



Additional Qualification Course Guideline Technological Studies Teaching Transportation Technology – Small Engine and Recreational Equipment

Schedule F – Teacher’s Qualification Regulation
February 2021



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Additional Qualification Course Guideline Small Engine and Recreational Equipment

1. Introduction

The Schedule F Teaching Transportation Technology - Small Engine and Recreational Equipment additional qualification course guideline provides a conceptual framework (Figure 1) for providers and instructors to develop and facilitate the Schedule F Teaching Transportation Technology - Small Engine and Recreational Equipment course. This guideline framework is intended to be a fluid, holistic and integrated representation of key concepts associated with Teaching Transportation Technology - Small Engine and Recreational Equipment.

The additional qualification (AQ) guideline Teaching Transportation Technology - Small Engine and Recreational Equipment is organized using the following conceptual framework,

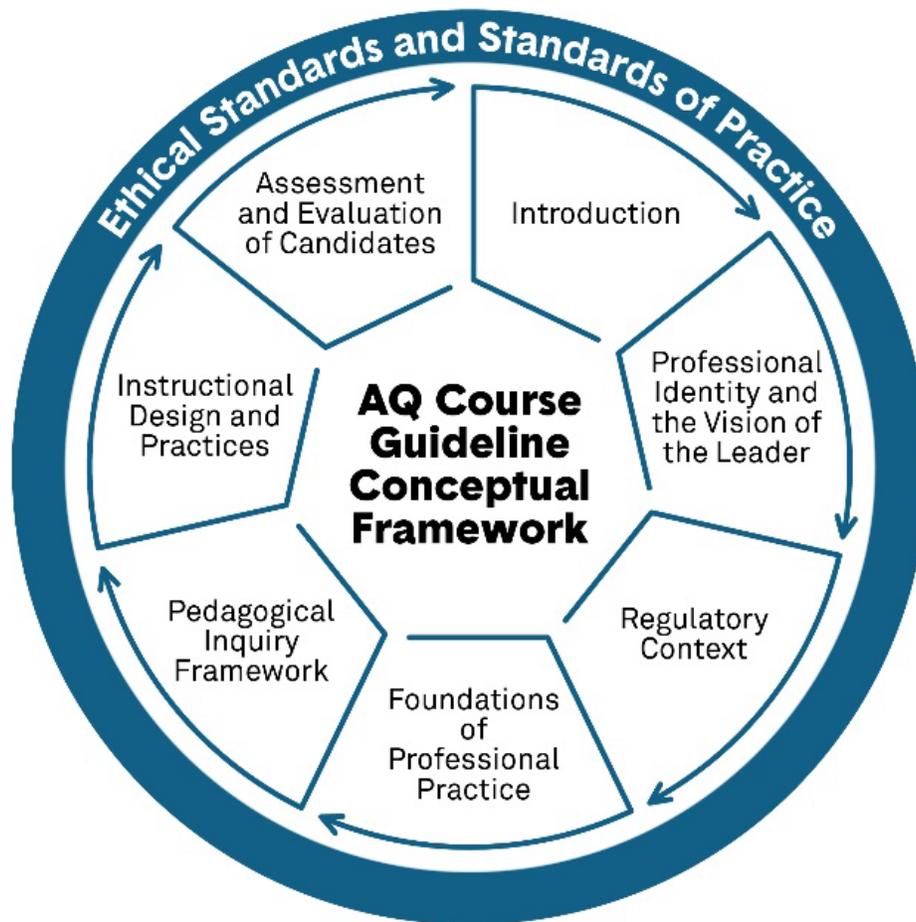


Figure 1: Conceptual Framework

Teachers are able to take the Additional Qualification course: Teaching Transportation Technology - Small Engine and Recreational Equipment if they hold a technological education qualification at Grades 9 and 10 or Grades 11 and 12 in the Broad-Based area of Teaching Transportation Technology.

The Additional Qualification Course: Teaching Transportation Technology - Small Engine and Recreational Equipment employs a critical, pedagogical lens to explore in a holistic and integrated manner theoretical foundations, learning theory, program planning, development and implementation, instructional design and practices, assessment and evaluation, the learning environment, research and ethical considerations related to teaching and learning across the divisions. Through these explorations, candidates

strengthen professional efficacy by gaining in-depth knowledge, refining professional judgment and generating new knowledge for practice.

Teachers qualified in Teaching Transportation Technology - Small Engine and Recreational Equipment facilitate active inquiry-based learning by combining knowledge of student development and learning with knowledge and understanding of subject matter, pedagogy and technological expertise. Successful candidates of this AQ will demonstrate technical proficiency in each of the technologies identified in *Part 8, Demonstrated Competence* in Teaching Transportation Technology - Small Engine and Recreational Equipment.

AQ Course Implementation

Course providers, instructors and developers will use this AQ guideline framework to inform the emphasis given to key guideline concepts in response to candidates' diverse professional contexts, knowledge, skills and understandings.

Critical to the holistic implementation of this course is the modeling of a positive learning environment that reflects care, diversity and equity. This course supports the enhancement of professional knowledge, ethical practice, leadership and ongoing professional learning.

The Ontario College of Teachers recognizes that candidates working in the publicly funded school system, independent/private institutions or First Nations schools will have a need to explore topics and issues of particular relevance to the context in which they work or may work.

Provincial Context

The French language and the English language communities will also need to implement these guidelines to reflect the unique contextual dimensions and needs of each community. Each of these language communities will explore the guideline content from distinct perspectives and areas of emphasis. This flexibility will enable both language communities to implement Teaching Transportation Technology - Small Engine and Recreational Equipment as understood from a variety of contexts.

In this document, all references to “candidates” are to teachers enrolled in the Additional Qualification course. References to “students” indicate those enrolled in school programs.

2. Professional Identity and the Image of the Learner

The professional identity of the AQ course instructor and course candidates conveyed in this AQ course guideline reflects the vision of the educator articulated in the *Ethical Standards for the Teaching Profession*, the *Standards of Practice for the Teaching Profession* and the *Professional Learning Framework*.

This vision of the educator (Figure 2) positions professional educators as innovative scholars and practitioners, critical pedagogues who forward social and ecological justice, as well as:

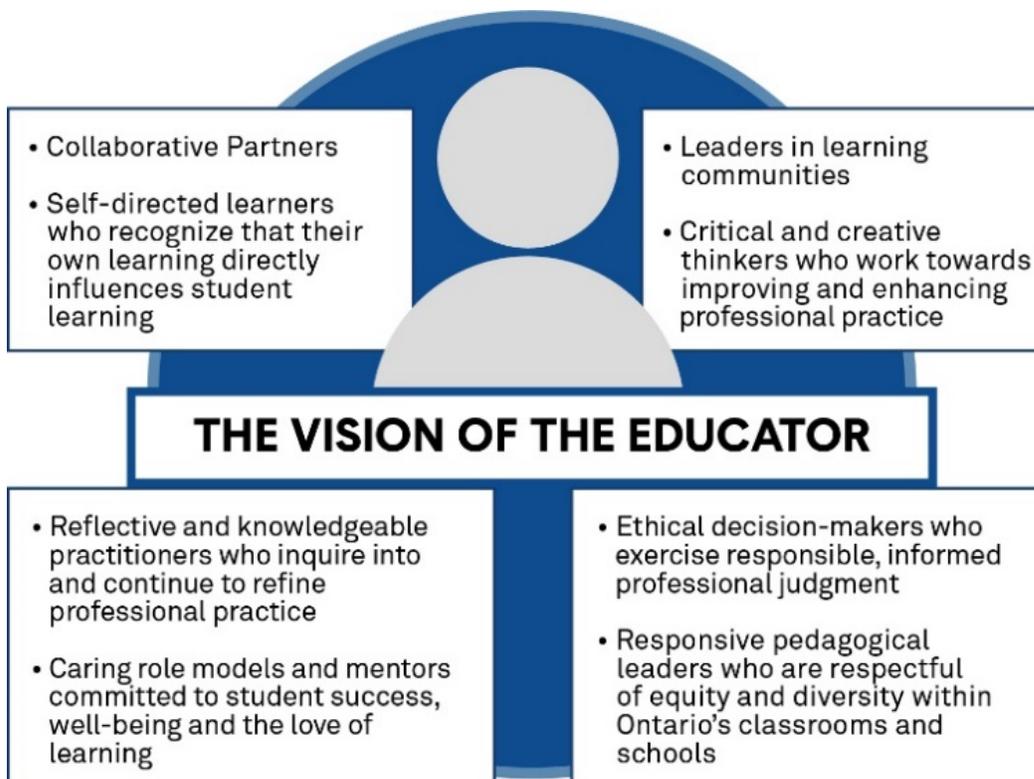


Figure 2: Image of the Educator¹

¹ Note. From "The Foundations of Professional Practice," by Ontario College of Teachers, 2012, p. 17. Copyright 2012 by Ontario College of Teachers. Reprinted with permission.

The image of the student conveyed in this AQ (Figure 3) is of a learner who is empowered, independent, a democratic citizen, knowledgeable, creative, collaborative, a critical thinker, ethical, reflective, accepting, inclusive, courageous, self-assured, a problem-solver, and whose voice and sense of efficacy are integral to shaping the teaching and learning process.

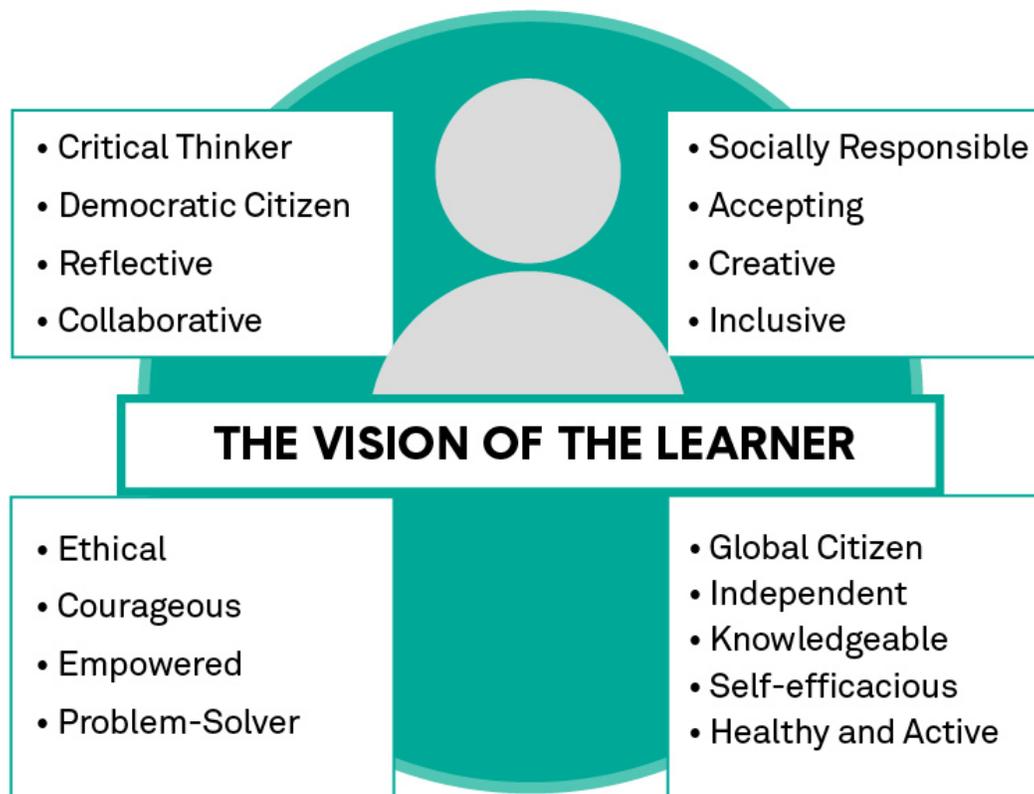


Figure 3: Image of the Learner

3. Regulatory Context

The College is the self-regulating body for the teaching profession in Ontario. The College's responsibility related to courses leading to additional qualifications includes the following:

- to establish and enforce professional standards and ethical standards applicable to members of the College
- to provide for the ongoing education of members of the College
- to accredit additional qualification courses and more specifically,

The program content and expected achievement of persons enrolled in the program match the skills and knowledge reflected in the College's Standards of Practice for the Teaching Profession and the Ethical Standards for the Teaching Profession and in the program guidelines issued by the College. (Regulation 347/02, Accreditation of Teacher Education Programs, Part IV, Subsection 24).

Additional qualifications for teachers are identified in the *Teachers' Qualifications Regulation* (Regulation 176/10). This regulation includes courses that lead to Additional Qualifications, the Principals' Development Qualification, the Principal's Qualifications, the Primary Division, the Junior Division and the Supervisory Officer's Qualifications. A session of a course leading to an additional qualification shall consist of a minimum of 125 hours as approved by the Registrar. Accredited additional qualification courses reflect the *Ethical Standards for the Teaching Profession*, the *Standards of Practice for the Teaching Profession* and the *Professional Learning Framework for the Teaching Profession*.

The AQ course developed from this guideline is open to candidates who meet the entry requirements identified in the *Teachers' Qualifications Regulation*.

Successful completion of Additional Qualification: Teaching Transportation Technology - Small Engine and Recreational Equipment, listed in Schedule F of the *Teachers' Qualifications Regulation*, is recorded on the Certificate of Qualification and Registration.

4. Foundations of Professional Practice

The *Foundations of Professional Practice* conveys a provincial vision of what it means to be a teacher in Ontario. This vision lies at the core of teacher professionalism. The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* (Appendix 1) are the foundation for the development and implementation of the Additional Qualification course. These nine standards, as principles of professional practice, provide the focus for ongoing professional learning in the Additional Qualification Course: Teaching Transportation Technology - Small Engine and Recreational Equipment. In addition, the *Professional Learning Framework for the Teaching Profession* is underpinned by the standards, articulates the principles on which effective teacher learning is based and acknowledges a range of options that promote continuous professional learning.

The ongoing enhancement of informed professional judgment, which is acquired through the processes of lived experience, inquiry and critical reflection, is central to the embodiment of the standards and the *Professional Learning Framework* within this AQ course and professional practice.

The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* serve as guiding frameworks that underpin professional knowledge, skills and experiences that teachers require in order to teach effectively within and contribute to an environment that fosters *respect, care, trust and integrity*.

Teacher Education Resources

The College has developed resources to support the effective integration of the standards within Additional Qualification courses. These teacher education resources explore the integration of the standards within professional practice through a variety of educative, research and inquiry-based processes. These resources can be found on the [College web site](#).

These teacher education resources support the development of professional knowledge, judgment and efficacy through critical reflective praxis. The lived experiences of Ontario educators are illuminated in these teacher education resources and serve as key supports for AQ courses.

5. Pedagogical Inquiry Framework

The pedagogical inquiry framework (Figure 4) for Teaching Transportation Technology - Small Engine and Recreational Equipment supports a holistic, integrated, experiential and inquiry-based AQ course. This pedagogical inquiry framework supports the professional knowledge, judgment, critical pedagogies and practices of course candidates.

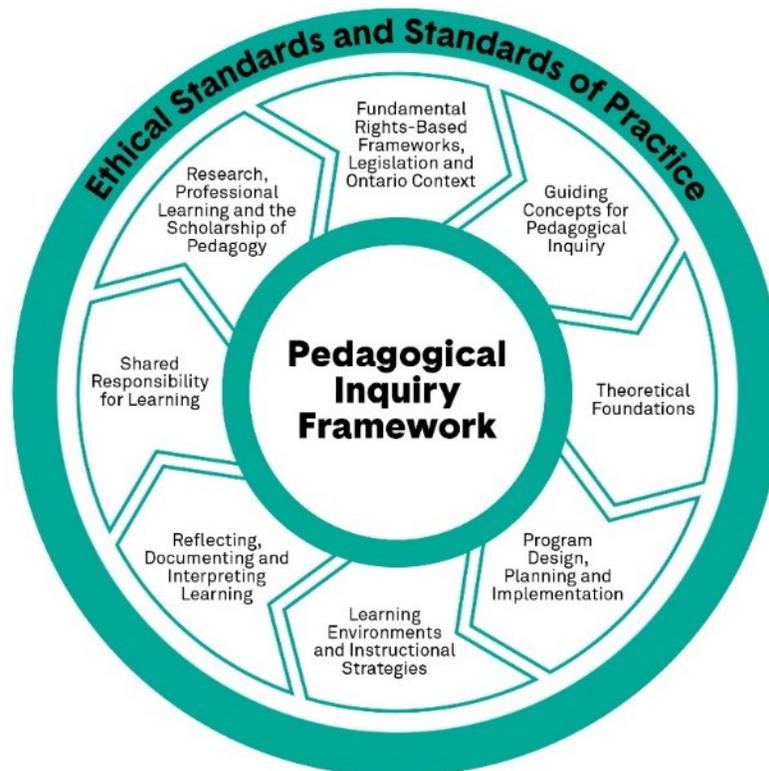


Figure 4: Pedagogical Inquiry Framework for Teaching Transportation Technology - Small Engine and Recreational Equipment

A. The Ethical Standards for the Teaching Profession and the Standards of Practice for the Teaching Profession:

The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* represent a collective vision of professional practice. At the heart of a strong and effective teaching profession is a commitment to students and their learning. Members of the Ontario College of Teachers, in their position of trust, demonstrate responsibility in their relationships with students, parents, guardians, colleagues, educational partners, other professionals, the environment and the public.

The holistic integration of the standards within all course components supports the embodiment of the collective vision of the teaching profession that guides professional knowledge, learning, and practice. The following principles and concepts support this holistic integration within the AQ course.

- understanding and embodying care, trust, respect and integrity
- fostering commitment to students and student learning
- integrating professional knowledge
- enriching and developing professional practice
- supporting leadership in learning communities
- engaging in ongoing professional learning.

Course candidates will continue to critically inquire into professional practices, pedagogies and ethical cultures through professional dialogue, collaborative reflection and the lenses of the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession*.

B. Guiding Concepts for Pedagogical Inquiry

The following theoretical concepts are provided to facilitate the holistic design and implementation of this AQ course through pedagogical and professional inquiries.

This Additional Qualification course supports critical reflective inquiry and dialogue informed by the following concepts which will be critically explored through holistic and interrelated processes:

- critically exploring assumptions, beliefs and understandings associated with teaching and learning within the context of this AQ
- critically exploring the professional identity and practices associated with the views of teachers as co-inquirers, teacher scholars and teacher researchers working alongside student researchers in the co-creation of democratic, knowledge-rich learning environments
- critically exploring and interpreting Ontario's curriculum, policies, frameworks, strategies and guidelines related to the Broad Based Technology
- collaboratively examining and integrating the meaningful and respectful inclusion of First Nations, Métis and Inuit ways of knowing, cultures, histories and perspectives in teaching and learning processes as valid means to understand the world
- critically exploring multiple ways of knowing and being in community

- applying critical pedagogy as a theoretical foundation for the design, assessment and implementation of practices and/or programs
- critically exploring pedagogical processes and assessment and evaluation practices that link curriculum to student interests, strengths, inquiries, needs, resiliency, well-being and mental health
- critically examining processes, practices and policies to create and sustain holistic learning environments that nurture the identities of students and their intellectual, social, emotional, physical, linguistic, cultural, spiritual and moral development
- engaging and collaborating with school personnel, parents/guardians, caregivers, the community, local business and industry as it relates to Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically exploring engagement processes and practices intended to foster collaboration with students, in-school personnel, parents/guardians and the community to support the learning, identity, resiliency and well-being of the school community
- critically exploring and integrating a variety of resources, including technological and communication resources, to enhance professional knowledge in support of student learning, independence, well-being and agency
- critically exploring professional practice through ongoing collaborative inquiry, dialogue, reflection, innovation and critical pedagogy
- critically examining the ethical principles, ethical knowledge and ethical actions that contribute to collective ethical pedagogy and leadership
- critically exploring and integrating environmentally sustainable practices, policies and pedagogies
- critically examining processes to foster responsible and active environmental stewardship and democratic citizenship
- collaboratively exploring the co-construction of communities of inquiry committed to critical pedagogy, ongoing professional learning and collective professional efficacy
- critically exploring innovative practices for integrating information and communication technology to enhance teaching and learning

- critically examining the processes involved in creating and sustaining safe, healthy, equitable, holistic and inclusive learning environments that honour and respect diversity, facilitate student learning, foster student voice, encourage critical thinking and promote social justice
- critically examining qualitative and quantitative research associated with professional practices, policies and pedagogies in support of student learning, empowerment and agency
- critically exploring and integrating educational processes, practices and policies that support students' well-being, resiliency, efficacy and mental health
- critically exploring and integrating inclusive processes for fostering interprofessional collaboration that support the collaborative development and implementation of Individual Education Plans (IEPs) and Transition Plans for students that include the voices of all those involved
- critically examining processes, practices and policies that contribute to a school and/or system culture of inquiry that promotes openness to innovation, change, culturally inclusive pedagogies and the democratization of knowledge
- critically exploring and integrating emerging technologies that support Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically reflecting on health and safety risks associated with Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically applying knowledge and skills to create and maintain a safe learning environment that addresses program needs: curriculum, material handling, tool handling and equipment storage, supervision, safety standards and practices that are respectful of the environment
- collaboratively exploring and integrating technological literacy related to Teaching Transportation Technology - Small Engine and Recreational Equipment
- designing and managing portfolios as well as developing written technical reports
- critically exploring and integrating mathematical literacy in Teaching Transportation Technology - Small Engine and Recreational Equipment

- collaboratively exploring business management and entrepreneurial practices related to Teaching Transportation Technology - Small Engine and Recreational Equipment
- collaboratively and critically inquiring into practice through reflection, active engagement and innovation
- critically reflecting on the various professional practices and career opportunities associated with Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically exploring and integrating differentiated instruction, universal design and experiential learning to support student growth and development.

C. Ontario Context: Curriculum, Policies, Legislation, Frameworks, Strategies and Resources

The Additional Qualification Course: Teaching Transportation Technology - Small Engine and Recreational Equipment is aligned with current [Ontario curriculum](#), relevant legislation, government policies, frameworks, strategies and resources. These documents inform the design, development and implementation of the Additional Qualification Course: Teaching Transportation Technology - Small Engine and Recreational Equipment.

Course candidates are also encouraged to critically explore the policies, practices and resources available at school and board levels that inform teaching and learning related to Teaching Transportation Technology - Small Engine and Recreational Equipment.

D. Theoretical Foundations of Teaching Transportation Technology - Small Engine and Recreational Equipment

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring various theoretical frameworks underpinning this AQ, the principles fundamental to these frameworks and their practical applications in supporting student learning
- critically exploring and integrating theories of development and identity formation to inform practice and support student well-being, efficacy and agency
- critically exploring the relevance of critical pedagogy and constructivist theories as theoretical foundations for this AQ

- critically exploring current theoretical research, literature and scholarship related to this AQ
- critically exploring the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* as theoretical foundations for teacher professionalism within the Additional Qualification Course: Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically reflecting on teaching practice and engaging in professional dialogue regarding the relationship between theory and practice, as well as between practice and theory
- critically exploring critical pedagogy that is committed to curriculum design using students' inquiry questions, passions and interests
- critically exploring theories of child and adolescent development
- critically exploring Ontario curriculum, resources and government policies, frameworks and strategies related to Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically exploring and integrating learning theories and the individual learning strengths, styles and needs of students
- critically and collaboratively inquiring into the dimensions associated with creating and sustaining safe, inclusive, accepting and engaging learning environments
- critically exploring and integrating holistic and inclusive educational programs that build on learners' abilities and empower them to reach their learning goals
- critically exploring the significance of relevant legislation including the Ontario Human Rights Code, the Canadian Charter of Rights and Freedoms, Safe Schools Act, Accepting Schools Act, Ontarians with Disabilities Act, and the Accessibility for Ontarians with Disabilities Act (AODA) and associated responsibilities of professional practice
- critically exploring teachers' legal obligations and ethical responsibilities according to current provincial legislation and practices
- critically exploring innovative practices for integrating artistic expression to enhance teaching and learning

- critically exploring and integrating problem solving processes, methods and approaches as they relate to Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically exploring and integrating the fundamental technological concepts associated with Teaching Transportation Technology - Small Engine and Recreational Equipment.

E. Program Design, Planning and Implementation

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring and deepening understanding of how the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* can inform a program planning framework
- critically exploring the influence of society's diverse and changing nature on student learning, resiliency and well-being
- critically exploring and deepening understanding of program design, planning, development and implementation strategies and frameworks related to Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically exploring the philosophical underpinnings that strengthen teachers' professional efficacy to support curricular and interdisciplinary integration
- critically exploring various approaches to curricular integration through diverse planning models, content and resource development, pedagogical practices, and the implementation of equitable assessment and evaluation practices
- critically exploring and deepening understanding of differentiated instruction, universal design and the tiered approach in program planning, development and implementation
- critically exploring learning resources that support student learning and engagement (for example, print, visual, digital)
- critically exploring the types of secondary school pathways (including apprenticeship, college, university, workplace) and their relationship to students' post-secondary goals and career opportunities

- critically exploring how students' lived experiences, identities, narratives, development, strengths, inquiries, interests and needs can inform program planning, development and implementation
- critically exploring the integration of culturally inclusive pedagogies within program design, planning and development
- critically exploring strategies that support learners' resiliency, well-being and mental health
- critically exploring planning and instructional processes that honour students' learning styles, strengths and experiences
- critically exploring pedagogical documentation and utilizing a variety of assessment processes to inform program planning, support student learning and foster student engagement
- facilitating shared leadership in the implementation of local and provincial guidelines and policies that support safe and effective learning environments
- critically inspecting and reporting on the learning environment, facilities, equipment needs, resources and state of maintenance and repair for delivering Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically applying the theoretical foundations of Teaching Transportation Technology - Small Engine and Recreational Equipment by incorporating the broad-based pedagogical approach that embeds problem solving and fundamental technological concepts
- fostering leadership and shared responsibility for the safe, ethical and legal use of technology in Teaching Transportation Technology - Small Engine and Recreational Equipment programs.

F. Learning Environments and Instructional Strategies

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring processes for the creation of inclusive and vibrant learning environments that reflect the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession*
- creating and sustaining positive, ethical, equitable, accepting, inclusive, engaging and safe learning environments

- critically exploring processes for engaging all members of the community, supporting dialogue and collegiality and nurturing a sense of belonging
- critically exploring processes for fostering a collaborative community of empowered and engaged learners
- fostering engaging, trusting and inviting learning environments that promote student voice, leadership, critical inquiry and self-regulation
- critically exploring a variety of instructional strategies to support student learning, resiliency and well-being
- cultivating safe, ethical, legal and respectful practices in the use of information and communication technologies to support pedagogical practices
- critically exploring inclusive and innovative learning environments that integrate a variety of instructional strategies to respond the interests and needs of all learners (for example, universal design, experiential learning, differentiated instruction, inquiry and the tiered approach)
- critically exploring processes that engage students as active, democratic and global citizens in supporting environmental, social and economic sustainability
- critically exploring the professional identity, knowledge and leadership practices of educators as described in the *Ethical Standards for the Teaching Profession*, the *Standards of Practice for the Teaching Profession*, the *Professional Learning Framework*, and the *Foundations of Professional Practice*
- exploring methods for consensus-building, participatory democracy and student empowerment at the school and community levels
- fostering shared leadership and responsibility for the safe and effective management of a variety of technical learning environments
- promoting a shared commitment and responsibility towards planning, organizing and implementing effective health, safety, sanitation and environmental standards in the Teaching Transportation Technology - Small Engine and Recreational Equipment facility
- cultivating a culture of shared leadership and responsibility towards facility design and maintenance practices as per industry standards

- fostering a culture of collective understanding and compliance with workplace health and safety legislation and standards related to Teaching Transportation Technology - Small Engine and Recreational Equipment.

G. Reflecting, Documenting and Interpreting Learning

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring fair, equitable, transparent, valid and reliable assessment and evaluation methods that honour the dignity, emotional wellness, identity and development of all students
- critically exploring feedback processes that empower and inspire students to positively reflect on and identify goals for their learning
- fostering an examination of feedback that engages students in the critical analysis and interpretation of the learning process
- critically exploring equitable and inclusive processes for reflecting, documenting and interpreting learning
- critically exploring and integrating assessment, evaluation and reporting practices that align with the principles and processes of Ontario's curriculum, frameworks and policy documents
- critically exploring assessment practices for the following three purposes: to provide feedback to students and to adjust instruction (assessment for learning); to develop students' capacity to be independent, autonomous learners (assessment as learning); to make informed judgements about the quality of student learning (assessment of learning).

H. Shared Responsibility for Learning

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring a variety of effective communication and engagement strategies for authentic collaboration with parents/guardians, school/board personnel and community agencies
- fostering partnerships with parents/guardians that honour and value shared decision-making, advocacy and leadership

- critically and creatively exploring processes to encourage and honour student voice and identity in the learning process through shared decision-making and leadership
- critically exploring strategies and opportunities for professional collaboration that support student learning, resiliency, well-being and leadership
- critically exploring and openly addressing biases, discrimination and systemic barriers in order to support student learning, resiliency, well-being and inclusion
- critically exploring and analyzing positive, inclusive educational and professional cultures in which perspectives are freely-expressed and critically analyzed
- understanding and respecting the importance of shared responsibility and partnership that promote social and ecological justice as conveyed in the *Foundations of Professional Practice*
- critically exploring professional collaboration within interdisciplinary teams to support student learning, resiliency, self-advocacy and transitions
- collaboratively designing strategies for establishing links between the school community, industry and the Teaching Transportation Technology - Small Engine and Recreational Equipment program
- critically exploring and integrating sector-specific learning opportunities in other curriculum areas.

I. Research, Professional Learning and the Scholarship of Pedagogy

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring and reflecting on past, current and evolving practices in Teaching Transportation Technology - Small Engine and Recreational Equipment
- critically exploring professional practice through ongoing inquiry into theory and pedagogy/andragogy
- engaging in transformational professional learning through research, scholarship and leadership

- critically exploring critical pedagogy that integrates research and the scholarship of pedagogy/andragogy into teaching practice
- engaging in research and the scholarship of critical pedagogy/andragogy to advance communities of practice
- critically exploring knowledge-creation and mobilization to enhance professional practice and leadership.

6. Instructional Design and Practices in the Additional Qualification Course: Teaching Transportation Technology - Small Engine and Recreational Equipment

The instructional design and practices (Figure 5) employed in this AQ course reflect adult learning theories, effective andragogical processes and experiential learning methods that promote critical reflection, dialogue and inquiry.

Candidates collaboratively develop with course instructors the specific learning inquiries, learning experiences, holistic integration processes, and forms of assessment and evaluation that will be used throughout the course.

In the implementation of this Additional Qualification course, instructors **facilitate** andragogical processes that are relevant, meaningful and practical to provide candidates with inquiry-based learning experiences related to program design, planning, instruction, pedagogy, integration, and assessment and evaluation. The andragogical processes include but are not limited to: experiential learning, role-play, simulations, journal writing, self-directed projects, independent study, small group interaction, dialogue, action research, inquiry, pedagogical documentation, collaborative learning, narrative, case methodologies and critical reflective praxis.

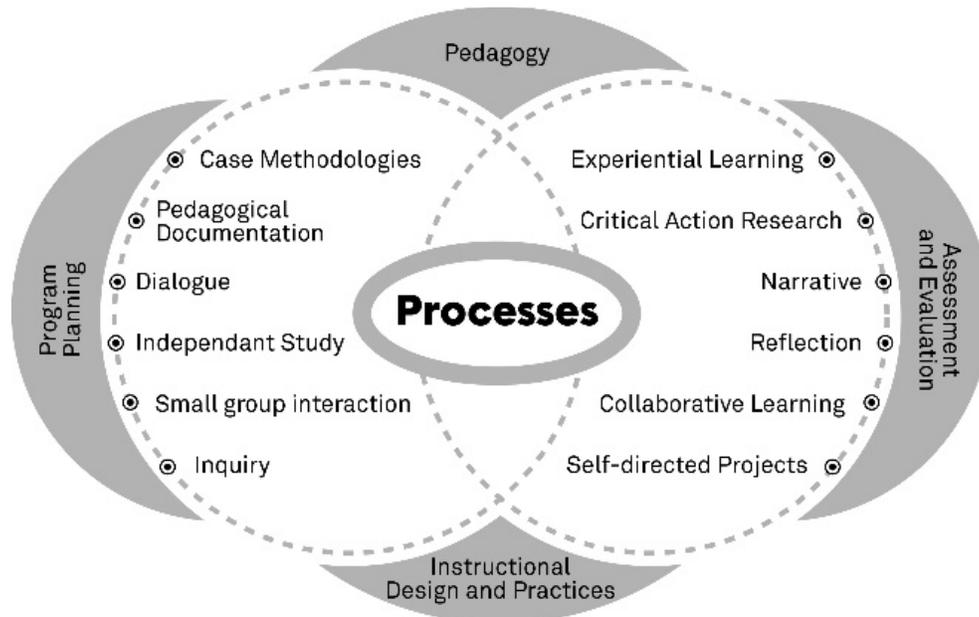


Figure 5: Instructional Processes

Instructors **embody** the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession*, honour the principles of adult learning, respect candidates' experience, recognize prior learning, integrate culturally inclusive practices and respond to individual inquiries, interests and needs. Important to the course are opportunities for candidates to create support networks, receive feedback from colleagues and instructors and share their learning with others. Opportunities for professional reading, reflection, dialogue and expression are also integral parts of the course.

Instructors **model** critical inquiry, universal design and differentiated instruction and assessment practices that can be replicated or adapted in a variety of classroom settings.

Experiential Learning

Candidates will be provided with opportunities to engage in experiential learning related to key concepts and aspects of Teaching Transportation Technology - Small Engine and Recreational Equipment as collaboratively determined by both the instructor and course candidates. The intent of the experiential learning opportunities is to support the application and integration of practice and theory within the authentic context of teaching and learning. Candidates will also engage in critical reflection and analysis of

their engagement in experiential learning opportunities and inquiries related to Teaching Transportation Technology - Small Engine and Recreational Equipment. The professional judgment, knowledge, skills, efficacy and pedagogical practices of candidates will be enhanced and refined through experiential learning and critical inquiry.

The College's standards-based resources help to support experiential learning through various professional inquiry processes. These resources can be found on the [College web site](#).

7. Assessment and Evaluation of Candidates

At the beginning of the course, candidates will collaboratively develop with course instructors the specific learning inquiries, learning experiences, and forms of assessment and evaluation that will be used throughout the course. Instructors will provide opportunities for regular and meaningful feedback regarding candidates' progress throughout the course.

A balanced approach to candidate assessment and evaluation is used. It includes the combination of self, peer and mutual (instructor and candidate) assessment, as well as instructor evaluation. The assessment and evaluation strategies reflect effective, collaborative and inquiry-based practices. A variety of assessment approaches will be used that enable candidates to convey their learning related to course inquiries. The course provides opportunities for both formative and summative assessment and evaluation.

Central to candidates enrolled in Additional Qualification courses is the opportunity to be engaged in relevant and meaningful inquiries. Assignments, artefacts and projects enable candidates to make connections between theory and practice. At the same time, assignments also allow candidates flexibility, choice and the opportunity to design individual inquiry opportunities.

Learning processes support an in-depth exploration of concepts and inquiries. These processes occur over the duration of the course and are reflective of critical thinking and reflection as the candidate gains knowledge and skills over the duration of the course.

The evaluation practices will also support significant and in-depth critical inquiries utilizing a variety of processes over the duration of the course. These inquiry-based assessment processes provide opportunities for candidates to illustrate a depth of professional knowledge, skills, pedagogies, ethical practices and instructional leadership.

A final culminating experience in the course is recommended. This synthesis experience will reflect the in-depth knowledge and understanding gained as a result of engagement in this AQ. It will also include critical reflections and an analysis of a candidate's learning over time.

The following processes are provided to guide assessment practices within this AQ course and are reflective of experiential learning and critical pedagogies. This list is not exhaustive.

- | | |
|--|--|
| <p>a) Pedagogical Leadership: co-constructing, designing and critically assessing culturally inclusive learning opportunities that integrate voice and perspectives, strengths, interests and needs. The learning opportunities will incorporate a variety of technologies and resources and are reflective of Ministry of Education curriculum</p> | <p>various action research approaches</p> |
| <p>b) Pedagogical Documentation: assembling visible records (for example, written notes, photos, videos, audio recordings, artefacts and records of learning) that enable educators, parents, families, caregivers, guardians and learners to discuss, interpret and reflect upon the learning process</p> | <p>e) Case Inquiry: critically reflecting on and inquiring into professional practice through case writing and/or case discussion</p> |
| <p>c) Critical Reflection: critically analyzing educational issues associated with this Additional Qualification utilizing scholarly research through multiple representations (for example, narratives, written documentation and images or graphics)</p> | <p>f) Transition Plan: critically reflecting on and analyzing a transition plan and generating recommendations for enhancement</p> |
| <p>d) Critical Action Research: engaging in individual and/or collaborative action research that is informed by the critical exploration of</p> | <p>g) Narrative Inquiry: collaboratively and critically analyzing narratives of teaching and learning through a number of lenses (for example, professional identity, professional efficacy, ethical leadership and critical pedagogies) utilizing the processes of narrative writing and/or narrative discussion</p> |
| | <p>h) Pedagogical Portfolio: creating a professional portfolio that critically analyzes teaching and learning philosophies, assumptions, practices and pedagogies designed to inform ethical and democratic learning environments</p> |
| | <p>i) Innovative Learning Experience: designing and facilitating an engaging, innovative learning experience that reflects differentiated instruction,</p> |

- universal design and the tiered approach
- j) **Partnership Plan:** designing a comprehensive plan that engages learners, parents, families, caregivers, guardians and the school and local communities in collaborative partnerships that support learning, growth and well-being
 - k) **I.E.P. Development:** collaboratively developing an I.E.P. with parents, families, caregivers, guardians, learners and the school team
 - l) **Visual Narrative:** creating a visual narrative (for **example**, digital story) that helps to support the collective professional identity of the teaching profession and advances professional knowledge and pedagogy.

8. Demonstrated Knowledge and Skill in Teaching Transportation Technology - Small Engine and Recreational Equipment

Successful candidates will be able to demonstrate technical knowledge and skill in the following:

Understanding Engines

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- The principles of the two stroke cycle
- The principles of the four stroke cycle
- The principles of marine engines
- The principles of snowmobile engines
- The principles of chain saws engines
- The principles of ATV engines
- The principles of weed trimmer engines
- The principles of leaf blower engine
- The principles of motorcycle engines
- The principles of snow-blower engines
- The principles of rototiller engines
- The principles of jet-ski engines
- The principles of dirt bike engines.

Be able to recognize and interpret:

- The difference between the two stroke and four stroke cycles as it pertains to Small Engines and Recreational Equipment

for example:

- Marine engines
- Snowmobile engines

- Chain saws engines
- ATV engines
- Weed trimmer engines
- Leaf blower engine
- Motorcycle engines
- Snow-blower engines
- Rototillers
- Jet-skis
- Dirt bikes.

Be able to identify and describe:

- The four stroke cycle operation (for example, intake, compression, power, exhaust)
- Various components of the two and four stroke cycle engines, for example:
 - Aluminum construction
 - Cast construction
 - Propellers
 - Carburetors
 - Cooling systems
 - Lubricating systems
 - Exhaust systems
 - Pistons
 - Crankshafts
 - Camshafts
 - Pistons Etc.

Transportation Technology Skills

Be able to apply:

- Diagnostic process steps necessary to diagnose malfunctioning Small Engines (for example, manufacturer trouble code charts; manufacturer service manual design process steps, wiring diagrams) as it applies to the Small Engine and Recreational Equipment industry
- Troubleshooting and problem solving skills to diagnose engine faults correctly (for example, engine noise, engine fluid leaks, engine overheating) as it applies to Small Engine and Recreational Equipment industry
- Small Engine and Recreational Equipment manufacturer recommendations for scheduled engine maintenance procedures (for example, oil change, tune ups, fluids).

Be able to demonstrate:

- Proper testing and servicing procedures for cylinder heads, valve trains, and related components following Small Engine and Recreational Equipment manufacturers' recommendations and safe work practices (for example, remove valves; adjust valve lash, valve lapping)
- Repair skills to replace Small Engine and Recreational Equipment engines (for example, motorcycle engines, boat engines, lawn tractor engines)
- Diagnosing and repair skills to replace Small Engine and Recreational Equipment engine components (for example, cylinder heads, pistons, valves, crankshafts, connecting rods, camshafts, valve springs)
- The skills to perform regularly scheduled maintenance on Small Engine and Recreational Equipment (for example, engine oil change, coolant changes, gear fluid change).

Be able to use:

- Manufacturer manuals and flowcharts to correctly troubleshoot engine concerns (engine misfire, engine surge, engine knock) in the Small Engine and Recreational Equipment industry
- Manufacturer specific diagnostic equipment / scan tools to diagnose malfunctioning engine components (for example, computerized scan tools, volt meter, test light) as it applies to the Small Engine and Recreational Equipment industry

- Specialty tools and equipment to replace Small Engine and Recreational Equipment engines (for example, engine crane, engine stand, transmission jack, transmission stand)
- Specialty tools and equipment to replace Small Engine and Recreational Equipment engine components (for example, flywheel puller, flywheel holder, piston stop)
- Specialty tools and equipment to perform regularly scheduled maintenance on Small Engine and Recreational Equipment (for example, boat hoist, chain saw sharpener, motorcycle hoist, floor jack, axle stands).

Understanding Engine Management Systems

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- Environmentally harmful gasses that are produced through combustion (for example, two stroke, four stroke, marine engines) and how the Engine Management systems control the level of emissions in the exhaust gases produced in Small Gas Engine and Recreational Equipment
- The principles of Engine Management systems that apply to fuel metering, engine timing devices, and emissions devices in the Small Gas Engine and Recreational Equipment industry
- A variety of electronically controlled fuel systems used in Small Gas Engine and Recreational Equipment industry

Be able to recognize and interpret:

- The principles of operation of various Engine Management systems (for example, exhaust gas re-circulation (EGR), electronic fuel injection (EFI)) in Small Gas Engine and Recreational Equipment
- Diagnostic flow charts to assist in engine performance diagnostics in the Small Gas Engine and Recreational Equipment industry
- Technical service bulletins provided by Small Gas Engine and Recreational Equipment manufacturers
- Service manual information as it pertains to the Small Gas Engine and Recreational Equipment industry

- Regularly scheduled maintenance recommended by Small Gas Engine and Recreational Equipment manufacturers (for example, air filter, fuel injector service, fuel filter).

Be able to identify and describe:

- Components of Engine Management systems (for example, catalytic converters, mufflers, baffles) in Small Gas Engine and Recreational Equipment
- Control devices commonly used in Engine Management systems (for example, powertrain control module, emission control units, electronic control unit) in the Small Gas Engine and Recreational Equipment industry.

Transportation Technology Skills

Be able to apply:

- Diagnostic process steps to diagnose malfunctioning Small Engine Management Systems (for example, manufacturer trouble code charts; manufacturer service manual design process steps, wiring diagrams) as it applies to Small Engine and Recreational Equipment.

Be able to demonstrate:

- Interruption of sensor and actuator data retrieved from diagnostic equipment to correctly diagnose engine control systems and components (for example, manufacturer scan tools) in the Small Engine and Recreational Equipment industry
- Safe working practices and knowledge of how to repair / replace malfunctioning Small Engine Management Systems (for example, removal and installation of replacement parts such as EGR valves, mufflers, fuel filters, fuel pumps) as it applies to the Small Engine and Recreational Equipment industry
- Proper identification and location of Engine Management sensors, actuators, and modules (for example, engine coolant temperature sensor, fuel solenoids, electrical / power train control module) in the Small Engines and Recreational Equipment industry.

Be able to use:

- Manufacturer manuals and flowcharts to correctly troubleshoot Small Engine Management Systems (poor fuel economy, engine surge) in the Small Engine and Recreational Equipment industry
- Manufacturer specific diagnostic equipment / scan tools to diagnose malfunctioning Small Engine Management Systems components (for example, computerized scan tools, volt meter, test light) as it applies to Small Engine and Recreational Equipment industry
- Manufacturer specific tools / equipment that illustrates how to repair malfunctioning Small Engine Management Systems components (for example, Removal and installation of replacement parts such as fuel injectors, mufflers, temperature sensors) as it applies to Small Engines and Recreational Equipment industry
- Specialty tools and equipment to perform regularly scheduled maintenance on Small Engine and Recreational Equipment (for example, boat hoist, boat motor water dunk tank, fuel injection pressurized cleaner).

Understanding Power Transfer Devices

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- The construction, operating principles, testing and servicing of power train assemblies, gearing fundamentals, drive shafts, universal joints and drive axle assemblies in the Small Gas Engine and Recreational Equipment industry
- Belt driven Recreational Equipment (for example, snowmobiles, go-karts, golf-carts)
- Chain driven Recreational Equipment (for example, motorcycles, dirt bikes, go-karts)
- Gear box driven Recreational Equipment (for example, snow blowers, ATVs)
- Outboard drive Recreational Equipment (for example, boats, jet skis)
- Track type operation in Recreational Equipment (for example, snowmobiles, ATV's).

Be able to recognize and interpret:

- How energy is converted into motion in Small Engine and Recreational Equipment
- Gear ratios that are used for torque multiplication in Small Engine and Recreational Equipment (for example, 2:1, 3:1, 4:1)
- How clutches and belts allow for movement in Recreational Equipment (for example, snowmobiles, go-karts, golf-carts)
- How gearboxes allow for movement in Recreational Equipment (for example, boats, ATVs, snow blowers)
- How chains allow for movement in Recreational Equipment (for example, motorcycles, dirt bikes, go-karts).

Be able to identify and describe:

- Identify specific Power Transfer devices (for example, belt driven, chain driven, gear box driven, clutch driven) in the Small Engine and Recreational Equipment industry
- Communication skills to describe diagnostic symptoms (for example, noise, vibration, rubbing, squeaks) in the Small Gas Engine and Recreational Equipment industry.

Transportation Technology Skills

Be able to apply:

- The principles of belt driven Recreational Equipment and the skills to repair or replace components (for example, taking tension off main drive clutch / pulley to replace snowmobile drive belt)
- The principles of chain driven Recreational Equipment and the skills to repair or replace components (for example, removing primary / secondary drive gear on a motorcycle or dirt bike to replace drive chain)
- The principles of gear boxes in Recreational Equipment and the skills to replace components (for example, splitting a snow blower in half to access and replace or repair gear box components)
- The principles of how outboard drives operate when submerged in water and the skills to replace components in Recreational Equipment (for example, removing boat motor from boat to replace lower end propeller).

Be able to demonstrate:

- Proper inspection / diagnosing skills / techniques of Power Transfer components to determine causes of Small Engine and Recreational Equipment failures (for example, snowmobile will not engage to move, loud grinding noises from snow blower and snow will not blow out shoot)
- A basic knowledge to identify various types of Power Transfer devices used in Small Engines and Recreational Equipment (for example, transmission, drive shaft, power take off, transfer case).

Be able to use:

- Manufacturer manuals and flowcharts to correctly troubleshoot Power Transfer Devices (no drive condition, no speed condition, surge condition) in the Small Engine and Recreational Equipment industry
- Manufacturer specific diagnostic equipment / scan tools to diagnose malfunctioning Power Transfer devices (for example, computerized scan tools, volt meter, test light) as it applies to Small Engine and Recreational Equipment industry
- Manufacturer specific tools / equipment of how to repair malfunctioning Power Transfer devices (for example, removal and installation of replacement parts such as snowmobile track, boat motor propeller, riding lawn mower gear box) as it applies to Small Engines and Recreational Equipment industry
- Specialty tools and equipment to perform regularly scheduled maintenance on Power Transfer devices (for example, lubricating pivot points, greasing nipples, fluid changes) as it applies to Small Engines and Recreational Equipment industry.

Understanding Electrical and Electrical Circuits and Components

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- inspection and diagnostics on specific applications and electrical circuits as it relates to the Small Engine and Recreational Equipment Industry (for example, starting systems, lighting circuits, charging systems)
- Fundamental principles of a series circuit as it relates to the Small Engine and Recreational Equipment industry

- Fundamental principles of a parallel circuit as it relates to the Small Engine and Recreational Equipment industry
- Fundamental principles of Ohm's law as it relates to the Small Engine and Recreational Equipment industry
- Fundamental Principles of Kirchhoff's circuit law as it relates to the Small Engine and Recreational Equipment industry
- Fundamental Principles of Watt's circuit law as it relates to the Small Engine and Recreational Equipment industry
- Applying manufacturers' wiring schematics and troubleshooting diagrams for Small Gas Engine and Recreational Equipment.

Be able to recognize and interpret:

- The components of a series and parallel circuit and how they relate to applications in the Small Engines and Recreational Equipment industry
- Diagnosing malfunctioning electrical circuits and components (for example, short to ground, voltage surge, open circuits) in the Small Gas Engine and Recreational Equipment industry
- Proper use of manufacturers' wiring schematics and troubleshooting diagrams relating to Small Gas Engines and Recreational Equipment
- Multi-meter readings based on electrical test results (for example, voltage drops, current flow, resistance checks) relating to Small Gas Engines and Recreational Equipment.

Be able to identify and describe:

- Electrical units of measure (for example, volts, ohms, amperage) as it relates to the Small Engine and Recreational Equipment industry
- Fundamentals of electronic circuits and components (for example, fuses, relays, fusible links) as it relates to the Small Engine and Recreational Equipment industry
- Electrical faults and proper repair procedures (for example, short, open, draws) as it relates to the Small Engine and Recreational Equipment industry

- Reading electrical component symbols from electrical schematics (for example, fuses, fusible links, relays, switches) as it relates to the Small Engine and Recreational Equipment industry.

Transportation Technology Skills

Be able to apply:

- Basic electrical skill for reading manufacturer wiring schematics and troubleshooting diagrams of all series and parallel circuits as it pertains to Small Engine and Recreational Equipment diagnostics (for example, malfunctioning components on a sea-doo, go-kart, boat)
- Ohm's Law principles in reading and understanding circuits / diagrams in Small Engine and Recreational Equipment diagnostics (for example, a malfunctioning headlight on a snowmobile, riding lawn mower, ATV)
- Kirchoff's Law principles in reading and understanding circuits / diagrams in Small Engine and Recreational Equipment diagnostics (for example, malfunctioning ignition switch on a golf-cart, motorcycle, or snow blower)
- Diagnostics and troubleshooting skills when determining a fault of an operative electrical circuit (for example, blown fuse, open circuit, faulty relay) in the Small Engine and Recreational Equipment industry.

Be able to demonstrate:

- Proper inspection techniques and testing of a variety of electrical circuits (for example, resistance checks, load testing, amperage draw test on circuits, voltage drop test) on Small Engine and Recreational Equipment
- Proper connects and repairs on electrical circuits both internally and externally (water exposure) in Small Engine and Recreational Equipment

Be able to use:

- Multi-meters, test lights, etc. when diagnosing / trouble shooting electrical concerns (for example, snowmobile handle bar warmers are inoperative) as it relates to the Small Engine and Recreational Equipment industry.
- Be able to use specific tools (for example, soldering gun, wires strippers, pliers) to repair malfunctioning components / connections in Small Engine and Recreational Equipment electrical circuits.

Understanding Major Systems and Components

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- Braking systems in the Small Engine and Recreational Equipment industry
- Lubrication systems in the Small Engine and Recreational Equipment industry
- Suspension systems in the Small Engine and Recreational Equipment industry
- Steering systems in the Small Engine and Recreational Equipment industry
- Fuel systems in the Small Engine and Recreational Equipment Industry
- Fuel / Oil systems in two stroke Small Engines (for example, mixing the correct gasoline to oil ratio) as it pertains to Small Engine and Recreational Equipment manufacturers' specifications
- Cooling systems (mixing the correct manufacturer specifications of ethylene glycol to water ratio) in the Small Engine and Recreational Equipment industry
- Navigation systems in the Small Engine and Recreational Equipment industry.

Be able to recognize and interpret:

- Diagnosis of all malfunctioning systems as it applies to Small Engine and Recreational Equipment
- Malfunctioning specific components as it applies to Small Engine and Recreational Equipment
- Brake system components (for example, rotors, drums, pads, shoes) in the Small Engine and Recreational Equipment industry
- Lubrication system components (for example, oil pumps, oil filters) in the Small Engine and Recreational Equipment industry
- Steering system components (for example, snowmobile skis, snowmobile shocks, snowmobile sliders, snowmobile carbides) in the Small Engine and Recreational Equipment industry

- Fuel system components (for example, fuel filters, fuel pumps) in the Small Engine and Recreational Equipment industry
- Cooling system components (for example, snowmobile heat exchangers, radiators, thermostats) in the Small Engine and Recreational Equipment industry.

Be able to identify and describe:

- Different braking systems and brake components in the Small Engine and Recreational Equipment industry (for example, snowmobiles brake pads, motorcycles disc rotors, lawn tractor drum brakes)
- Lubrication systems and lubrication system components in Small Engine and Recreational Equipment (for example, lawn mowers, rototillers, weed trimmers, gas oil mixed, boat motor oil pump driven)
- Different suspension systems and suspension components in Small Engine and Recreational Equipment manufacturer specific brands (for example, snowmobiles springs, ATV shocks, go-kart independent suspension)
- Different fuel systems in Small Engine and Recreational Equipment manufacturer specific brands (for example, EFI, mixed, fuel pump, diesel)
- Navigation systems and navigation system components in Small Engine and Recreational Equipment (for example, boats depth finder, boat CB radios, snowmobile GPS systems).

Transportation Technology Skills

Be able to apply:

- Diagnostic process steps to diagnosis malfunctioning systems (for example, Manufacturer diagnostic service manuals and wiring diagrams) as it applies to Small Engine and Recreational Equipment
- Diagnostic process steps to diagnosis malfunctioning components (for example, Manufacturer diagnostic service manuals and wiring diagrams) as it applies to Small Engine and Recreational Equipment.

Be able to demonstrate:

- Safe working practices and skills related to repair of malfunctioning components (for example, ATV rear drums, go-kart disc brake rotors, snowmobile brake pads, riding lawn tractor hydraulic brake fluid) of a Small Engine and Recreational Equipment braking system

- Safe working practices and skills related to repair of malfunctioning components (for example, lawn mower oil slinger, rototiller crankcase gasket, boat motor lower unit gear case) of a Small Engine and Recreational Equipment lubrication system
- Safe working practices and skills related to repair of malfunctioning components (for example, ATV shock absorbers, lawn tractor tires, snowmobile spring assemblies) of a Small Engine and Recreational Equipment suspension system
- Safe working practices and skills related to repair of malfunctioning components (for example, riding lawn tractor tie rod linkages, snowmobile skis/carbides, motorcycle tires, runners) of a Small Engine and Recreational Equipment steering linkage system
- Safe working practices and skills related to repair of malfunctioning components (for example, boats electronic fuel injection, chain saw gas to oil mixing ratio, dirt bike proper fuel grade selection) of a Small Engine and Recreational Equipment fuel system
- Safe working practices and skills related to repair of malfunctioning components (for example, snowmobile's GPS boat depth finder equipment, boat CB radios) of a Small Engine and Recreational Equipment navigation system
- Safe working practices and skills related to repair of malfunctioning components (for example, boat thermostat, snowmobile ethylene glycol to water ratio, lawnmower correct oil level and viscosity) of a Small Engine and Recreational Equipment cooling system
- Safe working practices and knowledge about performing regularly scheduled maintenance (for example, snowmobile ski runners/carbides, snowmobile sliders, outboard motor lower unit gear oil, ATV crankcase oil, golf-cart tire pressures) on Small Engine and Recreational Equipment.

Be able to use:

- Specific diagnostic equipment to diagnose malfunctioning systems (for example, Specific manufactures scan tools, spark tester, vacuum tester, compression tester) as it applies to Small Engine and Recreational Equipment

- Specific specialty tools to repair malfunctioning components (for example, piston stop, carburetor nozzle driver, one-way clutch socket, flywheel holder) as it applies to Small Engine and Recreational Equipment

Technological Literacy and Numeracy

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- Making written recommendations on user needs as it relates to the Small Engine and Recreational Equipment industry
- Proper use of technological terminology as it relates to the Small Engine and Recreational Equipment industry
- Understanding of and application of the Essential Skills (for example, reading text, writing, document use, computer use, oral communication, numeracy, and thinking skills) as identified in the Ontario Skills Passport, as it relates to the Small Engine and Recreational Equipment industry
- Understanding of, and application of the work habits (for example, initiative, organization, accountability, ethical conduct) as identified in the Ontario Skills Passport, as it relates to the Small Engine and Recreational Equipment industry
- Applying manufacturer wiring schematics and troubleshooting diagrams to Small Engine and Recreational Equipment diagnosing and repairs
- Mixing the correct gasoline to oil ratio as it pertains to Small Engines and Recreational Equipment manufacturer specifications
- Mixing the correct ethylene glycol to water ratio as it pertains to Small Engines and Recreational Equipment manufacturer specifications
- The specific meaning of each letter and number of the vehicle identification number (VIN.) (for example, place of origin, production year, engine size, paint color) on the basis of their placement in the VIN as it pertains to the Small Engine and Recreational Equipment industry.

Be able to recognize and interpret:

- Titles on a typical service manual and electrical circuit diagram as it relates to Small Engine and Recreational Equipment

- Proper use of manufacturer wiring schematics and troubleshooting diagrams in Small Engine and Recreational Equipment repair procedures
- Different technical terms and acronyms as it pertains to certain models, makes and manufacturer in the Small Engine and Recreational Equipment industry
- Gear ratio calculation in Small Engine and Recreational Equipment (for example, 2:1, 3:1, 4:1).

Be able to identify and describe:

- General terminology in the Small Engine and Recreational Equipment industry for correct use in written and oral communication (for example, remove and replace, remove and inspect)
- Mathematical concepts and calculations (for example, bore, stroke, horse power) in the Small Engine and Recreational Equipment industry
- Navigation systems (for example, boats, snowmobiles) as it relates to the Small Engine and Recreational Equipment industry
- Fuel Economy (for example, motorcycles, boats) as it relates to the Small Engine and Recreational Equipment industry.

Transportation Technology Skills

Be able to apply:

- Writing skills to create documents which describe design intention and content, making references for further information or context as it relates to the Small Engine and Recreational Equipment industry
- Appropriate mathematic and scientific concepts to product and process design as it relates to the Small Engine and Recreational Equipment industry
- Appropriate mathematics to calculate fuel economy (for example, miles per gallon, kms per litre) as it relates to the Small Engine and Recreational Equipment industry
- Reading skills navigation systems interpretation (for example, G.P.S., depth finder, maps, compass, CB radios) as it relates to the Small Engine and Recreational Equipment industry

- Gear ratio calculation (for example, 2:1, 3:1, 4:1) for specific applications in Small Engine and Recreational Equipment
- Be able to demonstrate:
 - Appropriate technical language when reading, creating, and using technical reports in the Small Engine and Recreational Equipment industry
 - Proper terminology for tools and equipment (for example, ratchets, air tools, battery chargers) when repairing and servicing Small Engines and Recreational Equipment
 - Calculating correct cylinder bore circumferences during machining process of engine re-building in the Small Engine and Recreational Equipment industry
 - Proper rebuilding aspects required to meet specific Horse Power (HP) specifications when rebuilding engines as it relates to the Small Engine and Recreational Equipment industry
 - Numeracy calculating skills to correctly mix fluids (for example, gas and oil ratio in two stroke engines, cooling systems ratios of water and ethylene glycol) as it relates to the Small Engine and Recreational Equipment industry.

Be able to use:

- Imperial and metric units of measurement correctly, using typical scales as it relates to the Small Engine and Recreational Equipment industry
- A variety of communications techniques and tools to present product and / or process designs as it relates to the Small Engine and Recreational Equipment industry
- Appropriate technical language and mathematical calculations when preparing reports for a range of audiences (for example, work orders, parts lists) in the Small Engine and Recreational Equipment industry
- Supporting documents including scaled drawings, technical reports, and cost analysis to present designs and manufacturing aspects as it relates to the Small Engine and Recreational Equipment industry
- Ohm's Law principles in reading and understanding circuits / diagrams in Small Engine and Recreational Equipment

- Navigation systems (for example, G.P.S., depth finder, maps, compass, CB radios) as it relates to the boats on a water way, or snowmobile deep in to the forest
- Correctly use a torque wrench (for example, foot lbs., inch lbs.).

Design Process/Solving Repair Challenges

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- The design process and how Small Engine and Recreational Equipment Manufacturers make use of it in fabricating and constructing different brands (for example, different model years of snowmobiles, boats, jet-skis)
- Tools and equipment selection process as it relates to the design process in fabrication and repairing of different models in the Small Engine and Recreational Equipment industry
- Fabrication processes of different manufacturer brands in the Small Engine and Recreational Equipment industry (for example, Boats - Legend, Lund, Regal).

Be able to recognize and interpret:

- Diagnostics and process steps in a typical service manual, and electrical circuit diagrams in repairing Small Engine and Recreational Equipment.

Be able to identify and describe:

- The elements of design (for example, line, shape, form, color, texture, space) in the Small Engine and Recreational Equipment industry
- Principles of design (for example, proportion, patterns, movement) in the Small Engine and Recreational Equipment industry.

Transportation Technology Skills

Be able to apply:

- Client invoices and billable hours and disbursements related to Small Engine and Recreational Equipment design projects

- Apply diagnosis and process steps in typical service manuals, and electrical circuit diagrams for Small Engine and Recreational Equipment repairs
- Technical skills to layout and inspect a product in the Small Engine and Recreational Equipment industry

Be able to demonstrate:

- Visual and Oral Presentations marketing the use of proposed designs to industry / clients (for example, ATV's, snowmobiles, boats, jet-skis, go-karts)
- The design process to plan and develop products or processes with a focus on the Small Engine and Recreational Equipment industry.

Be able to use:

- Research reports and presentations (for example, cost estimation, warranty period reports, cost estimation) found in Small Engine and Recreational Equipment industry
- Various research methods and strategies to gather, organize, and interpret Small Engine and Recreational Equipment information from appropriate resources
- Scaled Drawings and process specification as it relates to the Small Engine and Recreational Equipment industry.

Tools, Equipment and Materials

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- The function, purpose and operation of specialty tools, diagnostic equipment and technologies as it applies to the Small Engine and Recreational Equipment industry
- Layout and set-up tool procedures in Small Engine and Recreational Equipment diagnosing, repair, or servicing
- Advanced measuring tools (micrometer, dial indicators, depth gauges) as it pertains to the Small Engine and Recreational Equipment industry

- Tools and equipment selection process in major repairs of Small Engine and Recreational Equipment.

Be able to recognize and interpret:

- Proper tool terminology (for example, box-end wrench, combination wrench, line wrench) in the Small Gas Engine and Recreation industry.

Be able to identify and describe:

- All types of air, power, and hand tools (for example, ratchets, impact gun, drill, pliers) used in the Small Engine and Recreational Equipment industry
- Different tools and diagnostic equipment as it relates to different manufactures and brands (for example, Bombardier, Polaris, Artic Cat, Stihl, Yamaha, Lawn Boy) in the Small Engine and Recreational Equipment industry.

Transportation Technology Skills

Be able to apply:

- Measurement information retrieved from precision tools (for example, micrometers, dial indicators) to make accurate conclusions on component conditions used in the Small Engine and Recreational Equipment industry.

Be able to demonstrate:

- Proper tool and equipment selection process in scheduled maintenance and major repairs of Small Engine and Recreational Equipment (for example, engine rebuilding, snowmobile track removal, ATV front hub replacement)
- Interpretation of information retrieved from diagnostic equipment (scan tools, multi-metres) that will assist in proper Small Engine and Recreational Equipment diagnostics.

Be able to use:

- Different tools and diagnostic equipment as it relates to different manufacturers and brands (for example, Polaris, Lawn Boy, Artic Cat) in the Small Engines and Recreational Equipment industry

- Tools and equipment selection process in major repairs (jet-ski camshaft removal, boat motor lower end replacement, golf cart battery pack replacement) of Small Engines and Recreational Equipment
- Specialty tools and equipment (for example, engine crane, engine stand, transmission jack, transmission stand) to replace Small Engine and Recreational Equipment engines
- Specialty tools and equipment (for example, flywheel puller, flywheel holder, piston stop) to replace Small Engine and Recreational Equipment engines components
- Specialty tools and equipment (for example, boat hoist, chain saw sharpener, motorcycle hoist, floor jack, axle stands) to perform regularly scheduled maintenance on Small Engine and Recreational Equipment
- Advanced measuring devices to retrieve specific component readings (for example, compression tester, torque wrench, dial indicator) in the Small Engine and Recreational Equipment industry.

Transportation Technology and the Environment

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- Legislation, regulations, and standards, relating to Government / Ministry guidelines as it relates to the Small Gas Engine and Recreational Equipment industry
- Environmentally harmful gasses that are produced through combustion (for example, two stroke, four stroke, and marine engines) and how the engine management systems control the level of emissions in the exhaust gas.

Be able to interpret and recognize:

- Recyclable materials (for example, snowmobile tracks, riding lawn mower tires, coolant, batteries) used in the Small Gas Engine and Recreational Equipment industry.

Be able to identify and describe:

- Government requirements / regulations on emission testing (Canadian governments e-testing) as it pertains to the Small Gas Engine and Recreational Equipment industry.

Transportation Technology Skills

Be able to apply:

- Government regulated emission testing, diagnosis, and repairs to meet applicable environment guidelines as it pertains to the Small Engine and Recreational Equipment industry
- Legal requirements and emission standards when servicing, repairing and testing Small Engines and Recreational Equipment industry.

Be able to demonstrate:

- Environmentally responsible practices during the design and manufacturing of a product in the Small Engine and Recreational Equipment industry
- Safe working practices and knowledge about how to perform scheduled maintenance of Small Engine Lubrication Systems (for example, Proper service and disposal off used oil lubricants, coolant, brake fluid, gear oil) as it applies to Small Engines and Recreational Equipment industry.

Be able to use:

- Use Government regulated emission testing equipment to meet applicable environment guidelines
- Procedures and training required to preventing the release of ozone depleting materials and harmful substances used in the Small Engines and Recreational Equipment industry servicing and repair (for example, R-12 Freon, electrolyte, fuel, hydraulic fluid).

Transportation Technology and Society

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- Ways in which the Small Engine and Recreational Equipment sector is affected by the social and cultural characteristics of the communities in which they operate (for example, socio-economic demographic of a community)
- The Social and Economic impact of Small Engine and Recreational Equipment activities in a community.

Be able to recognize and interpret:

- Ways in which the Small Engine and Recreational Equipment sector is affected by the economic characteristics of the communities in which they operate (for example, age profile of community and requirements for different types of outdoor recreation)
- The impact of Small Engine and Recreational Equipment on Ontario's regional economies (for example, increased employment, new businesses).

Be able to identify and describe:

- Related industries affected by Small Engine and Recreational Equipment (for example, communities, hospitality and tourism, marinas).

Transportation Technology Skills

Be able to apply:

- Professional networks to include local businesses, attractions and destinations, and postsecondary programs to support learning and development through experiential learning in society (for example, guest speakers, job shadowing, volunteerism, donations).

Be able to demonstrate:

- An understanding of political, economic, cultural, and environmental issues impacting the Small Engines and Recreational Equipment industry
- The effects of various types of energy sources to power (for example, natural gas, bio-diesel, fry oil) in the Small Engine and Recreational Equipment industry from a consumer's perspective.

Be able to use:

- Information about potential technologies to assist in advancing today's society (for example, providing new solar powered Recreational Equipment for more efficient fuel economy) in the Small Engine and Recreational Equipment industry.

Health and Safety

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- Specific components of legislation and standards related to workplace safety in the Small Engine and Recreation Equipment industry

- Occupational Health and Safety Act [OHSA]
- Workplace Hazardous Materials Information System [WHMIS]
- Proper safety practices, housekeeping practices, lifting procedures, and fire prevention (spill cleanup, tripping hazards, equipment hazards) in the Small Engine and Recreation Equipment industry
- Material Safety Data Sheets [MSDS] sheets as it pertains to the Small Engine and Recreation Equipment industry
- Government mandatory boating license requirement
- Government mandatory snowmobile license requirement
- Boating safety requirements (for example, first aid kit, flares, whistle, bailing bucket, tool box, life jackets)
- Snowmobiling / ATV safety requirements (for example, first aid kit, helmet, flares, whistle, tow rope, tool box, extra dry clothes, gas line antifreeze)
- Motorcycle safety requirement (first aid kit, helmet, pylons, tool box).

Be able to recognize and interpret:

- Skills and working conditions related to each profession in the Small Engine and Recreation Equipment industry
- Safety hazards (oil spills, fires, icy areas) in the work area and the ability to resolve these issues in the Small Engine and Recreation Equipment industry.

Be able to identify and describe:

- Common industry hazards as it pertains to Small Engine and Recreation Equipment industry
- Occupational Health and Safety Act, mandatory Personal Protective Equipment and safe practices (for example, safety glasses, work gloves, hearing protection) as it pertains to the Small Engine and Recreation Equipment industry
- Potential health risks when working in the Small Engine and Recreation Equipment industry (for example, Carbon monoxide, brake asbestos, used engine oil).

Transportation Technology Skills

Be able to apply:

- Proper safety practices in the work environment to avoid injury (for example, safety guards are in place on pedestal grinder, equipment is secured properly, tire balancer cover) in the Small Engine and Recreational Equipment industry

Be able to demonstrate:

- Understanding and application of safe work procedures for using and maintaining materials, tools, and equipment in the Small Engine and Recreational Equipment industry
- Understanding of the Occupational Health and Safety Act (for example, duties of employers, rights and responsibilities of workers) as it pertains to the Small Engine and Recreational Equipment industry
- Follow legislation and regulations related to procedures and operations (for example, Workplace Hazardous Material Information, Material Data Safety Sheets) used in the Small Engine and Recreational Equipment industry
- Mandated safety practices and good housekeeping skills (for example, work area cleanup, clear tripping hazards, oil spills) in the Small Engine and Recreational Equipment industry working environment
- Appropriate safety precautions when servicing and repairing (for example, high pressure in fuel system, excessive heat from exhaust system, touching hazards materials) in the Small Engine and Recreational Equipment industry.

Be able to use:

- Mitigate potential health risks (for example, use appropriate ventilation, hearing protection, gloves, safety glasses, steel toed boots, breathing protection) and demonstrate the use of safe procedures when working in the Small Engine and Recreation Equipment industry
- Specialty tools and equipment safety (for example, engine cranes, engine stand, transmission jack, transmission stand) in the Small Engine and Recreational Equipment industry

- Specialty tools and equipment to replace Small Engine and Recreational Equipment engines components (for example, flywheel puller, flywheel holder, piston stop)
- Specialty tools and equipment (for example, boat hoist, chain saw sharpener, motorcycle hoist, floor jack, axle stands) to perform regularly scheduled maintenance on Small Engine and Recreational Equipment.

Career Opportunities

Transportation Technology Fundamentals

Be able to demonstrate an understanding of:

- Career opportunities in the Small Engine and Recreational Equipment industry and the education and training required
- The Interprovincial standards of Red Seal qualifications in the Small Engine and Recreational Equipment industry
- Ontario Youth Apprenticeship Program as it applies to the Small Engine and Recreational Equipment industry and obtaining a Provincial license designation
- Required work habits that are necessary to become successful (discipline, reliability, initiative) in the Small Engine and Recreational Equipment industry
- The Essential Skills as identified in the Ontario Skills Passport (for example, reading text, writing, document use, computer use, oral communication, numeracy, and thinking skills).

Be able to recognize and interpret:

- Professional associations relating to Small Engine and Recreational Equipment (for example, Ontario College of Trades)
- Regulations regarding restricted and non-restricted skill sets in the Apprenticeship and Certification Act.

Be able to identify and describe:

- Describe a variety of career opportunities in the Small Engine and Recreational Equipment industry (for example, marina manager, lawnmower salesman, Small Engine Technician)

- Careers in post-secondary education pathways (for example, university, college, apprenticeship) relating to the Small Engine and Recreational Equipment industry
- Describe educational programs of study, the training certification (s) needed for entry into the various programs in the Small Engine and Recreational Equipment industry
- The Canadian Red Seal program and specific trade options within it that pertain to the Small Engine and Recreational Equipment industry
- Describe the regulations regarding restricted skill sets in the Apprenticeship and Certification Act as it relates to the Small Engine and Recreational Equipment industry.

Transportation Technology Skills

Be able to apply:

- Apply knowledge of the employment process, develop resumes, cover letters and applications, as well as identify and use effective interviewing techniques within the Small Engine and Recreational Equipment industry.

Be able to demonstrate:

- Proper work habits (for example, safety, teamwork, organization) that will create success in the Small Engine and Recreational Equipment industry.

Be able to use:

- Up-to-date portfolio (a record of progress and work experience) that includes pieces of design work and other materials (for example, Ontario Skills Passport, Passport to Safety Certificate, technical reports, awards, reference letters) that provide evidence of skills and achievements in areas related to Small Engine and Recreational Equipment and explain why having a current portfolio is important for career development and advancement
- Up-to-date Resume, Cover letter, and References, specifically directed towards the Small Engine and Recreational Equipment industry / sector
- Specific industry training or certificates that relate to the Small Engine and Recreational Equipment industry / sector
- Specific hobbies that relate to the Small Engine and Recreational Equipment industry / sector.

Appendix 1

The Ethical Standards for the Teaching Profession

The *Ethical Standards for the Teaching Profession* represent a vision of professional practice. At the heart of a strong and effective teaching profession is a commitment to students and their learning. Members of the Ontario College of Teachers, in their position of trust, demonstrate responsibility in their relationships with students, parents, guardians, colleagues, educational partners, other professionals, the environment and the public.

The Purposes of the Ethical Standards for the Teaching Profession are:

- to inspire members to reflect and uphold the honour and dignity of the teaching profession
- to identify the ethical responsibilities and commitments to the teaching profession
- to guide ethical decisions and actions in the teaching profession
- to promote public trust and confidence in the teaching profession.

The Ethical Standards for the Teaching Profession are:

Care

The ethical standard of *Care* includes compassion, acceptance, interest and insight for developing students' potential. Members express their commitment to students' well-being and learning through positive influence, professional judgment and empathy in practice.

Trust

The ethical standard of *Trust* embodies fairness, openness and honesty. Members' professional relationships with students, colleagues, parents, guardians and the public are based on trust.

Respect

Intrinsic to the ethical standard of *Respect* are trust and fair-mindedness. Members honour human dignity, emotional wellness and cognitive development. In their professional practice, they model respect for spiritual and cultural values, social justice, confidentiality, freedom, democracy and the environment.

Integrity

Honesty, reliability and moral action are embodied in the ethical standard of *Integrity*. Continual reflection assists members in exercising integrity in their professional commitments and responsibilities.



The Standards of Practice for the Teaching Profession

The *Standards of Practice for the Teaching Profession* provide a framework of principles that describes the knowledge, skills and values inherent in Ontario's teaching profession. These standards articulate the goals and aspirations of the profession. These standards convey a collective vision of professionalism that guides the daily practices of members of the Ontario College of Teachers

The Purposes of the Standards of Practice for the Teaching Profession

- to inspire a shared vision for the teaching profession
- to identify the values, knowledge and skills that are distinctive to the teaching profession
- to guide the professional judgment and actions of the teaching profession
- to promote a common language that fosters an understanding of what it means to be a member of the teaching profession.

The Standards of Practice for the Teaching Profession are:

Commitment to Students and Student Learning

Members are dedicated in their care and commitment to students. They treat students equitably and with respect and are sensitive to factors that influence individual student learning. Members facilitate the development of students as contributing citizens of Canadian society.

Professional Knowledge

Members strive to be current in their professional knowledge and recognize its relationship to practice. They understand and reflect on student development, learning theory, pedagogy, curriculum, ethics, educational research and related policies and legislation to inform professional judgment in practice.

Professional Practice

Members apply professional knowledge and experience to promote student learning. They use appropriate pedagogy, assessment and evaluation, resources and technology in planning for and responding to the needs of individual students and learning communities. Members refine their professional practice through ongoing inquiry, dialogue and reflection

Leadership in Learning Communities

Members promote and participate in the

creation of collaborative, safe and supportive learning communities. They recognize their shared responsibilities and their leadership roles in order to facilitate student success. Members maintain and uphold the principles of the ethical standards in these learning communities.

Ongoing Professional Learning

Members recognize that a commitment to ongoing professional learning is integral to effective practice and to student learning. Professional practice and self-directed learning are informed by experience, research, collaboration and knowledge.



Appendix 2

Accessibility for Ontarians with Disabilities Act (AODA) Text:

Figure 5: Instructional Design and Practices from page 20 of this PDF

Figure 5 is a graphic representation of the possible andragogical instructional processes implemented in Additional Qualification courses. At the centre is a Venn diagram. In the right side of the Venn diagram, candidates are invited to explore the use of Experiential Learning, Critical Action Research, Narrative, Reflection, Collaborative Learning and Self-directed projects. In the left side of the Venn Diagram, candidates are invited to explore the use of Case Methodologies, Pedagogical Documentation, Dialogue, Independent Study, Small group interaction and Inquiry. These inquiry-based learning experiences interconnect at the centre to form a multiplicity of multifaceted processes that can enhance professional practice. The inquiry-based learning experiences outlined in the Venn diagram are related to the following four areas: Pedagogy, Assessment and Evaluation, Instructional Design and Practices and Program Planning, which surround the Venn diagram in an outer circle.

Appendix 3

College Standards-Based Resources

Information pertaining to the following standards-based resources, which support learning through professional inquiry, is available through the [College web site](#).

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