Making a Tippe Top

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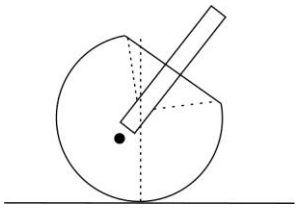
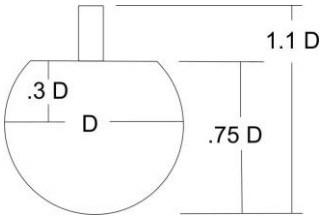
In order for a tippe top to work, the center of mass should be low in the top. As shown in the picture below, the center of mass should never be directly above the point of contact of the tippe top with the table (except when it is upright). If it is, then the tippe top will just spin in that position and not proceed far enough to flip over. In the diagram below, the center of mass is marked with a dot.





1. Start with a blank that is approximately 1.5 inches square and at least 2 inches long. Turn it round at somewhere between 1 and 1.5 inches, turn a tenon to fit your chuck and mount the blank on the chuck. In the diagram above, D is the diameter and the other dimensions are based on D. For example the height is 0.75 times D (or ¾ D).
2. Next turn the body of the top and hollow it. Drill a ¼ inch diameter ¼ inch deep hole for the stem.
3. Finish the hollowed part of the body. You can texture and paint it or just apply carnauba wax.
4. Rough the outside of the body to be approximately round and part it off.
5. Use the drilled ¼ inch hole to mount the top using a ¼ inch collet.
6. Finish turning the outside of the top keeping the dimensions as in the diagram above. The shape will be approximately round, but a little shorter than a perfect sphere.
7. Sand and finish the outside.
8. Use the diagram above to figure out the length of the stem. Alternatively, plan on the stem extending approximately ½ inch above the body and measure the length needed for the stem.
9. Use a blank approximately ½ inch square by at least 1.5 inches long for the stem. Mount in a chuck and turn the stem. Be sure the top of the stem is flat, concave, or just slightly convex.
10. Finish the stem and part it.
11. Insert the stem into the top and test it. If it works well, glue it and you are done. If not, continue to the next step.
12. If the top doesn't work, it may still be salvageable.
    a. If the tippe top spins like a regular top, flatten the bottom more.
    b. If the top does not rotate to the point where the stem touches the table top (as in the second position below) or if it takes a long time before the stem touches the table top (third position below), then try reshaping the top. Test if the center of mass is directly above points on the surface. Do this by placing the top flat on the table at various angles

and make sure that the top rotates back to the stem pointing up. If you find a spot where the top does not "want" to rotate back up, then the center of mass is directly above the point of contact which does not allow the top to flip. Often making the top a little shorter and flatter on the bottom does the trick.

c. If the stem touches the table top and tries to flip, but it is too unstable to spin on its stem, then try making a different stem. You could change the diameter – a quarter inch or a little less seems to work well. Another option is to shorten or lengthen the stem, just keep it long enough that it is not too difficult to spin. Also, make sure that the top of the stem is flat, concave or just a little convex.