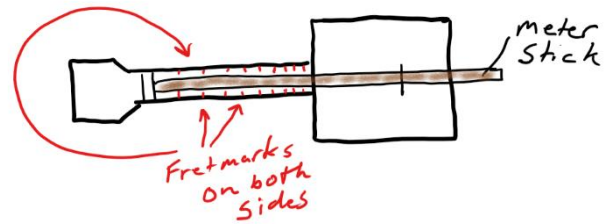
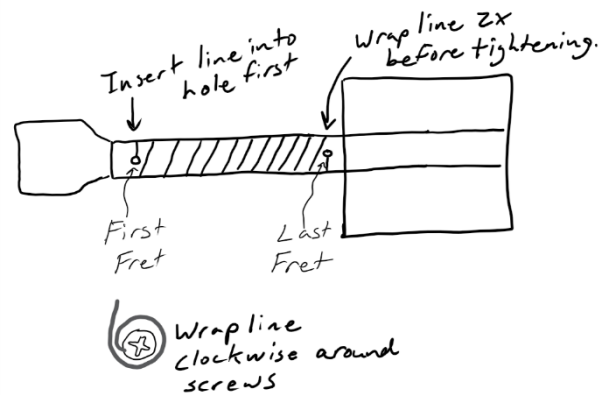


## Day 6 Instructions

9. Show your fretboard to Mr. Stapleton, so that he can confirm that it is flat enough to add your frets.
10. Mark the fret positions. Measure (in centimeters) the distance between the front edge of the nut to the near side (or middle, if you want) of the bridge.
  - a. Calculate your fret placements, based on this distance.
  - b. Tape a meter stick to your fret board, so that zero cm is at the front of the nut.
  - c. In pencil, mark each location on each side of the fret board. Make sure that an imaginary line between opposite fret marks would be perpendicular to the length of the neck.
  - d. Try to have at least 12 frets, but don't have any frets closer than 1" to the body of the instrument.
  - e. Using scissors, or a file, make **small** notches where each of your pencil marks meets the corner of the fret board.

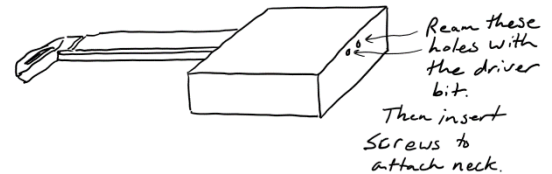


11. Attach the fret "wire". This is actually 100 pound fishing line that is on the fishing reel. Drill two 1/4" deep, 1/8" or smaller diameter holes
  - i. The first hole goes on the back of the neck, beneath the first fret.
  - ii. The second hole goes on the back of the neck, beneath the last fret.
- b. Using a phillips driver bit, run the drill backward (CCW) in each hole, to create a countersink for a screw.
- c. Use a manual screwdriver to screw a 1/2" screw into each hole. Push hard, but stop when the screw is fully seated. If you keep going, you will strip the wood.
- d. Remove the screw that is under the first fret. Leave the other screw in, but back it out at least half way.
- e. Calculate the length of fishing line that you will need for the frets; then add 30%.
- f. Remove the proper length of fishing line from the reel. Make sure that you don't have a knot in your segment!
- g. Insert one end of the line through one of the 4 special sticks of hardwood. Tie a knot or two about an inch from the end, so that the line won't pull back through the wood.
- h. Insert the other end of the line into the hole that you drilled near the nut. Screw a screw about 2/3 of the way into the same hole. Wrap the fishing line around the screw once, and screw the screw in the rest of the way, pushing hard.
- i. With a partner holding the hardwood end of the line, stretch out the line until there is a lot of tension between you. Begin to wrap the fret line around the neck, making sure that it seats in the fret notches that you made.
- j. It is important to apply a LOT of tension. The frets must be completely flat on the fretboard. This is 100# line. You won't break it.
- k. After you finish the last fret, maintain tension and wrap your string twice around the last screw. Maintaining tension, screw in the last screw, pushing hard.



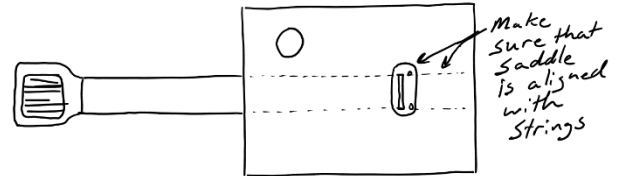
12. Attach the neck.

- a. Use a driver bit in reverse to ream out the body holes through which you will attach the neck.
- b. Insert the neck into the body using glue. Once the neck is fully seated, screw the body to the neck through.



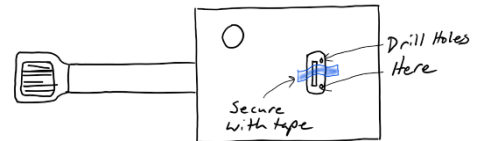
13. Add the saddle.

- a. Position the saddle so that the bridge slot is correctly located on the mark that you made. Tape it down.
- b. Use the saddle holes as a template to drill holes through the body top.
- c. Glue the saddle to the body top, and then firmly attach the saddle with pop rivets.



14. Add the tuners

- a. Get four tuner screws, four plastic tuners, and four pairs of wooden knob parts (one with a D-shaped hole, and one with a circular hole).
- b. Glue the four pairs of wooden knob parts together, matching D-hole piece with a circular hole piece.
- c. Use a file to remove any sharp burrs from the head of the tuning screws.
- d. Cut off the extra piece from the peg box (if you haven't already done so).
- e. Create grooves in the plastic tuners. Using a drill with a driver bit, screw a tuner screw rapidly into and out of a plastic tuner. Don't do this for too long, or friction will melt the plastic.
- f. Insert the tuning screws into their wooden knob parts. Add some hot glue if you want.
- g. Insert the tuning screws into the back of the peg box.
- h. Screw each a distance into its plastic tuner (just to keep them together).



15. Add the strings (ukulele) [\*metal strings will require a special anchor piece. Ask Mr. Stapleton for one.]

- a. If you are looking at your instrument with the neck pointing to your left, the string order (from nearest to you to farthest from you) is 40#, 80#, 60#, 40#. Cut four strings that are about 25% longer than your scale length.
- b. For each string...
  - i. Pass one end of the string through its hole in the saddle. Tie one or more knots in the end of it, so that it won't pull back through the hole.
  - ii. Pass the other end through the hole in the plastic tuner. Tie knots in the string so that the tuner barely reaches its slot in the peg box.
  - iii. Screw the tuning screw into the tuner until the string begins to tighten.
  - iv. Continue with the rest of the strings.
- c. Insert the bridge and the nut.
- d. Tighten the strings and decide whether or not you need to alter the nut or bridge.

16. Adjust the nut. You want the string to be very close to the first fret, but it should not touch the first fret. The easiest way is to deepen and/or widen the notches. You might try the junior hacksaws for this.

17. Adjust the bridge. The purpose of bridge adjustment is to get the strings close to the frets, so that their tension won't change much when you press down the string. You can adjust the bridge by sanding it shorter. You may want to add some notches to keep the strings in their places.

18. Tune your instrument.

- a. Typical Ukulele Tuning (GCEA): with the neck pointing to your left, the nearest string should be a G. The next should go down to the next C. Then up to E and up to A. You may be familiar with the "my dog has fleas" sound. There are a lot of tuning apps. Get one and go to a quiet place to tune.
- b. In the beginning, you may want to use a cordless drill.

- c. Ukulele strings stretch a lot in the first day! You will have to constantly retighten them. After a couple of days they should require much less tuning.
- d. You may run out of room on the tuning screws. If that happens, loosen the string and tie a new knot closer to the plastic tuner to shorten the string. Then re-tighten.