



Woodwork Career Alliance Correlation Chart



The content of the text and Lab Workbook correlates to Woodwork Career Alliance (WCA) skill standards. The WCA establishes a benchmark to measure and recognize an individual's skills and knowledge. The WCA skill standards help ensure that students are prepared for rigorous industry standards, and provide a pathway for advancement for professional woodworkers.

The WCA skill standards define the minimum requirements for specific woodworking machine operations. Using the WCA skill standards in a wood training program can help you, your students, and your program obtain industry recognition. The *Modern Cabinetmaking* textbook and Lab Workbook are correlated to the performance standards, helping prepare your students for certification.

7. Sanding

Sanding Considerations

- Pre-Operation Checklist is a prerequisite for ANY operation.
- Tool/machine manufacturer's safety rules and guidelines are followed.
- Stock is supported and secured from movement.
- Hands remain firmly on sander throughout entire operation.
- Sander is moved in smooth, continuous motion.
- Appropriate stance and hand position are utilized for optimum balance and part control.
- Clears machine and cleans work area after operation.
- Required OSHA-approved personal protective equipment is worn.
- Lock-out/tag-out procedure is in place and followed.
- Process is completed in a timely manner.
- Idler and driven drum bearings are functioning properly.
- Auxiliary tables are available and adjusted to correct height/angle.
- Guides material into contact with moving belt smoothly and gradually using stop block/fence.
- Stock is held securely against the fence, miter gauge, or fixture as appropriate.

- Part is fed against belt rotation when not using a support block.
- Machine is properly balanced and excess dust is removed from drums, table, and cabinet.
- A sharp belt of the appropriate coarseness is installed.
- Dust collection is connected and functioning properly.
- Adequate lighting is available to inspect finished edge quality.
- Part table is flat and free of debris and defects.
- Applies appropriate pressure to optimize motion of oscillating belt.
- Withdraws workpiece from moving belt while maintaining parallelism.
- Inspects edge for acceptable surface quality.
- All mill/saw marks are removed.
- All scratches, nicks, and machining defects are removed.
- Available dust control methods are used.
- Equipment is cleaned with compressed air, when available, or bench brush prior to beginning.
- Particle filtration (dust) mask is worn.
- Parts are cleaned of grit and dust prior to sanding with the next finer grit.
- Operator cleans tools and work area after use.
- Electrical cords and clothing are well away from rotating parts.
- Steel mandrel is correctly installed in the spindle collet or socket.
- Rubber cylinder, if used, has no defects before installing sandpaper sleeve.
- Abrasive sleeve is correctly installed on the mandrel.
- Abrasive sleeve has no defects such as tears, holes, or foreign material buildup.
- Table insert is correct size for the mandrel being used.
- Operator uses proper pressure and speed to sand part.
- Verifies tool is properly guarded.
- Demonstrates knowledge of and proper use of all machine specific controls.
- Inspect for evidence of defective finish conditions such as, but not limited to, chatter marks, streaking, or part hesitation.
- Spot check sanded dimensions following the operation.
- Abrasive belt conditions are monitored, analyzed and changed as required.

- If required, select proper program from controller or programmable logic controller (PLC).
- Operator clears machine and cleans work area after use.
- Auxiliary tables are available and adjusted to correct height.
- Lock-out/tag-out procedure is in place and followed by everyone.
- Operator uses proper pressure and speed to sand part.
- Proper stance and hand position are demonstrated.

Portable Belt Sander

Pre-Operation Checklist				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1		Demonstrates knowledge of and proper use of all machine specific controls.	Chapter 30	
		Ensures operational path has no obstructions to material and operator.	Chapter 30	
		Verifies belt is tracking correctly.	Chapter 30	
		Verifies switch is off before plugging in tool.	Chapter 30	
2		Installs belt properly.	Chapter 30	
		Verifies belt is clean and free of defects.	Chapter 30	
		Verifies platen is free of defects and in proper working order.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sand Solid Wood Panels				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given material and machine set up and ready to operate.	Dimensional tolerance ± 0.4 mm (1/64") [0.0156"] from flat.	Chapter 30	
		No apparent round over of edges.	Chapter 30	
		All scratches, nicks, and defects are removed.	Chapter 30	
		Sanding marks are consistent and directional with the wood grain.	Chapter 30	
		No evidence of edge/end-dubbing or marks caused by not moving the platen past the edge/end.	Chapter 30	

2	Select material and set up equipment.	Inspect part for minimum defects suitable for the finish desired.	Chapter 30	
		Select appropriate grit and composition of sanding belt to complete operation.	Chapter 30	
		Ensure sanding belt is installed on the device to maximize paper life.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sand Solid Veneered Panels				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given material and machine set up and ready to operate.	Dimensional tolerance ± 0.4 mm (1/64") [0.0156"] from flat.	Chapter 30	
		No apparent sand through (ghosting) of veneer.	Chapter 30	
		All scratches, nicks, and defects removed.	Chapter 30	
		Sanding marks shall be consistent and directional with the wood grain.	Chapter 30	
		No evidence of edge/end-dubbing or marks caused by not moving the platen past the edge/end.	Chapter 30	
2	Select material and set up equipment.	Inspect part for minimum defects suitable for the finish desired.	Chapter 30	
		Select appropriate grit and composition of sanding belt to complete operation.	Chapter 30	
		Ensure sanding belt is installed on the device to maximize paper life.	Chapter 30	
		Meets Level 1 performance standard.		

Edge Sander

Pre-Operation Checklist				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1		Verifies belt is properly tensioned, sharp, and tracking correctly.	Chapter 30	
		Demonstrates knowledge of and proper use of all machine specific controls.	Chapter 30	
		Verifies table is at correct height and locked.	Chapter 30	
		Cleans belt if needed.	Chapter 30	
		Verifies that 90° stop block/fence is square and securely clamped.	Chapter 30	
		Verifies work area is clean, organized, and free from tripping hazards.	Chapter 30	
2		Installs new belt.	Chapter 30	
		Adjusts tension and tracking.	Chapter 30	
		Adjusts table height to utilize fresh belt surface.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sand 90° Edge of Banded Panel				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given machine set up and ready to work, sand the long, straight, 90° edge of a 19 mm × 400 mm × 1066 mm (3/4" × 16" × 42") board that has been banded with a 3 mm (1/8")	A dimensional tolerance of ±1.5 mm (1/16") [0.0625"] from flat is maintained across entire length.	Chapter 30	Section Project 4-14
		A tolerance of ±1.5 mm (1/16") [0.0625"] from parallel is maintained from opposing edge.	Chapter 30	Section Project 4-14
		Edges are crisp, no apparent round over.	Chapter 30	Section Project 4-14

	[0.125"] solid hardwood edge.	Edge has no skips, burns, or washboarding or snipes.	Chapter 30	Section Project 4-14
		All mill/saw marks are removed.	Chapter 30	Section Project 4-14
2	Given a board with a long, straight, 90° edge of 19 mm × 400 mm × 1066 mm (3/4" × 16" × 42") that has been banded with a 0.7 mm (1/36") [0.027"] hardwood veneer edge, set up edge sander with a sharp belt of the appropriate coarseness and properly adjust table and stop block, and sand the material.	None of the veneer edge is sanded through.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sand 45° Edge of Board				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given an edge sander with a sharp belt of the proper grit and properly adjusted table, stop block, and a special jig or fixture equipped with toggle clamps or other positive clamping device, sand the straight, 45° edge of a 19 mm × 400 mm × 1066 mm (3/4" × 16" × 42") board that has been banded with a 3 mm (1/8") [0.125"] solid hardwood edge.	A dimensional tolerance of ±1.5 mm (1/16") [0.0625"] from flat is maintained across entire length.	Chapter 30	
		A tolerance of ±1.5 mm (1/16") [0.0625"] from parallel is maintained from opposing edge.	Chapter 30	
		Edges are crisp, no apparent round over.	Chapter 30	
		All mill/saw marks are removed.	Chapter 30	
		Edge has no skips, burns or washboarding or snipes.	Chapter 30	

2	Given an edge sander install an appropriate sharp belt, properly adjust table and stop block, and using a special jig or fixture equipped as in Level 1, sand the straight, 45° edge of a 19 mm × 400 mm × 1066 mm (3/4" × 16" × 42") board that has been banded with a 3 mm (1/8") [0.125"] solid hardwood edge.	Meets Level 1 performance standards.		
Operation—Sand 90° End of Solid Board				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given machine set up and ready to work, sand the straight, 90° end of a 1066 mm × 400 mm × 19 mm (42" × 16" × 3/4") solid hardwood board.	A tolerance of ±1.5 mm (1/16") [0.0625"] from parallel is maintained from opposing edge.	Chapter 30	Section Project 4-14
		End is crisp and straight, no apparent round over.	Chapter 30	Section Project 4-14
		End has no skips, burns, washboarding, or snipes.	Chapter 30	Section Project 4-14
2	Given a solid hardwood board of 1066 mm × 400 mm × 19 mm (42" × 16" × 3/4"), set up the edge sander with a sharp belt of the appropriate coarseness and properly adjust table and stop block, and sand the material.	Meets Level 1 performance standard.		

Oscillating Spindle Sander

Pre-Operation Checklist				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1		Demonstrates knowledge of and proper use of all machine specific controls.	Chapter 30	
		Verifies table is at correct height/angle and locked.	Chapter 30	
		Verifies that correct size table insert is installed.	Chapter 30	
		Verifies work area is clean, organized, and free from hazards.	Chapter 30	
2		Cleans abrasives and installs new abrasives when necessary.	Chapter 30	
		Adjusts table height (if equipped) to utilize fresh belt surface.	Chapter 30	
		Adjusts table angle.	Chapter 30	
		Selects and installs proper size mandrel and table insert.	Chapter 30	
		Selects and installs proper abrasive type and grit.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sand Straight Edge with Fence aid				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given an oscillating spindle sander set up with proper abrasive sleeve, with the table set to proper angle, and equipped with a straightedge fence set up in relation to abrasive	Selects proper part to be sanded.	Chapter 30	
		Surface of edge has all defects removed.	Chapter 30	
		Edge is straight and within +.015"/-0" of layout.	Chapter 30	
		Surface of edge free of burn marks.	Chapter 30	

	drum surface, sand a straight edge on rough cut material.	Surface of edge free of “dips” or “divots.”	Chapter 30	
		Material is sanded at proper angle.	Chapter 30	
2	Given an oscillating spindle sander and material for sanding, set up sander with a fence, and sand a straight edge on workpiece, with the spindle at 90°.	Install fence for straight sanding.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sand Curved Contour				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given an oscillating spindle sander set up with the proper abrasive sleeve and with the table surface set to the proper angle, sand a curved contour traced from a template.	Selects proper part/edge to be sanded.	Chapter 30	
		Surface of edge follows shape of contour within +.015”/–0” of layout.	Chapter 30	
		Surface of edge free of burn marks.	Chapter 30	
		Surface of edge free of “dips” or “divots.”	Chapter 30	
2	Given an oscillating spindle sander, install the proper abrasive sleeve and set the table surface to the proper angle. Sand a curved contour traced from a template.	Meets Level 1 performance standard.		

Portable Belt Sander

Pre-Operation Checklist				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1		Demonstrates knowledge of and proper use of all machine specific controls.	Chapter 30	
		Ensures operational path has no obstructions to material and operator.	Chapter 30	
		Verifies belt is tracking correctly.	Chapter 30	
		Verifies switch is off before plugging in tool.	Chapter 30	
2		Installs belt properly.	Chapter 30	
		Verifies belt is clean and free of defects.	Chapter 30	
		Verifies platen is free of defects and in proper working order.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sand Solid Wood Panels				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given material and machine set up and ready to operate.	Dimensional tolerance ± 0.4 mm (1/64") [0.0156"] from flat.	Chapter 30	
		No apparent round over of edges.	Chapter 30	
		All scratches, nicks, and defects are removed.	Chapter 30	
		Sanding marks are consistent and directional with the wood grain.	Chapter 30	
		No evidence of edge/end-dubbing or marks caused by not moving the platen past the edge/end.	Chapter 30	

2	Select material and set up equipment.	Inspect part for minimum defects suitable for the finish desired.	Chapter 30	
		Select appropriate grit and composition of sanding belt to complete operation.	Chapter 30	
		Ensure sanding belt is installed on the device to maximize paper life.	Chapter 30	
		Meets Level 1 performance standard.		

Random Orbital Sander

Pre-Operation Checklist				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1		Verifies tool is cleaned of excess sanding dust.	Chapter 30	
		Inspects condition of sanding pad.	Chapter 30	
		Confirms integrity of electrical or pneumatic connection.	Chapter 30	
Operation—Sand Flat Pieces of Solid Lumber				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given material and machine set up to operate, sand part(s) through specified sequence of progressively finer grits.	A dimensional tolerance of ± 0.4 mm (1/64") [0.0156"] from flat is maintained.	Chapter 30	
		Edges are crisp, no apparent round over.	Chapter 30	
		All scratches, nicks, and machining defects are removed.	Chapter 30	
		Pronounced orbital sanding marks are not present.	Chapter 30	

2	Given material and selection of abrasives, machine to sand part(s) through the appropriate sequence of progressively finer grits to a specified final grit.	Inspects part for minimum defects suitable for the finish desired.	Chapter 30	
		Uses appropriate grits and compositions of sandpaper for given operation.	Chapter 30	
		Installs sandpaper on the device to maximize paper life.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sand Flat Pieces of Veneered Panel				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given material and machine set up to operate, sand part(s) through specified sequence of progressively finer grits.	A dimensional tolerance of ± 0.4 mm (1/64") [0.0156"] from flat is maintained.	Chapter 30	
		Edges are crisp, no apparent round over.	Chapter 30	
		All scratches, nicks, and machining defects are removed.	Chapter 30	
		Pronounced orbital sanding marks are not present.	Chapter 30	
		Veneer body remains sound, without telegraphing as a result of sanding.	Chapter 30	
2	Given material and selection of abrasives, set up machine to sand part(s) through the appropriate sequence of progressively finer grits to a specified final grit.	Inspects part for minimum defects suitable for the finish desired.	Chapter 30	
		Uses appropriate grits and compositions of sandpaper for given operation.	Chapter 30	
		Installs sandpaper on the device to maximize paper life.	Chapter 30	
		Meets Level 1 performance standard.		

Wide Belt Sander

Pre-Operation Checklist				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1		Verifies dust collection operable/operating.	Chapter 30	
		Ensures paths of in-feed and out-feed have no obstructions to material and operator.	Chapter 30	
		Minimum part length is observed.	Chapter 30	
		Material is properly supported at in-feed and out-feed.	Chapter 30	
2		Correct sanding head(s) are selected and engaged.	Chapter 30	
		Sets optimum initial thickness prior to first pass based on maximum thickness or species of material.	Chapter 30	
		Installs appropriate grit/type of belt for given operation.	Chapter 30	
		Checks and adjusts (when required) abrasive belt tracking.	Chapter 30	
		Verifies proper adjustment of platen(s).	Chapter 30	
		Inspects and clears moisture traps and drains.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sanding Solid Wood				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given machine already set up, adjusted, with material ready, sand to the specified grit and thickness.	Correct surface is sanded.	Chapter 30	
		Proper incremental adjustment made on each pass to reach specified thickness.	Chapter 30	
		Staggers loading to ensure entire width of belt and bed is used.	Chapter 30	

		Demonstrates ability to monitor load meter.	Chapter 30	
		Pieces fed in correct direction with regard to grain.	Chapter 30	
2	Given specifications, set up machine to sand to the specified feed speed, grit, and thickness.	Feed speed set correctly.	Chapter 30	
		Proper grit installed.	Chapter 30	
		Multiple head machine started in proper sequence and time delay.	Chapter 30	
		Meets Level 1 performance standard.		
Operation—Sanding Veneered Panels				
Level	Objective	Performance Standard	Textbook Chapter	Lab Workbook Material
1	Given machine already set up, adjusted, with material ready, sand to the specified grit and thickness.	Correct surface is sanded.	Chapter 30	
		Proper incremental adjustment made on each pass to reach specified thickness.	Chapter 30	
		Stagger loading to ensure entire width of belt and bed is used.	Chapter 30	
		Demonstrates ability to monitor load meter.	Chapter 30	
		Pieces fed in correct direction with regard to grain.	Chapter 30	
2	Given a target finish condition, set up machine, and sand the correct surfaces of veneered panels to the specified grit.	Measure panel thickness and set machine.	Chapter 30	
		Height of pad adjusted to prevent sanding through.	Chapter 30	
		Uses proper feed speed.	Chapter 30	
		Processes and inspects trial panel and makes adjustments as necessary.	Chapter 30	
		Sets each sanding head for correct stock removal when utilizing multiple heads.	Chapter 30	
		Appropriate changes to program made as required.	Chapter 30	