

# Cindy Drozda

"The Fine Art of Woodturning"

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## Tapered Triangle Box

There are so many creative possibilities with this multi-axis technique! For a different look, experiment with more, or fewer, than 3 sides, and/or unequal sides. Try varying the size of the layouts. The larger the Centerpoint Circle is, the larger the radius of the arcs, and the flatter the triangle sides will be. The small layout can be just on center, with no offset. With one end using the center of the blank, instead of an offset layout, that end approaches round.

To get a twisted Triangle, rotate the layouts in relationship to each other.

This method uses only the standard size jaws on a small chuck.

An easier way to make this box is to turn the blank into the Triangle shape, and then cut it at the lid joint to make it into a box. Done this way, the lid will overhang the base of the box, due to the tapered shape.

Maximize grain match, and minimize lid overhang (in the above scenario), by using an insert for the lid tenon instead of making the lid all one piece.

Try threading the lid, before turning the Triangle.

The finished box will be 2-3/4" (70mm) diameter x 3-3/8" (87mm) tall. The box can be made in this size, or scaled up or down. To scale the design, you will want to do the layout on a piece of graph paper or Engineering Pad to get the proportions to work.

### Part 1: Prepare the Blanks:

Most any type of wood will work well for this project. Burls are nice, and most straight-grained wood. To minimize wood movement problems, it's a good idea to run the grain of the wood parallel to the bed of the lathe so that when the wood moves due to seasonal changes, the lid might still fit.

Whatever type of wood you choose, it should be dry. Changes in the wood as it dries can cause the lid to lose its good fit.

Some wood is prone to chipping out on the fragile corners of this design. Rotten or punky wood can cause you to lose accuracy.

**The Box Blank:** In the class, I will be using a box blank that is 3" (75mm) diameter x 4" (100mm) long. This allows for tailstock damage, the parting cut, and shaping.

**For the Jam Chuck:** You will need a jam chuck for the lid and/or base. I like to prepare the jam chuck with a hole through it to make removing the piece easier. It needs a chuck tenon on one end.

## Part 2: The Blank:

1. With the box blank between centers, turn it to a cylinder about 1/8" (3mm) larger than the top layout's blue diameter.
2. Mark a line on the blank to use for lining up the halves of the box for grain match.
3. Draw the layouts on both top and bottom of the blank.
4. Put the blank between centers and cut a tenon the diameter of the top layout's red diameter on the lid end.
5. Cut a tenon on the bottom end that is larger than the bottom layout
6. Chuck on the bottom tenon and part off the lid.

## Part 3: The Box:

1. With the base of the box in the chuck, hollow the base to the dimensions on the drawing. Maintain parallel walls for the top 3/8" of the inside.
2. Flatten the top edge (rim) of the base.
3. Sand (and finish if desired) the inside and top edge.
4. Put the lid in the chuck and turn a tenon to fit the base.
5. Flatten the shoulder around the tenon so that there will be a flat-to-flat connection between the top and base.
6. Hollow and sand the inside of the lid (and finish if desired). Drill for a jewel in the center, or decorate the inside of the lid, if desired.
7. Cut a contrasting color piece of paper to fit between the halves of the box (on the tenon shoulder, not on the tenon), and glue them together. Line up the marks for grain match. Be sure not to get glue within 1/8" of the tenon joint so you don't glue the box together permanently. CA is a good choice here.
8. Put another bead of CA around the outside of the glue joint. Catalyze if necessary.

## Part 4: The Triangle:

1. With the box between centers on the center points, cut a short tenon the size of the red diameter on the bottom.
2. Make the red diameter tenon on the lid end 3/4" (19mm) long.
3. Taper the blank from the lid joint to the blue diameter on the box bottom end.
4. Mount the box between pairs of centers 1, 2, and 3 to turn the 3-sided form. Cut each side until the cut touches the red diameter tenons on each end.
5. Now is the best time to sand the outside of the form, while it's easy to handle. Sanding can also be left until the piece is done.
6. With the box between centers on the center point, turn the top tenon smaller so it has a shoulder to locate on the chuck jaws.

## Part 5: Complete the Box:

1. Chuck on the lid end. With the tailstock in place, cut a vee groove where the paper joint is.
2. Tape around the joint and finish the bottom, including sanding.
3. If the lid fit is too tight, take some material off the lid tenon to get the fit you want.
4. Jam chuck the lid tenon and turn the lid shape.
5. Drill a hole to mount a jewel or finial on the top, if desired.
6. Sand the top of the lid.

## Part 6: Finishing touches:

1. Drill holes in the bottom to accept feet, if desired.
2. Apply your choice of finish to the box.
3. Glue on the feet and finial.
4. Sign your work. Congratulate yourself on a job well done!

### **Make it easier:**

1. Turning the multi-axis shape first, and then separating the halves to make it a box, requires less pre-planning accuracy in the hollowing.
2. Make a parallel sided box, using the same layout for the top and bottom.
3. Finish the top and bottom with convex instead of concave shaping.
4. Make a shallower box.

### **Customize your Box:**

1. Try different numbers of sides to the shape. Two, four, or more sides will give a different look. More sides tend to look more round, fewer sides make the shape look more angular.
2. Make the sides curved instead of straight. More planning is asked for, here!
3. Rotate the layouts in relationship to each other to make a twisted box.
4. Get a better grain match by using an insert for the lid tenon.
5. Thread the lid (before turning the multi-axis shape).
6. Scale the design up or down. The proportions of this layout work out in this size, but you might have to make adjustments for larger or smaller layouts. Drawing them out on paper to see how the different circle diameters interact is helpful. It's also helpful to turn the multi-axis form out of scrap wood before making it into a box.
7. Add inlay on top and/or bottom.
8. Experiment with different styles of finial and feet. They can be turned from wood, metal, or plastic. Use pearls, beads, or other jewels.
9. Decorate the inside of the lid.
10. Color, texture, or carve the outside.
11. Deliberately cut through the walls of the sides to create windows.
12. Try this technique on other turnings, such as tool handles, bowls, candlesticks, peppermills, hollow forms, and more.

### **Part 8: Please Turn Safely:**

**Keep the tailstock up to the work whenever possible. This is always a good idea. For the safety of your work piece and your self!**

**Be sure the tool rest and tailstock are tightened down and don't have a tendency to move. This is especially important when turning a blank between centers. Keep checking the tailstock pressure as you turn, as the wood can compress from the turning force.**

**Be sure the chuck is tightly fastened to the lathe spindle, and that the jaws are tight. If you leave for awhile, re-check the jaw tightness before turning on the lathe.**

**Keep all body parts away from the spinning wood.**

**Always stop the lathe before repositioning the tool rest. This is good practice all the time, but even more so with a natural edge piece.**

**Wear eye and/or full face protection at ALL TIMES**

**Use your own good judgment, and only do what feels safe to YOU.**

**Oh, and above all, be sure to HAVE FUN !!**

**A disclaimer: What I have written here, and what you see in my classes, is merely my way of doing woodturning. There are as many different methods as there are woodturners, and if it gets the job done safely, we are all “doing it right”. If you do things differently, and it works for you, I am not arguing or telling you to change. I am just offering another possibility. It is my hope that you will learn something useful from what I share. Please accept this information only for what it is: my way, my opinion, and not the only way to do things.**

### **Tools:**

This project can be done with a variety of tools, depending on the details you choose to do and how you like to work. These are the tools that I use.

3/4" Spindle Roughing Gouge  
1/16" Parting Tool  
3/8" Beading and Parting Tool  
3/8" 40/40 Bowl Gouge  
3/4" Arc Negative Rake Scraper  
1/8" Parting Tool  
General Brand Vernier Caliper (for scribing)  
3/8" Ray Key Signature Gouge (or other tool for hollowing, such as round scraper or carbide)  
1/2" Square Recess Scraper (or other square scraper)  
3/8" Finial Gouge  
1/4" Pyramid Tool  
1/2" Round Negative Rake Scraper  
Wall thickness Caliper  
Depth Gauge  
Compass for layout  
Awl  
Steb Centers for headstock and tailstock  
Miniature drill chuck and/or pin vise for micro drill bits  
Chuck(s) that can grip 1" (25mm) and 2-1/8" (70mm) tenons.

Please note that there are other choices of live centers, tools, and chucks, that are all equally good.