

# Turning a Three-Legged Display Stand

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## Getting started

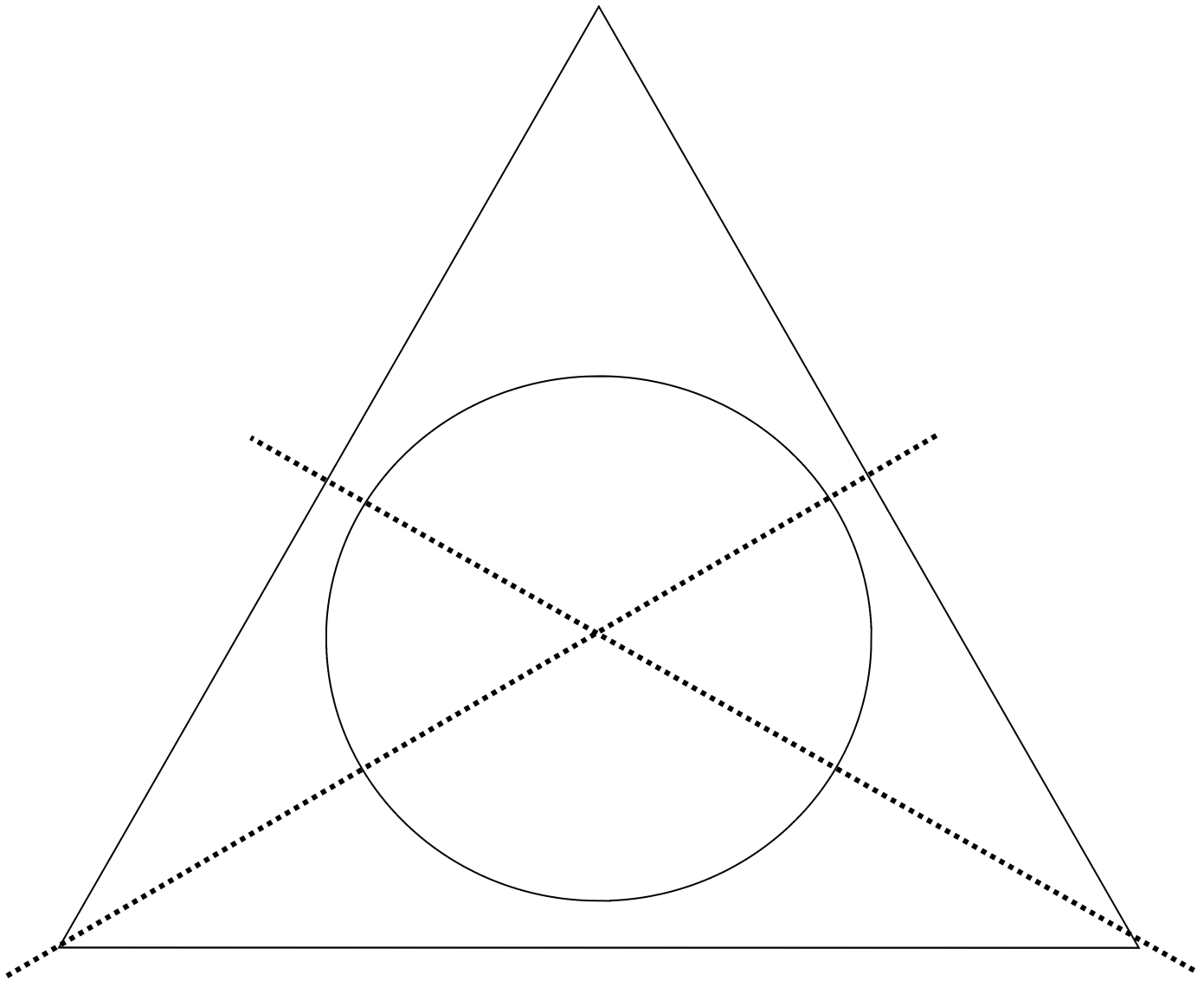
- First turn the piece you want to display, whether that be a sphere or some kind of a vase or form.

## Selecting Stock

- Select clear stock, no cracks, no faults
- You need stock that is thick enough to display your piece well
  - For spheres, I like the stand to be as tall as the diameter of the sphere at a minimum-usually I make them higher
  - For vases, I like to see the vase suspended ½ to 1” above the table top
  - NOTE: Practice making a couple before making the one you really want. Shorter is easier. Taller (thicker stock) with longer sides is exponentially more difficult. A good starting size is a 6” triangle, 2” thick
- Tight grain/or a bit wood that has longer fibers works the best – ash and sycamore have worked well for me, but I have also used walnut, chinaberry, hackberry, elm
  - Main thing is don’t use a brittle wood! e.g. cedar
- Reasonably dry wood – you don’t want the center hole going oval on you.

## Laying out the Triangle

- How big to make the triangle?
  - For starters I would suggest the hole that you put in the piece be no closer than ¼” to the sides. If you use the shape I use, that ¼” will be a little bigger in the final piece
    - The thin sides around the hole are the weak points. The thicker or wider you make the piece the stronger it will be.
- To figure hole size:
  - Spheres:
    - Use dial calipers to find diameter of sphere
    - Subtract 1mm or 1/32 from that. That should suspend the sphere roughly at the mid-point
  - Vases
    - Use what looks good, typically the standard 1/3 – 2/3 rule works well where 1/3 of the piece is above the stand and 2/3 hangs below
    - Find this spot using caliper (hang from caliper)
- Remember your geometry – all angles in an equilateral triangle are the same – 60 degrees. All sides are the same length.
  - The diagram on the next page gives you some starting sizes depending on the length of the triangle’s sides. I usually start there and then adjust the size larger or smaller as needed.
- Layout the triangle on the wood and mark the center points on both sides of the blank
  - Try to NOT have one side of the triangle be exactly perpendicular to the grain
  - Marking center easy- just find center of a sides and draw line to the opposite points



**Equilateral triangle**

All sides same length

All angles 60 degrees

Center point is center of sides to opposite point

**Length of sides**

**Approximate maximum hole size**

**1/4" from sides**

**3/8" from sides**

4"

1 7/8"

1 5/8"

5"

2 3/8"

2 1/8"

6"

2 7/8"

2 5/8"

7"

3 1/2"

3 1/4"

8"

4"

3 3/4"

## **Special issues when turning non-round shapes**

- Always test spin the piece (slowly!) after every change in tool rest
- Always stop the lathe before moving the tool rest
- Always double check you have the tool rest/banjo tight
- Keep your fingers clear! Do not extend past tool rest!
- Watch work from above – turning the shadows
  - Overhead light helps
- Use light pressure, heavy pressure bounces—causes ridges
- Want to cut as much as possible—scraping can cause tear-out

## **Mount Piece Between Centers**

- Mount on centers with bottom of piece facing tail stock
- Flatten the bottom and form tenon for your chuck

## **Forming the Top**

- Reverse the piece and put in four-jaw chuck
  - If piece is large, you can bring up tailstock for initial shaping
- Start rounding off corners to form the legs
- Going for a simple curve—dome shape
  - Simple = fast
  - Also remember any complex beads and coves must be duplicated on inside where there is less space and there will be more vibration
- Set the width of the legs and then blend the top into that.
  - Looking for smooth curve, sometimes follow grain pattern
  - Don't want legs too wide or too narrow, but want to allow the legs to be a bit wider at this point if the wood has a tendency to tear-out. The wider legs can be reduced via disc sander.

## **Sand the Top**

- For non-round shapes two basic ways to sand
  - Power sand w/lathe running
  - By hand with lathe off -- can still be power sanding
- Do NOT hand sand non-round shapes with lathe running unless you want injured fingers
- In any case for sanding—sand rough spots with lathe turned off first
- Apply finish to top

## **Cut Hole in Top**

- Use calipers to mark the hole size. Can also use compass set for hole diameter to draw circle if you want.
- Hollow down a ways using bowl gouge. This helps tell you when you are close when you hollow the bottom.
- Use bedan to cut final diameter, its trapezoidal shape allows you to get straight sides. Leave a shoulder for the chuck as you will be reverse chucking the piece via the hole in the top. You do not need to go all that deep for dovetail jaws. Straight jaws need more depth to grab.
- Use a small skew to cut small dovetail groove if you are using dovetail jaws.
  - I like a small 1/4" round skew for this

- Spread a little CA glue inside this area where the chuck will grab to strengthen it
  - Do this before removing from the chuck so if the CA flashes over, you can re-cut

### ***Reverse and Turn Bottom***

- Anchor chuck in the groove we turned in the top (dovetail jaws only)
- Use standard bowl gouge to begin hollowing
- First hog some out of the middle
- Start forming leg thickness
  - Do section at a time, just like you would with a bowl
  - You can actually see where you are going if you look down on the piece
  - With each section you do, once you reach your thickness you cannot go back to the previous section
- As you go farther in, you must keep in mind “turning the corner”
- If you can’t rub the bevel anymore when turning the corner, it’s time to switch to a gouge with a greater angle on the bevel. I typically start with a 40 degree beveled gouge and switch to a 60 degree later.
- If you have a ridge between the sections that you can’t see when the piece is spinning, mark the ridge with a pencil line and cut till the line is gone
- As you get to the bottom stop lathe and look at the outside border/leg thickness—want a uniform thickness
- When near the bottom you will break through where you hollowed from above. As you get closer, you will want to use the bedan to cut down to the jaws to judge the final thickness
  - Helps if opening is larger than jaws as you can see through the jaw gap the thickness and how far you have to go
- When you get close to final thickness at the center hole, remove from lathe and soak with CA glue to strengthen.
  - Helps to add a couple of small grooves to control the flow of the glue.
- Re-attach to chuck and finish turning to final thickness.

### ***Sanding Inside***

- Hopefully you have clean cuts and there won’t be much to clean up
  - Unfortunately, clean cuts in this small area with the “bounce” in the legs is hard to come by
    - Practice making a few using thicker/wider legs
- With the small size like this the inside sanding is done with the lathe off
- Power sand with lathe off—be careful not to go off edge and round them off—the sharp edge look is just cleaner
- Drum sanders of different types or mini-flop sanding disks (from Klingspor) for rotary tools are also good for sanding inside the legs.

### ***Finishing the hole***

- Use bedan to finish cutting open the hole to the chuck
- Remove from chuck and lightly sand the opening—don’t sand it out of round