

Spark Makerspace Woodshop Class: Bandsaw Box

This class is intended to increase student familiarity with the bandsaw, as well as introduce basic glue and finishing techniques for wooden projects. Students will create a small box, with a drawer, out of a solid block of wood.

Tools Used:

Bandsaw

Sandpaper

Materials Required: (per box)

- Solid or laminated wooden block, approximately 4" x 4" x 8"
- Wood glue
- Shellac

Class Outline:

Session #1 (2 hours) : Introduction, block glue-up, bandsaw introduction Session #2 (4 hours) : Box cutting, sanding, assembly glue-up Session #3 (2 hours) : Sanding and finishing

Session 1: Block Lamination (Glue-up #1)

- 1. Choose several pieces of wood of approximately 4 inches by 8 inches, of any thickness.
- 2. Stack pieces in an attractive pattern until stack is 3 to 4 inches high.
- 3. Glue boards into block approximately 8 inches by 4 inches by 4 inches
 - Protect the work surface from glue with plastic or scrap material
 - i. Wax paper, plastic wrap, or plastic bags work well to prevent glue from adhering the workpiece to the surface
 - b. Spread glue thinly and evenly on each flat face to be glued
 - c. Stand all boards on edge and align one set of ends
 - d. Clamp

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- i. Start with gentle clamping force, until all clamps are installed
- ii. Tighten all clamps firmly
- e. Let stand overnight

Session 2: Cutting, Sand, and Glue-up #2

- 1. Choose which side of the block is going to be the front face, and which will be the bottom.
 - a. Hint: Use the pretty one, and the flat one, respectively.
- 2. Scrape glue bumps off the bottom.
- 3. Sketch outline of the box and drawer(s) on the face of the block.
 - a. A minimum wall thickness of 1/4-inch is suggested for strength.
 - b. Determine the entry point for the bandsaw cut. It must be parallel to the wood grain to be properly hidden when glued.
 - c. While multiple drawers are possible, one drawer is easier and requires less sanding.
 - d. Drawer corners must be large enough in radius to allow the saw to make a single, sweeping cut. See the Spark Bandsaw Instructions for the minimum turning radius of the blade in use. Larger curves are better.
- 4. Using a narrow bandsaw blade, cut only the outside of the box
 - a. Save the offcuts. They will be useful for clamping later.
- 5. Using a wider bandsaw blade and the bandsaw fence, cut a 1/4-inch slice off the back of the box.
- 6. Using the narrow bandsaw blade, cut out the drawer.
 - Sand the newly cut surfaces until the cutting marks from the bandsaw are gone
 - a. Sand with the grain
 - b. Start with coarse sandpaper, and gradually work to finer grits
 - c. To keep surfaces true and corners sharp, use a hard sanding block or backer. For softer corners and more rolling surfaces, use a soft backer or sand without one.
 - d. It is not necessary to get to a final finish at this time; sanding will be done after gluing to correct any misalignment during the glue-up
 - e. The inside of the box should be sanded to final finish.
 - f. The outside of the drawer should be sanded shy of final finish; further sanding will be done after gluing the front and back

- 8. Taking a sharp pencil, lightly mark a few crossed or V-shaped lines across the entire bottom of the drawer.
 - a. These lines identify the bottom of the drawer to prevent it from being cut out accidentally.
 - b. These lines will also allow the front and the back to be properly aligned after they are cut off.
 - c. The marks will be sanded off after gluing the drawer back together.
- 9. Using the wider bandsaw blade and the bandsaw fence, cut a 1/4-inch slice off the front and back of the drawer.
- 10. Mark the material to be removed from the inside of the drawer on one of the newly cut surfaces.
 - a. Ensure that the bottom is not being cut, or your drawer will be upside down
 - b. A minimum thickness of 1/4-inch is suggested for strength.
 - c. While multiple drawers are possible, one drawer is easier and requires less sanding.
 - d. Drawer corners must be large enough in radius to allow the saw to make a single, sweeping cut. See the Spark Bandsaw Instructions for the minimum turning radius of the blade in use. Larger curves are better.
- 11. Using the narrow bandsaw blade, cut out the inside of the drawer.
 - 12. Sand the newly cut surfaces until the marks from the bandsaw are gone
 - a. The inside of the drawer should be sanded to final finish. The outside will be finish sanded after gluing the front and back.
 - 13. Glue the following pieces together. Care should be taken to align the pieces properly before clamping:
 - a. The front, body, and back of the drawers

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- i. Use the pencil marks on the bottom of the drawer to align the parts correctly.
- ii. Soft scrap material, cardboard, or plastic should be used to help prevent damaging the surface of the work during clamping.
- iii. If required, use the waste piece from the drawer to help prevent bowing of the front and back during clamping
 - 1. Ensure the waste piece is held in a way which prevents it from being glued into place, or trapped in the assembly once the glue dries.
- b. The carcass of the box to itself, to close the blade kerf made when cutting out the drawer.
 - i. This should be clamped gingerly; too much pressure can distort or split the box.
 - ii. If required, the offcuts from the initial cutting process can be used to help the clamps hold on curved surfaces.
- c. The back of the box to the carcass
 - i. Align as cleanly as possible.
 - ii. Soft scrap material, cardboard, or plastic should be used to help prevent damaging the surface of the work during clamping.
- d. A pull to the front of the drawer
 - i. Cut off a piece of the pull stock to the wanted length
 - ii. Align, glue, and clamp gently

Session 3: Sanding and Finishing

- 1. Unclamp everything, and return the clamps to the proper storage location.
- 2. Sand everything to final finish levels.
- 3. Finish with shellac
 - a. Shellac is alcohol based, and dries quickly. It is non-toxic, but is not the strongest or highest gloss finish.
 - b. As with most finishes, more thin coats are better than one thick coat. It will generally take 30-60 minutes for each coat to dry.
 - c. Start by pouring a small quantity (a few ounces) from the can into a plastic cup. Add approximately half as much alcohol to the cup, and mix thoroughly.
 - d. Brush the finish onto the wood.
 - i. Initial brush strokes can go any direction required to spread the finish, but should be rebrushed with the grain before the finish starts to dry.
 - ii. The brush should be put into alcohol to keep it soft between coats. Flick the brush dry before each coat.
 - e. Let the shellac dry until hard
 - f. Sand gently with 320 grit sandpaper. More sanding will be required after the first coat as the wood grain absorbs the moisture and portions swell.
 - g. Coat 2-3 times, depending on desired finish. Do not sand after the final coat.

Continuations and Variations

Bandsaw boxes can be in a variety of sizes, proportions, materials, styles, and drawer counts. The bandsaw box class at Spark currently uses box blanks made through the lamination process, the gluing together of many layers. Boxes can also be made out of single pieces of lumber, and can be made of nearly any material which can be safely cut on the bandsaw. Smaller versions of the boxes may be made using the scroll saw, or cut by hand with a coping saw. The Spark model uses a single drawer, but the number of drawers is only limited by the cutting radius of the bandsaw blade and the size of the blank. The white bandsaw at Spark uses a 1/4-inch blade, which is the narrowest commonly available blade. Smaller saws may use blades down to 1/8-inch.

Spark members with approved shop access may use the shop to create items, like those described in this tutorial, at any time. If you have any question on methods, materials, or tools, please contact the Spark Woodshop Leads at: WOODSHOP@SPARKMAKERSPACE.ORG