StewMac®

Sheet #i-5351 Updated 11/18

# UKULELE KIT

## Assembly Instructions

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# Tools and supplies

These are the tools and supplies we recommend for assembling this kit. StewMac item numbers are included where applicable.

**Tools**

Clamps (few are needed, but more are handy)
- 2 or more clamps with 4" or longer reach (#3867)
- 1 or more small C-clamps or spring clamps
- 12 or more clothespins or mini spring clamps (#3712)
- Rubber bands to wrap around clothespins

Scratch awl, pushpin or center punch (#1672)
Flat mill file or pillar file (#4175)
Razor knife (#4878)
Small chisel or fine-cut saw (#1619 or #3617)
Side cutter or fret cutter (#0619)
Hammer for fret installation (#4895)
Electric hand drill
1/4" and 1/16" drill bits (#4850, #1710)
Small brush for applying glue (#4167)
Scissors
Straightedge to reach from string nut to bridge (#3850)
Measuring tape
Rubber binding band (provided)

**Supplies**

Titebond III wood glue (#0621)
StewMac #10 Thin Super Glue with whip tip (#0010)
Masking tape or low-tack protective tape (#1683)
Double-stick tape (#1689)
Scraps of wood for various clamping cauls and supports
Waxed paper
For body mold:
- 3/4" plywood, 19"x12" (22"x15" for baritone)
- Four 2-1/2" steel corner braces with mounting screws
- Eight large screw eyes or screw hooks

Sandpaper (#5562 or #5096)
- 80-grit, 120-grit, 220-grit, 320-grit, 400-grit

Sanding blocks (scrap wood or #3701, #3699)
ColorTone Wipe-On Poly finish (#3622)
ColorTone Liquid Stain (optional)
Light Duty 3M Scotch-Brite Pad (#7445)
Steel wool, 0000-gauge (optional, for dulling the finish)
Fretboard oil or lemon oil (#3863 or #3864)
Paste wax, such as car wax
Cotton balls
Scraps of t-shirt material

## Welcome to instrument making!

If you're a first-time builder, this kit is a great way to start. You'll have fun and learn a lot.

A ukulele kit is an excellent way to get into instrument building. It can be built with basic tools. The design and construction is similar to an acoustic guitar, but faster and easier.

You'll learn to brace the top, build the body, fret the neck and apply a simple finish. When you're done, you'll have a great sounding ukulele!

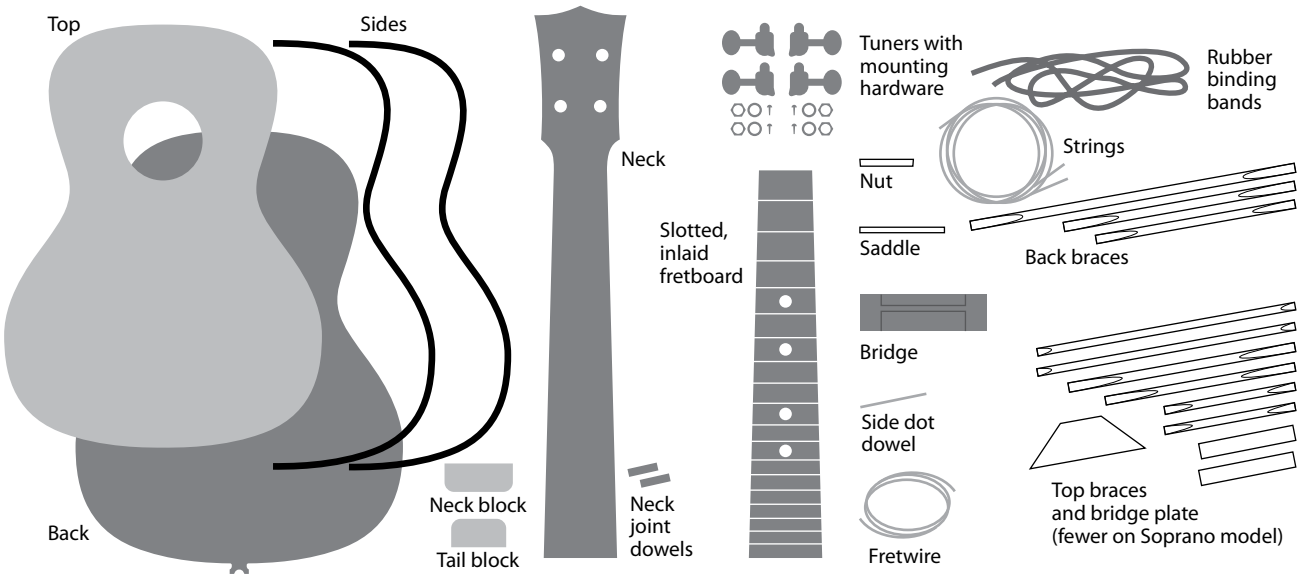
## Video: "How To Build A Ukulele"

**Watch the video:** PART 1 **LET'S GET STARTED!**

We captured every step of this process on video! Watch and build along with Dan Erlewine as he assembles this uke kit in his workshop. These free videos are available at:

stewmac.com/**ukevideos**

## Parts list



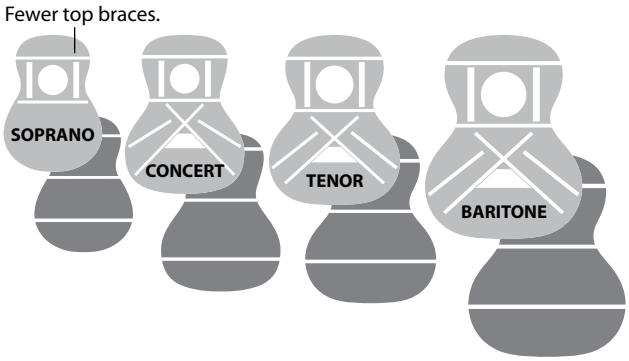

**Kit contents**

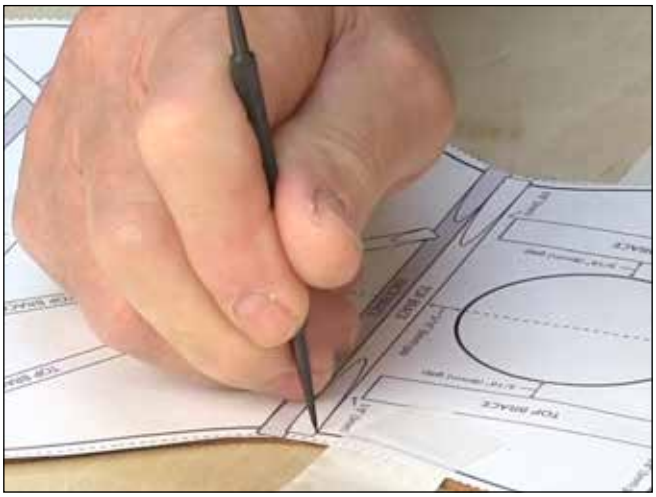
Solid mahogany top
Laminated mahogany back
Laminated mahogany sides
Fully shaped neck with two dowel pins for neck joint
Neck block and tail block
Slotted fretboard with inlaid position markers
Tuners with mounting hardware
Shaped string nut
Carved, drilled bridge
Shaped saddle
Plastic dowel for making side dots
Fretwire
Rubber binding bands
Three carved back braces
Six carved top braces (Soprano has two)
Two flat soundhole braces
Shaped bridge plate (not on Soprano)
Full-size bracing plan
Instruction book
Strings

## Brace the top and back

**Watch the video:** PART 2 **BRACING THE TOP+BACK**

The first step is gluing the top and back braces. The back has three braces. The number of top braces depends on the model of your ukulele: the Soprano has fewer than the Concert or Tenor.



**Transfer the brace plan to the wood**

The full-size plan shows where to place the braces. Back braces are printed in gray, and top braces in white.

The heavy black line on the plan is the actual shape of the ukulele. Outside of this is a dotted line indicating the slightly oversize top and back wood. Cut the plan out on this dotted line.

Decide which side of the top and back you prefer to have facing outward. We'll mark brace locations on the opposite side, which will become the inside of the uke.

Lay the plan over the back or top, centering it on the wood. Transfer the plan's centerline to the upper and lower edges of the top and back wood.

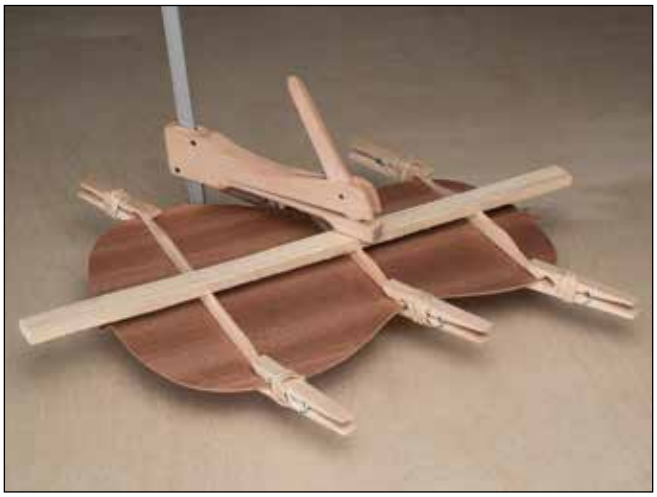
Use a pushpin to poke small holes into the wood at the brace ends. Connect these holes with a pencil and straightedge, and you have the brace locations marked for gluing.

Save the plan drawing for use later when building the body.

**Clamps**

You'll need at least one clamp big enough to reach onto the top or back for clamping braces. Smaller clamps are good for the brace ends. Wooden clothespins make great small clamps, if you wrap them with rubber bands for extra strength.

You don't need many clamps. TiteBond III dries fast, so gluing the braces goes quickly even when clamping one brace at a time.



Use pieces of wood to protect the uke parts from the clamps. Cauls of scrap wood also distribute clamping pressure more evenly. Cauls also can be placed across multiple braces, so one clamp can glue two or even three at once.

A piece of wood clamped to your table makes a very handy gluing rig. It holds the back and top in place while giving you lots of room to arrange clamps.

**Start with the back braces**

The back bracing is simpler than the top, so that's a good place to start. When you move on to the top braces, you'll be familiar with clamping and gluing.

You can glue each brace separately, or use wooden cauls to clamp more than one at a time as in the photo of clamped back braces on the previous page.

**Do a dry run before gluing**

Test your clamping setup before you use glue. Decide where to place clamps and cauls, and look to see that the braces are held down tightly from end to end. You don't want to figure this out while the glue is drying!

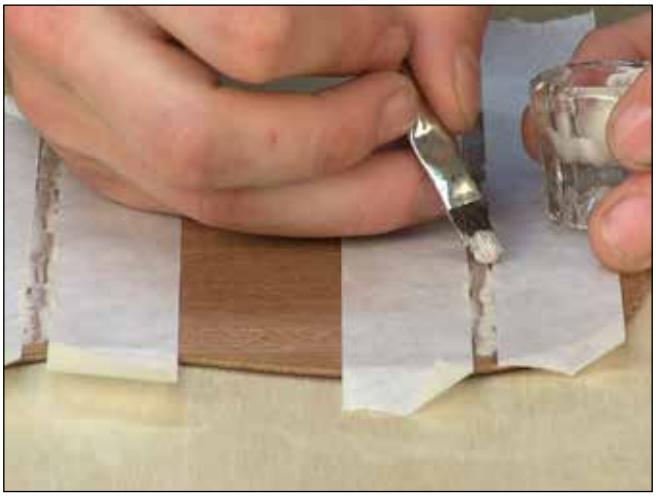
The important thing is that you're comfortable with your clamping plan, and have seen that it works before you're under the time pressure created by wet glue.

**Use tape for a clean joint**

When you dry-run your clamping setup, place masking tape next to the braces. When glue squeezes out during the glue-up, the tape catches it. Peel the tape away, and most of the glue mess goes with it.

**Keep a bowl of water handy**

Water is always needed for cleanup, and sometimes for wetting the glue joint as you get ready to clamp.



**Apply the glue**

Apply the glue to the exposed wood between the strips of tape. It's not necessary to put glue on the braces; an even coat on the back/top wood will be enough. A glue brush is helpful. Use scissors to trim the brush smaller for better control.

**Let it dry for 45 minutes**

Titebond III recommends a drying time of 30 minutes. That generally is plenty of time, but to be extra sure, we recommend giving your glue joints an extra 15 minutes under clamping pressure.

**Glue the top braces**

Start with the upper braces above and below the soundhole. With a caul spanning them, they can be glued up at the same time.

Position the soundhole reinforcement strips between the upper braces, 3/8" from the soundhole. The cauls in the photo above include the neck block and tail block included with the kit. A piece of waxed paper keeps glue from getting on these parts.

Glue the X-braces and fan braces next.

Add the bridge plate between the X-braces.

The complete set of top braces on a Concert model. The larger Tenor uses the same bracing pattern.

**Clothespin clamps**

Wooden clothespins are inexpensive small clamps. Their springs aren't strong enough for brace clamping, so wrap them in a rubber band to get enough pressure.

When you need extra pressure, add a second clothespin, backwards, as in the photo above.

## Make the body mold

**Watch the video:** PART 3 **ASSEMBLING THE BODY**

Assembling the ukulele body starts with creating the body mold. This is a very simple fixture: a piece of plywood and four 2-1/2" corner braces (angle brackets). It holds the body pieces in shape while you build.

For a Soprano, Concert or Tenor uke, start with a piece of 3/4" plywood, 19"x12". The Baritone needs a larger board: 22"x15". Draw a centerline down the middle of the board.

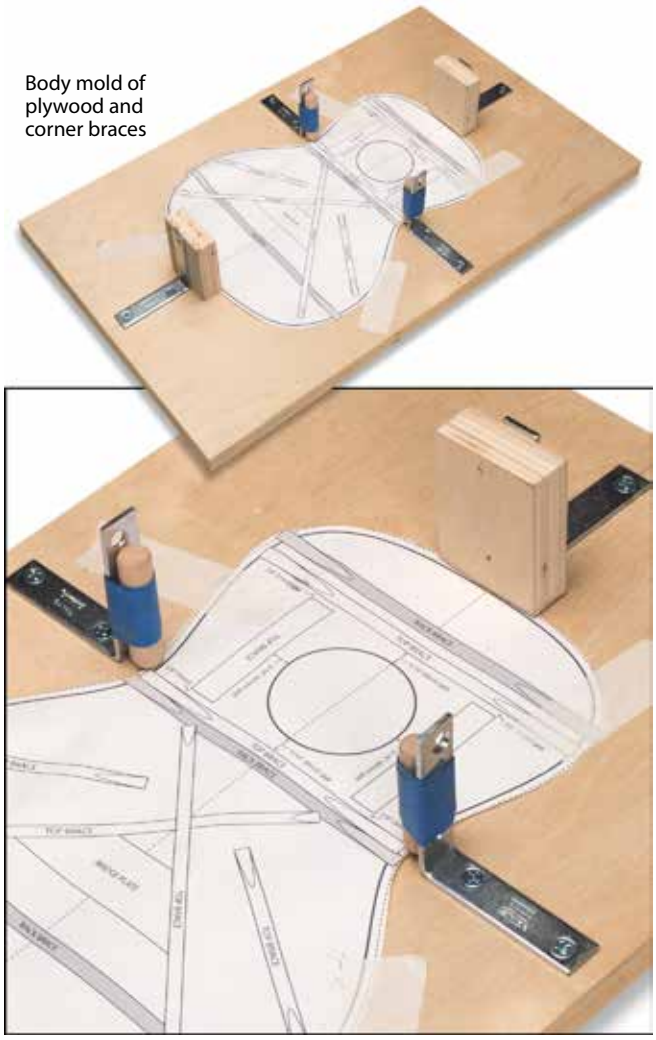
Tape the plan drawing to the plywood, aligning it on the centerline. The bold black line on the plan drawing is the final shape of your uke.

Attach blocks of wood to two of the corner braces, as shown in the photo (next page). Screw these two braces to the plywood, on the centerline. Position them so they are against the bold line of the uke shape. These are clamp supports for gluing the neck block and tail block to the sides.

These clamping blocks should be no taller than the sides of the ukulele.

The other two corner braces support the sides at the uke's waist. To avoid metal scarring the mahogany sides, give these brackets some padding. A piece of dowel wrapped in masking tape works well.

Screw these braces to the plywood, positioning them against the uke outline at the waist.



Body mold of plywood and corner braces

## Assemble the body

**Watch the video:** PART 3 **ASSEMBLING THE BODY**

Place the bent sides into the body mold, with their ends butted together at the center. Now you can see the body of your ukulele taking shape! If the sides don't precisely match the body shape on the plan drawing, don't worry. A little variation between ukes is fine. As long as the side curves match each other nicely, you'll have a great looking instrument.

The corner braces will hold your sides nicely square to the baseboard, so the body doesn't "lean" in one direction. If you like, use a square to double-check this.

The neck block and tail block are the same size and shape, so you can use either block at either end. Press these blocks against the side joints with sturdy clamps. Do your dry run before using glue. A piece of waxed paper between the sides and the body mold will prevent accidentally gluing the sides to the mold.

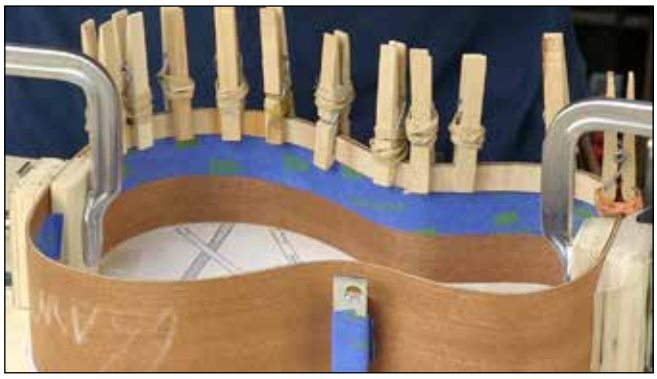
The neck and tail blocks need to be the same height as the sides. If yours are taller than the sides, trim them with a saw or chisel. This is easier to do now than later.

**Glue the sides and blocks**

When you're comfortable with your clamping setup, put glue on the neck and tail blocks. Put a little glue on the narrow edges of the sides that butt together, too.

If the neck and tail blocks quickly absorb the glue, add more to make sure you have a wet gluing surface. You don't want a glue-starved joint.

Clamp the blocks and sides, and let them dry for 45 minutes. Use warm water to clean up any glue squeezeout while it's still wet.



**Install the linings**

The flexible wooden linings will be glued to the edges of the sides, flush with the top and back. These strengthen the body and provide a wider surface for gluing the top and back.

For firm gap-free pressure all along the linings, you'll need at least 12 clothespins to glue one lining strip. Using even more clothespins, closely spaced, ensures that the linings are pressed to the sides at every point along the curves.

Do a dry run by clamping the linings flush with the edge of the side. While the lining is held in place, put masking tape against its lower edge to catch glue squeezeout.

When you're ready, apply glue to the linings and clamp them. Clean up any glue drips, and when there's no more squeezeout, peel away the masking tape strips.

Allow them to dry for 45 minutes, then turn the sides over in the body mold and glue the linings to the other edge.

**Sand the linings flush**

The edges of the sides need to be smooth and uniform for gluing the top and back. Use a straight piece of wood, longer than the body, for a sanding stick. Cover the stick with 80-grit sandpaper, taping the sandpaper in place.

Lay this stick across the sides and sand evenly over every point, in all directions. Scribble with a pencil on the edges to be sanded, and on the neck and tail block. Watch your pencil marks as you sand; when they disappear, you know you've sanded every point.

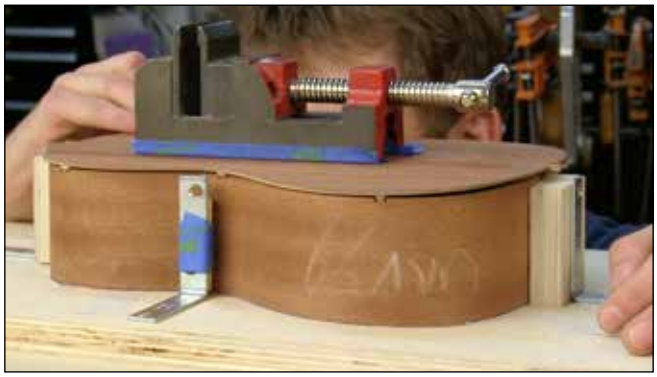
Keep moving the stick as you sand, to sand every point evenly. If your neck or tail blocks are taller than the sides, you'll need to trim them or sand them until they're flush.

**Fit the back to the sides**

The braces on the back are intentionally longer than the width of the body. When you place the back on, these braces will overhang the sides.

The next step is trimming braces to length, and creating notches in the side linings so the back drops in place.

Place the back in position, aligning it on center. Use a weight to hold it in place. Make small pencil marks on the sides to show where the braces touch. Extend these marks over the edge of the sides and linings.



With a sharp razor knife, cut notches in the linings for the braces. A small chisel is helpful for chipping out the notch.

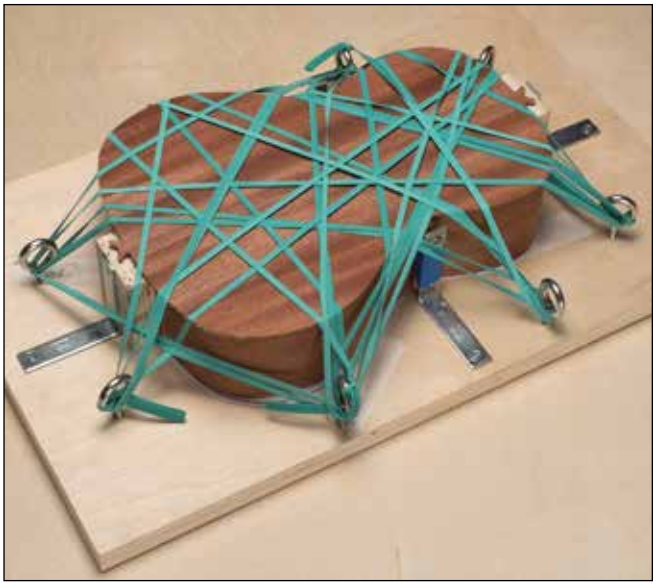
Trim the ends of the braces so they fit within the sides, dropping into the notches. Scrape the trimmed brace ends off the back. When you're done, the back fits flat onto the sides, with the braces keyed into the notches.

The top and back are slightly oversize, with edges that hang over the sides. This overhang will be removed after gluing.

**Glue the back and top**

To get good clamping pressure all around the back, the body mold is now put to use again. By adding screw eyes or hooks around the edges of the of the plywood, you can use the rubber clamping band included with your kit. If your clamping band is an unbroken loop, cut it to make it one long strip.

Tie the end of the clamping band and stretch it tightly over the body to the opposite corner. Continue strapping from corner to corner until the back is clamped under a web of rubber bands. Tie off the end to one of the screw eyes. Try this as a dry run.



When you're ready for glue, apply it to the edge of the side and lining, and to the end of the neck and tail blocks. Put the back in position and wrap with the rubber clamping band. Let the glue dry for 45 minutes, then remove the body from the mold. Clean away any dripped glue, especially where it can be seen through the soundhole of the assembled body.

Place the body back into the mold and repeat the process to glue the top on.

**Trim the overhang**

The top and back needs to be trimmed to make them flush with the sides. This involves cutting the overhang to make it very slight, then sanding away the remainder to make the edges smooth and even.

A Dremel rotary tool with StewMac's Precision Router Base and Edge Guide is ideal for trimming the overhang. Use a downcut router bit to make a clean cut. Rout away most of the overhang, leaving it small enough to remove with sandpaper.

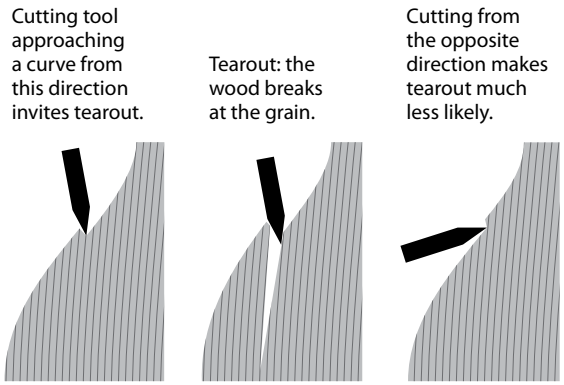
You can also trim the overhang with a sharp razor knife and a flat file. Using the knife, carve away a small bit of wood with each cut, reducing the overhang until it is close to the sides. Follow with the file to bring it close enough to remove with sandpaper.

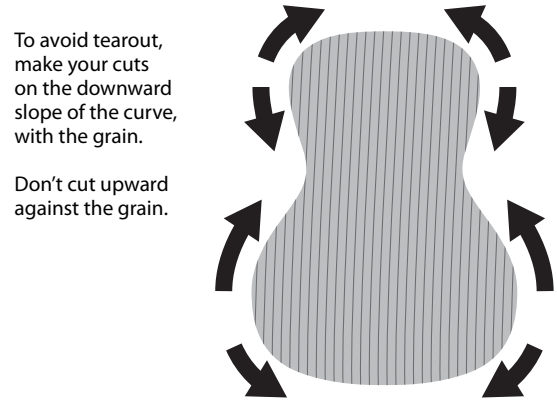
**Beware of tearout.** Whether you use a router or a knife, you must pay attention to the grain of the wood on the body curves—especially with the top which is solid mahogany, not laminated.

At the curves, a cutting tool working against the grain wants to dig into the wood. This action makes it easy to tear out a chunk of wood. See the illustration on the next page.

To avoid tearout, plan your cuts so that the router or knife appoaches each curve on its downward slope, rather than climbing upward. The eight arrows on the illustration show the direction to make each cut around the body.

**Tearout: accidentally breaking at the grain line**



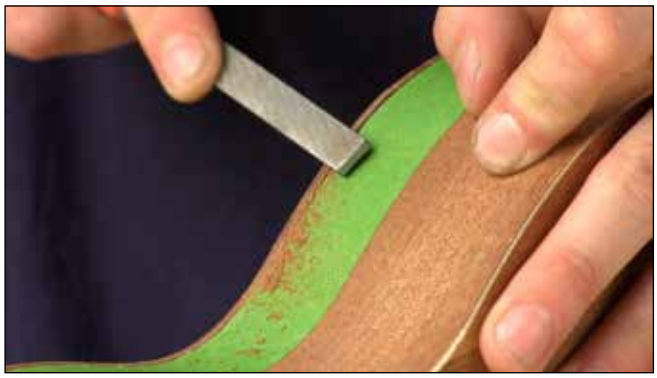




After trimming, the remaining back and top overhang should be very small. You'll remove this with a file and sandpaper.

**Sand the top and back flush with the sides**

A flat file will remove the remaining bit of overhang, followed by sandpaper to make a smooth, flush edge.

Put masking tape on the sides to protect them from file marks. Carefully file away the overhang until it's small enough that you feel ready to switch to sandpaper. You might not need the file at all: 120-grit sandpaper may be all you need.



With a flat sanding block, follow the outer curves of the body to flush the edges with the sides. A curved sanding block or a stout wooden dowel makes a good sanding block for the inside curves at the waist.

Don't sand the sides at this point. That comes later. Just make the top and back edges flush with the sides.

Sand until you have a smooth edge all around the uke.

## Prepare the neck

**Watch the video:** PART 4 **PREPARING THE NECK**

**Install the side dots**

The position markers on the side of the fretboard are made from a small plastic dowel, 1/16" in diameter. The dots are centered between the same frets that have inlaid dots on the board.

Use a sharp point to mark holes for drilling. Make sure all the holes are centered equally down the side of the board. You might want to put two dots at the 12th fret to indicate the octave; this is optional on a ukulele.

Using a drill with a 1/16" bit, start each hole by briefly running the drill in reverse. This will create an indentation in the wood to center the bit so it doesn't wander when drilling.

Hold the drill square to the surface, and drill each hole about 1/8" deep.

Turn the end of the side dot dowel against a piece of sandpaper to clean up the end so it will slide into the hole. Then dip it in Titebond glue and insert it in the hole.

Wipe away any excess glue, then cut the dowel off at the surface of the wood using a fine-cut saw. After installing all the dots, use a file to level them flush with the surface of the wood. The result is a line of small round position markers.

**Straighten the fretwire**

Straighten the curved fretwire by working down the length of it with both hands, carefully bending it straight. If it still has a slight curve, that's okay—it will straighten out when you hammer the frets in.

Clamp the fretboard to a smooth flat work surface. You want a solid table that won't bounce or shake when you tap the frets with a hammer.

**Cut the frets**

Lay the end of the wire over the first fret slot, so it protrudes only very slightly over the edge of the board. Holding the wire down with one hand, cut the fret at the other side of the board. This creates a fret that's cut to length for this slot, with very little extra metal to file away from the ends later.

Use a fret cutter or side cutter to cut the fretwire.

Set the cut fret aside and move on to the next. Fasten a piece of masking tape to your table, sticky side up, to keep your cut frets in order while you work.

**Install the frets**

The top of the fret is called the crown. The strip that fits into the fret slot is called the tang. Position the first fret so the tang sits on the fret slot. Hold the fret in position by pressing it down at the center with one finger. With a hammer in your other hand, tap the two ends of the fret into the slot.

When the ends are seated in the slot, you can remove your finger and tap down the center of the fret. Do this for each fret down the board.

Any hammer can be used, but a small one, like a fretting hammer, works best. Don't hit the fret or the board hard enough to cause dents.

**Glue the frets**

Adding water-thin super glue under the frets, such as StewMac #10 super glue, keeps the frets seated. Such thin glue can be introduced at both ends of the fret slot, and will pull itself into the slot under the fret.

Before doing this, wax the fretboard surface to keep the glue from soaking into the wood. Any soft wax, such as floor wax or car wax will do. Use a soft rag to wipe it onto the board.

Turn the board on its side and run the thin super glue under the fret slots. A small whip tip on the glue bottle will help pinpoint the fret slot. Place waxed paper under the fretboard in case the glue runs out the other end—so you don't glue the board to your table.

After adding glue to each slot, turn the board over and do the same to the other side.

**File the fret ends**

Clamp the fretted fingerboard onto a piece of wood with one edge overhanging. This is a convenient way to file the fret ends. Use cauls to prevent the clamps from damaging the fretboard.

Using long strokes with a flat file, remove the ends of the frets so they are flush with the fretboard edge.

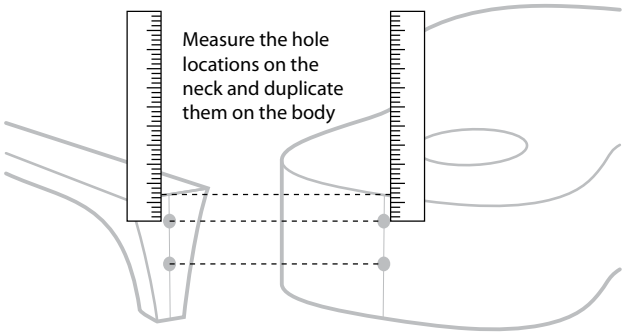
A two-handed grip is recommended: it takes firm pressure to file down the fret ends—especially at first, while their cut ends are sharp and uneven.

When you've made the fret ends flush, tip your file and give a slight bevel to the fret crowns. This makes the frets more comfortable to play.

When the fret ends on one side are smooth, rotate the board and give the same attention to the other side.

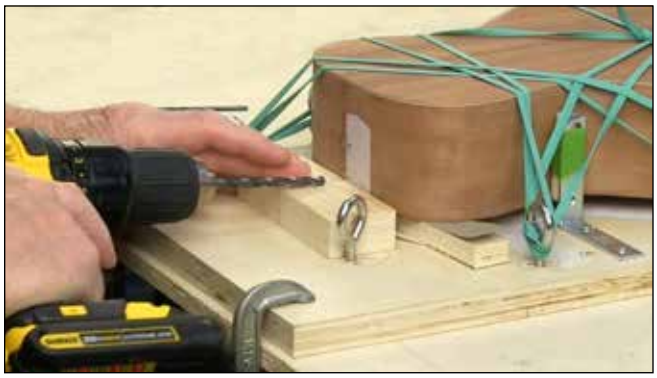
**Drill the neck joint**

The neck has two 1/4" diameter holes for the dowels that support the neck joint. You need to drill matching holes in the body to fit these dowels.



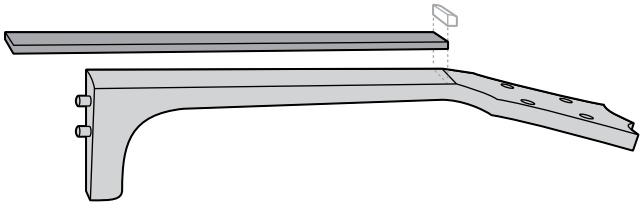

Measure from the top of the neck to find the center of the two dowel holes. Use these measurements to mark and drill matching holes on the body.

The body mold is a good way to hold the body while drilling these holes. Strap the body in, and clamp the mold to your table. You'll need to place scraps of wood under the body to lift it enough to accommodate your drill.



A block of wood can help align the drill bit. Draw a line at a right angle to give you a visual reference when lining up the bit. If you measure and cut the wood, you can create a block that supports the drill bit at the height you need for the hole. (See photo above; also see our video Part 4 Preparing The Neck.) A helper can also view your drill bit from the side to let you know when you have it square to the body.

When you're jigged and ready, drill the two holes using a 1/4" drill bit. Drill them at least 5/8" deep.



**Attach the fretboard**

The end of the fretboard will butt up against the front of the nut. This point may already be marked on the neck with a pencil line. If not, the back of the nut aligns with the peghead angle, and the front of the nut is where the fretboard starts. Put a pencil mark at this point.

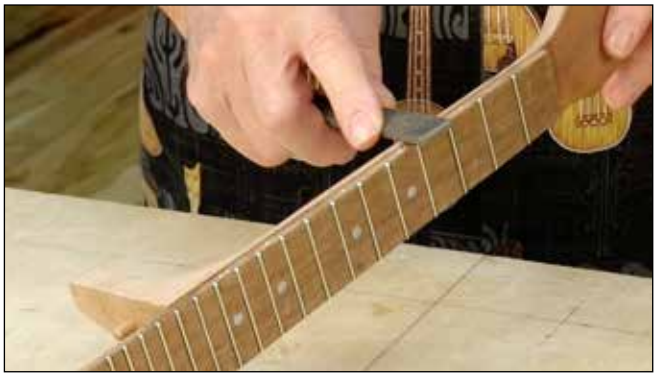
Brush glue onto the surface of the neck, and press the fretboard into place. Align it to the front-of-nut pencil mark. Wrap the board tightly with rubber binding bands. Check to be sure the board is centered on the neck. Allow the glue to dry for 45 minutes.

## Level the frets

**Watch the video:** PART 5 **LEVELING THE FRETS**

**Smooth the fretboard/neck transition**

The glue joint between the fretboard and neck needs to be smoothed to get a comfortable transition between the rounded neck and the flat edge of the fretboard.



Use a flat file and sandpaper to slightly round the fretboard edge, blending it into the neck. At this stage, you're shaping, not final sanding. Final sanding comes later, as you prepare for finishing.

While filing along the length of the neck, this is a good time to double-check the bevel of your fret ends. When playing the uke, you'll appreciate the feel of the rounded neck blending smoothly into the fretboard, with comfortably beveled fret ends.

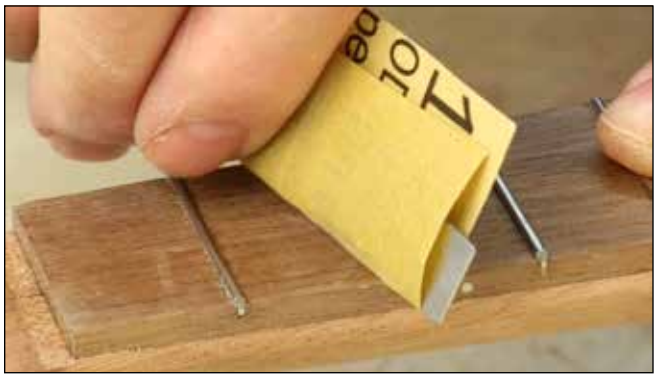
**Level the frets with sandpaper**

No matter how carefully you've installed the frets, some fret tops will be higher than others.

To level the frets, tape 320- and 400-grit sandpaper to a flat table top. Lay the frets face-down on the 320-grit and slide back and forth to sand them. When all the fret tops have been scuffed by the paper, the frets are level. Follow this with 400-grit paper, sanding gently to remove scratches.

**Round the fret ends**

The beveled fret ends will have some roughness from filing. 400-grit sandpaper wrapped around a metal ruler to



makes a good tool for rounding the fret ends. Stroke the ends where they meet the fretboard, rounding them until they feel smooth.

**Round the fret tops**

Leveling the frets leaves flat surfaces on the fret tops. Round off these flats using 400-grit sandpaper wrapped around your fingers. Run the sandpaper up and down the fretboard to smooth the frets. Follow this with 600-grit paper for a nice satin surface.

## Sand the body and neck

**Watch the video:** PART 6 **SANDING THE BODY+NECK**

**Sand with 180-grit**

Sand the body using 180-grit sandpaper and a flat sanding block. Make your sanding strokes with the grain direction, not sideways across it. You're looking for and removing any scratches deeper than the grain itself, and a sideways or circular motion will create small new scratches.

A stout wooden dowel makes a good sanding block for the inner curves at the waist.

Smooth all sharp edges to make them slightly rounded. When edges are too sharp, it's easy to accidentally sand the finish away at those points when you sand between coats. Knock off all sharp edges so they receive and hold a good coat of finish.

A dowel makes good block for sanding the waist.

Sand to make sharp edges slightly rounded.

**Don't oversand the veneer**

The back and sides are laminted with mahogany veneer. They're quite smooth to begin with, and don't require much sanding. If you were to sand unnecessarily deep, you might reach wood that's near the glue under the veneer. This could produce uneven results when staining. This doesn't apply to the top wood, which is solid mahogany.

**Raise the grain by damp sanding**

Sandpaper cuts away the fuzzy fibers of wood grain. Sanding causes some of these fibers to lay down flat, even though they haven't been removed. When wet finish touches them, the fibers lift up and make your finish feel rough.

Solve this problem by raising the grain with a damp rag. When you're done with the 180-grit sanding, wipe the wood with a rag that's been dipped in water and squeezed-out, leaving it just damp. After the wood dries, you'll feel the roughness of the raised grain.

**Sand with 220-grit**

Now move on to sanding with 220-grit, which cuts away the fibers raised by the damp rag. Completely sand the body and neck. After sanding with 220, the wood is ready for finish.

Before finishing, you need to establish the bridge location in order to tape off the area where it will be glued later.

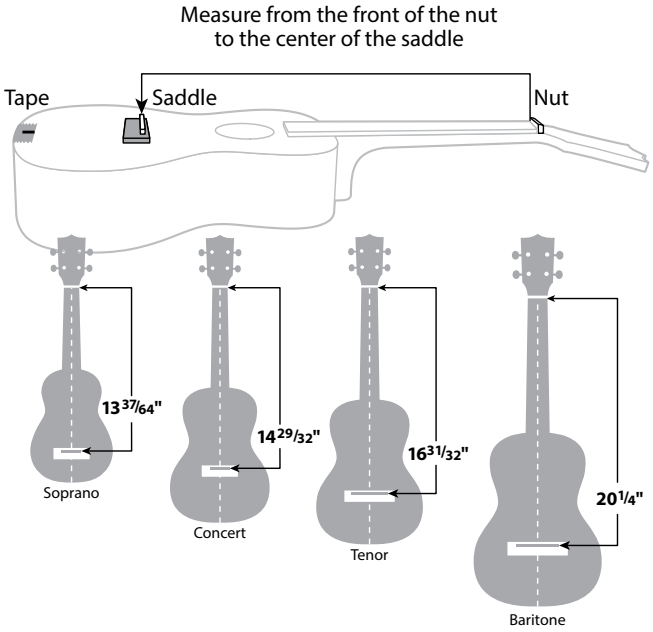
## Locate the bridge

**Watch the video:** PART 6 **SANDING THE BODY+NECK**

The bridge needs to be at the correct distance from the string nut for your uke to play in tune. We've made locating the bridge very simple: you just need one measurement.

Dry-fit the neck onto the body using one of the neck joint dowels. With a straightedge down the middle of the fretboard, find the center point on the tail of the uke. Mark this on a piece of tape.

Measure carefully along this centerline to locate the bridge. Start from the end of the fretboard where it will contact the nut, and locate the distance indicated in the drawing below, depending on the size of your uke.

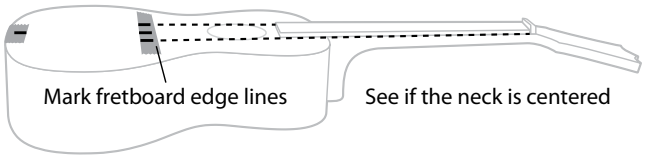



This is the distance from the nut to the center of the saddle slot.

Use a piece of tape to mark this location on the uke. The tape should be longer than the width of the bridge. Line up the edge of this tape with the center of the saddle slot to ensure proper bridge placement. Draw a pencil line from the center of the saddle slot to the edge of the bridge on each side to aid in lining up the bridge. It can be erased later.

Place a piece of tape along the front edge of the bridge while holding it in the proper location. This will mark the location of the bridge, the first piece of tape can be removed.

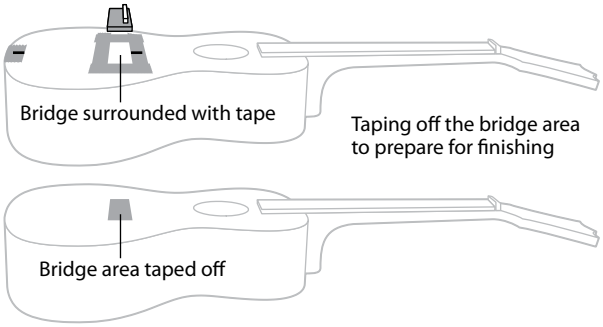
With your straightedge, mark the centerline on this tape.




**Center the neck**

Check to see if the neck is centered. Place the straightedge along both sides of the fretboard and mark the tape at the bridge location. These two marks should equally straddle the centerline that you've already marked. If they're off-center, shift the neck until it's centered.

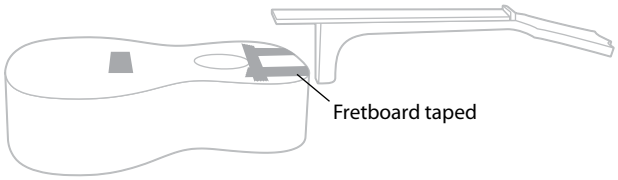
Small spring clamps through the soundhole can grip the fretboard to keep the neck in its corrected position while you center the neck.




**Tape off the bridge area**

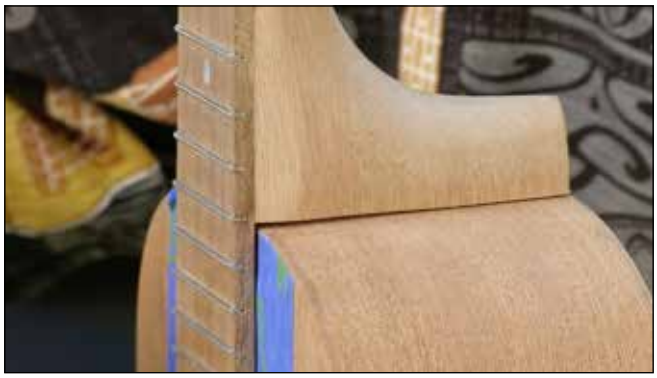
Pencil a centerline on the front edge of the uke bridge, and line the bridge up against the tape that marks your measurement. With the bridge centered and square to the centerline, place masking tape around all four edges.

Remove the bridge, and you've a framed the bridge's "footprint" with masking tape. Cut more tape to exactly fill the inside of this frame. Remove the outer tape. After you've applied the finish, this taped-off bridge area will be left unfinished for good adhesion when you glue the bridge.



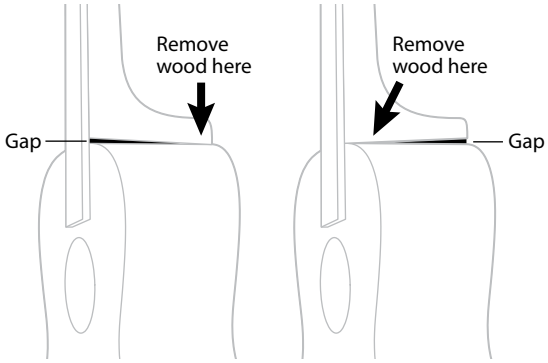

**Tape off the fretboard area**

Put tape around the fretboard extension to create a "frame" around this area also. Before you place tape inside the frame, consider whether your neck joint needs to be adjusted.



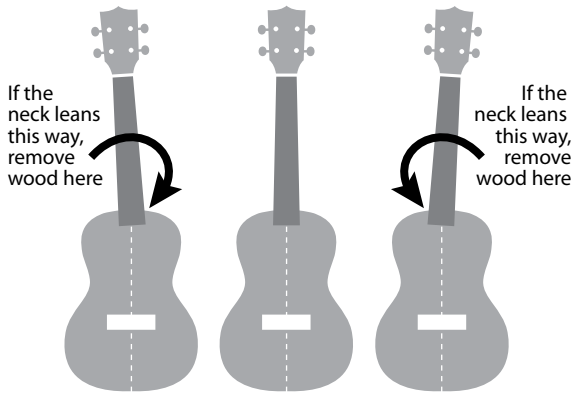
**Fitting the neck joint**

When you dry-fitted the neck, if it needed to be shifted left or right for centering, the neck joint needs to be adjusted. Or, you may find a gap between the neck and the body. This can be caused by any number of things, and it's not hard to correct.




The gap in the photo above can be fixed by removing wood from the heel of the neck. Because the gap is toward the fretboard, wood needs to be removed from the bottom of the heel. If the gap were ran the opposite way, wood would be removed from the top of the heel.

If the neck leans to the left or right, wood needs to be removed from the opposite side of the neck heel.




Remove wood by strip-sanding with 80-Grit sandpaper. Cut a strip of paper to fit under the area you're sanding, and slide

it between the neck and body. Hold the neck firmly down onto the body, and pull the sandpaper out. Repeat this until enough wood has been sanded away. Wear gloves to avoid paper cuts from the edge of the sandpaper.

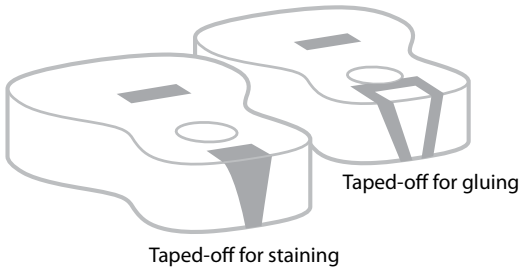
Watch our video, *How To Build A Ukulele, Part 6: Sanding The Body + Neck* to see Dan Erlewine demonstrate strip-sanding.

**Tape off the neck heel area**

Frame the neck heel with masking tape, as you did for the bridge and fretboard. Remove the sharp edge on the body where the neck will fit by filing or beveling it with a sharp knife. This will help the neck joint fit closely.

The next step depends on whether you're going to stain your ukulele or give it a clear natural finish. If you're staining, tape inside the neck heel and fretboard extension, then remove the frame of tape. Like the bridge, the neck joint area is now masked to keep it free of stain and finish, for gluing later.

If you're not staining, the frame of tape around the neck joint is ready for gluing the neck.



## Apply the stain (optional)

**Watch the video:** PART 7 **STAINING THE BODY+NECK**

If you're going to stain the wood, do it before attaching the neck. When the neck is on, stain accumulates along the seam where the neck meets the body. To avoid having to remove stain from this crevice, stain the neck and body separately.

If you're choosing an unstained natural finish, you can skip this section on staining and attach the neck.

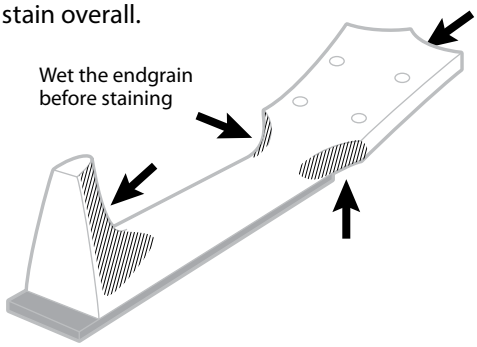
It's not impossible to have difficulty with stain. Dark spots, light spots or otherwise uneven coverage are possibilities. If you want to follow the easiest, most foolproof path to a finished uke, go with the clear natural finish.

Use ColorTone Liquid Stains to create rich dark browns or vibrant colors. The color in the bottle may be exactly what you want, but don't hesitate to mix colors. On our Part 7 video, you'll see a brown uke that we stained with a mix of Tobacco Brown and Medium Brown.

**Mix the stain with water**
ColorTone Stains are concentrated, so mix them with water. The amount of water and stain depends on the color you're after and the wood you're staining. You can build a dark color with thinned stain by wiping on more. To get a feel for mixing, watch Dan Erlewine use stain on the video.

**Wipe on with cloth-wrapped cotton**
Wrap a ball of cotton in a scrap of t-shirt material to make a pad for staining.

**Wet the endgrain with water**
Down the length of the neck, the wood grain runs straight. The carved heel and peghead have exposed endgrain, indicated by dark areas in the illustration below. The end of the peghead is endgrain also. These areas will absorb more stain than the straight grain, making them darker. Compensate for this by wetting these areas with a damp paper towel before you begin staining. The damp endgrain will suck up less stain than if it were dry, giving better balance to your stain overall.




Wait until your color is mixed and you're ready to begin staining before you wet the endgrain, so it doesn't have time to dry out.

**Wipe on the stain**
Wear gloves! Work quickly with the cloth/cotton pad, building the color evenly all over the body and neck. You can go back and apply more stain, and can even darken the edges around the body using a semi-dry staining pad.

## Attach the neck

**Watch the video:** PART 8 **ATTACHING THE NECK**

At last, it's time to put the neck on the body!

The neck will be held in place during gluing with a rubber binding band. A small clamp will hold the fretboard extension to the top. This might be the spring clamp used when test-fitting the neck.

If more pressure is needed on the fretboard extension, a C-clamp can be used. Use a piece of scrap wood as a caul to protect the frets from the clamp.

Inside the body, the C-clamp foot will land on the top brace. To protect the brace from damage, glue a caul from three pieces of scrap wood. This U-shaped block straddles the brace, giving the clamp a solid surface to bear against.

If you stained your uke, apply masking tape again around the neck joint surfaces. Apply glue to the neck heel and fretboard extension, and to the matching areas on the body. Put glue on the dowels and the holes they fit into.

Clamp the neck in place, checking to make sure it's aligned and centered. Tie the rubber binding band to the neck. Stretch it down over the tail of the uke and back up around the heel of the neck, wrapping tightly.

When the neck is bound with rubber bands, clean away any sqeezeout you can reach. Allow to dry for two hours (there's a lot of glue in that neck joint).

## Apply the finish

**Watch the video:** PART 9 **APPLYING THE FINISH**

Tape off the fretboard to avoid getting finish on it.

If there is a gap between the neck and body, fill it with ColorTone Grain Filler. A mix of our Mahogany and Ash colors made a good match for the light mahogany of this unstained kit.

Tape off both sides of the gap, then use a knife to press the filler into it. Wipe off the excess with a damp paper towel and peel away the tape. Clean up with paper towel if needed. Allow to dry, then sand with 400-grit paper.

Wear nitrile or other protective gloves when handling the uke now, to keep the surface dry and clean for finishing.

**Make a holder peg**

You can hold the uke by the neck while finishing the body, but by the time you're finishing the peghead you'll need a hand grip.

Sand a taper onto the end of a dowel, so it will press-fit into one of the tuner holes, like a violin peg. This gives you a

handle while adding the last stroke of finish. You can also clamp this peg to your table when leaving the uke to dry.

**Wipe on the first coat**
Using ColorTone Wipe-On Poly finish, apply the first coat using the pad made of cotton wrapped in a piece of t-shirt cloth. The wood will soak up this first coat very quickly; it's basically a sealer coat. Allow to dry.

**Scuff-sand with 400-grit**
When the coat is dry, lightly sand it with 400-grit paper, to remove surface imperfections.

**Brush on the second coat**
A foam brush lays down more finish than a cloth pad, so brushing builds the finish more quickly while still being very easy to do.

**Scuff-sand again with 400-grit**
When dry, lightly sand again with 400-grit paper.

**Apply the final coat**
Add a third coat for a complete finish. Allow to dry for a day.

**Shiny or satin?**
The finish will have a nice sheen. If you'd rather have a satin look, you can dull the finish by rubbing it with 0000-grade steel wool.

## Glue the bridge

**Watch the video:** PART 10 **FINAL ASSEMBLY+SETUP**

Be careful not to install the bridge backwards! The saddle goes toward the neck, and the string tie block goes toward the tail.

Remove the tape from the bridge area and fretboard. Place the bridge onto its "footprint" and tape around it to catch any glue squeezeout.

**Reduce the tackiness of masking tape**
Masking tape's adhesive is strong, and contains chemicals that could react with your new finish—so don't leave tape on the finish any longer than you have to. Also, make the tape less tacky by pressing it onto your clothing before applying it.

**Dry-run your clamping setup**

You can glue the bridge with a single clamp. Protect the top of the bridge with a wooden caul. Apply pressure to the ends of the bridge with small wooden wedges.

Depending on the style of your clamp, it may not fit easily between the X-braces on Concert and Tenor ukes. It's easy to modify the clamp for this job.

Referring to your bracing plan drawing, cut a shape of wood that fits into the angle of the X-braces. Tape this to the clamp so it can reach between the braces.

**Glue and clamp up**
Apply the glue and clamp the bridge. Clean away squeeze-out, and allow it to dry for 45 minutes.

## Install the tuners

Put the tuners in the peghead, and place the washers over the string posts. Add the hex nuts and make them finger-tight. Line the tuners up so they stick out at right angles, not crooked. Use a sharp awl to mark the tuner mounting holes. Drill the pilot holes and install the screws. Use a wrench to tighten the hex nuts on the peghead face.

## Fit the nut and saddle

Place a straightedge on the frets, and see where it meets the bridge. It should be roughly at the height of the bridge top.

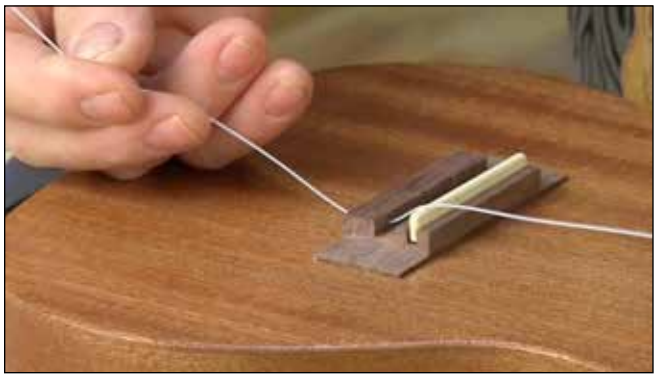
Press the saddle into its slot and rest the straightedge on it. Pretend the straightedge is a string and imagine that string passing over the first fret. Lift the straightedge so it's a little less than 1/16" above the first fret (about .050"). This is a good height for your strings. When the nut is installed, we'll want it to hold the strings at about this height.

**Clean up the nut ledge**

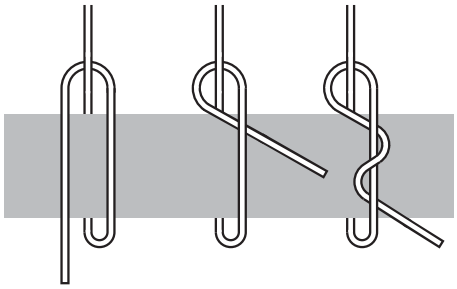
Use sandpaper to be sure the the flat area for the nut is level and free of finish. An easy way to do this is to double-stick tape a piece of 220-grit sandpaper to the bottom of the nut and slide it back and forth. Remove the sandpaper and place the nut in position, holding it with a bit of double-stick tape.

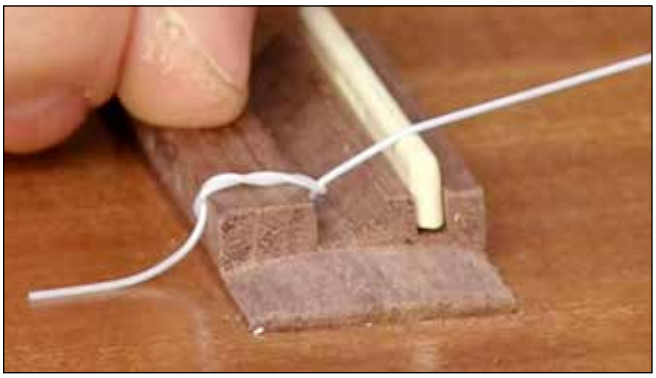
**Install the two outside strings**

There are four strings on a uke—two thin ones and two thicker ones. The thin ones are the outermost strings. Install these two outer strings so you can check the height of the nut and saddle.



Thread the string through the back of the bridge. Tie it as shown in the three-step drawing below. Draw it tight.





Pull it tight, and the knot holds securely.

When installing all four strings, tuck the tail end of the first string into the wrap of the second string. Continue this pattern for a clean job of stringing the uke.

Uke strings are stretchy. To get them to hold tight to the string post, pass them through the hole, around and through again to create a knot. This is quicker than slowly wrapping many times to get a good grip on the post.

**Adjust the nut height**
If the string heights are comfortable, you're almost done.

If the nut is too high, you can lower it by sanding material off the bottom. Tape sandpaper to your table and slide the nut on it until you've removed enough material. Hold the nut against a piece of wood to keep square. Also smooth and round the ends of the nut on the sandpaper.

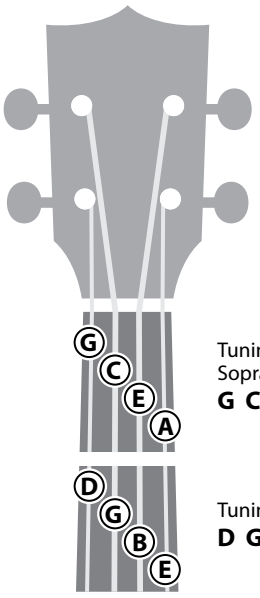
If the nut is too low (unlikely), place a thin shim cut from wood or a business card under it to raise it.

**Oil the fretboard and bridge**
Before stringing up, wipe the fretboard with fretboard oil or lemon oil. Use a Q-tip to do the same for the bridge.

**Install the nut**
Put a small drop of glue under the nut, and place it in position. The strings will hold it securely.

**Install the strings**
String up and you're done! Your uke is ready to play.

**Tune your uke**
The four open strings are shown in the chart below.
Have fun with your new custom-built uke!




Tuning for
Soprano, Concert or Tenor:
**G C E A**

Tuning for Baritone:
**D G B E**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