# ADC701A

COMMUNICATION INFORMATION TECHNOLOGY

## Applied Digital Communication

# Curriculum Guide

Prince Edward Island
CANADA

# ACKNOWLEDGMENTS

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## Course Description

ADC701A is designed to develop foundational skills and knowledge needed to use digital tools in a practice that is ethical, responsible, and reflective of the academic, social, and personal lives of students. Learners will have the opportunity to develop knowledge and enhance skills in keyboarding, word processing, visual presentations, spreadsheets, and coding. Learners will consume, curate, evaluate, create, and share digital content to express themselves and develop an awareness of their own digital wellbeing. Through practice and application learners will discover potential interests and pathways that connect to real-world issues and cultivate passion and purpose.

## Essential Graduation Competencies

Curriculum is designed to articulate what students are expected to know and be able to do by the time they graduate from high school. The PEI Department of Education and Lifelong Learning designs curriculum that is based on the Atlantic Canada Framework for Essential Graduation Competencies released by the Council of Atlantic Ministers of Education and Training (CAMET 2015).

Competencies articulate the interrelated sets of attitudes, skills, and knowledge—beyond foundational literacy and numeracy—that prepare learners to successfully participate in lifelong learning and life/work transitions. They are cross-curricular in nature and provide opportunities for interdisciplinary learning. Six competencies have been identified: citizenship, communication, personal-career development, creativity and innovation, critical thinking, and technological fluency (Figure 1). Achievement of the essential graduation competencies (EGCs) will be addressed through the assessment and evaluation of curriculum outcomes developed for individual courses and programs.

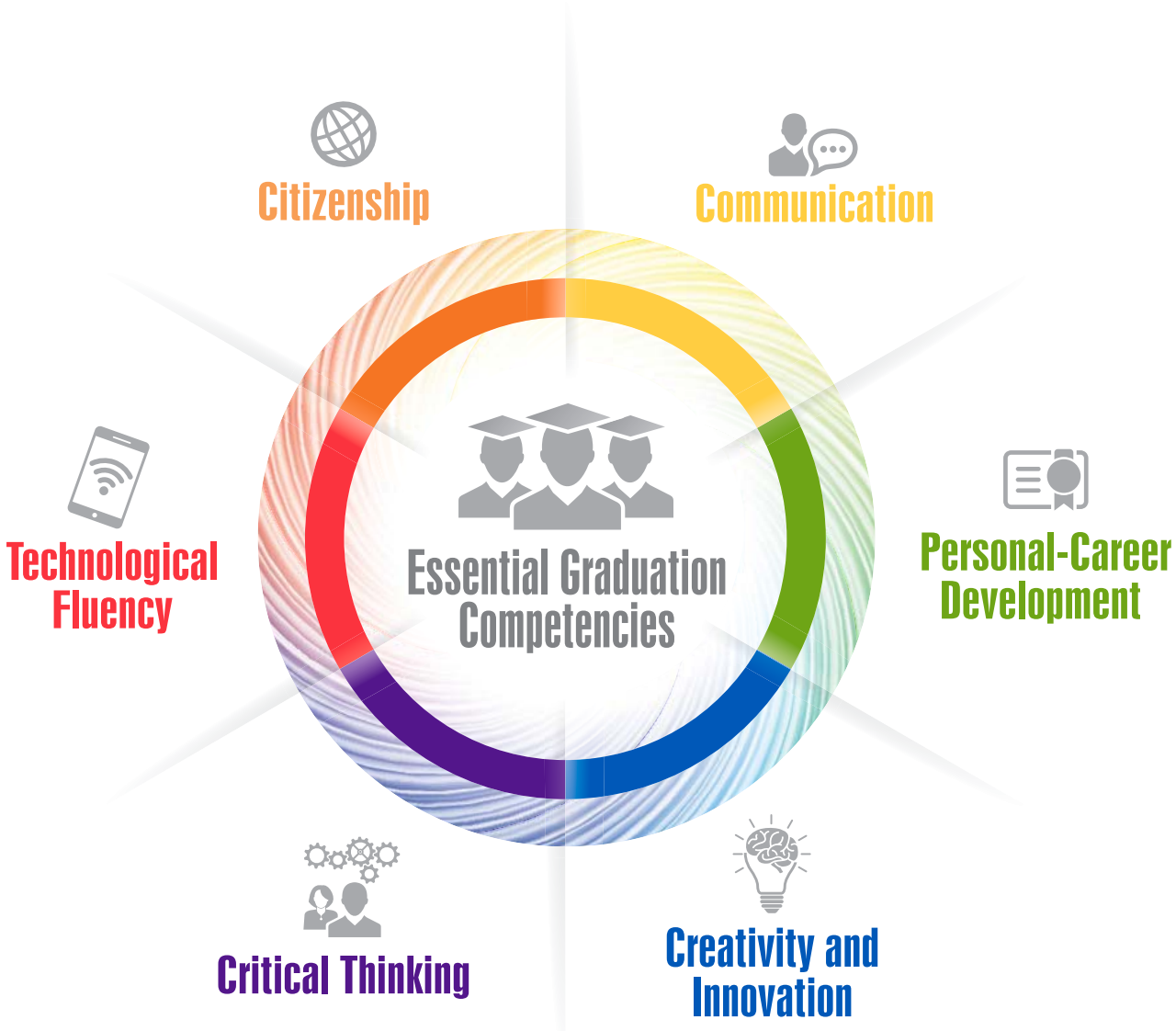



Figure 1. Essential Graduation Competencies

## Critical Thinking

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

Learners are expected to

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

## Technological Fluency

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

Learners are expected to

- recognize that technology encompasses a range of learning tools and contexts;
- use and interact with technology to create new knowledge;
- apply digital technology to gather, filter, organize, evaluate, use, adapt, create, and share information;
- select and use technology to impact and advance one another; and
- adopt, adapt, and apply technology efficiently, effectively, and productively.

## Citizenship

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

Learners are expected to

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

## Communication

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

Learners are expected to

- listen and interact purposefully and respectfully in formal and informal contexts;
- engage in constructive and critical dialogue;
- understand, interpret, and respond to thoughts, ideas, and emotions presented through multiple media forms;
- express ideas, information, learnings, perceptions, and feelings through multiple media forms, considering purpose and audience;
- assess the effectiveness of communication and critically reflect on intended purpose, audience, and choice of media; and
- analyse the impact of information and communication technology.

## Personal-Career Development

Learners are expected to become self-aware and self-directed individuals who set and pursue goals.

They understand and appreciate how culture contributes to work and personal life roles. They make thoughtful decisions regarding health and wellness, and career pathways.

Learners are expected to

- connect learning to personal and career development;
- demonstrate behaviours that contribute to the well-being of self and others;
- build healthy personal and work relationships;
- establish skills and habits to pursue physical, spiritual, mental, and emotional well-being;
- develop strategies to manage career balance and wellness;
- create and implement a personal, education, career, and financial plan to support transitions and achievement of personal, education, and career goals; and
- demonstrate preparedness to learn and work individually, cooperatively, and collaboratively in diverse, evolving environments.

## Creativity and Innovation

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

Learners are expected to

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

## Broad Overview of Program Area

### Vision of Program

Communication and Information Technology (CIT) is more than computers and computing systems. Learners who have a working understanding of information communication technology principles and practices and who can think computationally will be better prepared to take advantage of opportunities in the modern digital world. Leveraging computational thinking and practical understanding of computer-based technology will help build learner confidence and competency. This allows learners to explore a wide range of disciplines and complete meaningful work. CIT challenges students to explore, find, and apply solutions to solve problems in all other fields of study.

### Goals of Communication and Information Technology

The goals for Communication and Information Technology are to:

- develop skill and competence through the study of CIT enabling the learner to actively participate, not merely consume, in the modern digital world;
- support an environment of exploration and experimentation, normalizing failure as learning opportunities in the pursuit of understanding the world around us in computational terms;
- make connections between CIT and other fields of study that require technological literacies, enabling the agility required for learners to actively engage in the development and implementation of their own career plans. (e.g., postsecondary education, entrepreneurship, or within other working opportunities);
- develop the tools learners need to develop their sense of digital wellbeing and apply technological habits in order to achieve their own personal digital wellbeing goals; and
- reflect critically on thinking processes enabling learners to explore a broad range of transferable problem-solving skills and techniques.
- explore curiosity and creativity by creating artifacts that promote innovative thinking, problem solving, and collaboration.

## Pathways and Opportunites in CIT

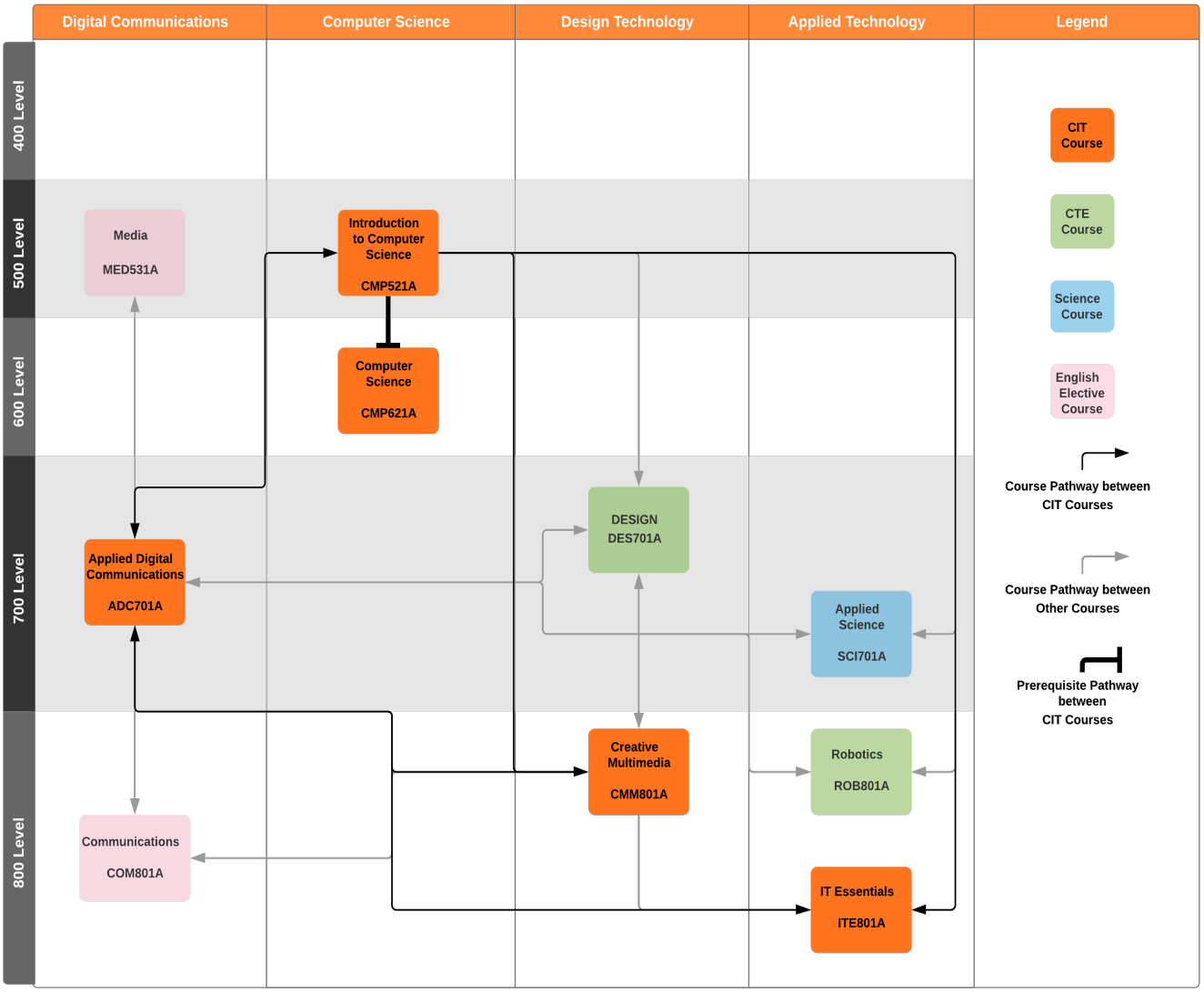



Figure 2. CIT Pathways

## General Curriculum Outcomes

General curriculum outcome statements articulate what students are expected to know and be able to do upon completion of study in the Communication and Information Technology courses.

Table 1. Technology Education General Curriculum Outcomes

| Strand | Description |
|---|---|
| **GCO 1** | Technological Problem Solving<br>Students will be expected to design, develop, evaluate,and articulate technological solutions. |
| **GCO 2** | Technological Systems<br>Students will be expected to operate and manage technological systems. |
| **GCO 3** | History and Evolution of Technology<br>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<br>Students will be expected to demonstrate an understanding of current and evolving careers and of the influence of technology on the nature of work. |
| **GCO 5** | Technological Responsibility<br>Students will be expected to demonstrate an understanding of the consequences of their technological choices. |

## Unit Structure

The table below outlines the unit structure for Communication and Information Technology courses. The specific curriculm outcomes for individual courses are organized into these units and provide a lens through which each curriculum outcome may be viewed and understood.  Although the outcomes are organized into specific units, they are not intended to be experienced in isolation, but should be considered in ways that allow them to be integrated across units.

Table 2. CIT Unit Structure

| Units | Description |
|---|---|
| **Technological Fluency** | Through the lens of Technological Fluency, learners use information and communication technologies to consume, curate, evaluate, create, and share digital content to express themselves in an appropriate and professional way. Learners leverage the use of digital tools in a digital practice that is ethical, responsible and reflective in their academic, social and personal life. |
| **Skills Development** | Through the lens of skill development, learners acquire, practice, and improve their skills related to digital technologies through the creation of projects, presentations, publications, and analysis of data. |
| **Applied Design** | Through the lens of applied design, learners explore their curiosity and creativity by creating digital artifacts through a design process that is cognitive, strategic, and practical. Learners create artifacts through experiential, hands-on experiences that promote innovative thinking, problem solving, and collaboration. |
| **Technological Systems** | Through the lens of technology systems, learners acquire the knowledge and ability to use computers and technologies efficiently by developing knowledge and understanding allowing learners to explore areas of personal interest, post secondary opportunities, and apply these skills in routine activities. |

## Specific Curriculum Outcomes

Specific curriculum outcomes (SCOs) identify what students are expected to know and be able to do for a particular course. They provide a focus for instruction in terms of measurable or observable student performance and are the basis for the assessment of student achievement across the province. PEI specific curriculum outcomes are developed with consideration of Bloom's Taxonomy of Learning and the Essential Graduation Competencies.

SCOs will begin with the phrase—Learners are expected to… .

## Achievement Indicators (AIs)

Each specific curriculum outcome is described by a set of achievement indicators that support, define, and demonstrate the depth and breadth of the corresponding SCO.

Taken together as a set, AIs support the SCO in defining specific levels of knowledge acquired, skills applied, or attitudes demonstrated by a student for that particular outcome. It is important to note that AIs are not a prescriptive checklist to be taught in a sequential manner, are not a prioritized list of instructional activities, and are not a set of prescribed assessment items. Achievement indicators provide clarity and understanding to ensure instructional design is aligned to the SCO.

The set of achievement indicators for a given outcome begins with the phrase—Learners who have achieved this outcome should be able to… .

## Elaborations

An elaboration provides a fuller description of the SCO and the instructional intent behind it. It provides a narrative for the SCO, gives background information where possible, and offers a broader context to help teachers gain a deeper understanding of the scope of the SCO. This may also include suggestions and/or reference supporting resources that may be helpful for instruction and assessment of the SCO.

## Bloom's Taxonomy

Bloom's Taxonomy was published in 1956 as a framework for the purpose of classifying expectations for student learning as indicated by educational outcomes. David Krathwohl's 2002 revision of this taxonomy expands on the original work by defining the relationship between the cognitive process dimension—how we expect students to come to know and think about the outcome—and the knowledge dimension—the category of knowledge expressed by the outcome.

A full understanding of the relationship between the cognitive process and knowledge dimensions of Bloom's Taxonomy will serve students, teachers, and administrators by:

- providing a framework for developing the specific curriculum outcomes (SCOs) for a particular course;
- identifying the type of knowledge and cognitive process of the outcome;
- providing a means for the alignment of specific curriculum outcomes with instructional activities and assessments; and
- providing a common language about the curriculum outcomes within all subjects to facilitate communication.

## Cognitive Process Dimension

The cognitive process dimension classifies six types of cognition that learners may be expected to demonstrate or use as they work towards proficiency of any given specific curriculum outcome. The verb(s) that begins a specific curriculum outcome identifies the cognitive process dimension.

Table 3. Cognitive Process Dimension

| Category | Description |
|---|---|
| Remembering | Retrieve, recall, and/or recognize specific information or knowledge from memory. |
| Understanding | Construct meaning from different sources and types of information, and explain ideas and concepts. |
| Applying | Implement or apply information to complete a task, carry out a procedure through executing or implementing knowledge. |
| Analysing | Break information into component parts and determine how the parts relate or interrelate to one another or to an overall structure or purpose. |
| Evaluating | Justify a decision or course of action, problem solve, or select materials and/or methods based on criteria and standards through checking and critiquing. |
| Creating | Form a coherent functional whole by skillfully combining elements together and generating new knowledge to guide the execution of the work. |

## Knowledge Dimension

The knowledge dimension classifies four types of knowledge, ranging from concrete to abstract, that learners may be expected to acquire or construct.

These types of knowledge include factual, conceptual, procedural, and metacognitive. The noun(s) or noun phrase(s) included in a specific curriculum outcome represent the type of knowledge for the knowledge dimension.

Table 4. Knowledge Process Dimension

| Category | Description |
|---|---|
| Factual | The basic elements students must know to be acquainted with a discipline or solve problems in it (e.g., knowledge of terminology; knowledge of specific details and elements). |
| Conceptual | The interrelationship among the basic elements within a larger structure that enables them to function together (e.g., knowledge of classifications and categories, knowledge of theories, models, and structures). |
| Procedural | How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods (e.g., knowledge of subject-specific skills and algorithms, knowledge of subject-specific techniques and methods, knowledge of criteria for determining when to use appropriate procedures). |
| Metacognitive | Knowledge of cognition in general as well as awareness and knowledge of one's own cognition (e.g., strategic knowledge, knowledge about cognitive tasks, including appropriate contextual and conditional knowledge, self-knowledge). |

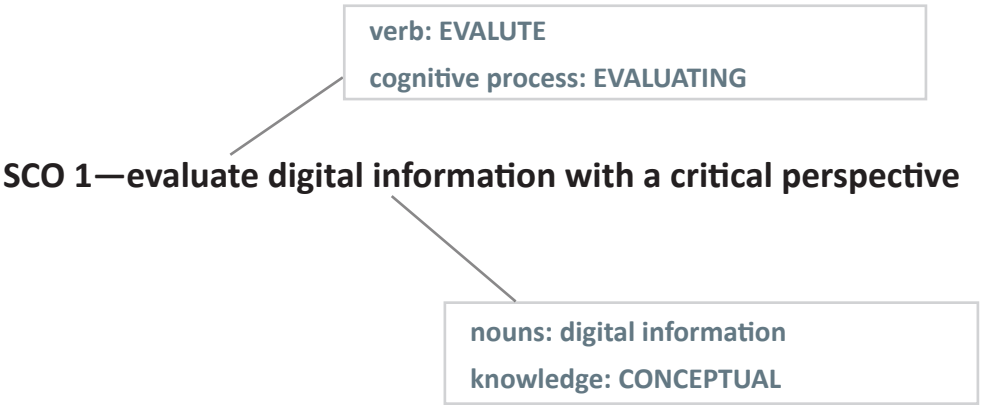
## Taxonomy Tables

Combining the cognitive process dimension and knowledge dimension into one taxonomy table helps teachers to visualize the overall expectations. As teachers reflect deeply and collaborate to identify the types of cognition and knowledge required by each outcome, they will be better able to plan what student achievement will look, sound, and feel like in the learning environment, leading to student achievement of the outcomes at the targeted level.

The taxonomy tables in the PEI curriculum guides are constructed as two-dimensional tables where the knowledge dimension forms the vertical axis and the cognitive process dimension forms the horizontal axis. This results is a 24-cell matrix on which any specific curriculum outcome can be classified in terms of both dimensions.

## SCO Structure

Examining the structure of a specific curriculum outcome is necessary to fully understand its intent prior to planning instruction and assessment. The verb(s) in the outcome relates to the expected level and type of thinking (cognitive process). A noun or noun phrase communicates the type of knowledge (i.e., factual, conceptual, procedural, or metacognitive) that is the focus of the outcome.




## Curriculum Guide Layout

The curriculum guide layout is designed to highlight the critical elements of the curriculum guide.

Table 5. Curriculum Guide Layout

| Feature | Description |
|---|---|
| Unit Name | Appears in the upper left hand corner. |
| Taxonomy Table | Appears in the upper right hand corner and is specific to the given outcome. |
| SCO Block | Appears in the coloured box; may contain a scope and sequence chart. |
| AI List | Appears in the body of the page immediately following the SCO. |
| EGC Map | Appears at the bottom of the page. |

Curriculum Unit

Bloom's Taxonomy Table

Essential Graduation Competencies Map

*TECHNOLOGICAL FLUENCY*

ESSENTIAL GRADUATION COMPETENCIES

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

**TF1**

Cognitive Process Dimension

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | ■ | |
| Procedural | | | | | | |
| Metacognitive | | | | | | |

General Curriculum Outcome Map

**TF1**

*Learners are expected to ...*

**evaluate digital information with a critical perspective.**

Specific Curriculum Outcome

**Achievement Indicators**

*Learners who have achieved this outcome should be able to ...*

List of Achievement Indicators

a. define technological fluency in terms of digital information;

b. compare various sources of digital information (tools, styles, formats, and media) as a medium for communication;

c. discuss the benefits and limitations of digital information on personal data (tracking);

d. discuss the legal and ethical rights and responsibilities of the digital user;

e. discuss how digital information impacts personal, ethical, social, economic, and cultural practices;

f. use various search methods/tools to authenticate digital information;

g. assess digital information to determine context, perspective, bias, and/or motive;

h. assess digital information for accuracy, validity, and quality; and

i. argue a point of view using well vetted, defendable digital information and sources.



Course Name & Course Code

Version Number and Date

Figure 3. Sample Curriculum Guide Page

## Teaching Strategies

Teaching is both a science and an art. There is a wealth of instructional strategies and methodologies described in the literature related to Computer Information Technology (CIT) that teachers have at their disposal when creating a learning environment that best suits the needs of their students.

Below is a CIT Teaching Strategies Wheel that is designed to identify a range of strategies that are effective when preparing lessons, assignments, and experiences for the CIT classroom. The list is not intended to be exhaustive and CIT teachers are encouraged to continually read and engage in current research, pedagogy, and practice related to their field.

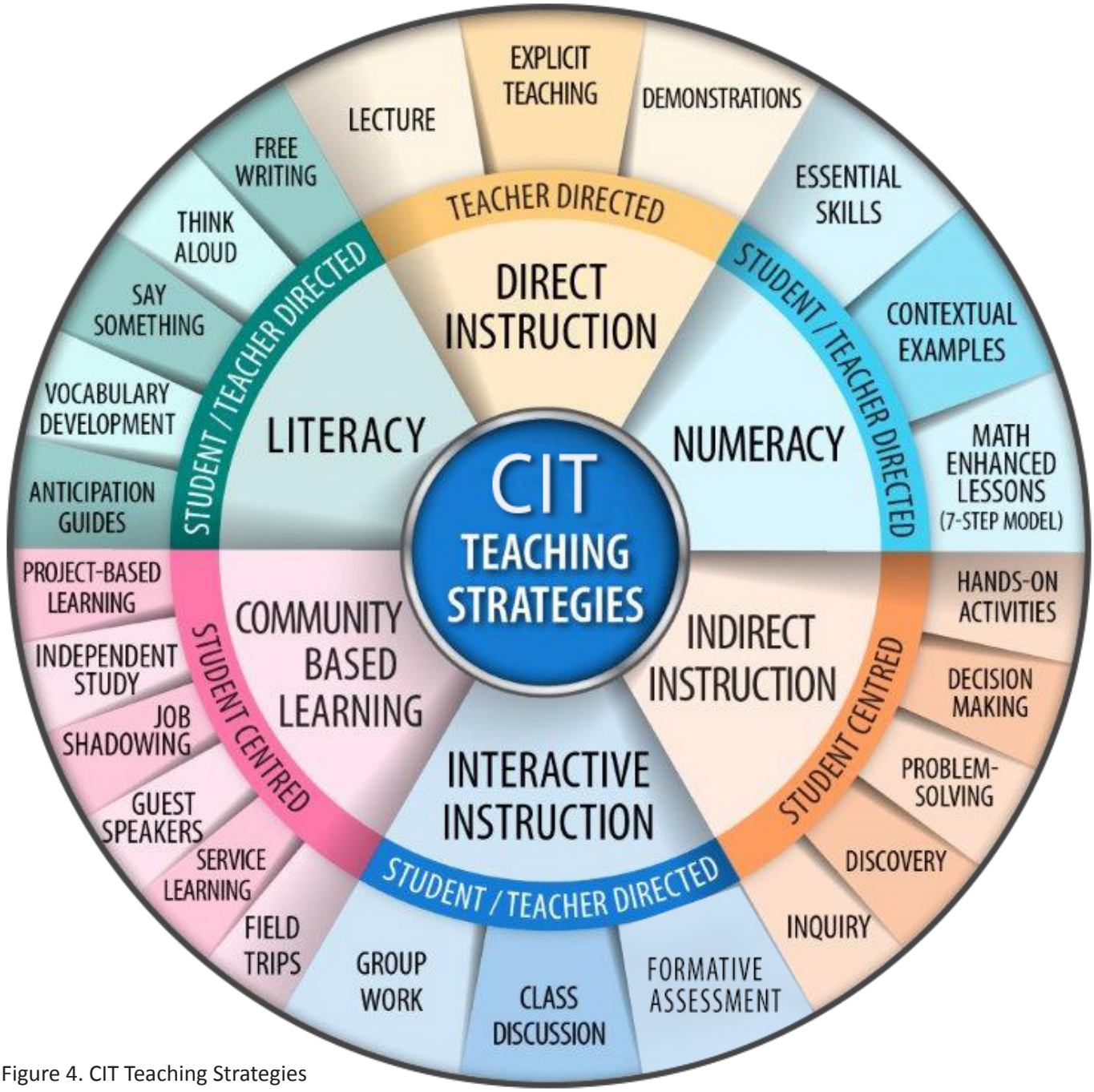



Figure 4. CIT Teaching Strategies

### Direct Instruction

Direct instruction is highly teacher-directed and is among the most commonly used strategy. Direct instruction is effective for providing information, developing step-by-step skills, introducing other teaching methods, or actively involving students in knowledge construction. Examples include lecture, didactic questioning, explicit teaching, practice and drill, and demonstrations.

### Indirect Instruction

Indirect Instruction is primarily student-centred and complements direct instruction. Indirect instructin draws on the inquiry process, induction, problem solving, decision making, and discovery. Examples include reflective discussion, concept formation, concept attainment, problem solving, and guided inquiry.

### Interactive Instruction

Interactive instruction relies heavily on discussion and sharing among learners and allows for a range of groupings and interactive methods. Examples include full class discussions, small group discussions, group projects, and peer support when working on assignments.

### Numeracy

Numeracy instruction is an integral part of all learning. By Incorporating numeracy into the CIT context, students are able to make connections to their math classes and continue to develop their transferable math skills.

### Community Based Learning

Community-based learning is an instructional teaching and learning strategy that integrates meaningful community engagement with instruction and reflection enriching the learning experience with a greater emphasis on reciprocal learning and reflection (Marshall University, 2020).

## Literacy

Integrating literacy into the CIT classroom is essential for students to develop strong connections between the practical skills and technical knowledge required. The following strategies are a sample of reading and writing strategies support effective CIT instruction.

## Pre-Reading Strategies

Pre-reading strategies are used prior to assigning a reading and are designed to activate the students' prior knowledge on a subject, promote inquiry and discussion, provide clarity, and give the students reason to engage in the text. Examples include the following.

***Free Writing -*** provides students with a short amount of time to record what they already know or believe about the topic. Free writes should never be collected or evaluated. The only rule of the free write is that students write for the entire time allotted even if they run out of things to say.

***Anticipation Guides -*** consist of four or five statements about a topic that students are asked to either agree or disagree with prior to reading. The statements should be carefully crafted to raise the students' interest in the subject (so that all students do not respond in the same way), and be supported by the assigned reading. After reading, students should revisit and discuss their responses.

## During-Reading Strategies

During-Reading strategies are designed to promote active reading of the material. They provide students' with specific tasks to complete or things to discover while reading the document. During-reading strategies can be used in small groups or as individual tasks.

***Think Aloud*** - Think Aloud is a very effective strategy to use when reading aloud to students. During the Think Aloud it is important to model and reflect on how you yourself make meaning when reading challenging CIT related text, and how you relate the topic back to prior topics covered.

***Say Something*** - Before assigning the Say Something, take time to model the strategy with a student or colleague and review the rules that will make for a successful Say Something (it is a good idea to post these rules so everyone can see them and be reminded of them during the activity):

- With your partner, decide who will say something first;
- When you say something, make a prediction, ask a question, clarify something you had misunderstood, and or make a connection;
- If you cannot do one or more of the above things, then you need to reread.

***Re-reading*** - "Re-reading is probably the number one strategy independent readers use when something stumps them in a text. It's probably the last strategy dependent readers use." (Kylene Beers). Before asking students to reread a section of text you must first set the activity up for success:

- Prove to students that rereading is valuable to their learning. You can model this while doing a Think Aloud where you model your thinking as you interpret the text.
- Provide the students with specific tasks to complete while they reread a section.
- Review the text as a group after everyone has reread it.

## Computational Thinking (BBC, 2020)

What is computational thinking? Computers can be used to help us solve problems. However, before a problem can be tackled, the problem itself and the ways in which it could be solved need to be understood. Computational thinking allows us to do this.

Computational thinking allows us to take a complex problem, understand what the problem is and develop possible solutions. We can then present these solutions in a way that a computer, a human, or both, can understand.

### The four cornerstones of computational thinking

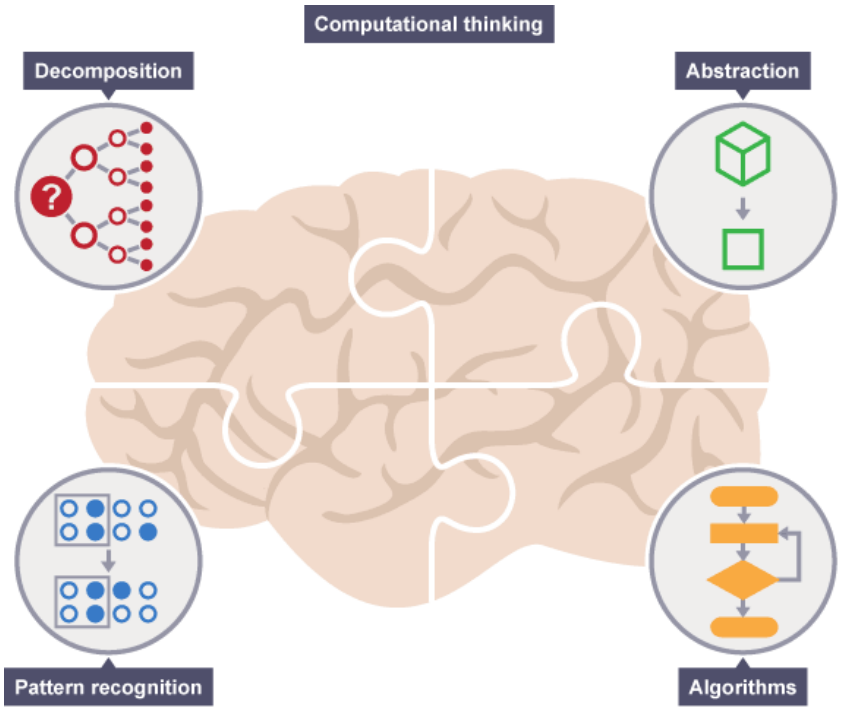
There are four key techniques (cornerstones) to computational thinking:

- **decomposition** - breaking down a complex problem or system into smaller, more manageable parts
- **pattern recognition** – looking for similarities among and within problems
- **abstraction** – focusing on the important information only, ignoring irrelevant detail
- **algorithms** - developing a step-by-step solution to the problem, or the rules to follow to solve the problem

Each cornerstone is as important as the others. They are like legs on a table - if one leg is missing, the table will probably collapse. Correctly applying all four techniques will help when programming a computer.

### Computational thinking in practice

A complex problem is one that, at first glance, we don't know how to solve easily. Computational thinking involves taking that complex problem and breaking it down into a series of small, more manageable problems (**decomposition**). Each of these smaller problems can then be looked at individually, considering how similar problems have been solved previously (**pattern recognition**) and focusing only on the important details, while ignoring irrelevant information (**abstraction**). Next, simple steps or rules to solve each of the smaller problems can be designed (**algorithms**). Finally, these simple steps or rules are used to **program** a computer to help solve the complex problem in the best way.



## BIG 3! Learning Goals, Success Criteria, and Descriptive Feedback

The "Big 3" describes strategies that teachers can use with students that are proven to increase student achievement. These are: setting and communicating learning goals, creating lists of things that students need to do to be successful (success criteria), and providing timely and descriptive feedback to students based on those criteria.

## Workshop Model

The opening is an opportunity to share the day's learning targets and set the stage for the day.

During the mini-lesson the teacher provides direct instruction for the whole class.

During the work time, students get to dig in and practice the learning. This is the most important part of the workshop and therefore must be the longest part of the period. Students should use the bulk of the class to work, practice, or apply what has been taught during the mini-lesson.

Students may be working at different tasks during work time and teachers may be working with individual students. This supports student independence while also scaffolding to support growth in skills.

## Gradual Release Model

Teachers must determine when students can work independently and when they require assistance. In the gradual release of responsibility model, students move from a high level of teacher support to independent practice. The teacher models a concept or strategy and makes explicit the thinking he/she engages in when choosing, and applying the strategy in a specific context. The teacher gradually releases the responsibility through a phase of shared and guided practice which leads the student to independence. If necessary, the teacher increases the level of support when students need further assistance.

Teachers may begin the process at any point in the cycle. For example, teachers may provide a diagnostic assessment (independent stage) to establish what students know prior to teaching in order to determine which practices need to be modelled and which ones the students are able to perform independently.

## Marzano's High-Yield Instructional Strategies

Below is a set of High-Yield Strategies that are key to CIT. The list is not intended to be exhaustive.

- Identifying similarities and differences.
- Summarizing and note taking.
- Reinforcing effort and providing recognition.
- Homework and practice.
- Non linguistic representations.
- Cooperative learning.
- Setting objectives and providing feedback.
- Generate and testing hypothesis.

## Understanding by Design

Understanding by Design (UbD) is often referred to as "backward design". UbD is a curricular planning model developed by American educators Grant Wiggins and Jay McTighe. The main premise is that learning, and hence understanding, must be demonstrated through transference—the ability to apply what has been learned to a new situation or problem. In order to assess the level of learning, it is necessary to plan instruction as a "backward" experience of three stages: beginning with the end-in-mind or the desired results, evidence-of-learning or assessment, and finally the learning plan or the activities that will engage students and scaffold toward the end result or performance task.

**The basics of UbD is to**

- help transform SCOs into meaningful learning elements and assessments;
- encourage teachers to become coaches and facilitators of meaningful learning rather than purveyors of superficial content;
- reveal learning when students make sense of and are able to transfer learning to new and authentic situations;
- require ongoing review of instructional design to ensure effective practice and continuous improvement for achievement;
- promote a way of thinking about curricular planning in a broader sense not a rigid program or prescriptive plan;
- ensure deeper student understanding by making meaning from "big ideas"; and
- overcome tendency to commit the twin sins; textbook coverage and activity-oriented teaching (activity without a clear purpose).

Table 6. Understanding by Design

| Stage 1—Desired Results | Stage 2–Evidence | Stage 3—Learning Plan |
|---|---|---|
| The knowledge, skills, and attitudes that are articulated in specific curriculum outcomes (SCOs) are identified. | Performance tasks and criteria are determined. Performance tasks should be authentic tasks that are designed to simulate or replicate real-world performances and establish a realistic context with a genuine purpose, audience, and constraints.<br><br>Performance criteria will provide the evidence of learning that is needed to assess performance or product.<br><br>• Criteria can be weighted and include:<br>• Content: aptness, adequacy, or accuracy of knowledge and skills used.<br>• Process: the means, processes, attitude, or approaches taken in the performance or in the preparation for performance.<br>• Quality: attention to detail, polish, and craftsmanship<br>• Impact: Did the performance work? What was its effect, its result, its outcome, irrespective of effort, attitude, and approach? | In the final stage the sequence of learning activities that will scaffold students toward the performance task and understanding are planned. |

## Assessment and Evaluation

Assessment and evaluation are integral components of the teaching and learning process.

Effectively planned assessment and evaluation promotes learning, builds confidence, and develops students' understanding of themselves as learners. It also improves and guides future instruction and learning.

Effective and authentic assessment involves

- designing performance tasks that align with specific curriculum outcomes;
- including students in determining how their learning will be demonstrated; and
- planning for the three phases of assessment (for, as, and of learning).

Assessments need to be reflective of the cognitive processes and level(s) of knowledge and skill indicated by the outcome. An authentic assessment will collect data at the level for which it is designed.

Whether conducting assessment for learning or assessment of learning, a teacher must have sufficient proof of a students' learning. By using a process known as triangulation, teachers can obtain data of student learning from three different sources (e.g., observations, conversations and products) thereby ensuring sufficient data is collected for evaluation. Observations and conservations are more informal forms of evidence which may be, for example, recorded as anecdotal notes. Products include tests, projects, or other tasks that enable students to demonstrate what they know and can do at the end of the learning process. By collecting data from multiple sources, teachers are able to verify the data they collect against each other thus allowing them to gain an accurate portrayal of student progress.

Effective evaluation involves considering the totality of the assessment data and interpreting it to make informed judgments about student learning.

## Assessment Strategies

Assessment is the act of gathering information on an ongoing basis in order to understand students' individual learning and needs. It is the journey of their learning.

Effective assessment improves the quality of learning and teaching. It helps students to become self-reflective and to feel in control of their own learning and enables teachers to reflect on and adjust their instructional practices. When students are given opportunities to demonstrate what they know and what they can do with that knowledge, optimal performance can be realized.

Assessment has three interrelated purposes:

- Assessment for learning to guide and inform instruction.
- Assessment as learning to involve students in self-assessment and setting goals for their own learning.
- Assessment of learning to determine student progress relative to curriculum outcomes.

Even though each of the three purposes of assessment requires a different role and planning for teachers, the information gathered through any one purpose is beneficial and contributes to an overall picture of an individual student's achievement.

All assessment practices should respect the needs of diverse learners and should respect and appreciate learners' cultural diversity. Teachers should provide students with a variety of ways to demonstrate on an ongoing basis what they know and are able to do with many different types of assessment over time. Valuable information about students can be gained through intentional conversations, observations, processes, performance, and products. A balance among these sources ensures reliable and valid assessment of student learning.

**Effective assessment strategies**

- are appropriate for the purposes of instruction, the needs and experiences of the students, and learning strategies used;
- assist teachers in selecting appropriate instruction and intervention strategies to promote the gradual release of responsibility;
- reflect where the students are in terms of learning and help to determine the levels and types of support or instruction that will follow;
- allow for relevant, descriptive, and supportive feedback that gives students clear directions for improvement, and engages students in metacognitive self-assessment and goal setting that can increase their success as learners;
- are explicit and communicated to students and parents so students know expectations and criteria to be used to determine the level of achievement;
- must be valid in that they measure what they intend to measure and reliable in that they consistently achieve the same results when used again, or similar results with a similar group of students;
- involve students in the co-construction, interpretation, and reporting of assessments by incorporating their interests, multiple intelligences, and their learning styles;
- accommodate for the diverse learning needs of students; and
- are comprehensive and enable all students to have diverse and multiple opportunities to demonstrate their learning consistently, independently, and in a range of contexts in everyday instruction.

Students should know what they are expected to learn as designated by SCOs and 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 which can be used to make judgments about their own learning. Assessment must provide opportunities for students to reflect on their progress, evaluate their learning, and set goals for future learning. Students may benefit from examining various scoring criteria, rubrics, and student exemplars.

Student involvement in the assessment process can be achieved by

- incorporating students' interests into assessment tasks (e.g., allowing students to select texts to read/view that relate to their interests);
- providing opportunities for students to self-assess their learning;
- co-creating assessment criteria with the student, working to describe how a specific skill or product is judged to be successful; and
- using student exemplars to illustrate a range of skill development (i.e., practise using the assessment criteria to guide their own work).

## Evaluation

Evaluation is the culminating act of interpreting the balanced information gathered through relevant and authentic assessments for the purpose of making judgments.

Inherent in the idea of evaluating is “value”. Evaluation is based on the cumulative assessments of the SCOs. The SCOs should be clearly understood by learners before instruction, assessment, and evaluation takes place. Evaluation is informed by a quality, authentic formative and summative assessment process.

During evaluation, the teacher

- interprets all assessment information and makes judgments about student progress;
- reports on student progress; and
- makes informed decisions about student learning programs based on the judgments or evaluations.

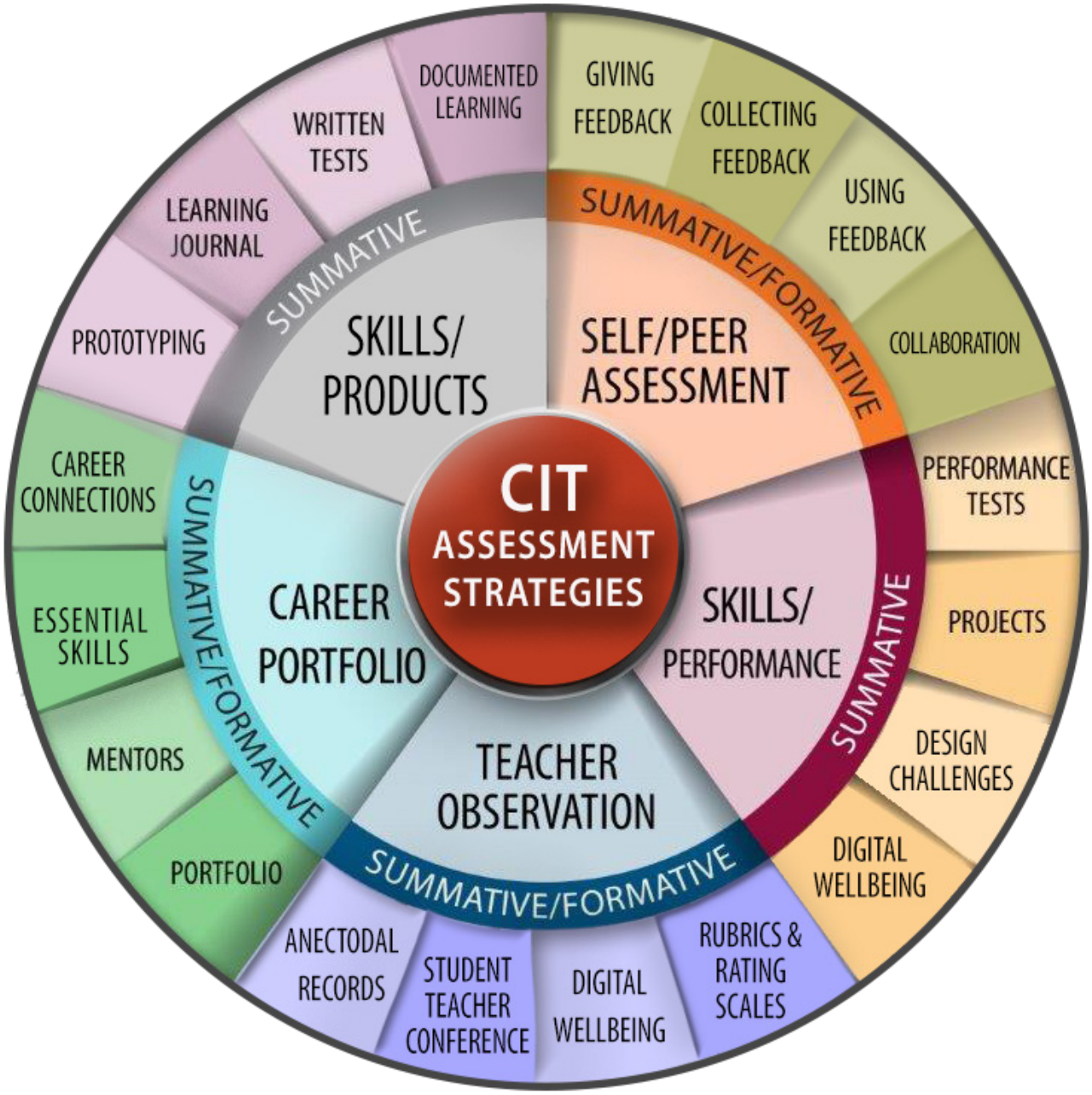



Figure 5. CIT Assessment Strategies

## Outcome Summary

The outcomes of ADC701A are categorized into four units. These units and specific outcomes are designed to provide learners a holistic introduction to the skills and competencies needed for success. Each outcome, with its related achievement indicators and elaborations, can be found starting on page 26.

Table 7. Summary of Specific Curriculum Outcomes for ADC701A

| Unit | Weighting | Code | Learners are expected to ... |
|---|---|---|---|
| **Technological Fluency** | **20-25%** | TF1 | evaluate digital information with a critical perspective. |
| | | TF2 | examine personal connections between technological content and skills and potential pathway choices. |
| | | TF3 | examine the impact of online behaviours and practices on digital well-being. |
| **Skills Development** | **50-55%** | SD1 | develop proficiency in typing skills for speed and accuracy. |
| | | SD2 | produce documents using a variety of digital tools for publication. |
| | | SD3 | assemble data using a variety of digital tools to communicate information. |
| | | SD4 | prepare presentations using a variety of digital tools for delivery. |
| | | SD5 | apply principles and procedures to produce code. |
| **Applied Design** | **20-25%** | AD1 | transfer digital skills and knowledge to solve design challenges. |
| | | AD2 | collaborate through a design process to create an authentic digital artifact. |
| **Technological Systems** | 5-10% | TS1 | apply basic operating skills for a variety of technologies. |

## Application of Bloom's Taxonomy

Table 8 below shows where ADC701A outcomes sit within Bloom's Taxonomy. This should serve as a guide to the breadth and depth to which outcomes are addressed. Refer to "Bloom's Taxonomy" on page 10 for descriptions of the Cognitive Process and Knowledge Dimensions. Please note that the Skills Development (SD) outcomes build essential skills and knowledge for learners to use within other outcomes. This should be considered when developing an assessment and evaluation plan.

Table 8. Bloom's Taxonomy Table for ADC701A

| | | Cognitive Process Dimension | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Remembering** | **Understanding** | **Applying** | **Analysing** | **Evaluating** | **Creating** |
| **Knowledge Dimension** | **Factual** | | | | | | |
| | **Conceptual** | | | | TF3 | TF1 | |
| | **Procedural** | | | SD1, SD2, SD3, SD4, SD5, TS1 | AD1 | AD2 | |
| | **Metacognitive** | | | | TF2 | | |

## Verb Chart

Table 9 below will provide guidance as to the intended cognitive process that is associated with each verb in the context of the guide. It is important to note that some verbs could easily appear in different cognitive process levels, but have been placed as indicated because of the nature of the task(s).

The verb, ***transfer***, for example, could be found under the Applying level in some curricula, but what students are asked to do within Applied Digital Communications puts this verb at an Analysing level.

For a detailed description of each category see "Bloom's Taxonomy" on page 10.

Table 9. Verb Chart for ADC701A

| Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|
| define<br>locate | compare<br>describe<br>discuss<br>explain<br>explore<br>identify | apply<br>assemble<br>complete<br>develop proficiency<br>edit<br>participate<br>prepare<br>present<br>produce<br>research<br>transcribe<br>use<br>write | examine<br>make connections<br>reflect<br>transfer | argue<br>assess<br>collaborate<br>evaluate<br>select and apply | |

*TECHNOLOGICAL FLUENCY*

ESSENTIAL GRADUATION COMPETENCIES

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

**TF1**

Cognitive Process Dimension

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | ■ | |
| Procedural | | | | | | |
| Metacognitive | | | | | | |

**TF1**

*Learners are expected to ...*

**evaluate digital information with a critical perspective.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. define technological fluency in terms of digital information;

b. compare various sources of digital information (e.g., tools, styles, formats, and media) as a medium for communication;

c. discuss the benefits and limitations of digital information on personal data (e.g., online tracking);

d. discuss the legal and ethical rights and responsibilities of the digital user;

e. discuss how digital information impacts personal, ethical, social, economic, and cultural practices;

f. use various search methods and tools to authenticate digital information;

g. assess digital information to determine context, perspective, bias, and/or motive;

h. assess digital information for accuracy, validity, and quality; and

i. argue a point of view using well vetted and defendable digital information and sources.

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome TF1. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

Learners use information and communication technologies to consume, curate, evaluate, create, and share digital content to express themselves. The intent of this outcome is for learners to consume and evaluate digital information with a critical lens. It is important for learners to understand how to leverage the use of digital tools in a practice that is ethical, responsible, and reflective in their academic, social, and personal life.

Learners must understand how digital information is produced, processed, and shared to deepen their understanding of various evaluative measures allowing them to vette information for authenticity, accuracy, and validity. Learners should be given opportunities to explore various digital platforms such as social media, web browsers, and websites to recognize how digital information is communicated and explore the different mediums (styles, format, tools, media) that are used for a specific audience.

Teachers are encouraged to cover some of the essential topics of digital information authentication. For example, concepts, such as, sources of information, currency of information, relevance of information, accuracy of information, purpose, publication, format, and supporting documentation are suggested concepts for teachers to consider to engage students in the discovery, understanding, and application of their work.

***Online tracking -*** understand how an online user's activity is tracked online and how it is used to match personal interests, sending search queries back to the user to customize the experience.

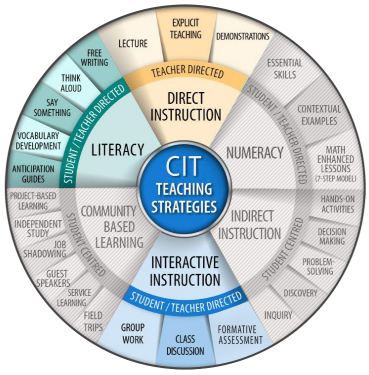
***Marketing and targeting audiences -*** awareness of how online marketing is used to attract a specific audience or user.

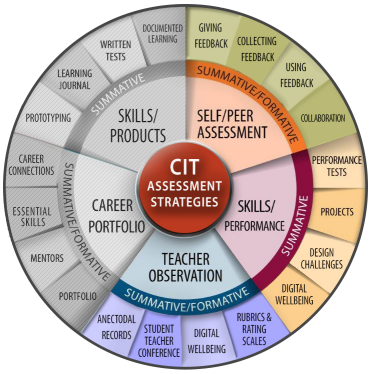
***Social media concepts -*** deep fakes, social media, influencers, marketing, and website analytics.

***Rights and responsibilities of the digital user -*** right to freedom of expression, right to privacy, right to credit of personal works, right to digital access, right to our identity, responsibility to report bullying, harassing, sexting, or identity theft, responsibility to cite works used for resources and researching, responsibility to download music, videos, and other material legally, responsibility to model and teach student expectations of technology use, responsibility to keep data/information safe, responsibility not to falsify our identity in any way.

## Considerations for Effective Instruction and Assessment (wheels)

The outcome TF1 is expected to be assessed through a variety of assessment opportunities. Learners should be given opportunities to engage in classroom discussions to explore relevant themes and current events. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*TECHNOLOGICAL FLUENCY*

ESSENTIAL GRADUATION COMPETENCIES

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

**TF2**

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | | | | |
| Metacognitive | | | | | **TF2** | |

Cognitive Process Dimension

*Learners are expected to ...*

**TF2** **examine personal connections between technological content and skills and potential pathway choices.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. discuss how advances in technology affect the workplace and potential pathway choices (e.g., artificial intelligence, automation, privacy and security, culture innovation);

b. discuss how technological knowledge and skills are transferable;

c. discuss the impact of social media and digital footprints on future opportunities;

d. make connections between technological content and skills to inform potential pathway choices;

e. reflect on how technology impacts and influences their personal interests and/or activities; and

f. develop a variety of educational and/or career pathways that build on their personal interests and technological skills.

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome TF2. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

Technologies are developing and changing rapidly. Skills are evolving as well. It is estimated that automation will affect half of all jobs in the next 15 to 20 years. This change will significantly impact the current and future workforce and career pathway opportunities. The intent of this outcome is for learners to explore personal interests and potential pathway opportunities. Teachers are encouraged to provide opportunities for learners to explore and discuss various topics that connect to personal interests, pathway opportunities, and required skills.

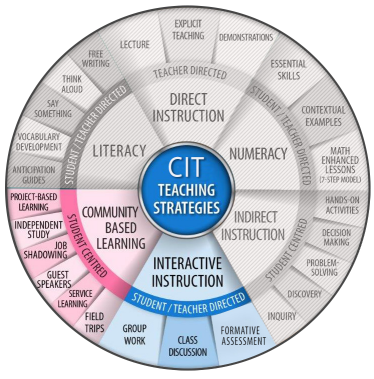
Learners should be encouraged to explore skill requirements in a variety of pathways or careers. Exploring pathways through an interest driven-approach can benefit the learner in discovering opportunities that they may not have previously considered. Teachers may consider inviting guest speakers from the community to speak to students about their own interests and pathways.

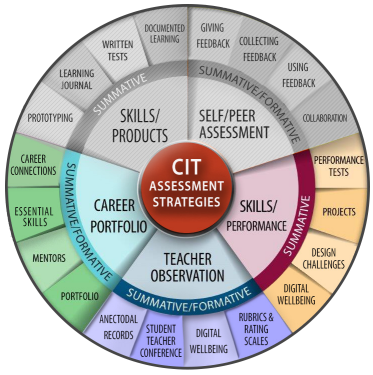
### *Topics to consider*

- technology automation and the workforce
- artificial intelligence and the workforce
- innovation
- social media and branding
- digital footprint
- hybrid job trends
- current and future job opportunities

## Considerations for Effective Instruction and Assessment

The outcome TF2 is expected to be assessed through a variety of assessment opportunities. Opportunities for learning should be integrated as much as possible to encourage learners to demonstrate and make connections between personal interests, knowledge, potential pathways, and skills. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*TECHNOLOGICAL FLUENCY*

ESSENTIAL GRADUATION COMPETENCIES

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

**TF3**

Cognitive Process Dimension

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | ■ | | |
| Procedural | | | | | | |
| Metacognitive | | | | | | |

**TF3**

*Learners are expected to ...*

**examine the impact of online behaviours and practices on digital well-being.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. discuss technological factors that affect mental well-being (e.g., screen time, notifications, influencers, devices);

b. discuss potential health issues associated with using technology (e.g., addictive/obsessive behaviour, depression, anxiety, self-esteem);

c. reflect on their relationship between their use of technology and their mental well-being;

d. discuss technological factors that affect physical well-being (e.g., eye strain, ergonomics, sitting, activity levels);

e. discuss the recommended Canadian 24hr movement guidelines;

f. reflect on the relationship between their use of technology and their physical well-being;

g. discuss online behaviours that affect overall well-being (e.g., cyberbullying, trolls, photos);

h. discuss digital practices that affect overall well-being (e.g., agents of change, digital marketing, consumerism)

i. discuss peer and digital media influences on overall well-being (e.g., relationships, self-esteem, social influencers);

j. reflect on how personal attitudes, values, social norms, and beliefs affect digital practices and online behaviour; and

k. reflect on their online behaviour and digital practices and their overall well-being.

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome TF3. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

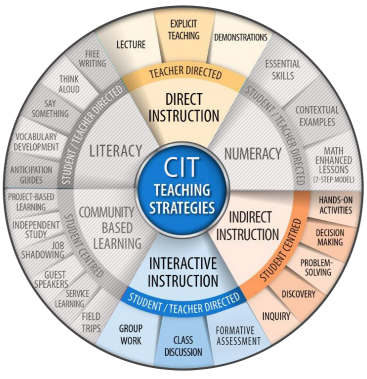
Technology enables consumers to access information instantly from anywhere. The rise of online influencers, media outlets, social media, and other digital trends impact our lives sometimes even without realizing it. Living a balanced and healthy lifestyle includes recognizing how technology affects our lives both physically and mentally.

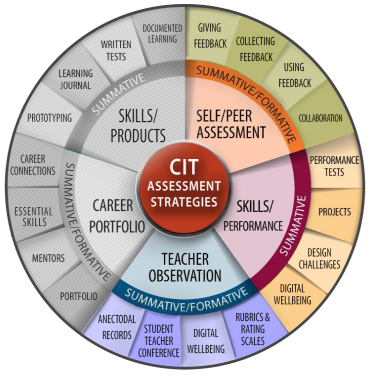
This outcome provides learners with an opportunity to examine their overall digital health through the lens of mental, physical, and digital well-being. Ongoing classroom discussions are important throughout this course. Classroom discussions will provide opportunities for students to examine current events and relevant topics relating to the impact of technology on well-being. A series of mini-lessons could be beneficial to learners as a way to continue ongoing discussions on topics of mental, physical, and digital well-being. Topics for these mini-lessons could be (but not limited to):

- cyberbullying
- agents of change
- digital marketing
- consumerism
- ergonomics
- addictive/obsessive behaviours in technology
- mental health (depression, anxiety)
- social media influencers
- wellness apps
- awareness of the effect of technology on mental well-being
- physical activity (movement guidelines)
- behaviours behind the screen

## Considerations for Effective Instruction and Assessment

The outcome TF3 is expected to be assessed through a variety of assessment opportunities. Teachers should consider modeling self-reflection exercises with learners to help demonstrate overall well-being practices. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*SKILLS DEVELOPMENT*

ESSENTIAL GRADUATION COMPETENCIES

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

**SD1**

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | ■ | | | |
| Metacognitive | | | | | | |

Cognitive Process Dimension

| SD1 | *Learners are expected to ...* |
|---|---|
| | **develop proficiency in typing skills for speed and accuracy.** |

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. describe ergonomic strategies to promote healthy work station habits;

b. describe ergonomic adaptations for individual needs (e.g., standing stations, special keyboards);

c. use proper hand and body positions and smooth rhythmic keystrokes;

d. transcribe information from various sources; and

e. use keyboarding techniques to build speed and accuracy.

*ELABORATIONS*

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome SD1. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

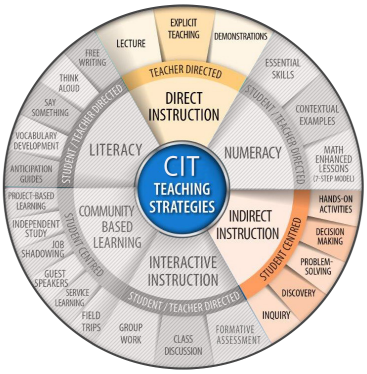
## Concepts / Content

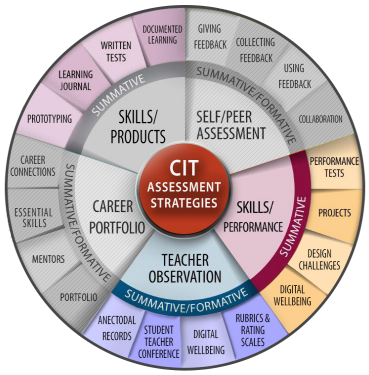
Keyboarding is an essential skill that can help individuals communicate effectively across various platforms, including in social, educational, and professional settings. The purpose of this outcome is for learners to develop proficiency in their typing skills, use proper ergonomic strategies, and improve on typing speed and accuracy.

It is important for learners to develop proper keyboarding techniques. Proper technique forms the foundation for successful touch keyboarding and helps learners practice healthy work station habits. The importance of modeling and encouraging proper technique with students cannot be over emphasized. Learners should be encouraged to transcribe information from various sources such as audio and print. This will help learners become more efficient in developing keyboarding techniques, speed, and accuracy.

## Considerations for Effective Instruction and Assessment

The outcome SD1 is expected to be assessed through a variety of assessment opportunities. Sufficient practice time must be allowed for learners to improve keyboarding techniques and skills. It is recommended that teachers set aside a portion of class time to devote to the practice of keyboarding. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*SKILLS DEVELOPMENT*

ESSENTIAL GRADUATION COMPETENCIES

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

**SD2**

Cognitive Process Dimension

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | ■ | | | |
| Metacognitive | | | | | | |

**SD2**

*Learners are expected to ...*

**produce documents using a variety of digital tools for publication.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. locate common features and components of the workspace;

b. explore the function of the standard toolbar;

c. explore the function of the formatting toolbar;

d. use the standard and formatting toolbar to edit text;

e. use the standard and formatting toolbar to edit paragraphs;

f. use the standard and formatting toolbar to edit documents;

g. edit text, paragraphs, and documents using revision tools (e.g., spell check, grammar, dictionaries);

h. use collaborative tools to revise documents (e.g., commenting, suggesting);

i. produce text documents with proper formatting for intended audiences and/or purposes;

j. use digital tools to appropriately cite and format sources for intended audiences and/or purposes; and

k. use digital tools to export documents for intended audiences and/or purposes.

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome SD2. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

The intent of this outcome is for learners to explore, edit, and publish documents using a variety of digital tools.

Producing documents that adhere to common design protocols are skills that can be applied and transferred in various publishing platforms. This outcome is heavily based on skill development. Learners should be given the opportunity to explore, recognize, and apply the following content and tools to documents being produced. Teachers are encouraged to model the suggested tools. Exploring these tools will enable learners to examine and determine how a variety of digital tools support the editing, revision, and publishing of documents.

***Suggested standard toolbar topics:***

- saving (save as, save a copy)
- download a copy, export (various formats)
- find and replace tool
- headers, footers, page numbers
- columns
- spelling and grammar tools
- dictionaries

***Suggested formatting toolbar topics:***

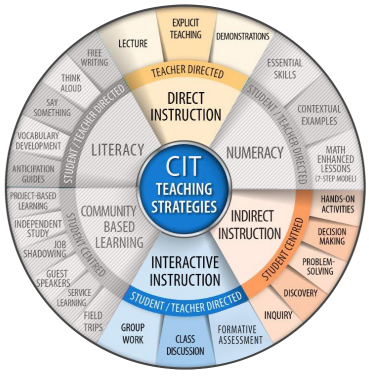
- text styles
- font and font size
- typographical emphasis (bold, italic, underline, strikethrough)
- highlighting/text color tools
- text hyperlinks
- images/graphics
- aligning tools (center, left, right, justify)
- line spacing tools
- list tools (numbering, bulleted)
- indentation tools

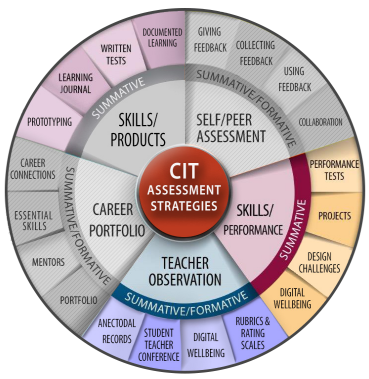
***Suggested collaborative tools:***

- commenting
- suggestion
- revising tools (show commenting, track changes)

## Considerations for Effective Instruction and Assessment

The outcome SD2 is expected to be assessed through a variety of assessment opportunities. It is important that learners understand that skills developed in one application are often transferable. Once these skills have been mastered, learners should transfer and apply these skills to projects or activities that mimic real world application. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*SKILLS DEVELOPMENT*

ESSENTIAL GRADUATION COMPETENCIES

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

**SD3**

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | ■ | | | |
| Metacognitive | | | | | | |

Cognitive Process Dimension

| SD3 | *Learners are expected to ...* |
|---|---|
| | **assemble data using a variety of digital tools to communicate information.** |

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. discuss the uses, applications, and advantages of spreadsheet programs or other digital tools used to prepare and assemble data;

b. locate common features and components of digital tools used to prepare and assemble data;

c. explore the function of the standard toolbar;

d. explore the function of the formatting toolbar;

e. discuss various types of data, sources of data, and ways to organize data;

f. use the standard and formatting toolbar to organize data for input;

g. discuss methods used to analyse and interpret data;

h. explore the function of the formula toolbar;

i. write basic formulas and functions to analyse and interpret data using proper conventions;

j. use the formula toolbar to process data;

k. discuss methods used to present data in tables, charts, and graphs;

l. explore the functions within the digital tool to present data; and

m. use the digital tool to present data

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome SD3. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

Digital tools and software such as spreadsheets offer a variety of powerful tools to edit, manipulate, and present data. The purpose of this outcome is for learners to explore, practice, and apply the skills required to assemble and organize information using a variety of digital tools.

This outcome is heavily based on skill development. Learners should be given the opportunity to explore, recognize, and apply the following content and tools to assemble data. Teachers are encouraged to model the suggested tools. Exploring these tools will enable learners to examine and determine how a variety of digital tools support the editing, manipulation, and presenation of data.

***Suggested standard toolbar topics:***

- column and row features (add, delete, freeze)
- protect sheet (password features)
- images, charts, drawings

***Suggested toolbar topics:***

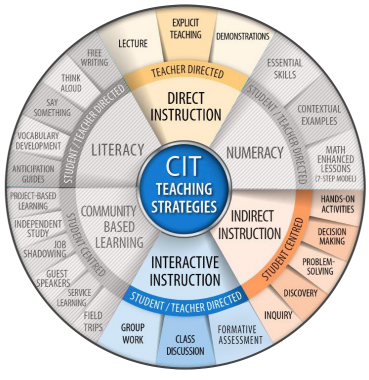
- formatting tools (currency, data & time, custom, decimals, percentages)
- text formatting (font, size, color)
- cell formatting (color, lines, borders, merge)
- alignment tools
- text wrapping tools
- conditional formatting

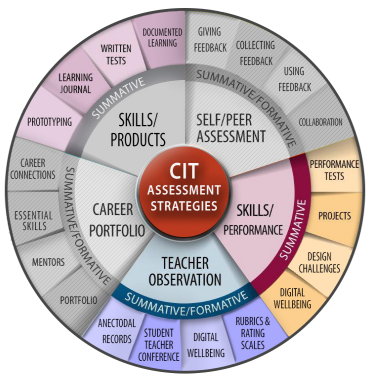
***Suggested formula toolbar topics:***

- functions (basic formulas)
- formula toolbar

## Considerations for Effective Instruction and Assessment

The outcome SD3 is expected to be assessed through a variety of assessment opportunities. It is important that learners understand that skills developed in one application are often transferable. Once these skills have been mastered, learners should transfer and apply these skills to projects or activities that mimic real world application. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*SKILLS DEVELOPMENT*

ESSENTIAL GRADUATION COMPETENCIES

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

**SD4**

Cognitive Process Dimension

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | ■ | | | |
| Metacognitive | | | | | | |

**SD4**

*Learners are expected to ...*

**prepare presentations using a variety of digital tools for delivery.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. discuss the uses, applications, and advantages of presentation programs or other digital tools used to present information (e.g., functionality, audience engagement, visual representation, ease of use);

b. locate common features and components of digital tools used to present information;

c. explore the function of the standard toolbar;

d. explore the function of the formatting toolbar;

e. use the standard and formatting toolbar to layout and organize a presentation;

f. research the elements and principles of visual design;

g. use the standard and formatting toolbar to design and format presentation (e.g., colour, theme, images, hyperlinks, video, layered visuals);

h. research effective presentation guidelines;

i. use the standard and formatting toolbar to prepare for presentation (e.g., transitions, speaker notes, revision, automation, handouts, export, web/online);

j. use collaborative tools to revise and present presentations (e.g., commenting, suggesting, speaker notes); and

k. prepare a presentation with proper formatting for intended audiences and/or purposes.

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome SD4. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

The purpose of this outcome is for learners to acquire the skills and knowledge to prepare presentations using a variety of digital tools. Presentation tools and applications allow users to effectively communicate ideas, key messages, and information to an audience. Preparing presentations that adhere to elements and principles of visual design and appropriate presentation guidelines are critical to the preparation of effective presentations. Learners should be encouraged to explore, research, and participate in classroom discussions on the use, applications, and advantages of presentation applications. Learners should also be encouraged to explore and use collaborative tools to review and revise presentations.

This outcome is heavily based on skill development. Learners should be given the opportunity to explore, recognize, and apply the following content and tools to design presentations. Teachers are encouraged to model the suggested tools. Exploring these tools will enable learners to examine and determine how a variety of digital tools apply support the editing, revision, publishing, and presenting of presentations.

***Suggested standard toolbar topics:***

- page setup, master pages
- animations
- audio, video, charts, diagrams, text art
- slide numbering
- spelling and grammar checker

***Suggested formatting toolbar topics:***

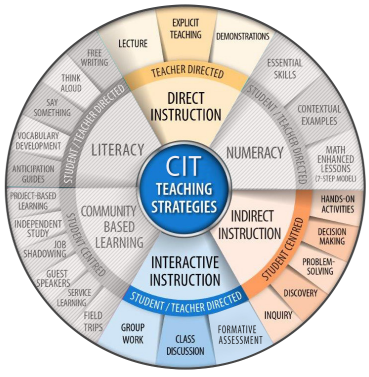
- text tools (textbox, font, font size, color, alignment, spacing, indent)
- images
- shape tools
- line tools
- background tools
- layout tools
- theme
- transitions

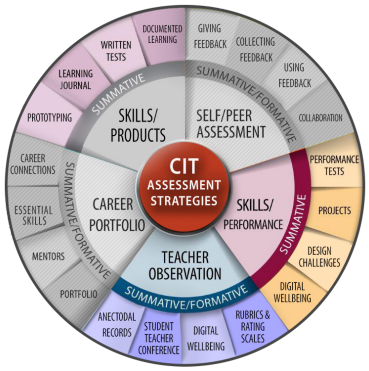
***Suggested collaborative tools:***

- commenting
- suggesting
- reviewing tools (show commenting, track changes)

## Considerations for Effective Instruction and Assessment

The outcome SD4 is expected to be assessed through a variety of assessment opportunities. It is important that learners understand that skills developed in one application are often transferable. Once these skills have been mastered, learners should transfer and apply these skills to projects or activities that mimic real world application. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*SKILLS DEVELOPMENT*

ESSENTIAL GRADUATION COMPETENCIES

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

**SD5**

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | ■ | | | |
| Metacognitive | | | | | | |

Cognitive Process Dimension

**SD5**

*Learners are expected to ...*

**apply principles and procedures to produce code.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. discuss the uses, applications, and advantages of programming and coding (e.g., big data, algorithms, analytics, applications);

b. discuss how computational thinking is used in programming and coding;

c. explain how algorithms are used in programming and coding;

d. identify various programming languages and tools used for coding (e.g., block, html, java);

e. define basic computational concepts (e.g., sequencing, loops, events, parallelism, conditionals, operators, and data);

f. locate key toolbars and components of digital tools used for coding; and

g. use basic computational concepts (e.g., sequencing, loops, events, parallelism, conditionals, operators, and data in coding applications).

## *ELABORATIONS*

**Essential Graduation Competencies (ECGs)**
Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome SD5. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

**Concepts / Content**
The purpose of this outcome is for learners to explore a beginner programming language (block coding or text-based coding) and be able to apply basic coding principles to tasks and activities.

Three dimensions of Computational Thinking as defined by Brennan & Resnick, 2012.

***Computational concepts*** **-** concepts designers employ as they program.

- *Sequences* - series of steps or instructions that can be executed by a computer.
- *Loops* - mechanism for running a sequence multiple times (repetition of event).
- *Events* - the cause and effect of one thing causing another thing to happen.
- *Parallelism* - sequences of instructions happening at the same time.
- *Conditionals* - ability to make decisions based on certain conditions (if/then statements).
- *Operators* -mathematical, logical, and string expressions.
- *Data* - storing, retrieving, and updating values (variables/lists).

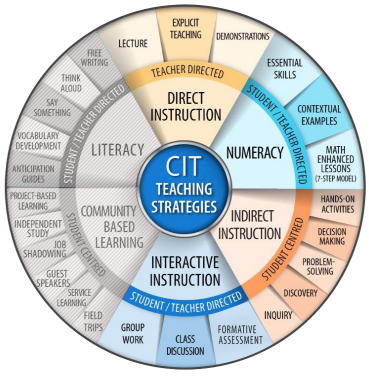
***Computational practices*** **-** practices designers develop as they program.

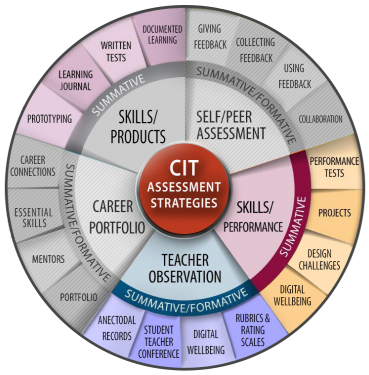
- *Being incremental and iterative* - iterative cycles of imagining and building, developing in increments, trying it out, and developing further, based on experiences and new ideas.
- *Testing and debugging* - testing, trial and error, developing strategies for dealing with and anticipating problems.
- *Reusing and remixing* - building on other people's work has been a longstanding practice in programming, encourage students to reuse and remix to create more complex code that they could create on their own.
- *Abstracting and modularizing* - building something larger by putting together a collection of smaller parts; practice for design and problem solving.

***Computational perspectives*** **-** perspectives designers form about the world around them and about themselves.

- *Expressing* - creating and designing for self-expression; learners see computation as a medium to create and express ideas.
- *Connecting* - social practices of interactions with others, access to people benefits the creative process; value of authentic audience.
- *Questioning* - feeling empowered to ask questions and make sense of the world as it relates to computational design.

**Considerations for Effective Instruction and Assessment**
The outcome SD5 is expected to be assessed through a variety of assessment opportunities. Teachers should be mindful to scaffold the activities in a way that learners can build on prior knowledge and apply new knowledge to help with the coding process. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*APPLIED DESIGN*

ESSENTIAL GRADUATION COMPETENCIES

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

**AD1**

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | | ■ | | |
| Metacognitive | | | | | | |

Cognitive Process Dimension

**AD1**

*Learners are expected to ...*

**transfer digital skills and knowledge to solve design challenges.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. identify the skills required for a specific design challenges;

b. use appropriate digital tools to complete specific tasks within a design challenge;

c. transfer digital skills and knowledge across platforms and/or applications; and

d. complete design challenges to meet required criteria and intended purpose.

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome AD1. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

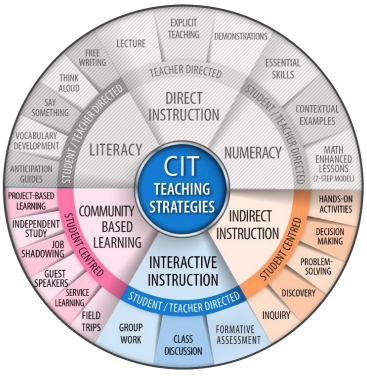
A design challenge is a process that initiates the learner to cycle through a series of steps to address a challenge, problem, or opportunity. In the context of this course, design challenges provide opportunities for learners to demonstrate their learning by practicing, combining, applying, and transferring a variety of skills and knowledge to complete specific tasks.

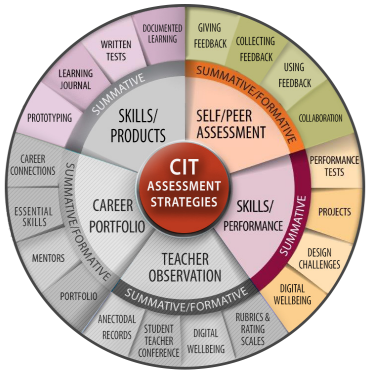
Teachers should consider offering a variety of design challenges for students to choose from. The following are examples of possible design challenges.

- Plan a traveling opportunity to any country or across various countries of your choice (with a given budget).
- Choose a new product that has recently hit the market and create a marketing plan for this product.
- Find a job posting of interest to you, apply for the job, and create a personal portfolio.
- Find a recent news article of choice and argue your point of view.
- Redesign a poster/communication for an upcoming event.
- Recreate your favorite childhood book/story into a different format.
- Create a newsletter for an organization of choice.
- Create a public service announcement.

## Considerations for Effective Instruction and Assessment

The outcome AD1 is expected to be assessed through a variety of assessment opportunities. Special considerations should be given to the entirety of the design process and not solely on the final product. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



ESSENTIAL GRADUATION COMPETENCIES

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

**AD2**

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | | | ■ | |
| Metacognitive | | | | | | |

Cognitive Process Dimension

**AD2** *Learners are expected to ...*

**collaborate through a design process to create an authentic digital artifact.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. explain design thinking;

b. explore a variety of design processes (e.g., inquiry, engineering, creative, scientific, other);

c. discuss a variety of real world issues that may have technological solutions (e.g., personal, school, community, national, global);

d. collaborate in co-creating project objectives and performance criteria to address a real world issue;

e. select and apply a design process to address an identified real world issue;

f. apply computational thinking strategies to solve a problem.

g. collaborate in the creation of a digital artifact;

h. use appropriate digital tools to complete specific tasks;

i. transfer digital skills and knowledge across platforms and/or applications;

j. present solution(s) to an authentic audience; and

k. participate in a peer evaluation of the design process.

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome AD2. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

Design thinking is a process that focuses on the development of innovative ideas and solutions that support human needs. It embraces a mindset that builds creative confidence, empathy, optimism, embraces ambiguity, and recognizes failure as opportunities. (IDEO, 2020)

The purpose of this outcome is for learners to address a real world issue by designing a digital artifact through the use of research, design, testing, evaluating, and presenting solutions to address a problem.

Real world issues can be inspired by media, social media, community, school, organizations, or through other avenues that cultivate passion and/or purpose. Providing learners with the opportunity to select an authentic issue that is relevant can help the learner build a genuine connection to their work. Teachers may want to consider providing learners with opportunities to work on the design of the artifact in small increments throughout the course or offer it as a full end-of-semester culminating project that integrates knowledge, skills, and processes obtained throughout the course.

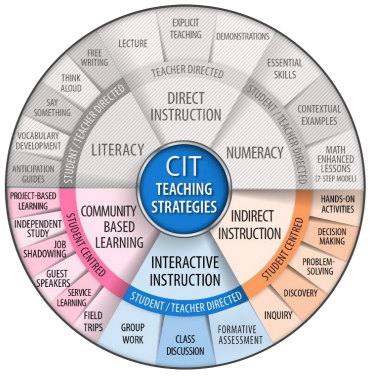
Design processes are intended to help define a series of steps in the creation of design artifacts. In the context of this course, learners will apply a design process that best fits their choice of a real world challenge. It is important that learners work in collaboration with one another throughout the design process.

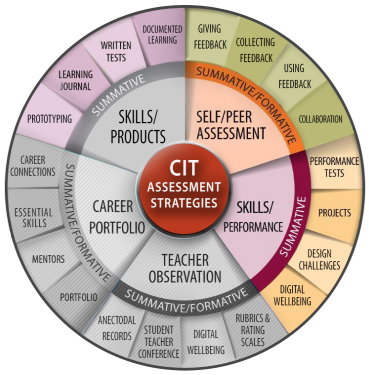
There are various models of design processes, however many design processes contain common components. The following are examples of various design process models:

- Scientific Design Process
- Generic Design Process
- Creative Design Process
- Engineer Design Process
- Inquiry Design Process

## Considerations for Effective Instruction and Assessment

The outcome AD2 is expected to be assessed through a variety of assessment opportunities. Frequent assessments of the process (vs. end product), self-reflections, and peer-reflections should be considered. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



*TECHNOLOGICAL SYSTEMS*

ESSENTIAL GRADUATION COMPETENCIES

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

**TS1**

| Knowledge Dimension | Remembering | Understanding | Applying | Analysing | Evaluating | Creating |
|---|---|---|---|---|---|---|
| Factual | | | | | | |
| Conceptual | | | | | | |
| Procedural | | | ■ | | | |
| Metacognitive | | | | | | |

Cognitive Process Dimension

**TS1**

*Learners are expected to ...*

**apply basic operating skills for a variety of technologies.**

## Achievement Indicators

*Learners who have achieved this outcome should be able to ...*

a. identify common components of physical and virtual computers and computing devices;

b. compare various types of software (e.g., apps, programs, add-ons, extensions);

c. apply file management skills to organise files in both physical and cloud computing environments; and

d. develop proficiency in operating skills across platforms, environments, and computing devices.

## Essential Graduation Competencies (ECGs)

Consider the highlighted EGCs when designing learning opportunities for learners to engage with the content and skills of outcome TS1. EGCs help prepare learners by developing attitudes, skills, and knowledge to support pathway transitions and lifelong learning.

## Concepts / Content

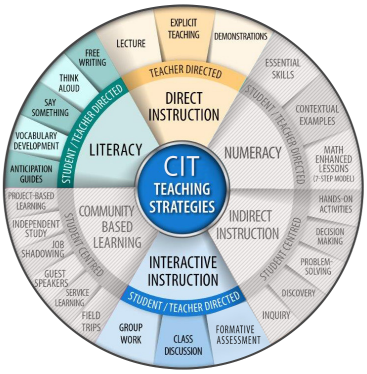
Computing devices are found interwoven in our daily routines. Understanding the basics of computing systems can help learners make connections between the use of digital tools in physical, and in virtual computing environments. The purpose of this outcome is for learners to be able to transfer and apply operating skills in a variety of platforms, computing environments, and computing devices.

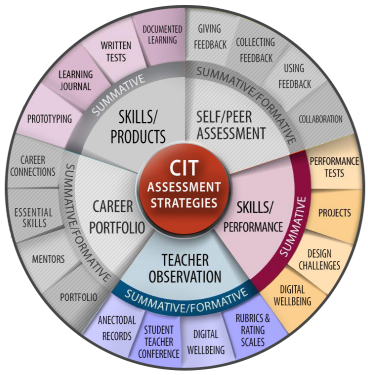
Learners should be given the opportunity to explore the following common components of computer systems:

- operating systems
- input devices (e.g., keyboard, mouse, mic, digital camera)
- processing devices (e.g., CPU, GPU, RAM)
- output devices (e.g., monitor, speakers, printer)
- storage devices (e.g., hard disk, flash storage)
- cloud computing (e.g., virtual servers, data storage)
- applications, extensions, software (e.g., across devices / platforms)
- cloud computing file management
- electronic file management

## Considerations for Effective Instruction and Assessment

The outcome TS1 is expected to be assessed through a variety of assessment opportunities. The intent of this outcome is for learners to be able to demonstrate how computer systems operate, and less about the ability for learners to recall the components of computing systems. Consider the highlighted teaching and assessment strategies in the figures below when designing assessments.



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