

Student Designed Laminated Project Procedure

~ Cutting Board ~

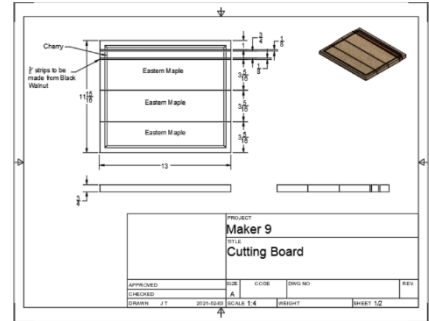
Name: _____

Class Days (*circle*): Mon/Wed Tues/Thur

Preparation

1. **Design** your laminated project using **Fusion 360**. Follow the video tutorials on how to draw it in 3D and produce a paper ‘working drawing’ (*plan*), that you will use in the shop to make your project from.

Your goal will be to produce a final project that is true to the plan.



2. **Select** your boards. These will need to be larger than their finished sizes as noted on your plan. We call wood at this stage ‘rough’ wood and the sizes the ‘rough sizes’. Adhere to the following criteria when selecting:

a) Location

- a) You must select from the short ends bins **FIRST**
- b) **ONLY** if you cannot find a suitable piece ask your teacher for permission to take wood from the wood rack.

b) Rough Thickness

- c) Must be no larger than 1” and at least 3/16” larger than what will be your finished thickness.

c) Rough Width

- d) Must be at least 1/2” wider than the size specified on your plan

d) Rough Length

- e) Must be at least 1” longer than the size specified on your plan

3. On your working drawing, **number** each board. Number each of your boards with the number on your working drawing. (USE PENCIL!)

4. Once you have found suitable material (all pieces), **have your teacher verify/approve this.**

Approval to Proceed

Machining

- Using the **Mitre Saw**, cut all pieces to 'Rough Length' (*see 2d of the previous section*)
- On all pieces, use the **Jointer** - Read instructions a through e below before beginning this task!
 - Joint a **FACE SIDE** and use a pencil to mark it with the accepted mark
 - Joint a **FACE EDGE** and use a pencil to mark it with the accepted mark
 - DO NOT** joint the opposing edge/side
 - Machine the wood **as few times as possible**, just enough to make the boards flat and square
- Create a '**Cut Plan**' by completing the table below. Use the same numbers you noted on your working drawing. Keep outside boards $\frac{1}{2}$ " larger than finished width, these will be trimmed later.

Board Number	Inside or Outside Board?	Material	Finished Width (size you will cut to)

- Using the table above for guidance, **Rip Cut** all pieces to final width on the **Table Saw**. Offcuts are to be returned to the short ends bin. Remember, Outer boards of your design should be kept $\frac{1}{2}$ " wider than finished width.
- At the **Thickness Planer**, plane all boards by working through the following steps (*read and understand all steps before beginning*):
 - Set the planer at a size $\frac{1}{16}$ " less than the thickness of the thickest board.
 - Run the thickest board through the planer (face side down) and then any other boards of similar thickness one at a time.
 - Raise the planer's table $\frac{1}{32}$ ". Run the boards from step 'b' through and any other boards suitable for this setting
 - Repeat step 'c' until all boards are flat and the same thickness (*goal is to keep boards as thick as possible*)

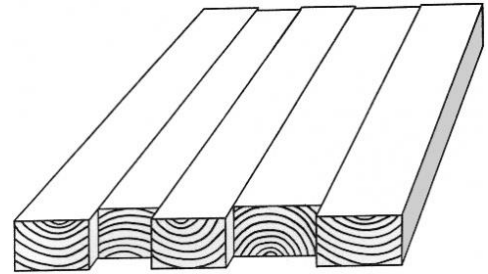
Glue Up

1. **Inspect** all edges to be joined/glued. Arrange boards on a flat ‘true’ surface (a machine’s table is good) in the pattern that will be glued. Inspect all joints. Correct any concerns at the Jointer, using the Jointer that is set to remove the least amount of material.

Do not proceed until all joints are perfect.

2. **‘Dry clamp’** the pieces together (no glue!)

- Look at the grain direction in the diagram below for gluing correctly. Alternating the grain will help keep your finished project from cupping.
- Use clamps and strong backs to assist with alignment
- Make sure you have waxed paper between your board and the clamps and strong backs.
- If there are any gaps between the pieces, go back to the jointer



3. Have your **setup checked** by the teacher

4. **ONLY after the teacher has approved** your setup, glue your project together

- If it will contact water, use water resistant Type II glue.
- Use a wet paper towel to remove any excess glue, wiping afterwards with dry paper towel.

5. After your project has dried (next class), **use a scraper to remove any excess glue**. Securely clamp your project to the bench for scraping using the bench vise and bench dog

Final Machining

1. Place your board on a flat/true surface (ie, table saw table) and **check it for flat**. If it is stable, proceed. If not stable, identify high spots and remove using a Hand Plane.
2. Use the **Thickness Planer** to plane the cutting board to its final thickness
 - put the stable side down first (flat side) and plane the opposite side smooth
 - flip the board over and plane the other side smooth
 - plane the board until it is to planned finished thickness

3. Use the **Table Saw** & the **Crosscut Sled** to cut your board to its final length...
 - a) Place your board in the sled and use a pencil to mark the edge in contact with sled's fence
 - b) Trim one end square, removing as little as possible to do so
 - c) Flip the board end for end making sure to keep the marked edge in contact with the sleds fence.
 - d) Measure and use a pencil to mark the leading edge of your board at its final length
 - e) Holding the board against the sled's fence, align the saw blade with this mark
 - f) Pull the sled back so that your work is clear of the blade
 - g) With hands clear and the board held against the sled's fence, start the saw and complete the cut

4. Use the **Table Saw** to rip cut to final width...
 - a) Checking your plan, measure and mark where the board should be cut (you only need a small mark at the leading edge of the board that you can align with the saw blade)
 - b) Adjust the fence to cut the board at your line keeping the majority of the board's width between the fence and the saw blade and the edge that you referenced when cross cutting against the fence
 - c) Complete your first cut.
 - d) Set the rip fence to your boards final size
 - e) Complete your final cut

Congratulations, you have created a cutting board that is dimensioned accurately to your plan / 3D model!

It is now time to machine the drip groove using the CNC Router. Complete the Tutorial for programming the CNC router found on the class website.