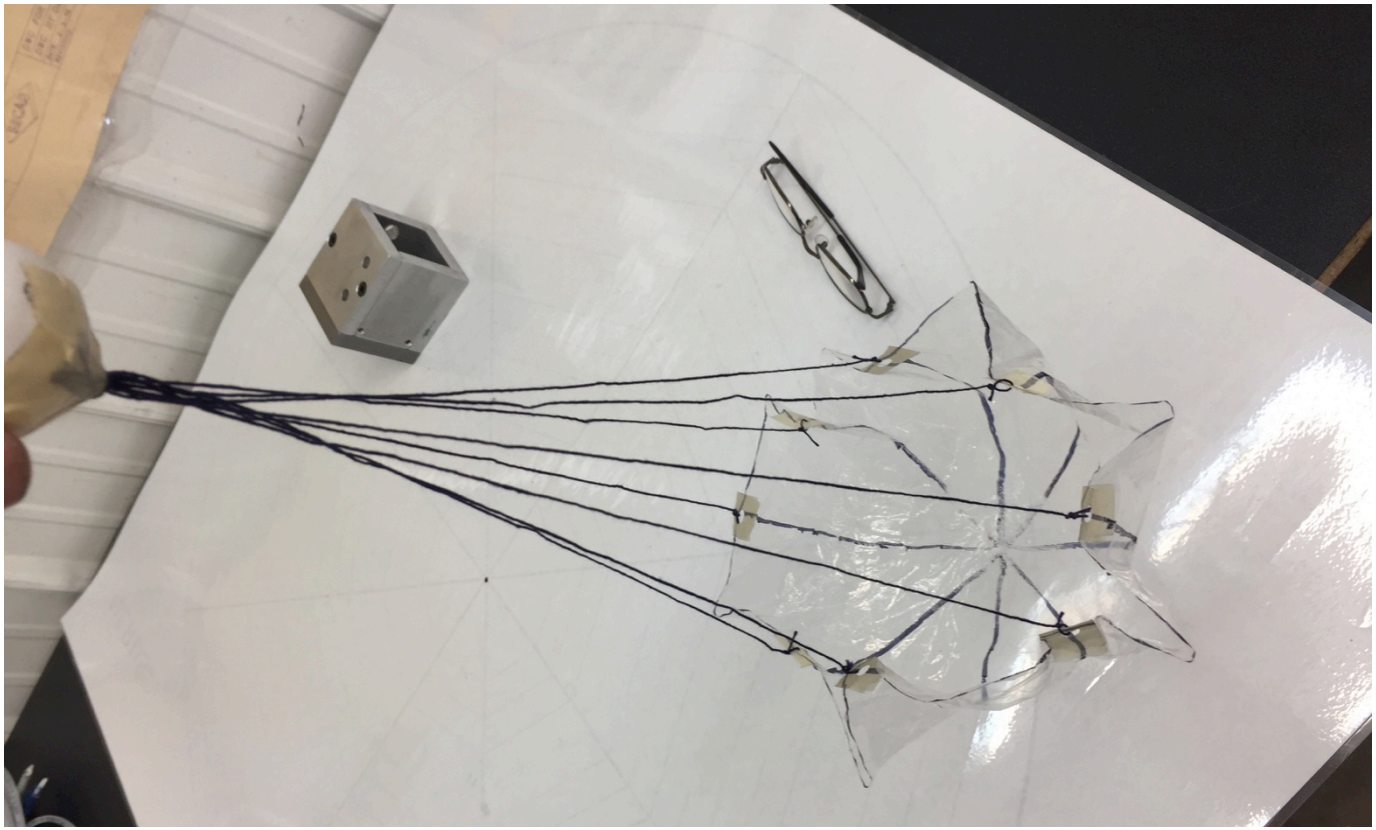
Making a Parachute

Tape the PP Ball to the Shroud Lines



Making a Parachute

A finished octagonal Parachute. Ready for testing



Making a Parachute

The Second Parachute Canopy Design

- Repeat every step as before up to taping the canopy to the template.

Making a parachute

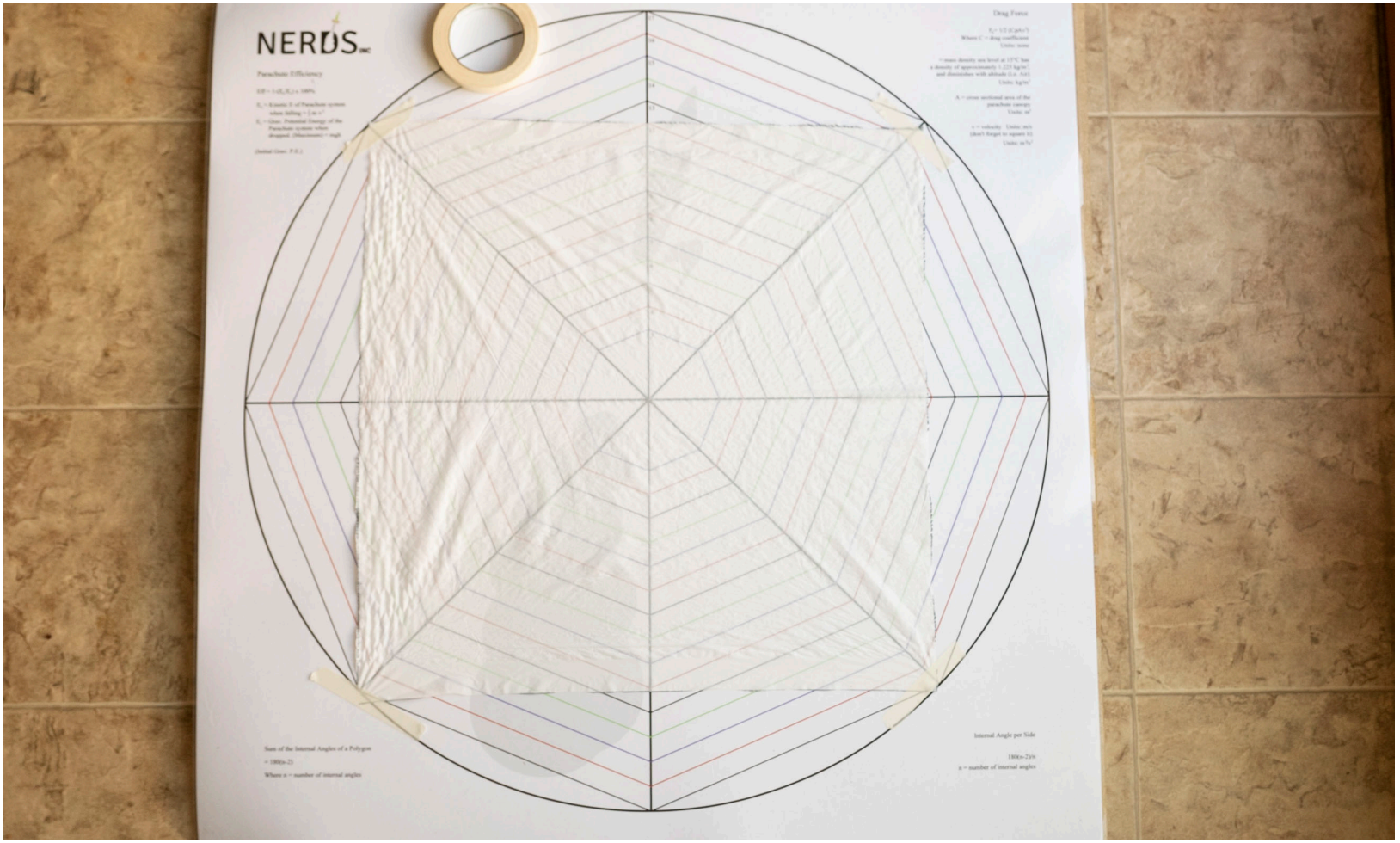
Drill holes in a Meter Stick in the following locations. Feel free to drill holes beyond those shown. (a 12 inch ruler is great for smaller parachutes.)

Making a Parachute

Here is a close up of hole location. The numbers represent the radius of the circular canopy.

Making a Parachute

Attach the canopy to the Parachute Template as shown.



Making a Parachute

Beginning the Circular Canopy Design

Make a hole in the center of the template

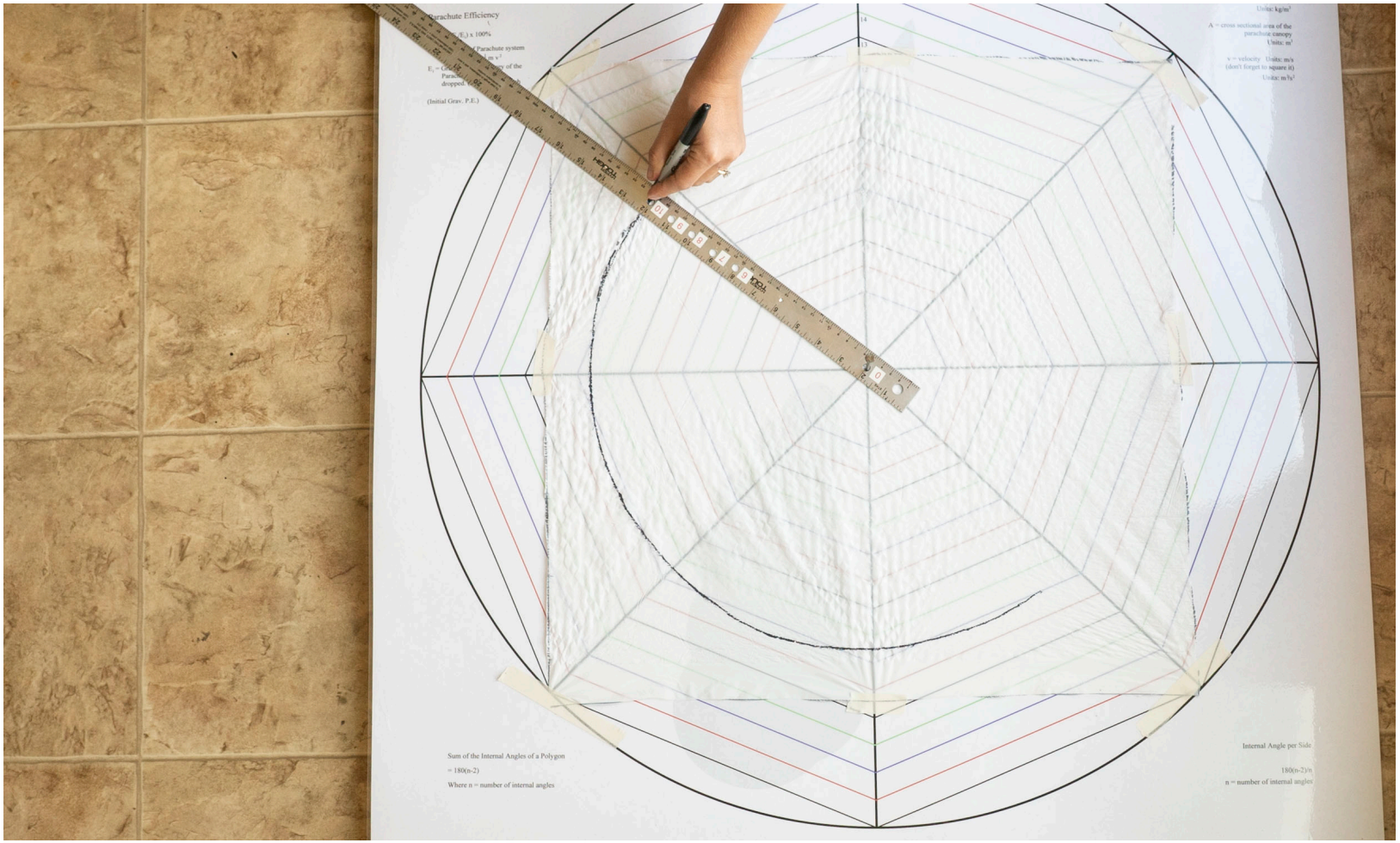
Making a Parachute

Drill a guide hole for the nail.

Hammer a nail as shown.

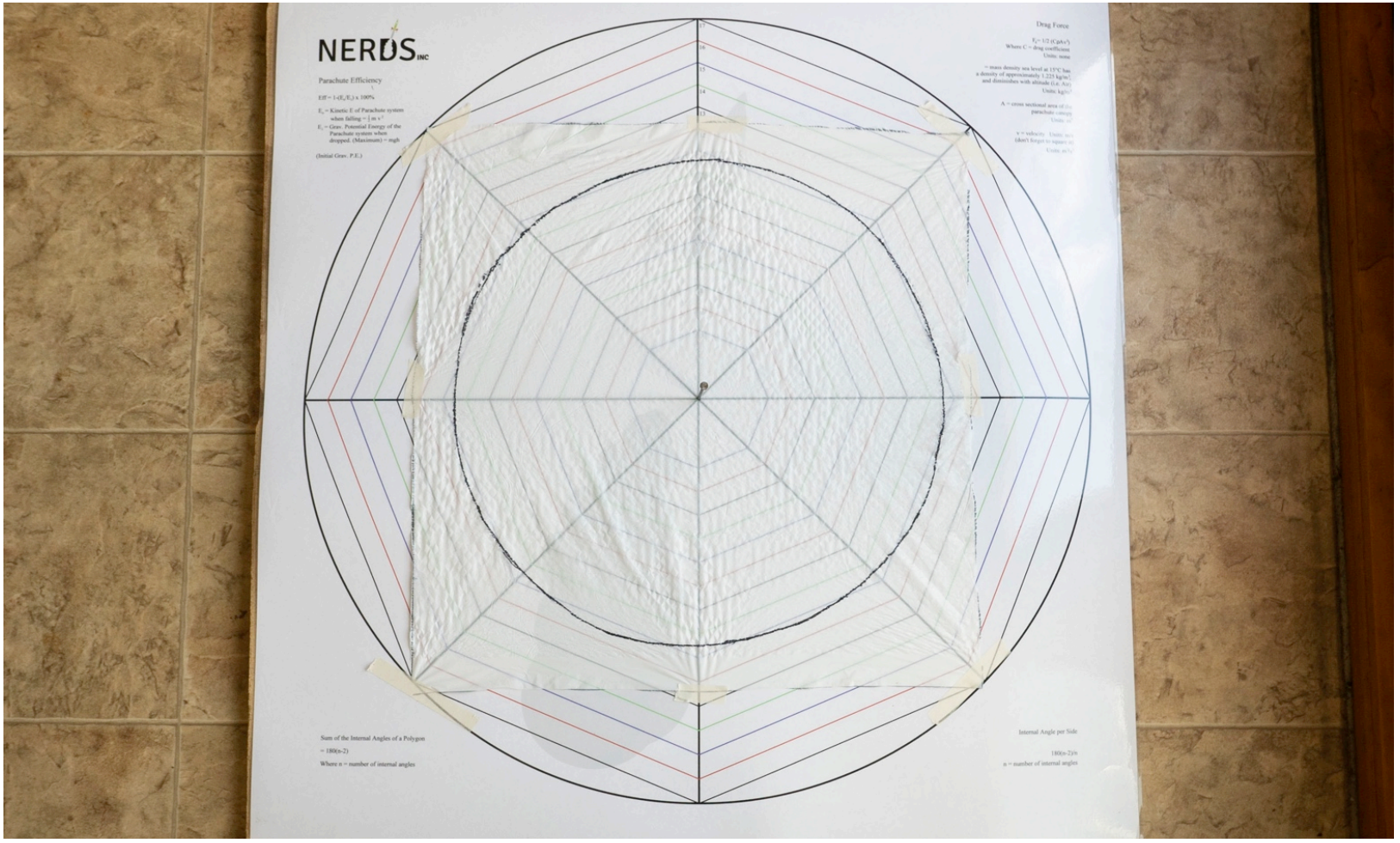
Making a Parachute

Use your meter stick or ruler as you would a compass to make a circle. Here we're making a 10 inch radius (20 inch diameter) circular canopy.



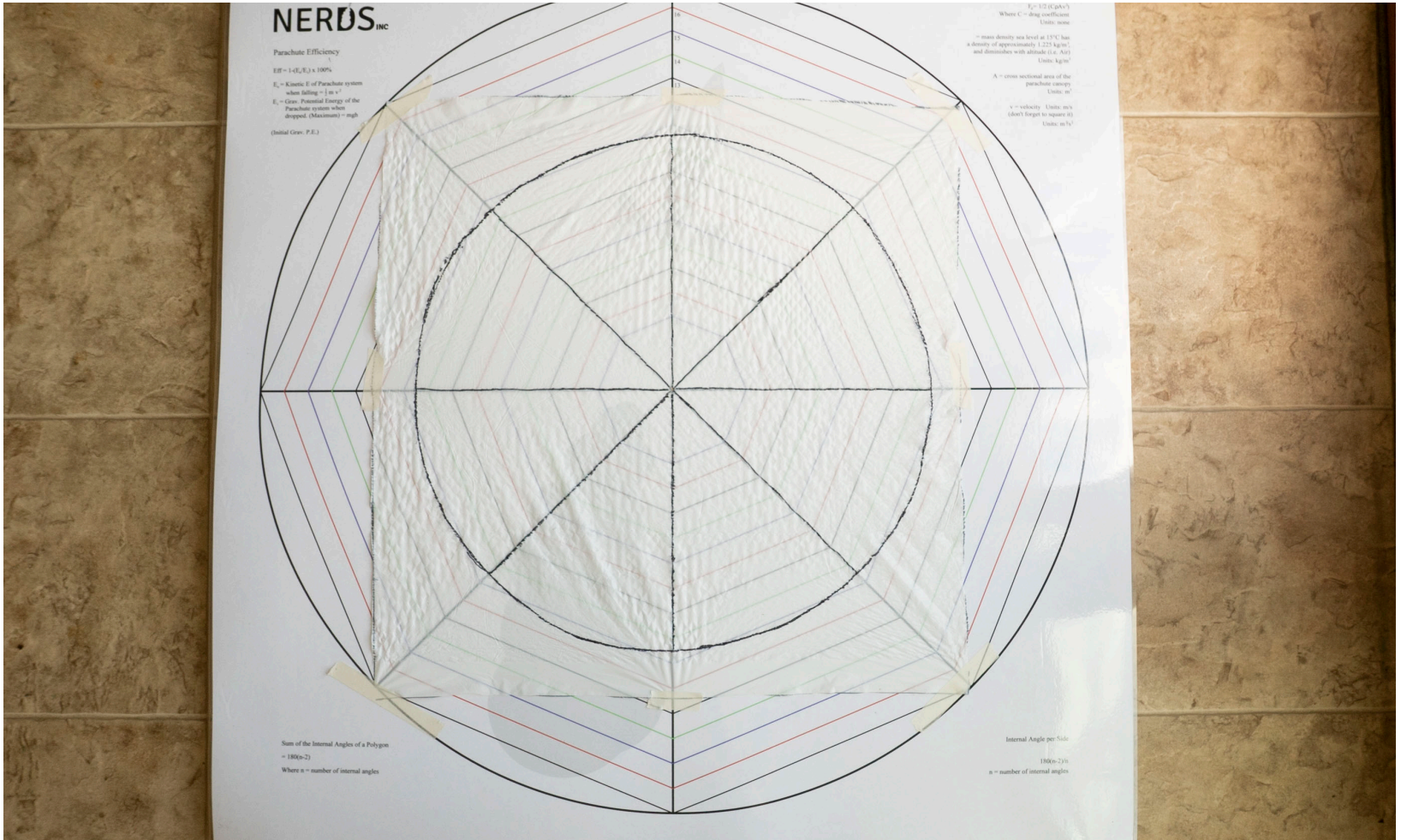
Making a Parachute

Here is the drawn 20 inch diameter circular canopy.



Making a Parachute

Use the Parachute Template to draw in the straight lines as shown.

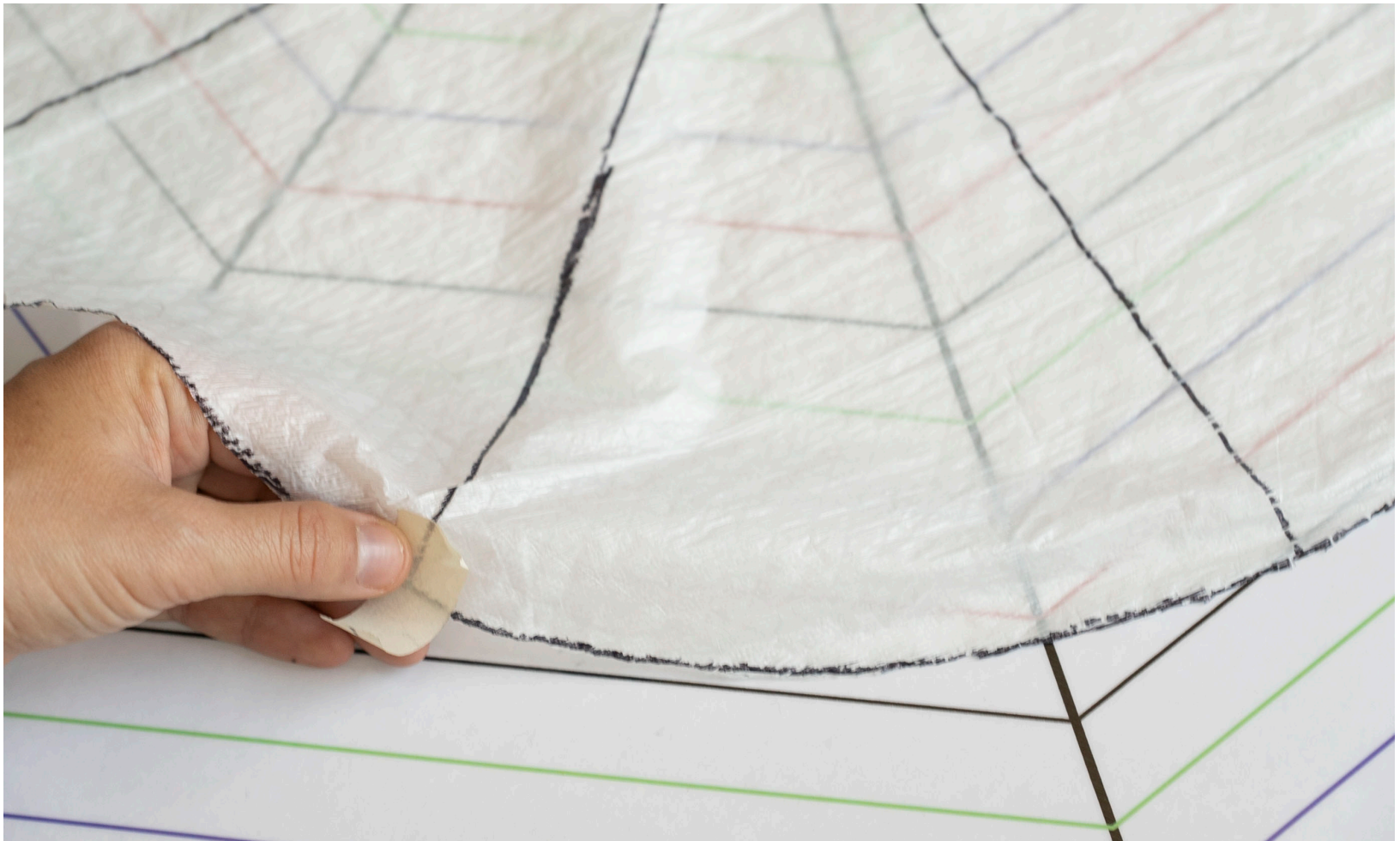


Making a Parachute

Cut out the circular canopy

Making a Parachute

Attaching the Shroud Lines. Put tape at each of the corners. (Where the straight lines reach the edge of the canopy.)



Making a Parachute

Fold the tape over so it is on both sides of the canopy.

Making a Parachute

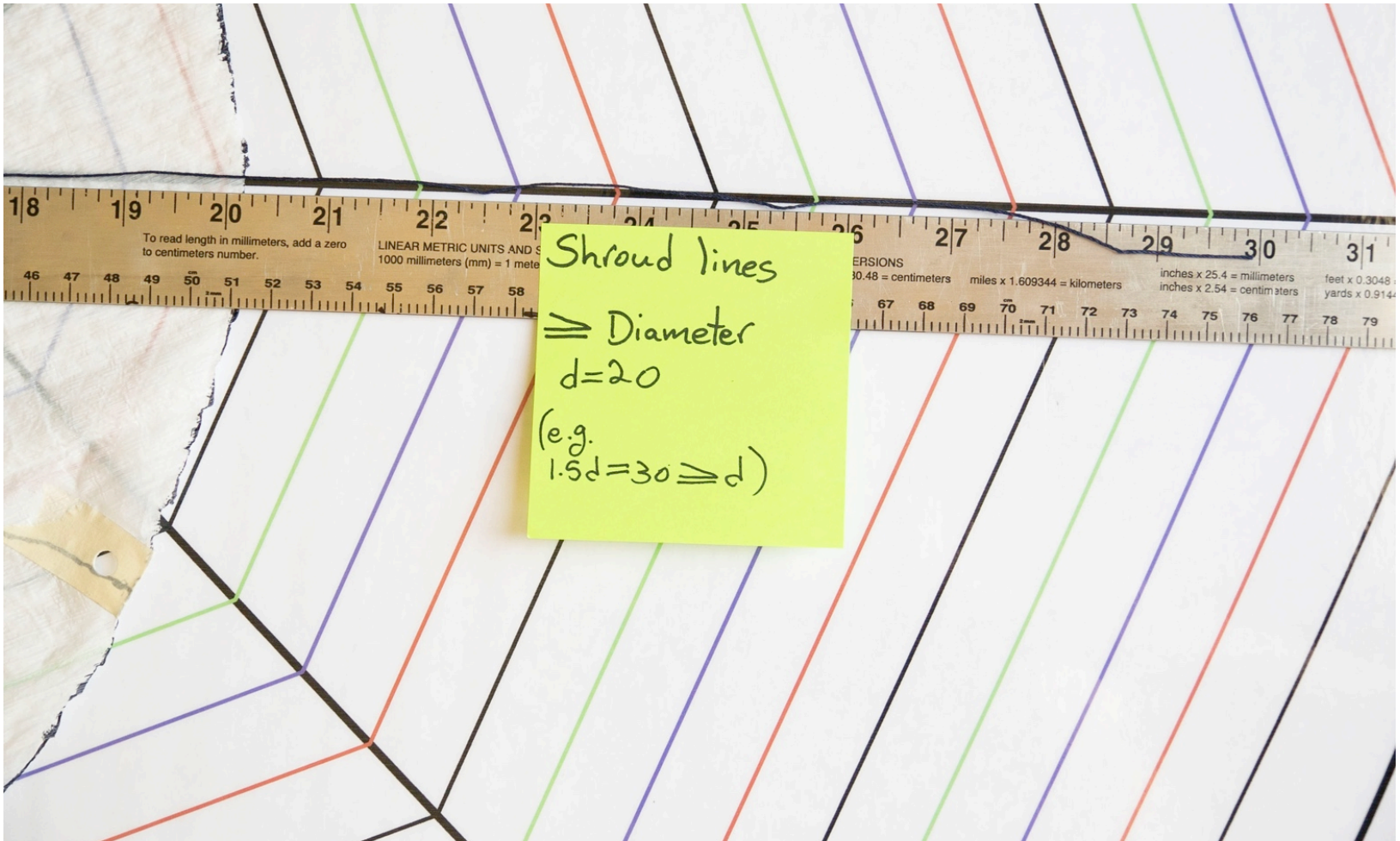
Punch holes through the masking tape. Use a hole punch or a pencil or any pointed object.

Making a Parachute

Here's the hole through the masking tape. Repeat this for each of the corners.

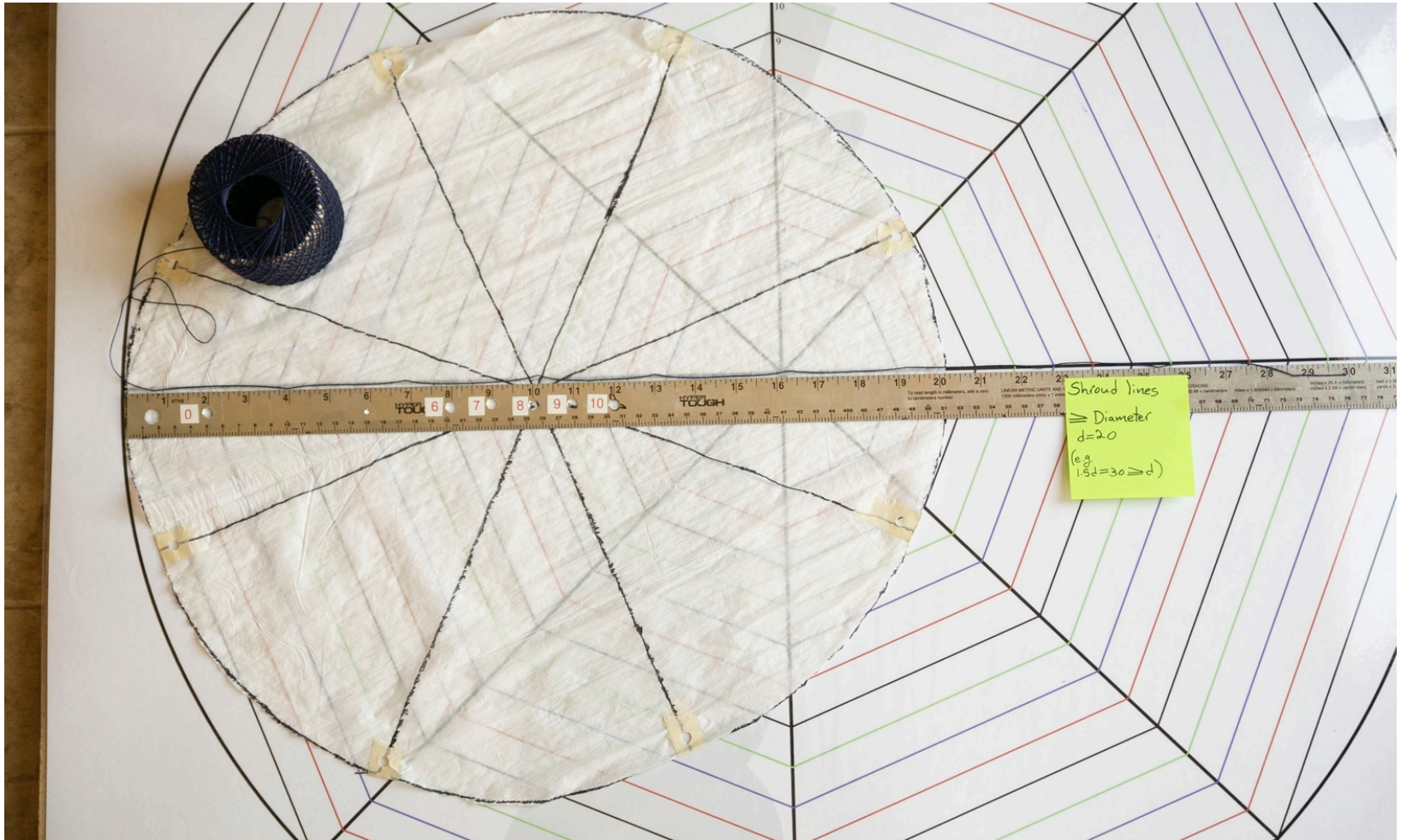
Making a Parachute Shroud Line Length

S.L.Length≥Canopy Diameter



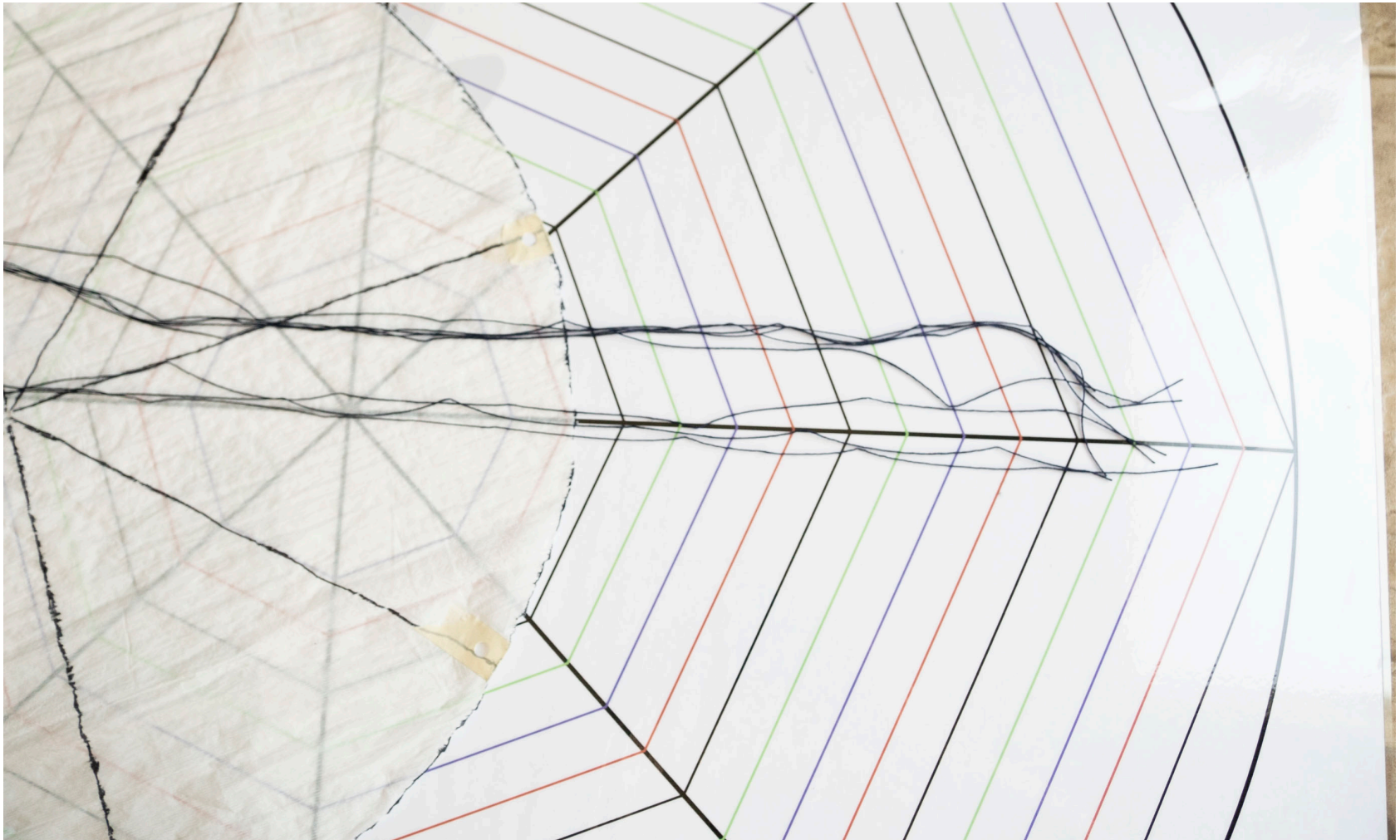
Making a Parachute

For our 20 inch circular parachute if we wanted S.L.L. to be 1.5 the diameter we need 30 inch shroud lines



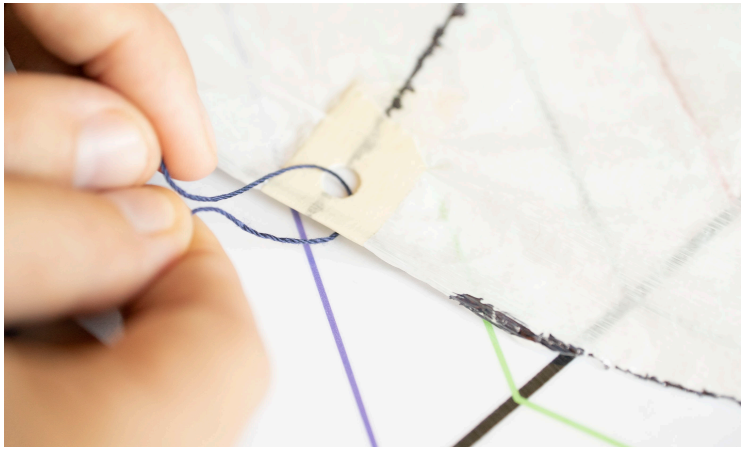
Making a Parachute

Our 20 inch diameter canopy needs 8 shroud lines of 30 inches in length.



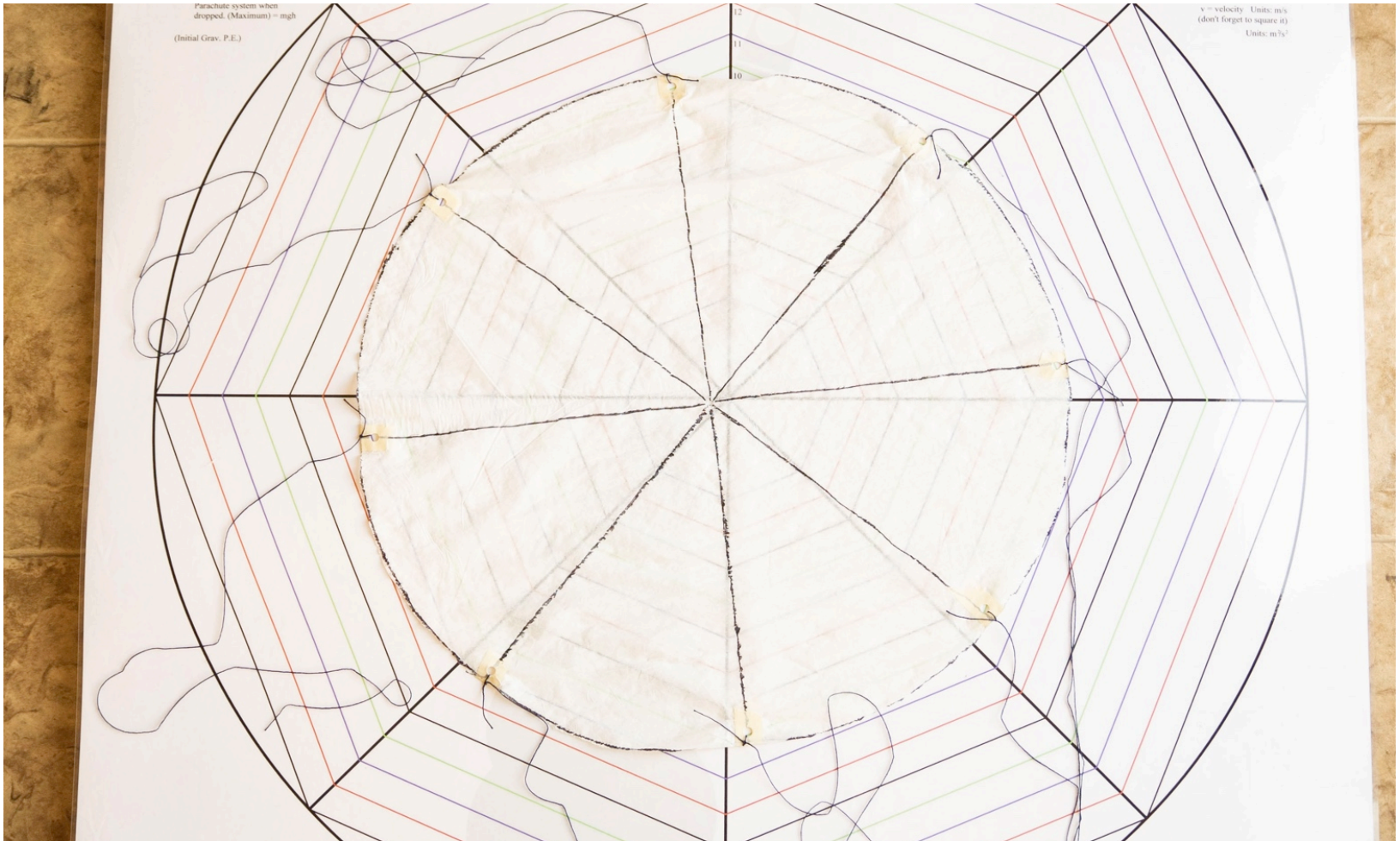
Making a Parachute

Tying the strings to the canopy



Making a Parachute

The intersection of the straight line with the edge of the canopy has shroud lines tied to it.



Making a Parachute

The Circular Chute is ready for testing!