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| WI Youth Apprenticeship Logo | Manufacturing Processes  Youth Apprenticeship |

# MANUFACTURING processes

Manufacturing Process youth apprentices work with tools, equipment, and processes in various manufacturing industries. Apprentices must adhere to industry safety and security standards.

**Length of Apprenticeship:** One or two years

# occupational Competencies

Manufacturing Processes youth apprentice must complete **a total of** **17** competencies during year 1. All **7** Manufacturing Fundamentals Competencies must be completed. No substitutions to this list. **Ten** Manufacturing Processes competencies must be completed. Employers can substitute up to **1** Manufacturing Processes 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 manufacturing processes youth apprenticeship must select a minimum of 1 different manufacturing process than the first year and indicate it in the appropriate place on this guide.

**Document the Manufacturing 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** | **Manufacturing Processes Competencies** |
| 1. Focus on customer needs 2. Use various instruments 3. Operate tools and equipment safely 4. Practice quality assurance principles 5. Follow personal safety requirements 6. Maintain a safe work environment 7. Demonstrate professional role to be used in an emergency | 1. Read technical drawings and work orders 2. Interpret manufacturing processes 3. Identify set up for manufacturing process 4. Select tools and materials 5. Assist production set up 6. Support set up 7. Operate equipment 8. Monitor product and process specifications 9. Process production documents 10. Follow shutdown process |

# 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

|  |  |
| --- | --- |
| WI Youth Apprenticeship Logo | Manufacturing Processes  Youth Apprenticeship  On-the-Job Learning Performance Standards Guide  (tO BE COMPLETED BY ya cONSORTIUM) |

# 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.

Manufacturing Process(es) selected

Year 1 Competency checklist

Employability Skills checklist (in this OJL Guide) or the DPI Employability Skills Certificate

Related instruction equal to 1 high school credit or at least 3 college credits

Minimum of 450 work hours

**Level Two Requirements**

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

Manufacturing Process(es) selected

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

Minimum of 900 work hours

# Hours

Record the hours the youth apprentice worked.

|  |  |  |
| --- | --- | --- |
| Total Hours Employed | Company Name | Telephone Number |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# Related Instruction

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

|  |  |  |  |
| --- | --- | --- | --- |
| Dual Credit | Course Number and Title | Credits | **Instruction Provider** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

YEAR 2: Indicate which related instruction courses the youth apprentice completed.

|  |  |  |  |
| --- | --- | --- | --- |
| Dual Credit | Course Number and Title | Credits | **Instruction Provider** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# 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 (TO BE COMPLETED BY yA EMPLOYER/MENTOR)

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.

1. If a student has successfully completed a Wisconsin Department of Public Instruction (DPI) State-Certified Cooperative Education, [Co-Op Employability Skill certification](https://dpi.wi.gov/cte/skills-standards/cooperative/portfolios) 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,

1. Completed and rated “Employability Skills” through this YA OJL guide as described below.

|  |  |
| --- | --- |
| **3** | ***Exceeds Expectations:*** Exceeds entry-level criteria; requires minimal supervision; consistently displays this behavior |
| **2** | ***Meets Expectations:***  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** | | |
| --- | --- | --- | --- | --- |
| **Competency and Rating Criteria** | | **Minimum Rating of 2 for EACH**  **Check Rating** | | |
| **1** | **2** | **3** |
| 1. Develops positive work relationships with others.   *Examples of qualities and habits that the employee might exhibit include . . .*   * 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 | |  |  |  |
| 1. Communicates effectively with others   *Examples of qualities and habits that the employee might exhibit include . . .*   * Adjusts 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 * Models behaviors to show active listening * Applies what was read to actual practice * Asks appropriate questions for clarity | |  |  |  |
| 1. Collaborates with others   *Examples of qualities and habits that the employee might exhibit include . . .*   * 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 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 | |  |  |  |
| 1. Maintains composure under pressure   *Examples of qualities and habits that the employee might exhibit include . . .*   * Uses critical thinking to determine the best options or outcomes 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 | |  |  |  |
| 1. Demonstrates integrity   *Examples of qualities and habits that the employee might exhibit include . . .*   * Carries out responsibilities in an ethical, legal and confidential manner * Responds to situations in a timely manner * Takes personal responsibility to correct problems * Models behaviors that demonstrate self-discipline, reliability, and dependability | |  |  |  |
| 1. Performs quality work   *Examples of qualities and habits that the employee might exhibit include . . .*   * Carries out written and verbal directions accurately * Completes work efficiently and effectively * Performs 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 | |  |  |  |
| 1. Provides quality goods or services (internal and external)   *Examples of qualities and habits that the employee might exhibit include . . .*   * 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 | |  |  |  |
| 1. Shows initiative and self-direction   *Examples of qualities and habits that the employee might exhibit include . . .*   * Prioritizes and carries out responsibilities without being told * 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 | |  |  |  |
| 1. Adapts to change   *Examples of qualities and habits that the employee might exhibit include . . .*   * 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 effectiveness * Displays a "can do" attitude | |  |  |  |
| 1. Demonstrates safety and security regulations and practices   *Examples of qualities and habits that the employee might exhibit include . . .*   * Follows personal safety requirements * Maintains a safe work environment * Demonstrates professional role in an emergency * Follows security procedures * Maintains confidentiality | |  |  |  |
| 1. Applies job-related technology, information, and media   *Examples of qualities and habits that the employee might exhibit include . . .*   * Applies technology effectively in the workplace * Assesses and evaluates information on the job * Assesses training manuals, website, and other media related to the job | |  |  |  |
| 1. Fulfills training or certification requirements for employment   *Examples of this requirement may include . . .*   * 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 | |  |  |  |
| 1. Sets personal goals for improvement   *Examples of this requirement may include . . .*   * Setting goals that are specific and measurable * 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 goals | |  |  |  |

**OCCUPATIONAL Competencies**   
(tO BE COMPLETED BY ya employer/mentor)

Youth apprentices must complete a **total of 17** competencies in year 1. All 7 Manufacturing Fundamentals Competencies must be completed in Year 1. No substitutions to this list. Second year youth apprentices must complete a minimum of **8** manufacturing processes competencies and use a minimum of 1 different process. During both year 1 and 2 employers can substitute **1** manufacturing processes competency per year with another occupationally appropriate skill. That skill should be added to the competency list for assessment.

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

**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

If any competencies are rated "1" on the final performance review checklist that is submitted to WI DWD it is considered a failed checklist.

| **Manufacturing Fundamentals Occupational Competencies** | **Ratings** | | |
| --- | --- | --- | --- |
| **Competency and Rating Criteria** | **Minimum Rating of 2 for EACH**  **Check Rating** | | |
| **1** | **2** | **3** |
| 1. **Focus on customer needs**  * identify internal and external customers impacted by the production process * satisfy internal and external customer expectations * collaborate with team * assist work site professional to keep internal and/or external customers informed of project progress and decisions that may affect them * define the impact of the Voice of the Customer * determine the impact of your work to the internal and external customer |  |  |  |
| 1. **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 |  |  |  |
| 1. **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 safely with guarding devices * monitor 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 |  |  |  |
| 1. **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 |  |  |  |
| 1. **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 |  |  |  |
| 1. **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 |  |  |  |
| 1. **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 |  |  |  |
| **Comments**: | | | |

# mANUFACTURING PROCESSES occupational COMPETENCIES (tO bE COMPLETED BY YA employer/mentor)

Enter the Manufacturing Processes practiced by the Youth Apprentice. A minimum of 1 process is required for each year. Year 2 must be different than year 1. Multiple processes per year are acceptable.

|  |  |
| --- | --- |
| **Year 1 Manufacturing Processes** | **Year 2 Manufacturing Processes** |
|  |  |

|  |  |
| --- | --- |
| **Manufacturing Processes Examples** |  |
| **1. Casting**  Examples: Metal, Sand, Die, Plaster, Slush, Static, Centrifugal, Continuous | **5. Forming**  Examples: Forging, Open/Closed Die, Extrusion, Pressing, Punching, Blanking, Drawing, Piercing |
| **2. Conditioning**  Examples: Heat Treating, Annealing, Hardening, Tempering | **6. Jointing/Combining**  Examples: Welding, Brazing, Soldering, Sintering, Adhesive Bonding, Thermosetting, Fastening, Stitching, Stapling, Press-Fitting, Chemical |
| **3. Filing**  Examples: Aseptic, Bottling, Canning | **7. Molding**  Examples: Power Compaction, Sintering, Injection, Blow, Liquid Resin, Thermoforming, Extrusion, Foam, Vacuum Forming, Compression, Shrink Filing |
| **4. Finishing**  Examples: Barrel, Sanding, Deburring, Buffing, Brushing, Polishing, Electropolishing, Chemical Cleaning, Ultrasound Cleaning, Vapor Degreasing, Painting, Coating, Dipping, Electroplating, Engraving, Plating | **8. Separating**  Examples: Cutting, Sawing, Centrifuging, Filtration, Pressing, Distillation, Evaporation, Fractionalization, Chemical |

**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

If any competencies are rated "1" on the final performance review checklist that is submitted to WI DWD it is considered a failed checklist.

| **Occupational Competencies** | **Rating** | | |
| --- | --- | --- | --- |
| **Competency and Rating Criteria** | **1** | **2** | **3** |
| 1. **Read technical drawings and work orders**  * review technical drawings * gather reference materials * determine type of print and views used * determine material specifications * determine critical dimensions and tolerances * analyze supplementary data * determine product/job instructions and specifications * interpret assembly/packaging symbols * follow assembly/packaging procedures | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Interpret manufacturing processes**  * interpret technical drawings for job task * 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 assembly and packaging plan from a technical drawing | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Identify set up for manufacturing process**  * review technical drawings, work orders, and/or procedures * plan process sequencing * identify tools and equipment needed for process * identify set up * verify correct set-up, production schedule, deadlines, and time frames | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Select tools and materials**  * select tools and production equipment for process * select appropriate work holding devices for work piece and equipment * check raw materials needed against work order * verify raw materials meet specifications * gather all resources needed at the workstation * notify work site professional of discrepancies | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Assist production set up**  * assemble tools and production equipment * verify production equipment is available for use and in working order * verify production equipment is current for preventative maintenance and/or calibration * calculate control settings * check equipment fluid, air, pressure levels * set production equipment parameters for the procedure * secure work holding devices * stage pieces and raw materials for production | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Support set up**  * verify set up meets process requirements and product specifications * examine first piece/product or production run for visual and/or dimensional specification * adjust piece/product * verify repeatability of set up * document set up procedure | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Operate equipment**  * wear required Personal Protective Equipment (PPE) * follow equipment safety procedures * operate equipment according to machine requirements * monitor equipment for correct operation * notify work site professional of operating discrepancies | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Monitor product and process specifications**  * monitor product for specification * monitor process and equipment performance * adjust process for quality and/or productivity * take corrective actions to resolve problems * replenish processing materials * test product for function * label products for compliance or non-compliance * document quality control checks * verify pieces meet specifications * notify worksite profession of discrepancies | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Process production documents**  * document processing data on items such as labor, quality, quantity, and time * verify fabrication and production documentation is completed * verify documentation is legible * verify documentation is complete * verify documentation is in appropriate format * verify documentation is stored or forwarded * verify pieces are stored or staged | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| 1. **Follow shutdown process**  * review shutdown procedure * stop production process * verify all equipment is shut down safely * identify process or equipment maintenance concerns with the production run * report process or equipment maintenance concerns | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| **Competency Substitute** (if you replaced a competency above, note the competency and rating) | **Year 1 Rating** | | |
|  |  |  |
| **Year 2 Rating** | | |
|  |  |  |
| **Comments**: | | | |

|  |  |
| --- | --- |
| WI Youth Apprenticeship Logo | Post-Program Completion Survey  Youth Apprenticeship |

# YA Post-Program Completion survey: Employer Feedback

Employers complete the following information. YA Coordinators will enter this into the Post-Program Completion Survey.

|  |  |
| --- | --- |
| **YA Employer Post-Program Completion Questions** | |
| Will you offer or have you offered the Youth Apprentice a continuing position with your company? | Yes  No |
| If continuing position offered to youth apprentice, did they accept? | Yes  No |
| **If yes, please answer the questions below:** | |
| Was the offer for full time or part time work? | Full-time  Part-time |
| Title of the position offered: | |
| What is the wage of the continuing employment offer? | |
| If applicable, will the youth apprentice advance to a Registered Apprenticeship? | |

# YA Post-Program Completion survey: completed by YA consortiuM

The [Post-Program Completion Survey](https://dwd.wisconsin.gov/dwd/forms/dws/detw-18081-e.htm) 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. This **form should be** **completed by the Youth Apprenticeship Coordinator** to capture information from all high school seniors and their employers after successful completion of the Youth Apprenticeship Program.

The form should be completed during the final meeting between the student, mentor, and Youth Apprenticeship Coordinator, when the final checklist or On-the-Job Learning (OJL) Guide is filled out and signed. Information captured on this form must be entered online using the Bureau of Apprenticeship Standards Electronic Records System (BASERS).

No part of this document may be altered, duplicated, or extracted without written consent from the Wisconsin Department of Workforce Development (DWD).

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.

