

MACHINING

Machining youth apprentices assist with basic machine operations, processes, and tools. Apprentices must adhere to industry safety and security standards.

Length of Apprenticeship: One or two years

COMPETENCIES

Machining youth apprentices must complete all **7** Manufacturing Fundamentals Competencies in Year 1. No substitutions to this list. **Year 1** Youth apprentices must also complete a minimum of **nine** of the 14 Machining competencies. **Year 2** youth apprentices must complete **13** of the 14 machining competencies using a minimum of one different process. Employers can substitute up to **1** competency with another occupationally appropriate skill. Substitutions must be added to the competency list for assessment. Note that where necessary, skills can be simulated.

NOTE: Students completing a 2-year machining processes youth apprenticeship must select a minimum of 1 different machining process than the first year and indicate it in the appropriate place on this guide.

Document the Machining Process for each year in this guide.

***Students who completed a previous Manufacturing YA program do *not* need to repeat the Manufacturing Fundamentals Competencies.

	Manufacturing Fundamentals Competencies		Machining Competencies
1.	Focus on customer needs	1.	Read machining technical drawings and work orders
2.	Use various instruments	2.	Interpret machining symbols and procedures
3.	Operate tools and equipment safely	3.	Perform safety checks
4.	Practice quality assurance principles	4.	Operate machining equipment
5.	Follow personal safety requirements	5.	Monitor machining product and process specifications
6.	Maintain a safe work environment	6.	Process production documents
7.	Demonstrate professional role to be	7.	Follow shutdown machining process
	used in an emergency	8.	Use hand tools
		9.	Monitor equipment for correct operation
		10.	Identify set up
		11.	Select tools and materials
		12.	Support set up
		13.	Verify set up
		14.	Perform start up

REGISTERED APPRENTICESHIP BRIDGING OPPORTUNITIES

The following Registered Apprenticeship is available in this area:

• Machine Repair

POST-SECONDARY PATHWAY OPPORTUNITIES

There are several post-secondary pathway opportunities in this area. The following is an example.

• Precision Machining Technology Technical Diploma



Youth Apprenticeship ON-THE-JOB LEARNING PERFORMANCE STANDARDS GUIDE

YOUTH APPRENTICE INFORMATION

Youth Apprentice Name	
YA Coordinator	YA Consortium
School District	High School Graduation Date

REQUIREMENTS

Level One Requirements

Youth apprentices must complete ALL the items listed below. Check completed areas.

- Year 1 Competency checklist
- Employability Skills checklist (in this OJL Guide) or the DPI Employability Skills Certificate
- \square Related instruction equal to 1 high school credit or at least 3 college credits
- \Box Minimum of 450 work hours

Level Two Requirements

Youth apprentices must complete ALL the items listed below. Check completed areas.

- □ Year 2 Competency checklist
- Employability Skills checklist (in this OJL Guide) or the DPI Employability Skills Certificate
- □ Related instruction equal to 2 high school credits or at least 6 college credits
- \Box Minimum of 900 work hours

HOURS

Record the hours the youth apprentice worked.

Total Hours Employed	Company Name	Telephone Number

CAREER PREPARATION

Youth apprentices must complete **<u>one</u>** of the following during Youth Apprenticeship participation:

 \Box 1. Student is participating in a local or regional career pathway*.

Identify the pathway below:

For more information contact the <u>Wisconsin Department of Public Instruction</u>. Additional help may be found on the WI DPI <u>Wisconsin Pathways – Regional Career Pathways</u> and <u>DPI Career</u> <u>Clusters and Pathways</u> web pages.

*Local and Regional career pathways as defined by the WI DPI means that a student is participating in or has completed at least one CTE class in a cluster pathway sequence and has completed at least one of the other career pathway components: instructional related course, work-based learning, dual college credit, and/or career and technical student organization.

 \Box 2. Student has completed one of the following certificates during their YA program or possess current certification earned previously.

A copy of the certificate must be uploaded with the completed checklist. Select the certificate from the list below.

- □ Leadership Certificate (DPI)
- □ OSHA Safety Training (10 or 30)
- □ -SNAP ON Certifications (i.e., precision measurement)
- □ Manufacturing Skill Standards Certification (MSSC)
- Other certificates identified by the <u>Career and Technical Education (CTE) Approved</u>
 <u>Certifications List</u> related to this occupational field (or related to this occupation) (YA certificates excluded)

Title of Certification:

□ 3. Student is participating in a <u>Dual Enrollment Course</u> connected to any postsecondary education provider including UW System, Wisconsin Association of Independent Colleges and Universities (WAICU), and any of the 16 Wisconsin Technical Colleges (WTCS).

College Name:

College Course Title:

Course Number:

For more information on Dual Enrollment opportunities, please contact one of the resources below:

- WTCS
- WAICU
- UW System connect with the college of choice.

SIGNATURES

The On-the-Job Learning Performance Standards Guide includes a list of competencies youth apprentices learn through mentoring and training at the worksite.

Instructions for the Worksite Employers/Mentors and School-Based or YA coordinators: This document should be reviewed with the employer/mentor, school-based or YA coordinator on a regular basis with the youth apprentice to record progress and plan future steps to ensure completion of the required competencies. Mentors, school-based/YA coordinator, and the apprentice sign below.

Employer/Mentor Signature	Employer/Mentor Signature
Employer/Mentor	Employer/Mentor
Business/Company	Business/Company
Date Signed	Date Signed
School-Based and/or YA Coordinator Signature	School-Based and/or YA Coordinator Signature
School-Based and/or YA Coordinator	School-Based and/or YA Coordinator
School District or Organization	School District or Organization
Date Signed	Date Signed
Youth Apprentice Signature	Youth Apprentice Signature
Youth Apprentice	Youth Apprentice
School District / High School	School District / High School
Date Signed	Date Signed

EMPLOYABILITY SKILLS

Youth apprentices must demonstrate key employability skills.

The DWD YA program employability skills requirement may be attained and demonstrated through two processes. (See options listed below.) Employability skills must be completed for every year a student is in the program. The DPI Employability Skills Certificate may be counted as meeting one of those two years, provided the certificate is earned in the same year the student is enrolled in youth apprenticeship or they can complete the YA Employability Skills in the OJL. The Employability Skills Certificate must be obtained through the DPI.

 If a student has successfully completed a Wisconsin Department of Public Instruction (DPI) State-Certified Cooperative Education, <u>Co-Op Employability Skill certification</u> then they have met the YA Employability Skills requirement for that year. A copy of the student's DPI Co-Op Employability Skill Certificate must be maintained on file with their YA regional consortium.

Earned Wisconsin Employability Skills Certificate (checked if applicable) or,

2. Completed and rated "Employability Skills" through this YA OJL guide as described below.

3	<i>Exceeds Expectations:</i> Exceeds entry-level criteria; requires minimal supervision; consistently displays this behavior
2	<i>Meets Expectations:</i> Meets entry-level criteria; requires some supervision; often displays this behavior
1	Working to Meet Expectations: Needs improvement; requires much assistance and supervision;
	rarely displays this behavior

The following skills are required of all youth apprentices.

	Employability Skills	Rating		
		Minimun	n Rating of 2	2 for EACH
Competency and Rating Criteria		Check Rating		
		1	2	3
1.	Develops positive work relationships with others.		Year 1 Ratir	ng
	Examples of qualities and habits that the employee might exhibit			
	include		Year 2 Ratir	Ig
	 Interacts with others with respect and in a non-judgmental manner 			
	• Responds to others in an appropriate and non-offensive manner			
	 Helps co-workers and peers accomplish tasks or goals 			
	 Applies problem-solving strategies to improve relations with others 			
	• When managing others, shows traits such as compassion,			
	listening, coaching, team development, and appreciation			

2.	Communicates effectively with others	•	Year 1 Ratir	Ig
	Examples of qualities and habits that the employee might exhibit			
	include	,	Year 2 Ratir	Ig
	• Adjust the communication approach for the target audience,			
	purpose, and situation to maximize impact			
	 Organizes messages/information in a logical and helpful manner Speaks clearly and writes legibly 			
	 Speaks clearly and writes legibly Models behaviors to show active listening 			
	 Applies what was read to actual practice 			
	 Asks appropriate questions for clarity 			
3.	Collaborates with others	•	Year 1 Ratir	g
	Examples of qualities and habits that the employee might exhibit			
	include	•	Year 2 Ratir	Ig
	Works effectively in teams with people of diverse backgrounds			
	regardless of sex, race, ethnicity, nationality, sexuality, religion, political views, and abilities			
	 Shares responsibility for collaborative work and decision making 			
	 Uses the problem-solving process to work to work through 			
	differences of opinion in a constructive manner to achieve a			
	reasonable compromise			
	Avoids contributing to an unproductive group conflict			
	• Shares information and carries out responsibilities in a timely			
	manner			
4	National and a second second second		leas 1 Detin	-
4.	Maintains composure under pressure Examples of qualities and habits that the employee might exhibit		Year 1 Ratin	
	include			
	Uses critical thinking to determine the best options or outcomes		Year 2 Ratin	
	when faced with a challenging situation			
	Carries out assigned duties while under pressure			
	• Acts in a respectful, professional, and non-offensive manner			
	while under pressure			
	Applies stress management techniques to cope under pressure			
5.	Demonstrates integrity		Year 1 Ratir	ng l
5.	Examples of qualities and habits that the employee might exhibit			
	include			
	Carries our responsibilities in an ethical, legal and confidential		Year 2 Ratin	
1	manner			
	 Responds to situations in a timely manner 			
	 Responds to situations in a timely manner Takes personal responsibility to correct problems Models behaviors that demonstrate self-discipline, reliability, 			
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6. Performs quality work	,	Year 1 Ratir	Ig
Examples of qualities and habits that the employee might exhibit			
include	,	Year 2 Ratin	g
Carries out written and verbal directions accurately			
Completes work efficiently and effectively			
Preforms calculations accurately			
 Conserves resources, supplies, and materials to minimize costs and environmental impact 			
 Uses equipment, technology, and work strategies to improve 			
workflow			
Applies problem-solving strategies to improve productivity			
Adheres to worksite regulations and practices			
Maintains an organized work area			
7. Provides quality goods or services (internal and external)		Year 1 Ratir	Ig
Examples of qualities and habits that the employee might exhibit			
include	,	Year 2 Ratin	Ig
 Shows support for the organizational goals and principles by 			
 own personal actions Displays a respectful and professional image to customers 			
 Displays an enthusiastic attitude and desire to take care of 			
customer needs			
Seeks out ways to increase customer satisfaction			
 Produces goods to workplace specifications 			
8. Shows initiative and self-direction		Year 1 Ratir	_
Examples of qualities and habits that the employee might exhibit include			
 Prioritizes and carries out responsibilities without being told 		Year 2 Ratir	
 Responds with enthusiasm and flexibility to handle tasks that 			
need immediate attention			
Reflects on any unsatisfactory outcome as an opportunity to			
learn			
 Improves personal performance by doing something different or differently 			
Analyzes how own actions impact the overall organization			
Supports own action with sound reasoning and principles			
Balances personal activities to minimize interference with work			
responsibilities			
9. Adapts to change		Year 1 Ratir	σ
Examples of qualities and habits that the employee might exhibit			
include		Year 2 Ratir	
Shows flexibility and willingness to learn new skills for various			
job roles			
Uses problem-solving and critical-thinking skills to cope with			
changing circumstances			
 Modifies own work behavior based on feedback, unsatisfactory 			
outcomes, efficiency, and effectivenessDisplays a "can do" attitude			
- Displays a call up attitude			

10.	 Demonstrates safety and security regulations and practices <i>Examples of qualities and habits that the employee might exhibit include</i> Follows personal safety requirements 		Year 1 Ratir	ng
	 Maintains a safe work environment Demonstrates professional role in an emergency Follows security procedures Maintains confidentiality 			
11.	Applies job-related technology, information, and media		Year 1 Ratir	
	Examples of qualities and habits that the employee might exhibit include			
	Applies technology effectively in the workplace		Year 2 Ratir	
	 Assesses and evaluates information on the job 			
	 Assesses training manuals, website, and other media related to the job 			
12.	Fulfills training or certification requirements for employment		Year 1 Ratir	ng
	Examples of qualities and habits that the employee might exhibit			
	include		Year 2 Ratir	ng
	 Participation in required career-related training and/or educational programs Passing certification tests to qualify for licensure and/or certification 			
	Participation in company training or orientation			
13.	Sets personal goals for improvement	,	Year 1 Ratir	ng
	Examples of qualities and habits that the employee might exhibit			
	include		Year 2 Ratir	ng
	 Setting work-related goals that align with the organization's mission Identifying strategies to reach goals Reflecting on goal progress to regularly evaluate and modify 			
	 Setting goals that are specific and measurable Setting work-related goals that align with the organization's mission Identifying strategies to reach goals 			

MANUFACTURING FUNDAMENTALS COMPETENCIES

Machining youth apprentice must complete a total of **21 competencies**. All **7** Manufacturing Fundamentals Competencies must be complete in Year 1. No substitutions to this list. **Thirteen** of the 14 Machining competencies listed below must be complete each year. Second year youth apprentices must select a minimum of 1 different manufacturing process, indicated below. Employers can substitute up to 1 competency with another occupationally appropriate skill. Substitutions must be added to the competency list for assessment. Note that where necessary, skills can be simulated.

***Students who completed a previous Manufacturing YA program do *not* need to repeat the Manufacturing Fundamentals Competencies

Rating Scale

3: Exceeds entry level criteria | Requires minimal supervision | Consistently displays this behavior
2: Meets entry level criteria | Requires some supervision | Often displays this behavior
1: Needs improvement | Requires much assistance and supervision | Rarely displays this behavior

MANUFACTURING FUNDAMENTALS – Complete all competencies

	Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
			2	3	
1. Fe • • •	production process satisfy internal and external customer expectations collaborate with team				

	Competency and Rating Criteria		Rating of 2 Check Rating	
		1	2	3
2.	 Use various instruments consider the degree of precision required by the part feature choose correct measuring instrument for task verify equipment is available for use and in working order verify equipment preventative maintenance and/or calibration inspect tools and work area for safety considerations clean and adjust measuring instrument prior to use use gauges, calipers, and micrometer instruments use semi-precision and precision layout tools use digital gauges, checking fixtures use digital scales, thermometers confirm measurement accuracy record measurement correctly including unit of measurement at proper interval calibrate, clean, and store measuring instruments properly convert standard to metric – metric to standard measurement units 			
3.	 Operate tools and equipment safely operate only tool/equipment that he/she is trained on choose correct tool/equipment for the task follow tool check list verify tool/equipment is available for use and in working order verify tool/equipment is current for preventative maintenance and/or calibration wear appropriate Personal Protective Equipment (PPE) inspect tool/equipment and work area for safety considerations prepare tool/equipment for safe operation operate tool/equipment for safe operation while operating compare tool/equipment performance regularly to optimal equipment operations follow facility procedures for clean-up and shut down after use perform required preventative maintenance procedures report abnormal tool/equipment conditions properly shut down and label any tool/equipment that is not operating as expected follow Lock Out/Tag Out procedures as applicable document use and maintenance 			

	Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3	
4.	 Practice quality assurance principles inspect materials/piece/product at all stages of production identify quality or condition of materials/piece/product monitor materials, processes, equipment, tools, and products throughout the production process inspect final product/piece to ensure it meets specifications identify and segregate materials and/or product that do not meet specification communicate with work site professional if materials/product do not meet requirements document all quality checks participate in root-cause analysis of process/product take ownership of work collaborate with work site professional on corrective action 				
5.	 Follow personal safety requirements (safety) participate in required safety training follow all worksite guidelines for personal safety apply principles of proper body mechanics report exposures, injuries, near misses, or accidents, personal or to others immediately locate key information on safety data sheets (SDS) handle and dispose of any hazardous materials appropriately operate equipment that he/she is trained on adhere to equipment safety standards visually inspect equipment before operation wear required personal protective equipment (PPE) at all times follow company emergency action plan identify hazardous conditions and restricted areas in the workplace avoid pinch points be aware of surroundings 				

	Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3	
6.	 Maintain a safe work environment (safety) comply with posted safety warnings and symbols identify unsafe conditions and/or work habits report unsafe conditions and/or work habits help maintain a clean and safe working environment free of debris and obstacles maintain clean, organized work area use hazardous materials according to company procedure report any indications of insects or pests, if necessary follow appropriate Lock out – tag out procedures adhere to Occupational Safety and Health Administration (OSHA) safety guidelines follow rules for operating equipment (Powered Industrial Vehicle-PIV) identify applicable Emergency Stops 				
7.	 Demonstrate professional role to be used in an emergency (safety) participate in emergency safety simulations and drills describe company's policy and procedures for work site incidents, accidents, electrical, fire, tornado, bomb threats, robbery, hostage situations, and other emergency situations identify the closest fire alarms and emergency exits identify the fire extinguishers identify appropriate alarms and procedures for using alarms contact emergency personnel in the event of an emergency contribute to emergency incident documentation 				
Con	nments:				

MACHINING COMPETENCIES

Select the Machining Process and circle the applicable year:

- □ Manual Machining (Drilling, Lathe, Grinding) completed during year: Year One or Two
- □ Mill/Lathe Combination completed during year: Year One or Two
- □ CNC completed during year: Year One or Two
- Other: _____: Year One or Two

Rating Scale

3: Exceeds entry level criteria | Requires minimal supervision | Consistently displays this behavior

2: Meets entry level criteria | Requires some supervision | Often displays this behavior

1: Needs improvement | Requires much assistance and supervision | Rarely displays this behavior

	Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3	
1.	Read machining technical drawings and work orders		Year 1 Ratir	ng	
	review technical drawing				
	 gather reference materials 		Year 2 Ratir	ng	
	 determine type of print and views 				
	determine material specifications				
	 determine critical dimensions and tolerances 				
	analyze supplementary data				
	determine machining instructions and specifications				
	 interpret machining symbols and procedure 				
2.	Interpret machining symbols and procedures	Year 1 Rating			
	 interpret technical drawings accurately for machining 				
	tasks		Year 2 Ratir	ng	
	use appropriate terminology				
	 identify lines, views, symbols, and representations on the drawings 				
	 interpret dimensions, tolerances, and scale on the drawings 				
	 interpret threads, tapers, and shop notes on the drawings 				
	• interpret the machining plan from a technical drawing				
3.	Perform safety checks	Year 1 Rating			
	 review machining procedure to be used 				
	 review safety requirements of equipment procedure 		Year 2 Ratir	ng	
	 verify safety equipment needed for machining process 				
	 verify personal protective equipment (PPE) needed for machining process 				
	 inspect tools and work area for safety considerations 				
	examine equipment labeling and safeguarding				

		Minimum Rating of 2 for EACH		
	Competency and Rating Criteria		Check Ratin	
4	Oncursto mochining equipment	1	2 Veer 1 Detir	3
4.	Operate machining equipment		Year 1 Ratir	
	 wear the required -personal -protective -equipment (PPE) cucle equipment 			
	cycle equipment constant cofely		Year 2 Ratir	с —
	operate equipment safely			
	 operate equipment according to machine requirements 			
_	monitor equipment for correct operation while operating			
5.	Monitor machining product and process specifications		Year 1 Ratir	
	monitor piece/product machined for specification			
	monitor the machining and equipment for performance		Year 2 Ratir	-
	 adjust the process for quality and/or productivity 			
	take corrective actions to resolve problems as they occur			
	replenish processing materials			
	test piece/product for function			
	label pieces/products for compliance or non-compliance			
	document quality control checks			
	 grind pieces to specified tolerances 			
	 pieces show no sign of burn marks 			
	 pieces are smooth and free of burrs 			
	notify work site professional of discrepancies			
6.	Process production documents		Year 1 Ratir	
	document processing data			
	 verify fabrication and production documentation is 		Year 2 Ratir	Г —
	completed			
	documentation is legible			
	documentation is complete			
	 documentation is in appropriate format 			
	 documentation is stored or forwarded as required 			
	pieces are correctly stored or staged			
7.	Follow shutdown machining process		Year 1 Ratir	г <u> </u>
	review procedure to be used			
	stop production process		Year 2 Ratir	
	 verify all equipment is shut down safely 			
	 identify any process or equipment maintenance concerns 			
	with the production run			
	 take corrective action to report and correct maintenance concerns 			
8.	Use hand tools		Year 1 Ratir	α
0.	 cut metal stock with a hand hacksaw 			
	 cut threads with hand taps and dies 		Year 2 Ratir	
	 ream holes with hand reamer 			ι <u>ε</u>
	 tap holes using hand tools 			
	 deburr using hand tools 			
	 band material safely 			
	 verify piece(s) meet specification 			
L				1

Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating	
	1	2	3
9. Monitor equipment for correct operation		Year 1 Ratin	-
 review equipment quality measures for trends and 			
problems as required		Year 2 Ratin	•
compare current equipment performance to optimal			
equipment			
 report noted deviations from expected performance ensure equipment is properly labeled 			
 remove inoperative equipment from production 			
 assist work site professional to investigate abnormal 			
equipment			
 assist work site professional to follow up on repaired 			
equipment			
10. Identify set up		Year 1 Ratin	~
 Identify set up review applicable technical drawings, work orders, 			
and/or procedures		Year 2 Ratin	
 plan sequencing, tools, and equipment 			
 identify set up needed 			
• verify production schedule, deadlines, and timeframes			
with worksite professional			
11. Select tools and materials		Year 1 Ratin	
select tools and machining equipment			
 select appropriate work holding devices for work piece and equipment 		Year 2 Ratin	-
 check raw materials needed against work order 			
 verify raw material(s) meet specifications 			
 gather all resources needed at the workstation 			
 notify work site professional of discrepancies 			

Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
	1	2	3	
12. Support set up		Year 1 Ratin	g	
 assemble tools and machining equipment 				
 adjust tools and machining equipment 		Year 2 Ratin	g	
 verify machining equipment is available for use and in working order verify machining equipment is current for preventative maintenance and/or calibration calculate needed control settings check fluid, oil, air, pressure levels set machining equipment parameters install work holding devices so they are secure, aligned, and do not interfere with the machining mount, dress, and balance selected grinding wheel for the operation select appropriate lathe tool bit and holder for lathe 				
 process sharpen lathe punches, drill bits, and chisels stage lathe pieces and raw materials for machining select correct blade or cut-off wheel assure blade is properly sharp and in good condition stage raw material for cut-off 				
13. Verify set up		Year 1 Ratin		
 verify set up meets machining requirements and product 				
 specifications examine first piece/product or production run for visual and/or dimensional specification adjust ensure piece/product meets specification verify repeatability of set up if applicable document set up procedure for repeatability 		Year 2 Ratin		
14. Perform start up		Year 1 Ratin	g	
 review start-up safety procedures 				
 verify correct set up of equipment adjustments 		Year 2 Ratin	g	
inspect piece/productdocument start up procedure				
Competency Substitute (if you replaced a competency above,		Year 1 Ratin	g	
note the competency and rating)				
		Year 2 Ratin	g	
Comments:				

RELATED INSTRUCTION

YEAR 1: Indicate which related instruction courses the youth apprentice completed:

Course Title	Credits	Location

YEAR 2 (If applicable): Indicate which related instruction courses the youth apprentice completed:

Course Title	Credits	Location



Post-Program Completion Survey

Youth Apprenticeship

YA POST-PROGRAM COMPLETION SURVEY

The <u>Post-Program Completion Survey</u> form is to be provided to each student completing the Youth Apprenticeship program to capture information on the student's plans after leaving the program. The form should be filled out during the final meeting between the student, mentor, and Local Youth Apprenticeship Coordinator, when the final checklist if filled out and signed. Information captured on this form must be entered online using the Youth Apprenticeship Online Data Application (YODA) System.

DWD is an equal opportunity employer and service provider. If you have a disability and need assistance with this information, please dial 7-1-1 for Wisconsin Relay Service. Please contact the Division of Employment and Training at 888-258-9966 and press 6 to request information in an alternate format, including translated to another language.



Department of Workforce Development