

TIPI Design Challenge: A Blackfoot Perspective

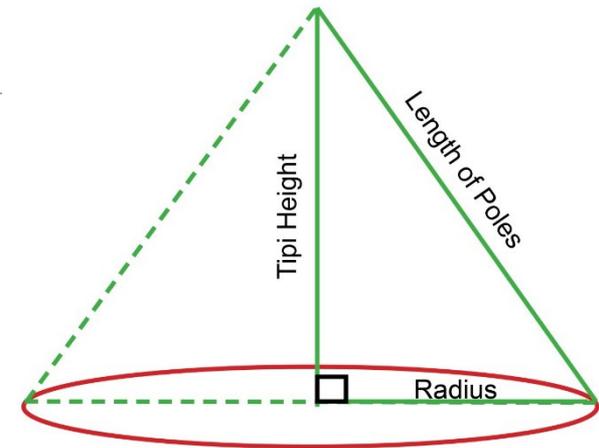
WOMEN IN ENGINEERING DAY 2026

UNIVERSITY OF CALGARY

SCHULICH SCHOOL OF ENGINEERING

JESSICA BEKKER

FEBRUARY 19, 2026

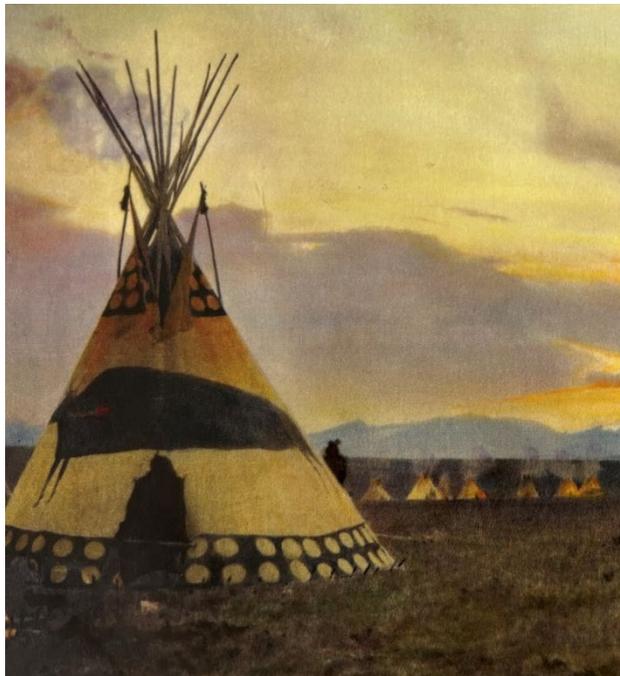


Tipi cover design

This is the Tipi design guide to construct and paint a small Blackfeet style Tipi.

Supplies are provided and there is 1 hour and 15 minutes to work on this project. If you are unable to complete the mini-Tipi in this session you can complete this at a later time.

A copy of this guide is located at: <https://profiles.ucalgary.ca/jessica-bekker> and my email is: Jessica.bekker@ucalgary.ca



Tipi Cover – Step 2



Materials: Canvas strip, scissors, pen/marker, canvas cover template, tape.

Note – may need to share listed materials.

After cutting out the canvas along the traced shape, cut out the circle as shown. Use the scissors to place a cut inside the circle. Use the cut to insert the scissors to cut out the traced circle.



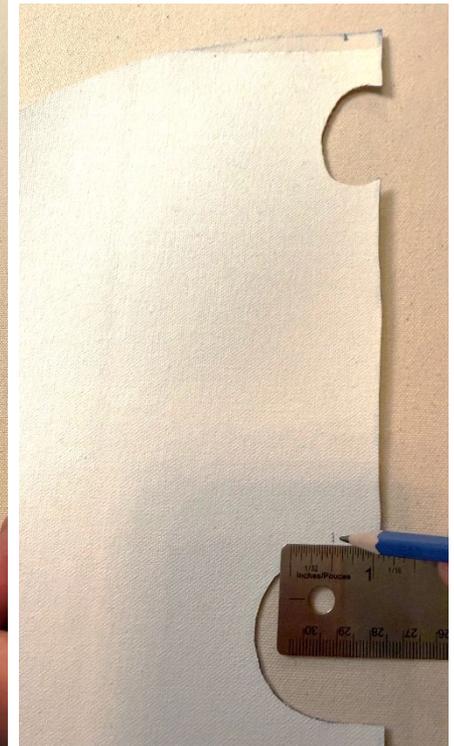
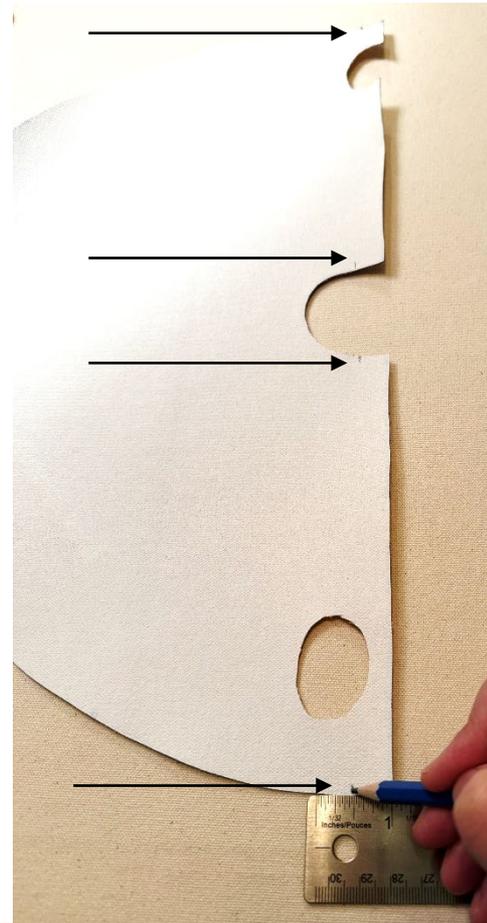
Tipi Cover – Step 3



Materials: Canvas cover, ruler, pen/marker.
Note – may need to share listed materials.

Turn the tipi cover to the white side (painted). Use a pen and a ruler to place 4 marks that are $\frac{1}{2}$ inch from the long edge as shown.

- 1 mark near the top edge,
- 1 mark near the top of the center curve
- 1 mark near the bottom of the center curve
- 1 mark at the bottom edge



Tipi Cover – Step 4

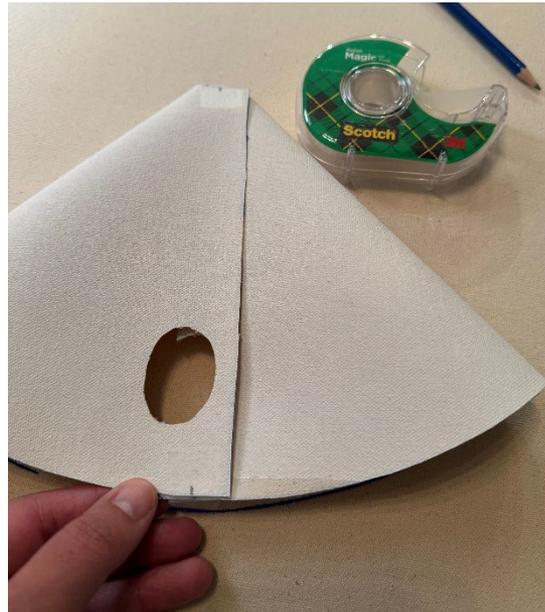


Materials: Canvas cover, tape.

Note – may need to share listed materials.

Fold the tipi cover as shown.
There will be some overlap
when the marks line up at the
top and bottom of the cover.

Use tape to hold this folded
position at the top and
bottom of the cover.



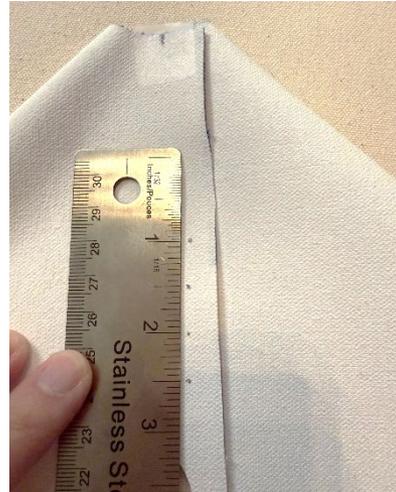
Tipi Cover – Step 5



Materials: Canvas cover, pen/marker, ruler.

Note – may need to share listed materials.

Use a pen/marker to place a dot about $\frac{1}{4}$ inch from the edge and about 2 inches above the circle. Then add three more dots below, spaced $\frac{1}{2}$ inch apart as shown. Then measure one inch to the left from those 4 dots and add another 4 dots as shown. There should be 8 dots in total.



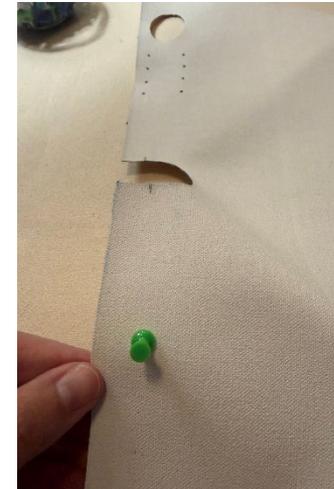
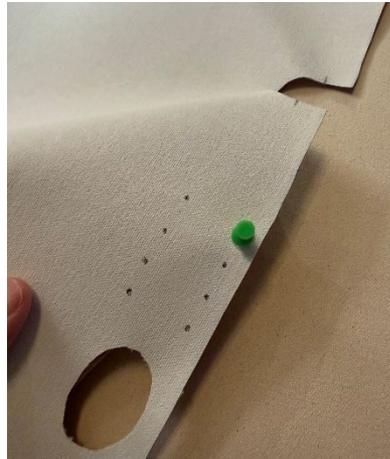
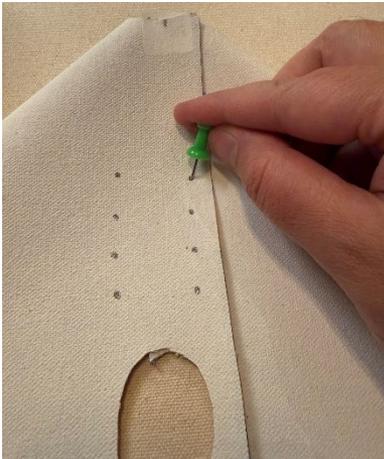
Tipi Cover – Step 6



Materials: Canvas cover, push pin.

Note – may need to share listed materials.

Use the push pin to poke a hole into each dot. Push the pin into all 8 dots and hard so there is an imprint or hole in both layers of canvas. Remove the tape from the canvas cover and unfold it. Place the push pin into each dot again and move the push pin around to stretch the hole size. Repeat for the 4 holes on the other side of the cover.



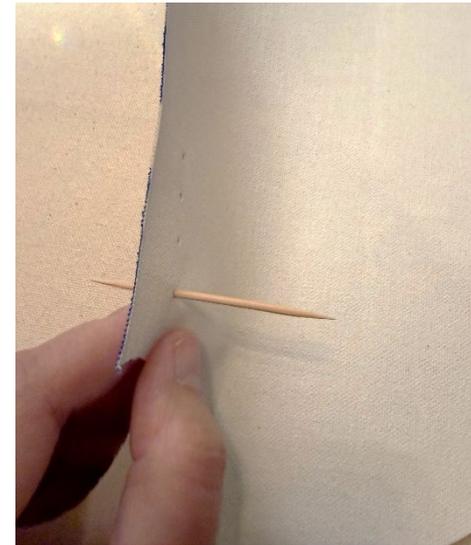
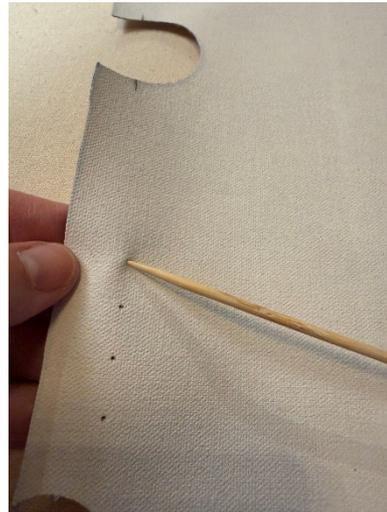
Tipi Cover – Step 7



Materials: Canvas cover, skewer, toothpick.

Note – may need to share listed materials.

Place the end of the skewer in each hole. Push and twist the skewer around to stretch the hole larger. Use the toothpick to test the hole size. If the toothpick can go through the hole, the hole is the correct size. Repeat for all holes in the cover.



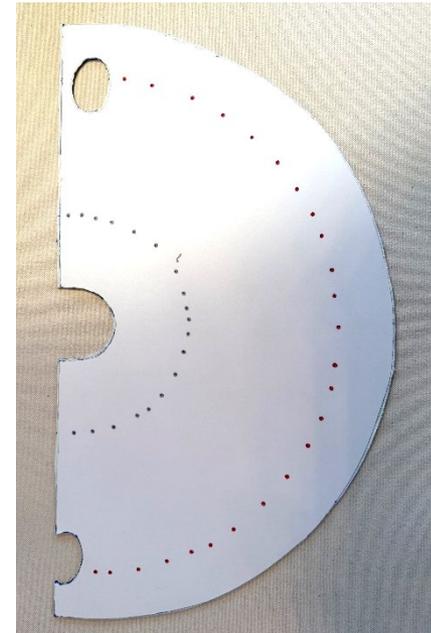
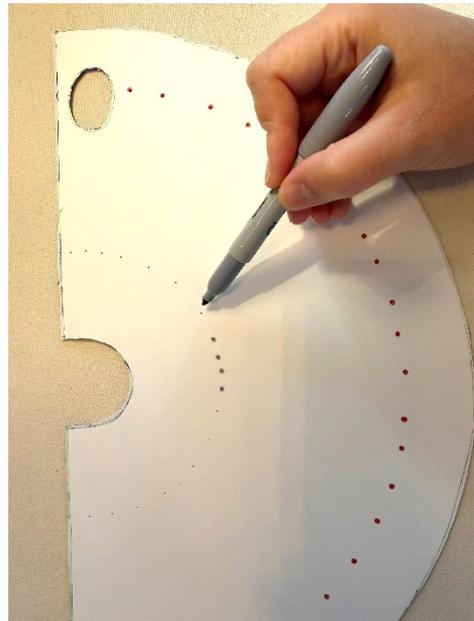
Tipi Cover – Step 8



Materials: Canvas cover, marker/pen.

Note – may need to share listed materials.

Place the cover template on top of the canvas, white side up. Place the tip of the marker into each hole of the template as shown. The marked dots are placed along the inner curve and along the outer curve.



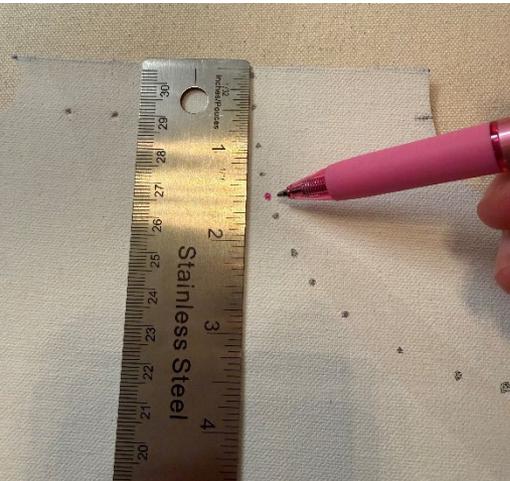
Tipi Cover – Step 9



Materials: Canvas cover, marker/pen, ruler, scissors.

Note – may need to share listed materials.

Use the ruler to measure 1 ½ inches from the edge to the curved dotted line. Add a mark that is on the dotted line. Repeat on the other side of the dotted line. Use the scissors to cut starting from the edge, along the dotted line and end the cut at the 1 ½ inch mark. Repeat on the same cut other side of the dotted line.



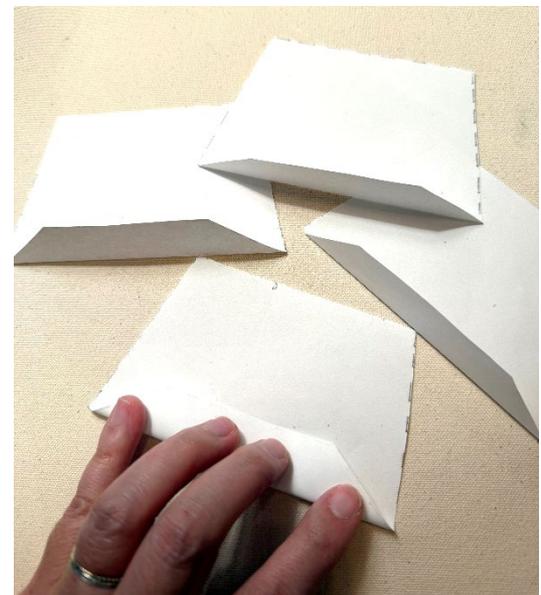
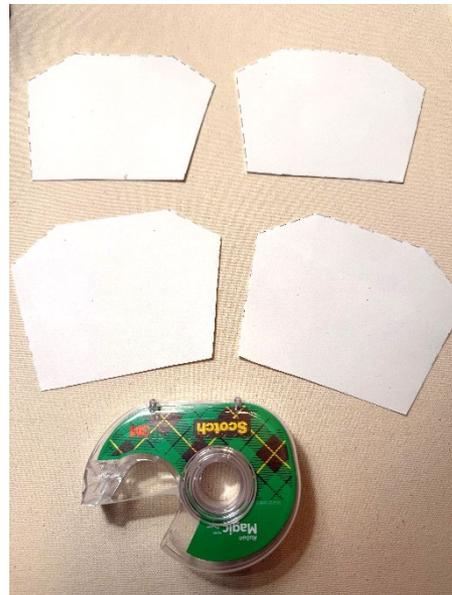
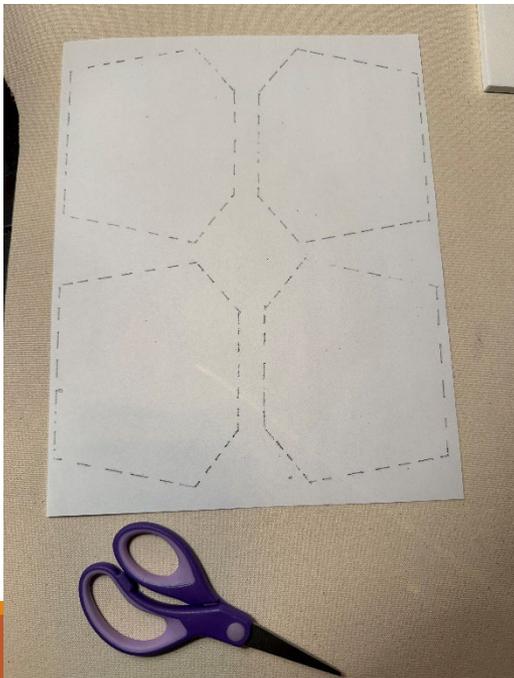
Tipi Liner – Step 10



Materials: Tipi liner paper sheet, tape, scissors.

Note – may need to share listed materials.

The Tipi liner paper sheet contains the cutout pattern to create the Tipi liner. Use the scissors to cut along the dotted lines. There should be 4 panels. Fold the panels at the widest section of the panel as shown.



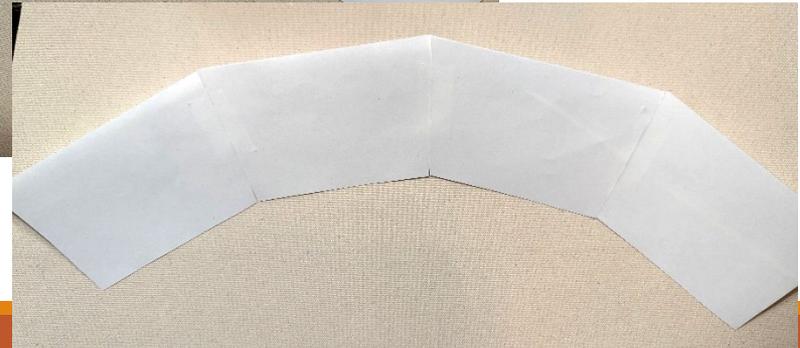
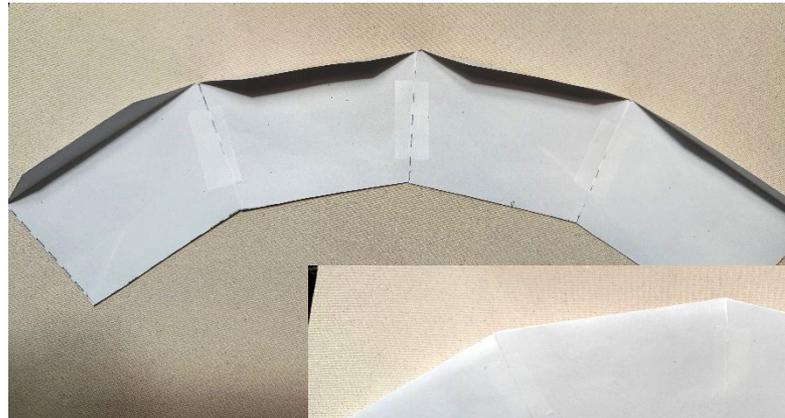
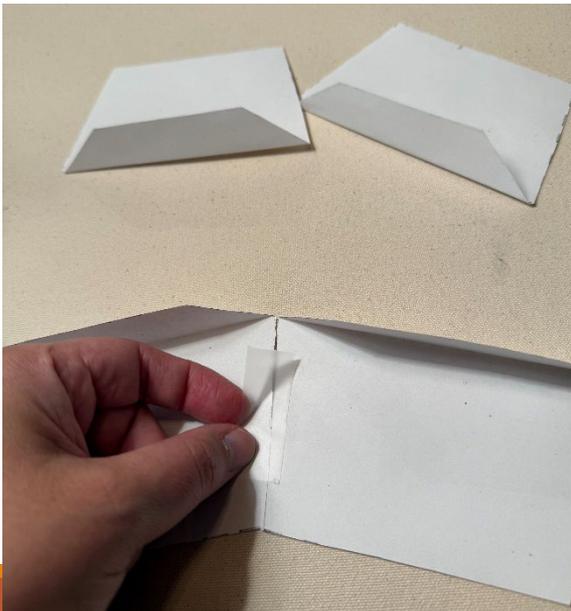
Tipi Liner – Step 11



Materials: Tipi liner paper sheet, tape, scissors.

Note – may need to share listed materials.

Take two panels and place their edges together as shown. Place a piece of tape to hold the panel edges together. Add the third panel by taping its edge to the one of the other panels. Repeat add the last panel. All folded edges face the same direction. Flip the liner over and add tape to the edges of each panel.



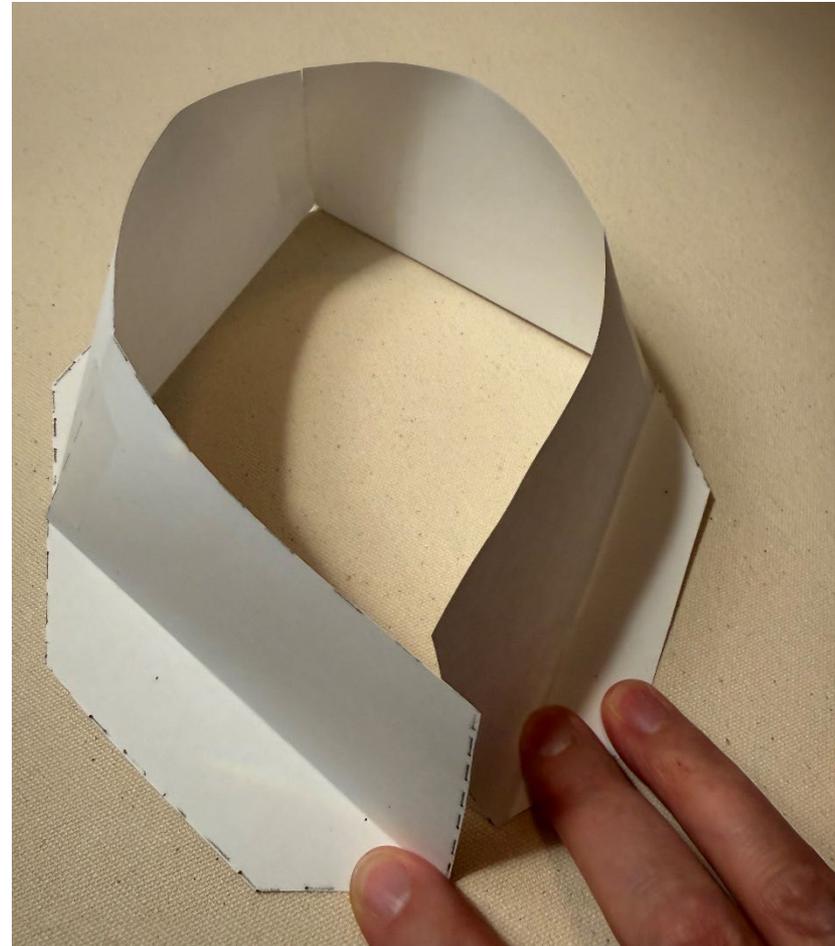
Tipi Liner – Step 12



Materials: Tipi liner paper sheet, tape, scissors.

Note – may need to share listed materials.

Now the Tipi liner is constructed. Note how it will stand on the folded edge. Will add this liner after creating the Tipi base.



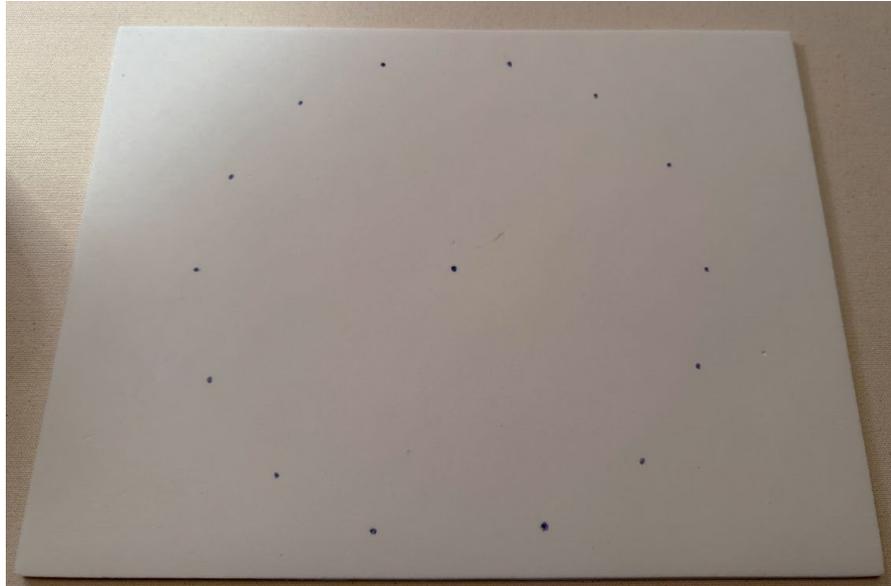
Tipi Base – Step 13



Materials: foam sheet (9in x 12in), marker/pen.

Note – may need to share listed materials.

Take a foam sheet and the template of the dotted circle. Place the template on top of the foam sheet and center it on top of the foam sheet. Place the marker tip into each hole to mark each dots on the foam sheet. IF the foam sheet is a dark color, use a push pin and push it into each hole of the template and through into the foam sheet.



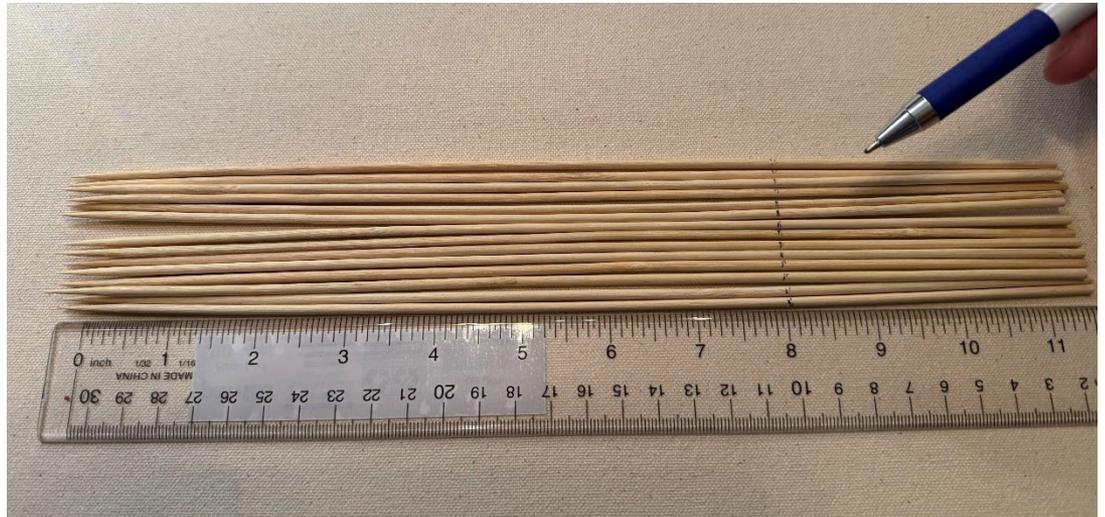
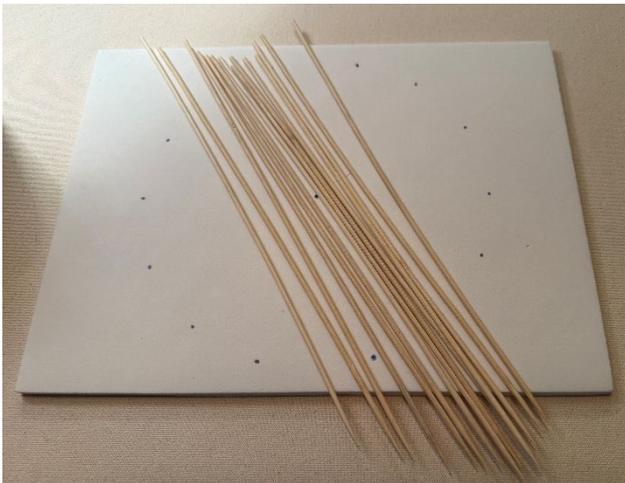
Tipi Base – Step 14



Materials: foam sheet (9in x 12in), 14 skewers, ruler, glue.

Note – may need to share listed materials.

Collect 14 skewers. Line the skewers along the ruler as shown. Mark with a pen 8 inches on the skewers. Rotate the skewers and mark 8 inches again.



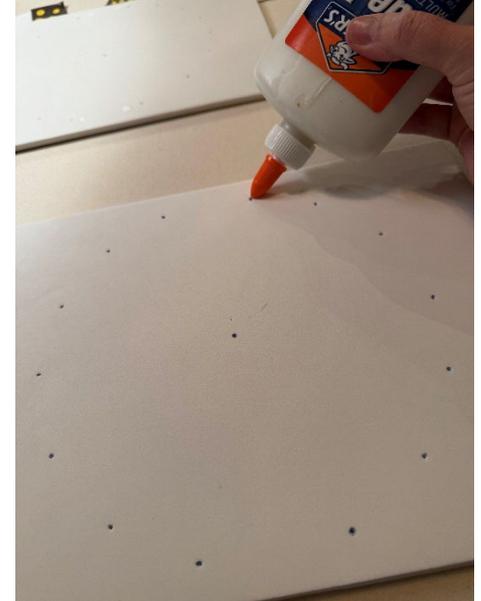
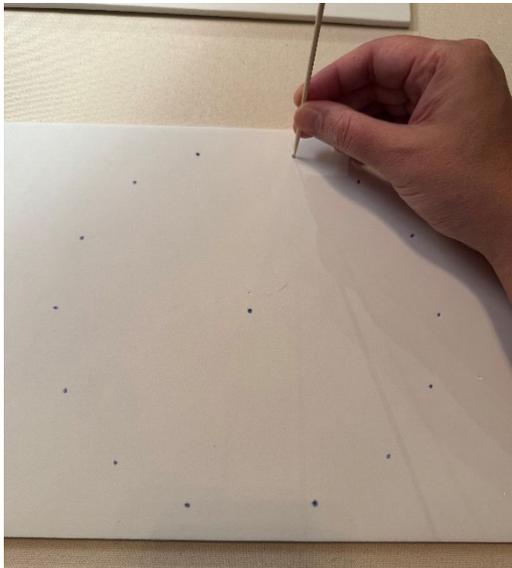
Tipi Base – Step 15



Materials: foam sheet (9in x 12in), 14 skewers, glue.

Note – may need to share listed materials.

Collect 14 skewers. At each dot poke the foam sheet with a skewer at each dot as shown. All 14 skewers should be standing in the foam sheet. Remove all the skewers. Place a small amount of glue at each dot. Poke the skewers back in the foam sheet at each dot. The glue will help to secure the skewers in place.



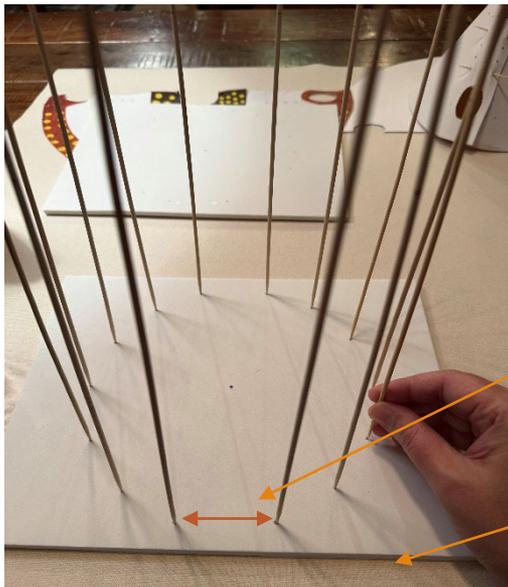
Tipi Liner and Base – Step 16



Materials: foam sheet (9in x 12in), Tipi liner, 14 skewers.

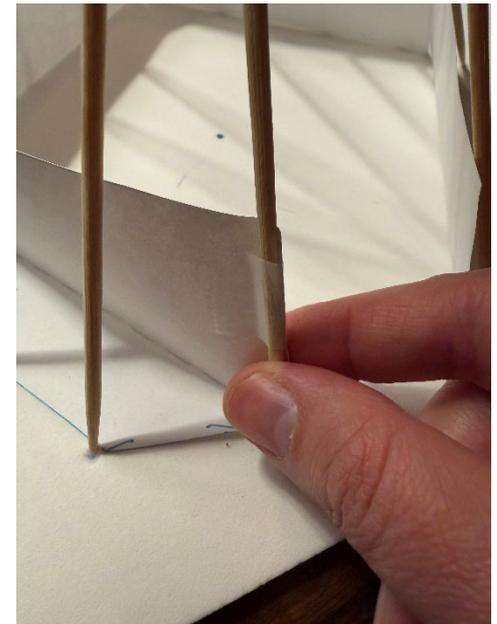
Note – may need to share listed materials.

Place the Tipi liner inside of the skewers. Keep the liner gap at the front of the foam sheet. The front side is one of the long edges (12 in). This will be the location of the Tipi door. Tape the ends of the Tipi liner to the skewer at the gap.



Gap on
front side

Front
side



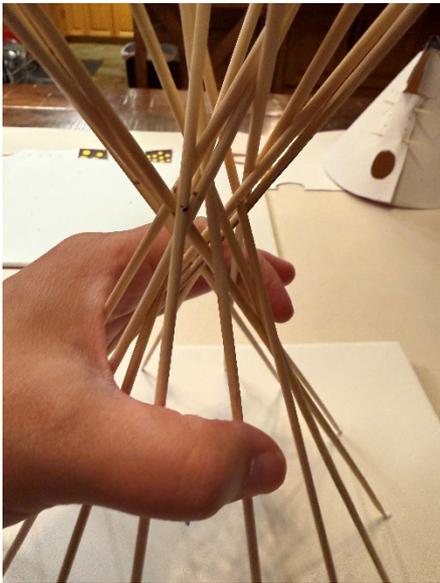
Tipi Liner and Base – Step 17



Materials: foam sheet (9in x 12in), 14 skewers, string.

Note – may need to share listed materials.

Cut a piece of string about 7-8 inches long. Gather the skewers near the pen markings. Wrap and tie the string around the crossing area. Note the string wraps a little below most of the pen marks on the skewers. The string should be tied in a knot.



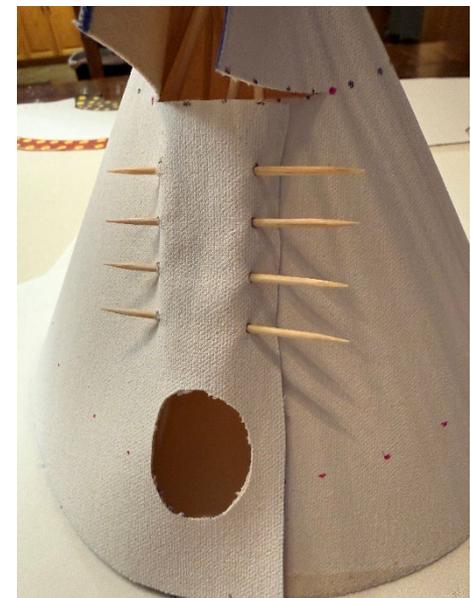
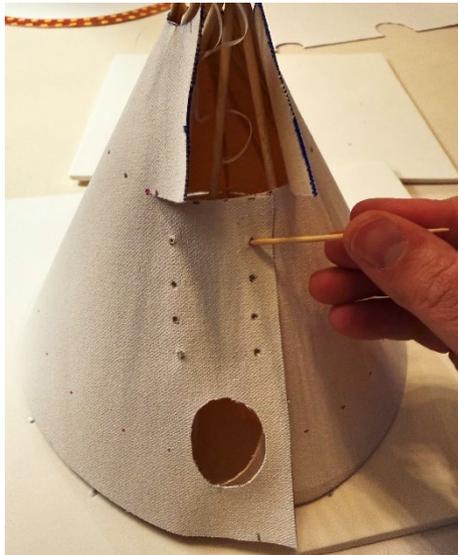
Tipi Liner and Base – Step 18



Materials: foam sheet (9in x 12in), 14 skewers, toothpicks.

Note – may need to share listed materials.

Wrap the Tipi cover around the skewers. Part of the cover will overlap. Line up the circles for the door and the holes to insert the toothpicks. Start with one toothpick and push/twist through the first hole. Twist and push the toothpick on the underside until it appears through the second lateral hole. Repeat to insert all 4 toothpicks.



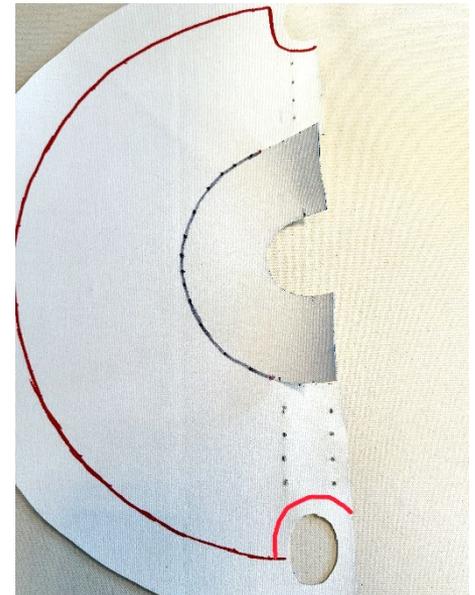
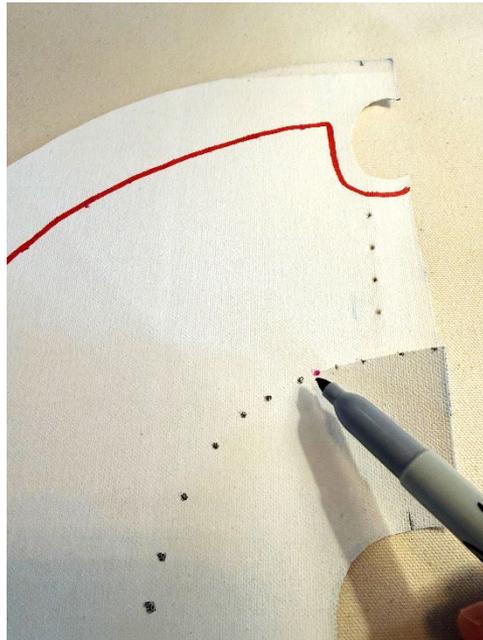
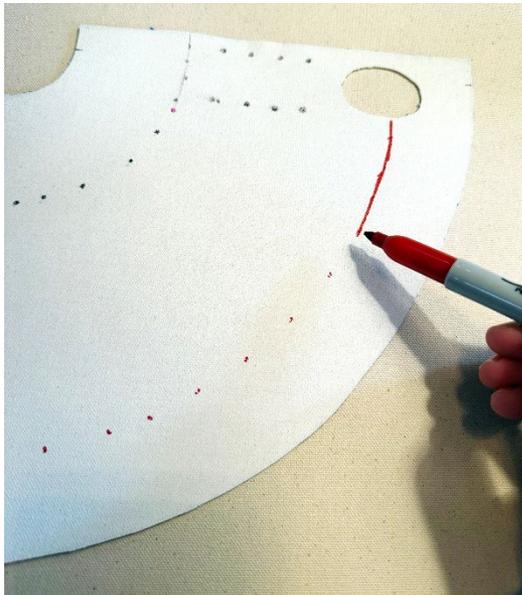
Tipi Covering – Step 19



Materials: Pen/marker.

Note – may need to share listed materials.

Take out the tooth picks and lay the canvas flat, white side up. Select a pen/marker to connect the marked dots along the outer curve. Draw around the full circle as shown. For the inner curve, start to connect the marked dots starting at the uncut canvas as shown.



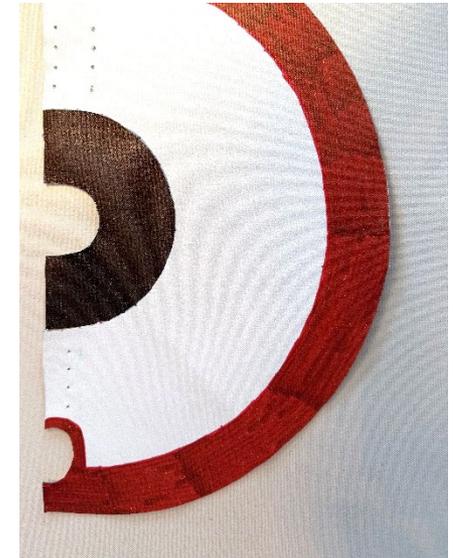
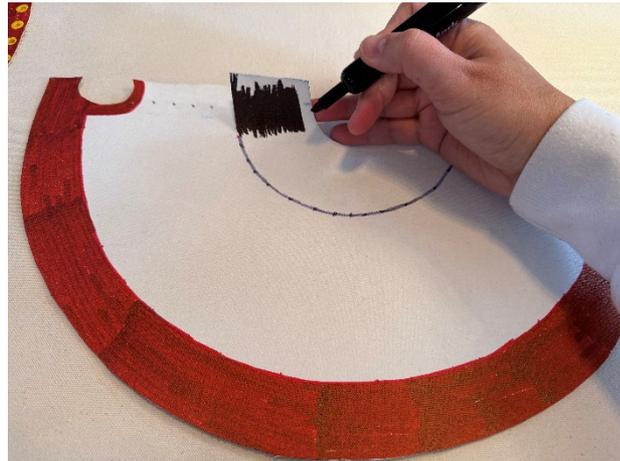
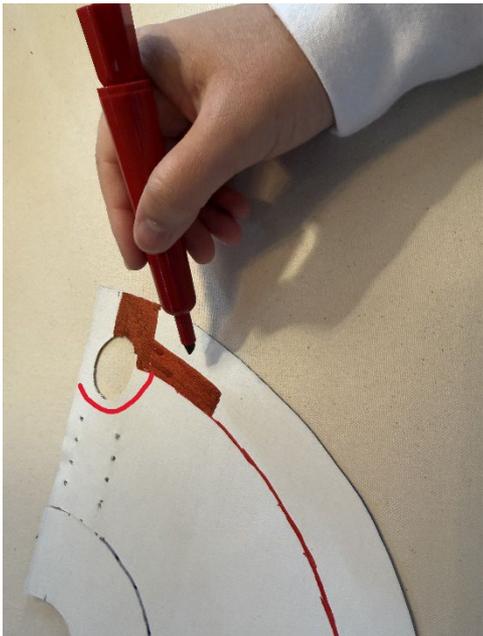
Tipi Covering – Step 20



Materials: Pen/marker.

Note – may need to share listed materials.

Select a thick marker to fill in the tracedout bands near the inner and outer curve.



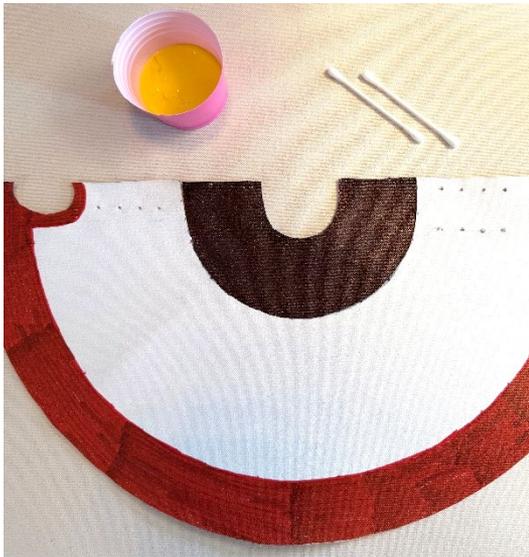
Tipi Covering – Step 21



Materials: Paint, cup, Q-tips.

Note – may need to share listed materials.

Use the Q-tip to paint dots onto the inner curve band. Press the Q-tip downwards like a stamp. This area represents the night sky and the stars. Feel free to randomize the dots to look like a starry night or paint dot patterns to represent constellations like the big dipper.



Tipi Covering – Step 22



Materials: Paint, cup, Q-tips.

Note – may need to share listed materials.

Repeat for the outer curved band. Press the Q-tip downwards like a stamp. This area represents the land the plants. Start the dot pattern as one row as shown. The second row of dots should align radially as shown. Let dry for about 5 mins.



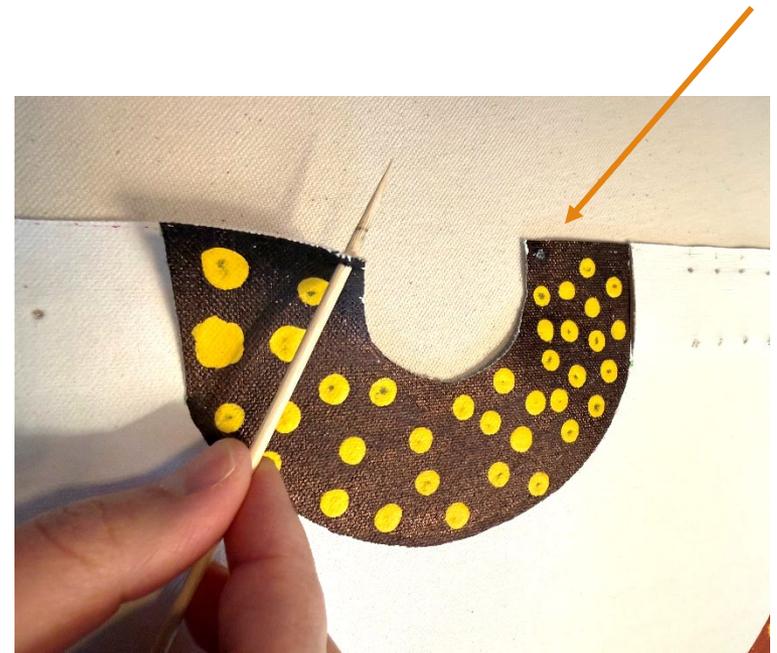
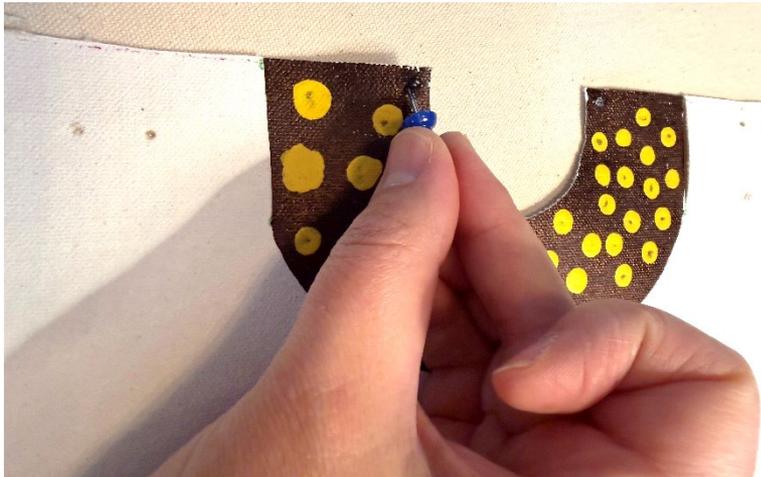
Tipi Covering – Step 23



Materials: Push pin, skewer.

Note – may need to share listed materials.

After drying, use a push pin to poke a hole through the corner of the inner circle band area as shown. Use a skewer to widen the hole size by twisting through the canvas. Repeat on the opposite corner.



Tipi Assembly – Step 24



Materials: Toothpicks, skewer.

Note – may need to share listed materials.

Wrap the Tipi canvas cover around the skewers and align the door with the gap in the tipi liner. Place in the toothpicks to hold the canvas in place. Take a skewer and place it into the hole near the top pointed end first. Twist the skewer to move it through the hole.



Tipi Assembly – Step 25



Materials: Skewer, glue.

Note – may need to share listed materials.

Poke the skewer into the foam sheet at the back corner as shown. Can add a drop of glue to secure the skewer. Repeat on the other side as shown.



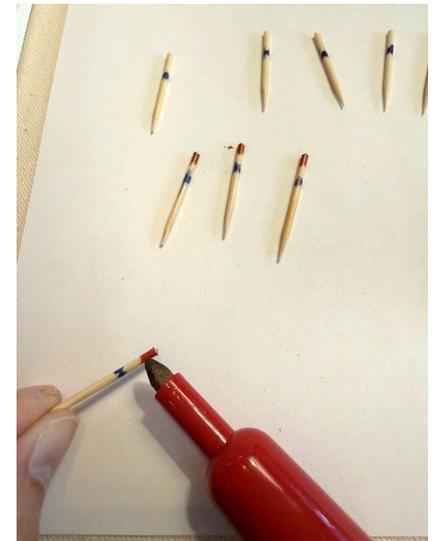
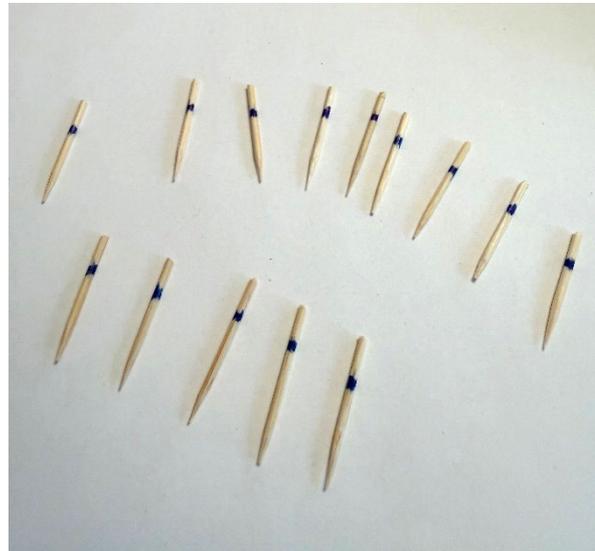
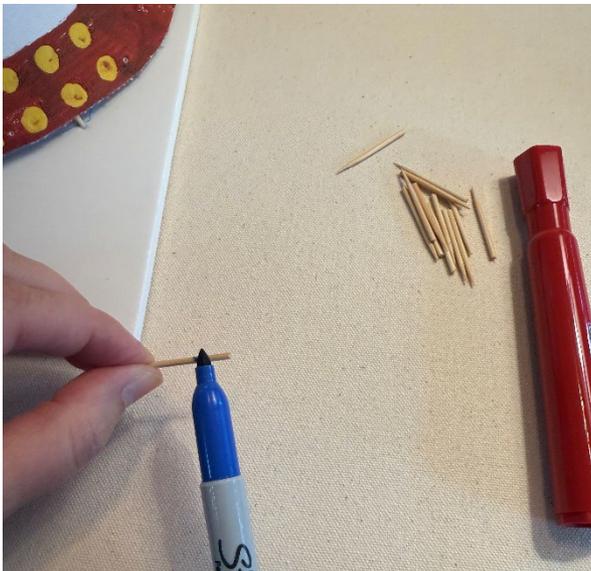
Tipi Assembly – Step 26



Materials: ½ picks, marker.

Note – may need to share listed materials.

Take 14 ½ picks and choose the color(s) for the picks (represents the Tipi stakes). Draw two bands of color on the picks towards the flat end. Twist the pick and keep the marker felt tip on the pick as it turns.



Tipi Assembly – Step 27



Materials: ½ picks, marker.

Note – may need to share listed materials.

Take each ½ pick and poke into the foam sheet near the skewer locations as shown. Can add a drop of glue to secure in place.



Tipi Assembly – Last Step 28



Materials: Felt sheet, glue.

Note – may need to share listed materials.

Take a felt sheet and place under the foam sheet. Spread glue on the felt. Place the foam sheet on top and let dry. The felt will protect from sharp skewers poking through the foam sheet.

