

Instructional Framework

Cabinetmaking
48.0703.00



Domain 1: Project Construction	
Instructional Time: 45-55%	
STANDARD 3.0 Demonstrate basic cabinetmaking skills	
3.1 Apply math skills to solve problems related to cabinetmaking, including written instructions to complete a task	<ul style="list-style-type: none"> • add, subtract, multiply, divide fractions • measure accurately
3.2 Calculate linear feet, square feet, and board feet	<ul style="list-style-type: none"> • straight line, area, volume • unit conversion (inches to feet) • board feet (length x width x thickness)
3.3 Tally lumber products	<ul style="list-style-type: none"> • cabinet parts estimations (hardware, backs, toe kicks, styles, rails, etc.)
3.4 Measure accurately and convert to standard and/or metric measurement systems as required	<ul style="list-style-type: none"> • tape measure, ruler measurements • metric to standard conversions • standard to metric conversions
3.5 Lay out straight and angled cuts	<ul style="list-style-type: none"> • combination square • adjustable T-bevel • protractor • try square
3.6 Determine plumb, level, and square	<ul style="list-style-type: none"> • plumb bob • level • framing square, try square, combination square, ruler • tape measure
3.7 Handle and store wood products	<ul style="list-style-type: none"> • sheet goods • wet lumber or freshly cut • climate control
3.8 Specify wood stock for species, grade, grain patterns, and color compatibility	<ul style="list-style-type: none"> • oak, pine, maple, birch, alder, walnut, ash • hardware grades

	<ul style="list-style-type: none"> • sheet good grades
STANDARD 7.0 Interpret plans and blueprints to create a product	
7.1 Read and interpret blueprints	<ul style="list-style-type: none"> • house floor plans • business floor plans • cabinet placement
7.2 Extract information from plans for design and specifications	<ul style="list-style-type: none"> • measurements
7.3 Verify design plans with field measurements	<ul style="list-style-type: none"> • field measurement • drywall compensation • electrical placement • plumbing placement
7.4 Create a cut list	<ul style="list-style-type: none"> • parts and sizes for cabinets • face frames, doors, drawer components
7.5 Create a bill of materials	<ul style="list-style-type: none"> • cut list • lumber prices • profit percentage
STANDARD 8.0 Cut and shape products	
8.1 Mill rough lumber to create S4S (surfaced on four sides) stock	<ul style="list-style-type: none"> • planer, jointer, table saw • process of creating S4S
8.2 Cut sheet goods to size and shape	<ul style="list-style-type: none"> • panel saw • table saw • saw blade types
8.3 Create basic woodturnings	<ul style="list-style-type: none"> • wood lathe • tools (calipers, gouge, skew, parting tool, etc)
8.4 Create basic mouldings	<ul style="list-style-type: none"> • routers, shaper • bit types
STANDARD 9.0 Demonstrate common joinery applications	

9.1 Layout and cut butt joints	<ul style="list-style-type: none"> • square, accurate cuts
9.2 Reinforce butt joints using dowels, screws, biscuits, and pocket screws	<ul style="list-style-type: none"> • dowels, screws, biscuits, pocket screws
9.3 Layout and cut a dado joint	<ul style="list-style-type: none"> • thickness of material • depth of cut • table saw, router • location of joint • common uses
9.4 Layout and cut a rabbet joint	<ul style="list-style-type: none"> • location of joint • table saw, router • thickness of material • depth of cut • common uses
9.5 Layout and cut a lap joint	<ul style="list-style-type: none"> • table saw, router • thickness of material • depth of cut • common uses
9.6 Layout and cut a miter joint	<ul style="list-style-type: none"> • angles calculation • miter saw • common uses
9.7 Layout and cut a tongue and groove joint	<ul style="list-style-type: none"> • shaper, router, table saw • thickness of material • depth of cut • location of joint • common uses
9.8 Layout and cut a mortise and tenon joint	<ul style="list-style-type: none"> • depth of cut • thickness of material • location of joint • common uses • hollow chisel mortiser, drill press • blind and through
9.9 Layout and cut a dovetail joint	<ul style="list-style-type: none"> • thickness of material • common uses

	<ul style="list-style-type: none"> • dovetail jig, router • half blind and through • pins and tails
9.10 Layout and cut a box joint	<ul style="list-style-type: none"> • thickness of material • common use • depth of cut • table saw, dovetail jig, router
STANDARD 10.0 Assemble products using fasteners, adhesives, and hardware	
10.1 Explain the purpose and applications of common fasteners	<ul style="list-style-type: none"> • screws and nails • length of fasteners • round, oval, flat screws • common, finish, brad nails
10.2 Explore various fasteners and RTA (Ready to Assemble) connectors	<ul style="list-style-type: none"> • camlock, cam and bolt
10.3 Explain the purpose, types, and applications of common adhesives	<ul style="list-style-type: none"> • contact cement, wood glue, construction adhesive, silicone, polyurethane
10.4 Use adhesives appropriate to the application	<ul style="list-style-type: none"> • plastic laminate, veneer, solid surface material, lumber products
10.5 Use various clamping devices	<ul style="list-style-type: none"> • bar clamps, wood screw clamps, quick clamps, c clamps, band clamps, pipe clamps
10.6 Demonstrate various ways to remove excess glue	<ul style="list-style-type: none"> • putty knife, scraper, dry cloth
10.7 Assemble drawer components	<ul style="list-style-type: none"> • slides, pulls, knobs
10.8 Explore cabinet installation using fasteners and levelers	<ul style="list-style-type: none"> • types of screws, shims
10.9 Fasten stock with metal fasteners (e.g. nails, screws, and staples)	<ul style="list-style-type: none"> • nails, screws, staples • pneumatic nail gun, hammer, nail sets, drills, impact guns
10.10 Construct case/box	<ul style="list-style-type: none"> • dado joints

	<ul style="list-style-type: none"> • clamps • measuring tools • glue • fasteners
10.11 Assemble panel doors	<ul style="list-style-type: none"> • rail styles • dry fit • measuring tools • clamps
10.12 Attach moulding and trim	<ul style="list-style-type: none"> • finish nailer • adhesive • wood filler/putty
10.13 Explore common uses and applications of jigs and fixtures	<ul style="list-style-type: none"> • self-centering jigs • line drilling jigs • drawer slide jig
10.14 Fasten a top to the casework	<ul style="list-style-type: none"> • adhesive, clear silicone • screws
10.15 Install cabinet hardware	<ul style="list-style-type: none"> • screws • hinges, knobs, pulls • pilot holes • drills • drawer slides • door bumpers
10.16 Reinforce joints with block	<ul style="list-style-type: none"> • glue blocks
STANDARD 12.0 Demonstrate finishing materials and processes	
12.1 Explain the purpose and applications of various types of finishes and finishing processes	<ul style="list-style-type: none"> • color application • seals pores to protect wood • brush, spray, dip, hand rubbed
12.2 Select finishing materials for compatibility	<ul style="list-style-type: none"> • oil-based, water or latex based, lacquer
12.3 Follow a finish schedule	<ul style="list-style-type: none"> • surface preparation • fill • pretreat sealer

	<ul style="list-style-type: none"> ● sanding sealer ● stain ● top coat application
12.4 Apply filler to a wood surface	<ul style="list-style-type: none"> ● paste filler ● sandable filler
12.5 Apply a seal coat to a wood surface	<ul style="list-style-type: none"> ● sanding sealer ● uniform color finish ● wood conditioner ● shellac
12.6 Select and use appropriate abrasive types and grit sizes	<ul style="list-style-type: none"> ● sandpaper ● grit size 220-600 ● steel wool ● steel wool grade #4-#0000
12.7 Stain a wood surface	<ul style="list-style-type: none"> ● water based, oil based ● pigmented, dye ● gel coat
12.8 Apply clear coat finishes to wood surfaces	<ul style="list-style-type: none"> ● roll, brush, spray, dip
12.9 Apply pigmented finishes to wood surfaces	<ul style="list-style-type: none"> ● water based, oil based ● pigmented ● gel coat
12.10 Use cleanup methods according to safe and approved methods (OSHA, EPA, DNR)	<ul style="list-style-type: none"> ● water based/latex - water clean up ● oil based - mineral spirits/paint thinner ● lacquer - lacquer thinner ● proper disposal of liquids ● proper disposal of rags/brushes
12.11 Repair blemishes/touch up finishes	<ul style="list-style-type: none"> ● wax sticks ● steam dents

Domain 2: Machine and Tool Safety

Instructional Time: 45-55%

STANDARD 2.0 Demonstrate general shop safety

2.1 Explain the importance of shop safety	<ul style="list-style-type: none">● health risks● personal injuries
2.2 Maintain appropriate appearance and safe work attire	<ul style="list-style-type: none">● closed toed shoes● no long sleeves● no baggy clothing● long hair tied back● jewelry removed
2.3 Wear appropriate PPE equipment (personal protective equipment) when needed (e.g. eye protection, ear protection, impact hat)	<ul style="list-style-type: none">● safety glasses/goggles● face shield● hearing protection (ear muffs, foam plugs)● hard hat● respirator● dust masks
2.4 Use equipment safety features according to manufacturer's recommendations	<ul style="list-style-type: none">● machine guarding● automated feeders
2.5 Use proper lifting techniques	<ul style="list-style-type: none">● lift with legs, not back
2.6 Examine health-related problems related to exposure to hazardous materials	<ul style="list-style-type: none">● chemical burns● diseases from exposure
2.7 Examine the benefits of using dust collection	<ul style="list-style-type: none">● respiratory health● explosion danger
2.8 Comply with government regulations regarding health and safety in the shop [e.g. OSHA (Occupation Safety and Health Administration), EPA (Environmental Protection Agency), and DNR (Department of Natural Resources)]	<ul style="list-style-type: none">● OSHA standards on safety equipment (machine guarding)● ANSI requirements to meet OSHA standards for PPE
2.9 Comply with lockout/tagout rules and procedures	<ul style="list-style-type: none">● lockout/tagout station● lockout/tagout procedures

2.10 Handle, use, and store chemicals according to MSDS/SDS sheets	<ul style="list-style-type: none"> ● protective gloves ● eye protection ● flammable storage cabinet ● flammable storage procedures
2.11 Apply fire safety rules and procedures	<ul style="list-style-type: none"> ● fire evacuation routes ● used flammable goods disposal procedures ● types of fire extinguishers ● PASS method
STANDARD 4.0 Practice safe and appropriate use of hand and portable power tools	
4.1 Use steel rules/tapes, squares, T-bevels, and calipers	<ul style="list-style-type: none"> ● steel rules/tapes ● squares ● T-Bevels ● calipers
4.2 Use planes and cabinet scrapers to smooth surfaces	<ul style="list-style-type: none"> ● planes ● cabinet scrapers
4.3 Use wood chisels to notch or mortise stock	<ul style="list-style-type: none"> ● wood chisels ● mortise stock
4.4 Drive and set nails and screws	<ul style="list-style-type: none"> ● nail sets ● hammers ● screws, nails
4.5 Fasten materials using a pneumatic stapler or nailer	<ul style="list-style-type: none"> ● various staples, nails
4.6 Use a circular saw to make straight, beveled, and compound angle cuts	<ul style="list-style-type: none"> ● combination square ● circular saw
4.7 Use a saber/jig saw to plunge/cut curves	<ul style="list-style-type: none"> ● saber/jig saw ● blades
4.8 Drill holes with a portable power drill	<ul style="list-style-type: none"> ● portable power drill ● bits
4.9 Use a power drill to bore holes to specified depth	<ul style="list-style-type: none"> ● depth stops ● bits ● tape

4.10 Create pocket screw joints using a drill and jig	<ul style="list-style-type: none"> • drill • KREG jig
4.11 Use a router to shape edges; cut a groove, dado, and rabbet	<ul style="list-style-type: none"> • router • various bits
4.12 Use a router with a dovetail jig	<ul style="list-style-type: none"> • router • dovetail jig and bits
4.13 Use plate/biscuit joiners for square and angled joints	<ul style="list-style-type: none"> • plate/biscuit joiners • biscuits (#0, #10, #20)
4.14 Use sanders for roughing and finishing	<ul style="list-style-type: none"> • orbital sander • random orbital sander • various sandpaper grits
4.15 Use a belt sander and grinder to scribe cut a product	<ul style="list-style-type: none"> • belt sander • grinder sander • scribe
4.16 Clean and maintain hand and portable power tools	<ul style="list-style-type: none"> • dry rag, brushes, compressed air • lubrication • inspect for damage
STANDARD 5.0 Practice safe and appropriate use of stationary machines	
5.1 Use a table saw to make rip, cross, miter, bevel, and groove cuts	<ul style="list-style-type: none"> • table saw • miter gauge • dado blade • rip fence • rip, cross cut, and combination blades
5.2 Select, change, and set up blades on a table saw	<ul style="list-style-type: none"> • dado, rip, cross cut, and combination blades • wrenches • direction of lock nut (loosen, tighten)
5.3 Use a radial arm saw to make cross, miter, and compound angle cuts	<ul style="list-style-type: none"> • radial arm saw
5.4 Select, change blades, and adjust for squaring on a radial arm saw	<ul style="list-style-type: none"> • dado, rip, cross cut, and combination blades • wrenches • direction of lock nut (loosen, tighten)

	<ul style="list-style-type: none"> ● framing square
5.5 Use a miter/sliding miter saw to make cross, bevel, miter, and compound miter cuts	<ul style="list-style-type: none"> ● miter/sliding miter saw
5.6 Select and change blades on a miter saw	<ul style="list-style-type: none"> ● dado, rip, cross cut, and combination blades ● wrenches ● direction of lock nut (loosen, tighten)
5.7 Use a band saw to cut irregular shapes and re-saw materials	<ul style="list-style-type: none"> ● band saw ● fence
5.8 Select, change, or replace band saw blades	<ul style="list-style-type: none"> ● size of blade dictates circle size ● proper blade tension
5.9 Set up and use a drill press	<ul style="list-style-type: none"> ● drill press ● drill bit index ● clamping device ● chuck key
5.10 Use a jointer to square, bevel, and flatten stock	<ul style="list-style-type: none"> ● jointer ● precision square ● push blocks
5.11 Use a router in a router table	<ul style="list-style-type: none"> ● router ● push blocks ● push sticks ● router bits ● feather boards
5.12 Use a surface planer to smooth surfaces	<ul style="list-style-type: none"> ● surface planer
5.13 Utilize a hollow chisel mortiser	<ul style="list-style-type: none"> ● layout
5.14 Set up and use a line boring machine	<ul style="list-style-type: none"> ● set up ● adjust spacing ● adjust number of holes
5.15 Set up and use a lathe for woodturning	<ul style="list-style-type: none"> ● wood lathe ● calipers ● face plate

	<ul style="list-style-type: none"> ● tool rests ● various lathe tools
STANDARD 6.0 Examine computer numerical control equipment (CNC)	
6.1 Explore various CAM (Computer Aided Manufacturing) software for programming CNC (Computer Numerical Control) manufacturing equipment	<ul style="list-style-type: none"> ● CAM software ● CNC machine ● CNC simulator
6.2 Explore various CNC equipment and equipment operations, including 3-dimensional technology	<ul style="list-style-type: none"> ● CNC routers ● CNC lathe ● rotary indexer ● X, Y, Z axis
6.3 Demonstrate CNC equipment operation (actual or simulated)	<ul style="list-style-type: none"> ● live presentation ● video presentation
6.4 Program CNC machines to produce a part	<ul style="list-style-type: none"> ● CAM software ● various bits ● computer

Domain 3: Veneers and Laminates	
Instructional Time: 5-10%	
STANDARD 11.0 Apply wood veneers and laminates	
11.1 Cut veneers and laminates with appropriate saw blades and router bits	<ul style="list-style-type: none"> ● veneers, plastic laminate ● trim routers ● carbide router bits ● straight edge ● clamps
11.2 Seam two pieces of veneers and/or laminates	<ul style="list-style-type: none"> ● veneers, plastic laminate ● trim routers ● carbide router bits ● straight edge ● clamps
11.3 Apply adhesive	<ul style="list-style-type: none"> ● trays

	<ul style="list-style-type: none"> • brushes • rollers • sprayer • contact cement • spray adhesive
11.4 Apply edge banding	<ul style="list-style-type: none"> • edge bander • J roller • hot iron • self-stick edge banding • edge banding • laminate edge trimmer
11.5 Apply veneers and/or laminates to core	<ul style="list-style-type: none"> • contact cement • brushes, rollers, spray adhesive • J roller • dowel rods
11.6 Apply wood edges	<ul style="list-style-type: none"> • wood glue • pneumatic nail guns
11.7 Cut veneers and/or laminates to size	<ul style="list-style-type: none"> • trim routers • carbide router bits
11.8 Fit veneers and/or laminate joints	<ul style="list-style-type: none"> • dry fit • tight, flat, invisible
11.9 Trim edges	<ul style="list-style-type: none"> • trim routers • carbide router bits • laminate edge trimmer

Domain 4: Business Practices

Instructional Time: 5-10%

STANDARD 1.0 Demonstrate business operations in a shop

1.1 Estimate the cost of a job (supplies, materials, labor, overhead)	<ul style="list-style-type: none"> • material list • lumber prices
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	<ul style="list-style-type: none">● profit percentage● labor cost● overhead cost
1.2 Develop a materials order from a cut list and plan	<ul style="list-style-type: none">● cut list● plan
1.3 Develop a materials order from a cut list and plan	<ul style="list-style-type: none">● quality control of product● lumber grades
1.4 Use customer service skills to be successful	<ul style="list-style-type: none">● proper dress and appearance● proper phone etiquette (name, business name, how can you help)● Complete deadlines in timely fashion, no late work/setbacks