



Professional Skills Record

Machinist

NOC 7231

ACKNOWLEDGEMENTS

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Journeyperson's Handbook

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This handbook is designed to help skilled trades Journeypersons manage the skills and learning of their Apprentices who are using a Professional Skills Record.

1 Why Do I Need this Handbook?

Eighty percent of all learning in a trade happens on the job. This means the apprentice has the responsibility to learn and you, as their journeyperson, have the responsibility to mentor and teach.

Signing off for the learning an apprentice has completed under your supervision is a huge responsibility. With all the skills needed in a trade, it is important that both you and the apprentice have a tool to help you record and sign off on that learning.

2 But We Have Logbooks

When a tradesperson registers as an apprentice in most provinces or territories in Canada, they are given a Logbook.

A Logbook:

- is issued by the apprenticeship authority within a jurisdiction
- is created from the National Occupational Analysis (NOA) in a trade
- is a list of all the general skill areas (**Blocks and Tasks**) in a trade
- records an apprentice's progress in the general skill areas of a trade
- is signed off by a journeyperson to guarantee that an apprentice is performing these tasks to Industry Standard.

A Logbook lists the Blocks and Tasks from the NOA **but** the Interprovincial Red Seal exam and trades training courses in colleges and trade schools use **all** the information in the NOA. This includes the Blocks, Tasks, **Sub-tasks and the Knowledge and Abilities** listed in the NOA.

Each apprentice needs a tool that lists **all** the skills and learning they need in their trade career. Then, if they have one employer or several employers over their entire term of apprenticeship, both the apprentice and the journeyperson know what learning has been completed:

- the journeyperson knows what skills they are signing off to verify what has been taught; and
- the apprentice knows what they need to learn to be successful in their Red Seal exam.

3 What is a National Occupational Analysis (NOA)?

The Canadian Council of Directors of Apprenticeship, which is made up of managers and directors of apprenticeship from every province and territory in Canada, guides a Human Resources and Skills Development Canada (HRSDC) sponsored program to develop NOAs.

Under this partnership, joint planning committees made up of tradespeople who have a Certificate of Qualification, Red Seal endorsement from each province and territory in Canada, come together in Ottawa every four to five years to review and revise the NOA in all of the 45 skilled trades.

Each NOA is accepted as the national standard in that trade. The NOA is then used to:

- identify and group tasks performed by skilled workers in each trade in every province and territory in Canada
- group these tasks by Blocks, Tasks, Sub-tasks, Knowledge, Skills and Abilities (also called "**competencies**") required in a trade
- give information on the breakdown of questions from all sections of the NOA in the Interprovincial Red Seal exam
- create all the questions for the Red Seal exam
- create curriculum for trade school programs and Block Release/Period/Level* programs in a trade.

* *The in-school portion of apprenticeship has several names across Canada. In some provinces and territories it is called Block Release, in others it is called Period Training or Level.*

4 If there is an NOA, why do we need a Professional Skills Record (PSR)?

The NOA is designed to be used for creating curriculum and for developing test questions for the Red Seal exam.

The PSR is designed to be used by an apprentice and a journeyperson in the workplace. The PSR provides a fair and objective assessment tool to record the apprentice's learning and skills.

The PSR has been developed **with** apprentices during a three-year research project on PEI called Trade Essentials. Recommendations made by the apprentices who tested the tool have been built into the document.

The PSR was then validated by teams of tradespeople who have a Certification of Qualification, Red Seal endorsement in each trade who came together and discussed what an apprentice is expected to learn from their journeyperson in the workplace.

The apprentice has the main responsibility for completing the PSR. It is designed as a self-assessment tool so the apprentice can keep track of his/her skills and learning and make plans to fill any technical skills training gaps.

The PSR takes information from the NOA and:

- lays it out in a chart
- lists the percentage and number of questions for the Red Seal exam from each task on every page
- takes the skills from the NOA and describes them in terms of what a tradesperson does on the job, for example:
 - In the **NOA**, the skill says – “knowledge of blueprints and drawings”
 - In the **PSR**, the skill says – “read and interpret blueprints and drawings”
- has a rating chart so the apprentice can judge his/her level of learning and have it all recorded for you to review
- provides you, the journeyperson, with a tool to discuss details of an apprentice's skill areas that are great and areas that may need to improve
- helps the apprentice make a plan so he/she can improve skills
- helps you know what skills you still have to teach the apprentice.

5 Am I expected to teach all the skills in a PSR?

No. A PSR contains **all** the skills and learning a tradesperson has to learn over all their years as an apprentice. You, as their journeyperson, can help make this tool useful by completing the sign-off on the learning and skill you know they have. Some of the ways you can assess the skills your apprentice has are:

- **OBSERVATION** – you watch them use their knowledge, skills and abilities or competencies to perform a task or sub-task

For example, you ask them to select a tool for a specific job, then watch them use that tool to do a task.

- **INTERVIEW** – you have a discussion with your apprentice to find out if they can demonstrate an understanding of what they are doing

For example, you ask them to tell you about any safety precautions that have to be followed before they start a certain task.

- **DOCUMENTATION** – an apprentice may have a document that provides proof of skills they already have. You can use the PSR to sign-off on tasks the document covers. The document or certificate could be from:

- another employer,
- a trade school or college,
- an industry training course,
- another province or territory,
- or even from another country.

For example, you need all your employees to be trained in WHMIS. A new apprentice you just hired shows you a WHMIS certificate he/she have from a job they were working on a couple of months ago in northern Canada.

Apprentices will also tell you, through their self-assessments, the best way they think they can prove the skills they have. This can help guide you, as their mentor, to choose a way to assess your apprentice that works best for both of you.

6 Are there any tips on how to be a good mentor to my apprentice?

Mentoring has always been the foundation of apprenticeship. In trades, a mentor is a person who has a great deal of learning and skills from experience in a trade who helps a less experienced person by guiding, teaching and sharing their skills and learning.

Along with having learning and experience in their trade, the most successful mentors are:

- **Patient** - and understand the apprentice needs time to learn and practise their skills to become as good as their mentor.
- **Organized** - and set a schedule to meet regularly with their apprentice to track their learning and make plans for new learning.
- **Positive** – and supportive in helping an apprentice tackle new learning and encourage them to keep working on skills they find difficult to learn.
- **Respectful** – so that other employees in the workplace accept the apprentice and are willing to help and encourage the new apprentice.

As a mentor, you are a role model for your apprentice. To create a successful relationship between you and your apprentice you can:

- **Lead by example.** If you set safety and quality assurance as firsts on your list each and every day, so will your apprentice.
- **Build trust.** If you want your apprentice to trust and respect you, you can show trust in them by assigning them some responsibility as soon as you see an opportunity.
- **Communicate.** Communication is a two-way street. Be willing to listen as you give directions and be available to your apprentice when they need you. Always treat every question seriously. If your apprentice has the confidence to ask, it is important to give a respectful answer.
- **Be reliable.** Your apprentices need to know they can depend on you when they run into a problem. Create supportive relationships with other employees so if you are away from the workplace, your apprentice feels confident in approaching another employee for help.

6.1 Tips

- **Give clear instructions.** When assigning a task and giving direction, give step-by-step instructions, then ask your apprentice to repeat the instructions. This gives them the opportunity to ask questions on things that might not be clear to them.

Checklist for giving instructions:

- ✓ **explain the task**
 - ✓ **show them how it is done**
 - ✓ **answer their questions**
 - ✓ **oversee the work**
 - ✓ **give them time to practise**
 - ✓ **give feedback on how they are doing**
 - ✓ **take time to show them how to do the task better**
- **Give feedback.** Giving feedback often helps your apprentice to have a clear understanding of what you want them to do and how you want them to perform. The PSR helps you to give feedback because each knowledge, skills and ability (competency) statement is clear.

There are three types of feedback that work best in the workplace:

Positive feedback means you want your apprentice to continue what they are doing. People are motivated by hearing they are doing a good job. They usually do more and try harder.

Constructive feedback means you want your apprentice to change how or what they are doing. Offering support and guidance to your apprentice to make the changes you need usually brings the best results.

Direct feedback focuses on what you have seen, not on secondhand information. Focus on how the apprentice is doing and what you have planned for them to do.

- **Give your apprentice experience in many skills.** Sometimes apprentices end up performing the same set of skills over and over again because they are really good at them. They are required to learn the scope of the entire trade during their apprenticeship. If you have the capability, it would be helpful to take advantage of the opportunity to cover a wide range of skills by moving your apprentice from one set of skills to another on a regular basis.
- **Track and Document learning.** Every employer cannot offer an apprentice training in every skill in a trade because each workplace is unique. Some workplaces are specialists in one area of a trade.

As a journeyperson, you have the responsibility to sign off on the skills your apprentice learns under your guidance in your workplace. A PSR can help you identify those skills.

Setting a regular review date once every month or two, and keeping that time just for you and your apprentice, can increase their scope in their trade and increase their knowledge which will be an asset in the workplace.

This meeting time gives you the best opportunity to:

- monitor your apprentice's progress,
- make a plan with him/her to learn more skills, and
- find out if there are any problem areas where he/she may need help.

Regular meeting dates also help your apprentice to be prepared and able to track his/her learning. This can be done by using a Professional Skills Record (PSR).

7 So how do I use a Professional Skills Record (PSR) with my apprentice?

The PSR is laid out in a chart. Each skill your apprentice has to learn has an action word to tell them how they are supposed to perform a skill. It gives you a level you can use to judge whether they are performing that skill properly. **Industry standard** is the term used to describe when your apprentice can complete a task to the level and quality of performance required by industry without assistance or supervision.

When you see the words "demonstrate an understanding of," you may find it easier to ask them questions about the skill to make sure they know what they are doing.

PROFESSIONAL SKILLS RECORD (PSR) JOURNEYPerson'S HANDBOOK

Your apprentice has the responsibility to complete the "Knowledge, Skills and Abilities – Competencies" section.

When you are sure your apprentice has proven to you they have completed the learning they say they have, you verify it by initialing the sub-task.

Trade Name IP Exam – 125 Questions BLOCK A 5% - 6 questions on the IP <u>Learning Category</u> OCCUPATIONAL SKILLS
Task 1 – A 3 questions on the IP exam <u>Learning Outcome</u> Uses and maintains tools and equipment
Journeyperson Sign-off Task 1 <div style="display: flex; justify-content: space-between; align-items: center;"> Complete <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/> </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 10px;"> Incomplete <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/> </div>



Knowledge, Skills and Abilities - Competencies

SUB-TASK 1.01 <u>Learning Objective</u> Uses hand tools JP Sign-off ____	1.01.01 Identify boring tools <div style="display: flex; justify-content: space-between;"> Rating ____ Complete </div> <div style="display: flex; justify-content: space-between;"> Proof ____ <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/> </div> <div style="display: flex; justify-content: space-between;"> Use ____ <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/> </div>	1.01.02 Identify hand cutting tools <div style="display: flex; justify-content: space-between;"> Rating ____ Complete </div> <div style="display: flex; justify-content: space-between;"> Proof ____ <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/> </div> <div style="display: flex; justify-content: space-between;"> Use ____ <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/> </div>
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When your apprentice proves to you that he/she has finished enough sub-tasks to have a good grasp of the task, you verify that learning by initialing "complete".



If your apprentice has not completed enough sub-tasks or you do not agree with the ratings they have given themselves, initial "incomplete".

Task I Learning Needs	
Sub-Tasks <u>Learning Objectives</u> to be completed Comments	

Comments

You might

- 

The PSR can help you give a fair assessment of your apprentice's ability to perform each technical skill task. If you are assigned an apprentice from another employer, province, territory or country, you can use the PSR to review his/her skills so you do not waste your valuable time teaching them skills they already know and can do.

PROFESSIONAL SKILLS RECORD

A tool for recording and recognizing skills and learning of trade apprentices

Machinist

NOC 7231

A project of:
The Province of PEI
and
Human Resources and Skills Development Canada



Human Resources and
Skills Development Canada

Ressources humaines et
Développement des compétences Canada

The **Professional Skills Record (PSR)** is a technical skills assessment tool designed to be used in the workplace by an apprentice and a journeyperson. The PSR has taken the content from the National Occupational Analysis (NOA) and arranged it so apprentices can use it to measure their progress in their trade from the time they sign up for apprenticeship through to Red Seal certification.

This PSR has been through a validation process with a team of trade professionals with Certificate of Qualification, Red Seal endorsement, who reached agreement on the wording of each and every knowledge and skill (*competency*) to make it measurable.

The PSR was originally designed as a tool to help apprentices move through a Recognition for Skills and Learning (RSL) process so they can receive recognition for skills they have, no matter where they learned them. Through completion of a PSR, they can avoid relearning what they already know and can do by entering the apprenticeship Block/Period/Level in-school process at a higher level. For example, move directly into Block/Period/Level three rather than relearning Block/Period/Level One and Two.

Feedback from testing and validation of the PSR has opened many new possibilities for using this tool. The PSR can be used:

- as a tool for valid assessment in a Recognition for Skills and Learning (RSL) process
- as a tool that new Canadians and people planning to emigrate can use, to assess their skills against Canadian standards, receive recognition for skills they already have and, if necessary, make a plan to fill any technical skill gaps they may still have
- in the secondary-school system and in post-secondary trades training so students can know the full scope of the trade they are entering
- as a tool to guide journeypersons while they are mentoring apprentices so they are aware of all the skills apprentices need to learn to be fully competent in their professional trade designation.

INFORMATION SITES:

PROJECT SITE
www.tradeessentials.ca

CANADIAN RED SEAL SITE
www.red-seal.ca

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Machinist Trade Information

Name: _____ Full Address: _____
Email Address: _____
Phone: Home _____ Work _____ Cell _____

Technical Skills Journey person Assessor/s

Name: _____	Business Name: _____
Phone: Home: _____ Work: _____ Cell: _____	Business Address: _____
Email Address: _____	_____
Name: _____	Business Name: _____
Phone: Home: _____ Work: _____ Cell: _____	Business Address: _____
Email Address: _____	_____
Name: _____	Business Name: _____
Phone: Home: _____ Work: _____ Cell: _____	Business Address: _____
Email Address: _____	_____

Apprenticeship Program Start Date _____ Completion Date: _____ Red Seal Certification Date _____

Apprenticeship Training Officer:

Signature: _____

Provincial/Territorial Apprenticeship Manager:

Signature: _____

Province/Territory: _____

Professional Skills Record (PSR) Development

Professional Skills Record (PSR)

The Professional Skills Record (PSR) is designed as a tool of assessment. Learning and skills are validated through the PSR when they are signed-off by a journeyperson in the trade in which the apprenticeship is being served.

All skills and learning assessed in this PSR are measured against the standards listed in the National Occupational Analysis (NOA). The NOA is recognized by the Canadian Council of Directors of Apprenticeship (CCDA) as the national standard for the occupation of Machinist.

PSR Machinist Document Validation

To conduct a reliable assessment through a formal recognition process, skills and learning statements must be measurable. To assess skills and learning using a PSR in the trades, the Knowledge, Skills and Abilities listed in the NOA have been made into measurable competency statements by adding an “action word.” This action word describes the skill and learning level which must be reached by an apprentice on the job in order to meet industry standards. Each PSR has been validated by a trades team, all of whom hold a Certificate of Qualification with Red Seal endorsement, and who reached consensus on each action word used in every knowledge, skill and ability statement.

Where Technical Trade Learning Happens

This Professional Skills Record (PSR) records and recognizes directly related trade technical skills and knowledge learned through:

- **Formal Learning** – structured learning that occurs in formal education and training institutions (for example, high school, trades school, apprenticeship programs, registered union and industry training programs)
- **Non-formal Learning** – learning that happens through planned, structured training or education outside the formal education system (for example, workshops, seminars, community school)
- **Informal/Experiential Learning** – learning that results from experience, occurs outside a structured environment, and is controlled by the learner (for example, experience on-the-job, volunteer work, self-study and life experiences). Informal or experiential learning must be current and essential to the trade.

Definitions: Adopted and/or interpreted from Work-related Informal Learning: Research and Practice in the Canadian Context, CAPLA 2008

Academic Trade Certification Requirement

Trade Designation: Machinist National Occupational Classification (NOC) 7231

One of the following prerequisites must be met before writing the Interprovincial Red Seal exam: an academic Grade 12 certificate or a General Education Diploma (GED) or successful assessment in the following Essential Skills.

Essential Skills common to all trades are listed in Appendix B of this document. Specific Essential Skills for the Machinist trade are listed on the Red Seal website: www.red-seal.ca. (Once on that site, you will find the Essential Skills Profiles under “National Occupational Analysis.”)

A document can prove valuable learning that is recognized by industry and learning institutions.
Record and save every document earned in industry, trade school or union.

Document Record							
Document Name	Issued By	Place Issued	Date Issued	Evidence of recognition for:			Recognition Awarded
				Block/s <u>Learning Category/s</u> Completed	Task/s <u>Learning Outcome/s</u> Completed	Academic Requirement	

Prior Learning Assessment and Recognition (PLAR). . . Recognition for Skills and Learning (RSL)

PLAR is a formal recognition process in which a variety of tools are used to help people identify, demonstrate and receive recognition for skills and learning they have from the workplace, educational institutions, credentialing organizations or regulatory bodies.

The **Professional Skills Record (PSR)** is a tool designed to assist a trades apprentice to record skills and learning, and then receive recognition for the skills and learning through a PLAR trades process called:

RECOGNITION FOR SKILLS AND LEARNING (RSL)

Traditionally, 80% of learning in a trade happens in the workplace. Through a **Recognition for Skills and Learning (RSL)** process, an apprentice can advance in a trade when they prove they have the required hours, skills and learning for that trade. Proof of skills and learning is **recorded** by the apprentice in a **PSR** and **verified** when signed-off by a journeyperson in that trade.

Through the completion of a **PSR**, an apprentice can avoid relearning what they already know and can do. Through an **RSL** process, a trade apprentice can submit a PSR for assessment to:

- advance in Block/Period/Level in-school training by not having to complete a Block/Period/Level in which proof is provided that skills and learning have already been achieved for that Block/Period/Level.
- transfer common skills from one trade to another - **Skills and learning must be transferred prior to writing the Interprovincial Red Seal exam. The same skills and learning cannot be recognized toward certification in two trades.**
- compare skills and learning in a trade from another country to Canadian standards (**as stated in the National Occupational Analysis**) and receive recognition for the skills and learning that meets Canadian standards.

The following assessment indicators (Rating, Proof, Use) have been developed to help record and then assess skills and learning in accordance with the standards of the trade outlined in the National Occupational Analysis (NOA).

Assessment Standard ONE		
Rating: Self-assessment performance rating in the workplace		
Workplace Performance	Rating	Examples of Workplace position/s
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to meet or shorten task timelines - beyond the expected level and quality of performance required by industry - can manage, lead and train others to perform this task and series of sub-tasks 	6	Journeyman with a Certificate of Qualification, Red Seal endorsement and/or Gold Seal tradesperson who is an expert in their field <ul style="list-style-type: none"> - Project Manager/Foreman - Highly skilled and experienced Manager/Supervisor - Expert who comes from industry to serve as an instructor in a trades training program
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to meet or shorten task timelines - to the highest level and quality of performance required by industry - take the initiative to respond to unexpected situations when they arise and supervise others 	5	Highly skilled and experienced journeyman with a Certificate of Qualification, Red Seal endorsement to whom co-workers turn for direction and help
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to meet task timelines - to the highest level and quality required by industry without supervision 	4	Experienced, skilled journeyman with a Certificate of Qualification, Red Seal endorsement
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to the level and quality required by industry without assistance or supervision 	3	Newly certified journeyman with a Certificate of Qualification, Red Seal endorsement
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to the required level and quality of performance with direction, some assistance and supervision 	2	Apprentice working under the direction of a journeyman with a Certificate of Qualification, Red Seal endorsement
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to the required level and quality of performance with assistance and constant supervision 	1	A helper or new apprentice who must work directly under the constant supervision of a journeyman with a Certificate of Qualification, Red Seal endorsement

Proof: Self-assessment options to prove skills and learning have been achieved

Type of Proof – Observation ... Interview ... Documentation

Observation

When you choose “Observation” to prove that you can perform a task, the person who verifies your work must be Red Seal Certified in the trade in which you are an apprentice.

Interview

When you choose “Interview” to prove that you can perform the task, the person who verifies your work must be Red Seal Certified in the trade in which you are an apprentice. In the case of a panel, at least one person on the panel must be Red Seal Certified in the trade in which you are an apprentice.

Documentation

When you choose “Documentation” to prove that you can perform a task, the document must be from a certified training school or from an industry training course. Course content must be part of the requirements of your trade. If the document is from another country, it must be verified as equivalent to Canadian requirements in the trade.

NOTE: Gather all your documents and keep them with your PSR.

Assessment Standard THREE

Use: Self-assessment rating to help make a plan for additional learning and skill updates needed to be successful in achieving goals in a trade

Use of Knowledge, Skills and Abilities –	1 Daily	2 Often	3 Seldom	4 Never
------------------------------------------	---------	---------	----------	---------

Show how often you use a skill. This will help you to know:

- ♦ what skills you do well because you do them on a regular basis
- ♦ what skills you have to update if you want to transfer to another employer or move to another province or territory
- ♦ what skills you have to get from a training school, industry program or other employer

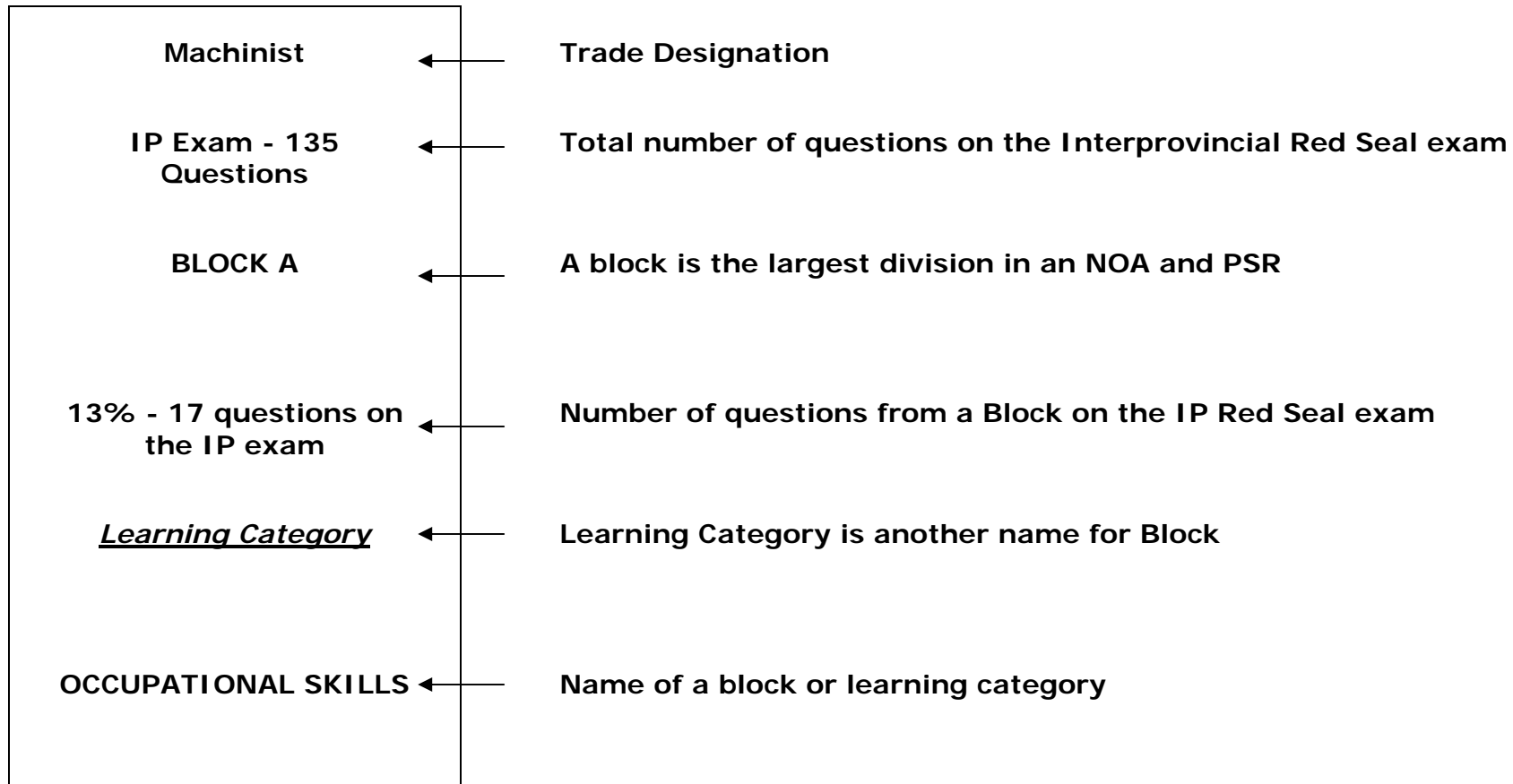
Completing this PSR can help you:

- ♦ know the full scope of your trade by exploring all the technical skills in your trade
- ♦ highlight the skills you already have
- ♦ identify any gaps that you may have to fill so you can be successful in writing your Interprovincial Red Seal certification exam
- ♦ create a plan you can follow to fill these technical skills gaps

Professional Skills Record (PSR) Components

Information from the National Occupational Analysis (NOA) is the foundation document for the Professional Skills Record (PSR). The PSR has been designed so that information is easily found to help a trade apprentice take control and direct his/her own individual skills and learning path.

Information in the PSR includes:



Professional Skills Record (PSR) Components (cont'd)

Task 1 – A

**7 questions on the
IP exam**

Learning Outcome

**Uses tools and
equipment**

Task Number and Block/Category (letter number)

Number of questions on the IP Red Seal exam from the task

Learning Outcome is another name for a task

Task or learning outcome description

Journey person
Sign-off
Task 1

Complete ☐

Incomplete ☐

Journey person's initials verify that an apprentice can perform the task to industry standards.

Journey person's initials indicate "incomplete" when the apprentice requires more work because the task is not being performed to industry standards.

Professional Skills Record (PSR) Set-up (cont'd)

Task 1 Learning Needs
Sub-Tasks <u>Learning Objectives</u>
To be completed
Comments

Journeyperson lists any Sub-Tasks (Learning Objectives that an apprentice must improve before they can have their Task (Learning Outcome) signed off).

←
When completed, this column becomes a learning plan for the apprentice.

Sub-Task 1.02
<u>Learning Objective</u>
Uses power tools
JP Sign-off _____

← Sub-Task Number

← Learning Objective is another name for sub-task

← Sub-task or learning objective description

← Journeyperson assesses and signs off when the apprentice can perform a sub-task or learning objective to industry standard

How to Self-Assess Skills and Learning Using a PSR

For easier use, the self-assessment charts have been shortened into an assessment key which is located at the top of each two-page section in a PSR. The "3" rating is considered "Industry Standard."

RATING:

- 6 - Expert perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

TYPE OF PROOF:

O - Observation I - Interview D - Documentation

USE:

1 – Daily 2 – Often 3 – Seldom 4 - Never

How to Record Skills and Learning Using a PSR

Self-assessment takes place where the learning of skills takes place in each of the Knowledge, Skills and Abilities. (Knowledge, Skills and Abilities can also be called Competencies).

1.02.01

Implement application of all power tools such as electric, pneumatic and hydraulic portable

← Skill and Learning that must meet industry standard.

Rating 5

← Choose and insert a number from the RATING key that best describes your level of performance in the workplace.

Proof I

← Choose and insert a letter from the PROOF key that indicates your best choice to provide proof that you have this knowledge, skill and ability in the trade.

Use 2

← Choose and insert a number from the USE key that indicates how often you use the knowledge, skills and ability (competency).

Complete



← Insert a check mark in the box to indicate completion of the competency to industry standard.

Tips to making sure you get recognition for all your skills and learning:

- take your **time** when you are working on your PSR
- do not try to complete **too much** at any one time
- be **fair and honest** with yourself; remember, this is a **self-assessment** tool
- **focus** on each task (*learning outcome*) and sub-task (*learning objective*)

Machinist
IP Exam - 135 Questions

BLOCK A
13% - 17 questions on the IP exam

Learning Category
OCCUPATIONAL SKILLS

Task 1 - A
7 questions on the IP exam

Learning Outcome
Uses tools and equipment

Journeyperson
 Sign-off
 Task 1

Complete ☐

Incomplete ☐

Task 1
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
 2 - Complete a task with some assistance and supervision
 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 1.01 <u>Learning Objective</u> Uses hand tools JP Sign-off _____	1.01.01 Demonstrate the application of all types of hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.02 Convert between imperial and metric systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.03 Apply hand-eye coordination Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.04 Organize hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.05 Maintain hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	1.01.06 Store hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.07 Recognize worn, damaged or defective hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			
SUB-TASK 1.02 <u>Learning Objective</u> Uses power tools JP Sign-off _____	1.02.01 Demonstrate the application of all types of power tools such as electric, pneumatic and hydraulic Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.02 Determine and follow appropriate operating procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.03 Apply hand-eye coordination Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.04 Organize power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.05 Maintain power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	1.02.06 Store power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.07 Recognize worn, damaged or defective power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 1 - A
(cont'd)**

Learning Outcome
Uses tools and equipment

**Task 1
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 1.03 <u>Learning Objective</u> Uses measuring tools JP Sign-off _____	1.03.01 Use all types of measuring devices such as micrometers, vernier calipers, gear tooth verniers, protractors, sine bars and gauge blocks Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.02 Convert between imperial and metric systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.03 Organize measuring devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.04 Maintain measuring devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.05 Store measuring devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	1.03.06 Recognize worn, damaged or defective measuring tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 1.04 <u>Learning Objective</u> Uses hoisting, lifting and rigging equipment JP Sign-off _____	1.04.01 Recognize all types of hoisting and lifting equipment such as jacks, chain hoists and overhead cranes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.02 Determine applications of hoisting, lifting and rigging procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.03 Determine limitations of lifting equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.04 Perform hoisting and lifting equipment maintenance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.05 Communicate using hand signals Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	1.04.06 Recognize worn, damaged or defective hoisting and lifting equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 1 - A
(cont'd)**

Learning Outcome
Uses tools and equipment

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
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 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

**Task 1
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 1.05 <u>Learning Objective</u> Uses layout tools and equipment JP Sign-off _____	1.05.01 Demonstrate the application of all types of layout tools and equipment such as height gauges, angle plates, scribes and surface tables Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.05.02 Convert between imperial and metric systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.05.03 Organize layout tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.05.04 Maintain layout tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.05.05 Store layout tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	1.05.06 Recognize worn, damaged or defective layout tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 1.06 <u>Learning Objective</u> Uses personal protective equipment (PPE) and safety equipment JP Sign-off _____	1.06.01 Select and use all types of PPE such as respiratory, hearing, eye and body protection Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.06.02 Determine approved PPE and safety equipment operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.06.03 Follow workplace safety and health regulations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.06.04 Establish location of PPE and safety equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.06.05 Inspect and maintain PPE and safety equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	1.06.06 Store PPE and safety equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.06.07 Recognize worksite hazards Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.06.08 Recognize worn, damaged or defective PPE and safety equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

Task 1 - A
(cont'd)

Learning Outcome
Uses tools and equipment

Task 1
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies					
<div> <div>SUB-TASK 1.07</div> <div> <u>Learning Objective</u> Uses basic welding equipment </div> <div>JP Sign-off _____</div> </div>	<div> <div>1.07.01</div> <div>Demonstrate the application of all types of welding equipment such as oxyacetylene and metal inert gas (MIG)</div> <div> Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____ </div> </div>	<div> <div>1.07.02</div> <div>Determine basic welding operating procedures</div> <div> Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____ </div> </div>	<div> <div>1.07.03</div> <div>Perform basic welding and heating applications such as bending, heat treating and tacking</div> <div> Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____ </div> </div>	<div> <div>1.07.04</div> <div>Apply hand-eye coordination</div> <div> Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____ </div> </div>	<div> <div>1.07.05</div> <div>Organize welding equipment</div> <div> Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____ </div> </div>
	<div> <div>1.07.06</div> <div>Maintain welding equipment</div> <div> Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____ </div> </div>	<div> <div>1.07.07</div> <div>Store welding equipment</div> <div> Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____ </div> </div>	<div> <div>1.07.08</div> <div>Recognize worn, damaged or defective welding equipment</div> <div> Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____ </div> </div>		

Task 2 - A
4 questions on the IP exam

Learning Outcome
Organizes work

Journey person
Sign-off
Task 2

Complete ☐
Incomplete ☐

Task 2
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 2.01 <u>Learning Objective</u> Interprets documentation JP Sign-off ____	2.01.01 Interpret first and third angle projection Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.01.02 Translate symbols such as surface finishes, scales and tolerances Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.01.03 Read and interpret types of documentation such as work orders, technical data and reference manuals Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.01.04 Use reference material such as Machinery's Handbook, tool specifications and material specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.01.05 Read and interpret drawings such as blueprints, engineering drawings and sketches Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 2.02 <u>Learning Objective</u> Plans sequence of operation JP Sign-off ____	2.02.01 Determine machining operations such as turning, milling and grinding Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.02 Determine material characteristics such as composition, properties, application and machinability Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.03 Estimate time required to complete each operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.04 Recognize heat treatment required Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.05 Plan work procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	2.02.06 Prioritize operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 2 - A
(cont'd)**

Learning Outcome
Organizes work

**Task 2
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 2.03 <u>Learning Objective</u> Maintains safe work environment JP Sign-off ____	2.03.01 Follow Workplace Hazardous Materials Information System (WHMIS)	2.03.02 Follow federal and provincial/territorial safety regulations such as the Occupational Health and Safety Act (OHSA)	2.03.03 Determine types and operation of fire extinguishing equipment	2.03.04 Comply with disposal and recycling procedures	2.03.05 Determine work hazards such as those associated with the operation of hand and power tools, cutting, grinding and machining equipment
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	2.03.06 Apply work place housekeeping procedures and practices	2.03.07 Utilize absorbent materials	2.03.08 Perform lockout procedures	2.03.09 Recognize potential hazards specific to each machining and work location	2.03.10 Handle and store hazardous materials
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	2.03.11 Organize and maintain a clean and safe work area				
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 2.04 <u>Learning Objective</u> Communicates with others JP Sign-off ____	2.04.01 Communicate using technical terminology	2.04.02 Effectively use verbal and written communications	2.04.03 Use communication equipment and media such as Internet, email and fax	2.04.04 Translate technical information into lay person's terms	2.04.05 Communicate with other related professionals such as engineers, supervisors and co-workers
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	2.04.06 Communicate with other related professionals such as engineers, supervisors and co-workers	2.04.07 Communicate with customers			
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

Task 3 - A
3 questions on the IP exam

Learning Outcome
Processes material

Journeyperson
Sign-off
Task 3

Complete ☐
Incomplete ☐

Task 3
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
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1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 3.01 <u>Learning Objective</u> Selects workpiece material JP Sign-off ____	3.01.01 Analyze types and grades of material Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.02 Determine material characteristics such as composition, properties, application and machinability Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.03 Interpret identification markings such as ASME systems, ANSI systems, colour codes and number systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.04 Assess material measurements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.05 Determine material type and shape required Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	3.01.06 Visually inspect material for faults such as bends, cracks and size deviations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 3.02 <u>Learning Objective</u> Performs layout JP Sign-off ____	3.02.01 Implement layout procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.02 Select layout media such as dyes, paint, markers and coating Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.03 Apply geometry and trigonometry principles Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.04 Use charts and scientific calculators Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 3.03 <u>Learning Objective</u> Marks workpiece for identification JP Sign-off ____	3.03.01 Implement marking procedures such as etching, engraving, colour coding and stamping Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.03.02 Mark workpiece without compromising the integrity of the workplace Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 3 - A
(cont'd)**

Learning Outcome
Processes material

**Task 3
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<div>SUB-TASK 3.04</div> <div>Learning Objective</div> <div>Performs basic heat treatment</div> <div>JP Sign-off _____</div>	<div>3.04.01</div> <div>Demonstrate an understanding of changes to the material structure following the application of heat (Metallurgy)</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.04.02</div> <div>Apply types of heat treatment processes such as hardening, normalizing, annealing and stress relieving</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.04.03</div> <div>Assess tempering colours</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.04.04</div> <div>Perform basic procedures such as flame hardening and quenching</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.04.05</div> <div>Apply hardness tests such as scratch, Brinell and Rockwell</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>
<div>SUB-TASK 3.05</div> <div>Learning Objective</div> <div>Applies material testing</div> <div>JP Sign-off _____</div>	<div>3.05.01</div> <div>Test material after heat treatment (Metallurgy)</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.05.02</div> <div>Recognize types of defects and faults</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.05.03</div> <div>Visually inspect material</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.05.04</div> <div>Perform basic non-destructive testing (NDT) such as dye penetrant</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	
<div>SUB-TASK 3.06</div> <div>Learning Objective</div> <div>Deburs workpiece</div> <div>JP Sign-off _____</div>	<div>3.06.01</div> <div>Demonstrate deburring techniques</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.06.02</div> <div>Use deburring tools such as files, chisels, rotary deburrers, scrapers and abrasive stones</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.06.03</div> <div>Assess and identify burrs and rough edges</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.06.04</div> <div>Remove burrs to meet specifications</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.06.05</div> <div>Secure workpiece</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>
<div>SUB-TASK 3.07</div> <div>Learning Objective</div> <div>Inspects workpiece</div> <div>JP Sign-off _____</div>	<div>3.07.01</div> <div>Apply inspection procedures and techniques such as incoming, in-process and final</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.07.02</div> <div>Assure required dimensions and dimensional accuracy are achieved</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.07.03</div> <div>Apply geometric dimensioning and tolerancing</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.07.04</div> <div>Perform inspection techniques such as visual and manual verification using inspection equipment</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.07.05</div> <div>Measure gears</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>
<div>SUB-TASK 3.08</div> <div>Learning Objective</div> <div>Sketches parts</div> <div>JP Sign-off _____</div>	<div>3.08.01</div> <div>Perform sketching techniques</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.08.02</div> <div>Apply third angle projection techniques</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.08.03</div> <div>Recognize dimensioning practices</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>3.08.04</div> <div>Sketch in third angle projection</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	

Task 4 - A
3 questions on the IP exam
Learning Outcome
Maintains machines and tooling

Journeyperson
 Sign-off
 Task 4

Complete ☐

Incomplete ☐

Task 4
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
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Type of Proof:

- O - Observation I - Interview D - Documentation

Use:

- 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 4.01 <u>Learning Objective</u> Cleans machines JP Sign-off ____	4.01.01 Follow manufacturers' specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.02 Follow cleaning techniques and requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.03 Use appropriate cleaning solvents Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.04 Use cleaning equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.05 Utilize machine lockout procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	4.01.06 Determine sensitive components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.07 Clean chips from inactive machine Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			
SUB-TASK 4.02 <u>Learning Objective</u> Lubricates machines JP Sign-off ____	4.02.01 Follow manufacturers' specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.02 Determine types of lubricants Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.03 Determine lubrication points Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.04 Follow maintenance schedule Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.05 Use lubrication equipment such as grease gun, oil gun and oil feeders Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	4.02.06 Check oil levels Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.07 Perform preventative maintenance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 4 - A
(cont'd)**

Learning Outcome
Maintains machines and tooling

**Task 4
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 4.03 <u>Learning Objective</u> Sharpens tooling JP Sign-off ____	4.03.01 Determine tool geometry such as rake angles, relief angles and chip breakers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.03.02 Determine types of tool sharpening equipment such as tool and cutter, pedestal and drill grinders Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.03.03 Set up grinding equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.03.04 Perform sharpening operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 4.04 <u>Learning Objective</u> Applies cutting fluid and coolant JP Sign-off ____	4.04.01 Determine types of cutting fluids such as oil and water soluble fluids Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.02 Determine types of coolants and application techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.03 Perform mixing procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.04 Maintain concentration of soluble fluids Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.05 Follow a maintenance schedule Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

4.04.06 Determine when to apply cutting fluid and coolant Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 4.05 <u>Learning Objective</u> Troubleshoots equipment JP Sign-off ____	4.05.01 Recognize machine operations and components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.05.02 Review previous problems and potential machine malfunctions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.05.03 Visually inspect equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.05.04 Identify and isolate problem Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.05.05 Take corrective action Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 4.06 <u>Learning Objective</u> Maintains machine alignment JP Sign-off ____	4.06.01 Use all types of alignment equipment such as dial indicator, precision level and square Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.06.02 Make adjustments Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.06.03 Determine where and when alignment is required Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

Machinist

BLOCK B
9% - 12 Questions on the IP exam

Learning Category
BENCH WORK

Task 5 - B
8 questions on the IP exam

Learning Outcome
Performs hand processes

Journeyperson
Sign-off
Task 5

Complete ☐

Incomplete ☐

Task 5
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 5.01 <u>Learning Objective</u> Files workpiece JP Sign-off ____	5.01.01 Recognize all types of cuts such as coarse, bastard and smooth Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.02 Use all types of files such as single cut, double cut and needle files Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.03 Determine shapes and size of files such as round, flat and square Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.04 Select file types and file material for job requirement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.05 Select filing technique for job requirement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	5.01.06 Install handle onto file Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 5.02 <u>Learning Objective</u> Saws workpiece JP Sign-off ____	5.02.01 Recognize tooth pitch of saw blades Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.02 Use saw blade tooth set such as raker, wave and straight Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.03 Perform sawing techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.04 Recognize holding techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.05 Select saw blade Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	5.02.06 Install and tension blade Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

5 - B
(cont'd)

Learning Outcome
Performs hand processes

Knowledge, Skills and Abilities - Competencies

SUB-TASK 5.03	5.03.01	5.03.02	5.03.03
	Recognize holding techniques	Identify types of tooling such as drills, reamers and hones	Select drill size such as fractional, metric, letter and number
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
JP Sign-off ____	Use ____	Use ____	Use ____

Task 5
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 5.04	5.04.01	5.04.02	5.04.03	5.04.04	5.04.05
	Identify holding techniques	Recognize taps such as taper, plug, bottom and pipe	Determine thread, pitch and form	Develop thread cutting techniques	Calculate and select tap drill size
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
JP Sign-off ____	Use ____	Use ____	Use ____	Use ____	Use ____
	5.04.06	5.04.07	5.04.08	5.04.09	
	Cut threads	Adjust die	Repair threads using tools such as nut dies and thread files	Apply cutting fluids for cooling and chip removal	
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	
	Use ____	Use ____	Use ____	Use ____	
SUB-TASK 5.05	5.05.01	5.05.02	5.05.03	5.05.04	
	Identify types of inserts such as single coil, double coil, key insert and tabbed insert	Recognize special taps	Select hole size for inserts	Use installation tools	
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	
JP Sign-off ____	Use ____	Use ____	Use ____	Use ____	
SUB-TASK 5.06	5.06.01	5.06.02	5.06.03	5.06.04	5.06.05
	Identify keyseat and other broach forms	Recognize types and sizes of keys	Select broaches, bushings and shims	Produce a keyway and other broach forms	Perform calculations such as depth of keyway
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
JP Sign-off ____	Use ____	Use ____	Use ____	Use ____	Use ____

5 - B
(cont'd)

Learning Outcome
Performs hand processes

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

3 - Complete a task to the level and quality of performance required by industry without assistance or supervision

2 - Complete a task with some assistance and supervision

1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation

I - Interview

D - Documentation

Use:

1 - Daily

2 - Often

3 - Seldom

4 - Never

Knowledge, Skills and Abilities - Competencies

Task 5
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 5.07 <u>Learning Objective</u> Performs pressing operations JP Sign-off _____	5.07.01 Identify types of presses such as arbour and hydraulic Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.07.02 Determine supporting techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.07.03 Regulate pressure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.07.04 Align parts Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 5.08 <u>Learning Objective</u> Bends workpiece JP Sign-off _____	5.08.01 Determine holding techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.08.02 Determine bending temperature Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.08.03 Shape workpiece Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
SUB-TASK 5.09 <u>Learning Objective</u> Finishes workpiece JP Sign-off _____	5.09.01 Identify lapping and honing techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.09.02 Recognize polishing and blending techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.09.03 Chose appropriate abrasives Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.09.04 Select lapping and honing abrasives Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.09.05 Maintain lapping tables and plates Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

6 - B
4 questions on the IP exam
Learning Outcome
Refurbishes components

Journeyperson
 Sign-off
 Task 6

Complete ☐

Incomplete ☐

Task 6
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 6.01 <u>Learning Objective</u> Analyzes components JP Sign-off _____	6.01.01	6.01.02	6.01.03	6.01.04
	Identify fits, clearances and tolerances	Troubleshoot and document defect	Perform visual inspection	Perform basic NDT such as dye penetrant
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
	Use ____	Use ____	Use ____	Use ____

SUB-TASK 6.02 <u>Learning Objective</u> Plans procedures JP Sign-off _____	6.02.01	6.02.02	6.02.03
	Assess original specifications and application of components	Determine repair techniques	Plan and implement repair sequence
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
	Use ____	Use ____	Use ____

SUB-TASK 6.03 <u>Learning Objective</u> Disassembles components JP Sign-off _____	6.03.01	6.03.02	6.03.03
	Recognize retention techniques such as snap rings, blocking collars and interference fits	Remove mechanical components such as bearings, seals and adapters	Determine damage requiring repair
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
	Use ____	Use ____	Use ____

SUB-TASK 6.04 <u>Learning Objective</u> Assembles components JP Sign-off _____	6.04.01	6.04.02	6.04.03	6.04.04	6.04.05
	Identify bearings	Determine types of oil seals	Recognize adhesives and joining techniques	Install mechanical components	Test fit and function
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
	Use ____	Use ____	Use ____	Use ____	Use ____

Machinist

BLOCK C

9% - 12 Questions on the IP exam

Learning Category
DRILL PRESSES

7 - C

7 questions on the IP exam

Learning Outcome
Sets up drill presses

Journey person
Sign-off
Task 7

Complete ☐

Incomplete ☐

Task 7
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<div>SUB-TASK 7.01</div> <div><u>Learning Objective</u> Selects drill press types</div> <div>JP Sign-off _____</div>	<div>7.01.01</div> <div>Determine drill press types such as radial arm drill, sensitive drill press and pedestal drill</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.01.02</div> <div>Recognize capacity of drill press</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.01.03</div> <div>Determine work holding devices and their applications</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>		
<div>SUB-TASK 7.02</div> <div><u>Learning Objective</u> Plans drill press sequence</div> <div>JP Sign-off _____</div>	<div>7.02.01</div> <div>Identify size and types of cutting tools</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.02.02</div> <div>Determine drill press operations such as centre drilling, drilling, counterboring, countersinking, spot facing, tapping and renaming</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.02.03</div> <div>List order of drill press operations</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.02.04</div> <div>Recognize capacity of drill press</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.02.05</div> <div>Optimize sequence of drill press operations</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>
<div>SUB-TASK 7.03</div> <div><u>Learning Objective</u> Selects jigs, fixtures and work holding devices</div> <div>JP Sign-off _____</div>	<div>7.03.01</div> <div>Identify types of work holding devices such as vises, V-blocks and angle plates</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.03.02</div> <div>Determine types of jigs and fixtures</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.03.03</div> <div>Determine clamping pressure</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.03.04</div> <div>Recognize capacity or work holding device</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.03.05</div> <div>Match jig, fixture and work holding devices for the job setup</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>
<div>SUB-TASK 7.04</div> <div><u>Learning Objective</u> Sets up jigs, fixtures and work holding devices</div> <div>JP Sign-off _____</div>	<div>7.04.01</div> <div>Recognize types of work holding devices such as vises, V-blocks, angle plates and clamps</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.04.02</div> <div>Recognize types of jigs and fixtures</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>	<div>7.04.03</div> <div>Position, align and secure jigs and fixtures in work holding devices</div> <div>Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____</div>		

**7 - C
(cont'd)**

Learning Outcome
Sets up drill presses

**Task 7
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 7.05</p> <p><u>Learning Objective</u> Selects tooling</p> <p>JP Sign-off _____</p>	<p>7.05.01 Identify types of tooling such as drills, reamers and taps</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.02 Determine cutting tool characteristics such as shape, grade, geometry and capacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.03 Select cutting tools and tool holders to match machining operation and material of workpiece</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		
<p>SUB-TASK 7.06</p> <p><u>Learning Objective</u> Sets up tooling</p> <p>JP Sign-off _____</p>	<p>7.06.01 Locate types of tooling such as drills, reamers and taps</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.06.02 Identify cutting tool characteristics such as shape, grade, geometry and capacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.06.03 Execute installation and positioning techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.06.04 Mount tooling in holders and in spindles</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
<p>SUB-TASK 7.07</p> <p><u>Learning Objective</u> Sets up workpiece</p> <p>JP Sign-off _____</p>	<p>7.07.01 Determine workpiece characteristics such as shape, material and size</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.07.02 Establish clamping pressure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.07.03 Position and secure workpiece in work holding device</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		
<p>SUB-TASK 7.08</p> <p><u>Learning Objective</u> Selects speeds and feeds</p> <p>JP Sign-off _____</p>	<p>7.08.01 Evaluate cutting tool capacities such as depth of cut and chip load</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.08.02 Determine cutting tool materials such as carbide, high speed steel (HSS) and ceramic</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.08.03 Identify size and types of cutting tools such as drills and reamers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.08.04 Determine rigidity of machine tool, workpiece and setup</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.08.05 Calculate speeds and feeds</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

8 - C

5 questions on the IP exam

Learning Outcome
Operates drill presses

Journeyperson
Sign-off
Task 8

Complete ☐
Incomplete ☐

Task 8
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

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2 - Complete a task with some assistance and supervision

1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation

I - Interview

D - Documentation

Use:

1 - Daily

2 - Often

3 - Seldom

4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 8.01 <u>Learning Objective</u> Drills holes JP Sign-off _____	8.01.01 Execute drilling techniques such as pecking, trepanning and deep-hole drilling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.02 Correlate tool geometry and material Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.03 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
	SUB-TASK 8.02 <u>Learning Objective</u> Cuts countersinks, counterbores, chamfers and spot faces JP Sign-off _____	8.02.01 Identify reference material to determine fastener size and types Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.02.02 Identify reference material to determine counterbore diameter and corresponding pilot diameter Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.02.03 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.02.04 Select countersinks and spot faces Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 8.03 <u>Learning Objective</u> Performs tapping JP Sign-off _____	8.03.01 Determine tap types such as spiral flute, straight flute, spiral point and skip tooth Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.03.02 Recognize thread types such as UNF, UNC, Acme, NPT, NPS and metric Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.03.03 Determine required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.03.04 Apply tapping procedures such as use of tapping attachments and manual centering Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.03.05 Apply cutting fluids for lubrication and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	8.03.06 Make adjustments to tapping attachments Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**8 - C
(cont'd)**

Learning Outcome
Operates drill presses

**Task 8
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 8.04 <u>Learning Objective</u> Finishes holes JP Sign-off _____	8.04.01 Determine hole finishing techniques such as boring, honing and reaming Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.04.02 Verify required surface finish of hole Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.04.03 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.04.04 Apply cutting fluids for lubrication and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
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Machinist

BLOCK D
22% - 30 Questions on the IP exam

Learning Category
LATHES

9 - D
16 questions on the IP exam

Learning Outcome
Sets up lathes

Journey person
Sign-off
Task 9

Complete ☐

Incomplete ☐

Task 9
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

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2 - Complete a task with some assistance and supervision

1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 9.01 <u>Learning Objective</u> Selects lathe types JP Sign-off ____	9.01.01 Determine lathe types such as engine lathes, turret lathes and vertical lathes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.02 Recognize capacity of lathe such as swing and size Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.03 Determine work holding devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	SUB-TASK 9.02 <u>Learning Objective</u> Plans lathe sequence JP Sign-off ____	9.02.01 Recognize lathe operations such as turning, threading, boring and grinding Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.02.02 Evaluate machining capacity of lathe Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 9.03 <u>Learning Objective</u> Selects work holding devices JP Sign-off ____	9.03.01 Identify types of work holding devices such as four-jaw chuck, three-jaw chuck, face plate and fixtures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.03.02 Determine clamping pressure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.03.03 Evaluate capacity of work holding device Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	SUB-TASK 9.04 <u>Learning Objective</u> Sets up work holding devices JP Sign-off ____	9.04.01 Mount all types of work holding devices such as four-jaw chuck, three-jaw chuck, face plate and fixtures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.04.02 Identify mounting types such as cam lock and threaded spindle nose Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	9.02.04 Optimize sequence of lathe operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.03.04 Select work holding device to match work piece requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

9 - D
(cont'd)

Learning Outcome
Sets up lathes

Task 9
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 9.05</p> <p><u>Learning Objective</u> Selects tooling</p> <p>JP Sign-off _____</p>	<p>9.05.01 Identify types of tooling such as indexable insert and HSS</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.05.02 Recognize cutting tool characteristics such as shape, grade, geometry and capacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.05.03 Select cutting tools and tool holders to match machining operation and material of workpiece</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
<p>SUB-TASK 9.06</p> <p><u>Learning Objective</u> Sets up tooling</p> <p>JP Sign-off _____</p>	<p>9.06.01 Prepare types of tooling such as turning, boring, drilling and grinding</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.06.02 Interpret cutting tool characteristics such as shape and dimensions</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.06.03 Determine installation and positioning techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.06.04 Mount tooling in holders and in lathes</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
<p>SUB-TASK 9.07</p> <p><u>Learning Objective</u> Selects lathe accessories</p> <p>JP Sign-off _____</p>	<p>9.07.01 Recognize types of accessories such as taper attachments, steady rests and follower rests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.07.02 Recognize contact material for steady rests and follower rests such as bronze pads, brass pads and rollers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.07.03 Select accessory to match workpiece requirements</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
<p>SUB-TASK 9.08</p> <p><u>Learning Objective</u> Sets up lathe accessories</p> <p>JP Sign-off _____</p>	<p>9.08.01 Mount types of accessories such as taper attachments, steady rests and follower rests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.08.02 Perform setup and alignment techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.08.03 Position, fasten and adjust accessories</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.08.04 Perform calculations such as taper and parallelism correction</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

9 - D
(cont'd)

Learning Outcome
Sets up lathes

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
 2 - Complete a task with some assistance and supervision
 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 9.09 <u>Learning Objective</u> Sets up workpiece JP Sign-off _____	9.09.01 Recognize workpiece characteristics such as shape, material and size Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.09.02 Determine setup and alignment techniques such as dialling-in and shimming Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.09.03 Position and secure workpiece in work holding device Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	SUB-TASK 9.10 <u>Learning Objective</u> Selects speeds and feeds JP Sign-off _____	9.10.01 Determine cutting tool capacities such as depth of cut and chip load Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.10.02 Determine cutting tool materials such as carbide, HSS and ceramic Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.10.03 Recognize size and types of cutting tools such as boring bars, facing tools and turning tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
			9.10.04 Determine rigidity of machine tool, workpiece and setup Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.10.05 Calculate speeds and feeds Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

10 - D
14 questions on the IP
exam

Learning Outcome
Operates lathes

Journeyperson
Sign-off
Task 10

Complete ☐

Incomplete ☐

Task 10
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 10.01 <u>Learning Objective</u> Turns surfaces JP Sign-off _____	10.01.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.02 Apply tool geometry Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.03 Prepare workpiece for machining operations using procedures such as centre drilling, machining steady rest band and facing Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.04 Turn internal and external surfaces Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.05 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	10.02.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.02.02 Apply tool geometry Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.02.03 Prepare workpiece for machining operations using procedures such as centre drilling, machining steady rest band and facing Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.02.04 Face internal and external surfaces Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.02.05 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 10.03 <u>Learning Objective</u> Turns tapers JP Sign-off _____	10.03.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.02 Determine types of tapers such as Morse, Brown & Sharpe and non-standardized Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.03 Apply tool geometry Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.04 Follow procedures for turning tapers such as using taper turning attachments, using compound rests and tail stock offsets Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.05 Calculate tapers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	10.03.06 Turn internal and external tapers such as machine tapers and self-holding tapers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.07 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			
SUB-TASK 10.04 <u>Learning Objective</u> Knurls JP Sign-off _____	10.04.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.02 Determine tools and tool holders Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.03 Select knurling wheels for pattern and size Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.04 Recognize tool wear affecting knurling efficiency Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.05 Verify that knurled surface meets specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

10 - D
(cont'd)

Learning Outcome
Operates lathes

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
 2 - Complete a task with some assistance and supervision
 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 10.05 <u>Learning Objective</u> Parts off workpiece JP Sign-off _____	10.05.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.05.02 Determine types of parting tools such as carbide and HSS Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.05.03 Apply tool geometry Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.05.04 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	SUB-TASK 10.06 <u>Learning Objective</u> Drills JP Sign-off _____	10.06.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.06.02 Recognize drilling techniques such as pecking, trepanning and deep-hole drilling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.06.03 Apply tool geometry Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.06.04 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	10.06.05 Set up and secure workpiece Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
	10.06.06 Apply cutting fluids for cooling and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 10.07 <u>Learning Objective</u> Finishes holes JP Sign-off _____	10.07.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.07.02 Recognize hole finishing techniques such as drilling, reaming, boring and honing Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.07.03 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.07.04 Apply cutting fluids for cooling and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

10 - D
(cont'd)

Learning Outcome
Operates lathes

Task 10
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 10.08 <u>Learning Objective</u> Cuts grooves JP Sign-off _____	10.08.01 Meet required surface finish	10.08.02 Recognize types of grooving tools such as carbide and HSS	10.08.03 Apply tool geometry	10.08.04 Recognize tool wear	10.08.05 Set up and position workpiece for grooving internal and external surfaces
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 10.09 <u>Learning Objective</u> Cuts threads JP Sign-off _____	10.09.01 Recognize types of common threads such as UNC, NPT, Acme and metric	10.09.02 Determine procedures and techniques to produce internal and external threads	10.09.03 Recognize single and multi-start threads	10.09.04 Perform thread calculations	10.09.05 Identify left and right hand thread
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	10.09.06 Use die heads and tapping heads	10.09.07 Grind cutting tool to produce thread form	10.09.08 Set up machine to cut external and internal threads	10.09.09 Set up machine to cut special threads	10.09.10 Recognize tool wear
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 10.10 <u>Learning Objective</u> Turns eccentrics JP Sign-off _____	10.10.01 Recognize procedures for turning eccentric diameter	10.10.02 Calculate centre offset	10.10.03 Recognize tool wear	10.10.04 Set up and position workpiece for turning eccentrics
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

Machinist

BLOCK E

22% - 30 Questions on the IP exam

Learning Category

MILLS

11 - E

17 questions on the IP exam

Learning Outcome

Sets up milling machines

Journey person
Sign-off
Task 11

Complete ☐

Incomplete ☐

Task 11

Learning Needs

Sub-Tasks

Learning Objectives
to be completed

Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 11.01 <u>Learning Objective</u> Selects mill types JP Sign-off ____	11.01.01 Identify milling machine types such as vertical, horizontal, ram and turret, and horizontal boring mill Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.02 Recognize capacity of milling machine Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.03 Identify work holding devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
SUB-TASK 11.02 <u>Learning Objective</u> Plans milling sequence JP Sign-off ____	11.02.01 Identify milling techniques such as climb milling, conventional milling and boring Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.02 Determine milling machine operations such as facing, contouring, cutting T-slots and dovetails, and boring Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.03 Determine roughing and finishing operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.04 Evaluate machining capacity of milling machine Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.05 List sequence of milling operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	11.02.06 Prioritize sequence of milling operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.07 Operate horizontal boring mills Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			
SUB-TASK 11.03 <u>Learning Objective</u> Selects work holding devices JP Sign-off ____	11.03.01 Identify clamping pressure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.03.02 Interpret capacity of work holding device Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.03.03 Select work holding device to match workpiece requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

11 - E
(cont'd)

Learning Outcome
Sets up milling machines

Task 11
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 11.04 <u>Learning Objective</u> Sets up work holding devices JP Sign-off _____	11.04.01 Determine types of work holding devices such as vises, angle plates and V-blocks Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.04.02 Perform mounting and aligning techniques and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.04.03 Position, align and secure work holding device to match workpiece requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 11.05 <u>Learning Objective</u> Selects tooling JP Sign-off _____	11.05.01 Determine types of tooling such as HSS tooling, carbide tooling and carbide inserts Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.02 Evaluate cutting tool characteristics such as shape, grade, geometry and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.03 Select cutting tools and tool holders to match machining operation and material of workpiece Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 11.06 <u>Learning Objective</u> Sets up tooling JP Sign-off _____	11.06.01 Determine types of tooling such as HSS tooling, carbide tooling and carbide inserts Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.06.02 Perform installation and positioning techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.06.03 Mount tooling in tool holders Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.06.04 Recognize insert wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.06.05 Replace inserts Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

11.06.06 Mount tool holder in machines Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 11.07 <u>Learning Objective</u> Selects milling accessories JP Sign-off _____	11.07.01 Identify types of accessories such as rotary tables and indexing heads Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.07.02 Select accessory to match workpiece requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

11 - E
(cont'd)

Learning Outcome
Sets up milling machines

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 11.08</p> <p><u>Learning Objective</u> Selects milling accessories</p> <p>JP Sign-off _____</p>	<p>11.08.01 Identify types of accessories such as rotary tables and indexing heads</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.08.02 Evaluate setup and alignment techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.08.03 Position, fasten and adjust accessories to match workpiece requirements</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.08.04 Perform calculations such as direct, simple, angular and differential indexing</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
<p>SUB-TASK 11.09</p> <p><u>Learning Objective</u> Sets up workpiece</p> <p>JP Sign-off _____</p>	<p>11.09.01 Interpret workpiece characteristics such as shape, material and size</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.09.02 Determine clamping pressure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.09.03 Establish datum point</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.09.04 Perform setup and alignment techniques such as dialling-in workpiece</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.09.05 Position and secure workpiece in work holding device</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>11.09.06 Establish workpiece zero reference point</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.09.07 Align machine to datum using edge finder and digital readout system</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			
<p>SUB-TASK 11.10</p> <p><u>Learning Objective</u> Selects speeds and feeds</p> <p>JP Sign-off _____</p>	<p>11.10.01 Determine cutting tool capacities such as depth of cut and chip load</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.10.02 Identify cutting tool materials such as carbide, HSS and ceramic</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.10.03 Assess size and types of cutting tools such as boring bars, end mills and face mills</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.10.04 Determine rigidity of machine tool, workpiece and setup</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.10.05 Calculate speeds and feeds</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

12 - E
13 questions on the IP
exam

Learning Outcome
Operates milling
machines

Journeyperson
 Sign-off
 Task 12

Complete ☐

Incomplete ☐

Task 12
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 12.01 <u>Learning Objective</u> Faces surfaces JP Sign-off _____	12.01.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.02 Recognize methods of milling such as climb milling and conventional milling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.03 Apply tool geometry Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.04 Machine vertical, horizontal and angled surfaces Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.05 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	12.01.06 Calculate dimensions from reference point Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 12.02 <u>Learning Objective</u> Mills profiles and pockets JP Sign-off _____	12.02.01 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.02 Determine types and applications of specialized cutters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.03 Apply tool geometry Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.04 Follow procedures for cutting pockets and profiles such as T-slots, dovetails and keyways Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.05 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	12.02.06 Perform profile calculations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.07 Apply cutting fluids for cooling and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.08 Cut profiles using accessories such as rotary tables and indexing heads Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
SUB-TASK 12.03 <u>Learning Objective</u> Drills holes JP Sign-off _____	12.03.01 Execute drilling techniques such as pecking, trepanning and deep-hole drilling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.03.02 Calculate tool geometry and composition Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.03.03 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.03.04 Apply cutting fluids for cooling and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

12 - E
(cont'd)

Learning Outcome
Operates milling
machines

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

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2 - Complete a task with some assistance and supervision

1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation

I - Interview

D - Documentation

Use:

1 - Daily

2 - Often

3 - Seldom

4 - Never

Knowledge, Skills and Abilities - Competencies

Task 12
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 12.04 <u>Learning Objective</u> Cuts countersinks, counterbores, chamfers and spot faces JP Sign-off ____	12.04.01 Access reference material to determine fastener size and types for selected operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.02 Access reference material to determine counterbore diameter and corresponding pilot diameter Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.03 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.04 Select countersinks and spot faces Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.05 Apply cutting fluids for cooling and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 12.05 <u>Learning Objective</u> Performs tapping JP Sign-off ____	12.05.01 Identify types of threads such as UNF, UNC and metric Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.05.02 Meet required surface finish Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.05.03 Apply tapping procedures such as use of tapping head and manual centering Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.05.04 Apply cutting fluids for cooling and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 12.06 <u>Learning Objective</u> Finishes holes JP Sign-off ____	12.06.01 Perform hole finishing techniques such as drilling, reaming, boring and honing Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.06.02 Meet required surface finish of hole Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.06.03 Recognize tool wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.06.04 Apply fluids for cooling and chip removal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

Machinist

BLOCK F

6% - 8 Questions on the IP exam

Learning Category

SAWS

13 - F

5 questions on the IP exam

Learning Outcome

Sets up power saws

Journey person
Sign-off
Task 13

Complete ☐

Incomplete ☐

Task 13

Learning Needs

Sub-Tasks

Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 13.01 <u>Learning Objective</u> Selects saw types JP Sign-off ____	13.01.01 Identify saw types such as vertical, horizontal and reciprocating Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.02 Determine capacity of saw such as speed, feed and size Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.03 Identify work holding devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.04 Evaluate shape and composition of workpiece material Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 13.02 <u>Learning Objective</u> Selects saw blades JP Sign-off ____	13.02.01 Evaluate types and capabilities of power saws Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.02 Match blade to types of workpiece material and shapes to be cut Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.03 Verify blade sizes, set tooth pitch and composition Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.04 Verify blade length and width Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.05 Evaluate blade effect on cutting rate, tool life, finish and accuracy Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	13.02.06 Determine of break-in period of new blades Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

SUB-TASK 13.03 <u>Learning Objective</u> Installs blades JP Sign-off ____	13.03.01 Perform installation techniques and procedures for various saws Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.03.02 Handle coiled saw blades Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.03.03 Measure and cut blade to size Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.03.04 Join and grind saw blades Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.03.05 Position blade in machine Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	13.03.06 Set and adjust blade tension Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.03.07 Set and position blade guides Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.03.08 Break in saw blade Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

13 - F
(cont'd)

Learning Outcome
Sets up power saws

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
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 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 13.04 <u>Learning Objective</u> Selects speeds and feeds JP Sign-off _____	13.04.01 Identify type and capacity of saw Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.02 Determine saw blade parameters such as size, tooth pitch, set and composition Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.03 Determine rigidity of machine, workpiece and setup Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.04 Calculate speeds and feeds Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	SUB-TASK 13.05 <u>Learning Objective</u> Makes saw adjustments JP Sign-off _____			
	13.05.01 Demonstrate an understanding of adjustments for all types of saws Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.05.02 Adjust saw settings such as angles, guides, stops, speeds and feeds Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
SUB-TASK 13.06 <u>Learning Objective</u> Sets up workpiece JP Sign-off _____	13.06.01 Verify workpiece characteristics such as shape, material and size Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.06.02 Determine clamping pressures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.06.03 Position and secure workpiece in work holding device Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.06.04 Position work support device Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

14 - F
3 questions on the IP
exam

Learning Outcome
Operates power saws

Journey person
 Sign-off
 Task 14

Complete ☐

Incomplete ☐

Task 14
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

<div>SUB-TASK</div> <div>14.01</div> <div><u>Learning Objective</u></div> <div>Saws straight and angle cuts</div> <div>JP Sign-off _____</div>	<div>14.01.01</div> <div>Operate all types of saws such as horizontal, vertical and reciprocating</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>14.01.02</div> <div>Perform sawing procedures</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>14.01.03</div> <div>Cut test piece to verify workpiece</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>14.01.04</div> <div>Apply cutting fluid for cooling and chip removal</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	
<div>SUB-TASK</div> <div>14.02</div> <div><u>Learning Objective</u></div> <div>Cuts irregular shapes</div> <div>JP Sign-off _____</div>	<div>14.02.01</div> <div>Operate all types of saws such as horizontal, vertical and reciprocating</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>14.02.02</div> <div>Perform sawing procedures</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>14.02.03</div> <div>Lay out workpiece</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>14.02.04</div> <div>Feed material and follow contour layout line</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>	<div>14.02.05</div> <div>Apply cutting fluid for cooling and chip removal</div> <div>Rating _____ Complete</div> <div>Proof _____ <input type="checkbox"/></div> <div>Use _____</div>

Machinist**BLOCK G**

8% - 11 Questions on the
IP exam

Learning Category
GRINDERS

15 - G
6 questions on the IP
exam

Learning Outcome
Sets up grinders

Journey person
Sign-off
Task 15

Complete ☐

Incomplete ☐

Task 15
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

3 - Complete a task to the level and quality of performance required by industry without assistance or supervision2 - Complete a task with some assistance and supervision1 - Complete task with assistance and constant supervision**Type of Proof:**

O - Observation

I - Interview

D - Documentation

Use:

1 - Daily

2 - Often

3 - Seldom

4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 15.01 <u>Learning Objective</u> Selects grinder types JP Sign-off _____	15.01.01 Identify types of grinding machine such as surface, cylindrical, centreless, and tool and cutter Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.02 Determine capacity of grinding machine Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.03 Identify work holding devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.04 Identify grinding machine accessories such as support rests and power heads Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 15.02 <u>Learning Objective</u> Plans grinding sequence JP Sign-off _____	15.02.01 Recognize types of grades of grinding wheels such as cubic boron nitride (CBN), aluminum oxide and silicon carbide Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.02 Assess grinding machine operations such as surface, cylindrical, tool and cutter and centreless grinding Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.03 List sequence of grinding machine operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.04 Determine grinding capacity of grinding machines Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.05 Optimize the sequence of grinding operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 15.03 <u>Learning Objective</u> Selects work holding devices JP Sign-off _____	15.03.01 Identify types of work holding devices such as centres, four-jaw chuck, three-jaw chuck, face plate, fixtures, magnetic chuck and magnetic sub-plates Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.02 Determine clamping pressure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.03 Determine capacity or work holding device Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.04 Select work holding device to match workpiece requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 15.04 <u>Learning Objective</u> Sets up work holding devices JP Sign-off _____	15.04.01 Mount all types of work holding devices such as centres, four-jaw chuck, three-jaw chuck, face plate, fixtures, magnetic chuck and magnetic sub-plates Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.02 Perform mounting techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.03 Position, align and secure work holding devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

15 - G
(cont'd)

Learning Outcome
Sets up grinders

Task 15
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 15.05	15.05.01	15.05.02	15.05.03
	Recognize types, grades and sizes of grinding wheels	Interpret standard grading system	Determine abrasive type, grain size, grade, structure and bond
JP Sign-off _____	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
	Use ____	Use ____	Use ____

SUB-TASK 15.06	15.06.01	15.06.02	15.06.03	15.06.04	15.06.05
	Mount all types, grades and sizes of grinding wheels	Perform proper techniques and procedures for storing, handling and mounting grinding wheels	Utilize blotter applications	Perform balancing techniques and procedures	Perform truing and dressing techniques and procedures such as contour dressing and diamond dressing
JP Sign-off _____	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
	Use ____	Use ____	Use ____	Use ____	Use ____
	15.06.06	15.06.07	15.06.08	15.06.09	15.06.10
	Visually inspect and ring test grinding wheels	Install grinding wheel on a balancing mandrel	Balance grinding wheel	Install grinding wheel on grinding machine	Selecting truing and dressing tools
	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
	Use ____	Use ____	Use ____	Use ____	Use ____
	15.06.11				
	Dress and true grinding wheel				
	Rating ____ Complete				
	Proof ____ <input type="checkbox"/>				
	Use ____				

SUB-TASK 15.07	15.07.01	15.07.02	15.07.03
	Identify types of accessories such as rests, tail stock, internal grinding head, wheel dressers, laminated blocks, magnetic spring clamps, chucks, drive dogs and mandrels	Identify contact material for steady rests and follower rests such as bronze pads and brass pads	Select accessory to match workpiece requirements
JP Sign-off _____	Rating ____ Complete	Rating ____ Complete	Rating ____ Complete
	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>	Proof ____ <input type="checkbox"/>
	Use ____	Use ____	Use ____

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
 2 - Complete a task with some assistance and supervision
 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

Task 15
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 15.08 <u>Learning Objective</u> Sets up grinding accessories JP Sign-off ____	15.08.01 Mount all types of accessories such as rests, tail stock, internal grinding head, wheel dressers, laminated blocks, magnetic spring clamps, chucks, drive dogs and mandrels Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.08.02 Identify contact material for steady rests and follower rests such as bronze pads and brass pads Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.08.03 Perform setup and alignment techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.08.04 Position, fasten and adjust accessories Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.08.05 Perform taper calculations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 15.09 <u>Learning Objective</u> Sets up workpiece JP Sign-off ____	15.09.01 Identify workpiece characteristics such as shape, material and size Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.09.02 Perform setup and alignment techniques such as shimming and dialling-in Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.09.03 Clean and maintain magnetic work holding device Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.09.04 Position and secure workpiece in work holding device Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 15.10 <u>Learning Objective</u> Selects speeds and feeds JP Sign-off ____	15.10.01 Evaluate the effect of speeds, feeds and depth of cut on finish and wheel life Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.10.02 Determine application of grinding wheels Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.10.03 Determine rigidity of machine tool, workpiece and setup Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.10.04 Calculate speeds and feeds Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

16 - G
5 questions on the IP exam

Learning Outcome
Operates grinders

Journeyperson
Sign-off
Task 16

Complete ☐

Incomplete ☐

Task 16
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 16.01</p> <p><u>Learning Objective</u> Grinds flat surfaces</p> <p>JP Sign-off _____</p>	<p>16.01.01 Grind using all types of surface grinders such as vertical and horizontal</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.02 Perform surface grinding techniques required to produce surfaces such as parallel, flat and square</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.03 Select grinder type</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.04 Identify when wheels require dressing</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.05 Plunge grind and traverse grind</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
<p>SUB-TASK 16.02</p> <p><u>Learning Objective</u> Grinds profiles</p> <p>JP Sign-off _____</p>	<p>16.02.01 Grind using all types of grinding machines</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.02 Grind types of profiles such as vees and radii</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.03 Perform cylindrical and surface grinding techniques to produce profiles such as angles, radii, recesses, shoulders and special forms</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		
<p>SUB-TASK 16.03</p> <p><u>Learning Objective</u> Grinds cylindrical and tapered surfaces</p> <p>JP Sign-off _____</p>	<p>16.03.01 Grind using all types of cylindrical grinders such as centreless, universal, external and internal</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.03.02 Perform setup and alignment techniques for drive plates, grinder carriers, drive dogs, trip dogs, tail stock, centres, chucks, work heads, wheel heads and the upper table</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.03.03 Position and secure workpiece between centres</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.03.04 Perform internal, external, plunge and traverse grinding</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
<p>SUB-TASK 16.04</p> <p><u>Learning Objective</u> Grinds tools and cutters</p> <p>JP Sign-off _____</p>	<p>16.04.01 Grind using all types of tool and cutter grinders such as drill grinders and end mill grinders</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.04.02 Select appropriate accessories</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.04.03 Set up various cutter types such as form relief cutters, reamers and end mills</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.04.04 Interpret relief angles and clearances</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.04.05 Determine setup techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
<p>16.04.06 Sharpen cutters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>					

Machinist

BLOCK H
11% - 15 Questions on the IP exam

Learning Category
COMPUTER NUMERICAL CONTROL (CNC) MACHINES

17 - H
5 questions on the IP exam

Learning Outcome
Performs basic CNC programming

Journey person
Sign-off
Task 17

Complete ☐

Incomplete ☐

Task 17
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
 2 - Complete a task with some assistance and supervision
 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 17.01 <u>Learning Objective</u> Reviews process documentation JP Sign-off _____	17.01.01 Determine order of CNC machining operations Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	17.01.02 Read and interpret workpiece documentation such as drawings and setup sheets Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	17.01.03 Read and interpret reference material such as charts, tables, CAM files and Machinery's Handbook Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	
SUB-TASK 17.02 <u>Learning Objective</u> Calculates coordinates for tool path JP Sign-off _____	17.02.01 Demonstrate an understanding of Cartesian Coordinate System Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	17.02.02 Calculate using trigonometry Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	17.02.03 Perform calculations Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	
SUB-TASK 17.03 <u>Learning Objective</u> Inputs program data into control memory JP Sign-off _____	17.03.01 Demonstrate an understanding of CNC machine control Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	17.03.02 Select and load programs Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	17.03.03 Store and retrieve programs Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	17.03.04 Manually input program data Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____

**17 - H
(cont'd)**

Learning Outcome
**Performs basic CNC
programming**

**Task 17
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 17.04 <u>Learning Objective</u> Interprets program codes JP Sign-off _____	17.04.01 Use programming codes such as G, M and S codes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.02 Relate program code to machine movement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 17.05 <u>Learning Objective</u> Edits program JP Sign-off _____	17.05.01 Optimize programming codes such as G, M and S codes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.02 Review program to verify accuracy Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.03 Modify and update program Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

18 - H
6 questions on the IP
exam

Learning Outcome
Sets up CNC machines

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
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 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK
18.01

Learning Objective
Selects tooling and tool holders

JP Sign-off _____

18.01.01

Verify types of tooling such as index- able insert tooling and HSS tooling

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.01.02

Identify types of tool holders

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.01.03

Evaluate cutting tool characteristics such as shape, grade, geometry and capacity

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.01.04

Identify tool holder characteristics

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.01.05

Identify cutting tool and tool holder identification system

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.01.06

Verify size and shape of cutting tool and tool holder

Rating ____ Complete
 Proof ____ ☐
 Use ____

SUB-TASK
18.02

Learning Objective
Sets up tooling and tool holders

JP Sign-off _____

18.02.01

Install all types of tooling such as index- able insert tooling and HSS tooling

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.02.02

Install all types of tool holders

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.02.03

Position and secure tooling and tool holders with techniques such as shrink fit and clamping

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.02.04

Orient cutting tool in tool holder

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.02.05

Touch off tooling and establish offsets

Rating ____ Complete
 Proof ____ ☐
 Use ____

SUB-TASK
18.03

Learning Objective
Establishes work datum

JP Sign-off _____

18.03.01

Demonstrate an understanding of CNC machine control

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.03.02

Identify machine codes to establish work datum

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.03.03

Read and interpret workpiece documentation such as drawings and setup sheets

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.03.04

Use probes and edge finders

Rating ____ Complete
 Proof ____ ☐
 Use ____

18.03.05

Manually adjust machine axes

Rating ____ Complete
 Proof ____ ☐
 Use ____

18 - H
(cont'd)

Learning Outcome
Sets up CNC machines

Task 18
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 18.04 <u>Learning Objective</u> Sets up workpiece JP Sign-off _____	18.04.01 Mount workpiece taking into consideration the characteristics such as shape, material and size Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	18.04.02 Perform setup and alignment techniques such as dialling-in and shimming Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	18.04.03 Position and secure workpiece in work holding device Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____
SUB-TASK 18.05 <u>Learning Objective</u> Verifies program JP Sign-off _____	18.05.01 Optimize programming codes such as G, M and S codes Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	18.05.02 Perform dry run and single block cycle to check tool path Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____	18.05.03 Relate program code to machine movement Rating _____ Complete Proof _____ <input type="checkbox"/> Use _____

19 - H
4 questions on the IP
exam

Learning Outcome
Operates CNC machines

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
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 1 - Complete task with assistance and constant supervision

Type of Proof:

O - Observation I - Interview D - Documentation

Use:

1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK
19.01

Learning Objective
Adjusts offsets

19.01.01

Demonstrate an understanding of CNC machine control

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.01.02

Verify types of offsets and compensations such as length, diameter and tool nose radius

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.01.03

Adjust machine offset parameters

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

JP Sign-off ____

SUB-TASK
19.02

Learning Objective
Adjusts offsets

19.02.01

Apply clamping pressure

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.02.02

Use work holding devices such as hydraulic chucks and vises

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

JP Sign-off ____

SUB-TASK
19.03

Learning Objective
Monitors machining processes

19.03.01

Determine tool life expectancy

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.03.02

Screen load monitoring system

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.03.03

Screen machine alarms and alarm codes

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.03.04

Recognize signs of tool wear such as poor finish, vibration and excessive noise

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.03.05

Correct observed problems

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

JP Sign-off ____

19.03.06

Use machine overrides such as rapid override and speed and feed override

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.03.07

Recognize chip control problems

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

19.03.08

Ensure cutting fluid delivery

Rating ____ **Complete**
 Proof ____ ☐
 Use ____

Task 19
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

**19 - H
(cont'd)**

Learning Outcome
Operates CNC machines

**Task 19
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 19.04 <u>Learning Objective</u> Interrupts program cycle JP Sign-off _____	19.04.01 Perform as needed, manual cycle stop procedures	19.04.02 Move machine axes to take corrective action
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

SUB-TASK 19.05 <u>Learning Objective</u> Restarts program cycle JP Sign-off _____	19.05.01 Demonstrate an understanding of CNC machine controls	19.05.02 Locate restart point in program	19.05.03 Position machine to avoid collision on restart
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

APPENDIX A

MACHINIST

NATIONAL OCCUPATIONAL ANALYSIS

GLOSSARY OF TERMS

Block A Occupational Skills	Repetitive general skills for many tasks performed by a machinist that are common to several machine tool applications
Block B Bench Work	All the activities performed using hand tools at a bench such as sawing, reaming, tapping, assembly and disassembly
Block C Drill Presses	All the activities performed on a drill press
Block D Lathes	All the activities performed on a lathe
Block E Mills	All the activities performed on a mill
Block F Saws	All the activities performed on a saw
Block G Grinders	All the activities performed on a grinder
Block H Computer Numerical Control (CNC) Machines	All the activities performed with a CNC machine
Boring	A machining process that produces a round straight hole using a single point tool
Chamfer	Usually a 45 degree angle machined on the start of a bore or a shaft to allow for ease of assembly
Computer numerical control (CNC)	The control of a machine tool using coded instructions from a programmer or an operator

Counterbore	Enlarging the end of a previously created hole
Countersink	Creating a tapered hole on the end of an existing hole to accommodate a tapered head screw
Drill press	A machine used to produce holes in workpieces; reaming, tapping, spot facing and countersinking can also be performed on drill presses
Grinder	A machine that removes material from workpieces using abrasive wheels
Heat treatment	The heating and cooling of metals to modify their mechanical properties
Knurling	Using a tool to produce a pattern on the diameter of a workpiece in a lathe
Lathe	A machine that holds and rotates the workpiece; a cutting tool is moved on slideways to cut cylindrical, tapered or threaded features on a workpiece
<i>Machinery's Handbook</i>	A reference book used by the mechanical engineering disciplines such as engineers, toolmakers and machinists
Mill	A machine that holds the workpiece while a rotating cutter with single or multiple cutting edges cut surfaces and contours
Saw	A machine commonly used to cut off workpieces from bar stock using a multi-tooth blade
Spot facing	A machining operation that creates a flat surface at 90° to a hole
Tapping	Cutting threads within a hole using a cutting tool called a tap
Traverse grinding	Grinding using an automatic feed
Trepanning	Cutting a groove in the form of a circle or boring or cutting a hole by removing the centre or core in one piece

Machinist National Occupational Analysis

ACRONYMS

ANSI	American National Standards Institute	NPS	National Pipe Straight
ASME	American Society of Mechanical Engineering	NPT	National Pipe Taper
CBN	cubic boron nitride	PPE	personal protective equipment
CMM	coordinate measuring machine	S Codes	spindle speed control
CNC	computer numerical control	UNC	Unified National Course (a thread system for course threads)
EDM	electrical discharge machine	UNF	Unified National Fine (a thread system for fine threads)
G Codes	preparatory command	WHMIS	Workplace Hazardous Materials Information System
HSS	high speed steel		
M Codes	miscellaneous function command		
NDT	non-destructive testing		

APPENDIX B

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Technical Reading	<ul style="list-style-type: none"> ➤ Find and use information from one source - i.e., a book, Internet, and work order ➤ Find and use information from many parts of a single source - i.e., a code book ➤ Recognize what is important from several sources of information ➤ Interpret information using more than one source ➤ Apply information to the task
Document Use	<ul style="list-style-type: none"> ➤ Use large or difficult documents which are organized into units, headings chapters or sub-headings -i.e., a code book ➤ Find information in large or very specialized documents which may have many smaller documents - i.e., operations manuals, safety manuals ➤ Find information from many sources - i.e., code books, blueprints, work manuals ➤ Enter information into pre-set documents and forms - i.e., accident report forms, order forms ➤ Combine information from several sources and use it – i.e., alter a work order using information from code books, manuals and blueprints ➤ Create new documents using information from a variety of sources – i.e., create work orders, material lists, time log sheets

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Writing	<ul style="list-style-type: none"> ➤ Write information into a pre-set form – i.e., contract, lease, building permit ➤ Write short messages, explanations, requests or directions – i.e., write a work order, memo, written message for a foreman, supervisor or client ➤ Write longer messages, explanations, requests or directions – i.e., write an accident report, a detailed message to a foreman, supervisor or client ➤ Write a longer article which may need to be organized into headings with a table of contents, i.e., work report, section of a work manual ➤ Write detailed, non-routine articles – i.e., make recommendations, use technical language to give directions to or ask for information from other tradespeople
Math	<ul style="list-style-type: none"> ➤ Perform math calculations using formulas, fractions, decimals and percent ➤ Combine one or more math operations to solve a problem ➤ Estimate numbers ➤ Convert between imperial and metric measurement systems ➤ Solve equations ➤ Use trigonometry to solve problems (not a requirement in every trade)

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Computer Use	<ul style="list-style-type: none"> ➤ Perform basic computer operations needed to produce a document – i.e., a letter ➤ Find information on the Internet ➤ Find information in workplace databases ➤ Send and receive e-mail ➤ Enter data into a set format – i.e., form, spreadsheet, chart ➤ Manage electronic information – i.e., save files ➤ Choose and use the best software program for the task
Oral Communication	<ul style="list-style-type: none"> ➤ Take directions from a supervisor or co-workers on work-related projects ➤ Give directions to co-workers on work-related projects ➤ Exchange information using trade terminology ➤ Provide details on facts ➤ Provide opinions on work-related projects ➤ Organize, present and interpret ideas in a logical manner ➤ Communicate one-on-one or in a group about complex work-related matters

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Thinking Skills	<ul style="list-style-type: none"> ➤ Identify problems ➤ Apply learning from previous experiences to identify possible solutions to a problem ➤ Find, evaluate and choose appropriate information to solve a problem ➤ Evaluate the best possible solution to a problem ➤ Make decisions ➤ Plan and organize job tasks to set time-lines ➤ Ensure quality control standards are met
Working with Others	<ul style="list-style-type: none"> ➤ Complete tasks to industry standard under supervision ➤ Complete tasks to industry standard without supervision ➤ Complete assigned tasks to meet time-lines that meet project deadlines ➤ Accept feedback ➤ Give feedback ➤ Evaluate and apply recommendations from co-workers ➤ Resolve conflict ➤ Mentor an apprentice

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Continuous Learning	<ul style="list-style-type: none"> ➤ Identify work/career strengths and areas for improvement ➤ Develop a work/career learning plan ➤ Set goals ➤ Participate in learning opportunities to meet workplace goals ➤ Apply new learning in the workplace environment ➤ Revisit, reflect and revise the learning plan regularly ➤ Engage in learning opportunities to keep skills current and meet career goals

