

# Communication Technology 7

*Curriculum Guide 2023*



## ***Department of Education Vision Statement***

***Building an educational community in Newfoundland and Labrador that fosters safe, inclusive, and healthy learning environments for all educators and students in the early learning, K-12 and post-secondary education systems.***

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# Section One: Newfoundland and Labrador Curriculum

## Introduction

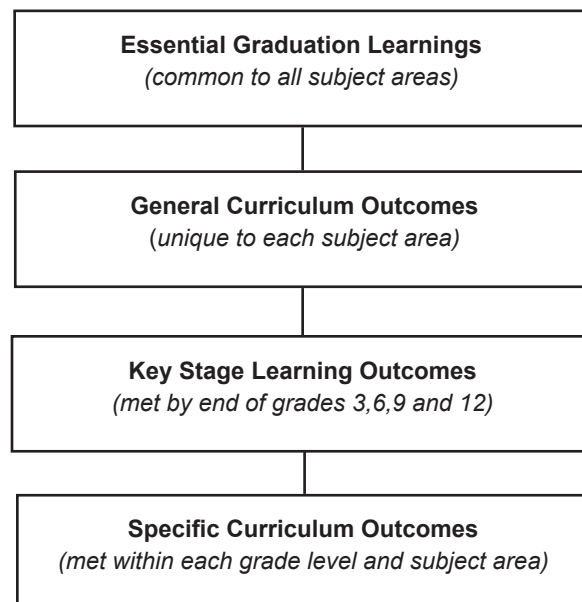
There are multiple factors that impact education: technological developments, increased emphasis on accountability, and globalization. These factors point to the need to consider carefully the education students receive.

The Newfoundland and Labrador Department of Education believes that curriculum design with the following characteristics will help teachers address the needs of students served by the provincially prescribed curriculum:

- Curriculum guides must clearly articulate what students are expected to know and be able to do by the time they graduate from high school.
- There must be purposeful assessment of students' performance in relation to the curriculum outcomes.

## Outcomes Based Education

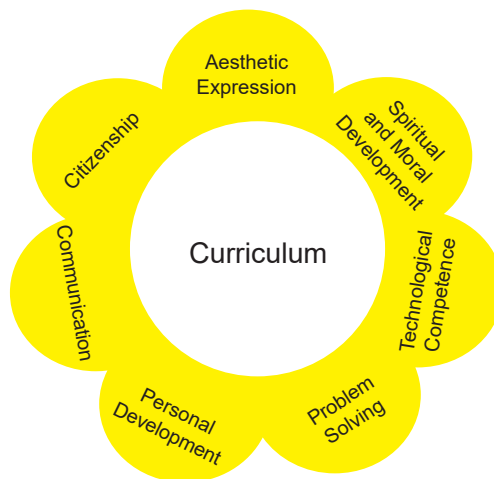
The K-12 curriculum in Newfoundland and Labrador is organized by outcomes and is based on *The Atlantic Canada Framework for Essential Graduation Learning in Schools* (1997). This framework consists of Essential Graduation Learnings (EGLs), General Curriculum Outcomes (GCOs), Key Stage Curriculum Outcomes (KSCOs) and Specific Curriculum Outcomes (SCOs).



### *Essential Graduation Learnings*

EGLs provide vision for the development of a coherent and relevant curriculum. They are statements that offer students clear goals and a powerful rationale for education. The EGLs are delineated by general, key stage, and specific curriculum outcomes.

EGLs describe the knowledge, skills, and attitudes expected of all students who graduate from high school. Achievement of the EGLs will prepare students to continue to learn throughout their lives. EGLs describe expectations, not in terms of individual subject areas, but in terms of knowledge, skills, and attitudes developed throughout the K-12 curriculum. They confirm that students need to make connections and develop abilities across subject areas if they are to be ready to meet the shifting and ongoing demands of life, work, and study.



***Aesthetic Expression*** – Graduates will be able to respond with critical awareness to various forms of the arts and be able to express themselves through the arts.

***Citizenship*** – Graduates will be able to assess social, cultural, economic, and environmental interdependence in a local and global context.

***Communication*** – Graduates will be able to use the listening, viewing, speaking, reading and writing modes of language(s), and mathematical and scientific concepts and symbols, to think, learn and communicate effectively.

***Problem Solving*** – Graduates will be able to use the strategies and processes needed to solve a wide variety of problems, including those requiring language, and mathematical and scientific concepts.

***Personal Development*** – Graduates will be able to continue to learn and to pursue an active, healthy lifestyle.

***Spiritual and Moral Development*** – Graduates will demonstrate understanding and appreciation for the place of belief systems in shaping the development of moral values and ethical conduct.

***Technological Competence*** – Graduates will be able to use a variety of technologies, demonstrate an understanding of technological applications, and apply appropriate technologies for solving problems.

## Curriculum Outcomes

Curriculum outcomes are statements that articulate what students are expected to know and be able to do in each program area in terms of knowledge, skills, and attitudes.

Curriculum outcomes may be subdivided into General Curriculum Outcomes, Key Stage Curriculum Outcomes, and Specific Curriculum Outcomes.

### **General Curriculum Outcomes (GCOs)**

Each program has a set of GCOs which describe what knowledge, skills, and attitudes students are expected to demonstrate as a result of their cumulative learning experiences within a subject area. GCOs serve as conceptual organizers or frameworks which guide study within a program area. Often, GCOs are further delineated into KSCOs.

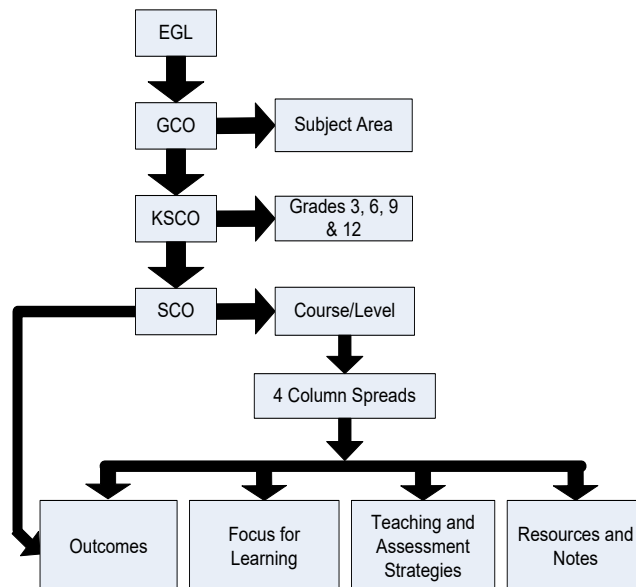
### **Key Stage Curriculum Outcomes (KSCOs)**

Key Stage Curriculum Outcomes (KSCOs) summarize what is expected of students at each of the four key stages of grades three, six, nine, and twelve.

### **Specific Curriculum Outcomes (SCOs)**

SCOs set out what students are expected to know and be able to do as a result of their learning experiences in a course, at a specific grade level. In some program areas, SCOs are further articulated into delineations. *It is expected that all SCOs will be addressed during the course of study covered by the curriculum guide.*

## EGLs to Curriculum Guides



## Context for Teaching and Learning

Teachers are responsible to help students achieve outcomes. This responsibility is a constant in a changing world. As programs change over time so does educational context. Several factors make up the educational context in Newfoundland and Labrador today: inclusive education, support for gradual release of responsibility teaching model, focus on literacy and learning skills in all programs, and support for education for sustainable development.

### Inclusive Education

#### *Valuing Equity and Diversity*

*Effective inclusive schools have the following characteristics: supportive environment, positive relationships, feelings of competence, and opportunities to participate. (The Centre for Inclusive Education, 2009)*

All students need to see their lives and experiences reflected in their school community. It is important that the curriculum reflect the experiences and values of all genders and that learning resources include and reflect the interests, achievements, and perspectives of all students. An inclusive classroom values the varied experiences and abilities as well as social and ethno-cultural backgrounds of all students while creating opportunities for community building. Inclusive policies and practices promote mutual respect, positive interdependencies, and diverse perspectives. Learning resources should include a range of materials that allow students to consider many viewpoints and to celebrate the diverse aspects of the school community.



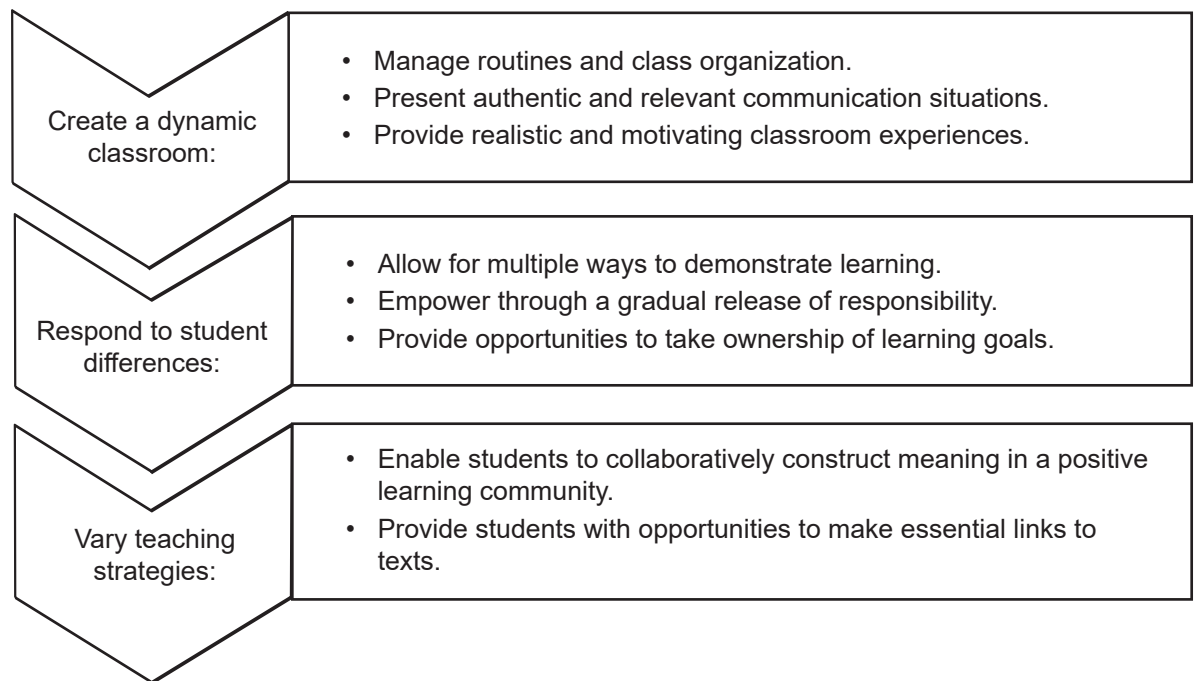
## Differentiated Instruction

*Differentiated instruction is a teaching philosophy based on the premise that teachers should adapt instruction to student differences. Rather than marching students through the curriculum lockstep, teachers should modify their instruction to meet students' varying readiness levels, learning preferences, and interests. Therefore, the teacher proactively plans a variety of ways to 'get it' and express learning. (Carol Ann Tomlinson, 2008)*

Curriculum is designed and implemented to provide learning opportunities for all students according to abilities, needs, and interests. Teachers must be aware of and responsive to the diverse range of learners in their classes. Differentiated instruction is a useful tool in addressing this diversity.

Differentiated instruction responds to different readiness levels, abilities, and learning profiles of students. It involves actively planning so that the process by which content is delivered, the way the resource is used, and the products students create are in response to the teacher's knowledge of whom he or she is interacting with. Learning environments should be flexible to accommodate various learning preferences of the students. Teachers continually make decisions about selecting teaching strategies and structuring learning activities that provide all students with a safe and supportive place to learn and succeed.

### Planning for Differentiation



## Differentiating the Content

Differentiating content requires teachers to pre-assess students to identify those who require prerequisite instruction, as well as those who have already mastered the concept and may therefore apply strategies learned to new situations. Another way to differentiate content is to permit students to adjust the pace at which they progress through the material. Some students may require additional time while others will move through at an increased pace and thus create opportunities for enrichment or more in-depth consideration of a topic of particular interest.

Teachers should consider the following examples of differentiating content:

- Meet with small groups to reteach an idea or skill or to extend the thinking or skills.
- Present ideas through auditory, visual, and tactile means.
- Use reading materials such as novels, websites, and other reference materials at varying reading levels.

### *Differentiating the Process*

Differentiating the process involves varying learning activities or strategies to provide appropriate methods for students to explore and make sense of concepts. A teacher might assign all students the same product (e.g., presenting to peers) but the process students use to create the presentation may differ. Some students could work in groups while others meet with the teacher individually. The same assessment criteria can be used for all students.

Teachers should consider flexible grouping of students such as whole class, small group, or individual instruction. Students can be grouped according to their learning styles, readiness levels, interest areas, and/or the requirements of the content or activity presented. Groups should be formed for specific purposes and be flexible in composition and short-term in duration.

Teachers should consider the following examples of differentiating the process:

- Offer hands-on activities for students.
- Provide activities and resources that encourage students to further explore a topic of particular interest.
- Use activities in which all learners work with the same learning outcomes but proceed with different levels of support, challenge, or complexity.

### *Differentiating the Product*

Differentiating the product involves varying the complexity and type of product that students create to demonstrate learning outcomes. Teachers provide a variety of opportunities for students to demonstrate and show evidence of what they have learned.

Teachers should give students options to demonstrate their learning (e.g., create an online presentation, write a letter, or develop a mural). This will lead to an increase in student engagement.

## *Differentiating the Learning Environment*

The learning environment includes the physical and the affective tone or atmosphere in which teaching and learning take place, and can include the noise level in the room, whether student activities are static or mobile, or how the room is furnished and arranged. Classrooms may include tables of different shapes and sizes, space for quiet individual work, and areas for collaboration.

Teachers can divide the classroom into sections, create learning centres, or have students work both independently and in groups. The structure should allow students to move from whole group, to small group, pairs, and individual learning experiences and support a variety of ways to engage in learning. Teachers should be sensitive and alert to ways in which the classroom environment supports their ability to interact with students.

Teachers should consider the following examples of differentiating the learning environment:

- Develop routines that allow students to seek help when teachers are with other students and cannot provide immediate attention.
- Ensure there are places in the room for students to work quietly and without distraction, as well as places that invite student collaboration.
- Establish clear guidelines for independent work that match individual needs.
- Provide materials that reflect diversity of student background, interests, and abilities.

The physical learning environment must be structured in such a way that all students can gain access to information and develop confidence and competence.

## *Meeting the Needs of Students with Exceptionalities*

All students have individual learning needs. Some students, however, have exceptionalities (defined by the Department of Education) which impact their learning. The majority of students with exceptionalities access the prescribed curriculum. For details of these exceptionalities see [www.gov.nl.ca/edu/k12/studentsupportservices/exceptionalities.html](http://www.gov.nl.ca/edu/k12/studentsupportservices/exceptionalities.html)

Supports for these students may include

1. Accommodations
2. Modified Prescribed Courses
3. Alternate Courses
4. Alternate Programs
5. Alternate Curriculum

For further information, see Service Delivery Model for Students with Exceptionalities at [www.cdli.ca/sdm/](http://www.cdli.ca/sdm/)

Classroom teachers should collaborate with instructional resource teachers to select and develop strategies which target specific learning needs.

*Meeting the Needs  
of Students who are  
Highly Able  
(includes gifted and  
talented)*

Some students begin a course or topic with a vast amount of prior experience and knowledge. They may know a large portion of the material before it is presented to the class or be capable of processing it at a rate much faster than their classmates. All students are expected to move forward from their starting point. Many elements of differentiated instruction are useful in addressing the needs of students who are highly able.

Teachers may

- assign independent study to increase depth of exploration in an area of particular interest;
- compact curriculum to allow for an increased rate of content coverage commensurate with a student's ability or degree of prior knowledge;
- group students with similar abilities to provide the opportunity for students to work with their intellectual peers and elevate discussion and thinking, or delve deeper into a particular topic; and
- tier instruction to pursue a topic to a greater depth or to make connections between various spheres of knowledge.

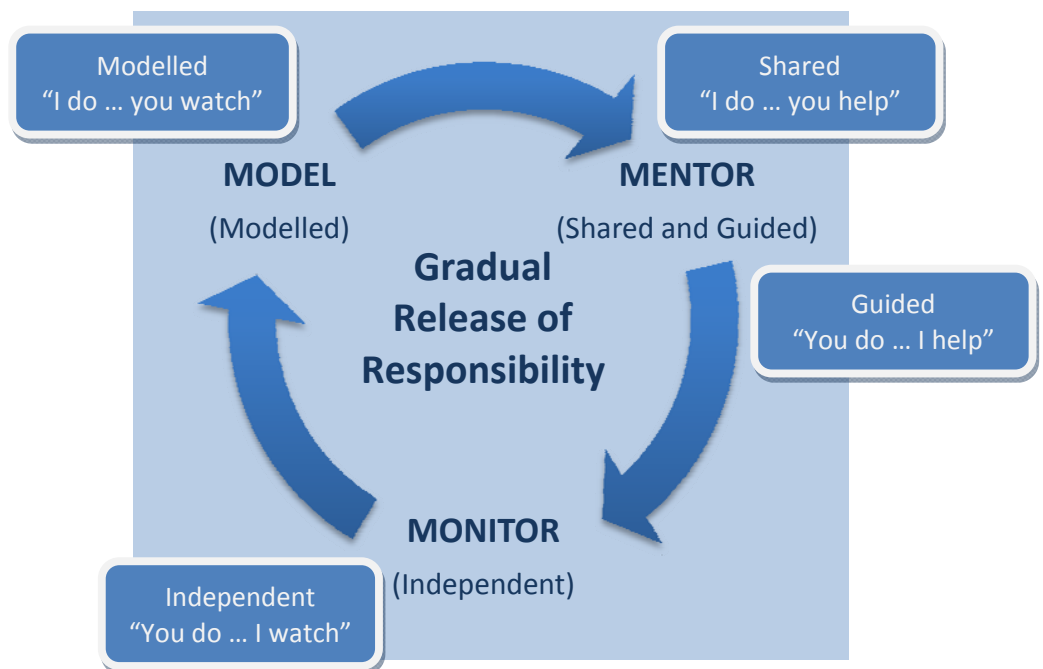
Highly able students require the opportunity for authentic investigation to become familiar with the tools and practices of the field of study. Authentic audiences and tasks are vital for these learners. Some highly able learners may be identified as gifted and talented in a particular domain. These students may also require supports through the Service Delivery Model for Students with Exceptionalities.



## *Gradual Release of Responsibility*

Teachers must determine when students can work independently and when they require assistance. In an effective learning environment, teachers choose their instructional activities to model and scaffold composition, comprehension, and metacognition that is just beyond the students' independence level. In the gradual release of responsibility approach, students move from a high level of teacher support to independent work. If necessary, the teacher increases the level of support when students need assistance. The goal is to empower students with their own learning strategies, and to know how, when, and why to apply them to support their individual growth. Guided practice supports student independence. As a student demonstrates success, the teacher should gradually decrease his or her support.

### *Gradual Release of Responsibility Model*



# Literacy

*“Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society”. To be successful, students require a set of interrelated skills, strategies and knowledge in multiple literacies that facilitate their ability to participate fully in a variety of roles and contexts in their lives, in order to explore and interpret the world and communicate meaning. (The Plurality of Literacy and its Implications for Policies and Programmes, 2004, p.13)*

Literacy is

- a process of receiving information and making meaning from it; and
- the ability to identify, understand, interpret, communicate, compute, and create text, images, and sounds.

Literacy development is a lifelong learning enterprise beginning at birth that involves many complex concepts and understandings. It is not limited to the ability to read and write; no longer are we exposed only to printed text. It includes the capacity to learn to communicate, read, write, think, explore, and solve problems. Individuals use literacy skills in paper, digital, and live interactions to engage in a variety of activities:

- Analyze critically and solve problems.
- Comprehend and communicate meaning.
- Create a variety of texts.
- Make connections both personally and inter-textually.
- Participate in the socio-cultural world of the community.
- Read and view for enjoyment.
- Respond personally.

These expectations are identified in curriculum documents for specific subject areas as well as in supporting documents, such as *Cross-Curricular Reading Tools* (CAMET).

With modelling, support, and practice, students’ thinking and understandings are deepened as they work with engaging content and participate in focused conversations.

## Reading in the Content Areas

The focus for reading in the content areas is on teaching strategies for understanding content. Teaching strategies for reading comprehension benefits all students as they develop transferable skills that apply across curriculum areas.

When interacting with different texts, students must read words, view and interpret text features, and navigate through information presented in a variety of ways including, but not limited to

Advertisements	Movies	Poems
Blogs	Music videos	Songs
Books	Online databases	Speeches
Documentaries	Plays	Video games
Magazine articles	Podcasts	Websites

Students should be able to interact with and comprehend different texts at different levels.

There are three levels of text comprehension:

- Independent level – Students are able to read, view, and understand texts without assistance.
- Instructional level – Students are able to read, view, and understand most texts but need assistance to fully comprehend some texts.
- Frustration level – Students are not able to read or view with understanding (i.e., texts may be beyond their current reading level).

Teachers will encounter students working at all reading levels in their classrooms and will need to differentiate instruction to meet their needs. For example, print texts may be presented in audio form, physical movement may be associated with synthesizing new information with prior knowledge, or graphic organizers may be created to present large amounts of print text in a visual manner.

When interacting with information that is unfamiliar to students, it is important for teachers to monitor how effectively students are using strategies to read and view texts:

- Analyze and think critically about information.
- Determine importance to prioritize information.
- Engage in questioning before, during, and after an activity related to a task, text, or problem.
- Make inferences about what is meant but not said.
- Make predictions.
- Synthesize information to create new meaning.
- Visualize ideas and concepts.

## Learning Skills for Generation Next

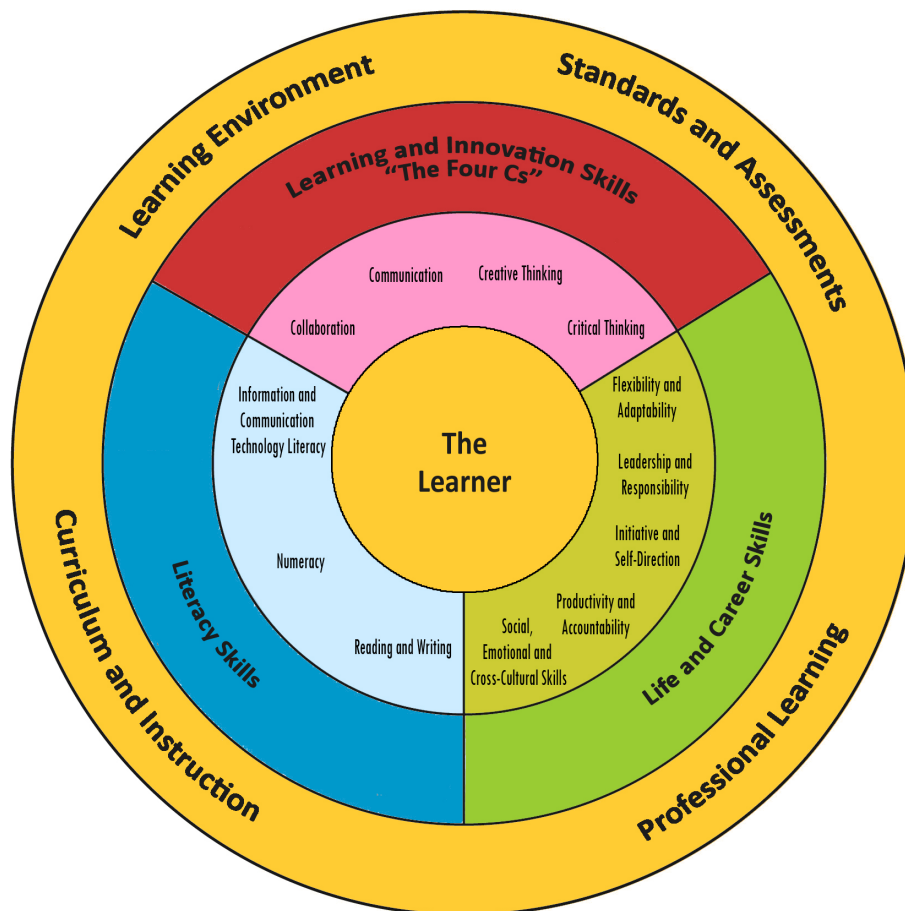
*Generation Next is the group of students who have not known a world without personal computers, cell phones, and the Internet. They were born into this technology. They are digital natives.*

Students need content and skills to be successful. Education helps students learn content and develop skills needed to be successful in school and in all learning contexts and situations. Effective learning environments and curricula challenge learners to develop and apply key skills within the content areas and across interdisciplinary themes.

Learning Skills for Generation Next encompasses three broad areas:

- Learning and Innovation Skills enhance a person's ability to learn, create new ideas, problem solve, and collaborate.
- Life and Career Skills address leadership, and interpersonal and affective domains.
- Literacy Skills develop reading, writing, and numeracy, and enhance the use of information and communication technology.

The diagram below illustrates the relationship between these areas. A 21<sup>st</sup> century curriculum employs methods that integrate innovative and research-driven teaching strategies, modern learning technologies, and relevant resources and contexts.



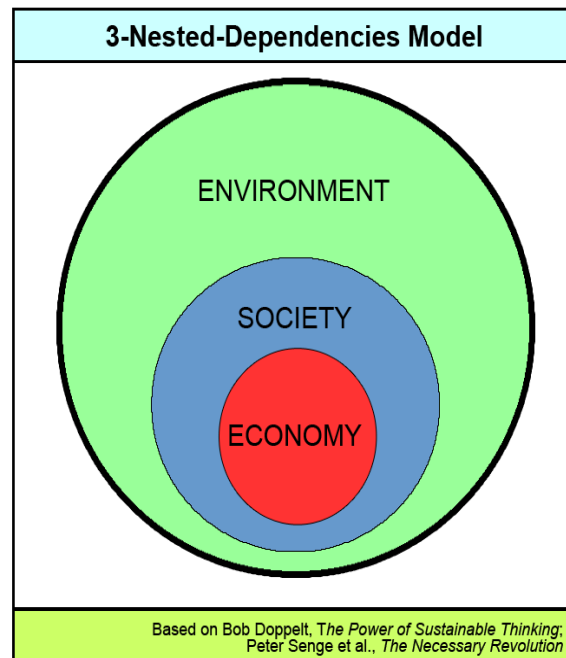
Support for students to develop these abilities and skills is important across curriculum areas and should be integrated into teaching, learning, and assessment strategies. Opportunities for integration of these skills and abilities should be planned with engaging and experiential activities that support the gradual release of responsibility model. For example, lessons in a variety of content areas can be infused with learning skills for Generation Next by using open-ended questioning, role plays, inquiry approaches, self-directed learning, student role rotation, and Internet-based technologies.

All programs have a shared responsibility in developing students' capabilities within all three skill areas.

## Education for Sustainable Development

*Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. (Our Common Future, 43)*

Sustainable development is comprised of three integrally connected areas: economy, society, and environment.



As conceived by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) the overall goal of Education for Sustainable Development (ESD) is to integrate the knowledge, skills, values, and perspectives of sustainable development into all aspects of education and learning. Changes in human behaviour should create a more sustainable future that supports environmental integrity and economic viability, resulting in a just society for all generations.

ESD involves teaching *for* rather than teaching *about* sustainable development. In this way students develop the skills, attitudes, and perspectives to meet their present needs without compromising the ability of future generations to meet their needs.

Within ESD, the knowledge component spans an understanding of the interconnectedness of our political, economic, environmental, and social worlds, to the role of science and technology in the development of societies and their impact on the environment. The skills necessary include being able to assess bias, analyze consequences of choices, ask questions, and solve problems. ESD values and perspectives include an appreciation for the interdependence of all life forms, the importance of individual responsibility and action, an understanding of global issues as well as local issues in a global context. Students need to be aware that every issue has a history, and that many global issues are linked.

# Assessment and Evaluation

## Assessment

Assessment is the process of gathering information on student learning.

How learning is assessed and evaluated and how results are communicated send clear messages to students and others about what is valued.

Assessment instruments are used to gather information for evaluation. Information gathered through assessment helps teachers determine students' strengths and needs, and guides future instruction.

Teachers are encouraged to be flexible in assessing student learning and to seek diverse ways students might demonstrate what they know and are able to do.

Evaluation involves the weighing of the assessment information against a standard in order to make a judgement about student achievement.

Assessment can be used for different purposes:

1. Assessment *for* learning guides and informs instruction.
2. Assessment *as* learning focuses on what students are doing well, what they are struggling with, where the areas of challenge are, and what to do next.
3. Assessment *of* learning makes judgements about student performance in relation to curriculum outcomes.

### *1. Assessment for Learning*

Assessment *for* learning involves frequent, interactive assessments designed to make student learning visible. This enables teachers to identify learning needs and adjust teaching accordingly.

Assessment *for* learning is not about a score or mark; it is an ongoing process of teaching and learning:

- Pre-assessments provide teachers with information about what students already know and can do.
- Self-assessments allow students to set goals for their own learning.
- Assessment *for* learning provides descriptive and specific feedback to students and parents regarding the next stage of learning.
- Data collected during the learning process from a range of tools enables teachers to learn as much as possible about what a student knows and is able to do.

## *2. Assessment as Learning*

Assessment *as* learning involves students' reflecting on their learning and monitoring their own progress. It focuses on the role of the student in developing metacognition and enhances engagement in their own learning. Students can

- analyze their learning in relation to learning outcomes,
- assess themselves and understand how to improve performance,
- consider how they can continue to improve their learning, and
- use information gathered to make adaptations to their learning processes and to develop new understandings.

## *3. Assessment of Learning*

Assessment *of* learning involves strategies designed to confirm what students know in terms of curriculum outcomes. It also assists teachers in determining student proficiency and future learning needs. Assessment *of* learning occurs at the end of a learning experience and contributes directly to reported results. Traditionally, teachers relied on this type of assessment to make judgements about student performance by measuring learning after the fact and then reporting it to others. Used in conjunction with the other assessment processes previously outlined, assessment *of* learning is strengthened. Teachers can

- confirm what students know and can do;
- report evidence to parents/guardians, and other stakeholders, of student achievement in relation to learning outcomes; and
- report on student learning accurately and fairly using evidence obtained from a variety of contexts and sources.

## *Involving Students in the Assessment Process*

Students should know what they are expected to learn as outlined in the specific curriculum outcomes of a course as well as the criteria that will be used to determine the quality of their achievement. This information allows students to make informed choices about the most effective ways to demonstrate what they know and are able to do.

It is important that students participate actively in assessment by co-creating criteria and standards which can be used to make judgements about their own learning. Students may benefit from examining various scoring criteria, rubrics, and student exemplars.

Students are more likely to perceive learning as its own reward when they have opportunities to assess their own progress. Rather than asking teachers, "What do you want?", students should be asking themselves questions:

- What have I learned?
- What can I do now that I couldn't do before?
- What do I need to learn next?

Assessment must provide opportunities for students to reflect on their own progress, evaluate their learning, and set goals for future learning.



## *Assessment Tools*

In planning assessment, teachers should use a broad range of tools to give students multiple opportunities to demonstrate their knowledge, skills, and attitudes. The different levels of achievement or performance may be expressed as written or oral comments, ratings, categorizations, letters, numbers, or as some combination of these forms.

The grade level and the activity being assessed will inform the types of assessment tools teachers will choose:

Anecdotal Records	Photographic Documentation
Audio/Video Clips	Podcasts
Case Studies	Portfolios
Checklists	Presentations
Conferences	Projects
Debates	Questions
Demonstrations	Quizzes
Exemplars	Role Plays
Graphic Organizers	Rubrics
Journals	Self-assessments
Literacy Profiles	Tests
Observations	Wikis

## *Assessment Guidelines*

Assessments should measure what they intend to measure. It is important that students know the purpose, type, and potential marking scheme of an assessment. The following guidelines should be considered:

- Collect evidence of student learning through a variety of methods; do not rely solely on tests and paper and pencil activities.
- Develop a rationale for using a particular assessment of learning at a specific point in time.
- Provide descriptive and individualized feedback to students.
- Provide students with the opportunity to demonstrate the extent and depth of their learning.
- Set clear targets for student success using learning outcomes and assessment criteria.
- Share assessment criteria with students so that they know the expectations.

## *Evaluation*

Evaluation is the process of analyzing, reflecting upon, and summarizing assessment information, and making judgements or decisions based on the information gathered. Evaluation is conducted within the context of the outcomes, which should be clearly understood by learners before teaching and evaluation take place. Students must understand the basis on which they will be evaluated and what teachers expect of them.

During evaluation, the teacher interprets the assessment information, makes judgements about student progress, and makes decisions about student learning programs.

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## Section Two: Curriculum Design

### Rationale

Technological competence is one of the Essential Graduation Learnings common to all program areas in the Newfoundland and Labrador curriculum. The International Society for Technology in Education (ISTE) outlines Empowered Learner, Knowledge Constructor, Innovative Designer and Creative Communicator as four of its seven standards for students. In addition, the Conference Board of Canada Employability Skills Profile lists the ability to communicate, manage information, use numbers and think and solve problems as fundamental employability skills. Technology has become increasingly ubiquitous in the day to day lives of students and learning how to manage information through technology is an essential form of communication.

### Curriculum Overview Technology 7

Technology Education engages students directly in constructing technological solutions to everyday, real-world problems. Technology Education employs a wide variety of hands-on activities. Students are exposed to a broad range of technological issues, systems, and problem situations in a systemic, systematic fashion. They employ a wide range of technological resources and processes to design, fabricate, and test solutions to familiar and unfamiliar problems. Outcomes, learning experiences, and evaluation of student achievement are designed for engagement. Technology Education provides a naturally integrative function that helps students identify contextual relationships between technological activity and principles, and the underlying scientific, mathematical, and other concepts, principles, laws, and theories.

### Communication Technology 7

This communications technology module is designed to help intermediate students build practical skills in the production of multimedia artifacts. While building new skills students will create audio and video productions. They will also create original graphics and animations. In the final unit of the course students will use these new skills to solve authentic problems and create multimedia products with a specific purpose.

## Curriculum Outcome Framework

### General Curriculum Outcomes (GCOs)

The foundation of the curriculum outcomes framework is the general curriculum outcomes (GCOs). Five general curriculum outcomes have been identified to delineate the five critical aspects of Technology Education. These five GCOs are common to all Technology Education courses in Newfoundland and Labrador.

#### GCO 1: Technological Problem Solving

Students will be expected to design, develop, evaluate, and articulate technological solutions.

#### GCO 2: Technological Systems

Students will be expected to operate and manage technological systems.

#### GCO 3: History and Evolution of Technology

Students will be expected to demonstrate an understanding of the history and evolution of technology, and of its social and cultural implications.

#### GCO 4: Technology and Careers

Students will be expected to demonstrate an understanding of current and evolving careers and the influence of technology on the nature of work.

#### GCO 5: Technological Responsibility

Students will be expected to demonstrate an understanding of the consequences of their technological choices.

### Key Stage Curriculum Outcomes

The Key stage curriculum outcomes, based on the general curriculum outcomes, identify what students are expected to know and be able to do at the end of the primary/elementary, intermediate and high school grades in order to meet the essential graduation learnings. Key stage outcomes are identified for each of the dimensions. These key stage curriculum outcomes serve as the basis for the development of specific programs and courses for Technology Education.

Key Stage Curriculum Outcomes (KSCOs). By the end of grade 9 students will be expected to:

### GCO 1: Technological Problem Solving

[1.301] articulate problems that may be solved through technological means

- examine problem situations
- construct simple design briefs that include the problem statement and conditions affecting the solution

[1.302] conduct design studies to identify a technological solution to a problem

- investigate related solutions
- document a range of options to solve the problem
- determine and justify the best option
- create a plan of action that includes technical sketches

	<p>[1.303] develop (prototype, fabricate, make) technological solutions to problems</p> <ul style="list-style-type: none"> <li>• identify appropriate tools and resources</li> <li>• employ safe practices and resource conservation</li> <li>• develop the solution with redesign as necessary to ensure the design brief is satisfied</li> <li>• document all activities and decisions</li> </ul> <p>[1.304] critically evaluate technological solutions and report their findings</p> <ul style="list-style-type: none"> <li>• use established and their own criteria to evaluate the effectiveness of both their own and others' technological solutions</li> <li>• assess solution components and incorporate the required changes during the design activity</li> <li>• document and report their changes, the rationale for change, and conclusions.</li> </ul> <p>[1.305] communicate ideas and information about technological solutions through appropriate technical means</p> <ul style="list-style-type: none"> <li>• create more sophisticated orthographic and isometric views</li> <li>• create alternate representations, such as computer animations and physical models</li> </ul>
GCO 2: Technological Systems	<p>[2.301] operate, monitor, and adjust a representative range of technological systems</p> <p>[2.302] manage a representative range of technological systems</p> <p>[2.303] employ programming logic and control systems to sense, switch, and regulate events and processes</p> <p>[2.304] classify technological systems, using one or more schema, and determine their operational components and parameters (e.g., schema include general make-up, underlying principles and purposes, and sub-systems)</p> <p>[2.305] diagnose and repair malfunctioning systems</p>
GCO 3: History and Evolution of Technology	<p>[3.301] examine the historical evolution of technologies and predict future developments</p> <p>[3.302] investigate ways that science activities depend on technology and that inventions in technology depend on science</p> <p>[3.303] examine technological literacy and capability in modern society and their effects on citizenship and education</p> <p>[3.304] evaluate the effects of rapid change in technological systems on people in their schools and communities</p> <p>[3.305] account for effects of cultural diversity on technological solutions</p> <ul style="list-style-type: none"> <li>• examine the effects of culture on traditional products, and vice versa</li> <li>• explore how products are designed differently for different markets</li> <li>• apply their understanding of cultural preferences when developing technological solutions</li> </ul>

GCO 4: Technology and Careers

[4.301] examine the technologies of specific careers and workplaces, including the organizational structures of work environments and the effects of newer technologies

[4.302] examine the roles of design and invention in business growth and economic development [4.303] develop strategies to assess their technological literacy/capability and plan for continuous personal growth, using external criteria

[4.303] develop strategies to assess their technological literacy/capability and plan for continuous personal growth, using external criteria.

GCO 5: Technological Responsibility

[5.301] demonstrate an understanding of the nature and purpose of legal and ethical rules and principles

[5.302] develop personal rules of conduct that ensure healthy and safe practices

[5.303] develop and demonstrate risk-management strategies for a variety of technological activities

## Specific Curricular Outcomes

The specific curriculum outcomes are statements that describe what students will know, value, and be able to do as a result of study in a specific course or program at a grade level. These are found in the curriculum guides for each program or course.

## Course Overview

In this module, students develop skills in graphic and multimedia communications. These skills are then applied in an innovation challenge as a culminating activity for the course. Students collaboratively incorporate digital audio, video, and graphic design in the innovation challenge.

Topics include:

- Introduction to Communication Technology
- Media Communication
- Impact of Communication Media
- Production Process
- Audio Communication
- Graphic Communication
- Video Communication
- Innovation Challenge
- Design Process
- Design Teams and Portfolio

## Suggested Yearly Plan

Communication Technology 7 is a 26 hour module that is intended to be offered in one semester. It is recognized however, that its integration into the school year will depend mostly on the school's schedule. There are no prerequisites for this course and it is designed for students who are beginning to explore the area of multimedia design and product creation.

Unit one is the big ideas unit for the module. It covers three subtopics. It is recommended that no more than five hours of instruction be allotted for this unit. Suggested time allocations for each subtopic are provided below.

Subtopic	# of hours
Introduction to Communication Technology	2
Media Communication	2
Impact of Communication Media	1

Unit two is a basic skills unit. It introduces students to the fundamentals of multimedia production. Students will explore the basic structures of multimedia design and production and create and create products for each type of media covered.

Subtopic	# of hours
Production Process	1
Audio Communication	2
Graphic Communication	3
Video Communication	2

Unit three represents the culminating activity for the module. Students will use their new knowledge from unit one and their new skills from unit two to complete an innovation challenge in unit three.

Subtopic	#of hours
Innovation Challenge	3
Design Process	5
Design Teams and Portfolio	5

# How to Use the Four Column Curriculum Layout

## Outcomes

Column one contains specific curriculum outcomes (SCO) and accompanying delineations where appropriate. The delineations provide specificity in relation to key ideas.

Outcomes are numbered in ascending order.

Delineations are indented and numbered as a subset of the originating SCO.

All outcomes are related to general curriculum outcomes.

## Focus for Learning

Column two is intended to assist teachers with instructional planning. It also provides context and elaboration of the ideas identified in the first column.

This may include

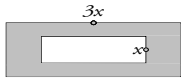
- cautionary notes
- clarity in terms of scope
- common misconceptions
- depth of treatment
- knowledge required to scaffold and challenge student's learning
- references to prior knowledge

## Sample Performance Indicator(s)

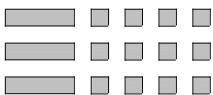
This provides a summative, higher order activity, where the response would serve as a data source to help teachers assess the degree to which the student has achieved the outcome.

Performance indicators are typically presented as a task, which may include an introduction to establish a context. They would be assigned at the end of the teaching period allocated for the outcome.

Performance indicators would be assigned when students have attained a level of competence, with suggestions for teaching and assessment identified in column three.

SPECIFIC CURRICULUM OUTCOMES	
<i>GCO 1: Represent algebraic expressions in multiple ways</i>	
Outcomes	Focus for Learning
<p>Students will be expected to</p> <p>1.0 model, record and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2) by monomials, concretely, pictorially and symbolically. [GCO 1]</p> <p>1.2 model division of a given polynomial expression by a given monomial concretely or pictorially and record the process symbolically.</p> <p>1.3 apply a personal strategy for multiplication and division of a given polynomial expression</p>	<p>From previous work with number operations, students should be aware that division is the inverse of multiplication. This can be extended to divide polynomials by monomials. The study of division should begin with division of a monomial by a monomial, progress to a polynomial by a scalar, and then to division of a polynomial by any monomial.</p> <p>Division of a polynomial by a monomial can be visualized using area models with algebra tiles. The most commonly used symbolic method of dividing a polynomial by a monomial at this level is to divide each term of the polynomial by the monomial, and then use the exponent laws to simplify. This method can also be easily modelled using tiles, where students use the sharing model for division.</p> <p>Because there are a variety of methods available to multiply or divide a polynomial by a monomial, students should be given the opportunity to apply their own personal strategies. They should be encouraged to use algebra tiles, area models, rules of exponents, the distributive property and repeated addition, or a combination of any of these methods, to multiply or divide polynomials. Regardless of the method used, students should be encouraged to record their work symbolically. Understanding the different approaches helps students develop flexible thinking.</p>
	<p><b>Sample Performance Indicator</b></p> <p>Write an expression for the missing dimensions of each rectangle and determine the area of the walkway in the following problem:</p> <ul style="list-style-type: none"> <li>The inside rectangle in the diagram below is a flower garden. The shaded area is a concrete walkway around it. The area of the flower garden is given by the expression <math>2x^2 + 4x</math> and the area of the large rectangle, including the walkway and the flower garden, is <math>3x^2 + 6x</math>.</li> </ul> 



SPECIFIC CURRICULUM OUTCOMES	
<i>GCO 1: Represent algebraic expressions in multiple ways</i>	
Sample Teaching and Assessment Strategies	Resources and Notes
<p>Teachers may use the following activities and/or strategies aligned with the corresponding assessment tasks:</p> <p>Modeling division using the sharing model provides a good transition to the symbolic representation. For example, <math>\frac{3x+12}{3} = \frac{3x}{3} + \frac{12}{3}</math>. To model this, students start with a collection of three <math>x</math>-tiles and 12 unit tiles and divide them into three groups.</p>  <p>For this example, <math>x + 4</math> tiles will be a part of each group, so the quotient is <math>x + 4</math>.</p> <p><b>Activation</b></p> <p>Students may</p> <ul style="list-style-type: none"> <li>Model division of a polynomial by a monomial by creating a rectangle using four <math>x^2</math>-tiles and eight <math>x</math>-tiles, where <math>4x</math> is one of the dimensions.</li> </ul> <p>Teachers may</p> <ul style="list-style-type: none"> <li>Ask students what the other dimension is and connect this to the symbolic representation.</li> </ul> <p><b>Connection</b></p> <p>Students may</p> <ul style="list-style-type: none"> <li>Model division of polynomials and determine the quotient               <ol style="list-style-type: none"> <li><math>(6x^2 + 12x - 3) \div 3</math></li> <li><math>(4x^2 - 12x) \div 4x</math></li> </ol> </li> </ul> <p><b>Consolidation</b></p> <p>Students may</p> <ul style="list-style-type: none"> <li>Draw a rectangle with an area of <math>36a^2 + 12a</math> and determine as many different dimensions as possible.</li> </ul> <p>Teachers may</p> <ul style="list-style-type: none"> <li>Discuss why there are so many different possible dimensions.</li> </ul> <p><b>Extension</b></p> <p>Students may</p> <ul style="list-style-type: none"> <li>Determine the area of one face of a cube whose surface area is represented by the polynomial <math>24s^2</math>.</li> <li>Determine the length of an edge of the cube.</li> </ul>	<p><b>Authorized</b></p> <ul style="list-style-type: none"> <li><i>Math Makes Sense 9</i></li> <li>Lesson 5.5: Multiplying and Dividing a Polynomial by a Constant</li> <li>Lesson 5.6: Multiplying and Dividing a Polynomial by a Monomial</li> <li>ProGuide: pp. 35-42, 43-51</li> <li>CD-ROM: Master 5.23, 5.24</li> <li>See It Videos and Animations:               <ul style="list-style-type: none"> <li>Multiplying and Dividing a Polynomial by a Constant, Dividing</li> <li>Multiplying and Dividing a Polynomial by a Monomial, Dividing</li> </ul> </li> <li>SB: pp. 241-248, 249-257</li> <li>PB: pp. 206-213, 214-219</li> </ul>

**Resources and Notes**

Column four references supplementary information and possible resources for use by teachers.

These references will provide details of resources suggested in column two and column three.

**Suggestions for Teaching and Assessment**

This column contains specific sample tasks, activities, and strategies that enable students to meet the goals of the SCOs and be successful with performance indicators. Instructional activities are recognized as possible sources of data for assessment purposes. Frequently, appropriate techniques and instruments for assessment purposes are recommended.

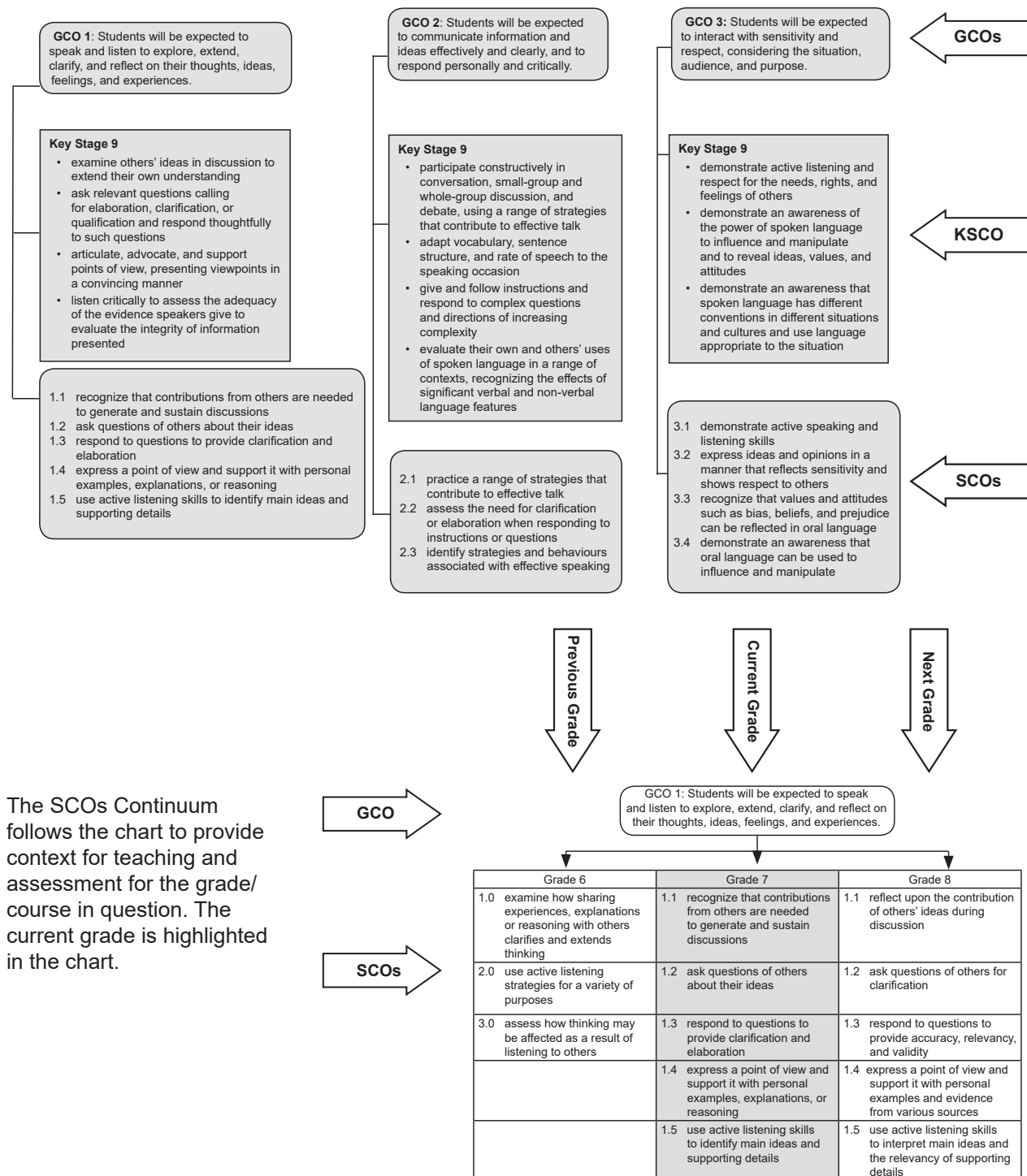
Suggestions for instruction and assessment are organized sequentially:

- **Activation** – suggestions that may be used to activate prior learning and establish a context for the instruction
- **Connection** – linking new information and experiences to existing knowledge inside or outside the curriculum area
- **Consolidation** – synthesizing and making new understandings
- **Extension** – suggestions that go beyond the scope of the outcome

These suggestions provide opportunities for differentiated learning and assessment.

## How to use a Strand overview

At the beginning of each strand grouping there is explanation of the focus for the strand and a flow chart identifying the relevant GCOs, KSCOs and SCOs.



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## Section Three: Specific Curriculum Outcomes

### Unit 1: Big Ideas

## Focus

In this Big Ideas unit students will explore knowledge-based introductory topics of the course. They will first reflect on technology and help to develop a definition of technology. Next students will explore the technology and innovation sector in Newfoundland and Labrador and Atlantic Canada and discuss some of the career opportunities in that sector of the economy. Students will then explore themes associated with the responsible use of technological devices and the significance of being a responsible digital citizen. In the final subtopic of the Big Ideas unit students will explore the impact of communications media.

## Outcomes Framework

**GCO 2 (Technological Systems): Students will be expected to operate and manage technological systems.**

- 4.0 identify types of media used in communication technology
- 5.0 discuss how technologies are used for a specific purpose and audience

**GCO 3 (History and Evolution of Technology): Students will be expected to demonstrate an understanding of the history and evolution of technology, and of its social and cultural implications.**

- 1.0 develop a definition for technology
- 2.0 identify milestones in the evolution of communication technologies

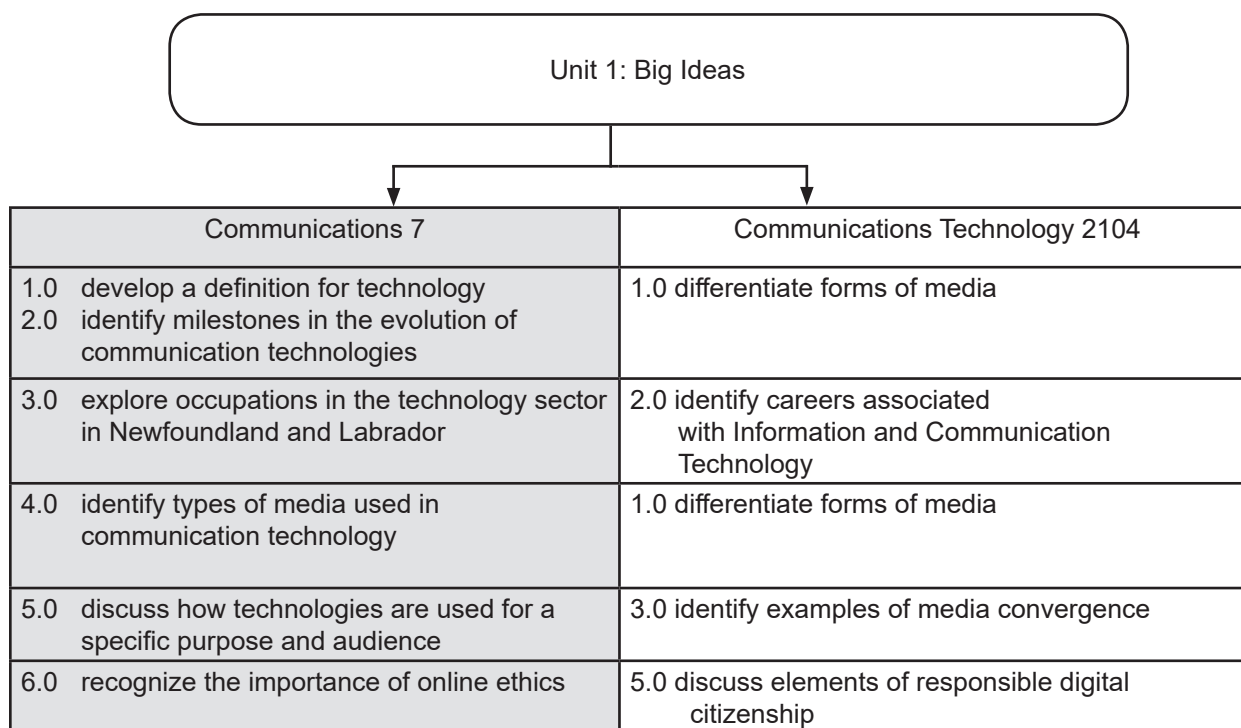
**GCO 4 (Technology and Careers): Students will be expected to demonstrate an understanding of current and evolving careers and of the influence of technology on the nature of work.**

- 3.0 explore occupations in the technology sector in Newfoundland and Labrador

**GCO 5 (Technological Responsibility): Students will be expected to demonstrate an understanding of the consequences of their technological choices.**

- 6.0 recognize the importance of online ethics
- 7.0 examine the impact of a digital lifestyle

## SCO Continuum



## Suggested Unit Plan

The suggested time for the Big Ideas unit is five hours. Approaches to delivery of this unit may vary depending on the teacher preference. For example, teachers may wish to infuse the outcomes from this unit into the other units rather than covering it separately.

## Introduction to Technology

### Outcomes

*Students will be expected to*

- 1.0 develop a definition for technology [GCO 3]

### Focus for Learning

It is important to illustrate to students that technology has evolved throughout time, so that they may have a greater understanding of the definition of technology. It is also important to realize that technology advancements have been borne out of necessity and invention. A common misconception is that technology has to be electronic in nature. Everyday objects are the products of solution development to enhance quality of life and can be considered technology.

When discussing this with students teachers should consider the seven common resources of technology:

- People - needed for idea generation and problem solving.
- Information - research and clarification of the problem to be solved.
- Materials - based on the results of the research the acquisition of resources to build a prototype.
- Energy - used to change the materials into products. Energy sources could be electricity or human hours.
- Tools and Machines - the equipment associated with the processing of materials.
- Money - needed to acquire materials.
- Time - associated with developing the idea and producing the product.

While addressing this outcome, it is important for students to reflect on technology as a product and technology as a process.

- Technological process involves the active state of technology and occurs at many different levels of complexity.
- Technological products are the consequence of technological activity and comprises the human-made environment.

Students should be encouraged to apply the language of technological problem solving. They should identify themselves as technology solution developers.

### Sample Performance Indicator

- Construct a definition of technology for an exit card.
- In your digital portfolio, reflect on your personal definition for technology.

## *Introduction to Technology*

### **Sample Teaching and Assessment Strategies**

#### **Activation**

Teachers may

- Lead a discussion about technological advancements throughout history.
- Guide class discussions and encourage a brainstorming session regarding the meaning of technology
- Lead a class discussion using a product or invention to discuss the seven common resources of relevant technology.

#### **Connection**

Students may

- Provide examples of the types of technology that impacts their own lives.
- Write a journal entry on what their lives would be like without technology.

#### **Consolidation**

Students may

- Construct a definition of technology for an exit card.

### **Resources and Notes**

#### **Supplementary**

Communication Technology 7  
Teacher Resource Guide:

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### **Suggested**

K-12 Professional Learning  
Newfoundland and Labrador,  
Communication Technology 7,  
Resource Links, organized by  
outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-1.html>

# Introduction to Technology

Outcomes	Focus for Learning
<p><i>Students will be expected to</i></p> <p>2.0 identify milestones in the evolution of communication technologies [GCO 3]</p>	<p>It is a common understanding that any medium, either visual or audio, used to convey information is considered communication technology. Communication has evolved over time. While reviewing milestones of the evolution of communication technology and the reasons for those advancements, students should touch on major inventions and events including but not limited to,</p> <ul style="list-style-type: none"><li>• camera;</li><li>• cloud computing - G-Suite;</li><li>• hieroglyphics, cave paintings;</li><li>• internet;</li><li>• paper;</li><li>• personal mobile devices;</li><li>• printing press - wooden or metal blocks, gutenber press;</li><li>• radio;</li><li>• social media;</li><li>• telephone technology;</li><li>• telegraph;</li><li>• television;</li><li>• wireless technology; and</li><li>• written language - pictographs.</li></ul> <p>Considering the many advancements in communication technologies, students should gain an understanding of the role of communication systems as a tool for lifelong learning.</p> <p><b>Sample Performance Indicator</b></p> <p>Construct a timeline showing inventions, innovations and other significant communications events.</p>



## *Introduction to Technology*

### **Sample Teaching and Assessment Strategies**

#### **Activation**

Teachers may

- Lead class discussions on the evolution of communication technologies.

#### **Connection**

Students may

- Identify sources of historical information on communication technologies such as local communication companies or the Internet.
- Share a communications artifact with the class.

#### **Consolidation**

Students may

- Create a digital presentation on how communication tools have been, and are being used.

### **Resources and Notes**

#### **Supplementary**

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### **Suggested**

K-12 Professional Learning  
Newfoundland and Labrador,  
Communication Technology 7,  
Resource Links, organized by  
outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-1.html>

## Introduction to Technology

### Outcomes

*Students will be expected to*

- 3.0 explore occupations in the technology sector in Newfoundland and Labrador [GCO 4]

### Focus for Learning

Throughout Newfoundland and Labrador, there are increasing opportunities in technology industries. Students should be aware of the necessary skills to be active participants in this sector of the labour market. Opportunities specific to communication technology should be highlighted. They could include, but are not limited to,

- audiologist,
- cable technicians,
- game designer,
- information manager,
- network administrator,
- programmer,
- research and development analyst, and
- software developer.

Make students aware of the employability skills companies are looking for in the technology sectors. These include but are not limited to,

- character,
- citizenship,
- collaboration,
- communication,
- creativity, and
- critical thinking.

### Sample Performance Indicator

Construct a list of occupations and the skills needed to attain success in the technology sector.

## *Introduction to Technology*

### **Sample Teaching and Assessment Strategies**

#### **Activation**

Teachers may

- Use current labour market resources to compile a list of technology careers within their region and discuss these careers with their students.
- Reach out to industry to provide students with authentic learning experiences such as guest speakers and field trips.

#### **Connection**

Students may

- Research the local job market as it pertains to the technology sector.

#### **Consolidation**

Students may

- Create a digital repository of local and global job opportunities in the technology sector.
- Create a profile of a local business and the skills they are looking for in current employees.

### **Resources and Notes**

#### **Supplementary**

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### **Suggested**

K-12 Professional Learning  
Newfoundland and Labrador,  
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outcome.

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## Media Communication

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### Outcomes

*Students will be expected to*

- 4.0 identify types of media used in communication technology [GCO 2]

### Focus for Learning

It is important for students to gain an understanding of the various types of media in communication technology. Media types may include

- audio,
- augmented reality,
- email,
- podcasting,
- radio news,
- social media,
- video, and
- virtual reality.

### Sample Performance Indicator

Develop a short presentation on the communication tools being used in school or at home.

## *Media Communication*

### **Sample Teaching and Assessment Strategies**

#### **Activation**

Teachers may

- Lead class discussions on the different media types.

#### **Connection**

Students may

- Share media types commonly used at home and within the community.

#### **Consolidation**

Students may

- Demonstrate via presentation a media type they are most comfortable with or use most often.
- Create a list of examples of media types being used in their daily lives.

### **Resources and Notes**

#### **Supplementary**

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### **Suggested**

K-12 Professional Learning  
Newfoundland and Labrador,  
Communication Technology 7,  
Resource Links, organized by  
outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-1.html>

# Media Communication

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Outcomes	Focus for Learning
<p><i>Students will be expected to</i></p> <p>5.0 discuss how technologies are used for a specific purpose and audience [GCO 2]</p>	<p>It is important for students to gain an understanding of the specific purposes of various technologies. This is needed in order to differentiate between professional and common language depending on the intended purpose and audience. In order for technology to be effective it must be applicable to its audience.</p> <p>Examples could include:</p> <ul style="list-style-type: none"><li>• Using Short Messaging Service (SMS) to contact someone informally rather than completing a formal business transaction; and</li><li>• Using graphics as part of an ad to promote a product or service compared to using graphics for entertainment.</li></ul> <p><b>Sample Performance Indicator</b></p> <p>Categorize various examples of technologies and how they are used for specific purposes to reach specific audiences.</p>

## *Media Communication*

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Lead a discussion on how we communicate within various platforms with specific purposes. (e.g., a chat with friends, an email in a professional environment, a podcast, ad, presentation to an employer).

#### Connection

Students may

- Compare how they would use technology to communicate with a friend vs with a teacher.

#### Consolidation

Students may

- Use an exit card to demonstrate how one form of technology is used for a specific audience.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

K-12 Professional Learning  
Newfoundland and Labrador,  
Communication Technology 7,  
Resource Links, organized by  
outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-1.html>

## *Impact of Communications Media*

### **Outcomes**

*Students will be expected to*

6.0 recognize the importance of online ethics [GCO 5]

### **Focus for Learning**

Identify the role of ethical decision making, intellectual honesty and validity of sources as factors in making technological choices.

It is important for students to gain an understanding of the ethical implications of using modern communication technology. This should include copyright and ownership rules when creating, remixing and/or using other people's intellectual property. Students need to understand that anything placed online is open for public consumption and may be used for the purpose of others.

Examples could include using:

- copyrighted music for a student video production, and
- elements of copyrighted graphics to create another image.

Refer to digital citizenship activities that may have been completed in earlier grades and refer to Procedure 5 of the Newfoundland and Labrador Safe and Caring Schools Policy (2013).

### **Sample Performance Indicator**

Evaluate two case studies where online ethics have been compromised.



## *Impact of Communications Media*

### **Sample Teaching and Assessment Strategies**

#### **Activation**

Teachers may

- Guide class discussions on copyright and ownership rules
- Facilitate brainstorming sessions on ethical implications of using technology and sharing media online.

#### **Connection**

Students may

- Share examples of posting media files online without proper permissions, and the potential of being flagged or muted by the hosting service. E.g., using copyright music in a student video online and being muted by the host.

#### **Consolidation**

Students may

- Research the origin of copyrighted material.
- Analyze a series of online media and assess their validity as a source of information.

### **Resources and Notes**

#### **Supplementary**

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### **Suggested**

K-12 Professional Learning  
Newfoundland and Labrador,  
Communication Technology 7,  
Resource Links, organized by  
outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-1.html>

*Impact of Communications Media*

Outcomes	Focus for Learning
<p><i>Students will be expected to</i></p> <p>7.0 examine the impact of a digital lifestyle [GCO 5]</p>	<p>It is a common understanding that we live in a digital time. Students need to realize the impact that living in a digital world has on their lives. Technology surrounds us and impacts our physical, social and emotional well-being.</p> <p>Items to consider are:</p> <ul style="list-style-type: none"><li>• digital footprint (e.g., sharing of personal information, photos, videos);</li><li>• digital awareness (e.g., critical consumer of online content, tolerance, etiquette);</li><li>• screen time (e.g., mobile device, computer, TV, video game console);</li><li>• social well-being (e.g., meeting new friends, being able to interact outside of the digital world);</li><li>• mental health (addictions, depression, narcissism, instant gratification); and</li><li>• physical health (e.g., vision, hearing, neck strain, fitness).</li></ul> <p><b>Sample Performance Indicators</b></p> <ol style="list-style-type: none"><li>1. Identify how your life can be impacted by your digital footprint and how being digitally aware can increase the positivity of your digital footprint.</li><li>2. Discuss how screen time affects physical, mental and social well-being.</li></ol>

## *Impact of Communications Media*

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Share examples of how people have been impacted positively and negatively by living in the digital age.
- Explore the idea of having a guest speaker to come in to discuss experiences of living in the digital age, or a representative from public health to discuss the social, physical and mental health implications.

#### Connection

Students may

- Record screen time for a week and make predictions how this impacts their health.
- Share and compare screen time with others in the class and reflect on how one's own screen time impacts their life.
- Consider the various social media platforms they participate in and what their digital footprint looks like to the outside world.

#### Consolidation

Students may

- Analyze the impact digital media has on their own life and create goals to use digital awareness and decrease overall screen time in an effort to improve overall health.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

K-12 Professional Learning  
Newfoundland and Labrador,  
Communication Technology 7,  
Resource Links, organized by  
outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-1.html>



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## Section Three: Specific Curriculum Outcomes

### Unit 2: Basic Skills

## Focus

The purpose for the Basic Skills unit is to give students the opportunity to develop skills in planning and creating multimedia products. Students will build skills in the software tools recommended for use with this module. The overall purpose of this unit is help students build skills and then use those new skills to create solutions to authentic problems through multimedia. Students will use the newly acquired skills as the basis for the innovation challenge in unit three.

## Outcomes Framework

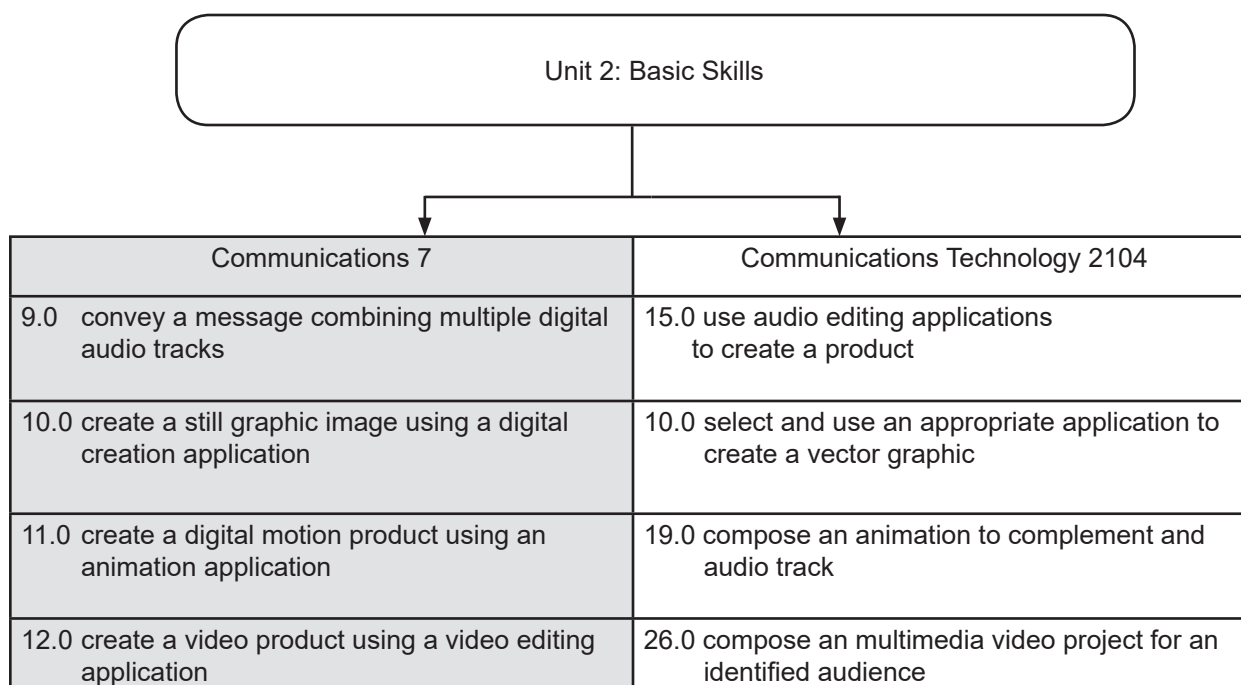
**GCO 1 (Technological Problem Solving) Students will be expected to design, develop, evaluate and articulate technological solutions.**

8.0 identify the components of the design process as it applies to communications technology

**GCO 2 (Technological Systems) Students will be expected to operate and manage technological systems.**

9.0 convey a message combining multiple digital audio tracks  
10.0 create a still graphic image using a digital creation application  
11.0 create a digital motion product using an animation application  
12.0 create a video product using a video editing application

## SCO Continuum



## Suggested Unit Plan

The suggested time for the Basic Skills unit is eight hours. Approaches to delivery of this unit may vary depending on the teacher's preference. It is recommended that teachers move through the outcomes sequentially allowing students the opportunity to experiment with each application before moving on to the next. There may be opportunities for cross curricular connections as students can practice their new skills while completing projects for other courses.

# Production Process

Outcomes	Focus for Learning
<p><i>Students will be expected to</i></p> <p>8.0 identify the components of the design process as it applies to communications technology [GCO 1]</p>	<p>It is important for students to understand the design process as it relates to communications. In communication technology, the three main stages are preproduction, production, and post-production.</p> <p>Preproduction is the process where students brainstorm ideas, research concepts, and develop a plan for production.</p> <p>Production is the process where students use their skills to create content. The stages involved in production are recording, editing and mixing.</p> <p>Post-production is the process where students reflect on their project for presentation. The stages involved in post-production involve group feedback and presentation.</p> <p>It is important to note that reflection and collaboration with group members and the teacher are imperative throughout the production process and that students can jump from one stage to another depending on the decisions being made.</p> <p><b>Sample Performance Indicator</b></p> <p>Identify and define the three stages of the production process for an exit card.</p>



## *Production Process*

### **Sample Teaching and Assessment Strategies**

#### **Activation**

Teachers may

- Lead class discussions on the production process for communication technologies. Roles at each stage in the process may include
  - audio/video editor,
  - graphic designer,
  - producer,
  - script writers, and
  - videographer
- Share examples where the production process would be used in different careers. Examples may include
  - audio engineers,
  - car manufacturer,
  - fashion designer,
  - graphic designers,
  - home decorators, and
  - videographers

#### **Connection**

Students may

- Share their ideas for activities they would engage in during each of the three stages.
- Select a task that they do at home and describe how planning and reflecting could make the task more successful.

#### **Consolidation**

Students may

- Create a document outlining the stages and activities involved at each stage in the production process.
- Participate in a class discussion highlighting the stages and activities involved at each stage of the production process.

### **Resources and Notes**

#### **Supplementary**

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### **Suggested**

K-12 Professional Learning  
Newfoundland and Labrador,  
Communication Technology 7,  
Resource Links, organized by  
outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-2-basic-skills.html>

Differentiated Instruction in the  
Inclusive Classroom

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/strategies/di.html>

## Audio Communication

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### Outcomes

*Students will be expected to*

- 9.0 convey a message combining multiple digital audio tracks [GCO 2]

### Focus for Learning

As a hands-on learning activity, students will create an audio product using a variety of tools and skills such as

- editing,
- layering,
- mixing tracks, and
- recording.

Examples of digital audio communication could include

- audiobooks,
- music tracks,
- podcasts,
- radio commercials, and
- soundtracks or narrations for video.

Students should consider their purpose and audience when creating audio products.

Students should be made aware, that the product of this activity can be used later in the course to be combined with other multimedia products.

### Sample Performance Indicator

Compose a multiple track audio recording using voice, music, and sound effects.

## Audio Communication

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Share examples of various types of audio products used for communication. This may include
  - commercial,
  - podcast, and
  - voice over used in animations and cartoons.
- Demonstrate to students how to record, edit, and mix tracks to insert into an audio product.
- Lead a class discussion on students' past experiences with audio production.

#### Connection

Students may

- Reflect on their previously created audio products.
- Share their experiences with audio tracks.

#### Consolidation

Students may

- Create an intro for a podcast.
- Create a 30-second radio commercial.
- Create a reflection journal entry on a desired topic.
- Create a public service announcement (PSA) for the school.
- Create a voiceover for a pre-existing video product.

#### Extension

Students may

- Interview a member of a community service group with the purpose of designing a custom message through an audio production.

### Resources and Notes

#### Supplementary

Saramonic SRMV2000 USB Microphone

Communication Technology 7 Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

Differentiated Instruction in the Inclusive Classroom

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/strategies/di.html>

K-12 Professional Learning Newfoundland and Labrador, Communication Technology 7, Resource Links, organized by outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-2-basic-skills.html>

## Graphic Communications

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### Outcomes

*Students will be expected to*

10.0 create a still graphic image using a digital creation application [GCO 2]

### Focus for Learning

As a hands-on learning activity, students will create a digital image using a variety of tools and skills.

Some examples of digital image communication could include

- drawing,
- infographics,
- logo, and
- posters.

Digital imagery involves presenting a message in a visual form. There are several technologies that can be used for this type of communication. These could include

- drawing programs,
- photo editing software, and
- slideshow programs.

The media can involve a combination of text and visual component, such as

- font,
- graphs, and
- images.

### Sample Performance Indicator

Create an infographic or graphic design promoting a school club or activity.

## Graphic Communications

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Lead a class discussion about how various graphic elements can convey a message.
- Share and discuss examples of visual imagery that employ the elements of visual design, such as
  - artwork,
  - billboards/ads,
  - memes, and
  - posters.
- Demonstrate to students how to manipulate the software tools associated with visual design.

#### Connection

Students may

- Reflect on examples of memes they have searched or created
- Share their experiences with effective visual communications, such as
  - album art,
  - graphics,
  - memes,
  - posters, and
  - video game art.

#### Consolidation

Students may

- Create a poster outlining a school event.
- Create their own meme.
- create a logo for a cover art for their own podcast.

#### Extension

Students may

- interview a member of a community service group with the purpose of designing a custom message through a visual production.
- create an infographic on a skill that they know.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

Differentiated Instruction in the  
Inclusive Classroom

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/strategies/di.html>

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Newfoundland and Labrador,  
Communication Technology 7,  
Resource Links, organized by  
outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-2-basic-skills.html>

# Graphic Communications

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Outcomes	Focus for Learning
<p><i>Students will be expected to</i></p> <p>11.0 create a digital motion product using an animation application [GCO 2]</p>	<p>Digital motion involves presenting a message with moving images. There are several technologies that can be used to create the illusion of movement for visual communication.</p> <p>The medium can involve a combination of digital tools and skills such as</p> <ul style="list-style-type: none"><li>• background design,</li><li>• character development, and</li><li>• editing.</li></ul> <p>Professional animators will often begin developing an animation project with a soundtrack.</p> <p>Students may use audio products created earlier in the unit to augment their animation products.</p> <p>Creating an animation can be a time consuming process. Plan the depth of this topic to ensure there is time left for skill development in other topics.</p> <p><b>Sample Performance Indicator</b></p> <p>Create an animation to illustrate a story or to explain an idea or concept.</p>

## Graphic Communications

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Lead a class discussion about how various animations can convey a message.
- Share and discuss examples of a variety of technologies that employ animation to convey a message
  - Animated GIFs
  - Animation
    - 2D,
    - 3D, and
    - stop motion.
- Demonstrate how to manipulate the software tools associated with digital animation.

#### Connection

Students may

- Reflect on examples of digital animation they have searched or created.

#### Consolidation

Students may

- Create an advertisement for a product or cause.
- Use an audio file as the background to create an animation.
- Create an animation product summarizing a novel.
- Create an animated logo as cover art for their own podcast.

#### Extension

Students may

- Interview a member of a community service group with the purpose of designing a custom message through an animation.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

Differentiated Instruction in the  
Inclusive Classroom

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Newfoundland and Labrador,  
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<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-2-basic-skills.html>

## *Video Communication*

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### **Outcomes**

*Students will be expected to*

12.0 create a video product using a video editing application [GCO 2]

### **Focus for Learning**

Video creation involves presenting a message that encompasses both visual and audio forms. There are several technologies that can be used for video creation.

The medium can involve a combination of text, auditory, and visual elements.

The medium can involve a combination of digital tools/skills from the animation outcome as well as the following video tools/skills

- camera angles;
- depth, foreground and background;
- focusing;
- green screening;
- lighting;
- recording;
- set design;
- sound quality; and
- video editing.

### **Sample Performance Indicator**

Create a short video to illustrate a story or explain an idea or concept. This video should include the mixing of multiple tracks.



## Video Communication

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Lead a class discussion about how various video methods can convey a message.
- Share and discuss examples of a variety of messages conveyed through video
  - ads,
  - films,
  - infomercials,
  - news broadcasts, and
  - rants.
- Demonstrate how to manipulate the application tools associated with video creation.

#### Connection

Students may

- Reflect on examples of videos they have seen or created.
- Share their experiences with effective video communications like commercials, gaming videos, and movies.

#### Consolidation

Students may

- Create an advertisement for a product or cause.
- Create a short film.

### Resources and Notes

#### Supplementary

Saramonic SRMV2000 USB  
Microphone

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

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Inclusive Classroom

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## Section Three: Specific Curriculum Outcomes

### Unit 3: Innovation Challenge

## Focus

This unit represents the culminating activity of the module. The module is designed so that students spend the first two units building their skills and knowledge in the creation of multimedia products. In Unit three students will be challenged to think critically about the world around them to identify authentic communications problems that can be solved with the available resources. Working cooperatively in design teams, students will create innovative solutions to identified communication problems and present multimedia products and documentation in a class or school-based innovation fair.

## Outcomes Framework

**GCO 1: Technological Problem Solving: Students will be expected to design, develop, evaluate and articulate technological solutions.**

14.0 maintain a design portfolio of documentation for the design activity  
15.0 investigate authentic problem situations to determine opportunities to develop an innovative solution  
16.0 generate a variety of solutions to a chosen problem and select the best solution  
19.0 assess the multimedia product's design to ensure that it solves the identified problem

**GCO 2: Technological Systems: Students will be expected to operate and manage technological systems.**

17.0 identify specific resources and approaches required to develop the solution  
18.0 build a multimedia solution using the identified hardware and software resource

**GCO 4: Technology and Careers: Students will be expected to demonstrate an understanding of current and evolving careers and of the influence of technology on the nature of work.**

20.0 present the project portfolio and prototype in an in-class or school-based technology fair

**GCO 5: Technological Responsibility: Students will be expected to demonstrate an understanding of the consequences of their technological choices.**

13.0 work cooperatively and collaboratively in design teams

## SCO Continuum

Unit 3: Innovation Challenge	
Communications 7	Computer Science 1204
13.0 work cooperatively and collaboratively in design teams	37.0 work cooperatively and collaboratively in design teams
14.0 maintain a design portfolio of documentation for the design activity	38.0 maintain a design portfolio of documentation for the design activity
15.0 investigate authentic problem situations to determine opportunities to develop an innovative solution	39.0 investigate authentic problem situations to determine opportunities to develop an innovative solution using sensing and control
16.0 generate a variety of solutions to a chosen problem and select the best solution	40.0 generate a variety of solutions to a chosen problem and select the best solution
17.0 identify specific resources and approaches required to develop the solution	41.0 identify specific tools, consumable materials and interfacing devices needed to develop the solution
18.0 build a multimedia solution using the identified hardware and software resources	42.0 build a prototype using the identified hardware and software resources
19.0 assess the multimedia product's design to ensure that it solves the identified problem	43.0 test and refine the prototype's design to ensure that it solves the identified problem
20.0 present the project portfolio and prototype in an in-class or school-based technology fair	44.0 share the project portfolio and prototype in an in-class or school based technology fair

## Suggested Unit Plan

The minimum recommended time for Unit 3 is 13 hours. The innovation challenge is the culminating activity of the course. It should be planned as one large project based learning (PBL) activity. Students are required to showcase their work in a class or school-based technology fair.

## *Getting Organized*

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### **Outcomes**

*Students will be expected to*

13.0 work cooperatively in design teams [GCO 5]

### **Focus for Learning**

Students should complete the design project as a team effort. This project should be completed using a cooperative approach.

In industry, design is always done by teams of professionals who bring a variety of skills to the project.

Working cooperatively in a team is an essential employability skill. Design teams are most effective in groups of two or three.

Review the characteristics of a good team member and principles of good group collaboration.

Students should establish a design team structure, determining roles and developing an initial plan of action.

Team members should

- allow others to take the lead when necessary,
- assume leadership in the area of expertise and interest when called upon to do so,
- compromise on some issues,
- participate,
- share ideas,
- share responsibilities, and
- show respect for the opinions of other group members.

## *Getting Organized*

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Introduce students to concepts of effective design teams.

#### Connection

Students may

- Relate working collaboratively with classmates within groups in other subject areas.
- Reflect on how collaboration plays a key role in major design projects in industry.

#### Consolidation

Students may

- Demonstrate effective teamwork while solving an innovation challenge.

#### Extension

Students may

- Work collaboratively with classmates.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

Differentiated Instruction in the  
Inclusive Classroom

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/strategies/di.htm>

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Newfoundland and Labrador,  
Communication Technology 7,  
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outcome.

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7/links/unit-3-innovation-challenge.html>

## *Getting Organized*

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### **Outcomes**

*Students will be expected to*

14.0 maintain a design portfolio of documentation for the design activity [GCO 1]

### **Focus for Learning**

Each design team should document the design process in the form of a portfolio.

The design portfolio is an essential component of the innovation challenge. It will make up most of the content of the final team presentation at the end of the project. It should contain

- an introductory page,
- a design team page,
- a daily log page, and
- the design process steps as major headings.

Due to time restraints teachers may wish to provide a design portfolio template. The portfolio can be electronic, using a variety of applications.

It is extremely important that students have the opportunity to make their design portfolio reflective of them as an individual. Students need to feel ownership of the portfolio and the process in general.



## *Getting Organized*

### **Sample Teaching and Assessment Strategies**

#### **Activation**

Teachers may

- Provide students with an exemplars of quality design portfolio.

#### **Connection**

Students may

- View portfolios that they create and maintain in English Language Arts or other subject areas.

#### **Consolidation**

Students may

- Use a digital medium of their choice to organize and maintain a portfolio.

### **Resources and Notes**

#### **Supplementary**

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### **Suggested**

Differentiated Instruction in the  
Inclusive Classroom

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## Getting Started

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### Outcomes

*Students will be expected to*

15.0 investigate authentic problem situations to determine opportunities to develop an innovative solution [GCO 1]

### Focus for Learning

The purpose of this stage of design is to investigate situations that may provide opportunities to design innovative solutions to authentic problems. In this design activity students should develop multimedia products.

There are three parts to this section of the process:

- Identify authentic problem opportunities from which they will select a suitable project.
- Collect information and pose questions to clarify the problems.
- Write a design brief summarizing the problem and general approach to solving it.

Although it may not be realistic to require students to identify their own problem situations, it is not the intent of the design activity to give students everything they need to develop a solution from a given set of plans. Design teams should be given every opportunity to question, problem solve, and troubleshoot as part of the design activity.

Regardless of the method of identifying projects, it is essential that students take ownership of the problem they have chosen to solve.

## Getting Started

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Present students with examples of problems and solutions that have been created and solved.

#### Connection

Students may

- Connect to problems solving techniques used in Mathematics and Science.

#### Consolidation

Students may

- Research problems and possible solutions to the problem.

#### Extension

Students may

- Identify a problem that existed in your community and investigate how a solution was developed.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

Differentiated Instruction in the  
Inclusive Classroom

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## Getting Started

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### Outcomes

*Students will be expected to*

- 16.0 generate a variety of solutions to a chosen problem and select the best solution.[GCO 1]

### Focus for Learning

Students should engage in brainstorming exercises. It may be useful to ask students to think about solutions in advance and share their ideas with other design team members.

Ensure that all students have an opportunity to express their ideas. All ideas should be given equal weight. Students should try for a minimum of 3-4 different ideas or variations of an idea.

Once ideas are generated and presented in the design team, students should use some sort of grading strategy to select the best possible solution to the problem.

### Sample Performance Indicator

Document 3-4 alternative solutions in the design portfolio and record an assessment strategy to select the best possible solution.

## *Getting Started*

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Introduce students to the importance of generating and considering multiple solutions.

#### Connection

Students may

- Relate alternative solutions to the multiple methods used to solve problems in Mathematics.

#### Consolidation

Students may

- Independently generate alternative solutions to be assessed by the rest of the design team.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

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Differentiated Instruction in the  
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## *Develop the Solution*

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### **Outcomes**

*Students will be expected to*

17.0 identify specific resources and approaches required to develop the solution  
[GCO 2]

### **Focus for Learning**

Students should develop the solution to the chosen problem including identifying resources and the necessary skills required.

This step is the most time consuming step of the design process.

Preparation should include

- identification and preparation of appropriate work spaces and digital media for the design teams;
- the collection of resources for the design activity;
- development of a strategy that ensures design work is shared equitably among the design team membership; and
- assurance that students understand and are aware of digital media appropriateness online ethics, as well as the intended audience and purpose.

### **Sample Performance Indicator**

Using their Design Portfolio, students document the resources and approaches needed to create possible solutions.

## *Develop the Solution*

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Remind students that they should use the resources and skills developed from Unit Two to solve the problem.

#### Connection

Students may

- Use the media skills developed in Unit Two.
- Research various examples of design portfolios.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

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Inclusive Classroom

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## *Develop the Solution*

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### **Outcomes**

*Students will be expected to*

18.0 build a multimedia solution using the identified hardware and software resources [GCO2]

19.0 assess the multimedia product's design to ensure that it solves the identified problem [GCO 2]

### **Focus for Learning**

Each design team should finish the solution during this phase. Once students have completed the initial multimedia product, they will assess its effectiveness.

This section of the design challenge will likely require the most significant amount of time. It is important to ensure that students are using some sort of systematic process to review and improve their solution. It is critical that students document the changes being made so that the review process results in a successful multimedia solution.

At this stage, students should make any adjustments required to increase the effectiveness of their multimedia product.

During this part of the process, teachers will need to work closely with each design team to ensure success.

### **Sample Performance Indicator**

- Create a multimedia product that provides a solution to the identified problem.
- Complete a documented reflection analysis of the innovation challenge to be included in the digital portfolio.



## *Develop the Solution*

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Work with each design team asking them probing questions and challenging their decision-making while they are constructing their multimedia project.
- Provide students with guiding questions to help them critically assess their multimedia products.

#### Connection

Students may

- Connect the reflection and assessment components of the design process to other general life skills.

#### Consolidation

Students may

- Review and reflect on the projects created by other design teams within their class.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

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## *Develop the Solution*

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### **Outcomes**

*Students will be expected to*

20.0 present the project portfolio and multimedia product in an in-class or school based fair [GCO 4]

### **Focus for Learning**

The project portfolio is the student's opportunity to summarize and present information that was collected during the innovation challenge.

Focus on how well students organize and present their material.

Evaluation of the Design Portfolio should consider

- completeness of items ;
- conciseness;
- evidence of decisions and reasons for them;
- inclusion of authentic information such as digital storyboarding, photos, audio files;
- level of detail; and
- organization according to design process headings.

## *Develop the Solution*

### Sample Teaching and Assessment Strategies

#### Activation

Teachers may

- Provide students with a guide of what is expected in their presentation of their project portfolio and multimedia project.

#### Connection

Students may

- Students may use presentation skills previously acquired in other curriculum areas.

#### Consolidation

Students may

- Present their digital portfolio and multimedia project to the class using a digital medium of their choice.

### Resources and Notes

#### Supplementary

Communication Technology 7  
Teacher Resource Guide

<https://www.k12pl.nl.ca/curr/7-9/tech-ed/ct7.html>

#### Suggested

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