Green Industries, Grade 10 (THJ2O)

2025-2026 Course Outline
Developed by Shaun Quinn: August 2025
Developed from *The Ontario Curriculum Grade 11 and 12 Business Studies (revised)*, published 2006

Credit Value: 1.0

Prerequisite Courses: None

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COURSE DESCRIPTION

This course introduces students to the various sectors of the green industries – agriculture, forestry, horticulture, floristry, and landscaping. Using materials, processes, and techniques commonly employed in these industries, students will participate in a number of hands-on projects that may include plant or animal propagation; production, maintenance, and harvesting activities; the development of floral or landscaping designs; and/or related construction activities. Students will also develop an awareness of environmental and societal issues related to green industry activities, learn about safe and healthy working practices, and explore secondary and postsecondary education and training pathways and career opportunities in the various industry sectors.

Credit Value: 1.0
Prerequisite Courses: None

CURRICULUM EXPECTATIONS

Green Industry Fundamentals

Overall Expectations

By the end of this course, students will:

- A1. demonstrate an understanding of plant and/or animal biology and species classification as they relate to the green industries;
- A2. describe the factors affecting the growth and care of plants and/or animals;
- A3. demonstrate an understanding of design procedures and applications and production processes and systems as they relate to the green industries;
- A4. demonstrate competence in the use of mathematical, documentation, and communication skills as they apply to the green industries.

Green Industry Skills

Overall Expectations

By the end of this course, students will:

- B1. apply effective design and production practices as they relate to a variety of green industries;
- B2. demonstrate competence in applying introductory technical skills used in the green industries.

Technology, The Environment, and Society

Overall Expectations

By the end of this course, students will:

- C1. identify the impact of green industries on the environment and describe ways of minimizing harmful effects;
- C2. describe the societal implications of current practices and trends in the green industries;
- C3. describe the relationship of a variety of green industries to the local communities in which they operate.

Professional Practice and Career Opportunities

Overall Expectations

By the end of this course, students will:

- D1. demonstrate an understanding of and comply with occupational health and safety standards;
- D2. identify careers in the green industries and describe the skills, education, and training required for entry into these positions.

COURSE OUTLINE

Unit Number	Unit Name	Topics Covered	Instructional Hours	Overall Curriculum Expectations
1	Green Industry Fundamentals	**Focus:** Core concepts, science, and principles behind green industries. **Activities:** Plant/animal biology labs, classification exercises, basic design tasks, measurement and documentation exercises.	35	A1, A2, A3
2	Green Industry Skills	**Focus:** Practical, hands-on skills used in the workplace. **Activities:** Design and build a planter or birdhouse, transplanting, tool use, scale sketches and site layout.	25	B1, B2
3	Technology, the Environment, and Society	**Focus:** The bigger picture — technology's role, sustainability, and human impact. **Activities:** Case studies on sustainability, research on environmental impacts (e.g., pesticide runoff), mapping local green industry businesses.	30	C1, C2, C3
4	Professional Practice and Career Opportunities	**Focus:** Career readiness, safety, and professionalism. **Activities:** Safety protocol development, WHMIS basics, guest presentations, career research and pathways.	20	D1, D2

TOTAL INSTRUCTIONAL HOURS…….. 110 Hours

TEACHING & LEARNING STRATEGIES AND STRATEGIES FOR ASSESSMENT & EVALUATION OF STUDENT PERFORMANCE

This course provides differentiated learning for students by implementing the following teaching and learning strategies.

- **Activity-based Strategies**
  Oral presentations, panel discussion, and repetition and practice.
- **Direct Instruction Strategies**
  Cloze, demonstration, guided writing, lecturer, mnemonic devices, practice and drill, prompting, review, visual stimuli, and Socratic dialogue.
- **Independent Learning Strategies**
  Homework, independent reading, independent study, learning log, memorization, portfolio, reflection, report writing, and response journals.
- **Inquiry and Research Model Strategies**
  Inquiry process, questioning process, research process, writing process.
- **Learning Skills Accommodation**
  Interpersonal intelligence, intrapersonal intelligence, logical-mathematical intelligence, verbal-linguistic intelligence, and visual spatial intelligence.
- **Technology and Media-based Strategies**

Communications applications, computer assisted instruction, email applications, Internet technologies, media presentations, media production, multimedia applications, and online public access catalogs.

- **Thinking Skills Strategies**
  Case study, classifying, concepts verification, concept mapping, expressing another point of view, issue-based analysis, lateral thinking, media analysis, metacognitive reflection, oral explanation, problem posing, problem-solving, and writing to learn.

ASSESSMENT POLICY

In keeping with the Ministry of Education's document, Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools, 2010, this course will be presented to students with consideration of the overall and specific expectations established for the credit, the achievement chart in the appropriate curriculum policy document, and the guidelines for Assessment and Evaluation. The course contains both content standards (the knowledge and skills a student is expected to demonstrate throughout the course) and performance standards (the quality of student learning as reflected by the student's work toward achieving these skills).

To support student learning and to ensure that the assessment and evaluation encourage and promote student achievement as much as possible, course evaluations will be designed with a mind to being:

- balanced and equitable, with clear instructions and criteria;
- reflective of the overall and specific expectations for the course;
- ongoing and varied, allowing students to demonstrate achievement throughout the year;
- committed to include ongoing descriptive feedback giving students indications of goals and strategies for improvement; and
- supportive of student skills in assessing their own learning (for self-improvement) so that they can set personal goals and strategies (metacognition).

ASSESSMENT TYPES

This course will contain all three types of assessment recommended by the Ministry of Education.

Assessment *for* learning

The teacher will gather information about student's skill and understanding in order to plan teaching activities to maximize student achievement. In addition, the teacher will give feedback on work which is designed to help the student direct his/her efforts to particular skills or content so that he/she can improve his/her results. These assessments are generally not completed for marks, but rather for feedback, and include such things as checklists, student reflections, practice activities, and sample questions.

Assessment *as* learning

The student will be asked to demonstrate progress in developing skills and understanding of content in a way which allows him/her to set goals, reflect on work, and determine strategies for progress. These assessments may or may not be evaluated for marks and may include such things as small tests, quizzes, brief presentations, student reflections and self and peer-assessed activities.

Assessment *of* learning

The student will be asked to demonstrate that he/she has acquired the skills taught and has developed a strong understanding of the content and performance standards related to the topic. These assessments are done in preparation for moving forward to new content and performance standards or in completion of the course itself. These are assessed for marks and are used to record and report what has been learned. They include such things as unit tests, presentations, assignments, projects, and exams.

All assessments are designed to fit into one or more of the Grade 9-12 Business Studies Achievement Chart categories: Knowledge and Understanding, Thinking, Communication, and Application (see Appendix 1).

Learning Skills & Work Habits

The development of learning skills and work habits is needed for success in school and in life. In addition to their assessment based on the achievement chart, student success also reflects a variety of specific learning skills, through

which students complete course work and assessments. These learning skills are not assigned grades based on the achievement chart, or a numeric grade, but are rather indicated on the student report card using levels (excellent, good, satisfactory, needs improvement). This indicates to the student which learning skills should receive increased effort by the student in order to improve his/her learning, and which skills are helping the student achieve their academic success. The learning skills are behaviours considered essential and integral to student learning and to the evaluation of a student's achievement as he/she progresses through each course and grade. The six learning skills are listed below; for a full description, see Appendix 2.

- Responsibility
- Organization
- Independent Work
- Collaboration
- Initiative
- Self-Regulation

ASSESSMENT STRUCTURE

Student achievement is communicated formally to students and parents by means of the Provincial Report Card. The report card provides a record of the student's achievement of the curriculum expectations in the form of a percentage grade. The percentage grade represents the quality of the student's overall achievement of the expectations for the course and reflects the corresponding level of achievement as described in the achievement chart. A final grade is recorded, and a credit is granted and recorded if the student's grade is 50% or higher.

The final grade in the course is determined as follows:

Term Work *	70%
Final Summative	30%
Final Grade	100%

*Term work is based on evaluations conducted throughout the course. This portion of the grade will reflect the student's most consistent level of achievement throughout the course, although special consideration may be given to more recent evidence of achievement.

ACHIEVEMENT CHART CATEGORIES

There are four categories into which student evaluations are divided: Knowledge and Understanding, Thinking, Communication, and Application. This means that a student's evaluated work will contain marks in all, or some, of these categories as indicated by the teacher and based on the teacher's professional judgment. Students are evaluated according to the criteria established for the course, not according to the achievement of other students. Achievement of level 3 in these categories represents the provincial standard.

There are four levels of student achievement, Levels 1-4 (as well as the possibility that a student's work can be evaluated as below level 1).

See full achievement chart for Business Studies Grade 9-12 in Appendix 1.

PROGRAM PLANNING CONSIDERATIONS IN TECHNOLOGY STUDIES STUDIES

Teachers who are planning a program in technological education must take into account considerations in a number of important areas, including those discussed below.

Instructional Planning

Technological education involves knowing and doing, and teaching and learning approaches should address both areas. Teachers should use projects as a major means of achieving course expectations, and students should be provided with a combination of information and experiences that will prepare them to make informed choices about the use of various technologies, to use technology wisely and well, and to solve technological problems.

Students learn best when they are engaged in learning in a variety of ways. Technological education courses lend themselves to a wide range of approaches in that they require students to discuss issues, solve problems, plan

solutions, participate in development of solutions, conduct research, think critically, and work cooperatively. When students are engaged in active and experiential learning strategies, they tend to retain knowledge for longer periods and to develop, acquire, and integrate key skills more completely.

Programs in technological education should involve an open, collaborative, activity-based approach to teaching that accommodates students' interests, aspirations, and learning styles. Activities should be designed to include both individual and team approaches, as technological projects in the workplace often require individuals to work collaboratively while undertaking a variety of roles and tasks. Students should be given opportunities to work both independently and with teacher direction, and to learn through the study of examples followed by practice. There is no single correct way to teach or to learn, and the strategies used in the classroom should vary according to the curriculum expectations and the needs of the students. Problem solving and/or the design process should be an integral part of all broad-based technological education. Teachers should work collaboratively with colleagues to plan and deliver the technological education curriculum. Individual teachers can contribute their expertise in particular areas of technology to ensure the successful implementation of the curriculum.

Some of the teaching and learning strategies that are suitable to material taught in technological education employ scaffolding. Scaffolding is an instructional approach that involves breaking down tasks so that students can concentrate on specific, manageable objectives and gradually build understanding and skill, with the aid of modelling by the teacher and ample opportunity for practice. Scaffolding provides students with a supportive structure within which to learn.

Some of the concepts taught in technological education involve abstract thinking, which can be difficult for many students. Role playing is an approach teachers can employ to help students internalize new concepts. Learning processes that include opportunities for physical activity by students can lead to better understanding and longer retention of concepts. The use of kinesthetic learning can be an effective way to adapt technological education to the varied learning styles that students may demonstrate.

When students work collaboratively they often accomplish more than when they work individually. Group activities, when used in a structured way, can enhance learning and foster positive attitudes. When working in a team, each student should have a specific role and be actively involved in the task. It is important to give students opportunities to take on different roles, from one project to another or in the course of a large project.

Students' attitudes towards technological education can have a significant effect on their achievement of expectations. Teaching methods and learning activities that encourage students to recognize the value and relevance of what they are learning for work and their lives beyond school will go a long way towards motivating students to work and learn effectively.

The study of current events related to technologies in various industries, including emerging technologies, should inform the technological education curriculum, enhancing both the relevance and the immediacy of the program. Discussion of current events related to various technologies and inclusion of these topics in daily lessons will stimulate students' interest and curiosity and also help them connect what they are learning in class with real-world events or situations. The study of events in industry sectors and technological developments in the world needs to be thought of not as a separate topic removed from the program but as an effective instructional strategy for implementing many of the expectations found in the curriculum.

Health and Safety in Technological Education

Health and safety is of paramount importance in technological education. In every course, students must be made aware that health and safety is everyone's responsibility at home, at school, and in the workplace. Before using any piece of equipment or any tool, students must be able to demonstrate knowledge of how the equipment or tool works and of the procedures they must follow to ensure its safe use. Personal protective gear must be worn as required.

Classroom practice and all aspects of the learning environment must comply with relevant municipal, provincial, or federal health and safety legislation, including the following:

- the Ontario Workplace Safety and Insurance Act
- the Workplace Hazardous Materials Information System (WHMIS)

- the Food and Drugs Act
- the Ontario Health Protection and Promotion Act
- the Ontario Building Code
- the Occupational Health and Safety Act
- local by-laws

Teachers should make use of all available and relevant resources to make students sufficiently aware of the importance of health and safety. These resources include:

- Live Safe! Work Smart! – website and related resources
- Passport to Safety – website and related resources
- Workplace Safety and Insurance Board (WSIB)
- Industrial Accident Prevention Association (IAPA)
- Ontario Ministry of Labour (MOL)
- Canadian Centre for Occupational Health and Safety (CCOHS)
- appropriate Safe Workplace Associations (SWAs) and clinics, such as the Construction Safety Association of Ontario (CSAO), the Ontario Service Safety Alliance (OSSA), the Transportation Health and Safety Association of Ontario (THSAO), the Electrical & Utilities Safety Association (E&USA), the Workers Health & Safety Centre (WHSC), and the Occupational Health Clinics for Ontario Workers (OHCOW)

Teachers are responsible for ensuring the safety of students during technology lab, shop, and classroom activities. Health and safety issues must also be addressed when learning involves cooperative education and other workplace experiences (see p. 39). Teachers need to encourage and motivate students to assume responsibility for their own safety and the safety of others, and they must help students develop the knowledge and skills needed for safe participation in all technology-related activities. For these reasons, teachers must model safe practices at all times and communicate safety expectations to students in accordance with school board policies and procedures, Ministry of Education policies, and Ministry of Labour regulations.

THE ONTARIO SKILLS PASSPORT AND ESSENTIAL SKILLS

Teachers planning programs in technological education need to be aware of the purpose and benefits of the Ontario Skills Passport (OSP). The OSP is a bilingual web-based resource that enhances the relevance of classroom learning for students and strengthens school–work connections. The OSP provides clear descriptions of Essential Skills such as Reading Text, Writing, Computer Use, Measurement and Calculation, and Problem Solving and includes an extensive database of occupation-specific workplace tasks that illustrate how workers use these skills on the job. The Essential Skills are transferable, in that they are used in virtually all occupations. The OSP also includes descriptions of important work habits, such as working safely, being reliable, and providing excellent customer service. The OSP is designed to help employers assess and record students' demonstration of these skills and work habits during their cooperative education placements. Students can use the OSP to assess, practise, and build their Essential Skills and work habits and transfer them to a job or further education or training.

The skills described in the OSP are the Essential Skills that the Government of Canada and other national and international agencies have identified and validated, through extensive research, as the skills needed for work, learning, and life. These Essential Skills provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change. For further information on the OSP and the Essential Skills, visit http://skills.edu.gov.on.ca.

THE ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY IN TECHNOLOGICAL EDUCATION

Information and communications technologies (ICT) provide a range of tools that can significantly extend and enrich teachers' instructional strategies and support student learning. ICT tools include multimedia resources, databases, Internet websites, digital cameras, and word-processing programs. Tools such as these can help students to collect, organize, and sort the data they gather and to write, edit, and present reports on their findings. Information and communications technologies can also be used to connect students to other schools, at home and abroad, and to bring the global community into the local classroom.

Whenever appropriate, therefore, students should be encouraged to use ICT to support and communicate their learning. For example, students working individually or in groups can use computer technology and/or Internet websites to gain access to technical information in Canada and around the world. Students can also use digital cameras and projectors to design and present the results of their research to their classmates.

Although the Internet is a powerful learning tool, there are potential risks attached to its use. All students must be made aware of issues of Internet privacy, safety, and responsible use, as well as of the potential for abuse of this technology, particularly when it is used to bully or promote hatred.

Teachers will find the various ICT tools useful in their teaching practice, both for whole class instruction and for the design of curriculum units that contain varied approaches to learning to meet diverse student needs.

PLANNING TECHNOLOGICAL EDUCATION PROGRAMS FOR STUDENTS WITH SPECIAL EDUCATION NEEDS

Classroom teachers are the key educators of students who have special education needs. They have a responsibility to help all students learn, and they work collaboratively with special education resource teachers, where appropriate, to achieve this goal. *Special Education Transformation: The Report of the Co-Chairs with the Recommendations of the Working Table on Special Education, 2006* endorses a set of beliefs that should guide program planning for students with special education needs in *all disciplines*. Those beliefs are as follows:

- All students can succeed.
- Universal design and differentiated instruction are effective and interconnected means of meeting the learning or productivity needs of any group of students.
- Successful instructional practices are founded on evidence-based research, tempered by experience.
- Classroom teachers are key educators for a student's literacy and numeracy development.
- Each student has his or her own unique patterns of learning.
- Classroom teachers need the support of the larger community to create a learning environment that supports students with special education needs.
- Fairness is not sameness.

In any given classroom, students may demonstrate a wide range of strengths and needs. Teachers plan programs that recognize this diversity and give students performance tasks that respect their particular abilities so that all students can derive the greatest possible benefit from the teaching and learning process. The use of flexible groupings for instruction and the provision of ongoing assessment are important elements of programs that accommodate a diversity of learning needs.

In planning technological education courses for students with special education needs, teachers should begin by examining the current achievement level of the individual student, the strengths and learning needs of the student, and the knowledge and skills that all students are expected to demonstrate at the end of the course, in order to determine which of the following options is appropriate for the student:

- no accommodations or modified expectations; or
- accommodations only; or
- modified expectations, with the possibility of accommodations; or alternative expectations, which are not derived from the curriculum expectations for a course and which constitute alternative programs and/or courses.

If the student requires either accommodations or modified expectations, or both, the relevant information, as described in the following paragraphs, must be recorded in his or her Individual Education Plan (IEP). More detailed information about planning programs for students with special education needs, including students who require alternative programs and/or courses, can be found in *The Individual Education Plan (IEP): A Resource Guide, 2004* (referred to hereafter as the *IEP Resource Guide, 2004*). For a detailed discussion of the ministry's requirements for IEPs, see *Individual Education Plans: Standards for Development, Program Planning, and Implementation, 2000* (referred to hereafter as *IEP Standards, 2000*). (Both documents are available at www.edu.gov.on.ca.)

Students Requiring Accommodations Only

Some students are able, with certain accommodations, to participate in the regular course curriculum and to demonstrate learning independently. Accommodations allow access to the course without any changes to the knowledge and skills the student is expected to demonstrate. The accommodations required to facilitate the student's learning must be identified in his or her IEP (see *IEP Standards, 2000*, p. 11). A student's IEP is likely to reflect the same accommodations for many, or all, subjects or courses.

Providing accommodations to students with special education needs should be the first option considered in program planning. Instruction based on principles of universal design and differentiated instruction focuses on the provision of accommodations to meet the diverse needs of learners.

There are three types of accommodations:

- *Instructional accommodations* are changes in teaching strategies, including styles of presentation, methods of organization, or use of technology and multimedia.
- *Environmental accommodations* are changes that the student may require in the classroom and/or school environment, such as preferential seating or special lighting.
- *Assessment accommodations* are changes in assessment procedures that enable the student to demonstrate his or her learning, such as allowing additional time to complete tests or assignments or permitting oral responses to test questions (see page 29 of the IEP Resource Guide, 2004, for more examples).

If a student requires "accommodations only" in technological education courses, assessment and evaluation of his or her achievement will be based on the appropriate course curriculum expectations and the achievement levels outlined in this document. The IEP box on the student's Provincial Report Card will not be checked, and no information on the provision of accommodations will be included.

Students Requiring Modified Expectations

Some students will require modified expectations, which differ from the regular course expectations. For most students, modified expectations will be based on the regular course curriculum, with changes in the number and/or complexity of the expectations. Modified expectations represent specific, realistic, observable, and measurable achievements and describe specific knowledge and/or skills that the student can demonstrate independently, given the appropriate assessment accommodations.

It is important to monitor, and to reflect clearly in the student's IEP, the extent to which expectations have been modified. As noted in Section 7.12 of the ministry's policy document *Ontario Secondary Schools, Grades 9 to 12: Program and Diploma Requirements, 1999*, the principal will determine whether achievement of the modified expectations constitutes successful completion of the course, and will decide whether the student is eligible to receive a credit for the course. This decision must be communicated to the parents and the student.

When a student is expected to achieve most of the curriculum expectations for the course, the modified expectations should identify *how the required knowledge and skills differ from those identified in the course expectations.* When modifications are so extensive that achievement of the learning expectations (knowledge, skills, and performance tasks) is not likely to result in a credit, the expectations should *specify the precise requirements or tasks on which the student's performance will be evaluated* and which will be used to generate the course mark recorded on the Provincial Report Card.

Modified expectations indicate the knowledge and/or skills the student is expected to demonstrate and have assessed in each reporting period (*IEP Standards, 2000*, pp. 10 and 11). The student's learning expectations must be reviewed in relation to the student's progress at least once every reporting period, and must be updated as necessary (*IEP Standards, 2000*, p. 11).

If a student requires modified expectations in technological education courses, assessment and evaluation of his or her achievement will be based on the learning expectations identified in the IEP and on the achievement levels outlined in this document. If some of the student's learning expectations for a course are modified but the student is working towards a credit for the course, it is sufficient simply to check the IEP box on the Provincial Report Card. If, however, the student's learning expectations are modified to such an extent that the principal deems that a credit will not be granted for the course, the IEP box must be checked and the appropriate statement from the *Guide to the Provincial*

Report Card, Grades 9–12, 1999 (p. 8) must be inserted. The teacher's comments should include relevant information on the student's demonstrated learning of the modified expectations, as well as next steps for the student's learning in the course.

PROGRAM CONSIDERATIONS FOR ENGLISH LANGUAGE LEARNERS

Ontario schools have some of the most multilingual student populations in the world. The first language of approximately 20 per cent of the students in Ontario's English language schools is a language other than English. Ontario's linguistic heritage includes several Aboriginal languages and many African, Asian, and European languages. It also includes some varieties of English – also referred to as dialects – that differ significantly from the English required for success in Ontario schools. Many English language learners were born in Canada and have been raised in families and communities in which languages other than English, or varieties of English that differ from the language used in the classroom, are spoken. Other English language learners arrive in Ontario as newcomers from other countries; they may have experience of highly sophisticated educational systems, or they may have come from regions where access to formal schooling was limited.
When they start school in Ontario, many of these students are entering a new linguistic and cultural environment. All teachers share in the responsibility for these students' English language development.

English language learners (students who are learning English as a second or additional language in English language schools) bring a rich diversity of background knowledge and experience to the classroom. These students' linguistic and cultural backgrounds not only support their learning in their new environment but also become a cultural asset in the classroom community. Teachers will find positive ways to incorporate this diversity into their instructional programs and into the classroom environment.

Most English language learners in Ontario schools have an age-appropriate proficiency in their first language. Although they need frequent opportunities to use English at school, there are important educational and social benefits associated with continued development of their first language while they are learning English. Teachers need to encourage parents to continue to use their own language at home in rich and varied ways as a foundation for language and literacy development in English. It is also important for teachers to find opportunities to bring students' languages into the classroom, using parents and community members as a resource.

During their first few years in Ontario schools, English language learners may receive support through one of two distinct programs from teachers who specialize in meeting their language-learning needs:

- **English as a Second Language (ESL)** programs are for students born in Canada or newcomers whose first language is a language other than English, or is a variety of English significantly different from that used for instruction in Ontario schools.
- **English Literacy Development (ELD)** programs are primarily for newcomers whose first language is a language other than English, or is a variety of English significantly different from that used for instruction in Ontario schools, and who arrive with significant gaps in their education. These students generally come from countries where access to education is limited or where there are limited opportunities to develop language and literacy skills in any language. Some Aboriginal students from remote communities in Ontario may also have had limited opportunities for formal schooling, and they also may benefit from ELD instruction.

In planning programs for students with linguistic backgrounds other than English, teachers need to recognize the importance of the orientation process, understanding that every learner needs to adjust to the new social environment and language in a unique way and at an individual pace. For example, students who are in an early stage of English language acquisition may go through a "silent period" during which they closely observe the interactions and physical surroundings of their new learning environment. They may use body language rather than speech or they may use their first language until they have gained enough proficiency in English to feel confident of their interpretations and responses. Students thrive in a safe, supportive, and welcoming environment that nurtures their self-confidence while they are receiving focused literacy instruction. When they are ready to participate, in paired, small-group, or whole-class activities, some students will begin by using a single word or phrase to communicate a thought, while others will speak quite fluently.

With exposure to the English language in a supportive learning environment, most young children will develop oral fluency quite quickly, making connections between concepts and skills acquired in their first language and similar concepts and skills presented in English. However, oral fluency is not a good indicator of a student's knowledge of vocabulary or sentence structure, reading comprehension, or other aspects of language proficiency that play an important role in literacy development and academic success. Research has shown that it takes five to seven years for most English language learners to catch up to their English-speaking peers in their ability to use English for academic purposes. Moreover, the older the children are when they arrive, the greater the amount of language knowledge and skills that they have to catch up on, and the more direct support they require from their teachers.

Responsibility for students' English-language development is shared by the classroom teacher, the ESL/ELD teacher (where available), and other school staff. Volunteers and peers may also be helpful in supporting English language learners in the language classroom. Teachers must adapt the instructional program in order to facilitate the success of these students in their classrooms. Appropriate adaptations include:

- modification of some or all of the subject expectations so that they are challenging but attainable for the learner at his or her present level of English proficiency, given the necessary support from the teacher;
- use of a variety of instructional strategies (e.g., extensive use of visual cues, graphic organizers, and scaffolding; previewing of textbooks; pre-teaching of key vocabulary; peer tutoring; strategic use of students' first languages);
- use of a variety of learning resources (e.g., visual material, simplified text, bilingual dictionaries, and materials that reflect cultural diversity);
- use of assessment accommodations (e.g., granting of extra time; use of oral interviews, demonstrations or visual representations, or tasks requiring completion of graphic organizers or cloze sentences instead of essay questions and other assessment tasks that depend heavily on proficiency in English).

When learning expectations in any course are modified for an English language learner (whether the student is enrolled in an ESL or ELD course or not), this information must be clearly indicated on the student's report card.

Although the degree of program adaptation required will decrease over time, students who are no longer receiving ESL or ELD support may still need some program adaptations to be successful.

For further information on supporting English language learners, refer to *The Ontario Curriculum, Grades 9–12: English as a Second Language and English Literacy Development, 2007; English Language Learners – ESL and ELD Programs and Services: Policies and Procedures for Ontario Elementary and Secondary Schools, Kindergarten to Grade 12, 2007;* and the resource guides *Supporting English Language Learners with Limited Prior Schooling: A Practical Guide for Ontario Educators, Grades 3 to 12, 2008 and Many Roots, Many Voices: Supporting English Language Learners in Every Classroom, 2005.*

ANTIDISCRIMINATION EDUCATION IN TECHNOLOGICAL EDUCATION

The implementation of antidiscrimination principles in education influences all aspects of school life. It promotes a school climate that encourages all students to work to attain high standards, affirms the worth of all students, and helps students strengthen their sense of identity and develop a positive self-image. It encourages staff and students alike to value and show respect for diversity in the school and the wider society. It requires schools to adopt measures to provide a safe environment for learning, free from harassment, violence, and expressions of hate.

Antidiscrimination education encourages students to think critically about themselves and others in the world around them in order to promote fairness, healthy relationships, and active, responsible citizenship.

Schools have the responsibility to ensure that school–community interaction reflects the diversity in the local community and wider society. Consideration should be given to a variety of strategies for communicating and working with parents and community members from diverse groups, in order to ensure their participation in such school activities as technology fairs, plays, and teacher interviews. Families new to Canada, who may be unfamiliar with the Ontario school system, or parents of Aboriginal students may need special outreach and encouragement in order to feel comfortable in their interactions with the school.

When planning instructional activities for technological education, teachers should base their decisions on the needs of students, taking into consideration the diversity of their abilities, backgrounds, interests, and learning styles. Teaching strategies, assessment and evaluation materials, and the classroom environment should be designed to value the experiences and contributions of all people.

Participation rates in some technological education subjects tend to be higher for male students than female students. To encourage greater participation among female students, it may be helpful to offer more projects and activities that have socially meaningful applications. For example, projects to develop assistive devices, as opposed to the more traditional activity of creating robotic arms, have proved successful in engaging the interest of female students. Similarly, projects involving the construction of playground equipment as opposed to the more traditional sheds and building structures may hold more appeal for young women. Providing outreach programs and establishing study groups for young women may help them develop greater self-confidence in technological education. Technology fairs and showcase events can introduce all students to a wide range of technology activities, and may encourage an interest in technological education. Offering choices from a range of instructional activities or allowing students to select their own projects can help motivate all the students in a classroom by acknowledging the differences in their experiences, attitudes, and interests.

It is important to have open and frank discussions about the kind of workplace environment students are likely to encounter in technological fields. Inviting female and visible minority role models who have had successful careers in various technology sectors to be guest speakers, and involving female and visible minority senior students as mentors, can have a very positive impact on students. Also, exploring strategies that would enable those with different learning and social styles, including Aboriginal students and students from other minority groups, to work effectively together will help establish a more inclusive working environment.

ENVIRONMENTAL EDUCATION IN TECHNOLOGICAL EDUCATION

Environmental education is education about the environment, for the environment, and in the environment that promotes an understanding of, rich and active experience in, and an appreciation for the dynamic interactions of:

- *the Earth's physical and biological systems*
- *the dependency of our social and economic systems on these natural systems*
- *the scientific and human dimensions of environmental issues*
- *the positive and negative consequences, both intended and unintended, of the interactions between human-created and natural systems.*

--- *Shaping Our Schools, Shaping Our Future: Environmental Education in Ontario Schools* (June 2007), p. 6

As noted in *Shaping Our Schools, Shaping Our Future*, environmental education "is the responsibility of the entire education community. It is a content area and can be taught. It is an approach to critical thinking, citizenship, and personal responsibility, and can be modelled. It is a context that can enrich and enliven education in all subject areas and offer students the opportunity to develop a deeper connection with themselves, their role in society, and their interdependence on one another and the Earth's natural systems" (p. 10).

There are many opportunities to integrate environmental education into the teaching of technological education. In each of the technological education courses, the expectations in the Technology/Industry Practices, the Environment, and Society strand allow students to develop critical thinking skills and an understanding of responsible practice with respect to the environmental implications of the technology they are studying. Students analyse the impact of technology on the environment and learn about the safe handling and disposal of materials and substances used in the development of products and the provision of services. In this way, students are able to explore how simple human interactions with the environment can have significant consequences. Students will be expected to actively engage in developing and implementing strategies to reduce, reuse, and recycle materials and products, and will learn about government agencies and community partners that have developed relevant opportunities to support such practices. By identifying and implementing measures to reduce the negative effects of technology on the environment, students will be contributing to responsible environmental stewardship.

The dynamic relationships resulting from human interaction with the environment provide a rich context for developing authentic learning activities in technological education courses. Technological education projects can readily be designed to integrate content and principles relevant to environmental education. For example, students can

be engaged in constructing solar-powered devices, designing recycling centres, or creating media projects that focus on environmental awareness.

LITERACY, MATHEMATICAL LITERACY, AND INQUIRY/RESEARCH SKILLS

Literacy, mathematical literacy, and inquiry/research skills are critical to students' success in all subjects of the curriculum and in all areas of their lives.

Many of the activities and tasks that students undertake in the technological education curriculum involve the literacy skills relating to oral, written, and visual communication. For example, students use language to describe their plans and the progress of their designs and projects in both informal and formal contexts, to produce work orders, and to report on the results of their projects in presentations and technical and other reports in oral, written, graphic, and multimedia forms. Technological education also requires the use and understanding of specialized terminology. In all technological education courses, students are required to use appropriate and correct terminology, and are encouraged to use language with care and precision in order to communicate effectively.

The technological education program also builds on, reinforces, and enhances mathematical literacy. For example, clear, concise communication often involves the use of diagrams, tables, and graphs, and many components of the technological education curriculum emphasize students' ability to interpret and use symbols and charts. Students are also required to take accurate measurements, produce plans to specified dimensions, and use metric and imperial systems of measurement, as required in their particular area of study.

Inquiry and research are at the heart of learning in all subject areas. In technological education courses, students are encouraged to develop their ability to analyse the context and background of challenges and to explore a variety of possible solutions to those challenges. As students advance through the grades, they acquire the skills to locate information relevant to solving problems and addressing challenges from a variety of sources, such as books, magazines, manuals, technical reports, dictionaries, client interviews, videos, and the Internet. As students in technological education courses conduct such research, teachers should guide them in recognizing that all sources of information have a particular point of view and that the recipient of the information has a responsibility to evaluate that information, determine its validity and relevance, and use it in appropriate ways. The ability to locate, question, and evaluate information allows a student to become an independent, lifelong learner.

CAREER EDUCATION

Ongoing discoveries and innovations coupled with rapidly evolving technologies have resulted in an exciting environment in which creativity and innovation thrive, bringing about new career opportunities. Today's employers seek candidates with strong technical skills, critical-thinking and problem-solving skills, and the ability to work cooperatively in a team, traits that are developed through participation in technological education. Technological education courses enable students to develop problem-solving skills, design skills, technical knowledge and skills, and the ability to conduct research, present results, and work on projects both independently and in a team environment.

COOPERATIVE EDUCATION AND OTHER FORMS OF EXPERIENTIAL LEARNING

Cooperative education and other forms of experiential learning, such as job shadowing, field trips, and work experience, are central to technological education, enabling students to apply the skills they have developed in the classroom to real-life activities in the community and in the world of technological innovation. Cooperative education and other workplace experiences also help to broaden students' knowledge of employment opportunities in a wide range of fields, including industrial, motive power, construction, service, and agricultural trades; engineering; hospitality and tourism; and health care. In addition, students develop their understanding of workplace practices, certifications, and the nature of employer–employee relationships. Teachers of technological education can support their students' learning by maintaining links with community-based businesses to ensure that students have access to hands-on experiences that will reinforce the knowledge and skills gained in school.

Students who choose a technological education course as the related course for two cooperative education credits are able, through this packaged program, to meet the group 1, 2, and 3 compulsory credit requirements for the OSSD.

Health and safety issues must be addressed when learning involves cooperative education and other workplace experiences. Teachers who provide support for students in workplace learning placements need to assess placements for safety and ensure that students understand the importance of issues relating to health and safety in the workplace. Before taking part in workplace learning experiences, students must acquire the knowledge and skills needed for safe participation. Students must understand their rights to privacy and confidentiality as outlined in the Freedom of Information and Protection of Privacy Act. They have the right to function in an environment free from abuse and harassment, and they need to be aware of harassment and abuse issues in establishing boundaries for their own personal safety. They should be informed about school and community resources and school policies and reporting procedures with respect to all forms of abuse and harassment.

Policy/Program Memorandum No. 76A, "Workplace Safety and Insurance Coverage for Students in Work Education Programs" (September 2000), outlines procedures for ensuring the provision of Health and Safety Insurance Board coverage for students who are at least 14 years of age and are on placements of more than one day. (A one-day job-shadowing or job-twinning experience is treated as a field trip.) Teachers should also be aware of the minimum age requirements outlined in the Occupational Health and Safety Act for persons to be in or to be working in specific workplace settings. All cooperative education and other workplace experiences will be provided in accordance with the ministry's policy document *Cooperative Education and Other Forms of Experiential Learning: Policies and Procedures for Ontario Secondary Schools, 2000.*

PLANNING PROGRAM PATHWAYS AND PROGRAMS LEADING TO A SPECIALIST HIGH-SKILLS MAJOR

Technological education courses are well suited for inclusion in some programs leading to a Specialist High Skills Major (SHSM) or in programs designed to provide pathways to particular apprenticeship or workplace destinations. In some SHSM programs, technological education courses can be bundled with other courses to provide the academic knowledge and skills important to particular industry sectors and required for success in the workplace and postsecondary education, including apprenticeship. Technological education courses may also be combined with cooperative education credits to provide the workplace experience required for some SHSM programs and for various program pathways to apprenticeship and workplace destinations. SHSM programs would also include sector-specific learning opportunities offered by employers, skills-training centres, colleges, and community organizations.

APPENDIX 1 – ACHIEVEMENT CHART

Knowledge & Understanding – Subject-specific content acquired in each course (knowledge),and the comprehension of its meaning and significance (understanding)				
Categories	**50–59% (Level 1)**	**60–69% (Level 2)**	**70–79% (Level 3)**	**80–100% (Level 4)**
Knowledge of content (e.g., facts, equipment, terminology, materials)	Demonstrates limited knowledge of content	Demonstrates some knowledge of content	Demonstrates considerable knowledge of content	Demonstrates thorough knowledge of content
Understanding of content (e.g., procedures, technological concepts, processes, industry standards)	Demonstrates limited understanding of content	Demonstrates some understanding of content	Demonstrates considerable understanding of content	Demonstrates thorough understanding of content
Thinking and Investigation – The use of critical and creative thinking skills and/or processes				
Categories	**50–59% (Level 1)**	**60–69% (Level 2)**	**70–79% (Level 3)**	**80–100% (Level 4)**
Use of planning skills (e.g., identifying the problem, selecting strategies and resources, scheduling)	Uses planning skills with limited effectiveness	Uses planning skills with some effectiveness	Uses planning skills with considerable effectiveness	Uses planning skills with a high degree of effectiveness
Use of processing skills (e.g., analysing and interpreting information, reasoning, generating and evaluating solutions, forming conclusions)	Uses processing skills with limited effectiveness	Uses processing skills with some effectiveness	Uses processing skills with considerable effectiveness	Uses processing skills with a high degree of effectiveness
Use of critical/creative thinking processes (e.g., problem-solving, design, and decision-making processes)	Uses critical/creative thinking processes with limited effectiveness	Uses critical/creative thinking processes with some effectiveness	Uses critical/creative thinking processes with considerable effectiveness	Uses critical/creative thinking processes with a high degree of effectiveness

Communication – The conveying of meaning through various forms				
Categories	**50–59% (Level 1)**	**60–69% (Level 2)**	**70–79% (Level 3)**	**80–100% (Level 4)**
Expression and organization of ideas and information (e.g., clear expression, logical organization) **in oral, visual, and/or written forms, including electronic forms**	Expresses and organizes ideas and information with limited effectiveness	Expresses and organizes ideas and information with some effectiveness	Expresses and organizes ideas and information with considerable effectiveness	Expresses and organizes ideas and information with a high degree of effectiveness
Communication for different audiences and purposes in oral, visual, and/or written forms	Communicates for different audiences and purposes with limited effectiveness	Communicates for different audiences and purposes with some effectiveness	Communicates for different audiences and purposes with considerable effectiveness	Communicates for different audiences and purposes with a high degree of effectiveness
Use of conventions (e.g., standards/symbols, units of measurement, acronyms), **vocabulary, and terminology of the discipline in oral, visual, and/or written forms**	Uses conventions, vocabulary, and terminology with limited effectiveness	Uses conventions, vocabulary, and terminology with some effectiveness	Uses conventions, vocabulary, and terminology with considerable effectiveness	Uses conventions, vocabulary, and terminology with a high degree of effectiveness
Application – The use of knowledge and skills to make connections within and between various contexts				
Categories	**50–59% (Level 1)**	**60–69% (Level 2)**	**70–79% (Level 3)**	**80–100% (Level 4)**
Application of knowledge and skills (e.g., concepts, procedures, processes, use of technology and materials) **in familiar contexts**	Applies knowledge and skills in familiar contexts with limited effectiveness	Applies knowledge and skills in familiar contexts with some effectiveness	Applies knowledge and skills in familiar contexts with considerable effectiveness	Applies knowledge and skills in familiar contexts with a high degree of effectiveness
Transfer of knowledge and skills (e.g., concepts, processes, use of equipment and technology) **to new contexts**	Transfers knowledge and skills to new contexts with limited effectiveness	Transfers knowledge and skills to new contexts with some effectiveness	Transfers knowledge and skills to new contexts with considerable effectiveness	Transfers knowledge and skills to new contexts with a high degree of effectiveness
Making connections within and between various contexts (e.g., between disciplines; between technology, the environment, and society; between school and future opportunities)	Makes connections within and between various contexts with limited effectiveness	Makes connections within and between various contexts with some effectiveness	Makes connections within and between various contexts with considerable effectiveness	Makes connections within and between various contexts with a high degree of effectiveness

APPENDIX 2 - LEARNING SKILLS & WORK HABITS

LEARNING SKILLS AND WORK HABITS IN GRADES 1 TO 12

Learning Skills and Work Habits	Sample Behaviours
Responsibility	The student: • fulfils responsibilities and commitments within the learning environment; • completes and submits class work, homework, and assignments according to agreed-upon timelines; • takes responsibility for and manages own behaviour.
Organization	The student: • devises and follows a plan and process for completing work and tasks; • establishes priorities and manages time to complete tasks and achieve goals; • identifies, gathers, evaluates, and uses information, technology, and resources to complete tasks.
Independent Work	The student: • independently monitors, assesses, and revises plans to complete tasks and meet goals; • uses class time appropriately to complete tasks; • follows instructions with minimal supervision.
Collaboration	The student: • accepts various roles and an equitable share of work in a group; • responds positively to the ideas, opinions, values, and traditions of others; • builds healthy peer-to-peer relationships through personal and media-assisted interactions; • works with others to resolve conflicts and build consensus to achieve group goals; • shares information, resources, and expertise and promotes critical thinking to solve problems and make decisions.
Initiative	The student: • looks for and acts on new ideas and opportunities for learning; • demonstrates the capacity for innovation and a willingness to take risks; • demonstrates curiosity and interest in learning; • approaches new tasks with a positive attitude; • recognizes and advocates appropriately for the rights of self and others.
Self-regulation	The student: • sets own individual goals and monitors progress towards achieving them; • seeks clarification or assistance when needed; • assesses and reflects critically on own strengths, needs, and interests; • identifies learning opportunities, choices, and strategies to meet personal needs and achieve goals; • perseveres and makes an effort when responding to challenges.

APPENDIX 3 - RESOURCE LIST

The Ontario Curriculum Grade 9 and 10 Technological Education (revised), published 2009.