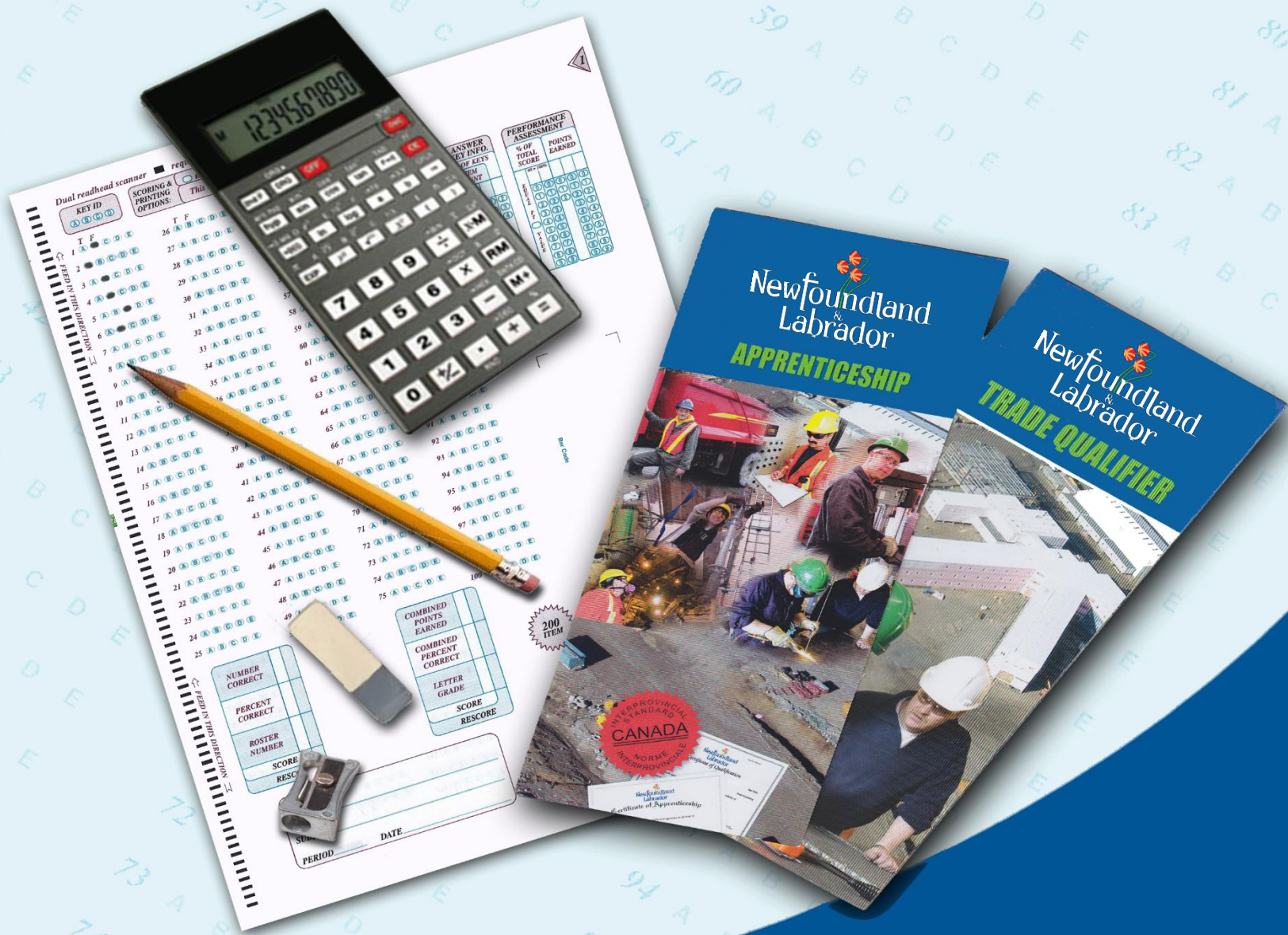


APPRENTICESHIP & CERTIFICATION

Study Guide Metal Fabricator (Fitter)



Apprenticeship and Certification

Study Guide

Metal Fabricator (Fitter)

(Based on Red Seal Occupational Standard – RSOS 2021)

Government of Newfoundland and Labrador
Department of Immigration, Population Growth and Skills

Version 11

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Introduction

This Study Guide has been developed by the Newfoundland and Labrador Department of Immigration, Population Growth and Skills, Apprenticeship and Trades Certification Division, to assist apprentices and trade qualifiers as they prepare to write the Red Seal Exam. Red Seal Exams are available for all Red Seal trades. For a list of Red Seal trades please refer to the Department of Immigration, Population Growth and Skills website: <https://www.gov.nl.ca/atcd/designated-trades/list-of-designated-trades/>

Some of the specific goals of this guide are:

- ⇒ to help you understand the skills and knowledge that might be covered on the exam
- ⇒ to help you identify your strengths and weaknesses
- ⇒ to provide organization and structure for a course of study
- ⇒ to provide a list of resources to help you with your study plan
- ⇒ to support and supplement the teaching and learning process

This study guide outlines the theoretical portion of the program. The intent is not to replace technical training provided under the guidance of instructors. Rather, it is a tool to be used in conjunction with formal training.



Exam Process

Before the Exam

You must contact the nearest Apprenticeship and Trades Certification Divisional office to make request to write the Red Seal exam (*See Appendix A for a list of regional offices*). Upon approval, the Apprenticeship Program Officer (APO) will notify you of your eligibility to write the exam, and provide you with scheduling information. If you require special accommodations due to a disability or language barrier, please contact your regional office for information on applying for this service.

During the Exam

You must bring:

- personal identification such as a photo or signature ID or valid Newfoundland and Labrador driver's license
- your notification letter

The following will be provided:

- a calculator (*see Appendix B for calculator information*)
- all other items required such as pencils, scrap paper, etc.

Important Note:

Personal cell phones, calculators, or other electronic equipment are NOT allowed into the exam room. If you do bring them, they will be stored away and returned to you when you have completed the exam.

After the Exam

Results will be mailed to you approximately seven to ten days after completion of the exam. All necessary instructions and information will be provided in the results letter.

The percentage mark you obtained will be provided. You will also be given a section by section breakdown, showing how many questions were in each section, as well as the number of questions in each section you completed successfully.

If you are successful in obtaining a 70% or more on your exam, you will be issued a Newfoundland and Labrador Certificate of Qualification with a Red Seal endorsement.

Exam Format

All Red Seal exams are written in multiple-choice format. Each exam has between 100 and 150 questions. A multiple choice question consists of a stem (a complete question) followed by four options (A, B, C, D). The stem contains all the information necessary to answer the question. The options consist of the one correct answer and three “distracters.” Distracters are incorrect. (See Appendix C for a sample answer sheet).

Red Seal exams contain three types of questions:

Level 1 Knowledge and Recall

Questions at this level test your ability to recall and understand definitions, facts, and principles.

Level 2 Procedural and Application

Questions at this level test your ability to apply your knowledge of procedures to a new situation.

Level 3 Critical Thinking

Questions at this level test your ability to interpret data, solve problems and arrive at valid conclusions.

On the following pages, examples of each of the three types of questions are provided.

Level 1 Examples:

1. What is referenced when determining the hardness of the steel in a component without testing?
 - A. Heat numbers.
 - B. Mill certificate reports.
 - C. Quality control reports.
 - D. Packing slip.



2. What is a marking template used for?

- A. Irregular bends.
- B. Irregular cuts.
- C. Duplicating holes.
- D. Forming bends.



3. What is used to locate holes for punching?

- A. Centre punch.
- B. Alignment punch.
- C. Cold chisel.
- D. Scribe.



Level 2 Examples:

1. Which method produces the finest finish on stainless steel?

- A. Anodizing.
- B. Electropolishing.
- C. Polish with a wire brush.
- D. Buff with a flapper wheel.



2. Which precaution is taken when using a magnetic drill in the vertical position?

- A. Disconnect from the power source.
- B. Use in conjunction with a transformer.
- C. Magnetically ground to the work.
- D. Safety chain to the work.



3. How is the stretch-out pattern for a template for a truncated cone developed?

- A. By working from the apex of the cone.
- B. By working from the base of the cone.
- C. By working from the top cut on the cone.
- D. By working from the centerline of the cone.



Level 3 Examples:

1. What is the designation of a wide flange 24 in. @ 76 lb. per foot?

- A. W 24 x 76.
- B. WWF 24 x 76.
- C. WT 24 x 76.
- D. M 24 x 76.



2. What is the length of a $\frac{5}{8}$ in. x 2 in. flat bar to roll a band 3 ft. 0 in. ID? ($\pi = 3.1416$)

- A. 111 in.
- B. 113 in.
- C. 115 in.
- D. 117 in.



3. A template is constructed to locate six equally spaced holes on a flange. The holes are 1 000 mm from the centre of the flange. What is the distance between the centres of adjacent holes?

- A. 523 mm.
- B. 1 000 mm.
- C. 1 047 mm.
- D. 2 000 mm.



Source of questions:

<http://www.red-seal.ca/s.1mpl.2.2x.1mQ.5.2st.3.4ns-eng.html?tid=145>

Exam Content

Understanding the *Red Seal Occupational Standard (RSOS)*

The Red Seal model has historically been based on the development of the National Occupational Analysis (NOA) which supports the development of multiple-choice format examinations.

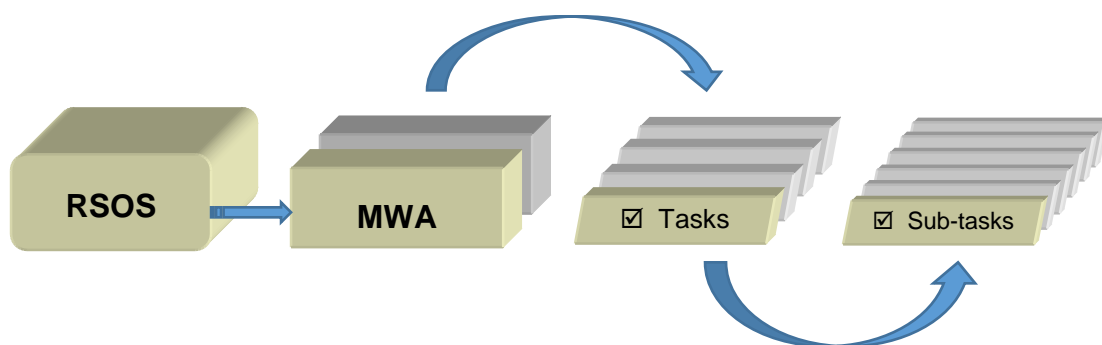
The RSOS was introduced in 2015 and is now taking the place of the NOA. Each RSOS or NOA sets the standard for a Red Seal trade. The Red Seal Examination is based on the Red Seal Standard.

The new standards provide greater consistency in learning resources and allow for increased industry involvement in the development of these standards. This new model places increases emphasis on apprenticeship training and assessing skills with industry learning objectives, outcomes and performance criteria.

The RSOS for each trade describes the tasks and sub-tasks; skills and knowledge requirements; summary of essential skills; safety information; trends affecting the trade; technical terms; names of tools and equipment; acronyms; learning objectives and outcomes; industry expected performance and essential skills related to each sub-task.

The RSOS is an excellent tool to use as you study for the Red Seal exam. RSOSs can be found at <http://www.red-seal.ca/resources/n.4.1-eng.html>

RSOS material is organized into the following categories: **MWA (Major Working Activity)**. The MWAs are further broken down into **TASKS** (*describes activities within an MWA*) and **SUB-TASKS** (*describe activities within a task – This is what the exam is based on*).

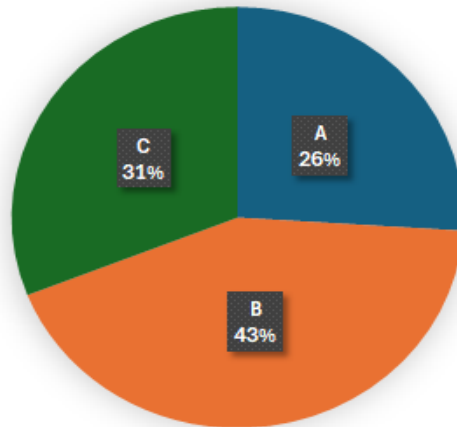


The NOA will continue to be used as the occupational standard for trades that do not yet have an RSOS developed.

RSOS Pie Chart

The RSOS Pie Chart presents the block percentages in the form of a pie chart which tells you the approximate number of questions from each MWA. For example, 26% of the questions on the **Metal Fabricator (Fitter)** Exam will be based on **MWA A**.

Metal Fabricator (Fitter)



MWA TITLES	
MWA A	Performs Common Occupational Skills
MWA B	Fabricates Components
MWA C	Assembles Components

Exam Breakdown

The **Metal Fabricator (Fitter)** Red Seal Exam has 130 questions. The following table shows a breakdown of the approximate number of questions that come from each RSOS MWA. It is important to note that the number of questions can change at any time. When you are ready to write your exam, you may contact your regional office to verify the number of questions (See Appendix A).

		# of Questions
MWA A	Performs Common Occupational Skills	34
Task 1	Performs safety-related functions	
Task 2	Uses and maintains tools and equipment	
Task 3	Organizes work	
Task 4	Performs quality assurance throughout fabrication and assembly process	
Task 5	Handles materials	
Task 6	Uses communication and mentoring techniques	
MWA B	Fabricates Components	56
Task 7	Performs layout	
Task 8	Cuts materials	
Task 9	Forms materials	
MWA C	Assembles Components	40
Task 10	Fits and fastens sub-components and components	
Task 11	Performs welding activities	
Task 12	Completes project	
Total		130

RSOS Sub-tasks

The following *RSOS Task Profile Checklist* outlines the MWAs, tasks and sub-tasks for your trade. The Red Seal exam is written to test your knowledge and abilities regarding the sub-tasks in the RSOS. This chart can be used to review your current knowledge. You can review by placing a check mark (✓) next to those you understand fully.

Place your focus on those you do not understand and study them until you are comfortable with the material. Think of possible questions in that particular content area.

The MWA also contains a list of “supporting knowledge and abilities” for each sub-task. They are the skills and knowledge you must have to perform a sub-task. The supporting knowledge and abilities identified under each sub-task will be very helpful as you review. The list can be found in the RSOS for your trade.

**Task Profile Checklist
Based on 2021 RSOS
Metal Fabricator (Fitter)**

MWA A: Performs Common Occupational Skills

Task 1: Performs Safety-Related Functions

Sub-Tasks

- Maintains safe work environment
- Uses personal protective equipment (PPE) and safety equipment

Task 2: Maintains and Uses Tools and Equipment

Sub-Tasks

- Uses hand, power, layout and measuring tools and equipment
- Uses stationary machinery
- Maintains cutting and welding equipment
- Uses access equipment

Task 3: Organizes Work

Sub-Tasks

- Interprets plans, drawings and specifications
- Organizes project tasks

Task 4: Performs Quality Assurance throughout Fabrication and Assembly Process

Sub-Tasks

- Performs visual inspections
- Verifies measurements, welds and layout
- Tracks materials and parts for traceability

Task 5: Handles Materials

Sub-Tasks

- Organizes material
- Determines weights
- Applies rigging practices
- Operates material handling equipment

Task 6: Uses Communication and Mentoring Techniques

Sub-Tasks

- Uses communication techniques
- Uses mentoring techniques

MWA B: Fabricates Components

Task 7: Performs Layout

Sub-Tasks

- Performs pattern development
- Calculates material allowances for various processes
- Determines dimensions
- Transfers dimensions
- Makes templates

Task 8: Cuts Materials

Sub-Tasks

- Cuts material using plasma cutting equipment
- Cuts material using oxy-fuel cutting equipment
- Cuts material using shears
- Cuts material using saws
- Cuts material using ironworkers
- Cuts material using computer numerical controlled (CNC) equipment
- Drills holes
- Cuts threads
- Prepares joints

Task 9: Forms Materials

Sub-Tasks

- Forms material using plate rollers
- Forms material using shape rollers
- Forms material using conventional and computer numerically controlled (CNC) press brakes
- Forms material using benders
- Applies heat for forming

MWA C: Assembles Components

Task 10: Fits and Fastens Sub-Components and Components

Sub-Tasks

- Assembles jigs
- Determines sequence for assembly
- Assembles sub-components and components
- Sets fabricated components in place
- Joins components on-site

Task 11: Performs Welding Activities

Sub-Tasks

- Applies heat prior to tack welding
- Performs tack welding
- Minimizes welding distortions
- Applies welding processes
- Corrects welding distortions

Task 12: Completes Project

Sub-Tasks

- Identifies type of finish
- Prepares material for finishing

Create a Study Plan

As you prepare for your exam, it is important to plan a schedule. The following two tables will help you stay on track.

The first table is a **“Weekly Study Plan.”** In this table list the areas you will focus your study for each day. You should include items you need to review as well as items you need to study. Remember, more time will be needed for study in areas you find difficult, whereas you may only require review in areas you are more familiar with. As you work through the RSOS sub-task list you can start to fill in this table.

The second table is a **“Study Time Table.”** It is important to create a study schedule where you determine the best days of the week and times of day for you to study.

Print several copies of these tables and fill out for each week of study. It is important to stick to your study schedule.

Weekly Study Plan for Week of: _____

	Area of Study 1	Area of Study 2	Area of Study 3	Area of Study 4	Area of Study 5	Area of Study 6
Mon.						
Tues.						
Wed.						
Thu.						
Fri.						
Sat.						
Sun.						

Study Time Table for Week of: _____

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8:00 AM - 9:00 AM							
9:00 AM - 10:00 AM							
10:00 AM - 11:00 AM							
11:00 AM - 12:00 Noon							
12:00 Noon - 1:00 PM							
1:00 PM - 2:00 PM							
2:00 PM - 3:00 PM							
3:00 PM - 4:00 PM							
4:00 PM - 5:00 PM							
5:00 PM - 6:00 PM							
6:00 PM - 7:00 PM							
7:00 PM - 8:00 PM							

Resources - Websites

Study information can be drawn from a variety of sources. A sample list of study materials (websites and books) is provided below. These and other helpful resources may be found in a local college bookstore, on the internet, or at your place of employment. You may also be able to borrow them from an apprentice or journeyman in your trade.

Study Strategies and Exam Preparation Guide

The *Study Strategies & Exam Preparation Guide* is meant to be used in conjunction with this study guide. It provides direction and information on such areas as study habits, test preparation and test taking techniques.

<https://www.gov.nl.ca/atcd/apprentices-youth/self-study/study-guides/>

Plan of Training (POT)

A *Provincial Plan of Training* details the full scope of learning for a particular occupation, including both technical training competencies and industry experiences necessary to write an IP Red Seal exam (and complete the requirements for Red Seal Certification), or to write a provincial examination. The Plan of Training is based on the RSOS.

<https://www.gov.nl.ca/atcd/designated-trades/pots-aacs/>

Red Seal Website

Red Seal is a program that sets common standards to evaluate the skills of tradespeople across Canada. It is a partnership between the Federal Government and the provinces/territories.

The Red Seal model has been based on the National Occupational Analyses (NOA) which supports the development of multiple-choice examinations. A new Red Seal Occupational Standard (RSOS) was introduced in 2015 and is taking the place of the NOA.

<http://www.red-seal.ca/>

Metal Fabricator PRACTICE Exam

This is **NOT** an Red Seal exam. This is a practice exam provided by the Red Seal Standards program. It was developed using similar question types to that of a Red Seal exam. The exam is intended to be used for self-assessment in preparation for writing a Red Seal Exam.

<https://www.red-seal.ca/eng/s.1mpl.2.2x.1mQ.5.2st.3.4ns.shtml?tid=145>

Red Seal Exam Self-Assessment Guide

Use this self-assessment tool to rate your own understanding and experience with the tasks of the trade that are on the Red Seal examination:

https://www.red-seal.ca/_conf/assets/custom/docms/metal-fabricator/self-assessment.pdf

List of Acronyms

The Red Seal website also lists Acronyms which will be helpful in preparing for your Red Seal exam:

<https://www.red-seal.ca/eng/trades/metalfabfit/app-a.shtml>

List of Tools and Equipment

The Red Seal website shows a list of Tools & Equipment which will be helpful in preparing for the Red Seal exam:

<https://www.red-seal.ca/eng/trades/metalfabfit/app-b.shtml>

Glossary

The Red Seal website also lists a Glossary of Terms which will be helpful in preparing for your Red Seal exam:

<https://www.red-seal.ca/eng/trades/metalfabfit/app-c.shtml>

Resources – Book List

You can use this book list to help you obtain information on specific topics. It is not necessary to use these books specifically, as you may find others that will be equally beneficial.

If you wish to obtain any of the resources listed above, here is the reference information:

- IPT's Guide to Blueprint Interpretation*, IPT Publishing and Training, 1985, ISBN 978-0920855423
- IPT Metal Trades Handbook*, IPT Publishing and Training, 1985, ISBN 978-0920855195
- IPT Pipe Trades Handbook*, Intl Publishing & Training Limited, 1991, ISBN 978-0920855188
- Blueprint Reading for Welders (Blueprint Reading Series)*, 8th edition, Delmar Cengage Learning, 2008, Bennett, A.E., and Siy, L.J., ISBN 978-1428335288
- Mathematics for Sheet Metal Fabrication*, Cengage Learning, 1970, Delmar, Delmar Thomson Learning and Learning Delmar, ISBN 978-0827302952
- Boiler Making Manual*, University of British Columbia Press, 1987, ISBN 978-0771882548

Disclaimer

Various external resources (websites, textbooks) have been listed in this study guide to assist an individual in preparing to write a Red Seal Exam. This does not mean the Department of Immigration, Population Growth and Skills, Newfoundland and Labrador endorses the material or that these are recommended as the best resources. There may be other resources of equal or greater value to an individual preparing for a Red Seal exam. The Department of Immigration, Population Growth and Skills has no control over the content of external textbooks and websites listed, and no responsibility is assumed for the accuracy of the material.

Conclusion

We hope this guide has provided you with some useful tools as you prepare for your Red Seal exam. If you have any questions regarding your Red Seal exam please contact your regional office (*see Appendix A for a list of regional offices*).

We appreciate your comments and feedback regarding the usefulness of this study guide. If you have any comments or suggestions, we welcome your feedback. The feedback form at the end of this guide can be used for this purpose.

Appendix A: Regional Offices

If you have any questions regarding your Red Seal exam, please contact one of the following regional offices:

Department of Immigration, Population Growth and Skills
Apprenticeship and Trades Certification Division
Toll Free: 1-877-771-3737

<https://www.gov.nl.ca/atcd/contact-us/staff-listing-and-office-locations/>

Corner Brook

1-3 Union Street
Aylward Building, 2nd Floor Corner
Brook, NL A2H 5M7

Telephone: (709) 637-2366
Facsimile: (709) 637-2519

Grand Falls-Windsor

42 Hardy Avenue
Grand Falls-Windsor, NL
A2A 2J9

Telephone: (709) 292-4215
Facsimile: (709) 292-4502

Clarenville

45 Tilley's Road
Clarenville, NL
A5A 1Z4

Telephone: (709) 466-3982
Facsimil (709) 466-3987

St. John's

P.O. Box 8700
1170 Topsail Road
Mount Pearl, NL A1B 4J6

Telephone: (709) 729-5688
Facsimile: (709) 729-5878

Happy Valley – Goose Bay

163 Hamilton River Road
Burse Building
Happy Valley – Goose Bay, NL
AOP 1E0

Telephone: (709) 896-6348
Facsimile: (709) 896-3733

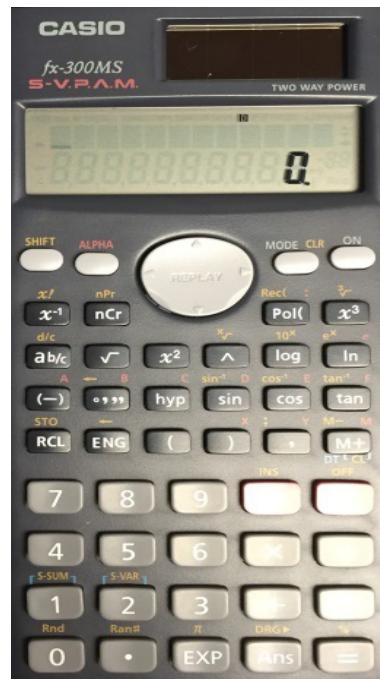
Appendix B: Calculator Use

The picture below shows a calculator with the same functions as the one you will be provided with during your exam. It is advisable to borrow or purchase one with similar functions so that you can familiarize yourself with it before you write your exam.

Casio FX-260



Casio FX-300 MS



Appendix C: Answer Sheet Example

With your exam you will be given an answer sheet like the one below. When answering multiple choice questions be sure to fill the circle completely and fill the circle that corresponds to the question on the exam.

Dual readhead scanner required to score this sheet

KEY ID
 A B C D

SCORING & PRINTING OPTIONS:
 RESCORE MULTIPLE ANSWER SCORING
 This sheet always uses the "Total Only" scoring option.

1 T F 1 A B C D E 26 T F 26 A B C D E 51 T F 51 A B C D E 76 T F 76 A B C D E
 2 A B C D E 27 A B C D E 52 A B C D E 77 A B C D E
 3 A B C D E 28 A B C D E 53 A B C D E 78 A B C D E
 4 A B C D E 29 A B C D E 54 A B C D E 79 A B C D E
 5 A B C D E 30 A B C D E 55 A B C D E 80 A B C D E
 6 A B C D E 31 A B C D E 56 A B C D E 81 A B C D E
 7 A B C D E 32 A B C D E 57 A B C D E 82 A B C D E
 8 A B C D E 33 A B C D E 58 A B C D E 83 A B C D E
 9 A B C D E 34 A B C D E 59 A B C D E 84 A B C D E
 10 A B C D E 35 A B C D E 60 A B C D E 85 A B C D E
 11 A B C D E 36 A B C D E 61 A B C D E 86 A B C D E
 12 A B C D E 37 A B C D E 62 A B C D E 87 A B C D E
 13 A B C D E 38 A B C D E 63 A B C D E 88 A B C D E
 14 A B C D E 39 A B C D E 64 A B C D E 89 A B C D E
 15 A B C D E 40 A B C D E 65 A B C D E 90 A B C D E
 16 A B C D E 41 A B C D E 66 A B C D E 91 A B C D E
 17 A B C D E 42 A B C D E 67 A B C D E 92 A B C D E
 18 A B C D E 43 A B C D E 68 A B C D E 93 A B C D E
 19 A B C D E 44 A B C D E 69 A B C D E 94 A B C D E
 20 A B C D E 45 A B C D E 70 A B C D E 95 A B C D E
 21 A B C D E 46 A B C D E 71 A B C D E 96 A B C D E
 22 A B C D E 47 A B C D E 72 A B C D E 97 A B C D E
 23 A B C D E 48 A B C D E 73 A B C D E 98 A B C D E
 24 A B C D E 49 A B C D E 74 A B C D E 99 A B C D E
 25 A B C D E 50 A B C D E 75 A B C D E 100 A B C D E

ANSWER KEY INFO.
 # OF KEYS
 ITEM COUNT

0	0	0	2
1	1	1	3
2	2	2	4
3	3	3	
4	4	4	
5	5	5	
6	6	6	
7	7	7	
8	8	8	
9	9	9	

PERFORMANCE ASSESSMENT
 % OF TOTAL SCORE (00 = 100%)

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Bar Code

NUMBER CORRECT	
PERCENT CORRECT	
ROSTER NUMBER	
SCORE	
RESCORE	

COMBINED POINTS EARNED	
COMBINED PERCENT CORRECT	
LETTER GRADE	
SCORE	
RESCORE	

200 ITEM

MARKING INSTRUCTIONS
 Use a No. 2 Pencil
 Fill oval completely
 Erase cleanly

STUDENT ID NUMBER

0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

NAME _____
 SUBJECT _____
 PERIOD _____ DATE _____

Feedback Form

Study Guide – Metal Fabricator (Fitter)

Please answer the following:

- (1) This Study Guide is a useful tool for exam preparation.
 strongly agree agree disagree strongly disagree
- (2) The topics contained in the guide are arranged in a logical order.
 strongly agree agree disagree strongly disagree
- (3) The design and format of the guide caught my attention.
 strongly agree agree disagree strongly disagree
- (4) The instructions throughout the guide are clear and to the point.
 strongly agree agree disagree strongly disagree
- (5) The resources listed in this guide are suitable and valuable.
 strongly agree agree disagree strongly disagree
- (6) The guide should contain more information.
 strongly agree agree disagree strongly disagree

Suggested information/resources to include:

Additional Comments:

Please complete this form and return via fax or mail to the following:

Department of Immigration, Population Growth and Skills
Apprenticeship and Trades Certification Division
Standards and Curriculum Unit
45 Tilley's Road, Clarenville, NL A5A 1Z4
Fax: (709) 466-3987

