Skilled Trades 10

Guide

NOVA SCOTIA
NOUVELLE-ÉCOSSE

2016

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Skilled Trades 10

Prepared by the Department of Education and Early Childhood Development

This is the most recent version of the current curriculum materials as used by teachers in Nova Scotia.

Skilled Trades 10

Draft, May 2016

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Skilled Trades 10, Draft, May 2016

Prepared by the Department of Education and Early Childhood Development

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Introduction

Skilled Trades courses are designed to give students the most realistic and current picture of what a career in the trades would be like. They are designed to be both true to the trades and pedagogically sound.

Aims of Skilled Trades 10

Skilled Trades 10 has been specifically designed to dispel these myths. It will provide a unique opportunity for young men and women in Nova Scotia, to investigate careers in the skilled trades. In Skilled Trades 10, students will learn about the tremendous impact that the skilled trades have on society, discover the tangible and intangible benefits of a skilled trade lifestyle, and experience the wonderful rewards that come from working with both their hands and their minds.

A unique feature of any skilled trade career is the necessity to be familiar with, and able to safely and competently use, a wide range of tools. From the very first class in Skilled Trades 10, students will be taught to use the same tools that professional tradespeople use in their work. Through practical exercises and a real construction project, students directly experience why physical capabilities, such as manual dexterity and hand-eye coordination, are essential to success in the skilled trades.

Besides using tools, students in Skilled Trades 10 will be introduced to the day-to-day realities of skilled trades work and the essential skills that must be mastered. They will develop the ability to achieve such tasks as

- working safely
- reading blue prints
- using documents
- making precise measurements and calculations
- estimating materials requirements
- handling materials
- communicating effectively
- working as part of a team

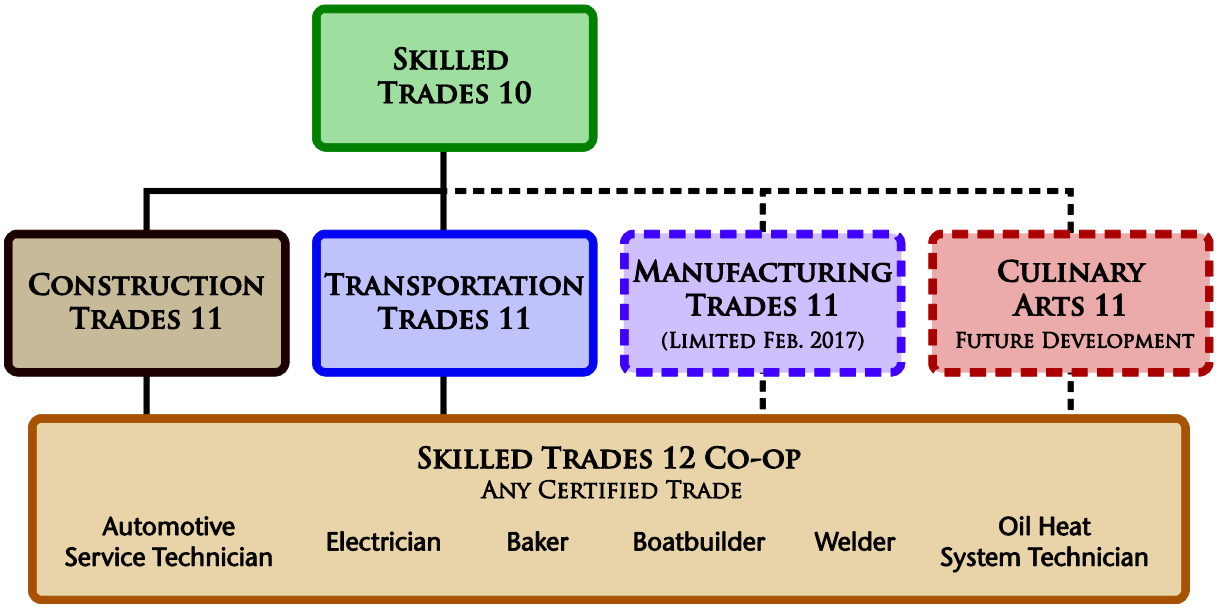
By the end of Skilled Trades 10, students will have received 110 hours of instruction. While this will not provide enough time to master all of the skills required to be a skilled tradesperson, it will provide students with a valuable starting point for considering a career in the skilled trades.

Among the many responsibilities of Nova Scotia's high schools is to develop competent, well-rounded learners who, once leaving high school, will continue to learn and to contribute to society through their work and their actions. Though many are available, there are no prescribed pathways for any high school student. High school is designed to open the minds of its students, present them with facts, and develop their thought-making processes so that they can make clear decisions about their future lives. Some decisions include further academic learning, entry into the workforce, and a career in the skilled trades.

A person choosing to work in the skilled trades are required to have familiarity with and competency in using a range of tools and materials. Skills must be mastered. These skills include, but are not limited to, the selection of appropriate tools, manual dexterity, balance, and well-developed hand-eye coordination. Skilled Trades 10 will introduce the student to these skills through practical exercises and real-world learning. In addition to the use of tools, students will work on other basic trades skills, including teamwork, measurement, document use, construction materials, and handling materials. This learning will take place inside a culture of safety—the milieu of the tradesperson.

Skilled Trades 10 will engage students in an active investigation into the skilled trades, the impact that they have on society, and the opportunities that exist for those who pursue a livelihood by working as a skilled tradesperson. In addition, Skilled Trades 10 will offer students multiple opportunities to experience the rewards that come from learning by doing and the aesthetic pride of a job well done to specifications. Specifically, students in Skilled Trades 10 will develop professional knowledge, skills, and attitudes that will benefit them in whichever career path they choose to follow.

Both the Skilled Trades 10 and the grade 11 Skilled Trades Sector Courses (see following diagram) are designed to give students opportunities to experience work in the trades in as realistic a setting as possible inside the high school (Skilled Trades Centre). Having this experience, and combining it with other high school learning, can help students to develop as more well-rounded, lifelong learners and to make life decisions based on their own knowledge and understanding.



Skilled Trades 10 requires students to learn in a model that is very similar to a formal apprenticeship. Students will spend approximately 20% of their time learning the theoretical, regulatory, and conceptual aspects of a job that is accomplished by using the hands to manipulate tools. The remaining 80% of the course time is performing the specific tasks required to complete a skilled trades project. Sole hands-on work does not exist in the trades. It is the intricate relationship of the head (brain) with the senses and legs, arms, hands, and other parts of the body that causes work to happen. Learning in the skilled trades is “hands-on, heads-in” learning. One cannot work without the other.

Every tradesperson must have adequate mental skills and judgmental acuity to properly perform the tasks of their respective trade. In addition, a person must be physically able, mentally fit, possess functional literacies, and have an attitude of craftsmanship to be successful as a tradesperson.

Theoretical Foundations of Teaching and Learning in Skilled Trades 10

One of the main premises of teaching and learning in Skilled Trades 10 is to introduce students to the skilled trades and to prepare students who might wish to work in the skilled trades after high school. It is also likely that some students in this course will eventually take up a vocation in the skilled trades and gain expertise as certified journeypersons. The term "vocation" is typically understood to mean a form of work that a person does. In their research in vocational education in the UK, Lucas, Spencer, and Claxton elaborated on the definition of vocation to include vocational expertise for which people get paid. (Lucas et al. 2012, 20) They state:

> "Within 'work', we include both employed ('having a job') and self-employed activity … we think it is essential to see vocational education as aiming to give all students the knowledge, confidence and attitudes needed to pursue their vocation entrepreneurially …" and "development of practical competence within, or for, a defined work 'domain.'" (Lucas et al. 2012, 21)

Grounding Teaching and Learning in Skilled Trades 10 in Vocational Pedagogy

Positioning teaching, learning, and curriculum documents in vocational education within a pedagogical framework can help to provide teachers with a foundation for understanding, practicing, and improving teaching and, optimally, student learning in this course. Essentially, pedagogy is the craft and practice of teaching. Having an understanding of pedagogy will help to give Skilled Trades 10 teachers both a lens and a language with which to examine their teaching practices for the purposes of understanding what they do in the Skilled Trades Centre and for maximizing the effectiveness of how they support student vocational learning.

Lucas, Spencer, and Claxton coined the term vocational pedagogy to describe "the science, art, and craft of teaching that prepares people for certain kinds of working lives." (Lucas et al. 2012, 21) According to the authors, vocational pedagogy is shaped by teachers'

- understanding the value-laden pedagogical decisions that they make about their teaching including decisions made in the moment in the vocational classroom (Skilled Trades Centre)
- knowing how they engage "particular kinds of learners to undertake the particular kind of learning on which they are embarked to achieve whatever vocational outcomes are desired" (Lucas et al. 2012, 13)

It can be a valuable exercise for teachers to think about the various aspects of their own vocational pedagogy. Consider the following:

- What are the specific outcomes of vocational learning that guide your teaching and students' learning?
- What are the demands and constraints of the various trades that you are exposing students to? It is likely that each one will require a different balance of teaching methods and learning experiences.
- What learning methods and processes are available to your learners? This requires knowledge of the particular learning skills, attitudes, beliefs, and barriers that students bring with them.
- What are your available resources in the learning environment? What are the constraints of that environment?

From the perspective of vocational pedagogy, teaching in the Skilled Trades Centre involves attention to the kinds of learning experiences that teachers foster with students. Teaching in a vocational education context, thus, necessitates providing individuals with necessary materials to do the job, along with hands-on, practical, and real-world activities while paying close attention to the accompanying and necessary mental acuities. Lucas, Spencer, and Claxton also claim that ongoing feedback, opportunities for questioning, application, reflection, co-operation, and theoretical models and explanations are also necessary for learning and growth to occur. (Lucas et al. 2012, 9) Furthermore, it is important for students to experience ongoing personal development and a sense of the impact that their work has on the economy and society in general. As such, a collection of learning experiences and tools to help support a context of practical problem-solving best suits vocational teaching and learning in Skilled Trades 10. All of the activities, events, rubrics, and other forms of assessment described in this course guide are designed to support the above aims of vocational pedagogy.

Design and Components

Overview

Skilled Trades 10 is a career exploration and life-skill course suitable for students in grade 10 and above. The course provides students with a unique mixture of in-class and simulated skilled trades activities. These activities enable students to experience what life and learning might be like in the skilled trades.

Because the Skilled Trades 10 curriculum offers such a unique mixture of activities, it is delivered in a specific learning environment called the Skilled Trades Centre. The Skilled Trades Centre is physically located inside the high school. Designed by experienced educators, the Skilled Trades Centre converts the space normally occupied by traditional classrooms into an area for both theoretical/vocational learning and practical learning to take place in a continuous and seamless fashion. This innovative blend of work and instruction space underscores the value of giving the skilled trades a prominent place in the high school curriculum inside the academic environment.

Over a period of 20 weeks, teachers will guide students deep into the realities of what work in the skilled trades could be. To help make this journey as productive and rewarding as possible, we have developed this Skilled Trades 10 curriculum guide. This guide provides a balanced set of learning projects, skill-building lessons, class projects, and suggestions for events to help meet the curriculum outcomes associated with the four areas of learning of Skilled Trades 10.

Areas of Learning of Skilled Trades 10

Area of Learning 1: Skilled Trades Living
Skilled Trades Living is the actualities and day-to-day living experiences of the skilled tradesperson, including regulations, job opportunities, essential workplace skills, mobility, and entrepreneurial opportunities.

Area of Learning 2: Safety
Safety is at the very heart of every action in the skilled trades. By its nature, work in the skilled trades can be extremely dangerous. As well, much work is performed by many people using tools and materials that could cause harm. This course may very well be a student's first introduction to the "culture of safety" of the skilled trades. Safety is the one Area of Learning around which all other aspects of the skilled trades work.

Area of Learning 3: Measurement and Calculation for the Skilled Trades
Measurement and Calculation for the Skilled Trades includes dry measure, weight, basic arithmetic and geometric skills, ratios, scaling, and fractions. The entire course uses Imperial measure so that fractions become intrinsic knowledge.

Area of Learning 4: Tools and Materials of the Skilled Trades
Tools and Materials of the Skilled Trades demonstrates there's more to the trades than nails and hammers. Both tools and materials are endless but there's a proper one for each job.

The Skilled Trades 10 curriculum guide also helps teachers to stay focused on four key instructional objectives that must be evident throughout the entire course:

- Ensuring students are safe at all times and that they adhere to all relevant safety practices and procedures.
- Providing students with a wide range of opportunities for exploring what it is like to work in the skilled trades and potential careers in the skilled trades.
- Immersing students in real skilled trades tasks and projects that involve working with tools, techniques, and materials from a variety of trades.
- Preparing students for success in further grade 11 sector courses such as Construction Trades 11 and Transportation Trades 11.

With only 110 hours of class time to work with, it may be tempting to focus exclusively on helping students master the tools and techniques required for success in the grade 11 skilled trades sector courses. However, it is important that students find time to explore the wide range of skilled trades career options, to learn about the historical roots of the skilled trades, to discuss where the skilled trades fit within society, and to understand the critical role that employability skills such as numeracy and literacy and their other high school courses play in the skilled trades. This is essential to providing students with a complete picture of what a career in the skilled trades potentially has to offer.

Course Features

Throughout the course, teachers and students address learning outcomes from four topical areas of learning by participating in the six key projects, activities, and events featured in the table below. These projects, activities, and events challenge students intellectually, physically, and emotionally and highlight the central role that essential employability skills such as reading, writing, document use, numeracy, working with others, and continuous learning play in a successful 21st-century journeyperson's career.

Skilled Trades 10 enables students to develop skills using real tools in situations that mimic the actual workplace. This is an excellent first step on the pathway to apprenticeship and possible certification as an interprovincial journeyperson in a designated trade. After high school, students who become interested in the trades can enter directly into a trade or to pursue additional training. Students who decide that the trades may not be for them will leave Skilled Trades 10 with valuable life skills that should last them a lifetime.

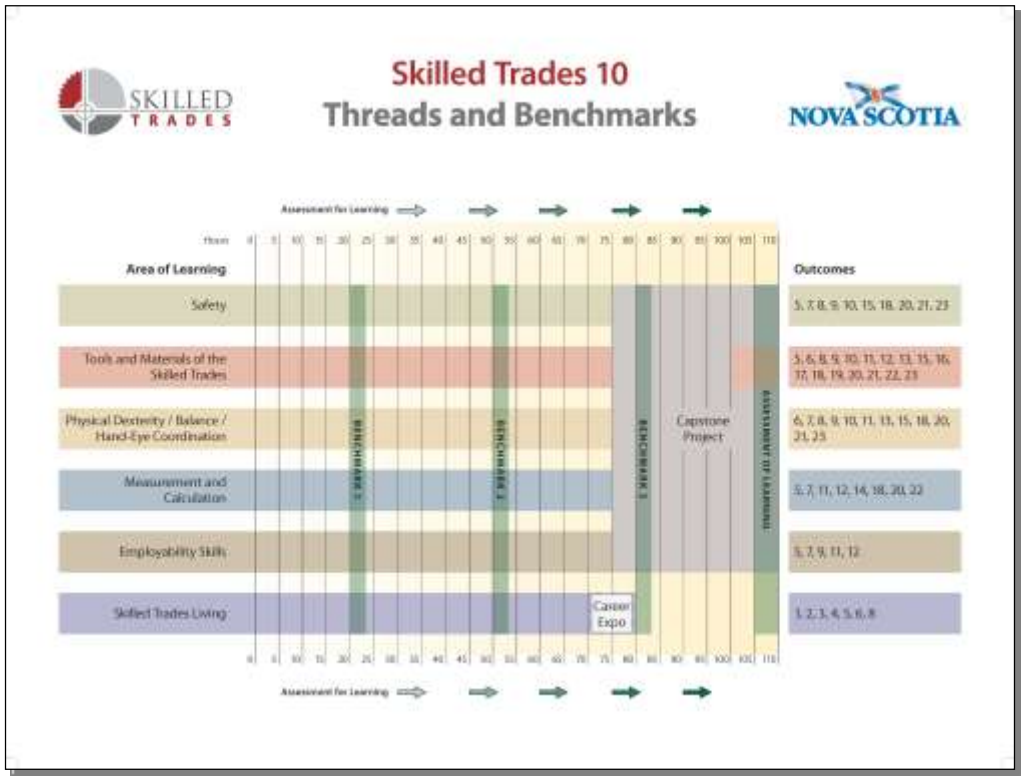
The fact that there are such strong ties between Skilled Trades 10 and the skilled trades workplace makes it a very demanding course—physically and mentally. In Skilled Trades 10, students must obey safety regulations (see Safety-Net package at http://goo.gl/itAuwd), follow instructions, and confront the challenges of working with real tools and real materials to complete real tasks on schedule.

Skilled Trades 10 Tool Box

The Skilled Trades 10 tools are a series of tasks, activities, and events that are the foundation upon which Skilled Trades 10 has been constructed. The course has been designed to use each and every one of them.

Skilled Trades 10 Course Map

The Skilled Trades 10 course map presents a graphical representation of the six areas of learning (threads) found within Skilled Trades 10 and, over time, identifies the specific curriculum outcomes (SCOs) associated with each of them. The map itself may be used to organize time and schedule events. Students can begin to learn graphical interpretation while beginning to understand how the various threads interact with each other.



The six areas of learning include:

- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation
- Employability Skills
- Skilled Trades Living

However, outcomes addressed in the course fall under four areas of learning. Students will participate in activities in two other areas of learning that address outcomes in the main four. Those two other categories are Physical Dexterity / Hand-Eye Coordination / Balance and Employability Skills.

The teaching time in Skilled Trades 10 is highlighted on the course map along the horizontal axis and labelled 0–110 hours. Three *assessment for learning* placemats are laid out at the 20-, 50-, and 80-hour marks of the course as reminders to engage in assessment for learning. These are not meant to be formal evaluations but an ongoing series of informal assessments by everyone involved in the learning (student, teacher, fellow learner, friends, etc.). These are used along with the *Skilled Trades 10 Record of Progress* to evoke dialogue and give support. These assessments are designed to keep students on track and to help them improve as they progress through the course. Questions such as, Where are you now (in your learning)? Where do you want to be? How are we going to get there? will help to create assessment for learning opportunities.

A more formal "assessment of learning" benchmark is highlighted at the end of the course. This is where a formal grade is assigned for every student. Notice that this placemat includes all of the threads and is comprised primarily of the Capstone Project.

The Capstone Project is designed for students to demonstrate their learning throughout the course. This project will be discussed in more detail starting on page 21. The Career Expo closes out the Skilled Trades Living area of the course (future inclusion). It should be clear when and where these activities fit within the course and their relationship to the six areas of learning described above; this will be critical to ensure students focus their time and activities, which have definite due dates.

The assessment for learning arrows shown on the top and the bottom of the chart are shaded. This is also true of the vertical Benchmark placemats and the Areas of Learning. This is meant to show that, as the learning increases and skills are acquired, the quality of the Assessment for Learning should improve.

Placement of the arrows around the learning is to signify that Assessment for Learning is embedded throughout the entire learning experience. It might be highlighted, but in order for it to work, Assessment for Learning has to be a part of everything that is done.

On the right-hand side of the chart is an area that indicates which outcomes support each Area of Learning.

Essential Graduation Competencies

[Alignment of the outcomes with these competencies will be addressed in a future revision.]

Public school education in Nova Scotia is designed to ensure that all students develop multiple literacies, increase depth of knowledge, and acquire a range of 21st-century skills and abilities. Students must also develop a desire for personal and collective achievement and a willingness to collaborate for the well-being of themselves, other peoples, and their planet. It is vital that graduate be well positioned to pursue aspirations, strengthen communities, and contribute to a more prosperous Nova Scotia.

To embrace change and adapt to improve student learning, Nova Scotia, in collaboration with Council of Atlantic Ministers of Education and Training (CAMET), has developed clear statements of what students are expected to know, be able to do, and reflect on by the time they graduate from high school. These competencies describe expectations, not only in terms of individual curricular areas but in terms of attitudes, skills, and knowledge developed throughout the curriculum. Competencies confirm that students need to make the connections and develop abilities across subject areas if they are to be ready to meet the shifting and ongoing demands of life, work, and learning today, and in the future. The Department of Education and Early Childhood Development has identified six competencies:

- Citizenship
- Communication
- Creativity and Innovation
- Critical Thinking
- Personal-Career Development
- Technological Fluency

Citizenship

Learners are expected to contribute to the quality and sustainability of their environment, communities, and society. They analyze cultural, economic, environmental, and social issues, make decisions, judgment, solve problems, and act as stewards in a local, national, and global context.

Learners are expected to be able to

- recognize the principles and actions of citizens in just, pluralistic, and democratic societies
- demonstrate the disposition and skills necessary for effective citizenship
- consider possible consequences of decisions, judgments, and solutions to problems
- participate in civic activities that support and promote social and cultural diversity and cohesion
- promote and protect human rights and equity
- appreciate the complexity and interconnectedness of factors in analyzing issues
- demonstrate understanding of sustainable development

Communication

Learners are expected to interpret and express themselves effectively through a variety of media. They participate in critical dialogue, listen, read, view, and create for information, enrichment, and enjoyment.

Learners are expected to be able to

- listen and interact purposefully and respectfully in formal and informal contexts
- engage in constructive and critical dialogue
- understand, interpret, and respond to thoughts, ideas, and emotions presented through multiple media forms
- express ideas, information, learnings, perceptions, and feelings through multiple media forms, considering purpose and audience
- assess the effectiveness of communication and critically reflect on intended purpose, audience, and choice of media
- analyze the impact of information and communication technology on social equity
- demonstrate the provincially defined level of a second language

Creativity and Innovation

Learners are expected to demonstrate openness to new experiences, to engage in creative processes, to make unexpected connections, and to generate new and dynamic ideas, techniques, and products. They value aesthetic expression and appreciate the creative and innovative work of others.

Learners are expected to be able to
- gather information through all senses to imagine, create, and innovate
- develop and apply creative abilities to communicate ideas, perceptions, and feelings
- take responsible risk, accept critical feedback, reflect, and learn from trial and error
- think divergently, and embrace complexity and ambiguity
- recognize that creative processes are vital to innovation
- use creation techniques to generate innovations
- collaborate to create and innovate
- critically reflect on creative and innovative works and processes
- value the contribution of creativity and innovation to social and economic well-being

Critical Thinking

Learners are expected to analyze and evaluate evidence, arguments, and ideas using various types of reasoning and systems thinking to inquire, make decisions, and solve problems. They reflect critically on thinking processes.

Learners are expected to be able to
- use critical-thinking skills to inquire, make decisions, and solve problems
- recognize that critical thinking is purposeful
- demonstrate curiosity, inquisitiveness, creativity, flexibility, persistence, open- and fair-mindedness, tolerance for ambiguity, and suspension of judgment
- ask powerful questions that support inquiry, decision making, and problem solving
- acquire, interpret, and synthesize relevant and reliable information from a variety of sources
- analyze and evaluate evidence, arguments, and ideas
- use various types of evidence, reasoning, and strategies to draw conclusions, make decisions, and solve problems
- reflect critically on thinking processes used and acknowledge assumptions
- effectively communicate ideas, conclusions, decisions, and solutions
- value the ideas and contributions of others who hold diverse points of view

Personal-Career Development

Learners are expected to become self-aware and self-directed individuals who set and pursue goals. They understand and appreciate how culture contributes to work and personal life roles. They make thoughtful decisions regarding health and wellness, and career pathways.

Learners are expected to be able to
- connect learning to personal and career development
- demonstrate behaviours that contribute to the well-being of self and others
- build healthy personal and work relationships

- establish skills and habits to pursue physical, spiritual, mental, and emotional well-being
- develop strategies to manage career balance and wellness
- create and implement a personal, education, career, and financial plan to support transitions and achievement of education and career goals
- demonstrate preparedness to learn and work individually, co-operatively, and collaboratively in diverse, evolving environments

Technological Fluency

Learners are expected to use and apply technology to collaborate, communicate, create, innovate, and solve problems. They use technology in a legal, safe, and ethically responsible manner to support and enhance learning.

Learners are expected to be able to
- recognize that technology encompasses a range of learning tools and contexts
- use and interact with technology to create new knowledge
- apply digital technology to gather, filter, organize, evaluate, use, adapt, create, and share information
- select and use technology to create and innovate
- analyze how technology and society impact and advance one another
- adopt, adapt, and apply technology efficiently, effectively, and productively

Specific Curriculum Outcomes

Area of Learning 1: Skilled Trades Living

Students will be expected to

SCO 1: demonstrate an understanding of the history, evolution, and societal impact of the skilled trades
SCO 2: demonstrate an understanding of skilled trades training and apprenticeship
SCO 3: demonstrate an awareness of labour standards and safety regulations
SCO 4: demonstrate an understanding of the economics and employment opportunities for work in the skilled trades
SCO 5: select appropriate artifacts to demonstrate learning throughout Skilled Trades 10 to be included in their portfolio
SCO 6: demonstrate an understanding of the nature of work and working conditions in the skilled trades
SCO 7: describe the essential skill sets required for success in the skilled trades

Area of Learning 2: Safety

Students will be expected to

SCO 8: demonstrate an understanding of and the ability to apply workplace health and safety practices and procedures
SCO 9: demonstrate knowledge of how to use tools and equipment safely and to identify safety risks and hazards in the workplace
SCO 10: know how to use and maintain personal protective equipment

Area of Learning 3: Measurement and Calculation for the Skilled Trades

Students will be expected to

SCO 11: interpret and apply various systems of measurement
SCO 12: perform trades-related calculations
SCO 13: demonstrate an ability to use various measuring tools and devices
SCO 14: scale and convert trades-related documents

Area of Learning 4: Tools and Materials of the Skilled Trades

Students will be expected to

SCO 15: describe and apply safety requirements for using tools and equipment
SCO 16: describe the characteristics of professional-quality tool design and construction
SCO 17: identify appropriate hand tools for a range of applications
SCO 18: demonstrate an ability to safely use and maintain hand tools
SCO 19: identify appropriate portable power and battery-operated tools for a range of applications
SCO 20: demonstrate an ability to safely use and maintain portable power and battery-operated tools
SCO 21: demonstrate an ability to safely use and maintain stationary power tools, equipment, and machinery
SCO 22: demonstrate the ability to select, identify, use, and store, in an environmentally sound way, trades-related materials
SCO 23: demonstrate an ability to work safely at levels above grade

Performance Indicators (Benchmarks)

Following is the detailed description of the three "assessment for learning" benchmarks for the six areas of learning. They are provided within the curriculum guide so that students' progress can be tracked. These benchmarks help define key performance indicators that should be observed throughout the course. Again, they are benchmarks—something to be measured from (in either direction).

Area of Learning	Performance Indicators (Benchmark #1)	Performance Indicators (Benchmark #2)	Performance Indicators (Benchmark #3)
Safety SCO 5 SCO 7 SCO 8 SCO 9 SCO 10 SCO 15 SCO 18 SCO 20 SCO 21 SCO 23	Students understand that safety is the number one priority within the Skilled Trades Centre and everyone's main responsibility at all times. Hard hats, safety glasses, and work boots fit properly and students no longer need to be reminded that PPE must be worn at all times within the Skilled Trades Centre. Students have completed an online safety course. Students have been introduced to the Job Safety Analysis (JSA) (future inclusion) process and/or attended Tool Box Meetings (p. 32) focused upon the safe use of six to eight basic tools, such as hammer, screwdriver, saw, or wrench. See the Safety-Net package at http://goo.gl/itAuwd.	Students are becoming more aware of what is taking place around them at any given time and are completing tasks more safely and deliberately at a steadier pace. Students are more readily identifying and removing potential hazards and becoming more responsible for maintaining a clean, safe jobsite. Tools and materials are never left lying around or stored improperly. Students can read and interpret WHMIS labels and MSD sheets and take appropriate action. Students have completed the JSA process or Tool Box Meetings for all of the hand tools featured in the course and have used a torch.	Students can now perform most tasks safely with little or no supervision. Most basic safety procedures have become habitual and, if required, students could lead the JSA process or Tool Box Meeting for a new task or tool. Students have worked exclusively with hand tools at this stage but are ready to be introduced to the following power tools: • Skill saw • Compound mitre saw • Cordless drill • Jig saw • 90% angle drill • Reciprocating saw • Grinder • Table saw Students know the basics of fall protection and have safely completed one or two tasks at levels above grade.

Area of Learning	Performance Indicators (Benchmark #1)	Performance Indicators (Benchmark #2)	Performance Indicators (Benchmark #3)
Tools and Materials of the Skilled Trades SCO 5 SCO 6 SCO 8 SCO 9 SCO 10 SCO 11 SCO 12 SCO 13 SCO 15 SCO 16 SCO 17 SCO 18 SCO 19 SCO 20 SCO 21 SCO 22 SCO 23	Students have been given preliminary skill-building lessons for six to eight of the basic hand tools. Students have a rudimentary understanding of the physics of work. They know their body provides a mechanical advantage when using most tools that is essential for completing tasks, such as driving nails quickly and efficiently. Student performance at this stage is still awkward and self-conscious. They can safely use the few tools that have been introduced, but are slow to complete most tasks as they are still struggling to internalize and master the techniques required for quicker, more efficient performance. Students have been introduced to different types of nails and screws and have developed an initial understanding of some of the adjustments that must be made, especially when driving screws into hardwood. Students have been introduced to the concept of choosing the right tool for the job.	Students have completed skill-building lessons for all of the basic hand tools required to complete the Capstone Project. Consistent practise with all of the tools has led to students becoming more quick and efficient with most of the tools they are using. Students are beginning to internalize the techniques required and are starting to look much more confident and professional. Because students are now working with a significantly expanded range of tools and materials, they are encountering more situations where they must give some thought to choosing the right tool for the job. Students are making the right decision most of the time, but sometimes make mistakes. Student are aware that every trade has its own distinct set of tools that are constantly evolving because of advancements to technology that have led to better materials and quicker, more efficient ways of completing tasks. Students appreciate the difference between professional-grade and consumer-grade tools.	Students are now capable of very quickly choosing the right tool for the job every time. Students are beginning to handle some of the tools they are using with the skill and confidence of a tradesperson, but still require hours and hours of more practice to reach professional standards for quickness and efficiency. Students have only worked with hand tools by this stage in the course, but are now capable of expanding their repertoire to include power tools.

Area of Learning	Performance Indicators (Benchmark #1)	Performance Indicators (Benchmark #2)	Performance Indicators (Benchmark #3)
Physical Dexterity / Hand-Eye Coordination / Balance SCO 6 SCO 7 SCO 8 SCO 9 SCO 10 SCO 11 SCO 13 SCO 15 SCO 18 SCO 20 SCO 21 SCO 23	Students have had preliminary skill-building lessons with six to eight tools and are still struggling to master the basic techniques for using each tool quickly and efficiently. Students are beginning to become familiar with handling a tape measure and layout tools. Students may exhibit some of the physical dexterity, hand-eye coordination, and balance required for using tools and completing skilled trades tasks, but only when performing at a very slow and deliberate pace. Student have simply not had enough practise yet to have internalized the mechanics required to reach more intermediate and advanced levels of performance. With few exceptions, anyone watching students work at this stage would instantly know that they are beginners.	Students have spent solid blocks of time working with basic hand tools. Students' technique and their speed has improved, and for brief stretches of time, they may even look a bit like a professional tradesperson. Anyone watching students work with tools for any length of time will note that they do not handle their tools with the consistency and speed of the professional tradesperson, whose physical dexterity, hand-eye coordination, and balance are always on display.	Students are using tools more quickly and efficiently. Their physical dexterity, hand-eye coordination, and balance have definitely improved and become more consistent. While most students will still be a long way from achieving the speed and efficiency of an experienced tradesperson, they are all looking much more confident and in control of what they are doing.

Area of Learning	Performance Indicators (Benchmark #1)	Performance Indicators (Benchmark #2)	Performance Indicators (Benchmark #3)
Measurement and Calculation for the Skilled Trades SCO 5 SCO 7 SCO 11 SCO 12 SCO 14 SCO 18 SCO 20 SCO 22	Students are just beginning to work with hand tools, but capable of using a tape measure to take one or two simple measurements for making a straight cut or drilling a hole. Even for the simplest measurements, students are aware that for the professional tradesperson accuracy is always critical. Students have a rudimentary understanding of what estimation means within the skilled trades and can make very basic estimates. Students are very slow and deliberate when taking measurements and prone to mistakes. Students are learning to work with fractions, and to transfer measurements taken from one object or location to another.	Students are beginning to work with simple layout plans that require making multiple cuts and working with angles and interdependent sets of measurements. Student can use a framing square, speed square, and a 24" level. Students understand the importance of plumb and level. Students are working more with fractions and beginning to make the more complex calculations required for measurements such as fitting allowances. Students understand the basic concept of scaling and can use it to manufacture simple drawings and layout. Students have become more practiced at estimating and are consistently using this skill to determine things like the length of time and the amount of material tasks will require. Students are becoming much quicker and efficient at taking measurements and making fewer mistakes and calculation errors.	Students can work with simple blueprints or more advanced drawings that may need to be scaled and require numerous measurements and calculations. Students can translate measurements taken from a model structure into a working drawing for the capstone, wall-building project. Students can calculate area, perimeter, and volume and know the differences among these three measurements. Students can quickly and efficiently layout a fairly detailed set of measurements, even when under the time pressure of the Skills Rodeo competition.

Area of Learning	Performance Indicators (Benchmark #1)	Performance Indicators (Benchmark #2)	Performance Indicators (Benchmark #3)
Employability Skills SCO 5 SCO 7 SCO 9 SCO 11 SCO 12	Students can identify the Employment and Social Development Canada's (ESDC) nine essential skills and are aware of the critical role they play in successful skilled trades careers. Students know there are a wide variety of designated trades that they could potentially pursue within Nova Scotia. Students have completed two or three skill-building lessons, which have introduced them to some of the physical demands of skilled trades work.	Students are aware of the myths and realities regarding skilled trades work and know that challenging, well-paying jobs are available for men and women right across Canada. Students are beginning to grasp the critical role that literacy and numeracy play within the skilled trades and that strong hands-on capabilities need to be matched with solid academic abilities in subject such as mathematics, language arts, and science. Students have been introduced to various trades' workplace pathways available and are starting to think about potential careers in the skilled trades or realizing that they have little or no interest in becoming a tradesperson. Students understand that personal qualities such as honesty and integrity are just as critical to success in the skilled trades as any of the nine essential workplace skills. Students have visited an NSCC campus or a local business, plant, or factory to learn more about trades workplace pathways and the realities of skilled trades living.	Students have a strong sense of the numerous career opportunities available in the skilled trades and the skills required to succeed. Students serious about pursuing a skilled trades career are beginning to think about their strengths and weaknesses and working harder in core academic subject areas such as mathematics, language arts, and science. Students have reached the stage where they understand why these subjects are relevant to their future career plans.

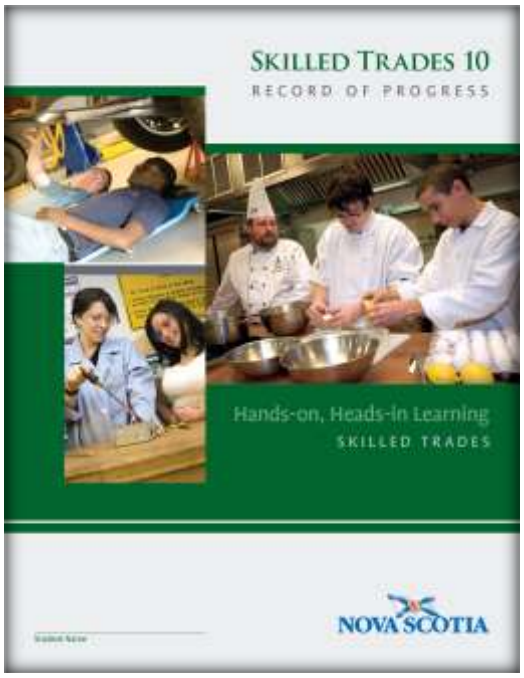
Area of Learning	Performance Indicators (Benchmark #1)	Performance Indicators (Benchmark #2)	Performance Indicators (Benchmark #3)
Skilled Trades Living (Discovering Designated Trades Career Fair Project) *A detailed description of the Career Fair Project will be forthcoming in a future edition.* SCO 1 SCO 2 SCO 3 SCO 4 SCO 5 SCO 6 SCO 8	Students have been introduced to the Discovering Designated Trades Career Fair project. Teacher has walked through at least two of the project's 12 required elements with students, and they have completed these elements and submitted their work for review. A date has been set for the Skilled Trades Career Fair and a definite plan and a list of guest speakers to invite has been created. You have developed a tentative promotional plan for letting people within your community know about the event.	Teacher has walked through at least seven of the project's 12 required elements with students, and they have completed these elements and submitted their work for review. Students have officially invited all of the guest speakers on the original list. Teacher and students have developed some basic promotional materials and are beginning to promote the Skilled Trades Career Fair within your community. Students from the school have visited all of the junior high schools within the community to promote Skilled Trades 10 and the Skilled Trades Career Fair.	Teacher has walked through all of the project's 12 required elements with students, and they have completed these elements and submitted a career fair exhibit for their designated trade. Teacher and students have set up a career fair exhibit in the Skilled Trades Centre and made all of the final arrangements required for hosting the Skilled Trades Career Fair at the school. Teacher and students have successfully hosted the Skilled Trades Career Fair and generated massive amount of enthusiasm for skilled trades careers and Skilled Trades 10 within the school and the community.

Skilled Trades 10 Student Snapshots

Three summaries, or snapshots, of the student progress at each of the placemats are also included to help provide the bigger picture of where students should be near the beginning, middle, and end of the course.

Student Snapshot at Benchmark #1	Student Snapshot at Benchmark #2	Student Snapshot at Benchmark #3
Students have gathered some knowledge in all areas of learning, but have not had enough time or practice for anything to become natural or second nature yet. Students can perform the steps required for safely using tools, but only in a very slow and deliberate manner. Speed and efficiency will begin to come only after considerably more practice. Students have a very general sense that tremendous opportunities exist in the skilled trades, but cannot likely articulate a specific career path that interests them. Students will be making lots of mistakes as they continue to experiment with the knowledge, techniques, and practices they are acquiring. However, if they are working hard and putting their heart and soul into the course, rapid progress will soon be made. The best description of where most students will be at this stage of the course is that of a young child learning to walk.	Students are rapidly developing more confidence, and through repeated practice and trial and error are beginning to develop significantly more proficiency in all areas of learning. Speed and accuracy are increasing, and students are now easily tackling challenges that a few weeks ago would have seemed insurmountable. Everything is still very new, but students are rapidly putting all of the pieces together and beginning to show some flashes of brilliance. Consistency still eludes students, but if they continue to put forth the same level of effort as they did at the beginning of the course, success is just around the corner. Students are rapidly gaining independence and are now capable of performing most tasks with minimal supervision. Career possibilities and the potential pathways available to students are becoming very clearly defined.	Everything is coming together for students at this stage of the course. They have achieved a reasonable level of mastery using basic hand tools and are ready to demonstrate the tremendous progress they have made by tackling the Capstone Project's considerable challenges. Students' capabilities in every area of learning have dramatically improved, and they can perform most tasks independently with few, if any, mistakes. Most students will have arrived at a definite conclusion of as to whether they would like to pursue a career in the skilled trades and have identified one or two trades that really appeal to them.

The Record of Progress



The *Skilled Trades 10 Record of Progress* is an integral and required component of Skilled Trades 10. It includes worksheets for some of the activities featured in the Learning Projects and space for students to log their daily activities. All skilled trades courses are based on a learning model of Anticipation, Engagement, and Reflection.

The *Record of Progress* is a compulsory part of the course and is used to achieve many functions. Among them are

- a log book
- a learning journal
- an assessment for learning tool
- a record of hours for apprenticeship credit
- a record of successful demonstration of tool knowledge and use

A component of every apprenticeship agreement is the maintenance of a logbook by the apprentice. This logbook is meant to document skills and knowledge that the apprentice acquires throughout the apprenticeship. It forms a part of the learning process as individual journeypersons, employers, and learning institutions certify each task as being to standard. In the *Record of Progress*, students are given space to record the date, time, skills, and knowledge that they have worked on and notes for each day of the course (Daily Activity Logs, pp. 14–48) and each week. These notes can be great cues as the student works at the Weekly Reflective Journal, pp. 15–49). Notice that the Week 14 Log also indicates Week 1 of the Capstone Project. This relates to the Skilled Trades 10 Course Map (p. 7) in the Skilled Trades 10 Tool Box.

Students have a greater likelihood of retaining knowledge developed as a result of various Learning Projects through journaling. Journaling, or reflective recording, is most successful when used as a part of the learning process. Students look back on the activities they accomplished (or did not) with a critical eye. They should “break apart” the project into components that are easily understood and then restate them in words that make sense to them. Teachers have the responsibility to read the notes and respond directly to students, closing the loop by answering any questions or filling in any hazy spots.

Along with the student’s work in the Weekly Reflective Journal is a space for teacher comments and for comments of parents/guardians. Having all of these people involved in the process gives legitimacy to the assessment for learning. Again, closing the loop, the Weekly Reflective Journal is used by the student to help self-assess each outcome.

The *Record of Progress* has Outcome Assessment Rubrics (p. 7) that should also help with the student’s self-assessment. The rubrics are separated into three components:

- Learning
- Achievement
- Projects

They are used in conjunction with the Outcome Assessments (pp. 8–11). Each specific curriculum outcome (SCO) has a letter in parentheses at the end of the outcome description. That letter refers to which rubric the student should use for that outcome. There are four individual time slots for each outcome. These relate to the Student Snapshots, which form a part of the Skilled Trades 10 Tool Box (p. 7).

On page 51 in the *Record of Progress* is the Tool Use and Safety Competency sign-off chart. This will be used in conjunction with the current Safety-Net package to indicate proficiency in tool use by the student. See Safety-Net package at http://goo.gl/itAuwd.

The *Record of Progress* concludes with an empty glossary (pp. 52–55) of work and learning terms for the student to research as a part of the Skilled Trades Living topic and a few pages (pp. 56–59) for students to collect artifacts for their own use. The use of artifacts can promote learning. For further information, visit Donald Clark's website at nwlink.com/~donclark/learning/artifacts.html.

The *Record of Progress* fits seamlessly inside the Skilled Trades 10 curriculum. It is a critical part of the course and requires support from the teacher. Special attention and class time should be available for working in the *Record of Progress*. Students should keep good care and work diligently on this part of the course.

Learning Projects

There are 39 Learning Projects described in this curriculum guide (future inclusion) that can be drawn upon to support curriculum outcomes for each of the four Skilled Trades 10 areas of learning. These Learning Projects correspond with six areas of learning mentioned on page 7 that run throughout this course.

Discovering Designated Trades: Research Project and Career Fair

Skilled Trades 10 challenges teachers and students to complete a series of research assignments throughout the term for some of Nova Scotia's designated trades.

Near the end of the term, students can gather together all of the information collected for each of the trades to create a series of displays for a Skilled Trades Career Fair (future inclusion). This Fair can be held within the Skilled Trade Centre and only involve students from the class or be advertised throughout the school and community as a means to promote the many exciting career opportunities that the skilled trades have to offer.

Community-Based Learning

Skilled Trades 10 requires students to take responsibility for inviting journeypersons and other trades-related people from within the community to visit the Skilled Trades Centre and participate in presentations focused upon the realities of skilled trades living. To complete this assignment, students must write invitations and thank you notes, and deliver introductions for each of their invited guests.

Skill-Building Lessons

Students will spend a great deal of time in Skilled Trades 10 mastering a variety of skill-building lessons involving real tasks and real tools. These skill building lessons are included as Learning Projects within the curriculum guide (future inclusion).

Skills Rodeo

To provide students with additional incentive to build their skills, one of the Learning Projects within the Skilled Trades 10 curriculum guide provides a plan for holding a skills rodeo competition after the skill-building lessons are completed.

Capstone Project

The capstone is the stone masons used to finish off a wall or a structure. It is meant to bring together into harmony all of the pieces. One could look at the capstone as being a definition of the project. This is how the Capstone Project is used in Skilled Trades 10. Once completed, the student can look back upon the course as a learning opportunity that they themselves built.

The Capstone Project for Skilled Trades 10 provides a challenging opportunity for students to demonstrate everything that they have learned throughout the entire course. It is meant to be their crowning achievement and a tangible expression of the skills and the knowledge they have gained.

Completing the Capstone Project immerses students in some of the day-to-day realities that journeypersons face. By experiencing these realities, student get a real sense of what it feels like to work in the trades, and develop the confidence, patience, discipline, and personal maturity required to tackle even bigger projects in grade 11, grade 12, and beyond.

The Capstone Project is a required part of Skilled Trades 10. It is meant to be a significant learning experience for the students. However, there is no absolute structure to a capstone project. It can be one of any number of projects that follows a specific set of criteria:

1. Must be rigorous and comprehensive, and involve skills and activities directly connected to the Specific Curriculum Outcomes (SCOs) for Skilled Trades 10.
2. Must involve real industry tasks and challenges.
3. Must involve common tasks performed within at least three designated trades.
4. Must take 30 to 50 hours of class time to complete.
5. Must be approved by a certified journeyperson from one of the project's trades.
6. Must involve a drawing, a set of drawings, a recipe, a schematic diagram or a blueprint that includes precise measurements and tolerances against which student performance can be assessed.
7. Must push students beyond their comfort zones.
8. Must be able to be completed within the current budget for capstone projects.
9. Must be achievable with tools and materials that are readily available and affordable.
10. Must provide sufficient work for teams of two to four students.
11. Must be safe for students to complete by themselves with minimal assistance.
12. Must sufficiently prepare students to meet the demands of the grade 11 sector courses.

Assessing and Evaluating Student Learning

Assessment is the systematic process of gathering information on student learning. Assessments help students to reflect on how well they have learned, to redirect their efforts, and to set goals for their future learning. Some assessments also serve as the basis for evaluation, which is the process of analyzing assessment information and then making judgments or decisions based on it.

Teachers have a responsibility to ensure that assessment and evaluation procedures are clearly communicated to students and parents. The Principles of Assessment and Evaluation articulated in *Public School Programs* should be used as the basis of assessment and evaluation policies, procedures, and practices.

Assessment in Skilled Trades 10

Assessment involves the use of a variety of methods to gather information about a wide range of student learning and to develop a valid and reliable snapshot of what students know and are able to do. Skilled Trades 10 has a strong emphasis on kinetic learning and, therefore, makes special demands on teachers in terms of assessment. Teachers must be able to articulate clear methods for assessing motor skills, safety practices, and interpersonal skills, as well as written work and oral presentations. Given the project-based nature of the course, teachers also need to think carefully about how to individually assess student work that is performed in teams.

Students will come to this course with differing degrees of knowledge about the skilled trades as well as differing levels of skill development. Recognizing the wide range of student abilities, teachers should treat assessment as an ongoing process rather than an event. They should consider assessment as being of two differing kinds—assessment for learning and assessment of learning. Skilled Trades 10 should incorporate both types of assessment as they are described below.

Assessment for Learning

Assessment for learning, or formative assessment, provides students with ongoing information about their development, letting them know how they are progressing and what they need to learn next in order to be successful. The primary purpose of this type of assessment is to enable students to improve their knowledge and skills. Teachers can communicate assessment for learning through a variety of methods, including on-the-spot feedback, rubrics, scales, and checklists. Student self-assessment and peer assessment can also play valuable roles in assessment for learning.

Assessment of Learning

Assessment of learning, or summative assessment, lets students know how their knowledge and skills have developed over the course of a project, unit, or semester. Examples of this type of assessment include tests, reports, and presentations (group and individual) given for the purpose of attaining marks. When it results in a mark or grade, assessment of learning becomes evaluation. Teachers use evaluations to communicate with students and parents about levels of student performance in relation to expected curriculum outcomes.

By treating assessment as part of the learning journey rather than the final destination, teachers empower students to take responsibility for their own progress.

Effective Assessment and Evaluation Practices

Effective assessment improves the quality of learning and teaching. It can help students to become more reflective and to take control of their own learning. It can also help teachers to monitor and focus their instructional programs.

Assessment and evaluation of student learning should accommodate the complexity of learning and reflect the complexity of the curriculum. Evaluation should be based on the full range of learning outcomes towards which students have been working during the reporting period. It should be proportionate to the learning experiences related to each outcome and focus on patterns of achievement as well as specific achievement.

In reflecting on the effectiveness of their assessment program, teachers should consider the extent to which their practices

- are fair in terms of the student's background or circumstances
- are integrated with learning
- provide opportunities for authentic learning
- focus on what students can do rather than on what they cannot do
- provide students with relevant, supportive feedback that helps them to shape their learning
- describe students' progress toward learning outcomes
- support learning risk taking
- provide specific information about the processes and strategies students are using
- provide students with diverse and multiple opportunities to demonstrate their achievement
- accommodate multiple responses and a range of tasks
- provide evidence of achievement in which students can take pride
- acknowledge attitudes and values as significant learning outcomes
- encourage students to reflect on their learning and to articulate personal learning plans
- include students in developing, interpreting, and reporting
- help teachers to make decisions about teaching strategies, learning experiences and environments, student grouping, and resources

Involving Students in the Assessment Process

When students are aware of the outcomes they are responsible for and the criteria by which their work will be assessed and evaluated, they can make informed decisions about the most effective ways to demonstrate what they know, are able to do, and value. It is important that students participate actively in the assessment of their learning. They should have access to models in the form of scoring criteria, rubrics, and work samples.

Using a Variety of Assessment Strategies

When teachers make decisions about what learning to assess and evaluate, how to assess and evaluate, and how to communicate the results, they send clear messages to students and others about what they value. For example, teachers can communicate that they value risk taking or lateral thinking by including these elements in assessment.

Teachers align evaluation and assessment practices with student-centred learning practices when they

- design assessment and evaluation tasks that help students make judgments about their own learning and performance
- provide assessment and evaluation tasks that allow for a variety of learning styles and preferences
- individualize assessment and evaluation tasks to accommodate specific learning needs
- work with students to describe and clarify what will be assessed and evaluated and how it will be assessed and evaluated
- provide students with regular and specific feedback on learning

Some of the various forms that assessment can take include the following:

- anecdotal records
- artifacts
- audio recordings
- checklists
- conferences
- certifications
- demonstrations
- dramatizations
- exhibitions
- rating scales
- interviews (structured or informal)
- inventories
- investigations
- learning logs or journals
- multimedia
- observations (structured or informal)
- peer assessments
- performance tasks
- portfolio
- reports/presentations
- projects
- questioning
- questionnaires
- quizzes, tests, examinations
- reviews of performance
- sorting scales (rubrics)
- self-assessments
- surveys
- video recordings
- work samples
- written assignments

Portfolios

A feature of assessment and evaluation in Skilled Trades 10 is the use of a portfolio. The portfolio is a purposeful selection of a student's work that tells the story of the student's efforts, progress, and achievement throughout the course.

Portfolios engage students in the assessment process and allow them to participate in the evaluation of their learning. Portfolios are most effective when they provide opportunities for students to reflect on and make decisions about their learning. The students and teacher should collaborate to make decisions about the contents of the portfolio and to develop the criteria for evaluating the portfolio. Portfolios should include

- the guidelines for selection of a particular piece of work
- the criteria for judging merit
- evidence of student reflection

Portfolio assessment is especially helpful for the student who needs significant support. Teachers should place notes and work samples from informal assessment in the portfolio and use the portfolio to collaborate with the student in identifying strengths and needs, selecting learning experiences, and selecting work that best reflects the student's progress toward achievement of learning outcomes. Outlines and other evidence of planning allow students to examine their progress and demonstrate achievement to teachers, parents, and others.

Students should be encouraged to develop a portfolio that demonstrates their achievements in a context beyond a particular course, including letters, certificates, and photographs, for example, as well as written documents. A portfolio can be very helpful when students need to demonstrate their achievements to potential employers or admission offices of post-secondary institutions.

It is important that students share their portfolios with other students so that all students may see exemplars that represent a range of strategies for expression and levels of complexity in ideas and understanding.

Tests and Examinations

Traditional tests and examinations are not, by themselves, adequate to assess student learning. To be meaningful, tests and examinations should be adapted to reflect key aspects of the curriculum. For instance, some teachers, have designed tests and examinations based on collaborative or small-group learning, projects, or portfolio learning. Creating opportunities for students to help design a test is an effective practice in the interactive classroom to assess higher-order learning rather than simply recall of information (e.g., learning that requires synthesis, analysis, or evaluation).

Much of the assessment in Skilled Trades 10 happens through direct observation and commentary, as the teacher moves among student groups performing tasks with tools. At the same time, there is also a place in the course for conventional testing, which plays an important role in skilled trades certification.

Students who eventually decide to pursue a career in the skilled trades will face a series of multiple-choice tests as part of the certification process. Replicating this type of assessment in the classroom can help students prepare for the conditions and assessment formats they may encounter in the workplace.

Contexts for Learning and Teaching

Principles of Learning

The public school program is based on principles of learning that teachers and administrators should use as the basis of the experiences they plan for their students. These principles include the following:

1. Learning is a process of developing abilities and actively constructing knowledge.

Therefore, teachers and administrators have a responsibility to

- create environments and plan experiences that foster investigating, questioning, critical inquiry, predicting, exploring, collecting, educational play, creativity and innovation, and communicating
- engage learners in experiences that encourage their personal construction of knowledge and abilities through integrated learning opportunities
- involve learners actively in personally meaningful ways

2. Students construct knowledge and make it meaningful in terms of their prior knowledge and experiences.

Therefore, teachers and administrators have a responsibility to

- find out what students already know and can do
- create learning environments and plan experiences that build on learners' prior knowledge and abilities
- ensure that learners are able to see themselves reflected in the learning materials used in the school
- recognize, value, and use the great diversity of experiences and information students bring to school
- provide learning opportunities that respect and support students' racial, cultural, and social identities
- ensure that students are invited or challenged to build on prior knowledge and abilities, integrating new understandings with existing understandings and abilities

3. Learning is enhanced when it takes place in a social and collaborative environment.

Therefore, teachers and administrators have a responsibility to

- ensure that play, talk, group work, and collaborative ventures are central and developmentally appropriate class activities
- see that learners have frequent opportunities to learn from and with others
- structure opportunities for learners to engage in diverse social interactions with peers and adults
- help students to see themselves as members of a community of learners

4. Students need to continue to view learning as an integrated whole.

Therefore, teachers and administrators have a responsibility to

- plan opportunities to help students make connections across the curriculum and with the world outside, and structure activities that require students to reflect on those connections
- invite students to apply strategies from across the curriculum to critically inquire and solve problems in real situations

5. Learners must see themselves as capable and successful.

Therefore, teachers and administrators have a responsibility to

- provide learning activities, resources, and challenges that are developmentally appropriate to the learner
- communicate high expectations for achievement to all students
- encourage perseverance and risk-taking in learning
- ensure that all students experience genuine success on a regular basis
- value experimentation and treat approximation as signs of growth
- provide frequent opportunities for students to reflect on and describe what they know and can do
- provide learning experiences and resources that reflect the diversity of the local and global community
- provide learning opportunities that develop self- esteem

6. Learners have different ways of knowing and representing knowledge.

Therefore, teachers and administrators have a responsibility to

- recognize each learner's preferred ways of constructing meaning and provide opportunities for exploring alternative ways
- plan a wide variety of open-ended experiences
- use assessment to inform teaching and learning
- recognize, acknowledge, and build on students' diverse ways of knowing and representing their knowledge
- structure frequent opportunities for students to explore, formulate, create, and innovate to express ideas, discoveries, and understandings

7. Reflection is an integral part of learning.

Therefore, teachers and administrators have a responsibility to

- challenge their beliefs and their practices based on continuous reflection
- encourage students to reflect on their learning processes, practices, and experiences
- encourage students to acknowledge and articulate their learnings and how they learn
- help students use their reflections to understand themselves as learners, make connections with other learnings, and proceed with new learning

Engaging All Learners

*"*No matter how engagement is defined or which dimension is considered, research confirms this truism of education: *The more engaged you are, the more you will learn."* (Hume 2011, 6)

Student engagement is at the core of learning. Engagement in learning occurs when students are provided with opportunities to become more invested in their learning. This is critical for teachers to take into account when planning and implementing instruction. Effective instruction engages, embraces, and supports all learners through a range of learning experiences that are both age and developmentally appropriate.

This curriculum is designed to provide learning opportunities that are equitable, accessible, and inclusive of the many facets of diversity represented in today's classrooms. When teachers know their students as individual learners and as individual people, their students are more likely to be motivated to learn, persist in challenging situations, and apply reflective practices.

Supportive Learning Environments

A supportive and positive learning environment has a profound effect on students' learning. Students need to feel physically, socially, emotionally, and culturally safe in order to take risks with their learning. In classrooms where students feel a sense of belonging, see their teachers' passion for learning and teaching, are encouraged to actively participate, and are challenged appropriately, they are more likely to be successful.

Teachers recognize that not all students progress at the same pace nor are they equally positioned in terms of their prior knowledge of particular concepts, skills, and learning outcomes. Teachers are able to create more equitable access to learning when

- instruction and assessment are flexible and offer multiple means of representation
- students have options to engage in learning through multiple ways
- students can express their knowledge, skills, and understanding in multiple ways

(Hall, Meyer, and Rose 2012)

In a supportive learning environment, teachers plan learning experiences that support *each* student's ability to achieve curriculum outcomes. Teachers use a variety of effective instructional approaches that help students to succeed, such as

- providing a range of learning opportunities that build on individual strengths and prior knowledge
- providing all students with equitable access to appropriate learning strategies, resources, and technology
- involving students in the creation of criteria for assessment and evaluation
- engaging and challenging students through inquiry-based practices
- verbalizing their own thinking to model comprehension strategies and new learning
- balancing individual, small-group, and whole-class learning experiences
- scaffolding instruction and assignments as needed and giving frequent and meaningful descriptive feedback throughout the learning process
- integrating "blended learning" opportunities by including an online environment that extends learning beyond the physical classroom
- encouraging students to take time and to persevere, when appropriate, in order to achieve a particular learning outcome

Multiple Ways of Learning

"Advances in neuroscience and education research over the past 40 years have reshaped our understanding of the learning brain. One of the clearest and most important revelations stemming from brain research is that there is no such thing as a 'regular student.'" (Hall, Meyer, and Rose 2012, 2) Teachers who know their students well are aware of students' individual learning differences and use this understanding to inform instruction and assessment decisions.

The ways in which students make sense of and demonstrate learning vary widely. Individual students tend to have a natural inclination toward one or a few learning styles. Teachers are often able to detect learning strengths and styles through observation and through conversation with students. Teachers can also get a sense of learning styles through an awareness of students' personal interests and talents. Instruction and assessment practices that are designed to account for multiple learning styles create greater opportunities for all students to succeed.

While multiple learning styles are addressed in the classroom, the three most commonly identified are:

- auditory (such as listening to teacher-modelled think-aloud strategies or participating in peer discussion)
- kinesthetic (such as examining artifacts or problem-solving using tools or manipulatives)
- visual (such as reading print and visual texts or viewing video clips)

For additional information, refer to *Frames of Mind: The Theory of Multiple Intelligences* (Gardner 2007) and *How to Differentiate Instruction in Mixed-Ability Classrooms* (Tomlinson 2001).

A Gender-Inclusive Curriculum and Classroom

It is important that the curriculum and classroom climate respect the experiences and values of all students and that learning resources and instructional practices are not gender-biased. Teachers promote gender equity and inclusion in their classrooms when they

- articulate equally high expectations for all students
- provide equal opportunity for input and response from all students
- model gender-fair language, inclusive practices, and respectful listening in their interactions with students
- identify and openly address societal biases with respect to gender and sexual identity

Valuing Diversity: Teaching with Cultural Proficiency

"Instruction that is embedded in socially meaningful contexts, and tasks that are meaningful and relevant to the lives of students, will engage students in high-level problem-solving and reasoning and enhance students' engagement (Frankenstein 1995; Gutstein 2003; Ladson-Billings 1997; Tate 1995)." (Herzig 2005)

Teachers appreciate that students have diverse life and cultural experiences and that individual students bring different prior knowledge to their learning. Teachers can build upon their knowledge of their students as individuals, value their prior experiences, and respond by using a variety of culturally proficient instruction and assessment practices in order to make learning more engaging, relevant, and accessible for all students. For additional information, refer to *Racial Equity Policy* (Nova Scotia

Department of Education 2002) and *Racial Equity / Cultural Proficiency Framework* (Nova Scotia Department of Education 2011).

Students with Language, Communication, and Learning Challenges

Today's classrooms include students who have diverse language backgrounds, abilities, levels of development, and learning challenges. By observing and interacting with students and by conversing with students and/or their families, teachers gain deeper insights into the student as a learner. Teachers can use this awareness to identify and respond to areas where students may need additional support to achieve their learning goals. For students who are experiencing difficulties, it is important that teachers distinguish between those students for whom curriculum content is challenging and those for whom language-based factors are at the root of apparent academic difficulties. Students who are learning English as an additional language may require individual support, particularly in language-based subject areas, while they become more proficient in their English language skills. Teachers understand that many students who appear to be disengaged may be experiencing difficult life or family circumstances, mental health challenges, or low self-esteem, resulting in a loss of confidence that affects their engagement in learning. A caring, supportive teacher demonstrates belief in the students' abilities to learn and uses the students' strengths to create small successes that help nurture engagement in learning and provide a sense of hope.

Students who Demonstrate Exceptional Talents and Giftedness

Modern conceptions of giftedness recognize diversity, multiple forms of giftedness, and inclusivity. Some talents are easily observable in the classroom because they are already well developed and students have opportunities to express them in the curricular and extracurricular activities commonly offered in schools. Other talents only develop if students are exposed to many and various domains and hands-on experiences. Twenty-first century learning supports the thinking that most students are more engaged when learning activities are problem-centred, inquiry-based, and open-ended. Talented and gifted students usually thrive when such learning activities are present. Learning experiences may be enriched by offering a range of activities and resources that require increased cognitive demand and higher-level thinking with different degrees of complexity and abstraction. Teachers can provide further challenges and enhance learning by adjusting the pace of instruction and the breadth and depth of concepts being explored. For additional information, refer to *Gifted Education and Talent Development* (Nova Scotia Department of Education 2010).

Following an Integrated Approach

Skilled Trades 10 comprises a range of activities. Some of these involve conventional "in your seat" learning, such as listening to a guest speaker, writing a report, or researching a topic on the Internet. Other activities involve "hands-on" learning, such as hammering a nail or cutting a board. In each class, teachers should provide a mix of conventional and hands-on activities. Interweaving the theoretical and practical components of the course creates a more engaging learning experience and also accommodates a variety of student learning styles.

Although the Skilled Trades 10 curriculum provides a rich array of possible activities, teachers do not need to complete all of them in order to meet the specified curriculum outcomes. Given that the course is largely project-based, students achieve many of the outcomes through the skill building exercises and the Capstone Project. Therefore, teachers can be selective and creative in the way that they integrate other activities with the core projects.

Setting the Right Tone

Skilled Trades 10 is largely based on activities to promote experiential learning. Consequently, the atmosphere in the Skilled Trades Centre must be "safe" for students in two ways. In the physical sense, workplace safety standards must be followed at all times. In another sense, the Skilled Trades Centre must provide a psychologically safe environment in which students are free to try new, demanding tasks. In experiential learning, mistakes serve as stepping stones to mastery. Therefore, students need plenty of time to perform tasks and refine techniques in order to develop the self-confidence to learn from their mistakes.

Teachers can foster a safe environment by holding themselves and their students to a high standard of respectful behaviour. Students need to learn by example how to handle tools properly and also how to manage emotions and relationships effectively. Teachers can help students to develop patience with themselves and others, perseverance, and polite ways to deal with frustration and conflict.

Maintaining Safety Standards

"Safety first" should be the mantra of Skilled Trades 10. Before beginning any skill-building activity, teachers should model safety standards and procedures. When students lead Tool Box Meetings (tool demonstrations), they should similarly emphasize safety precautions. Teachers need to repeat safety instructions over and over until they are confident that everyone in the class is routinely following them. All students must complete and receive 100% on safety tests when using tools and processes in the Skilled Trades Centre.

Incorporating Guest Speakers

Guest speakers play an important role in Skilled Trades 10. Their visits help to communicate about many important concepts, such as workplace safety, apprenticeship training, and professional ethics. The list of guest speakers should include tradespeople from a variety of trades and backgrounds. Ideally, women, members of visible minorities, and people with disabilities should be represented.

Teachers should aim to involve 6–10 guest speakers and/or guest experts during work time in the course. To make lesson planning manageable, teachers should create the schedule that includes dates for guest speakers at the beginning of the semester. As the course progresses, the teacher and students can choose and invite speakers to fill the available time slots.

Exploiting Digital Technologies

Since today's adolescents are growing up with digital technology pervading daily life, teachers may find that using such technology helps engage students in curriculum topics. Digital technologies can enhance activities that involve research, presentation, and collaboration.

Making Teamwork Work

Since teamwork plays a vital role in Skilled Trades 10, teachers should invest ample time in discussing team dynamics, establishing clear expectations for teamwork, and guiding student groups through team-building exercises.

Teachers should consider carefully the composition of student teams, taking into account various levels of ability and interests. Wherever possible, teachers should foster diversity in teams. At the same time, teachers need to ensure that team members share responsibility for completing the project or activity. To promote participation and accountability, teachers may want to make peer and self-assessment part of the project grade.

Working with Existing Resources

Teachers need to be aware that many pedagogical resources are published outside Canada and, therefore, need to be adapted for students. Teachers need to present Canadian equivalents of standards, legislation, and government agencies.

Teachers also need to recognize that many older resources do not honour the diversity of today's students. For instance, books and other materials may not incorporate inclusive language or feature images of women, visible minorities, and people with disabilities. Teachers can supplement such resources or adapt them as necessary. To encourage students to think about diversity, they may also wish to draw attention to missing or stereotypical elements and ask students to suggest changes.

Learning Projects

The following thirty-nine learning projects are designed to help teachers deliver outcomes in the Skilled Trades Centre. They are by no means meant to be comprehensive or exclusive. Each project provides background information about how it applies to Skilled Trades 10. The area of learning of the specific curriculum outcomes is indicated.

By incorporating these Learning Projects into the delivery of Skilled Trades 10, teachers will gain a head start ensuring that the curriculum outcomes and skills and competencies are addressed.

Project 1: Introducing the *Skilled Trades 10 Record of Progress*

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:

- Skilled Trades Living
- Safety
- Measurement and Calculation for the Skilled Trades
- Tools and Materials of the Skilled Trades
- Employability Skills

Background:
The *Skilled Trades 10 Record of Progress* plays a critical role in introducing students to the literacy and organizational demands of the skilled trades. It also provides you with a key means of assessing student learning and their overall engagement with the course. The purpose of this project is to emphasize the importance of the *Record of Progress* and to spend some time modelling all of its essential features for students.

Project:
Take a few minutes near the beginning of Skilled Trades 10 to introduce the *Record of Progress* and its essential features to students. Explain that keeping a daily record or log of activities completed is an essential part of most trades. Teachers should also take some time to explain the important role that reflection plays in learning and demonstrate for students how the *Record of Progress* encourages them to actively reflect upon everything they do within Skilled Trades 10.

Project 2: Discovering Designated Trades Class Project

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Area of Learning:
- Skilled Trades Living

Background:
The Discovering Designated Trades class project challenges each student to research and learn about one of Nova Scotia's 69 designated trades. While the 11 mini-research projects are relatively straightforward, teachers will still need to explain to students exactly what they are to do, model the work required, and demonstrate the quality of work expected for submission; the same way as a journeyperson mentors a new apprentice. One of the best ways to accomplish this is for the teacher to adopt a designated trade and to "think aloud" about the steps and the thought processes used to complete each of the 11 projects.

Project:
There are 12 essential elements, including the Career Fair, where students display what they have learned about their trade at the end of the project. Teachers will need to set up a schedule for completing all of the project's elements the first week of class and monitor student progress throughout the term to ensure that everyone's Career Fair display is ready to go the day of the Skilled Trades Career Fair. Explain to students that they will be provided with regular feedback throughout the term to help them improve. Assure them if they work hard throughout the term and keep improving that their final grade will take care of itself. See below for detailed descriptions, teaching suggestions, and assessment rubrics for each of the project's 12 elements.

Project Description

Before beginning this project, write the names of 20 to 25 designated trades to highlight in Skilled Trades 10 on individual index cards or on the classroom whiteboard. It is recommended to include the 20 designated trades listed below and up to 5 additional trades that students may find interesting or are relevant to their community. For instance, if there is a shipyard near the school, include Boatbuilder as one of the designated trades.

20 Potential Trades to Feature in Skilled Trades 10

- Automotive Service Technician
- Baker
- Bricklayer
- Carpenter
- Construction Electrician
- Cook
- Hairstylist
- Heavy Duty Equipment Technician
- Instrumentation and Control Technician
- Industrial Mechanic (Millwright)
- Machinist
- Metal Fabricator (Fitter)
- Motor Vehicle Body Repairer (Metal and Paint)
- Oil Burner Mechanic
- Plumber
- Refrigeration and Air Conditioning Mechanic
- Sheet Metal Worker
- Sprinkler System Installer
- Truck and Transport Mechanic
- Welder

Explain that one of the fundamental commitments teachers have made in teaching Skilled Trades 10 is to introduce students to as wide a range of trades as possible to ensure that they fully understand the range of potential career options available to them. Also explain that the Discovering Designated Trades Career Fair Project is a major part of Skilled Trades 10 that directly ties into everything they will be learning about the Skilled Trades throughout the course. This can be highlighted by briefly reviewing a list of the 23 Skilled Trades 10 learning outcomes and discussing their relevance to the project.
Take a few minutes to review the list of designated trades, emphasizing that every one of these trades can potentially offer a rewarding career for the right person. Discuss the different kinds of trades that exist and briefly explain some of the key things that distinguish Nova Scotia's designated trades:

- Red Seal Certified Trades
- Compulsory Certified Trades
- Trades with and without apprenticeship training options in Nova Scotia

Ask students to keep their mind open as they participate in Skilled Trades 10, and highlight the fact that some people do not end up working in the first trade that appeals to them. Teachers can offer personal examples they might have of people they know who started out with an interest in one trade and ended up working in another. Teachers can also highlight the fact that many people become certified in more than one trade.

Inform students that they will each be responsible throughout Skilled Trades 10 for becoming an expert on one of Nova Scotia's designated trades. At this stage, teachers can assign each student a trade or hand around a container with each student randomly selecting one of the 20 to 25 trades that have been included. After all students have selected a card, there should be a number of trades left over to choose from. Teachers can adopt one of these trades and use it as a model throughout the class to guide students through the process of researching, organizing, and sharing information about their adopted trade.

Once everyone has been assigned a trade, show students the list of 11 project elements that they will research and learn about for the trade they have selected. Explain that near the end of the term, teachers will be organizing a Skilled Trades Career Fair at the school that parents, other students, and teachers, and anyone else from the community who is interested can attend. Students will take all of the information they have collected about their trade and create a display to represent their trade at the career fair. During the career fair, students can answer questions and share some of the interesting things they have learned about their trade.

Depending upon when the career fair is held, students may also have an opportunity to display the work they have completed for their Capstone Projects from Skilled Trades 10.

Another possibility is to combine the Skilled Trades 10 Career Fair with the Skilled Trades Presentation Project. Under this scenario, teachers would essentially end up holding a mini Skilled Trades 10 Conference at the school that would include an exhibit hall featuring displays for 17 designated trades and a series of guest speakers from the local community that could include

- journeypersons
- contractors, apprentices, entrepreneurs, managers
- recent graduates from the NSCC pre-employment program
- an official from the Worker's Compensation Board
- the youth apprentice co-coordinator for Nova Scotia

Organizing a "Skilled Trades" day will significantly simplify things for the school's administrative team by eliminating the need to schedule multiple visits by guest speakers to the school. It will also make it easier for students to approach a potential guest speaker as they will have a specific date to offer and a bigger, more exciting community-based event to motivate them to participate.
After the Career Fair has ended, teachers might want to consider placing the student displays on the walls of the Skilled Trades Centre or in a main hallway within the school where other students from the school can learn about the 17 trades and the exciting career options that the skilled trades have to offer. Wherever the student displays are placed, ensure that proper safety procedures are followed.
Researching and creating displays for adopted trades, organizing a roster of guest speakers, and discussing adopted trades with visitors to the career fair are all excellent literacy-based tasks that add a valuable dimension to Skilled Trades 10. These tasks also ensure that students within the class, and potentially within the entire school, are exposed to the exciting career options that 17 of Nova Scotia's designated trades have to offer.

Elements of "Discovering Designated Trades Career Fair Project

To successfully complete the Discovering Designated Trades Career Fair Project, students must complete each of the elements listed below for their adopted trade.

Element	Description	Background
#1	Three photographs depicting people at work in the trade.	Students will be unfamiliar with many of the designated trades and find it very hard to visualize what a journeyperson for their adopted trade looks like. This is why it is important to have them begin the Discovering Designated Trades project by collecting pictures of people within their adopted trades working within standard environments and carrying out common tasks. Even students exploring well-known trades such as carpenter, hairstylist, and plumber will benefit from collecting photographs and both literally and figuratively putting a face to their trade. People are ultimately at the heart of every trade, no matter how much technology is used. Interesting pictures of tradespeople at work will also make student displays more interesting and visually appealing and grab the attention of visitors as they walk through the career fair.
#2	Two examples of the role literacy plays.	Discovering the fundamental role that literacy plays in the skilled trades can be a real eye-opener for students who think that work in the trades is only "hands-on." This element of the project introduces students to common reading and writing tasks carried out by journeypersons within their adopted trade.
#3	Five vocabulary terms.	Every trade has a unique set of vocabulary terms. Students must be able to learn and apply basic terminology for the different trades that they explore in Skilled Trades 10. This element provides students with an initial opportunity to focus on building vocabulary for a specific trade.
#4	Two examples of the role numeracy plays.	It is critical that students are aware of the fundamental role that numeracy plays in the Skilled Trades. This element of the project introduces students to mathematics skills, such as estimation, measurement, and calculation, that are performed by journeypersons within their adopted trade.
#5	Evidence of common hazards or primary safety concerns.	Safety must be consistently emphasized throughout Skilled Trades 10. That is why students need to identify and briefly report on a common hazard or primary safety concerns within their adopted trade.
#6	An example of the impact of technology.	In one way or another, technology is having a profound impact upon each of Nova Scotia's designated trades. Continuous learning to keep up with the rapid pace of technological change has become an essential skill for anyone pursuing a career in the skilled trades. Completing this element will provide students with some initial insight into this reality.

Element	Description	Background
#7	Three examples of essential skills.	Employment and Social Development Canada have identified and validated nine essential skills: • Reading text • Document use • Numeracy • Writing • Oral Communication • Working with others • Continuous learning • Thinking skills • Computer use Detailed profiles explaining the important role that the essential skills play within most of the designated trades can be found on their website at ESDC.gc.ca:80/eng/workplaceskills/essential_skills/general/tools_apps.shtml. At the beginning of each trade's profile, the three or four most important essential skills are highlighted. These are the essential skills students need to focus upon and highlight by providing examples from their adopted trade.
#8	Five photographs of standard tools and materials with descriptions of how they are used and how much they cost.	Knowing about the tools and materials associated with each of the trades is critical to understanding a particular trade. Discovering what these tools and materials are for their adopted trade and how much they cost is the purpose of this element.
#9	A step-by-step description of a common task, procedure, or technique.	Learning a trade essentially involves mastering the essential steps for a variety of essential tasks, procedures, and techniques. In most cases these steps involve estimating and planning which tools and materials are required, getting everything organized, identifying potential hazards, and then completing the required task, such as framing a wall, dyeing someone's hair, baking bread, or repairing a brake line. Because performing tasks, procedures, and techniques correctly and precisely essentially define the skilled trades, it is important to begin introducing students to the practice and discipline this involves at the very beginning of Skilled Trades 10.
#10	An example of the impact of ecological/environmental concerns.	Ecological/environmental concerns are having a profound impact upon most designated trades. Learning to work with greener materials and to make traditional industry practices more environmentally friendly are becoming essential to most trades in the 21st century. Completing this element will bring students face-to-face with some of the amazing innovations that environmentally responsible journeypersons in all trades are embracing.

Element	Description	Background
#11	A brief description of apprenticeship/ training requirements, employment prospects, and average wages.	An important part of Skilled Trades 10 is providing students with an understanding of how apprenticeship works and the training and educational requirements that must be met to become a journeyperson in any trade. It is also important for students to understand the employment prospects and potential wages that different skilled trades provide. To complete this element, students will need to become knowledgeable about both the apprenticeship requirements and employment prospects for their adopted trades.
#12	A career fair display featuring the eleven elements listed above.	Challenging students to create and present a career fair display provides a tremendous opportunity for them to take pride in their work, pay attention to details, find an aesthetically pleasing layout for their project's elements, perform research, write about and present a skilled trade, and work with standard computer and publishing technologies. Students may want to build a frame for their display out of wood or some other material.

Teaching Suggestions and Assessment Rubrics for Project 2

While most of the required elements for the project are relatively straightforward, teachers will still need to explain to students exactly what they are to do, and to demonstrate the quality of work they are expected to submit. One of the best ways to accomplish this is for the teacher to adopt a designated trade and to "think aloud" about the steps and the thought processes used to complete each element. A couple examples are provided below to help teachers get started if they are unfamiliar with thinking aloud.

Element #1: Three Photographs Depicting People at Work

Pick a trade that none of the students have chosen and complete Element #1 before reviewing it with students in class. While searching for photographs for the teacher's adopted trade, think about the decisions and choices that need to be made. What kinds of photographs are available? Why are some more appealing than others? What ultimately led to the selection of the three photographs that best represent this trade? Be prepared to think aloud about the steps and the thought processes taken to arrive at the final selections.

If hairstyling is the teacher's adopted trade, turn on a computer, project it on the screen at the front of the Skilled Trades Centre, open a web browser, and begin thinking aloud. Remember to pre-screen any Google searches presented and to always use a filter to eliminate the possibility of any offensive material becoming an unwanted part of the presentation.

Teachers might start like this: "The first thing you can do to start generating images for your trade is to type your trade's name into Google or another search engine and do an 'image' search. I am going to type in terms like 'hairstylist,' 'hairdresser,' 'hair salon,' and see what kinds of images I can find."
As images are generated, bring them up on the screen and think aloud about whether or not they are suitable. By thinking aloud, teachers are modelling the approach students could take when completing the task. Teachers might comment on an image by saying, "I really like this image because it is very up-close-and-personal. I wanted one image that really demonstrates that hairstylists are real people performing a valuable human task that requires considerable training and skill. I don't like this image because it is not very interesting and doesn't do anything to interest me in learning more about the trade." Teachers should work through a handful of pictures thinking aloud as they go before showing students their final three selections. Outline for students the essential criteria used in choosing these photographs. These might include

- close-up photographs portraying the human side of hairstyling that will attract people to my display

at the career fair
- broad, panoramic photographs that provide a real sense of what a modern hair salon looks like and provides at least a glimpse into what working conditions are like within this trade
- photographs that immediately leapt out from the dozens of photographs previewed and made hairstyling seem interesting, exciting, and worth learning more about

Teachers should think aloud about how their selection criteria led them to the final three photographs chosen. Teachers may also want to show a number of photographs that were rejected to provide students with a clear sense of some of the differences among a great photograph, a good photograph, and a bad photograph.

Element #2: Two Examples of the Role Literacy Plays

A great way to explain to students what is required for this element is to use a projector and computer, open a web browser, and type in the URL for Employment and Social Development Canada. (ESDC.gc.ca:80/eng/workplaceskills/essential_skills/general/tools_apps.shtml)
Click on the link in the left-hand column that is labelled, Understanding Essential Skills. This link contains a list of the nine essential skills that ESDC have identified that teachers can use to introduce students to the concept of essential skills.

After reviewing the nine essential skills, return to the original link and click on "Essential Skills Profiles." Scroll down and select "Search the profiles," and then "Occupation." A search engine will appear that allows the user to enter the name of an occupation. Once again, assume that teachers have chosen "hairstyling" as their adopted trade. Typing in "hairstylist" will lead to the complete essential skills profile for hairstylists with links to specific examples of the flowing essential skills for hairstylists:
- Reading text
- Document use
- Writing

Open each of these links and read through some of the examples "thinking aloud" about the process used to choose two examples of the role literacy plays in hairstyling. Show students the two final examples and explain the reason for choosing them and how the information provided by the ESDC site was paraphrased. Explain to students that it is expected that they will follow the same process and provide examples in their own words, and not just copy and paste examples from the ESDC site.

Teachers should also inform students that their examples should be accompanied by a heading, such as "The Role of Literacy in Hairstyling" so that it will be easy to identify this element when it is displayed along with all of the other elements in their final career fair display. Students should also be encouraged to provide samples of a sentence or two of text that a journeyperson from their adopted trade might read or a picture or reproduction of a typical document they might use, such as a drawing or blueprint. Possibilities include
- excerpts from MSDS related to the student's adopted trade
- a product description of a tool or material from a manufacturer's website
- a drawing
- a blueprint
- a material take-off list
- an excerpt from a trade magazine article
- an excerpt from an online user's manual for a tool or machine commonly used within the trade
- an excerpt from a Tool Box Meeting Guide

Another option some students might find appealing is to write a fictional conversation that focuses upon a common situation a journeyperson might encounter within their trade. Potential conversations might include:

- a fictional dialogue between a journeyperson and a client
- a fictional dialogue between a foreman and a journeyperson
- a fictional dialogue between a journeyperson and an apprentice

Element #3: Five Vocabulary Terms

The best approach for introducing this element to students is for the teacher to think aloud how they came up with a list of five words for their adopted trade. Assume once again that teachers have chosen hairstyling as their adopted trade. Open Google, or another search engine, and think aloud about the process and the word combinations used to arrive at a page with a good list of hairstyling terms and definitions. Explain to students that they will likely need to experiment with several different combinations of words, such as "vocabulary," "terms," "definitions," and "terminology," along with the name of the trade, to find some helpful websites. Teachers can page through some of the sites their own web searches revealed and think aloud about why they bookmarked them for later use or rejected them and kept searching. Emphasize to students that when they do find some helpful sites that they are to complete the following three tasks to complete this element.

- Choose five interesting vocabulary terms and write definitions for each word in their own words.
- Write sentences that correctly use two of their five terms.
- Drawn pictures or diagrams or find images that visually represents two of their five terms.

Ask students to organize all of their terms, definitions, sentences, and visuals in a document with a heading such as "Common Hairstyling Vocabulary Terms" that can be reproduced later and added to their career fair display.

Element #4: Two Examples of the Role Numeracy Plays

Follow the instructions provided for Element # 2, but select "Numeracy" on the essential skills profile for the adopted trade. Once again, think aloud through the various examples found there and explain how the final two examples were chosen.

Explain to students that they will once again need to provide a heading, such as Examples of Numeracy in Hairstyling, and provide an example of an actual formula, recipe, or spreadsheet that highlights the importance of numeracy within their adopted trade. Possibilities include

- a recipe or list of proportions of ingredient that need to be mixed together to create a final product
- a common mathematical formula used within the adopted trade, accompanied by a relevant diagram (e.g., formula for perimeter with a diagram or reproduction of a section from a blueprint that demonstrates how it applies
- a spreadsheet containing numerical details, such as the number of parts or the quantities of materials required for a project within a trade

Element #5: A Common Hazard or Primary Safety/Health Concern

Provide students with a Job Safety Analysis (JSA) Worksheet (see below), and pick a common task or tool from the teacher's adopted trade. Teachers should think aloud as they fill in each of the columns on the sheet using a Job Safety Analysis Process.

The table on the following page illustrates what a completed worksheet would look like if students had chosen hairstyling as their designated trade.

Job Safety Analysis Worksheet for Hairstyling

Task/Tool	Essential Steps	Potential Hazards	Preventative Measures
Washing hair	1. Seat client in reclining chair. 2. Cover client with cape to protect clothes. 3. Select appropriate shampoo for client's hair. 4. Ensure water temperature is not too hot or too cold by testing with your hand. 5. Wet client's hair. 6. Apply shampoo and rinse. 7. Apply conditioner and rinse. 8. Pat client's hair dry with a towel. 9. Escort client to your chair for haircut.	• Water is too hot when you wet or rinse your client's hair and you burn their scalp. • You mistakenly grab a chemical agent instead of shampoo or conditioner that is not meant to be applied directly to a client's hair, which burns your hands and causes damage to your client's scalp. • Some water sprays on the floor while you are washing your client's hair that causes you or your client to slip and fall as you leave the hair-washing area.	• Always test the water's temperature with your hand before washing or rinsing a client's hair. • Only allow bottles of shampoo and conditioner in the hair-washing area and keep chemical agents in a completely separate area. • Always double check the label on any bottle you are using to ensure that it is a shampoo or conditioner and not a harmful chemical agent. • Be careful to contain water to the sink and immediately mop up any water that escapes before escorting your client from the hair washing area.

Teachers should explain to students that they are expected to complete a JSA worksheet, for a task or tool from their adopted trade, using the exact same approach that was just demonstrated to them. Tell students they will include their completed JSA's as part of their final career fair display.

Element #6: An Example of the Impact of Technology

Tools, materials, and techniques within most trades are constantly evolving because of new technological breakthroughs. Explain to students that for this item they will put on their reporter's cap to see if they can discover an exciting new technological development that is already transforming or has the potential to transform their adopted trade.

For instance, scientists and hairstyling professionals have recently developed a product called the "Heat Cap" that will likely eliminate curling irons and hot rollers from professional hair salons. With the Heat Cap, all that a professional stylist needs to do is quickly apply some curlers to a client's hair, heat the Heat Cap in a microwave for a couple of minutes, place the Heat Cap over their client's hair for a few minutes, and then remove it to instantly produce a head full of soft, beautiful curls. Through the power of technology, a task that used to take up to an hour can now be completed in just 15 minutes. Encourage students to find their trades version of the Heat Cap. Ask them to look specifically for new tools, materials, and processes within their adopted trades as this is where technological advancements can usually be found.

Ask students to write one paragraph describing the new tool, material, or process and another paragraph describing the impact it is having within their adopted trade. Ask students to provide a catchy

title/header for their two paragraphs, such as New Technologies Transforming Hair Salons, that will ensure this item is highlighted within their final career fair display.

Element #7: Three Examples of Essential Skills

Students will already be familiar with essential skills after completing Element #2 and Element #4. Ask students to once again visit the ESDC website to find the Essential Skills Profile for their trade. Explain that at the beginning of every trade's profile, its two or three most important essential skills are highlighted.

Ask students to review the most important essential skills for their trade and provide three examples using their own words.

Element #8: Five Photographs of Standard Tools and Materials(or actual tools and artifacts)

This is probably the easiest element to explain for the entire project. Explain to students that they are to find images of the most commonly used tools and materials within their trade and provide a brief description of how they are commonly used. Every tool and its accompanying description should be labelled with the name of the tool or material.

Inform students that in many ways the most challenging part of this exercise is coming up with a short list of the most commonly used tools. Emphasize again that they are to use their own words to describe how the tools they select are used and not just copy and paste descriptions from a website they have found.

Element #9: A Step-by-Step Description of a Common Task, Procedure, or Technique

Experienced journeypersons are experts at organizing their work and planning ahead to ensure that they have the tools and materials required to complete a specific task.

This element challenges students to begin cultivating this mindset by thinking through and describing the steps involved in a common task for their adopted trade.

Students should begin by creating a list of the tools and materials they expect to use to complete the task they have chosen, and then, in as much detail as they can provide, describe every step that will be required to complete the task.

Explain to students that completing this exercise will be almost identical to Element #5, except that the emphasis has shifted from safety to selecting the right tools and the proper amount of materials in order to get a job done quickly and efficiently. In completing this element, students should provide a list for each of the following:

- Required tools
- Required materials
- Required steps to complete the task

In working with students to complete this element, teachers need to warn students to choose a manageable task, such as framing a section of a wall as opposed to building a house. If the task requires more than 5 to 10 steps, a large number of tools, and a vast quantities of materials, it is too complex.
Note: Be sure to ask students to select a different task then they chose for Element #5 when completing this element.

Element #10: An Example of the Impact of Ecological/Environmental Concerns

Tools, materials, and practices within most trades are changing due to the impact of ecological and environmental concerns.

Ask students to identify and briefly describe an ecological/environmental concern that is having a significant impact upon their adopted trade. Have students provide a title for their brief description, such as "Carpentry and the Environment" or "Highlighting Green Hair Salon Practices."
If carpenter was a student's adopted trade, they could highlight the use of the Oriented Strand Board or how more and more contractors are reusing and recycling building materials.

Element #11: A Brief Description of Apprenticeship/Training Requirements, Employment Prospects, and Average Wages

Completing this element simply involves researching and reporting on the following pieces of information:

- How long it takes to complete an apprenticeship.
- Whether you can become Red Seal certified and eligible to work anywhere in Canada.
- Whether you can receive training for the trade within Nova Scotia.
- How good employment prospects are likely to be over the next 5 to 10 years.
- What the average wages are for both a new apprentice and a very experienced journeyperson.

Explain to students that they are to present the required information using a table or a spreadsheet that will be entitled, Apprenticeship Requirements, Employments Prospects, and Average Wages.

Element #12: A Career Fair Display Featuring the Eleven Elements Listed Above

After students have completed Elements 1 to 11, they are ready to prepare their career fair display. Before they begin this process, teachers should assemble their own career fair display for their adopted trade and perform a think aloud to provide students with some insight into the thought processes and decisions made to layout the 11 project elements in the most aesthetically pleasing manner.

Stress to students the importance of using large headings and of clearly labelling every element so visitors to the career fair will be able to quickly and easily grasp the wealth of information provided. Teachers should also stress to students the importance of being neat and tidy, of striving to make their display as visually engaging as they possibly can, of taking pride in their work, and only including original work (not simply copying and pasting information directly from websites).

Teachers may want to design a project rubric that outlines all of the key assessment criteria for the project so that students will know exactly how they are being evaluated.

Project 3: Planning and Hosting a Skilled Trades Career Fair

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Teachers may want to consider putting students in charge of planning and hosting the Skilled Trades Career Fair. Students will learn valuable organizing and communication skills and build a tremendous amount of self-confidence.

Project:
Set a date and a time to hold a Skilled Trades Career Fair at the school. It is recommended to set aside a single day after the term for Skilled Trades 10 has been about 60%–75% completed. This will allow plenty of lead time for students to complete career fair displays and make all of the arrangements required for holding the event. Confining the event to a single day also makes it easier to book guest speakers and increases the potential to attract a large audience of people from the school and the larger community. Everyone can mark it on their calendars at the beginning of the term and will provide plenty of time to get the word out to everyone who is interested.
It will also need to be decided very early in the term if a guest speaker should be invited to be a part of the Skilled Trades Career Fair. See Learning Project 10 for a list of recommended speakers and ideas for turning this part of the event into a challenging learning experience for students.
The students' Discovering Designated Trades Career Fair displays should be set up in the Skilled Trades Centre. This will allow teachers to showcase Skilled Trades 10. Besides the Career Fair displays, visitors will be able to see all of the projects students are working on within the Centre. When installing projects in the Skilled Trades Centre, make sure that proper safety procedures are followed and that there is enough room for people to move around without bumping into anything.
The event can be confined to other teachers or students within the school or be opened up to the entire community. Teachers may want to consider inviting students from surrounding schools as this is where the next wave of recruits for Skilled Trades 10 will be found.
Students in the class can be responsible for working with the principal and school staff to book additional rooms and to make the required arrangements. They can also take charge of inviting guest speakers, developing promotional posters and possibly arranging some presentations highlighting Skilled Trades 10 and the Career Fair at surrounding schools.
Note: If two sections of Skilled Trades 10 are running at the same time, teachers may want to showcase twice as many trades and spread the tasks required to organize the Career Fair across both sections.
Teachers may also want to think about inviting local businesses to sponsor and participate in the event. These businesses might be able to provide some trades-related tools and equipment that some of their employees could demonstrate.
Teachers and students can ultimately make the Skilled Trades Career Fair whatever they want it to be. Anything is possible and there are a wealth of potential learning opportunities for students if they truly play an active role in planning and hosting the Fair.

Project 4: Exploring the Historical Roots of the Skilled Trades—Matching British Surnames with Medieval Occupations

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Area of Learning:
- Skilled Trades Living

Background:
Students may not realize that the skilled trades have been around for hundreds of years. This project provides them with a deeper appreciation of some of the historical roots of Skilled Trades Living, and a preliminary introduction to estimating, a fundamental skill that needs to be cultivated throughout the course. This project can be used to introduce the important role that literacy plays in the skilled trades, as using the Internet for research and recording or logging work are common tasks for every trade.

Project:
Distribute copies of the research worksheet provided below for this project. Explain to students that the worksheet contains 25 British surnames that have historical connections to medieval occupations. Explain that their task is to choose four to six of the surnames provided, guess which occupations they are connected with, and use the Internet or library to research to confirm whether they are right or not.
Teachers should also insist that students complete their research sheets neatly and accurately and explain that skilled tradespeople are frequently asked to fill out forms and log books to document their work.

Research Worksheet: Historical Connections

Name	Description of medieval occupation
Ackerman	
Bowman	
Brewster	
Carter	
Carver	
Clark(e)	
Dexter	
Fletcher	
Fuller	
Harper	
Hooper	
Luther	
Mason	
Miller	
Minter	
Partridge	
Porter	
Shepard	
Smith	
Sumner	
Tripper	
Walker	
Webster	
Wright	
Zeller	

Project 5: Identifying the Skilled Trades That Contributed to the Construction of Your School

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Area of Learning:
- Skilled Trades Living

Background:
Most of the students in Skilled Trades 10 will likely be familiar with only a few trades and be unaware of the specific contributions and roles of specific skilled trades. This project takes advantage of their immediate surroundings to provide students with an understanding of the work performed by tradespeople from Nova Scotia's designated trades.

Project:
Ask students to explore the entire school, both inside and out, to identify the contributions made and to identify the associated trades (see next page) and to note the location(s) within the school where the work is evident.
For detailed descriptions of trades listed in the table, students can visit the National Occupational Analyses link in the Resource Centre of the Red Seal Program website (www.red-seal.ca).
Review what students have discovered at the end of class and be sure to highlight any instances of green building practices within the school.
Teachers should also explain to students that this exercise, besides introducing them to the work performed by several trades, also simulates the essential literacy-based skill of observing and recording or logging information which, in a variety of forms, is fundamental to almost every trade.

Comparison of Skilled Trades

Trade	Location(s) within the School	Explanation of Work Performed
Powerline technician		
Painter/decorator		
Mobile crane operator		
Metal fabricator		
Lather		
Ironworker		
Insulator		
Bricklayer		
Construction craft worker		
Floor covering installer		
Glazier		
Roofer		
Sheet metal worker		
Sprinkler system installer		
Tilesetter		
Welder		

Project 6: Introducing the Nine Essential Workplace Skills

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Employment and Social Development Canada have identified and validated nine essential skills that are relevant to most skilled trades.
Detailed profiles explaining the important role that these essential skills play within most of the designated trades can be found on their website at esdc.gc.ca/en/essential_skills/tools/index.page#tab2.

Project:
Working in groups, students develop lists of what they think are the most important skills for people working in the skilled trades.
After students have developed their initial lists, teachers can introduce the nine essential workplace skills defined by Employment and Social Development Canada (ESDC):
- Reading text
- Document use
- Numeracy
- Writing
- Oral communication
- Working with others
- Continuous learning
- Thinking skills
- Computer use

Copies of this list are available from ESDC's Essential Skills website at esdc.gc.ca/eng/jobs/les/profiles/guide.shtml. During class discussion, teachers should also note the importance of physical capabilities, such as balance and hand-eye coordination, to the skilled trades.
Once the group discussion has concluded, students can return to their groups to sort the skills they identified at the beginning of the class into 10 categories—the nine essential skills and the physical demands of the job.

Project 7: Identifying an Essential Workplace Skill That Needs Personal Improvement

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
As students explore and start to become excited about careers in different trades, they need to think carefully about areas where they need to improve. No matter how much they love a trade, weak numeracy or literacy skills, if not addressed, could seriously limit their future options.

Project:
After reviewing the nine essential workplace skills, ask students to identify an essential skill they feel needs to improve, explain why it plays an important role in their skilled trade of choice, and create a plan for strengthening it. Below is the ESDC list of essential skills:
- Reading text
- Document use
- Numeracy
- Writing
- Oral communication
- Working with others
- Continuous learning
- Thinking skills
- Computer use

Students can create their plan by setting SMART goals for themselves (goals that are specific, measurable, attainable, realistic, and timely).

Project 8: Exploring a Designated Trade's Most Complex Tasks

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Investigating a trade's most complex and demanding tasks can provide students with real insight into whether a trade is a good fit for them.

Project:
Create a spreadsheet or table (like the example provided (next page) of the most complex tasks in a trade that are related to the nine essential skills. To create their spreadsheet or table, students need to complete the following steps:
- Go to the ESDC's Essential Skills website.
- Find the occupational profile for their trade.
- Identify the most complex task(s) for each essential skill.
- Write a description of these tasks in the "Most Complex Task(s)" column of their table. (See example on the following page.)

Profile of a Carpenter's Most Complex Tasks

Essential Skill	Most Complex Task(s)
Reading text	
Document use	
Numeracy	
Writing	
Oral communication	
Thinking skills	
Working with others	
Continuous learning	
Computers use	

Project 9: Identifying Key Differences in the Essential Skills among Skilled Trades 10's Adopted Trades

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Each of the adopted trades in Skilled Trades 10 shares the same set of essential skills as the other trades. The level of skills required in each trade are very different. Some of these differences are obvious and some are more subtle. Identifying some of the key differences among Skilled Trades 10 adopted trades is the purpose of this project.

Project:
The simplest way to begin this project is by writing a list of the class's adopted trades on the whiteboard. Ask students to review the list and say which trades stand out the most as being different from the others. Work with students to determine different ways of classifying and grouping trades based upon their differences. The following are some questions to consider:
- Which trades produce more tangible things, such as a houses, buildings, parts, or food items?
- Which trades are strictly service-based and never involve producing a new product?
- Which trades place a much heavier emphasis upon communicating and collaborating with other?
- Which trades largely involve working alone?
- Which trades are more dependent upon computers and new technologies?
- Which trades require extremely high levels of precision and incredible attention to detail?
- Which trades focus more upon trouble shooting and resolving problems for large, complex systems?

As teachers work through these questions with students, students will begin to see patterns and to develop a greater sense of some of the qualities that distinguish each of the highlighted trades.

Project 10: Introducing the Skilled Trades 10 Presentation Project

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Communication skills are a critical part of the skilled trades that students need to learn. The Skilled Trades 10 Presentation Project challenges students to step outside of their comfort zones in planning and managing, and execute events at their schools involving guest speakers from the local trades community.

Project:
Divide students into groups of four. Explain that each group will be responsible for arranging the visit of one or two guests to the Skilled Trades Centre during the Skilled Trades course. This project can be combined with a Skilled Trades Fair (see Project 3) and potentially extend invitations for everyone in the entire school or community to attend.
Ask students to draw potential guests from the following list:
- Journeypersons
- Contractors/apprentices/entrepreneurs/managers
- Recent graduates from NSCC pre-employment programs
- An official from the Worker's Compensation Board
- The Youth Apprentice Co-coordinator for Nova Scotia

A single event featuring invited speakers from all of the groups or four different events could be held, whichever is simplest. Explain to each student group that to successfully complete the Presentation Project they will need to
- write phone scripts or letters to invite guests
- meet guests at the entrance to the school and escort them to the skilled trades centre
- prepare a formal introduction for each guest
- write and send thank you notes to each guest, expressing appreciation and highlighting something valuable that was learned

Teachers will need to set up this project at the very beginning of Skilled Trades 10 and closely monitor each group's progress to ensure that things are not being left until the last minute. Teachers may want to establish deadlines for identifying and confirming who the guest(s) will be, for issuing invitations and for scheduling an appropriate day.

Project 11: Field Trip—Skilled Trades in Action

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Visiting an NSCC campus and seeing students at work in some of the programs available, or observing tradespeople at work in a plant or factory, provides students with field level experience to see first-hand skilled trades people in action.

Project:
Working in groups, students can
- organize a visit to the nearest campus of the Nova Scotia Community College to experience the skilled trades training opportunities available
- organize a visit to a local building site, plant, or factory to observe apprentices and skilled tradespeople working under real conditions

Even if teachers know someone at the college or the owner of a business, they should have students make the phone call that will likely be required to set up these visits. Making phone calls and setting appointments are daily realities for many tradespeople, so being exposed to this type of communication situation will be a valuable learning experience and a real confidence booster.
If a relationship has not already been established with the College Prep Coordinator at the nearest NSCC campus, teachers should set up a time to meet them to discuss collaboration.

Project 12: Reflecting on the Physical Demands of the Skilled Trades

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Physical Dexterity/Hand-Eye Coordination/Balance
- Skilled Trades Living
- Employability Skills

Background:
Most skilled trades are physically demanding, so it is extremely important for students to experience and reflect upon this reality when exploring potential career options.

Project:
Hammer nails, drive screws, saw a piece of scrap wood in two, join two pieces of pipe, or complete other physical trades-related tasks. In their *Record of Progress*, students can discuss and reflect on the physical attributes and skills required to perform these tasks quickly and accurately.

Project 13: Arranging for an In-Class "Skills in Demand" Presentation and Attending a Skills Canada Competition

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Skills Canada Nova Scotia holds annual skills competitions in Nova Scotia and works to promote the skilled trades as a career option for youth (skillsns.ca). Attending a competition provides a tremendous opportunity to observe highly skilled tradespeople in action and to experience the beauty, precision, and speed of their work.

Project:
Research the organization Skills Canada-Nova Scotia and arrange for a free in-class "Skills in Demand" presentation. Teachers may also arrange for the class to attend the annual Nova Scotia Skills or Canada Skills competitions if they are taking place nearby. Encourage students to consider competing at these events. Teachers can review the high school competition areas and put together a training program for those students who choose to compete.
Teachers should not be discouraged if a few students are not interested in competing; most will be interested. The main thing is to make students aware of the opportunity.

Project 14: Reviewing Apprenticeship and Training Organization Websites Using the K-W-L Instructional Tool

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
In this project, students use a guided reading instructional tool called K-W-L to review websites for apprenticeship and training organizations such as WorkIt Apprenticeship (workitns.ca), Nova Scotia Apprenticeship Agency (nsapprenticeship.ca), the Red Seal Program (red-seal.ca), and Skills Canada (apprenticetrades.ca).
K-W-L helps students activate prior knowledge, preview, form questions, read actively for information, summarize and review key information before, during, and after reading content from these websites. (see chart below)
The K-W-L strategy engages students in thinking about what they already know about a topic, developing questions about what might interest them further, reading actively with the purpose of determining answers to questions, and finally, reviewing what they have learned.

Project:
Refer students to the K-W-L worksheet (see below)
Before sending students to review one of the apprenticeship and training websites listed above, ask them to brainstorm (as a class, in groups, or individually) and to list any information about apprenticeship and skilled trades training that they already think they know.
Next, before or at the same time as they are reviewing one of the websites, ask students to write down as many questions or topics as they can think of in the What I Want to Know column from the worksheet. Students may need to quickly surf through some of the website's content to generate their list of questions and topics.
As students are reviewing their chosen website, and after they have finished reading the content it provides, ask students to identify key points that they previously did not know and list these in the What I Have Learned column. This column should include answers to some of the questions they posed in the What I Want to Know column and any new information that has been encountered.
After completing their worksheets, students can return to the website to look for information they may have missed.

K-W-L Chart

What I Think I Know	What I Want to Know	What I Have Learned

Project 15: Developing a Personal Career Plan

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Students entering Skilled Trades 10 with a strong sense of their favourite trade may want to begin mapping out a potential career plan.

Project:
Students can create a personal career plan by writing out the steps required to become an apprentice and a fully certified Red Seal journeyperson. Students' plans should be evaluated for comprehensiveness and accuracy.
Students can be creative when choosing the format for their career plan. They might like to create it as a personal narrative, an instruction manual, or a poster-size map. If students are allowed creative license, then the assessment instrument must be flexible enough to accommodate various forms of the assignment.

Project 16: Conducting a Mock Job Search

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Students entering Skilled Trades 10 with a strong sense of their favourite trade may want to experience first-hand the steps required to complete a job search.

Project:
Students can conduct a mock job search for a skilled trade they are interested in. They can create a report listing all of the sources of job postings that they can find. (The report should include copies of the job ads.) Students can pick one of the ads and outline the typical steps they would follow to submit an application.
Students can also play the role of a recently certified Red Seal journeyperson looking for their first full-time position. To complete this exercise, students will need to discover where jobs for the trade they have chosen are posted and the steps involved in submitting a successful application.

Project 17: Enrolling in an Online Health and Safety Course

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Safety

Background:
This online course is an excellent way to provide students with an introduction to the basics of workplace safety.

Project:
Students must complete an online health and safety course, such as those offered by the WCB (worksafeforlife.ca/Home/Getting-Started/For-Educators/Online-Safety-Programs). After completing the course, students can print the completion certificate and include it in their portfolio.

Project 18: Demonstrate the Proper Use and Maintenance of the PPE Available for Completing Tasks within the Skilled Trades Centre

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance

Background:
Students need to know how to properly use and maintain Personal Protective Equipment (PPE) in order to safely complete tasks within the Skilled Trades Centre.

Project:
Students can demonstrate the proper use, storage, and maintenance of PPE, such as
- respirators
- gloves
- aprons
- fall protection harnesses
- head, eye, and foot protection

Students can also create a spreadsheet of the tasks for which PPE would commonly be required within the Skilled Trades Centre.
There is a sign-off sheet for PPE included in the *Skilled Trades 10 Record of Progress* (Tool Use and Safety Competency) that needs to be completed and signed for every student in the class.

Project 19: Skimming WHMIS Labels and MSDS for Relevant Information

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Employability Skills

Background:
Experienced tradespeople have learned to skim through the information provided on Workplace Hazardous Materials Information System (WHMIS) labels and Materials Safety Data Sheets (MSDS) and extract whatever information is critical to the task at hand. In this project, teachers will introduce students to WHMIS labels and MSDS and provide explicit instructions for processing the valuable information they contain.

Project:
Print off WHMIS labels or MSDS for the class for a product, substance, or material that students will encounter in Skilled Trades 10. Tell students they are to focus on the following key techniques as they read:
- Fixing the purpose for reading the WHMIS label or MSD sheet firmly in their minds so they will know what they are looking for.
- Moving their eyes over the text searching for important words, key terms, and essential safety consideration for working with the product, substance, or material in question.
- Using their finger and moving it down the page to train their eyes to move more quickly.
- Looking for bold-faced, italicized, or capitalized words, symbols, and important facts that are central to the safety considerations being highlighted.
- Omitting sections of the material not relevant to their purpose.

After students have skimmed the WHMIS label or MSD sheet provided, ask them to study it in more detail by reading slowly and looking for specific information to meet their needs and/or purposes. Ask them to write down a one- or two-sentence summary of what they have just read.

Project 20: Maintaining a Portfolio

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Students should already have a LifeWork portfolio to assess their strengths, skills, abilities, and interests in relation to employability within the skilled trades.

Project:
As students progress through Skilled Trades 10, they should maintain a portfolio. Portfolios should not be graded, but can be used to assess the following:
- level of engagement in the course
- growth in awareness of skills and abilities
- development of employability and transferable skills
- growth in awareness of career opportunities in the skilled trades

Portfolios should include a resumé and may also include documentation of the student's
- education
- employability skills
- transferable skills, including fundamental, personal management, and teamwork skills
- career explorations
- career-related projects
- job-shadowing experiences
- co-operative education experiences
- work experience
- volunteer experience
- service to community
- certification
- credentials
- interests
- hobbies sports

Project 21: Understanding the Myths and Realities of Work and Working Conditions in the Skilled Trades

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Area of Learning:
- Skilled Trades Living

Background:
Using a Think-Pair-Share method, students collaboratively read an article highlighting several myths and realities about working conditions within the skilled trades. Working together, students can reach a deeper understanding of the content provided in the article through discussing and sharing ideas.

Project:
Provide students with copies of "The Real Scoop on Skilled Trades," which is included in the publication entitled, *Apprenticeship: Your Career Starts Now* (online.fliphtml5.com/ovpk/dxwz/#p=1).
Write the following question on the whiteboard for students to discuss and debate:
Which of the myths highlighted in the articles do you think has done the most to discourage people from pursuing careers in the skilled trades?

Step 1: Think
Explain to students that there are no right or wrong answers to this question and that they should take some time on their own to think about what a reasonable answer to this question might be.

Step 2: Pair
Next, at the end of the "think" time, ask students to form groups of two, three, or four to discuss, debate, and formulate a final answer for presentation to the rest of the class.

Step 3: Share
Ask student groups to share their final answers with the rest of the class.
Take a few minutes after all of the groups have presented their final answers to reflect upon the Think-Pair-Share process with students and examine how it influenced and potentially deepened their thinking about the article.

Project 22: Highlighting the Importance of Personal Qualities to Success in the Skilled Trades

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Skilled Trades Living
- Employability Skills

Background:
Personal qualities such as honesty and integrity are just as important, if not more so, to success in the skilled trades as physical dexterity or any of the nine essential skills.

Project:
Working in groups, students can identify two or three personal qualities and discuss why they are important. Examples of personal qualities include
- honesty/integrity
- strong work ethic
- punctuality
- ability to learn from mistakes / willingness to accept constructive criticism
- courtesy/politeness
- positive attitude
- maturity

Each group can present the personal qualities they have identified and explain their importance to the rest of the class.

Project 23: Performing Job Safety Analysis (JSA)

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Skilled Trades Living

Background:
Learning industry best practices for safety is an essential part of Skilled Trades 10. JSA and Tool Box Meetings are perhaps the best known approaches for establishing safe work procedures and are excellent ways to introduce and reinforce safe work habits.

Project:
Working in groups, use Job Safety Analysis (JSA) to establish correct work procedures for 10–15 specific tasks that students will complete with hand and power tools found in the Skilled Trades Centre. Explain that job safety analysis involves the following steps, which are set out in the JSA Worksheet below:
- Select the task.
- Break the task into a sequence of steps.
- Identify the hazards.
- Define preventative measures.

Teachers should note that only the most critical tasks or jobs need to be considered for the exercise. Critical tasks include those associated with
- frequent accidents and injuries
- severe accidents and injuries
- the potential for severe injury

Job Safety Analysis (JSA) Worksheet

Task/Tool	Essential Steps	Hazards	Preventative Measures

Sample Safety Audit Checklist

Date: _____

Location/Department: _____

Yes = Satisfactory No = Unsatisfactory, needs attention

Yes	No	Safe Work Practices	Yes	No	Fire Protection
		Use of machine guards			Fire extinguishers
		Proper manual lifting			Proper type/location
		Smoking only in safe, designated area			Storage of flammable materials
		Proper use of air hoses			Other:
		No horseplay			
		Other:			
Yes	**No**	**Use of Personal Protective Equipment (PPE)**	**Yes**	**No**	**Tools and Machinery**
		Eye/face protection			Power tools
		Footwear			Hand tools
		Gloves			Machine guarding
		Protective clothing			Belts, pulleys, gears, shafts
		Head protection			Oiling, cleaning, adjusting
		Aprons			Maintenance, oil leakage
		Respirators			Other:
		Other:			
Yes	**No**	**Housekeeping**	**Yes**	**No**	**First Aid**
		Proper storage areas			First-aid kits in rooms
		Proper storage of flammable materials (oily/greasy rags, etc.)			Trained first-aid providers
		Proper disposal of waste			Emergency numbers posted
		Floors (clean, dry, uncluttered)			All injuries reported
		Maintenance of yards, parking lots			Other:
		Other:			
Yes	**No**	**Electrical Safety**	**Yes**	**No**	**Miscellaneous**
		Machines grounding / GFI			MSDS / WHMIS Labels
		Electrical Cords			Dust/vapour/fume control
		Electrical Outlets			Safe use of ladders / scaffolds
		Other:			New processes or procedures carried out
					Other:

Adapted from Canadian Centre for Occupational Health and Safety

Sample Safety Audit Report

Location: _____

Department/Areas Covered: _____

Date of Inspection: _____ Time of Inspection: _____

Priority Codes:

A—do immediately B—do within three days C—do within 2 weeks D—other

Item (Location)	Hazards Observed	Repeat Item (Yes/No)	Priority Code	Recommended Action	Person Responsible	Action Taken	Date

Analysis and comments:

Adapted from Canadian Centre for Occupational Health and Safety

Project 24: Leading a Tool Box Meeting

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Skilled Trades Living

Background:
Learning industry best practices for safety is an essential part of Skilled Trades 10. JSA and Tool Box Meetings are perhaps the best known approaches for establishing safe work procedures and are excellent ways to introduce and reinforce safe work habits.

Project:
Have students lead Tool Box Meetings. They can teach the class about a safety topic, such as good housekeeping practices for a construction site, power tool safety, or personal protective equipment. Teachers can demonstrate how to run an effective Tool Box Meeting and then provide students with Tool Box Meeting checklists and guides.
Teachers can design their own Tool Box Meeting checklists and guides for different safety topics or use the excellent materials provided by WorkSafeBC.
WorkSafeBC Tool Box Meeting Checklist:
worksafebc.com/i/construction/toolbox/pdfs/TG06-00_Checklist.pdf
WorkSafeBC Tool Box Meeting Guides:
worksafebc.com/Portals/Construction/ToolboxMeetingGuides-Topic.asp?ReportID=34361

Project 25: Role-Playing a Mock Accident

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Skilled Trades Living

Background:
Developing a strong awareness of the types of accidents that can occur within skilled trades workplaces is an essential step on the path to prevention.

Project:
Working in groups, students can create role-plays of mock accidents. Each group can develop and perform a brief skit portraying an accident that could potentially take place in the Skilled Trades Centre. At the end of each skit, the teacher and the rest of the class identify what they liked about the skit, assess how realistic the accident was, and discuss what might have been done to prevent it. Rather than performing a skit, students could also search for videos of accidents on YouTube and discuss these. Teachers will need to stress to students that accidents are never something to laugh at as many of the accident videos uploaded to YouTube are there because people think they are funny.

Project 26: Estimating/Measuring Area, Perimeter, and Volume

Outcomes: Students will be expected to (Teacher-identified outcomes)
Area of Learning: • Measurement and Calculation for the Skilled Trades
Background: The ability to estimate and measure area, perimeter, and volume is a requirement for many trades.
Project: Challenge students to estimate the area and the perimeter of walls, rooms and other surfaces, and to use that information to estimate requirements for paint, flooring, wiring, pipes, drywall, and other standard building materials.

Project 27: Demonstrating the Importance of Scaling

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Area of Learning:
- Measurement and Calculation for the Skilled Trades

Background:
This project demonstrates the important role that scaling plays within the skilled trades.

Project:
Students create a hand drawing and a scaled drawing and compare them.
Follow the steps below:

Step #1
Hold up a piece of 2' × 4' or any object with clear dimensions that can be measured.

Step #2
Ask students to hand draw a sketch of the object.

Step #3
Compare student sketches to the actual object and explain that none of the drawings can be accurate without a scale.

Step #4
Explain that a full-sized 1 to 1 scale (1:1) of the object would mean that 6" = 6" or 1' = 1'.

Step #5
Hand out standard sheets of graph paper and explain that a smaller scale of $\frac{1}{4}$" to 1' is used to make it possible to represent full-sized objects on a single sheet.

Step #6
Divide students into groups and hand out a number of identical copies of the object held up at the beginning of the class.

Step #7
Ask students to measure the object and represent it using a $\frac{1}{4}$" to 1' scale on the graph paper provided.

Step #8
Ask students to hold up and compare their scaled drawings. They should be identical. If they are, students have understood the concept of scaling and the lesson is complete. If drawings are not to scale, work with students to identify the reasons their drawings are not to scale and ask them to make the necessary corrections.

Project 28: Driving Nails

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
At the beginning of Skilled Trades 10, teachers should inform students that they will be taking part in a professional building project later in the term. Students should be given a brief overview of the project, which involves building, wiring, installing plumbing, and hanging drywall for a 90" × 41" section of wall.
Explain to students that a significant amount of class time in the coming weeks will be dedicated to developing the following construction trade skills for the wall-building project. Also explain to students that for some of the skills they will mentor one another as mentoring is an important part of a tradesperson's life.

Mentoring Skills Block
- Driving nails
- Driving screws
- Boring
- Joining pipe

Teacher-Led Skills Block
- Using layout tools
- Using a knife
- Sawing
- Using a chisel

Briefly describe each of the eight skill-building lessons and stress how important it is for students to develop some proficiency in each skill.

Project:

Teacher Demonstrations

Begin the skill-building lesson by briefly describing the parts of a claw hammer:

- Face
- Head
- Cheek
- Claw
- Handle

Also identify the different types of nails and the situations in which they are used.

Demonstrate the proper stance and body positioning required for driving and removing nails with a claw hammer:

- Drive five $3\frac{1}{2}$" common spikes into solid stock resting on a workbench.
- Remove each of the common spikes.

During these demonstrations, discuss the physics of work. Explain that the body provides a mechanical advantage that is critical for driving nails quickly and efficiently. Use analogies from sports and the everyday world to further explain what is meant by mechanical advantage. Here are some possible examples to consider:

- Kicking a soccer ball
- Swinging a golf club
- Using a shovel
- Typing at a computer

Discuss and demonstrate the proper stance and body positioning required for other basic hammering positions:

- Secure a piece of pine or spruce to a beam positioned against a wall by driving five $2\frac{1}{2}$" common nails.
- Fasten a piece of 1' × 4' stock (maximum 16" long) to the bottom of an overhead beam by driving six $2\frac{1}{2}$" common nails (beam must be properly supported by staging).
- Remove the wood and nails that have been secured and fastened.

During these demonstrations, discuss the extra strength required when driving and removing nails into a wall or overhead. Explain why there is not as big a mechanical advantage to be gained in these hammering positions.

Student Practice Sessions

Students can be divided into groups of two or four to practice each of the five hammering tasks that has been demonstrated.

Observe each group and provide whatever feedback or encouragement is required for students to improve their performance driving nails.

Project 29: Driving Screws

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
At the beginning of Skilled Trades 10, teachers should inform students that they will be taking part in a professional building project later in the term. Students should be given a brief overview of the project, which involves building, wiring, installing plumbing, and hanging drywall for a 90" × 41" section of wall.
Explain to students that a significant amount of class time in the coming weeks will be dedicated to developing the following construction trade skills for the wall-building project. Also explain to students that for some of the skills they will mentor one another as mentoring is an important part of a tradesperson's life.

Mentoring Skills Block
- Driving nails
- Driving screws
- Boring
- Joining pipe

Teacher-Led Skills Block
- Using layout tools
- Using a knife
- Sawing
- Using a chisel

Briefly describe each of the eight skill-building lessons and stress how important it is for students to develop some proficiency in each skill.

Project:

Teacher Demonstrations

Begin the skill-building lesson by showing students the following screwdrivers and the types of screw heads that they are designed to drive:

- $\frac{5}{16}$" Slotted
- #2 Phillips
- #8 Robertson
- #10 Robertson

Explain that the slot screw driver was originally the only screwdriver available, until the Phillips screw driver was developed in the United States and then the Robertson screw driver was developed in Canada.

Identify the screwdriver's three sections:

- Handle
- Shank
- Blade

Also identify the different types of screws and the situations in which they are used. Hand out a number of different packages of screws that have heads corresponding to the four screwdrivers that have just been introduced. Explain to students how to read the package labels. They should note the following information:

- Dimensions
- Type of screw
- Material from which the screws are made

Basic Demonstration

Demonstrate the importance of choosing the proper screwdriver for the job as well as the proper stance and body positioning for using a screwdriver. Without creating a pilot hole, use each of the following screwdrivers to drive a screw into a soft piece of wood resting on a bench:

- Slotted
- #2 Phillips
- #8 Robertson
- #10 Robertson

During the demonstration, explain how important it is for the blade of the screwdriver to fit snugly into the head of the screw and not be too tight, too loose, too long, or too short. Describe the mechanical advantages provided by using different types and sizes of screwdrivers (slotted, Robertson, big, and small). For instance, explain how the Robertson screwdriver's square blade generates high torque power when used with matching square head screws.

Pilot Hole Demonstration

Demonstrate the advantage that drilling a pilot hole provides by repeating the demonstration above using pilot holes.

Explain that pilot holes keep the wood from splitting and are especially useful when doing woodworking.

Hardwood Demonstration

Repeat the demonstration above using a piece of hardwood. Point out how much more difficult it is to drive screws into hardwood than it is to drive screws into softwood.

Demonstration of Other Driving Positions

Discuss and demonstrate the proper stance and body positions required when using a screwdriver to perform the following tasks:

- Secure a piece of wood to a beam positioned against a wall.
- Fasten a piece of wood to an overhead beam.

Student Practice Sessions

Students can be divided into groups of two or four to practice each of the five screw-driving tasks that has been demonstrated.

Observe each group and provide whatever feedback or encouragement is required for students to improve their performance driving screws.

Project 30: Boring (Brace and Bit)

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
At the beginning of Skilled Trades 10, inform students that they will be taking part in a professional building project later in the term. Students should be given a brief overview of the project, which involves building, wiring, installing plumbing, and hanging drywall for a 90" × 41" section of wall. Explain to students that a significant amount of class time in the coming weeks will be dedicated to developing the following construction trade skills for the wall-building project. Also explain to students that for some of the skills they will mentor one another as mentoring is an important part of a tradesperson's life.

Mentoring Skills Block
- Driving nails
- Driving screws
- Boring
- Joining pipe

Teacher-Led Skills Block
- Using layout tools
- Using a knife
- Sawing
- Using a chisel

Briefly describe each of the eight skill-building lessons and stress how important it is for students to develop some proficiency in each skill.

Project:

Teacher Demonstrations

Begin the skill-building lesson by introducing students to the brace and bit. Demonstrate the proper stance, body positioning, and procedures required to use a brace and bit. Use a ship auger to demonstrate the following tasks:

- Drill a $\frac{13}{16}$" hole into a piece of solid spruce stock resting on a workbench.
- Drill a $\frac{5}{8}$" hole into a piece of solid pine or spruce stock that is positioned against a wall.
- Drill a $\frac{1}{4}$" hole with a bit into a piece of solid pine stock that is positioned overhead.

During these demonstrations, explain the wide range of bit sizes and augers that are available. Also discuss boring into different kinds of woods and stress the importance of drilling holes straight and true, and of always using sharp bits.

Student Practice Sessions

Session #1

Students can be divided into groups of two or four to practise each of the three boring tasks that has been demonstrated.

Observe each group and provide whatever feedback or encouragement is required for students to improve their performance drilling holes.

Session # 2

Teacher draws a specific layout for students to follow.

Ask students to cut a piece of pine or spruce stock to dimensions specified by the teacher.

After students have cut their piece of stock, ask them to measure, lay out, and drill each of the required holes using a brace and bit.

Project 31: Joining Pipe

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
At the beginning of Skilled Trades 10, inform students that they will be taking part in a professional building project later in the term. Students should be given a brief overview of the project, which involves building, wiring, installing plumbing, and hanging drywall for a 90" × 41" section of wall. Explain to students that a significant amount of class time in the coming weeks will be dedicated to developing the following construction trade skills for the wall-building project. Also explain to students that for some of the skills they will mentor one another as mentoring is an important part of a tradesperson's life.

Mentoring Skills Block
- Driving nails
- Driving screws
- Boring
- Joining pipe

Teacher-Led Skills Block
- Using layout tools
- Using a knife
- Sawing
- Using a chisel

Briefly describe each of the eight skill-building lessons and stress how important it is for students to develop some proficiency in each skill.

Project:

Teacher Demonstrations

Before this skill-building lesson, distribute enough pipe along with the elbows and couplings necessary for cutting and joining together a rectangular frame. The first version should be constructed with ABS piping, the second with copper piping, and the third with iron piping.
Teacher to provide a specification drawing and materials list.
Hold up two pieces of ABS pipe. Demonstrate the basic steps required to cut and join the pipe together. Repeat the demonstration using copper pipe and then iron pipe.

Student Practice Sessions

Divide students into groups of two and distribute the required pipe, couplings, and elbows.
Ask students to construct three frames: one made of ABS pipe, one made of copper pipe, and one made of iron pipe. The frames should be level when laid on a table. Emphasize that the frames will not be totally level unless the pieces that need to be cut are measured to the exact specifications required in the drawing.

Project 32: Using Layout Tools

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
At the beginning of Skilled Trades 10, inform students that they will be taking part in a professional building project later in the term. Students should be given a brief overview of the project, which involves building, wiring, installing plumbing, and hanging drywall for a 90" × 41" section of wall. Explain to students that a significant amount of class time in the coming weeks will be dedicated to developing the following construction trade skills for the wall-building project. Also explain to students that for some of the skills they will mentor one another as mentoring is an important part of a tradesperson's life.

Mentoring Skills Block
- Driving nails
- Driving screws
- Boring
- Joining pipe

Teacher-Led Skills Block
- Using layout tools
- Using a knife
- Sawing
- Using a chisel

Briefly describe each of the eight skill-building lessons and stress how important it is for students to develop some proficiency in each skill.

Project:

Teacher Demonstrations

Begin the skill-building lesson by introducing and demonstrating how to use the following layout tools:

- Tape measure
- Framing square
- Speed square
- 24" level

Explain how critical layout tools are for making accurate cuts and holes with saws and boring tools.
Demonstrate how to use a framing square to perform the following tasks:

- Produce a 90° angle on a piece of 2' × 4' or 2' × 6' stock.
- Produce a 45° angle on a piece of 2' × 4' or 2' × 6' stock with a framing square.

Demonstrate how to use a speed square to produce a 90° angle on a piece of 2' × 4' or 2' × 6' stock with a speed square.
Discuss the importance of plumb and level.
Demonstrate how to use a 24" level:

- Check the tool for level.
- Check the tool for plumb.
- Produce a 20" level line within a designated area.
- Produce a second 20" parallel line 8" from the 20" level line.
- Produce a 20" plumb line within a designated area.
- Produce a second 20" parallel line 8" from the 20" plumb line.

Student Practice Sessions

Students can be divided into groups of two or four to practise each of the nine layout tasks that have been demonstrated.
Observe each group and provide whatever feedback or encouragement is required for students to improve their performance using the framing square, speed square, and 24" level.

Project 33: Using a Knife

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
At the beginning of Skilled Trades 10, inform students that they will be taking part in a professional building project later in the term. Students should be given a brief overview of the project, which involves building, wiring, installing plumbing, and hanging drywall for a 90" × 41" section of wall. Explain to students that a significant amount of class time in the coming weeks will be dedicated to developing the following construction trade skills for the wall-building project. Also explain to students that for some of the skills they will mentor each other as mentoring is an important part of a tradesperson's life.

Mentoring Skills Block
- Driving nails
- Driving screws
- Boring
- Joining pipe

Teacher-Led Skills Block
- Using layout tools
- Using a knife
- Sawing
- Using a chisel

Briefly describe each of the eight skill-building lessons and stress how important it is for students to develop some proficiency in each skill.

Project:

Teachers should introduce the class to various types of knives. Of particular interest are the straight blade knife, utility knife, and folding jackknife. A straight blade knife can be used to demonstrate the various components:

- Tip/point
- Edge
- Heel
- Spine
- Bolster
- Tang
- Scales
- Rivets
- Butt

See sharpeningsupplies.com/knife_parts.aspx for diagram and supporting materials.

Teachers should stress the importance of safety when using any knife. The teacher should demonstrate proper use, storage, and handling of knives. Some of the major safe practices are as follows:

- Cut away from your body or from another person.
- Cut on a firm, secure surface.
- Use the right tool for the job. Knives are not screwdrivers or pry bars.
- Keep knives sharpened. Sharp blades are safe blades.
- Keep your fingers away from the arc of the blade when opening or closing a knife.

The teacher should make sure to review school policies on students carrying knives.

Teachers should demonstrate the proper use of a knife. Some possible ways to do this are to strip a wire of insulation, cut a piece of plastic sheet, and trim a piece of wood.

Students should be given an opportunity to handle and use a knife

Project 34: Sawing

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
At the beginning of Skilled Trades 10, inform students that they will be taking part in a professional building project later in the term. Students should be given a brief overview of the project, which involves building, wiring, installing plumbing, and hanging drywall for a 90" × 41" section of wall. Explain to students that a significant amount of class time in the coming weeks will be dedicated to developing the following construction trade skills for the wall-building project. Also explain to students that for some of the skills they will mentor one another as mentoring is an important part of a tradesperson's life.

Mentoring Skills Block
- Driving nails
- Driving screws
- Boring
- Joining pipe

Teacher-Led Skills Block
- Using layout tools
- Using a knife
- Sawing
- Using a chisel

Briefly describe each of the eight skill-building lessons and stress how important it is for students to develop some proficiency in each skill.

Project:

Teacher Demonstrations

Begin the skill-building lesson by introducing students to the crosscut saw and the ripsaw. Name the three parts for each of these saws:

- Handle
- Blade
- Teeth

Explain that saws are classified by the number, shape, size, slant, and direction of the teeth.

Crosscut Saw Demonstration

Demonstrate the proper stance, body positioning, and procedures required to use a crosscut saw with eight points to the inch:

- Take up an 8' piece of strapping.
- Using a framing square, mark the piece of strapping with a cut line.
- Make a cut.

Hold up one of the pieces of wood that has been cut and describe to students what it means to make cuts that are true and square.

Explain that a crosscut saw is designed to cut across the grain, not along the grain.

Ripsaw Demonstration

Demonstrate the ineffectiveness of using a crosscut saw to cut along the grain by attempting to cut the demonstration piece of strapping along the grain. Explain that the ripsaw is the saw of choice when you need to cut along the grain. Make a demonstration cut in the piece of strapping.

Hold up one of the pieces of wood that has been cut, and describe to students what it means to make cuts that are true and square.

Student Practice Sessions

Session #1

Students can be divided into groups of two or four to practice each of the tasks that have been demonstrated. Observe each group and provide whatever feedback or encouragement is required for students to improve their performance using crosscut saws and ripsaws.

Session # 2

Allow students to experience the differences involved in cutting harder and softer woods. Give individual students a piece of pine and a piece of spruce and ask them to make a true and square cut in each piece of wood.

Session #3

Give individual students an 8' piece of strapping and a crosscut saw with eight points to the inch. Ask them to perform the following tasks:

- Cut five pieces that are all an identical length of $14\frac{1}{4}$".
- Cut five smaller pieces that are 12", $10\frac{3}{4}$", $9\frac{1}{4}$", $6\frac{1}{2}$", and 5" in length (or whatever lengths you choose).

Observe students as they are measuring and making their cuts and provide whatever feedback or encouragement is required. Challenge students to strive to make their cuts true and square.

Session #4

Build a measuring station with a 4' × 8' frame of spruce strapping, backed with a piece of birch plywood $\frac{3}{4}$" thick. Map out the measurements for 48 pieces of wood that can be assembled to fill the measuring station's frame exactly.

Ask students to work together as a class to measure and cut 48 pieces of wood to the nearest $\frac{1}{16}$" so that the pieces exactly fill the measuring station's frame. When completed, the measuring frame should have 16 rows with three 1" × 3" pieces of wood in every row.

To manage this group project, follow the steps below:

1. Assign each of the 16 students in the class one of the measuring station's 16 rows and ask the student to cut the piece that will be placed in the left-hand side of the frame.
2. Reassign the rows and ask students to cut the piece that will be placed in the right-hand side of the frame.
3. Reassign the rows again and ask students to cut the piece that will be placed in the centre of each row. Students will be challenged to make exact measurements for the centre gap and to make a true and square cut that will allow their piece to fit.

Project 35: Using a Chisel

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
At the beginning of Skilled Trades 10, inform students that they will be taking part in a professional building project later in the term. Students should be given a brief overview of the project, which involves building, wiring, installing plumbing, and hanging drywall for a 90" × 41" section of wall. Explain to students that a significant amount of class time in the coming weeks will be dedicated to developing the following construction trade skills for the wall-building project. Also explain to your students that for some of the skills they will mentor one another as mentoring is an important part of a tradesperson's life.

Mentoring Skills Block
- Driving nails
- Driving screws
- Boring
- Joining pipe

Teacher-Led Skills Block
- Using layout tools
- Using a knife
- Sawing
- Using a chisel

Briefly describe each of the eight skill-building lessons and stress how important it is for students to develop some proficiency in each skill.

Project:

Teacher Demonstrations

Begin the skill-building lesson by identifying the three parts of a chisel:

- Head
- Bevel
- Blade

Demonstrate the proper stance, body positioning, and procedures required to use a chisel by letting in a piece of strapping:

1. Take up a piece of strapping.
2. Measure and lay out the cuts for a gain.
3. Make the cuts.
4. Knock the stock out with a hammer.
5. Clean the gain with a chisel.

Student Practice Sessions

Provide the class with two twelve-foot 2' × 4's for rails and two eight-foot 2' × 3's. Ask students to construct a ladder, using the twelve-foot pieces of wood for rails and the eight-foot pieces for rungs. The ladder needs to have eight rungs, so 16 gains need to be measured and chiseled out (one by each student).

Students take each of the two 12' rails for the ladder and measure and layout eight gains where the rungs need to be let in and secured. Each student uses his or her chisel to make one of the 16 required gains to complete the ladder.

Students then make the necessary measurements and cuts required to produce the ladder's eight rungs and work together to assemble the finished ladder.

Project 36: Holding an In-Class Skills Rodeo

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Tools and Materials of the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
To provide additional incentive for students to build their skills, plan to hold a skills rodeo competition after the skill-building lessons are completed. Describe the skills rodeo to students on the first day of the skill-building lessons.

Project:
The Skills Rodeo comprises eight events, one for each of the skill-building lessons. It works as follows. Students are divided into four teams, with four members on each team. Each team member will compete in only two of the eight skills competitions. This means that each team needs to determine the relative strengths of their members and decide who will compete in which events.
For each event, students are given a basic drawing (full-scale or, for an additional degree of difficulty, scaled). Students use the drawing to lay out the precise spots on a piece of stock where nails and screws will be driven, cuts sawed, and holes drilled. Students must then choose the appropriate tool and proceed quickly and efficiently to complete the assigned tasks. As with many competitions, the goal is to complete each task in the shortest amount of time. However, finishing a task first does not necessarily guarantee that a student will win, as the following two factors also need to be taken into account:
- How closely the locations of nails, screws, cuts and holes match specifications from the drawing
- Overall quality of the work (nails, screws, cuts, and holes should be straight and true)

Additional penalty time should be added to student completion times if the nails, screws, cuts, and holes have been placed inaccurately or are not straight and true.
After all of the events have been completed, the times that individual team members registered in each of the eight events are added together to provide a cumulative completion time. The team with the shortest cumulative completion time for the eight events is declared the winner of the skills rodeo.
Teachers may want to approach some tool manufacturers and ask them to donate first-, second-, and third-place prizes for the competing teams. The fourth-place team should also be awarded a small prize, as it is important that the skills rodeo provide a positive experience for everyone.

Project 37: Introducing the Wall-Building Project (Capstone Project)

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:

- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance
- Measurement and Calculation for the Skilled Trades
- Employability Skills
- Skilled Trades Living

Background:
The Capstone Project for Skilled Trades 10 provides a challenging opportunity for students to demonstrate everything that they have learned throughout the entire course. It is meant to be their crowning achievement and a tangible expression of the skills and knowledge they have gained. Completing the Capstone Project immerses students in some of the day-to-day realities that journeypersons face. By confronting these realities, students get a real sense of what it feels like to work in the trades and develop the confidence, patience, discipline, and personal maturity required to tackle even bigger trades projects in grade 11, grade 12, and beyond.

Project:
See the detailed step-by-step instructions for completing this project below.

The "Wall" Capstone

For this Capstone Project students will work to frame, wire, install plumbing, and hang drywall for a 4' × 6' section of wall. This particular project has been specifically designed for the construction trades. It is one capstone project among many that can be used for the same purpose.

The procedures for this project are as follows:

- The teacher constructs an exemplar of the wall.
  - The following tools are used: hand saw, keyhole saw, chisel, brace, appropriate-sized augur, #1 and #2 Robertson screwdrivers, and, for the first time, 90° $\frac{1}{2}$" power drill and $\frac{3}{8}$" drywall screw gun.
  - The studs, plate, shoe, and blocking are 2" × 6" and the diagonal brace is 1" × 3".
  - The blocking is placed between the studs to secure the octagon boxes. The blocking should be positioned so that the boxes are flush with the gyprock.
  - The holes for the copper pipe should be positioned so that the pipe is no closer than $\frac{3}{4}$" from the face of the 2" × 6".
  - The 2" × 6"stock should be chiseled out so that the diagonal brace is flush.
- The wall is shown to students, who then draw scale drawings of it.
- The wall is withdrawn. The students then construct the wall from their scale drawing.

How the wall project meets the criteria is indicated in the following table. It shows each project element and how it meets each criterion.

Project Element	Criterion	Applicability to Wall-Building Project
1	Must be rigorous and comprehensive, and involve skills and activities directly connected to the specific curriculum outcomes (SCOs) for Skilled Trades 10.	Students completing the wall-building project are immersed in some of the day-to-day realities of carpenters, plumbers, construction electricians, and lathers. Completing the project requires detailed knowledge of health and safety practices, an extensive use of measurement and calculation, and a standard set of building materials used for framing, wiring, and installing plumbing in buildings and houses. As a result, the project covers all of the specific curriculum outcomes for Skilled Trades 10.
2	Must involve real industry tasks and challenges.	Framing walls, installing wiring and plumbing, and hanging drywall are authentic construction trades tasks that require basic tools and standard materials used within the construction trades.

Project Element	Criterion	Applicability to Wall-Building Project
3	Must involve common tasks performed within at least three designated trades.	Tasks associated with four trades are featured in this project: carpenter, plumber, construction electrician, and lather.
4	Must take 30–50 hours of class time to complete.	Framing, wiring, installing plumbing, and hanging drywall to complete the 4' × 6' section of wall takes most students 40–50 hours of class time.
5	Must be approved by a certified journeyperson from one of the project's trades.	The wall-building project was developed by a project team that included certified journeypersons from the following trades: carpenter, plumber, and construction electrician.
6	Must involve a drawing, a set of drawings, a recipe, a schematic diagram, or a blueprint that includes precise measurements and tolerances against which student performance can be assessed.	To complete the wall-building project, students are required to create a complete scale drawing for the wall based upon a model built by their teacher. This drawing is used to complete construction of the wall and a part of student assessment.
7	Must push students beyond their comfort zones.	While some students had worked on construction sites before, none had ever been responsible for planning and completing a project involving tasks from four trades in just 30–50 hours. Students have to be extremely focused and work exceptionally hard to meet the project's requirements and timeline.
8	Must be able to be completed within the current budget for capstone projects.	Every Skilled Trades 10 class has a budget for completing up to eight 4' × 6' wall sections.
9	Must be achievable with tools and materials that are readily available and affordable.	To complete this project, students need only the basic set of hand tools used by most carpenters and a few tools and materials used by plumbers, construction electricians, and lathers.
10	Must provide sufficient work for teams of at least two students.	The wall-building project can keep a team of two students busy for 30–50 hours of class time.
11	Must be safe for students to complete mostly by themselves with minimal assistance.	Because the project does not involve power tools, and students are working in teams of two on a reasonably small scale (walls are only 4' × 6'), it can safely be completed with minimal assistance by most students who have basic safety training and a few hours of practise with the basic tools and construction techniques required.

Project Element	Criterion	Applicability to Wall-Building Project
12	Must sufficiently prepare students to meet the demands of the grade 11 sector courses.	Students completing the Skilled Trades 10 project are very well equipped to build a much larger structure in Construction Trades 11. All of the basic framing, plumbing, electrical, and drywall techniques learned in Skilled Trades 10 are put to use again in Construction Trades 11. The Skilled Trades 10 project also prepares students for working in teams and for performing to tight timelines.

Project 38: Distinguishing between Construction-Grade and Consumer-Grade Tools

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Area of Learning:
- Tools and Materials of the Skilled Trades

Background:
This hands-on experience enables students to directly experience the difference between professional and consumer quality tools.

Project:
Place an assortment of construction-grade and cheaper consumer-grade hand tools on a table. Each tool should have a number. Ask students to fill out a worksheet identifying which tools they think are construction-grade and which are consumer-grade. See below for an example of such a worksheet.

Tool Identification Worksheet

Tool	Construction Grade	Consumer Grade
Tool #1		
Tool #2		
Tool #3		
Tool #4		
Tool #5		
Tool #6		
Tool #7		
Tool #8		
Tool #9		

Project 39: Introducing and Signing Off on Power Tools

Outcomes:
Students will be expected to
(Teacher-identified outcomes)

Areas of Learning:
- Safety
- Tools and Materials of the Skilled Trades
- Physical Dexterity / Hand-Eye Coordination / Balance

Background:
Students need to be introduced to power tools by the end of Skilled Trades 10 as they are an important part of a skilled tradesperson's professional life that need to be experienced first-hand. Power tools are also used extensively in Construction Trades 11, and students planning to take this course need to be properly prepared.

Project:
Students can demonstrate their knowledge of the basic steps for safe use of the following power tools:
- Skill saw
- Compound mitre saw
- Cordless drill
- Jig saw
- 90% angle drill
- Reciprocating saw
- Grinder
- Table saw

Any of the following activities can be used:
- Listing the safe steps on paper or presenting them to other students in the class
- Summarizing, in writing or orally, operating procedures manuals
- Creating brief instruction manuals
- Doing de-energized demonstrations

There is a sign-off sheet for power tools included in the *Skilled Trades 10 Record of Progress* (Tool Use and Safety Competency) that will need to be completed and signed for every student in the class.

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