



# Production Operations

Youth Apprenticeship

## PRODUCTION OPERATIONS

Production Operation youth apprentices gain skills related to the procedures and tools associated with manufacturing operations. Foundation tools, data analysis and troubleshooting are integrated. Apprentices must adhere to industry safety and security standards.

**Length of Apprenticeship:** One Year

## COMPETENCIES

Production Operations youth apprentices must complete a **total of 16** competencies. All **7** Manufacturing Fundamentals Competencies must be complete. No substitutions to this list. **Eight** of the 9 Production Operations competencies listed below must be complete. 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.

Manufacturing Fundamentals Competencies	Production Operations Competencies
<ol style="list-style-type: none"> <li>1. Focus on customer needs</li> <li>2. Use various instruments</li> <li>3. Operate tools and equipment safely</li> <li>4. Practice quality assurance principles</li> <li>5. Follow personal safety requirements</li> <li>6. Maintain a safe work environment</li> <li>7. Demonstrate professional role to be used in an emergency</li> </ol>	<ol style="list-style-type: none"> <li>1. Assist recording and summarizing financial data</li> <li>2. Support coordination of work schedules and duty assignments</li> <li>3. Use quality tools</li> <li>4. Calibrate tools and equipment (W/S)</li> <li>5. Analyze production productivity processes</li> <li>6. Monitor operations for product and process quality</li> <li>7. Support investigation of root causes of product and/or process failure</li> <li>8. Take corrective action to restore or maintain quality</li> <li>9. Participate in quality improvement processes</li> </ol>

W/S = Worksite Experience or In Simulation

## REGISTERED APPRENTICESHIP BRIDGING OPPORTUNITIES

Some of the related instruction courses can bridge into the following registered apprenticeship:

- Industrial Manufacturing Technician

## **POST-SECONDARY PATHWAY OPPORTUNITIES**

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There are several post-secondary pathway opportunities in this area. Following is partial list.

- Industrial Maintenance Mechanic Technical Diploma
- Manufacturing Quality



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## ON-THE-JOB LEARNING PERFORMANCE STANDARDS GUIDE

### YOUTH APPRENTICE INFORMATION

<b>Youth Apprentice Name</b>	
<b>YA Coordinator</b>	<b>YA Consortium</b>
<b>School District</b>	<b>High School Graduation Date</b>

### REQUIREMENTS

#### Requirements

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

- Competency checklist
- Employability Skills checklist (in this job book) 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

### HOURS

Record the hours the youth apprentice worked.

Total Hours Employed	Company Name	Telephone Number

## COMPETENCIES

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\*\*\*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 behavior

### MANUFACTURING FUNDAMENTALS – Complete all competencies

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<b>1. Focus on customer needs</b> <ul style="list-style-type: none"> <li>• Identify internal and external customers impacted by the production process</li> <li>• Satisfy internal and external customer's expectations</li> <li>• Collaborate with team</li> <li>• Assist work site professional to keep internal and/or external customers informed of project progress and decisions that may affect them</li> <li>• Define the impact of the Voice of the Customer</li> <li>• Determine the impact of your work to the internal and external customer</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>2. Use various instruments</b></p> <ul style="list-style-type: none"> <li>• Consider the degree of precision required by the part feature</li> <li>• Choose correct measuring instrument for task</li> <li>• Verify equipment is available for use and in working order</li> <li>• Verify equipment preventative maintenance and/or calibration</li> <li>• Inspect tools and work area for safety considerations</li> <li>• Clean and adjust measuring instrument prior to use</li> <li>• Use gauges, calipers, and micrometer instruments</li> <li>• Use semi-precision and precision layout tools</li> <li>• Use digital gauges, checking fixtures</li> <li>• Use digital scales, thermometers</li> <li>• Confirm measurement accuracy</li> <li>• Record measurement correctly including unit of measurement at proper interval</li> <li>• Calibrate, clean, and store measuring instruments properly</li> <li>• Convert standard to metric – metric to standard measurement units</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>3. Operate tools and equipment safely</b></p> <ul style="list-style-type: none"> <li>• Operate only tool/equipment that he/she is trained on</li> <li>• Choose correct tool/equipment for the task</li> <li>• Follow tool check list</li> <li>• Verify tool/equipment is available for use and in working order</li> <li>• Verify tool/equipment is current for preventative maintenance and/or calibration</li> <li>• Wear appropriate Personal Protective Equipment (PPE)</li> <li>• Inspect tool/equipment and work area for safety considerations</li> <li>• Prepare tool/equipment for safe operation</li> <li>• Operate tool/equipment safely with guarding devices</li> <li>• Monitor tool/equipment for safe operation while operating</li> <li>• Compare tool/equipment performance regularly to optimal equipment operations</li> <li>• Follow facility procedures for clean-up and shut down after use</li> <li>• Perform required preventative maintenance procedures</li> <li>• Report abnormal tool/equipment conditions</li> <li>• Properly shuts down and labels any tool/equipment that is not operating as expected</li> <li>• Follow Lock Out/Tag Out procedures as applicable</li> <li>• Document use and maintenance</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>4. Practice quality assurance principles</b></p> <ul style="list-style-type: none"> <li>• Inspect materials/piece/product at all stages of production</li> <li>• Identify quality or condition of materials/piece/product</li> <li>• Monitor materials, processes, equipment, tools, and products throughout the production process</li> <li>• Inspect final product/piece to ensure it meets specifications</li> <li>• Identify and segregate materials and/or product that do not meet specification</li> <li>• Communicate with work site professional if materials/product do not meet requirements</li> <li>• Document all quality checks</li> <li>• Participate in root-cause analysis of process/product</li> <li>• Take ownership of work</li> <li>• Collaborate with work site professional on corrective action</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>5. Follow personal safety requirements (safety)</b></p> <ul style="list-style-type: none"> <li>• Participate in required safety training</li> <li>• Follow all worksite guidelines for personal safety</li> <li>• Apply principles of proper body mechanics</li> <li>• Report exposures, injuries, near misses, or accidents, personal or to others immediately</li> <li>• Locate key information on Material Safety Data Sheets (MSDS)</li> <li>• Handle and dispose of any hazardous materials appropriately</li> <li>• Operate equipment that he/she is trained on</li> <li>• Adhere to equipment safety standards</li> <li>• Visually inspect equipment before operation</li> <li>• Wear required Personal Protective Equipment (PPE) at all times</li> <li>• Follow company emergency action plan</li> <li>• Identify hazardous conditions and restricted areas in the workplace</li> <li>• Avoid pinch points</li> <li>• Be aware of surroundings</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>6. Maintain a safe work environment (safety)</b></p> <ul style="list-style-type: none"> <li>• Comply with posted safety warnings and symbols</li> <li>• Identify unsafe conditions and/or work habits</li> <li>• Report unsafe conditions and/or work habits</li> <li>• Help maintain a clean and safe working environment free of debris and obstacles</li> <li>• Maintain clean, organized work area</li> <li>• Use hazardous materials according to company procedure</li> <li>• Report any indications of insects or pests, if necessary</li> <li>• Follow appropriate Lock out – tag out procedures</li> <li>• Adhere to Occupational Safety and Health Administration (OSHA) Safety guidelines</li> <li>• Follow rules for operating equipment (Powered Industrial Vehicle PIV)</li> <li>• Identify applicable Emergency Stops</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>7. Demonstrate professional role to be used in an emergency (safety)</b></p> <ul style="list-style-type: none"> <li>• Participate in emergency safety simulations and drills</li> <li>• Describe company’s policy and procedures for work site incidents, accidents, electrical, fire, tornado, bomb threats, robbery, hostage situations, and other emergency situations</li> <li>• Identify the closest fire alarms and emergency exits</li> <li>• Identify the fire extinguishers</li> <li>• Identify appropriate alarms and procedures for using alarms</li> <li>• Contact emergency personnel in the event of an emergency</li> <li>• Contribute to emergency incident documentation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>1. Assist recording and summarizing financial data</b></p> <ul style="list-style-type: none"> <li>• Support processing of financial information such as bills of lading, accounts receivable, and accounts payable records</li> <li>• Calculate and summarize costs</li> <li>• Estimate required resources including staff time, staff training, equipment time, equipment maintenance and repair costs, support services and staff required, facility modifications</li> <li>• Estimate raw materials quantities needed including costs associated with handling, shipping, and transport</li> <li>• Estimate time requirements with times for approvals, delays, and repairs</li> <li>• Build an estimated budget for the production process</li> <li>• Support preparation of financial reports</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>2. Support coordination of work schedules and duty assignments</b></p> <ul style="list-style-type: none"> <li>• Determine amount of staff needed for services</li> <li>• Schedule staff according to hours required, employee status and service coverage required</li> <li>• Schedule staff to minimize labor costs</li> <li>• Incorporate coverage for vacations or leaves</li> <li>• Communicate schedules to staff</li> <li>• Maintain changes to master schedule with worksite professional</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>3. Use quality tools</b></p> <ul style="list-style-type: none"> <li>• Define question/problem to be assessed</li> <li>• Determine data analysis tool</li> <li>• Decide which data needs to be collected</li> <li>• Determine when and how to collect data</li> <li>• Collect data</li> <li>• Organize data using quality tools (i.e. Check Sheet, Pareto Chart, Scatter Diagram, Histogram, etc.)</li> <li>• Analyze data collected</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>4. Calibrate tools and equipment (W/S)</b></p> <ul style="list-style-type: none"> <li>• Follow schedule to calibrate tools and equipment</li> <li>• Check tool/equipment certification documentation</li> <li>• Check tool/equipment certification through observation of use</li> <li>• Clean and adjust instruments before calibrating</li> <li>• Calibrate tools and instruments accurately and correctly</li> <li>• Re-calibrate tools according to procedure</li> <li>• Label tools and equipment that have been calibrated</li> <li>• Document all calibration activities</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>5. Analyze production productivity processes</b></p> <ul style="list-style-type: none"> <li>• Assist work site professional/team to evaluate a production process</li> <li>• Use quality tools</li> <li>• Analyze the process to identify staff, tools, equipment, materials, environment, training, safety requirements, and procedures required to produce product</li> <li>• Calculate productivity and/or cycle time for the process</li> <li>• Assist work site professional/team to identify gaps and brainstorm solutions in productivity</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>6. Monitor operations for product and process quality</b></p> <ul style="list-style-type: none"> <li>• Review process control data to ensure process is meeting product specifications</li> <li>• Assess process cycle time to ensure that customer and facility needs are met</li> <li>• Sample and test materials/products to ensure they meet customer specifications</li> <li>• Regularly compare current equipment performance to optimal equipment operations</li> <li>• Investigate and report abnormal equipment conditions in a timely manner</li> <li>• Monitor equipment correction solved problem</li> <li>• Use quality tools and methods to monitor operations</li> <li>• Document all quality monitoring activities</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>7. Support investigation of root causes of product and/or process failure</b></p> <ul style="list-style-type: none"> <li>• Participate on team investigation</li> <li>• Gather data pertaining to the problem (magnitude, location, timing)</li> <li>• Review relevant data and quality monitoring tools</li> <li>• Develop a description of the problem or process failure</li> <li>• Identify potential contributory relationships</li> <li>• Explore solution options</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>8. Take corrective action to restore or maintain quality</b></p> <ul style="list-style-type: none"> <li>• Apply problem solving steps to reported production issues</li> <li>• Use quality tools</li> <li>• Review previous documentation on similar production issues to identify possible solutions</li> <li>• Create an improvement plan</li> <li>• Determine appropriate action for sub-standard piece/product</li> <li>• Correct the piece/product and/or process to meet quality standards</li> <li>• Communicate quality problems</li> <li>• Suggest continuous improvements to process, piece/product, and/or maintenance to improve production and/or reduce waste</li> <li>• Document corrective actions and outcome</li> <li>• Corrective actions occur in a timely manner</li> <li>• Verify corrective actions are supported by data</li> <li>• Monitor corrective action to validate effectiveness</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>9. Participate in quality improvement processes</b></p> <ul style="list-style-type: none"> <li>• Use quality tools to map a production process</li> <li>• Identify performance and training issues related to quality</li> <li>• Identify performance indicators to monitor</li> <li>• Assist worksite professionals to monitor production operations, equipment, and/or operator performance measures for product and process quality</li> <li>• Review quality measures for trends</li> <li>• Support periodic internal quality audit activities including testing of raw materials, of product at different production stages, and prior to final release</li> <li>• Document the results of quality tests or audits</li> <li>• Support assessment of customer feedback</li> <li>• Participate in the creation of an improvement plan</li> <li>• Outline changes in improvement plan</li> <li>• Support improvement plan with data</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Competency Substitute</b> (if you replaced a competency above, note the competency and rating)</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Comments:</b></p>			