

SCW Woodshop Orientation - Hands-On Training

Machine Instructions for Cheese Board Project

Trainee's Name: _____ Training Date: _____

Prior to coming to the hands-on portion of this Woodshop Orientation, please take the time to view two important safety videos (found at the links below). You can also find these links on the SCW Woodshop web site – under “Become a Member”, then “New Membership and Orientation_v2”.

Table Saw Kickback Video:

<http://www.youtube.com/watch?v=u7sRrC2Jpp4&feature=youtu.be>

Stopsaw Tablesaw Video: <https://www.youtube.com/embed/E3mzhvMgrLE>

Safety Note for Metal in Wood: Prior to working with any wood in our shop, make sure that all metal, nails, staples, etc are removed - these damage machines, set off saw-stops, and create dangers for users. If you suspect that any metal may be in your wood, pre-test the wood with the metal detector - located on the wall outside our maintenance room.

HANDS-ON ORIENTATION OBJECTIVES:

1. Learn **safe and correct** operation of our most commonly used power machines, then **use** the selected machines to make a Cheese Board.
2. Determine:
 - a) the **critical safety concerns** for each machine
 - b) **consequences** if safe actions are not performed correctly
 - c) learn **safe routine behaviors** needed for each machine
 - d) learn that it's **fun and rewarding** making things from wood

Cheese Board Project Overview

Steps to 'Mill' Rough Lumber – prepare boards for next class:

1. Jump Saw - **Rough-Cut** new boards to length of about 13”.
2. Chop Saw - **Rough-Cut** new boards to length of about 12”.
3. Jointer - **Plane** one surface flat.
4. Jointer - **Joint** one edge square to planed surface.
5. Thickness Planner - **Plane Top Surface** to ¾” thick, & parallel to bottom.
6. Table Saw - **Crosscut** ends to 90° using SLED, to final 11” length.
7. Table Saw - **Rip** off outer rough edge, then **Rip** board down middle.
8. **Glue** wide and narrow boards using clamps to prepare Cheese Boards for next class. **** All gluing in our shop is to be done in the Assembly room.**

Steps to 'Finish' Roughly Pre-Made Cheese Board - Follow steps 3-5 above on pre-made cheese board, then do the following:

1. Draw Cheese Board layout on pre-made board using provided template.
2. Drill Press - **Drill** the handle hole using forstner bit provided.
3. Band Saw - **Cut** the corners and handle curves.
4. Disc, Belt, & Oscillating Sanders - **Sand** edges, curves.
5. Drum Sander - **Surface sand** both sides smooth.

Competent Users of Power Machines Take These Actions Every Time:

- **Think** - about best machine to use and safest way to process wood
- **Ask** - if you are not sure about methods ... ask for help / suggestions
- **Read** - this document, and any signs on, around, or above machines
- **Open** - vacuum vent 'gates'
- **Setup** - adjust blade heights, fences, guards, safety equipment
- **Use** - safety-assist tools (ie: push stick, feather boards, Grr-ipper, etc)
- **Work** - carefully
- **Close** - vacuum vent 'gates'
- **Clean Up** - use erasers on sandpaper, vacuum machine, sweep floor

Detailed Steps to 'Mill' Rough Lumber – prepare boards for next class:

1. **With the Jump-Saw, rough-cut a board 12-inches long** - this board will be used by you to prepare a glue-up board for our next class. Using the Jump-Saw is safe and easy, since the saw securely holds your board in place with no-hands, and your hands are never near the blade.

- Put the board under the extended arm and align it to where the jump-blade will cut the correct length.
- Turn on the power - let the saw get up to speed (about a 3-second delay).
- Press & hold the foot-pedal for about 3 seconds, then take foot off pedal.
- Turn off power.

2. **Use a Chop Saw to cross-cut pre-milled boards (no rough-wood on this saw).**

- If your board is straight, hold it against the fence, lower the saw arm and start cutting your board - pushing the blade back toward the fence.
- Pull the chop saw arm & blade all the way toward you, then lower the arm so the blade is just above the top outer edge of board. Turn on the power, and lower blade all the way down into the saw's slot, then push entirely through the board until fully cut. Release the power switch prior to raising the blade.
- If your board is bowed or twisted, do not push the blade back toward the fence, as your board may trap the blade and cause KICKBACK.

TIPS: For bowed, warped or twisted boards, use one of the following processes:

- *If the board size allows, use the bandsaw to make your cut.*
- *If required for safety, use manual saws.*
- *Put convex side of any bowed board against the fence to prevent PINCHING a chop saw blade thus causing a KICKBACK*

- Insert a wood spacer between the long side of your board and the fence on only one side of the saw blade - thus avoiding blade-trapping.
- Make multiple shallow cuts starting farthest from fence. This opens up the cut to the blade width with each cut ... helping to prevent blade trapping.

- After making your cut, turn off the power, and let blade stop before raising it.
- Keep hands at least six inches (6") from the running blade.
TIP: For cutting dowels or round stock, use a "V" block jig on a bandsaw.

3. Plane the widest board “surface” (not narrow edge) flat on a Jointer.

- Put concave surface down, lay board as flat on bed as possible so grain is parallel to fence.
- Use nearby pushers designed for jointer. Use short pusher with shorter boards, longer pusher for longer boards ... hold rear handle of pushers.
- Push parallel to the fence; use one continuous push. If you stop partway through, the Jointer cutters will burn-mark your board.
- Repeat thin cuts of 1 /16" until entire surface is smooth.
TIP: Put pencil squiggles along/across board to help you see when the entire surface is ready.
- Do not try to plane short pieces, end grain, or cross-grain - use a belt or disc sander instead.
TIP: If you try jointing these, it is dangerous to yourself and others, split or chunk your wood, or damage jointer.

4. Joint one edge square to the surface planed in step 3 above.

- Using a square, verify that the fence is square with bed. Adjust if necessary - if you don't know how ... ask for help.

- Make sure the previously planed surface is tight against the fence. Push in one continuous motion, or you will burn-mark your board.
- Repeat thin cuts of about 1/16" until the board's edge is smooth.
TIP: The jointer's rear bed is adjustable, but is pre-set by our maintenance team, so do not change height without maintenance help, then make sure it is returned to the maintenance team's height when done.
- If board is taller than fence, push by hand, otherwise use a pusher.
- Joint only solid wood on our Jointers. No plywood, MDF or particleboard, as these will split, fly apart or disintegrate.
- Do not joint painted or varnished wood, or wood with wet glue – these gum-up and dull blades fast. Use 40-grit sander flat sander for these boards.
- Do not joint old wood, or wood with loose knots - these easily break apart & fly, clog the machine, and damage your wood.

5. Thickness Plane the second surface to desired thickness.

Safety Note: Do not plane a board which is less than 10 inches in length. Internal rollers which pull boards through planers are spaced for this minimum length.

- First - open the vacuum port - and close when done !!
- Before starting, crank the bed of the planer down so that the opening is wider than the entire length of your board. If your board is not uniform thickness, you may need to use the re-saw to correct this prior to using the thickness planer. Insert the board - flat / jointed side down onto the planer bed.
- Turn on power and lower the lever which engages the rollers.
- Slowly raise the bed height until the rollers engage your board and pull it through the planer without the cutting blades touching your board.

- Re-insert your board and raise the table ½ turn of the hand-crank ... repeat this process until you hear the top-mounted blades begin to gently cut the top of your board.

TIP: Keep your fingers away from bottom of board, or you'll get them pinched!

- After each pass-through, raise the planer base **one-quarter to one-half** turn.

TIP: When planing multiple boards to the same thickness, pass them all through at the same height setting prior to re-adjusting bed height. You may insert same-thickness boards side-by-side at the same time if they fit.

- Turn off machine - disengage the rollers - then close the vacuum port.

Safety Note: To make sure the machine is off, hold your hand on the top until you verify that there is no motor vibration.

6. Use Table Saw SLED to cut both ends at 90°, and board to desired length.

- Position sled in table-top grooves, raise blade and align cut mark with blade.
- Hold board flat against the back of the sled, then push sled handle forward to cut wood.

Safety Note: Stop pushing just when cut is done, to avoid exposing blade near hands. **NEVER** push the sled so far that the blade shows through the guard.

- "Knee off" power switch and wait for blade to stop turning before moving sled, to avoid damaging your board, saw blade, or causing KICK-BACK.

7. Rip board to proper width using the FENCE on Table Saw (length-wise in same direction as long wood grain).

- Use measurement scale on the right side of the fence, or use a measuring tool to get the desired distance from fence to blade, then lock fence in place.
- Place all un-needed tools and wood on the right side of fence to avoid interference with cutting work on the left side of the fence.

- Largest portion of board should be between fence and blade.

TIP: To hold your wood close to the fence, use a slotted or magnetic feather board, placed in front of the leading edge of the saw blade to help prevent KICKBACK or scorching / nicking your board.

- Push board against fence with a push stick, a pusher block, a "Grr-Ripper" or plywood pusher, then push your wood through in one continuous motion.

Tip: Make sure the pusher does not contact the blade during cutting.

Tip: Stopping, hesitating or backing out can cause a KICKBACK, and burn or mar your board. Most pushers should be positioned about ½ way between the blade and fence to have safer control of the wood.

TIP: Cut short, thick, narrow, round or warped wood on a bandsaw or chop saw.

8. GLUE 3 provided pieces together to make a rough-blank for new Cheese Board for next class. **Step 8 Will be Done in the Assembly Room:**

- When possible - do all glue work on one of our many white enamel gluing boards. Prior to doing any gluing in our shop, put a length of paper under your glue area and over the edges of our clamps. These steps help keep our table top benches glue-free, and keeps clamps working.
- **Place** the planed surfaces down, with jointed right angle edges toward each other. Prior to applying glue, check the fit for tightness. Those are the edges you will spread a thin layer of glue onto - using your finger, glue brush, scrap stick, old credit card, etc.
TIP: Put bar clamps on bench & close to correct length before starting to glue.
- **Push** the glued boards together, **slide** back and forth, then **clamp** using the short, back ends of the clamps. Snug clamp pressure, but not over-tight.
TIP: Check that all pieces are down tight and even on the bottom side.
- **Lift** clamps and board assembly, and with a damp towel **clean or scrape off** excess glue. Leave clamps in place at least an hour.
- Glue **MUST** dry for 24 hours before **any** machining or sanding!! Do not clog our machines or sanding paper with any glue!!

Detailed Steps to 'Finish' Roughly Pre-Made Cheese Board:

9. Draw Cheese Board layout on pre-made board using provided template.

10. On Drill Press #70, drill handle hole with FORSTNER BIT. This drill press is permanently set at the slower speed required for forstner bits only.

- Insert the bit, shaft only; tighten chuck using your hands. Note that other drill presses require bits to be tightened using keyholes in chuck to prevent bit from slipping while turning.

TIP: Remove any chuck key before starting a drill press.

- Use a backer board to prevent tearing out bottom edges of hole at exit, or damaging table.

TIP: Hold or clamp work tight to backing board & drill press table, and drill with slow vertical movements to get a clean exit hole. Place longer work against tubular band saw stand support to prevent spinning.

TIP: Since the bottoms of drill press tables are not flat, there are various tools to secure your work safely to the table - ie: C-Clamps, welding style Vise-Grips, quick clamps, etc. Long scrap wood clamped to bottom of table may help.

- Adjust table to usable height, and lock into place.
- Position the drill depth stop on side of drill if necessary to set correct depth of hole and verify that the depth of the inserted bit will cut through your project and only ½-way through the backer board.
- Drill Hole, remove drill bit, clean up.

11. With Band Saw, cut curves and handle curves just outside of traced lines.

- Open air gate. Lower blade guard-rollers to just above the surface of your wood. This reduces blade flex, cuts wood with less wandering, less blade breaking.

- Cut slowly !! Let the blade do the cutting, stay about 1/16" away from the line. Later, you will be sanding up to the lines.
- Cut straight relief kerfs into areas of tight curves. Back out slowly & safely.
TIP: With tighter curves, use a machine with narrower blade.
- Turn off power. When blade stops, clean up and close air gate.

12. Sand edges with Disc and Belt sanders, but sand curves / arcs with Oscillating spindle sanders of the appropriate size.

- On all sanders, open the vacuum vents prior to work, and close them after your sanding is done !!
- On all sanders, let the paper do the sanding and use a light touch !!
TIP: More pressure on any sanding does NOT sand faster, it just heats and burns your wood ... ruins the sand paper for you and other users.
- On sanders with grooves in the tables, jigs are available near the sanders for square or 45° sanding. Keep moving your wood to prevent burning it or the disk sandpaper.
TIP: Hold wood firmly on belt sanders, and work on the right side to help prevent the belt from grabbing / throwing your wood, or sanding your fingers.
- On Spindle Sanders, work against the direction of drum rotation.
TIP: Only hand tighten spindle sanding drums when changing drum diameters. Don't over tighten. (Wrenches are only for loosening over-tight drums).
- Use Crepe Rubber stick (ie: large erasers) to clean all sandpaper when done. Clean up and close vacuum vents.

13. Sand both surfaces smooth using a Drum Sander - we have several sizes.

- These sanders are used to create a surface smoothness in the thickness range of 1/64". Instructors will teach you how to adjust bed-heights of each.

TIP: If you need to thin your wood ... do not sand, use a Thickness Planer first to get your thickness close to total desired.

- **Lower** the table to have board pass freely under Drum.
- Turn on Feed Belt only. **Insert** board and raise table slowly until Sanding drum just **barely turns** as the wood passes underneath.
- Before starting, **lower table** handle by **one** small mark at handle crank.
TIP: Clearance needed at startup because heat and centrifugal force expands the Sanding Drum.
- Turn on Drum drive and run board through **3 times** before raising table by **one** small mark. Continue until smooth.
TIP: Remember; we're Surface Sanding for smoothness, not trying to heat or burn your wood, or damage the drum.
- Turn off sander, use eraser to clean sandpaper, clean up, close vacuum gate.

14. If time allows, use router to round-over sanded edges of cheese board.

Note: If there is no time to learn router operation, arrange to take a separate class on proper use of our table-top routers.

- Make sure router is unplugged from AC outlet prior to working on any router!
Make all pre-settings and preparations with router unplugged!
- Insert router bit all the way into collet, then raise bit about 1/8th of an inch, then tighten router bit in collet using the 2 nearby wrenches.
- Adjust the router speed based on the bit size - ASK if you don't know how.
- Make sure the fence gate opening will not touch any part of the router bit - adjust if needed using hand screw knobs on back of fence. If not using fence, make sure it is out of the way of your work.

- Verify that the tabletop router height-lock is NOT locked, then adjust the height of the router blade so that your cheese board will meet the router blade in a position you want for your project.
- After router height is set, lock the router height gently.
- Plug the router into one of the outlets designated for “routers only”, and turn it on to get used to the sound. Adjust speed if needed. Work against the rotation of the router blade ... right to left only !!!
- When finished routing - FIRST UNPLUG router, then unlock router height toggle, raise router carefully ... do not force it ... this will avoid stripping the threads on the height adjusting screw. Remove bit, clean up, and close vacuum gate.

CONGRATULATIONS! You have now finished your Hands-On Orientation, and Cheese Board ... the first "project" in our SCW Woodworking Shop. Enjoy your time here in "our" shop.

