Production Technology 11

The Box Project Step-by-Step

This project uses many of the same skills and steps as the toolbox project, but it allows you to have some choice in the overall design and construction of the project. It also expects that you will be able to work more independently, since you already know all the basics and steps from the toolbox.

These instructions assume that you are making the basic box. You can do something different from this if you know what you are doing. If not, do the basic box!

Step-by-step instructions for a 5”x5”x10” box

Mill your lumber

1. Select a single piece of wide lumber (a resawn 2x6)
2. Joint one face flat
3. Joint the two edges flat
4. Plane the wood to ½” thick
5. Set the fence to 5” and rip the board to width

Cut the pieces to size

1. **Clean the end:** Trim a few mm off the end of the board with the mitre saw to clean it up before measuring
2. **Cut the lid:** Measure 10” from the end and cut with a mitre saw
3. **Make box bottom dado in the remaining wood.** Unplug the table saw, remove the regular blade guard and replace it with the splitter. Set the blade height to ¼”, and set the fence to ¼”. Use a push block and a push stick to make a thin dado along one side of your board. Then set the fence to 3/8”, and do another pass, widening the dado to ¼”.
4. **Decide** which kinds of joints, and use the measurements for each one:
    - **Biscuit joints:** 10” sides and 4” ends
    - **Mitre joints:** 10” sides and 5” ends. Remember to cut both ends at 45 degrees.
    - **Finger or dovetail joints:** 10 1/8” sides and 5 1/8” ends. Ask for help for setting up the router if you are not cutting by hand.
    - **Rabbet joints:** 9½” sides and 5” ends. **The sides:** Measure ____” from the end and cut with a mitre saw. Then do that for the second side. (Note: do not measure out two at once – this will be inaccurate due to the width of the blade.)
5. **The ends:** Measure ____” from the end and cut with a mitre saw. Then do that for the second side.

Join the sides

1. **Do a mock assembly and lay out your joinery**
    - **Biscuit joints:** Mark in the middle of each corner where each side and end join. Mark which side of the wood is on the inside of the joint.
    - **Mitre Joints:** You’re done!
    - **Rabbet joints:** Mark with a line each part that you are going to rout out. You will be cutting a rabbet on the end of each side and on each side of the ends.
    - **Finger joints and dovetail joints:** Mark out the fingers and spaces on each board before cutting. Make sure that the spacing is ½” and that you clearly mark which parts are being cut away. Add a line that is 9/16” from the edge. When done, ask your teacher to check your work.
2. **Cut the joints**

- **Biscuit joint:** Make sure the biscuit joiner is set to #0 biscuits and that the fence is set to the right height. Ask your teacher if you are not sure. Use hearing protection. Clamp your work pieces onto the table or in the vise, line up the red line on the biscuit joiner with lines on the edge of the wood, and cut the biscuit slots.
- **Mitre joints:** You're good!
- **Rabbet joints:** Set up the router table so that it has a rabbetting bit installed. Adjust the height of the bit so that it cuts to ¼". Do several test cuts until you are sure the height is correct. Then cut the parts of the sides and ends that you marked earlier. Use a push block and push stick.
- **Finger joints:** If using the router, ask your teacher for help. If cutting by hand, use the band saw to make cuts on the **inside of the lines** of the parts that you will need to remove. Then use a sharp chisel to remove the squares.

3. **Do a test assembly of the sides.** Make adjustments and improvements.
4. **Cut the bottom to fit.** Measure the length and width of your box and subtract ½". Mark this onto plywood and then cut out with the bandsaw.
5. **Do a full test assembly.** Press the sides together tightly to make sure the bottom fits. If not, trim the bottom on the belt sender or band saw.
6. **Assemble with glue.** Put down paper before you begin. If your glue up will take a long time, use fish glue instead of regular wood glue. Brush glue onto both sides of the wood that will touch each other. If using biscuits, brush it onto the biscuits and inside the slot as well.
7. **Clamp in place.**

Cut the lid

1. Unplug the table saw, remove the regular blade guard and replace it with the splitter.
2. Set the blade height to 9/16", and set the fence to 3/8".
3. Set your lid vertically on the table against the fence.
4. Set a block of wood on top of the fence next to the lid. Clamp the block of wood tight onto the lid to make a sled that run along the fence. Ask your teacher to check your wood.
5. Use the sled to cut a thin rabbet along the top of the lid.
6. Unclamp the sled from the lid and cut the remaining rabbets along the edge of the lid.

Sand and finish

1. **Unclamp and fill.** Remove the clamps and then fill any gaps.
2. **Clean up your joinery.** If you were not using mitre joints, use the stationary sander to clean up your joints to remove all bumps. The joints should be perfectly smooth
3. **Sand the surface.** Use a palm sander to sand the surfaces of your box. Start with 60 grit, and go through each step, finishing with 150 grit. Sand by hand to get the inside.
4. **Varnish.** Design your next project while it is drying.
   - Do two or three base coats of varnish
   - Sand with 220 grit
   - Do two more coats, sanding between coats.

You are done! When it is dry, hand it in to Mr. Drapak to mark.