

SKILLS EXPLORATION 10 - 12

Program Guide 2014



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INTRODUCTION

Skills Exploration 10-12 (STX) is a Ministry Authorized course jointly supported by the Ministry of Education and the Industry Training Authority (ITA). Through participation in STX, students learn trades and technology skills and earn credit towards secondary school graduation. Later, students may decide to pursue an industry training program to become a certified tradesperson (journey person) or a certified technician/technologist. Typically, industry apprenticeship training programs consist of 80% work-based training and 20% in-school technical training. Generally, an apprenticeship program takes four years to complete. The British Columbia Ministry of Education is responsible for establishing standards and learning outcomes for STX. This Program Guide sets out those standards and learning outcomes.

The ITA leads and coordinates British Columbia's skilled trades system. ITA works with employers, employees, industry, labour, training providers and government to issue credentials, manage apprenticeships, set program standards, and increase opportunities in the trades.

The ITA awards provincial credentials (Certificate of Qualification) to candidates after they successfully complete their training programs.

One of the ITA's responsibilities is to oversee apprenticeship training. Apprenticeship training is paid, workplace-based training combined with in-school technical training, where apprentices acquire knowledge about the technical knowledge, skills, tools, and materials of a trade. The ITA has responsibility for two types of industry training programs: BC trades programs, which are recognized and specific to the province of BC, and Red Seal trades programs, which are recognized provincially and nationally. Through the Red Seal program, certified tradespeople can obtain a "Red Seal" endorsement on their BC Certificates of Qualification. The Red Seal allows qualified tradespeople to practice their trade in any province or territory in Canada where the trade is designated, without having to write further examinations. See www.red-seal.ca/ for additional information on the Red Seal Program.

This Program Guide was developed by the Ministry of Education in consultation with the ITA and BC educators to ensure that it reflects best practices in teaching and industry training. School authorities and school staff are responsible for implementing STX according to the standards contained in this Program Guide, and providing access to STX for all interested students.

RATIONALE

In the Graduation Program 2004, Trades and Technology is one of the eight Focus Areas that students explore in Planning 10. (For more information about the Graduation Program 2004, Focus Areas, and Planning 10, see www.bced.gov.bc.ca/graduation/grad2004.htm)

STX is a Ministry Authorized course intended to allow students to explore trades or technology careers and subsequently enrol in Accelerated Credit Enrolment in Industry Training (ACE IT) and/or Secondary School Apprenticeship (SSA). Although, STX is not a

prerequisite for ACE IT or SSA. STX involves learning that explores skills and knowledge in a number of trades or technology areas. STX is intended to assist students in making smooth transitions to either the workplace, or an appropriate post-secondary program.

Industry training increases the relevance and practical application of the secondary school curriculum by linking directly with the world of work. This Program Guide contains some of the same learning competencies and content tasks found in related apprenticeship Level 1 technical training programs. Students enrolled in STX learn introductory skills taught in the related Level 1 technical training programs, but are not taught comprehensive first level training content.

The Skills Exploration 10-12 Program Guide provides students with learning experiences that involve the knowledge, skills, and attitudes in a number of trades or technology areas. The Program Guide sets out what students are expected to know and be able to do, and contains the required content standards for students in BC secondary schools. Schools have the responsibility to ensure that students achieve the Prescribed Learning Outcomes and Competencies in this Program Guide. However, schools have flexibility in determining how the delivery of content can best take place.

GOALS FOR SKILLS EXPLORATION 10-12

Skills Exploration 10-12 has a number of goals:

- Introduce students to trades and technology careers, and the type of work involved in them, through hands on experience.
- Enhance existing interest in trades and technology careers.
- Enhance students' existing job-readiness skills, or provide opportunities for the development of new skills.

A central outcome is to provide all students with the opportunity to learn selected apprenticeship Level 1 technical training skills in a variety of trades. Providing students with smooth transitions from school to work, and helping to prepare students to enter the world of work with the skills, attitudes, and sense of responsibility necessary to be successful, are two further expected outcomes of STX.

CLASSROOM ASSESSMENT

Teachers are encouraged to develop assessment methods that best capture student performance as they progress through, and complete the course. For the effective assessment of Prescribed Learning Outcomes and Competencies, methods of classroom criterion-referenced assessment and evaluation are needed to track progress and measure student achievement.

Assessment evidence can be collected using a wide variety of methods, including:

- observation and comment (written, oral, practical)
- student self-assessments and peer assessments
- quizzes and tests (written, oral, practical)
- samples of student work
- projects

Student evaluation can be based on information collected through school-level assessment activities. Teachers use their experience, insight, knowledge about learning, and experience with students, along with the specific criteria they establish, to make judgments about student performance in relation to the Competency. Some of the Competencies may require a specific

demonstration of the learning tasks, while others might involve a demonstration of cognitive knowledge.

SAFETY CONSIDERATIONS

One of the fundamental requirements of the workplace is an understanding of safe work practices and procedures. This understanding is not limited to cognitive knowledge. Rather, it must be translated into actions and behaviours that students apply on a daily basis. This knowledge and experience should endure after students' time in the classroom.

As students begin to experience a more complex environment with tools and equipment in which operational dangers are inherent, essential safety procedures must become second nature and be reinforced throughout students' time in a workshop, or on a job site.

Teachers need to be highly aware of safety issues while students are involved in maintenance, repair, replacement, servicing, or production activities. Safe work practices and procedures include:

- modelling correct procedures at all times
- teaching specific instructions on safe and correct use and handling of equipment and tools
- teaching clear and specific instruction on how to use, handle, and dispose of waste or hazardous materials, and modelling these procedures in daily practice
- verifying that all equipment, tools, and utensils are in good repair and suitably arranged for effective and safe student use
- supervising students at all times and in a correct manner
- verifying that facilities provide adequate lighting for detailed work
- verifying that ventilation and air circulation are appropriate to the task
- clearly defining and teaching hazard and accident awareness and avoidance techniques in the work area
- teaching industry-specific safety standards and procedures (in accordance with WHMIS, the Workplace Hazardous Materials Information System)
- verifying that students can demonstrate knowledge and operational behaviours that indicate their understanding of the information in appropriate school-based activities
- establishing a safe learning environment by ensuring that working practices have safety as a priority while students complete their personal projects. This would include:
 - establishing rules and routines
 - ensuring that students wear appropriate clothing and safety equipment
 - referencing WorkSafeBC; Workers' Compensation Board (WCB) standards, regulations, and procedures; and Occupational Health and Safety Regulation content
 - selecting pertinent tasks that reflect Level 1 Learning Objectives appropriate for the skills and abilities of the students

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS is implemented through coordinated and interlocking federal, provincial, and territorial legislation. The Hazardous Products Act (HPA) and the Controlled Products Regulations (CPR) require Canadian suppliers (including importers and distributors) to

provide supplier labels and material safety data sheets (MSDSs) for controlled products that are sold or imported for use in Canadian workplaces.

Current industry WHMIS standards and practice must be embedded in instruction.

EMPLOYABILITY SKILLS

Employability skills are generic skills that all students need to make a successful transition to the workplace. These skills complement technical workplace skills. The Conference Board of Canada (<http://www.conferenceboard.ca/>) organizes these skills into three categories: Fundamental Skills, Personal Management Skills, and Teamwork Skills.

Fundamental Skills form the basis for further skills development. They include communication skills such as reading and understanding information, as well as listening to others and sharing information. Information management, the application or use of numbers, and problem solving are other fundamental skills.

Personal Management skills comprise positive attitudes and behaviours that determine student potential for growth. They include demonstration of responsibility, adaptability, continuous learning, and working safely in all situations.

Teamwork Skills are required for students to contribute productively in any environment. Teamwork skills include working with others on projects and tasks.

Employability Skills are introduced in Planning 10 to all students. The Prescribed Learning Outcomes and Competencies in this Program Guide provide students with the opportunity to observe, develop, or demonstrate a variety of the skills that are essential for employment in today's economy. Further information about employability skills can be found at www.conferenceboard.ca/topics/education/default.aspx.

CAREER AWARENESS/GUIDANCE

An integral part of STX is career awareness. Educators should provide information about how to get into a trade/apprenticeship or a technology career. Students should learn about the following:

- the Essential Skills required for trades or technology careers of interest
- Apprenticeship opportunities through their school or local post-secondary institutions (e.g. SSA, ACE-IT programs)
- Job opportunities in high demand trades or technical careers.

As part of the STX course, students should explore the Essential Skills Assessment site through the ITA at www.ita.essentialskillsgroup.com.

Open School BC has created materials and Learning Resources that support this Program Guide. This material includes lesson plans, and related materials, that support learning outcomes for each of the STX Modules. In addition to the trades-specific learning, other topics will also be covered including:

1. Overview of the Trade and Working Conditions.
2. How to Become a Tradesperson in a Specific Trade.

It is expected that during these activities students will investigate career paths and related training and apprenticeship opportunities. Teachers, career educators/counselors, and possibly local employment counselors may provide information and connections for learners.

PLANNING 10

Before participating in STX, students would benefit from having job-seeking skills, including resume writing and job interview skills. Students should have completed relevant Planning 10 learning outcomes involving job seeking, keeping a job, employment standards and workplace safety before taking STX.

ADDRESSING LOCAL LABOUR MARKET INFORMATION AND NEEDS

There are approximately 100 recognized trades in BC. Labour Market Information (LMI) gives clear details about specific occupations. This includes the nature of work, main duties, working conditions and wages, employment prospects, and education and training requirements. Usually this information addresses local, regional, and national work opportunities and trends.

For teachers, schools, and boards/authorities implementing STX, it is important to know the demand for specific occupations before instruction begins. Local industry associations and Industry Training Organisations (<http://www.itabc.ca/industry-training-organizations/industry-training-organizations-overview>) are a good source for obtaining information. WorkBC also has excellent information regarding careers at: www.workbc.ca/Job-Seekers.aspx.

FACILITIES, EQUIPMENT, AND RESOURCES

To deliver STX programs in BC schools, training sites should have adequate facilities, equipment, and resources, and should include:

- a safe facility and healthy working environment
- an appropriate quality and quantity of tools, equipment, supplies, materials, and safety equipment for effective instruction

Additional information about tool and equipment requirements for program delivery is provided in the ITA Program Outlines and the National Occupation Analysis (NOA) available on the Red Seal website: <http://www.red-seal.ca>.

Program-specific information can be found on the appropriate NOA lists, such as:

- Automotive Service Technician: www.red-seal.ca/tr.1d.2n.4.1l.3st@-eng.jsp?tid=23&nid=2
- Carpenter: www.red-seal.ca/tr.1d.2@-eng.jsp?tid=38&tid=38
- Construction Electrician: www.red-seal.ca/tr.1d.2@-eng.jsp?tid=51&tid=51
- Plumber: www.red-seal.ca/tr.1d.2@-eng.jsp?tid=181&tid=181

A suggested list for facility and equipment is available in the Appendix of this Program Guide.

MINISTRY COURSES AND CODES FOR SKILLS EXPLORATION 10-12

In order to make Skills Exploration 10-12 as flexible as possible, the Ministry has created course codes at grades 10, 11, and 12. The intention is for schools to have the flexibility to deliver instruction at any grade in the graduation program, and have a readymade course code tailored for each. However, it should be noted that course codes STX 10A, 11A, and 12A are four credit courses. Students, who enrol in other Skills Sampler courses or modules, may be awarded two or four credits depending on the instructional time. These two or four credit course codes are Skills Exploration 10B, 11B, and 12B. Districts that wish to award one credit for partial completion of any STX course, or for students who enrol in additional STX courses or Modules, may use Independent Directed Studies.

Ministry rules regarding covering the same course materials twice apply to any STX course. Students may not receive a second course credit if they repeat a module on a specific trade, or in any way cover the same material twice. This policy applies regardless of the grade level when students first enrol in STX. To be clear, students may not receive separate course credit for duplicate instruction in Plumbing, or any other trade Module. They may, however, upgrade their first course mark by retaking a STX course. It is also recommended that students who enrol in two credit courses twice have their transcripts changed to reflect a single four credit course.

The Ministry has designated the following courses for schools delivering Skills Exploration 10-12:

Skills Exploration 10A	4 Credits	Skills Exploration 10B	4 or 2 Credits
Skills Exploration 11A	4 Credits	Skills Exploration 11B	4 or 2 Credits
Skills Exploration 12A	4 Credits	Skills Exploration 12B	4 or 2 Credits

As stated, only Independent Directed Studies 12 may be used to award 1 credit for STX-related learning.

WORK-BASED TRAINING

Work-based training is an integral part of an industry training program. STX has an intrinsic fit with Work Experience 12. Subsequent to completing STX, students may undertake WEX 12 to apply learning from STX. This may be particularly useful for students considering, but not sure about, a trades career or further trades training, including SSA and ACE IT.

INDUSTRY CERTIFICATE COURSES

STX involves industry training based in part on trades-specific content. As such, there is a fit between this course and specific industry-related certificates.

Some schools may opt to offer certificates in STX. Additionally, certain elements of the following Industry Certificate Courses may be introduced by different school districts around the province.

- WHMIS
- First Aid (OFA Level 1)
- Fall Protection
- FOODSAFE Level I
- Construction Safety Training System (CSTS)
- Flag person
- Powder-actuated Fastening (e.g., Hilti training)
- Confined Spaces Training

PRESCRIBED LEARNING OUTCOMES

PRESCRIBED LEARNING OUTCOMES OVERVIEW

Prescribed Learning Outcomes (PLOs) are the legally required content standards for the provincial education system. They define the required skills and knowledge for STX courses. The PLOs are statements of what students are expected to know and be able to do by the end of each course within a subject area.

It is expected that student achievement will vary in relation to the PLOs. Evaluation, reporting, and student placement with respect to the Prescribed Learning Outcomes are dependent on the professional judgment and experience of teachers, guided by provincial policy.

Skills Exploration 10-12 as a course has two types of Prescribed Learning Outcomes:

- Core Prescribed Learning Outcomes. These PLOs involve the overarching learning all students must accommodate in STX, including career exploration, safety, workplace knowledge, essential skills, and common cross-trade content involved in the course.
- Trades - Specific Prescribed Learning Outcomes. Given that STX involves sampling authentic trades training, these PLOs cover content found in Industry Training Program Outlines.

THE ROLE OF MODULES IN SKILLS EXPLORATION 10-12

Given that STX is intended to provide students with a range of experiences in a number of different trades or technology areas, the Prescribed Learning Outcomes found in this Program Guide are divided into Modules:

1. Core
2. Automotive
3. Electrical
4. Plumbing
5. Carpentry
6. Local Option

The intention of this modularization is flexibility. School authorities are encouraged to structure the delivery of course content in a manner that best suits the needs of their students and community. Additional Modules will be created to increase the scope of STX. School Districts and Independent School authorities may decide to combine all modules into a single project. School personnel are in the best position to determine how to deliver the required content and meet the Prescribed Learning Outcomes.

The Core Module is intentionally cross-curricular in nature. The Core Module contains all related content not specific to a particular trade or technology area in the course. Content includes knowledge of BC's Apprenticeship system, Career Planning, Essential Skills, and Safety, and may include learning that applies to various certificates like FoodSafe, First Aid, or other safety related learning outcomes.

The Automotive, Electrical, Plumbing, and Carpentry Modules contain unique content and Prescribed Learning Outcomes, but, are similar in that they cover content specific to a particular trade. One essential aspect of Skills Exploration 10-12 is that each of the trades or technology areas will be given roughly the same weighting in terms of time spent on each Module. The Ministry recognizes that there will be variations in delivery methods and time spent on each Module, however, it is expected that schools will attempt to balance the content equitably.

The Local Option Module is intended to represent an additional ITA apprenticeship program / trade (i.e. different from Automotive, Electrical, Plumbing or Carpentry). As there may be local variation in terms of the specific trades or technology areas content to include in STX, the Local Option Module allows schools the flexibility to tailor the course to their needs. The Local Option Module can be used to replace the content of any other non-Core Module. Schools are authorized to use it as a fourth Module if they wish, but it is not required to be a fourth. Any Local Option Module is to be given the same weight in the course as any of the other Modules, and ITA-program specific Learning Outcomes are the basis for instruction.

WORDING OF PRESCRIBED LEARNING OUTCOMES

All Prescribed Learning Outcomes complete the stem: “It is expected that students will...”

When used in a Prescribed Learning Outcome, the word “including” indicates that any ensuing item must be addressed. Lists of items introduced by the word “including” represent a set of minimum requirements associated with the general requirement set out by the outcome. These lists are not necessarily exhaustive, however; teachers may choose to address additional items that also fall under the general requirement set out by the outcome.

Conversely, the abbreviation “e.g.” (for example) in a Prescribed Learning Outcome indicates that the ensuing items are provided for illustrative purposes or clarification, and are not required. Presented in parentheses, the list of items introduced by “e.g.,” is neither exhaustive nor prescriptive, nor is it put forward in any special order of importance or priority.

PRESCRIBED LEARNING OUTCOMES

Core Module

Competency: Students will demonstrate knowledge of BC's Apprenticeship system

Prescribed Learning Outcome

It is expected that students will:

- CO1. describe the Apprenticeship System in British Columbia
- CO2. learn about apprenticeship and trades careers
- CO3. learn about trades apprenticeship and certification
- CO4. use mathematics, science and technology in the trades

Competency: Career Planning

Prescribed Learning Outcome

It is expected that students will:

- CO5. recognize the value of trades and contributions of the trades to society
- CO6. demonstrate an understanding of employability skills (e.g., communication, problem solving, teamwork)
- CO7. compare a variety of post-secondary education and training institutions and programs

Competency: Essential Skills

Prescribed Learning Outcome

It is expected that students will:

- CO8. understand the Language, Numeracy, and Technical Fluencies required for entry into STX-related trades
- CO9. explore required trades skills using the ITA Essentials Skills online tool

Competency: Entrepreneurship

Prescribed Learning Outcome

It is expected that students will:

- CO10. understand and appreciate the contribution of entrepreneurial activity to business and the economy
- CO11. assess how personal attributes influence the success of a venture

Competency: Safety, Safe Work Practices, and WHMIS

Prescribed Learning Outcome

It is expected that students will:

- CO12. apply personal safety measures
- CO13. identify and use shop emergency equipment
- CO14. describe workplace hazards
- CO15. select and use personal protective equipment
- CO16. describe the purpose of the Workplace Hazardous Materials Information System (WHMIS) Regulations
- CO17. explain the contents of material safety data sheets (MSDS)

Automotive Module

Competency: Tools and Equipment

Prescribed Learning Outcome

It is expected that students will:

- AT1. identify hand tools, portable power tools, and lifting and jacking equipment
- AT2. select and demonstrate safe use of hand tools
- AT3. select and demonstrate safe use of portable power tools
- AT4. select and demonstrate safe use of lifting and jacking equipment

Competency: General Automotive Maintenance

Prescribed Learning Outcome

It is expected that students will:

- AT5. describe and identify lubricants and fluids
- AT6. describe and identify drive belts and filters
- AT7. perform basic maintenance

Competency: Automotive Electrical Systems

Prescribed Learning Outcomes

It is expected that students will:

- AT8. define electrical terminology
- AT9. identify and describe electrical components and their purpose
- AT10. use electrical test equipment and scan tools

Carpentry Module

Competency: Construction Drawings and Specifications

Prescribed Learning Outcome

It is expected that students will:

- CP1. describe construction drawings and specifications
- CP2. extract information from a set of construction drawings
- CP3. describe building codes and bylaws

Competency: Hand Tools, Power Tools, and Shop Equipment

Prescribed Learning Outcome

It is expected that students will:

- CP4. use measuring and layout tools
- CP5. use cutting, boring and alignment tools
- CP6. use portable power tools

Competency: Floors, Support Systems and Walls and Partitions

Prescribed Learning Outcome

It is expected that students will:

- CP7. describe the construction of floors and support systems
- CP8. describe the construction of wood frame walls
- CP9. select materials and construct floors, support systems and wood frame walls

Electrical Module

Competency: Electrical Circuit Concepts

Prescribed Learning Outcome

It is expected that students will:

- EL1. describe the principals of electricity
- EL2. describe the basic operation of electric circuits
- EL3. describe common components of electrical circuits

Competency: Drawings, Specifications and Manuals

Prescribed Learning Outcome

It is expected that students will:

- EL4. use common drawings for electrical circuits
- EL5. locate and interpret information found on working drawings
- EL6. coordinate information found on various drawings and supporting material
- EL7. describe codes, regulations and standards that apply to the electrical industry

Competency: Low Voltage Distribution Systems

Prescribed Learning Outcome

It is expected that students will:

- EL8. describe distribution centres
- EL9. describe the objectives of grounding and bonding
- EL10. identify raceways boxes and fittings
- EL11. install conductors and cables

Plumbing Module

Competency: Hand Tools and Portable Power Tools

Prescribed Learning Outcome

It is expected that students will:

- PL1. select hand and portable power tools
- PL2. use hand and portable power tools

Competency: Pipe, Valves and Fittings

Prescribed Learning Outcome

It is expected that students will:

- PL3. identify piping and tubing materials
- PL4. join piping
- PL5. identify valves and fittings
- PL6. describe connection methods
- PL7. select and install valves and fittings

Local Option Module(s)

The Local Option Modules(s) are intended to allow School Districts and Independent Schools the flexibility to modify STX to meet their requirements in terms of internal capacity, regional employment opportunities, or ability to effectively deliver instruction. The Prescribed Learning Outcomes for any Local Option Module must be based, in part, on ITA apprenticeship technical training currently in practice in BC. Schools must ensure that the amount of time spent in a Local Option Module is roughly equal to the time spent on tasks in the other modules.

There is no limit to the number of Local Option Modules in STX.

Every student must receive instruction in the mandatory Core Module.

Competency: Learn and demonstrate skills that apply to ITA apprenticeship Level 1 technical training in a specific trade.

Prescribed Learning Outcome

It is expected that students will:

LO1. Meet the Local Option Competency

**SUPPORTING MATERIALS, LEARNING RESOURCES
AND APPENDIXES**

LEARNING RESOURCES FOR SKILLS EXPLORATION MODULES

Open School BC has created Supporting Materials and Learning Resources for STX. These learning resources have been provided as support for teachers in instruction, assessment, and delivery of STX. As with all supplementary resources, local approval is required before use. Teachers wishing to use these materials should preview and select those that are appropriate for use in their classroom and by their students. The resources are not intended as an exhaustive or exclusive list; rather, these materials represent a useful collection, relating to many of the key elements of the course.

Open School BC's website is: <http://www.mytrainingbc.ca/SkillsExploration/index.html>

APPENDIX A: SUGGESTED TOOLS LIST BY TRADE

The following Tools Lists are suggestions only. They come from each of the related ITA Program Outlines. Schools should use these lists as guides and decide for themselves the necessary tools for their programs.

Automotive Module

Standard Tools

Air drills/tools
Air hammer/chisel
Air ratchet
Antifreeze tester
Axle boot clamp tool
Battery post service and reshape tool
Belt tension release tool
Blow gun
Bolt extractor set (easy outs)
Brake service tools (adjusters, spring removal, installation and caliper tools)
Caulking gun
Centre punch
Chisels, punches
Creeper/fender covers
Crowfoot wrenches (flare and std, SAE and Metric)
Dial indicator set (SAE and Metric)
Die grinder
Drill and bits
Drill gauge
Feeler gauges – SAE and metric
Files – bastard cut/half round/mill cut/square and thread file
Filter wrenches
Flare nut wrenches – SAE and metric
Flaring tool (SAE, metric and ISO)
Flash lights
Fuel line disconnect set
Hacksaw
Hammers – ball peen/dead blow/rubber

Mallet/softface
Hex keys – SAE and metric
High voltage safety gloves (0 rated 1000v)
Impact driver and bits
Impact wrench and impact socket set – SAE and metric
Inspection mirror
Jumper lead
Magnetic pick up tool
Mechanic's pick set
Multimeter (DVOM)
Pliers – slip joint, needle nose, adjustable, wheel weight, side cutter, snap ring, locking, hog ring and battery types
Pry bar
Pullers – gear, pulley, battery terminal and steering wheel
Ratchet and sockets – ¼, ⅜ and ½ drive – SAE and metric, swivel, spark plug, extensions and adapters
Rivet gun
Scraper (gasket and carbon)
Screwdriver set
Seal drivers and extractors
Soldering tools
Standard test leads and probes
Steel rule
Stethoscope
Straight edge
Stud extractor
Tamper-proof torx set
Tap and die set – SAE and metric
Tap extractor
Tape and ruler
Terminal remover tools

Test lamp –electronics safe (powered and non-powered)
Thermometer
Thread files
Thread pitch gauge
Tin snips – centre, left and right cut
Tire pressure gauge
Tool box
Torque angle meter/indicator
Torque limited sockets (torque sticks)
Torque wrenches – various sizes and ranges
Torx bits
Tread depth gauge (for tires and brakes)
Trouble light
Tube bending tool
Tube cutters
Upholstery tools – trim panel tools, hog ring pliers
Utility knife
Vacuum pump
Vacuum/pressure gauge
Vernier caliper – SAE and metric
Vise grips
Wire brush
Wire stripper/crimping tool
Wrench set – SAE and metric/various

Shop Tools and Equipment

Acetylene torches
Airbag for alignment adjustments
Airbag removal tools
Airbag simulators
Air buffer

Automotive Module cont.

Air compressor – hoses – inline filter and water separators
Alignment lift and equipment- 4 wheel
Angle grinder
Anti-static devices
Arbor press
Ball joint press and adapters
Battery charger/boosting equipment
Battery hydrometer
Battery tester/alternator and starter tester (AVR)
Bearing remover
Belt tension gauge
Bench grinders
Bench vises
Bottle jacks (2)
Brake adjustment calipers
Brake bleeder wrenches
Brake cylinder hone
Brake fluid moisture tester
Lathe
Brake pedal depressor
Brake pressure tester
Brake rotor gauge/micrometer
Brake system bleeder
Calibrated vessel
Caliper tools for rear-wheel disc
Chassis ears
Brake washer system (for 2 and 4 post hoists)
Computer – PC
Drill press
Electrical short detector
Floor jack
Funnels
Grease gun and fluid suction pump

Heat gun
Heli-coil kits
Hub service kit
Hydraulic press
Jack stands and supports
Leak detection equipment (refrigerants)
Leak detection tank (tires)
Oil drain barrels and disposal system
Parts washers
Pickle-fork tool set
Pitman arm pullers
Power steering pressure tester
Presses
Pressure washer
Reamer
Vacuum
Slide hammer
Smoke machine
Spreaders (tire)
Spring compressors – coil spring and strut
Spring
Steering wheel holder
Steering wheel puller set
Steering lock plate removal tool
Steering tilt pin removal tool
Tie-rod end puller
Tie-rod sleeve tools
Tire changing machine (run-flat capable)
Tire balancer equipment (road force type recommended)
Tire repair equipment
TPMS system service tools
Transmission fixtures
U-joint press
Door trim tools

Vehicle lifts
Vehicle service information system
Water hose
Welding equipment – GMAW welder and oxy fuelled

Measuring Tools and Equipment

ABS pressure tester
Ball joint dial indicator set
Brake drum gauge (for brake shoe adjusting)
Brake drum micrometer
Battery tester (electronic)
DVOM (Digital Volt Ohm Meter) (CAT III)
Headlight aiming equipment
Infrared thermometer
Lab scope or graphing multi-meter; 8 per class of 16 (channel, digital, curser function with time capture capability)
Lab scope accessories (shielded cables and back probes)
Low amp probe
Logic probe
Micrometer – SAE and metric
Power steering pressure tester
Pressure gauges
Scan tools, [CAN (Controller Area Network) bus capable with appropriate software no older than 5 years of current vehicles]
Spring scale

Carpentry Module

Hand Tools

Adjustable wrench
Allen wrenches
Angle divider
Aviation snips
Back saw
Brad driver
Builder's level
Butt gauge
Callipers (inside and outside)
Carpenter's apron
Caulking gun
Chalk line
Chamfer cutters
Circle cutter
Clamps
Cold chisel
Combination square
Concrete bits
Cone/tie wrench
Coping saw
Cordless drill
Dividers
Drawing instruments
Dry line
Drywall T-square
File
Framing square
Hack saw
Hammers (framing, finishing)
Hand level – 24" and 48"
Hand saws
Hatchet
High speed drill set
Hinge gain template
Hole saw
Keyhole saw
"J" rollers
Knives
Laminate knives
Levels
Measuring tape
Multi-driver screwdriver
Nail puller
Nail set
Plane (bench)
Plane (block)
Plane (compass)
Plane (fore)

Plane (jack)
Plane (jointer)
Plane (rabbet)
Plane (router)
Plane (smooth)
Plane (universal)
Pencil/marketing instrument
Pipe wrench
Pliers and side cutter
Plumb bob
Pop rivet gun
Pry bars
Putty knife
Rasp
Scale rulers
Screwdrivers
Scriber
Scribing compass
Set of chisels
Sheet metal brake
Sliding T-bevel
Stair gauges
Stapler
Stones (oil and water)
Spoke shaves
Speed square
Tape measure 100 ft
Tape measure 25 ft
Taps
Torpedo level
Trammel points
Try square
Wood boring bits
Wood chisels
Wood spade bit set
Wrecking bar

Survey Instruments

Laser level
Optical levels
Theodolite
Three-axis laser level
Total station
Transit
Water level

Standard Safety Equipment

Breathing apparatus
Cutting goggles
Dust mask
Lanyard
Reflective vest
Rope grab
Fall protection Safety boots
First aid kit
Safety glasses and goggles
Gloves Safety lifeline
Hard hat
Welding gloves
Hearing protection
Welding mask

Portable Power Tools and Portable Equipment

Air blowpipe
Ladder hoist
Air compressor
Ladder jacks
Belt sander
Laminate trimmer
Biscuit joiner
Metal cut-off saw
Bull float
Mini-grinder
Calculator
Mitre saw
Chainsaw
Mortise machine
Circular saw
Palm sander
Compressor
Planer
Concrete cutting saw
Pneumatic tools
Concrete vibrator
Portable power tool accessories
Construction heaters
Powder actuated tools
Cordless drill and bits
Power nailer/fastener
Cut-off saw
Reciprocating saw

Carpentry Module

cont.

Cut out tools
Roof jack
Drywall gun
Router and bits
Electric chipping hammer
Salamander type heater
Electric drill
Sander
Electric shears
Scaffold
Extension
Screed
Extension cords
Sprayers
Generator
Stapler
Grinder
Step ladders

Hammer drill
Tiger torch
Hydraulic jacks
Tile cutter
Igniter
Torches
Jackhammer
Wall jack
Jigsaw
Wet/dry vacuum
Ladder
Wheelbarrow

Rigging and Hoisting Equipment

Chokers
Ropes
Come-alongs
Skid ramps
Eyebolts
Tirfors

Nylon lifting straps
Turnbuckles
Pinch bar

Stationary Equipment

Band saw
Mortiser
Disk sander
Radial arm saw
Drill press
Router table
Dust collection equipment
Shaper
Grinder
Table saw
Jointer
Thickness planer

Plumbing Module

Hand Tools

Adjustable wrench
Plumb bob
Ball-peen hammer
Pry bars
Basin wrench
Punch
Broom
Ratchet
Caulking gun
Rubber mallet
Chalk line
Scratch awl
Chisels
Screwdrivers (complete set)
Claw hammer
Shovel
Combination wrench
Sledgehammer
Drywall saw
Socket set (imperial and metric)
Faucet seat wrench
Spud wrench
Files
Square
Flashlight
Striker

Hacksaw
Swedge (hand flaring tool)
Hand saw
T square
Hex Keys (set)
Tap and die sets
Hole saw
Tin snips (set)
Knife
Torque wrench
Levels Transfer pump (hand-operated)
Pick
Tri-square
Pipe wrench
Utility brushes
Pliers
Wire brushes

Power Tools

Air compressor and accessories
Heat pump
Band saw
Impact wrench
Bench grinder
Mini grinder
Booster pump

Portable band saw (hack saw)
Chop saw
Powder-actuated tools
Circular saw
Power drills
Cordless drills
Power hole saw
Drain cleaning equipment
Reciprocating saw
Drill press
Rotary hammer
Heat lamp
Task lighting equipment

Hoisting, Rigging and Access Tools and Equipment

Block and tackles
Scaffolding
Come-a-longs and Tirfors
Shackles (varying sizes)
Ladders
Slings and chokers
Lifting eyes
Snatch blocks
Rope/cable

Plumbing Module

cont.

Wire rope or nylon
(synthetic)

Personal Protective and Safety Equipment

Eye wash kit
Lock-out devices
Face shield
Overalls
Fire blanket
Rubber boots
Fire extinguisher
Respiratory mask
First aid kit
Safety boots
Gloves (industrial
rubber)
Safety glasses/goggles
Hard hat
Safety harness
Hearing Protection

Cutting and Joining Equipment

Copper tube cutter
Pipe roller
Crimpers
Pipe stand
PEX pipe expander
Pipe threader
Half round file
Pipe vise
Flaring tools
Plastic tube cutters (set)
Gas cylinders, and
soldering and brazing
equipment
Power vise
Hand operated
oiler Ratchet cutter
Mechanical crimper
Snap cutter
Oxy welding equipment
Specialized assembly
tools
Pipe cutter
Tube bender

Pipe groover
Tube cutter
Pipe reamer

Testing and Measuring Equipment

Builder's level
Hand pump and
accessories
Differential pressure
gauge
Hydrostatic pump and
gauge
Calculator
Laser level
Computer
Measuring tape and
markers
Drafting equipment
Multimeter
Electronic leak detector
Scale ruler

Electrical Module

Miscellaneous magnetic devices
Power supply stations
Motor Control Stations
Small 3-phase motors
Single-phase, split-phase, dual-voltage
motors
Analogue multimeters
Digital multimeters
Wattmeters
Clamp-on ammeters
Solenoid-plunger (wiggy) testers

Meggers
Wheatstone bridge
Outlet Analyzers
Light (photo) meters
Watt-hour meters
Wire gauges, micrometers, calipers
Misc. conductors, cables and raceways for
demo purposes
Misc. dimmer and snap switches
Variety of circuit protective devices
Electronic trainers

APPENDIX B: RECOMMENDED FACILITY REQUIREMENTS

(Source: Excerpted from ITA Carpentry Program Guide 2006)

Classroom Area

- Comfortable seating and tables suitable for training, teaching, lecturing
- Compliance with all local and national fire code and occupational safety requirements
- Lighting controls to allow easy visibility of projection screen while also allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating / Air conditioning for comfort all year round
- In-room temperature regulation to ensure comfortable room temperature
- In-room ventilation sufficient to control training room temperature
- Acoustics in the room must allow audibility of the instructor
- White marking board with pens and eraser (optional: flipchart in similar size)
- Projection screen or projection area at front of classroom
- Overhead projector and/or multi-media projector

Shop Area (Fixed Properties)

- Ceiling shall be a minimum height of 16' or as varied by good engineering practices and code
- Appropriate lifting devices (hoists) used in industry
- Suitable demonstration area
- Lighting appropriate for good vision in ambient light
- Compliance with all local and national fire code and occupational safety requirements
- Must meet Municipal and Provincial bylaws in regards to waste water management and environmental laws

APPENDIX C: GLOSSARY OF TERMS

ACE IT (Accelerated Credit Enrolment in Industry Training): An industry certification program for BC secondary school students that enables students to earn both graduation credits and credit for the first level of technical training associated with an Industry Training Program or apprenticeship.

Accredited Training Programs: Those programs have been designated through regulation by the Minister of Advanced Education under the provisions of the Industry Training Authority Act and lead to a Certificate of Qualification with an inter-provincial Red Seal endorsement.

Apprentice: The traditional name used to describe a person working in a trade and participating in an Apprenticeship Industry Training Program.

Apprenticeship Training: One type of Industry Training that combines work-based training and experience with components of institutional training leading to provincial and/or national industry training credentials (i.e., Red Seal) for trades-related occupations.

Certificate of Qualification Examination: A standardized provincial exam that is normally written upon completion of an Industry Training Program. The successful completion of a Certificate of Qualification exam leads to the issuance of a provincial Certificate of Qualification.

Certificate of Qualification: The credential awarded by the Industry Training Authority to apprentices who have successfully completed the requirements of an Accredited Industry Training Program or a Recognized Industry Training Program. An inter-provincial Red Seal Endorsement is affixed to a Certificate of Qualification for those apprentices in Accredited Training Programs who pass the written inter-provincial Red Seal examination.

Curriculum: Formally documented, instructional components that are designed to guide the delivery of an Industry Training Program to established standards. Curriculum components include a competency profile, a program outline, learning resources, and assessment tools.

Employer: An individual or group that, for the purposes of apprenticeship, agrees to provide work-based learning and/or experience.

Industry: Employers and their associated organizations, including sponsors of apprentices, within the various sectors (e.g. forestry, construction, tourism) and sub-sectors of the British Columbia economy who effectively utilize and manage the skills and knowledge produced by the BC industry training system.

ITA: Industry Training Authority. The legal body within British Columbia responsible for the apprenticeship system, certification, and all Industry Training.

ITA CS: Industry Training Authority Customer Service

ITA Direct Access: The online data management system for ITA data.

Inter-provincial Red Seal Examination: A standardized inter-provincial examination available in a number of trades. The successful completion of an Inter-provincial Red Seal Examination leads to a Red Seal Endorsement being affixed to the corresponding provincial Certificate of Qualification.

Journey-person or Tradesperson: A person who has acquired the knowledge and skills in a trade, occupation, or craft as attested to by the provincial authority (Industry Training Authority).

Joint Training Board: Committee of management and union members formed to manage apprenticeship agreements.

Level Examination: A standardized provincial exam that is normally written upon completion of a level of Technical Training. Level exams can also be challenged in cases where Technical Training is not completed.

National Occupational Analysis (NOA): A Competency Profile for an Accredited Industry Training Program that is nationally developed under the Inter-provincial Red Seal Program.

Occupation: A job for which people are recruited, retained, and compensated, including self-employment. Occupations comprise many broad activities called duties that the incumbent performs. Trades are one occupational sub-category for which Apprenticeship Training is the traditional method of skill and knowledge acquisition.

Program Outline: Curriculum component, derived from a Competency Profile, which delineates prescribed competencies into learning objectives/tasks, key content areas, and recommended time allocations and sequencing. Program outlines are typically used to guide the technical (in school) component of Industry Training Programs.

Recognized Training Programs: Those programs that have been approved pursuant to a bylaw by the Industry Training Authority Board of Directors and lead to a Certificate of Qualification.

Red Seal: A standardized national endorsement for specified trades that enables greater mobility of trades workers. Upon successful completion of an Inter-provincial Red Seal Exam, a nationally recognized Red Seal endorsement is added to the provincial Certificate of Qualification.

Related practical experience: Previous experience of a practical nature gained through employment or other practical engagement in tasks related to the specific trade or occupation.

SSA: Secondary School Apprenticeship.

Sponsor: A person or body registered with the Industry Training Authority willing and able to ensure the apprentice receives training and related practical experience in the tasks, activities, and functions that are carried out in that occupation, and undertakes to attest that the apprentice has met the established standards for the Industry Training Program.

Trade: A skilled occupation requiring manual skills and special training.

Technical Training: The institution-based component of Industry Training Programs that is intended to provide apprentices with a combination of theoretical knowledge and practical skills to complement their work-based training.

Trainer: An individual or organization that provides training services and has been designated by the Industry Training Authority, but is not a public college or post-secondary institute.

Training Institution: A public or private college or post-secondary institute that provides training services to the Industry Training Authority.

Workplace-based Training: Skill development through practical hands-on experiences under regular working conditions.

Youth Apprentice: An apprentices between the ages of 15 – 19 years of age. Active Youth Apprentices are closed out on the apprentice's 20th birthday or the apprentice's graduation date plus 150 days, whichever occurs first.