



**REPUBLIC OF TRINIDAD AND TOBAGO**

**MINISTRY OF EDUCATION**

**Secondary School Teacher's Guide**

**Information and Communication Technology**

**Curriculum Development Division**

© Ministry of Education  
Published in 2014 by the  
Curriculum Development Division  
Ministry of Education  
Rudranath Capildeo Learning Resource Centre  
Mc Bean, Couva  
Republic of Trinidad and Tobago  
Printed by insert Printer's name

## Table of Contents

Part 1: Introduction .....	iv
About This Guide .....	v
Subject Rationale.....	4
Content Framework for Information and Communication Technology .....	7
PART 2: <i>Teaching and Learning Strategies</i> .....	11
Nominal group technique .....	19
Group passing technique .....	19
Team idea mapping method .....	20
Planning for Instruction.....	24
PART 3: <i>Assessment Strategies</i> .....	33
What is Assessment.....	36
Types of assessment .....	36
Purpose of Assessment.....	36
Assessment tool for recording student achievement .....	36
Assessment Strategies .....	38
Examples of Assessment tools .....	40
Check list example .....	40
Rating scale example.....	41
Rubric example .....	42
Part 4: Useful Resources .....	44
Bibliography.....	48
Glossary.....	49

# **Part 1**

## **Introduction**

## About This Guide

This Teacher's Guide has been created in conjunction with the Curriculum Guide to provide support material for teachers who are implementing the ICT Secondary School curriculum.

**Part 1: Introduction** provides:

- Rationale for the Teacher's Guide
- Rationale for ICT infusion in the curriculum
- Applicable learning theories that guided the development of this curriculum
- Subject rationale
- Structure of the curriculum
- Content Framework for the Information and Communication Technology curriculum.

**Part 2: Teaching and Learning** section provides:

- Guidelines for planning for instruction
- Suggested approaches to teaching Information and Communication Technology
- Sample lessons plans

**Part 3: Assessment** gives guidelines on assessment strategies and includes a bank of rubrics and checklists that will be useful for teachers and students.

**Part 4: Useful Resources** provides a listing of suggested hardware and software resources, a glossary of terms and a list of reading materials for students. A Bibliography of useful reading for teachers and a list of useful websites have also been added for teachers' use.

It is hoped that this guide will help inspire teachers as they plan meaningful and engaging learning activities for students.

## **Rationale for Teacher's Guide**

Information and Communication Technology (ICT) refers to the diverse set of technological tools and resources used to create, store, share, exchange, disseminate and manage information. This broad definition of ICT includes such technologies as computers, mobile devices, the Internet, radio, television, video, telephones, and audio-visual equipment (both fixed line and mobile phones), satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as videoconferencing, electronic mail and social media (UNESCO, 2002).

The Teachers' Guide for the lower secondary school ICT curriculum provides teachers with various approaches to guide students' mastery of competencies in the use of Information and Communication Technologies towards the development of 21<sup>st</sup> Century skills in problem-solving, collaboration, decision making, inquiry and critical thinking.

### **Rationale for ICT Infusion**

Paradigm shifts in education in recent years prescribe a new type of learning culture that demands ICT integration with pedagogy in teaching and learning. Students' exposure and familiarity with smart devices coupled with their natural proclivity to digital mobile technologies create a need for delivery of instruction to be infused with ICT. The use of ICT in conjunction with pedagogy must be managed in such a way that its use can improve learning.

The Ministry of Education (MoE), cognizant of the significance of Information and Communication Technology (ICT) in the teaching and learning process as well as in national development, has listed the eConnect and Learn (eCAL) Laptop Initiative as the first of sixteen priority areas. For the period 2010 – 2013, through the eCAL laptop initiative, 68,850 laptops were distributed to four cohorts of students entering Form 1. The commitment of the Ministry of Education towards increased student mastery of ICT competencies and infusion of ICT in the teaching and learning process must be matched by teachers' proclivity to integrate ICT into students' learning experiences across the curriculum.

Infusing ICT in the curriculum facilitates multi-sensory delivery, incorporating text, graphics, animation, sound and video. This approach engages the learner, provides stimulus and motivation for greater learner engagement and increases the quality of teaching and learning. It further provides opportunity for students with varying abilities and different learning styles to better understand difficult concepts and generally makes for a more active and engaging learning experience in the classroom. This increased level of student engagement and interest can redound to greater fulfilment and improved academic performance. The benefits of integrating ICT into teaching and learning include:

- Improvement in quality of teaching and learning
- More effective delivery of the curriculum
- Engages students in active learning
- Addresses students' learning styles and multiple intelligences
- Empowers students with 21<sup>st</sup> Century skills
- Engenders culture of creativity and develops innovation and entrepreneurship
- Facilitates improved collaboration among peers and
- Automates administrative functions

The Teachers' Guide therefore seeks to provide guidance to the delivery of ICT skills and the infusion of ICT into the delivery of all subject areas in the curriculum. ICT infusion in curriculum implementation must also extend to the integration ICT into the planning, delivery and assessment of the curriculum. ICT is also used to improved classroom management and administrative functions. ICT infusion therefore impacts:

- scheme of work and lesson planning of teaching and learning activities/strategies
- lesson delivery and student communication
- student assessment, evaluation, analysis, feedback and storage of student assessment data
- teacher reflection and revision for instructional differentiation
- management and automation of student records and performance.

It is intended that teachers' consistent use of pedagogy in conjunction with technology in the implementation of the curriculum will redound to greater students' utilization of ICT tools towards decision-making and problem-solving in all areas across the curriculum, as well as in their daily lives.

### **Applicable Learning Theories and Principles**

The ICT curriculum aims to help students to learn how to process, analyze, evaluate information and use ICT tools to augment their learning, ultimately making them digitally literate and empowered within a technologically sophisticated, knowledge-based society. The curriculum is underpinned by constructivist theories of learning, preferred learner-centred approaches rather than memorization and rote regurgitation.

Active, collaborative and project-based learning are the pillars on which learning experiences are to be anchored. Active learning provides a forum for enquiry and analysis, facilitating learners to actively participate in the process of knowledge construction. Collaboration between the teacher and students, as well as among the students themselves is highly encouraged, since it promotes a rich source of invaluable learning experiences. Collaboration also facilitates scaffolding of learning as students are encouraged to work in heterogeneous groups to share knowledge and skills with each other.

Project-based learning (PBL) is an instructional method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to complex questions, problems or challenges. Students would therefore build competencies valuable for today's world, such as problem solving, critical thinking, collaboration, communication, and creativity/innovation, which are explicitly taught and assessed. PBL must be underpinned by pedagogy that supports long-term student-centred activities and the development of essential skills necessary for living in the twenty first century.



## **Subject Rationale**

Information and Communications Technology (ICT) is more about thinking skills and problem-solving than about mastering specific software applications. Where it is taught well, it has been shown to enhance students' levels of understanding and attainment in other subjects.

ICT can provide both the resources and the pedagogical framework for enabling pupils to become effective independent learners. For example, computer programs are adjustable to appropriate tasks and feedback on performance suited to the students' level.

Technologies such as Web 2.0 applications enable students and others to collaborate in ways that reflect a broadly constructivist approach to education.

ICT places all learners equally. Given the right hardware, software and curriculum activities, even severely physically disadvantaged students can achieve the same degree of success as anyone else.

ICT has been shown to have benefits in terms of motivating students since the computer is seen as being impartial and non-judgemental in its feedback to the student.

ICT enables students to gather data that would otherwise be difficult or even impossible to obtain. For example, data can be sourced from inaccessible places at possibly inconvenient times (eg late at night); from both overseas or locally on demand (without having to physically go anywhere); or accessing data at very precise time intervals.

ICT also enables students to gather data that would otherwise be time-consuming or costly. For example, students can use the internet to get up-to-the-minute information for projects and research. They can use a DVD or the internet to watch movies of world leaders speaking, view simulations of various scenarios or even listen to music by local artistes.

ICT enables students to experiment with changing aspects of a model which may be difficult or even impossible for them to do otherwise. For example, students who use spreadsheets can

simulate what might happen to the family budget if the value added tax on food items was raised or lowered.

ICT puts the student in control and facilitates self-directed learning, enabling him/her to select and create resources and even choose what to learn. This further encourages students to engage in personalised learning.

Every aspect of modern life involves some aspect of ICT. Failure to make use of ICT in the curriculum is anachronistic because digital technology pervades all aspects of modern society. Schools therefore have a duty to ensure that students understand the significance of ICT in the holistic development of their learnings, their preparedness for further education and for surviving in a technology-infused society.

## **Structure of the Curriculum**

The ICT curriculum provides objectives, teaching and learning strategies and suggested assessment arranged in six (6) Modules. It conforms to a spiral format, with competencies to be mastered in each Module increasing in complexity from Form 1 through to Form 3. While the sequence of topics and activities has been well structured along a development path over the three years, teachers are not compelled to rigidly adhere to the sequence. Topics can be addressed according to the present needs and abilities of the students/ school. Teachers should however, be cognizant of the formative continuous assessment requirements for submission to the NESC at the end of each academic year. The modules in the syllabus are as follows:

- Module 1 : Health and Safety
- Module 2 : Computer Fundamentals and Careers in ICT
- Module 3 : Software applications (Word Processing, Spreadsheets, Presentation, Drawing and Video Creation)
- Module 4 : Internet and Web 2.0 tools
- Module 5 : Programming Concepts and Computational Thinking
- Module 6 : Ethics in Technology

Effort has been made to ensure that students receive a holistic appreciation of the role of ICT in their everyday lives and its impact on their future career aspirations. The module on Ethics in Technology engages students towards demonstrating appropriate behaviour and attitude when using the Internet and interacting with others using social media. The module on Software Applications will empower students to use productivity tools for preparing assignments, reports, projects and for making multimedia presentations not only for this subject but for all other subjects in the school curriculum. In keeping with international best practice, the module Programming Concepts and Computational Thinking introduces students in the lower secondary school to problem-solving techniques, algorithm development and simple programming concepts.

## Content Framework for Information and Communication Technology

	Term 1	Term 2	Term 3
<b>Form 1</b>	<p><b>Health and safety</b> Ergonomics, Health Hazards</p> <p><b>Computer Fundamentals and Careers in ICT</b></p> <p>Definitions of Information Technology (IT), Information and Communication Technology (ICT) and Computer Science; Components of a computer system, Functions of computers, Computer care, Types of computers; Types of Software; Keyboarding</p> <p><b>Word Processing</b></p>	<p><b>Computer fundamentals and Careers in ICT</b></p> <p>File Maintenance, Computer maintenance, Saving/Protecting data, File backups and cloud computing</p> <p><b>Word Processing</b></p> <p>Page formatting, Tables, Inserting and editing images,</p> <p><b>Ethics in Technology</b></p> <p>Data Protection and Physical and Software Security issues</p> <p><b>Presentation</b></p> <p>Creation of a simple slideshow,</p>	<p><b>Drawing</b></p> <p>Creation of a digital drawing, Manipulate drawing, Formatting</p> <p><b>Ethics in Technology</b></p> <p>Plagiarism, Copyright, Freeware, Shareware, Software Piracy</p> <p><b>Health and safety</b></p> <p>Safety precautions, Green Computing, Disposal of equipment</p> <p><b>Presentation</b></p> <p>Animation, Working with Graphics</p>

	<b>Term 1</b>	<b>Term 2</b>	<b>Term 3</b>
	<p>Creation of a Word processing document, Basic file operations, Common formatting tools and editing features.</p> <p><b>Ethics in Technology</b> Netiquette Cyberbullying</p> <p><b>Internet and Web 2.0 tools</b> Introduction to the Internet, Internet browsing, Search Engines, Hyperlinks, Internet Information Sources, World Wide Web</p> <p><b>Presentation</b> Creation of a simple presentation, Manipulating a presentation, Saving/Printing a presentation</p>	<p>formatting, Working with images</p>	<p><b>Programming Concepts and Computational Thinking</b></p> <p>Information gathering, Brainstorming, Decision Making, Information Evaluation</p>

	<b>Term 1</b>	<b>Term 2</b>	<b>Term 3</b>
<b>Form 2</b>	<p><b>Word Processing</b> Templates, Images, Review document</p> <p><b>Video Creation</b> Source files, Videos, Storyboards</p> <p><b>Internet and Web 2.0 Tools</b> Representation and Evaluation of information, Copyright, Plagiarism</p> <p><b>Programming Concepts and Computational Thinking</b> Representation, Organization and Analysis of information</p> <p><b>Presentation</b> Multimedia, Hyperlinks</p>	<p><b>Spreadsheet</b> Creation of a spreadsheet, Manipulate a spreadsheet, Arithmetic Operations, Formula, Formatting, Managing worksheets, Graphs</p> <p><b>Video Creation</b> Video clips, Sound, Editing videos Titles, Sub-titles, Credits</p> <p><b>Internet and Web 2.0 tools</b> Ways of digital Communication, Digital footprint, SMS texting, Instant Messaging, E-mail, Blogs</p>	<p><b>Spreadsheet</b> Cell Referencing, Absolute and relative cell addressing, Cell alignment, Creating and labelling Graphs/ Charts</p> <p><b>Internet and Web 2.0 Tools</b> VoIP, Sky Drives, Collaboration Tools,</p> <p><b>Programming Concepts and Computational Thinking</b> Representation and Analysis of data Organisation of data; Problem Solving:  <div style="margin-left: 40px;"> Problem definition,  Evaluation and design of solution to real-world problems. </div> </p>

	Term 1	Term 2	Term 3
<b>Year 3</b>	<p><b>Internet and Web 2.0 tools</b> Virus, Spam and other malware, Computer crimes including identity theft</p> <p><b>Programming Concepts and Computational Thinking</b> Algorithm Development – Narrative, Flowcharts</p>	<p><b>Computer fundamentals and Careers in ICT</b> Hardware Specifications,</p> <p><b>Programming Concepts and Computational Thinking</b> Implementation and Evaluation of Solutions</p>	<p><b>Computer fundamentals and Careers in ICT</b> Careers in ICT</p> <p><b>Programming Concepts and Computational Thinking</b> Implementation and Evaluation of Solutions</p>

## **PART 2: *Teaching and Learning Strategies***



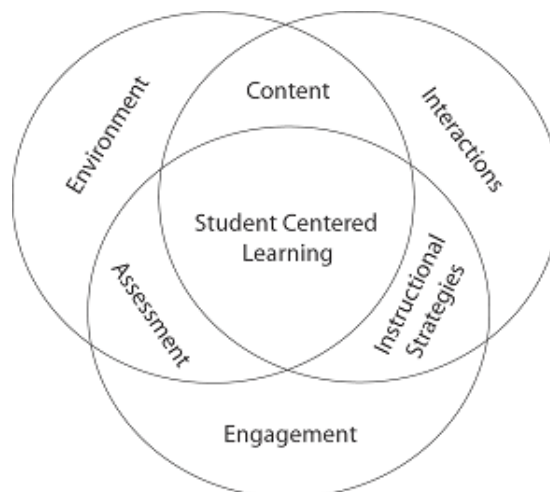
The ICT Curriculum is premised on teachers' proclivity to utilize diverse pedagogical strategies for implementation and assessment. These teaching/learning and assessment strategies must further be informed by meaningful appreciation and understanding of the heterogeneous composition of their classes and the awareness of students' diverse learning styles and multiple intelligences.

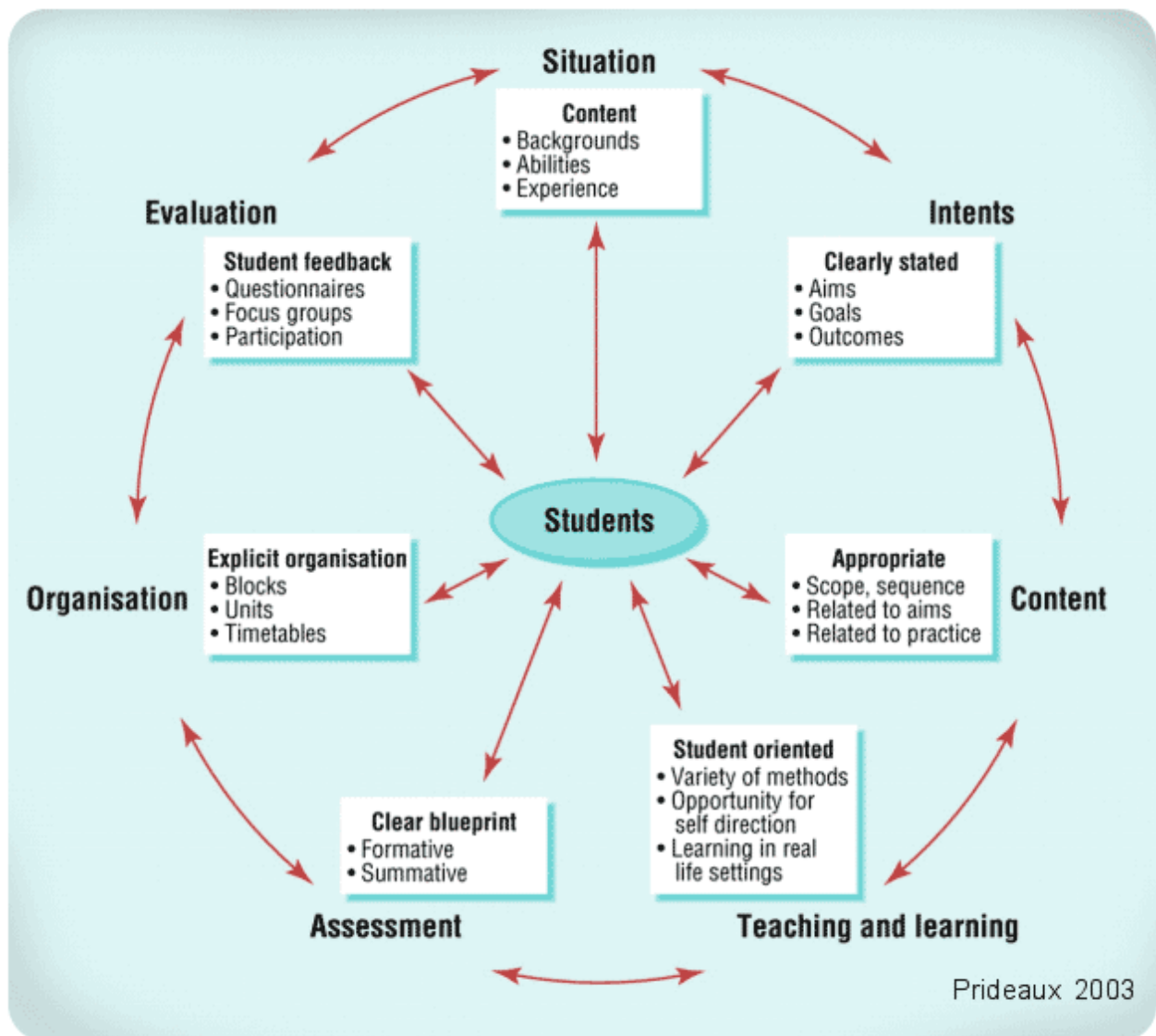
The ICT curriculum is expected to function in a dual capacity. The curriculum provides students with the essential knowledge, skills and attitudes in core ICT areas. Students would gain competence in 21<sup>st</sup> Century skills in order to find a niche in a technology enhanced, knowledge-based society. Other subject disciplines may utilize the tools, applications and services that ICT provides, allowing for effective ICT infusion across the curriculum.

Teachers should therefore utilize a wide range of teaching and learning strategies, ensuring that in the implementation of the ICT curriculum, the measure of ICT infusion is not limited to demonstrative ends but facilitates hands-on creative actualization.

## **STUDENT-CENTRED LEARNING**

It is imperative that the students be placed at the center of learning. Students must assume the responsibility for learning while the teacher accepts the role of guide, facilitating the learning experience. Traditionally, instructors focused on what they did and not on what the students were learning. In contrast, "learner-centered teaching" occurs when teachers focus on students' learning and their needs.



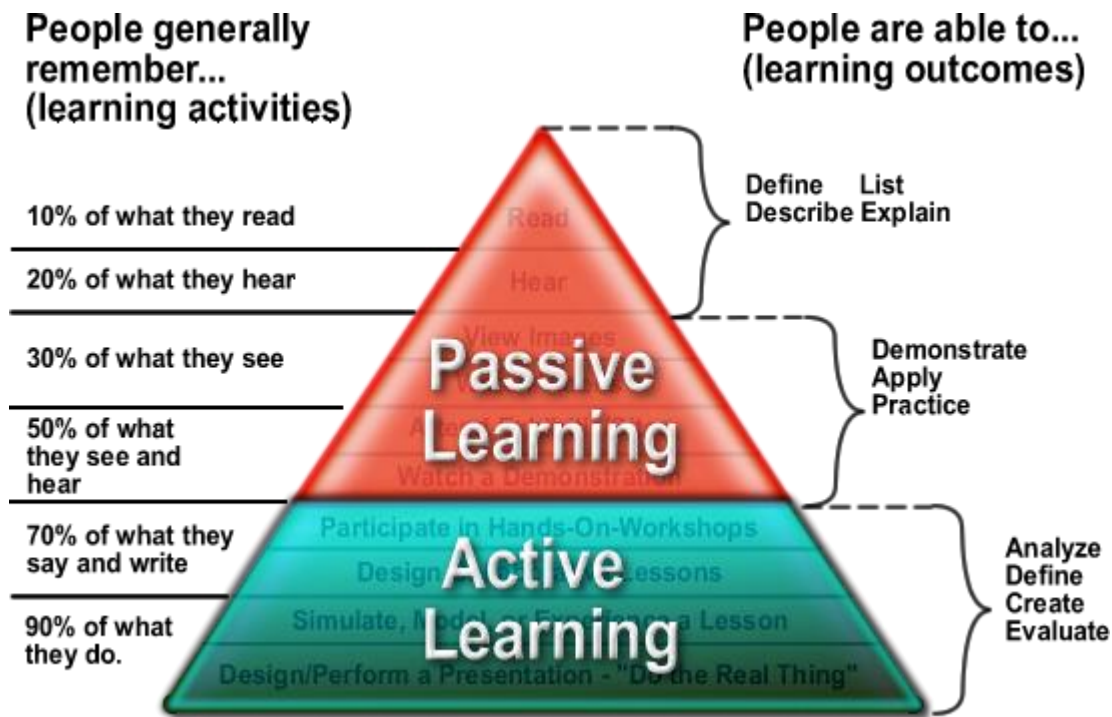


## ACTIVE LEARNING

It is strongly recommended that teachers of ICT engage students in self-directed active learning. Active learning is anything that students do in a classroom other than merely passively listening to the teacher. It is a planned series of actions or events that invite the participants to process, apply, interact and share experiences as part of the educational process.

For true learning to take place students must do more than just listen. They must read, write, discuss and be actively engaged in solving problems. Teachers should therefore guide students into higher-order thinking tasks such as analysis, synthesis and evaluation and the development of cognitive skills such as problem solving and critical thinking.

Active learning means developing and implementing planned activities to engage students as active partners in the learning process.

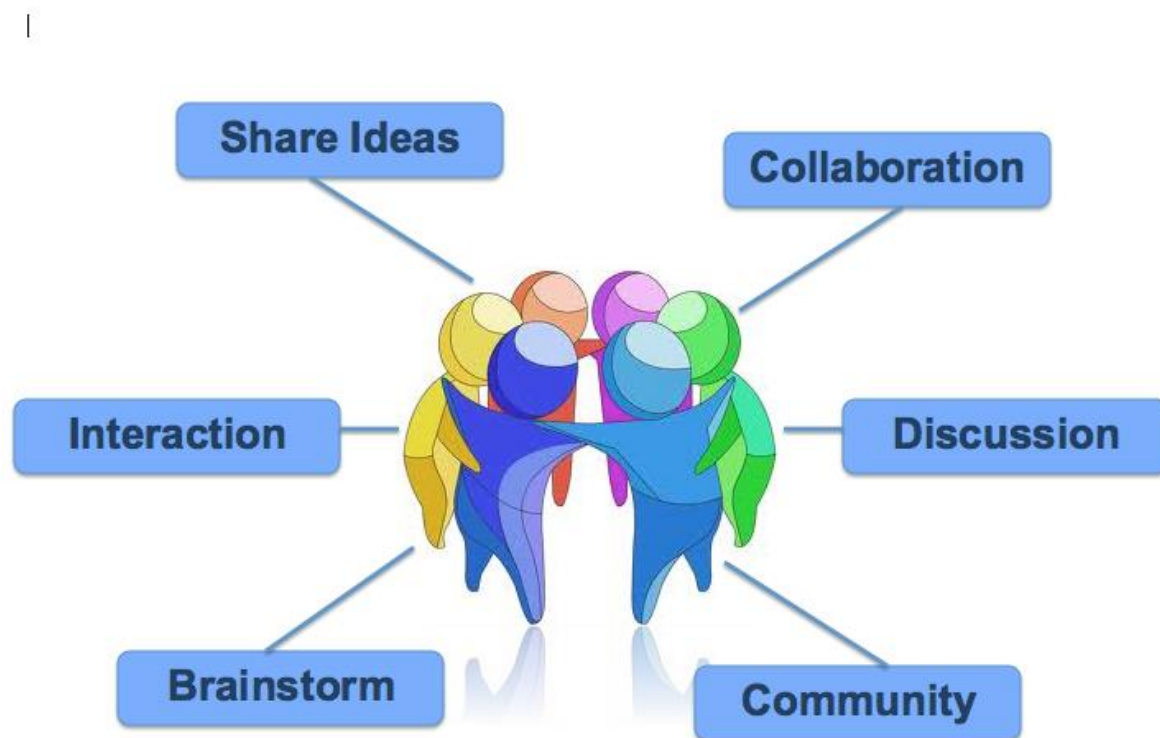


## COLLABORATIVE LEARNING

Several suggested teaching and learning strategies in the Curriculum Guide refer to students collaborating to accomplish various tasks. Collaborative learning is based on the model that premises that knowledge can be created when members actively interact by sharing experiences. It speaks to methodologies and environments in which learners engage in a common task where each individual depends on and is accountable to each other.



Collaborative learning incorporates approaches in which students work together in small groups to accomplish a common learning goal. In many Modules of the curriculum, especially in Programming Concepts and Computation Skills, teachers are advised to engage students in collaborative learning so that they can capitalize on one another's knowledge and skills, asking one another for information, evaluating one another's ideas, monitoring one another's work, etc. This is commonly illustrated when groups of students work together to search for understanding, meaning, solutions or to create a product of their learning.



## **DISCUSSION STRATEGIES**

Students have new and creative ideas and perspectives and are willing to share their experiences. All learners need frequent opportunities to generate and share their questions and ideas in small and whole class settings. Discussions provide such a forum. A discussion is an oral exploration of a topic, object, concept or experience. Engaging students in discussion deepens their learning and motivation by propelling them to develop their own views and hear their own voices.

Discussions help students make sense of the world. Discussions stimulate thought, wonder, explanation, reflection, recall and provide opportunities for students to clarify and expand their

ideas and those of others while promoting positive group interaction. Guided discussions begin with teacher-posed questions that promote the exploration of a particular theme, topic or issue. Through discussion, students would achieve a deeper understanding of the topic. Students should be encouraged to facilitate discussions by continuing to formulate and pose questions appropriate to the topic of study.

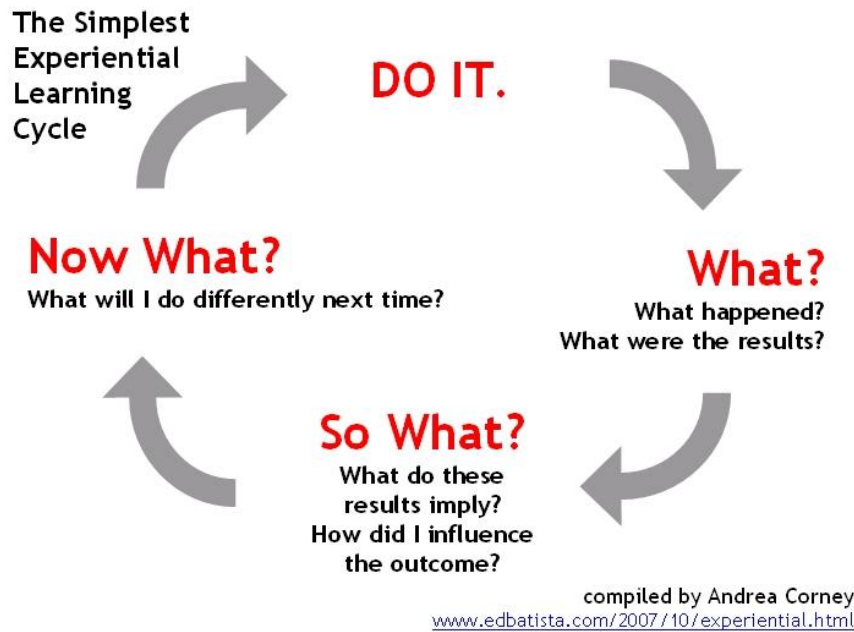
#### Points to Ponder

- Stay on the Topic – insist that viewpoints expressed are relevant and constructive
- Disagree with the comment/ ensure no one attacks the person
- Listening skills are important
- Try to maintain a balance in your tone
- Body gestures are very important
- Be the first and also the last to speak
- Work on your communication skills
- Make sure you read widely

### **EXPERIENTIAL LEARNING**

Teachers should be always cognizant of students' desire to 'do' things in the learning environment. Experiential learning is an approach to education that focuses on "learning by doing." It is learning through reflection on doing, which is often contrasted with rote or didactic learning. The role of the teacher is to design "direct experiences" that include preparatory and reflective exercises.

While teachers are expected to explain, discuss concepts and skills with students, more time should be devoted to students' active experience in the learning process.



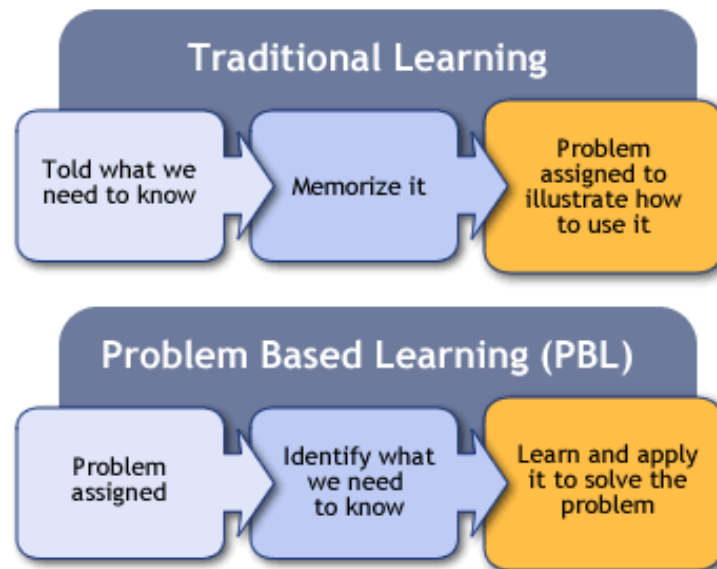
## PROBLEM-BASED LEARNING

Problem-based Learning (PBL) is a style of active learning that challenges students to “learn to learn.” It embodies a student-centered instructional pedagogy in which students learn about a subject through the experience of problem-solving, ideally through interaction with members of a group. The goals of PBL are to help the students develop flexible knowledge, effective problem solving skills, self-directed learning, effective collaboration skills and intrinsic motivation.

Throughout the syllabus, suggested teaching and learning strategies encourage students to work in groups to find solutions to real world problems. Working in groups, students identify what they already know, what they need to know and how and where to access new information that may lead to the resolution of a problem.

Essentially, PBL demands that teachers move away from the traditional, didactic classroom lecture approach to teaching and learning. Teachers are therefore admonished to be consistent in maintaining the paradigm shift from ‘spoon feeding’ students with information and notes, to a self-directed learning approach where students see themselves as being empowered to create

their own knowledge. For this approach to be successful, teachers must build students' confidence to take on various problems and direct them to the tools to be able to solve them.



Features of PBL:

- Student Centered Learning
- Learning is done in small student groups, ideally 6-10 people
- Teachers guide the students rather than teach
- A problem forms the basis for the organized focus of the group and stimulates learning
- The problem is a vehicle for the development of problem solving skills. It stimulates the cognitive process.
- New knowledge is obtained through Self-Directed Learning (SDL).

## **BRAINSTORMING**

Brainstorming is a group or individual creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its member(s). Brainstorming combines an informal approach to problem solving with lateral thinking, encouraging students to come up with thoughts and ideas on any given topic. Some of

these ideas can be crafted into original, creative solutions to a problem, while others can spark even more ideas.

Four general rules of brainstorming:

1. **Focus on quantity:** This rule is a means of enhancing divergent production, aiming to facilitate problem solving through the maxim quantity breeds quality. The assumption is that the greater the number of ideas generated, the greater the chance of producing a radical and effective solution.
2. **Withhold criticism:** In brainstorming, criticism of ideas generated should be put 'on hold'. Instead, students should focus on extending or adding to ideas, reserving criticism for a later 'critical stage' of the process. By suspending judgment, participants will feel free to generate unusual ideas.
3. **Welcome unusual ideas:** To get a good and long list of ideas, unusual ideas are welcomed. They can be generated by looking from new perspectives and suspending assumptions. These new ways of thinking may provide better solutions.
4. **Combine and improve ideas:** Good ideas may be combined to form a single better idea.

### **Nominal group technique**

Students are asked to write their ideas anonymously. The teacher then collects the ideas and the group votes on each idea. The vote can be as simple as a show of hands in favor of a given idea. This process is called distillation.

After distillation, the top ranked ideas may be sent back to the group or to subgroups for further brainstorming. For example, one group may work on the colour required in a product. Another group may work on the size and so forth. Each group will come back to the whole group for ranking the listed ideas. Sometimes ideas that were previously dropped may be brought forward again once the group has re-evaluated the ideas.

### **Group passing technique**

While working in groups, each student writes down one idea and then passes the piece of paper to the next person, who adds some thoughts. This continues until everybody gets his or her



original piece of paper back. By this time, it is likely that the group will have extensively elaborated on each idea.

The group may also create an "idea book" and post a distribution list to the front of the book. On the first page is a description of the problem. The first student to receive the book lists his or her ideas and then routes the book to the next person on the distribution list. The second person can log new ideas or add to the ideas of the previous person. This continues until the distribution list is exhausted. A follow-up "read out" meeting is then held to discuss the ideas logged in the book. This technique takes longer but it allows individuals time to think deeply about the problem.

### **Team idea mapping method**

This method of brainstorming improves collaboration and increases the quantity of ideas. It is designed so that all students participate and no ideas are rejected. The teacher must first define the topic. Each student brainstorms individually, then all the ideas are merged onto one large idea map. During this sharing, new ideas may arise by the association and they are added to the map as well. Once all the ideas are captured, the group can prioritize and/or take action.

Teachers may also research, Brainwriting, Online Brainstorming (Brain-netting), Crawford's Slip Writing Approach, Reverse Brainstorming, Starbursting.

### **JIGSAW STRATEGY**

Another teaching strategy advocated in the ICT curriculum is the Jigsaw approach. This strategy involves the creating of heterogeneous groups of students, dividing them into new groups to become expert on a topic and then returning them to their home groups. It seeks to bring value by creating positive interdependence in the classroom and improving students' attitudes toward school and each other.

The structure it provides also lends itself naturally to differentiated instruction. Learning experiences can be differentiated by content based on student readiness and interests. The jigsaw technique allows students to learn from text that is matched to their interests and independent

reading level while also learning from their peers, who have worked with text that is appropriate for them.

Steps in creating Jigsaw:

1. Divide students into small jigsaw groups (5-6 students). The groups should be diverse in terms of gender, ethnicity, race and ability.
2. Appoint one student from each group as the leader. Initially, this person should be the most mature student in the group.
3. Divide the ICT lesson into 5-6 segments. For example, if you want ICT students to learn about Social Media, you might assign students in groups to do online research on social media technologies:
  - a. collaborative projects (e.g. Wikipedia)
  - b. blogs and microblogs (e.g. Twitter)
  - c. content communities (e.g., YouTube)
  - d. social networking sites (e.g. Facebook)
  - e. virtual game-worlds (e.g. World of Warcraft)
4. Assign each student to learn one segment, making sure students have direct access only to their own segment.
5. Give students time to research and become familiar with their topic.
6. Form temporary “expert groups” by having one student from each jigsaw group join other students assigned to the same segment. Give students in these expert groups time to discuss the main points of their segment and to rehearse the presentations they will make to their jigsaw group.
7. Bring the students back into their jigsaw groups.
8. Ask each student to present her or his segment to the group. Encourage others in the group to ask questions for clarification.

9. Move from group to group, observing the process. If any group is having trouble (e.g., a member is dominating or disruptive), make an appropriate intervention. Eventually, it's best for the group leader to handle this task. Leaders can be trained by whispering an instruction on how to intervene until the leader gets the hang of it.
10. At the end of the session give a quiz on the material presented.

## **SOCIAL MEDIA**

The ICT curriculum encourages and expressly promotes the use of Social Media as an effective tool for teaching and learning. Social media refers to the means of interactions among people in which they create, share and exchange information and ideas in virtual communities. Social media and social networking are “Web 2.0” tools and platforms that enable teachers to engage students in new and different means of communication. Social Media tools allow for social interaction and easy creation of content by users.

It is important for all stakeholders including teachers and parents to understand the utility of emerging social media and the opportunities they offer for constructive collaboration between teacher and student and among student peers. The embrace of social media, well managed and moderated can profoundly impact teaching and learning.

Teachers should use Web 2.0 tools to deliver ICT-infused lessons that are student-centred using constructivist pedagogies designed in an online environment, enabling students to contribute and collaborate to e-learning environments in a number of ways. Social media also provides mechanisms for peer learning and peer assessment and for the development of active learning communities of practice.

Social Media:

Collaborative projects – e.g. Wikipedia

Content communities – e.g. YouTube

Blogs – Twitter

# Social Media Landscape



## **Planning for Instruction**

Planning for teaching and learning can prove to be an engaging activity for ICT teachers. It involves careful preparation, planning objectives and activities on a daily and weekly basis. Critical to the effective delivery of instruction is long term planning. Many teachers who deliver the ICT curriculum over several years may become complacent, confident in their knowledge of the syllabus and the requirements for teaching. This complacency however, can lead to ineffective teaching since students will bring their unique learning styles, previous knowledge and experiences.

Long-term planning ensures adequate coverage of appropriate curriculum content for the specified term period. Teachers are therefore expected to develop a meaningful and realistic Scheme of Work that seamlessly charts the development of student competencies through the term and academic year. Materials and equipment must be sourced and lessons prepared before the class is scheduled to begin. The multimedia projector should not be the only ICT equipment used by the teacher. As often as possible students should be encouraged to bring their laptops and these laptops should become a ubiquitous learning tool in the classroom.

Notwithstanding the effectiveness of the ICT tools used, teachers must be cognizant of the fact that the focus of each lesson is students' acquisition of new knowledge, skills and attitudes. Teaching and learning must be the central focus of classroom activity. Teaching and learning as a focus must be consistently communicated to students in the classroom and to observers (Stronge, 2010). In essence, teachers must:

- establish, manage and maintain learner-focused classroom environments.
- organize time, communicate expectations and plan instruction.
- present curriculum to support active and engaged learning.
- monitor student progress, identify student potential and meet the needs of special students in the classroom.

## SAMPLE LESSON PLANS

**MODULE:** 5 - Programming Concepts and Computational Thinking

**TOPIC:** 5.1 Outline the main steps to execute a simple activity

**TEACHER:**

**DATE:**

**CLASS:** Form 1, Term 3

**ESTIMATED TIME:** 40 minutes

### LESSON GOAL

Student will learn the concept of linear breakdown of sequences as a method to solve a problem.

### PREVIOUS KNOWLEDGE:

Students are able to follow simple instructions.

### RESOURCES:

1. Paper / paper item made/ instructions showing the steps
2. Journal /Class Blog
3. Students' laptops
4. Step by step instruction, checklist for peer assessment

### LEARNING OBJECTIVES:

Students will be able to:

- Produce step by step instructions to solve a problem
- Apply step by step instructions for a simple activity.

### PROCEDURE:

**SET INDUCTION (1 min.):** Teacher shows a paper item (example an airplane) that he/she made to the whole class, encourages students to discuss other paper items (e.g boat, flapper) that they can make and then shares lesson objectives with students.

Time	<i>Teacher activity</i>	<i>Student Activity</i>
2min.	Teacher use a fun grouping strategy to create groups of four (4) students. Then divide each group into pairs.	Students find their group and their partner in that group.

Time	<b><i>Teacher activity</i></b>	<b><i>Student Activity</i></b>
5min.	Teacher elicits from class – how the item was made - following a number of steps in order.	Students brainstorm ideas and share with group and then with class.
2min.	Teacher shares the instruction sheet and identifies the steps used to create the item.	Students follow.
5min.	Teacher uses question-and-answer to develop a discussion on the need to brainstorm ideas, gather information, evaluate the pros and cons of multiple solutions, and how to determine the most feasible solution.	Students participate in the discussion by responding to the questions.
15min.	Teacher challenges students to come up with a paper item and to create step by step instructions that another person can follow to build it. Differentiating product: Images with little text Text based A video with audio Teacher gives time for task. Teacher takes notes of the process of students' interaction/working	Brainstorm with their partner what to build. Students gather information on what is required to create item. Build item and create step by step instructions.
5min.	Teacher calls time and gives instruction to exchange instruction sheet.  Gives each pair a checklist and instructs them to follow the instruction sheet and evaluate it using the checklist.	Students exchange instruction sheet with the other pair in their group.  Attempt to follow the instructions to build the item.  Use checklist for peer assessment.
5min.	Teacher asks students to return instructions so adjustment could be made.	Students make adjustments to create final draft.

### **CLOSURE( 3min.):**

Teacher comments that this is how a program is developed for a computer to carry out a task.

And then asks a student to summarize the lesson and to record their learning in their journal /blog.

### **EVALUATION STRATEGIES:**

Teacher observes the process of students working and takes anecdotal notes.

Students use a checklist to evaluate the product

Students reflect on their learning in a journal or class blog

### **CONTINGENCY PLAN:**

If there is no internet connection, use a word processing application to create a journal for student reflection.

### **RESOURCES**

To make paper items use <http://www.wikihow.com> and search for an item (say paper airplane) (See Grouping techniques in Resources Section of this Teachers' Guide)

**MODULE:** 6 - Ethics in Technology

**TOPIC:** Discuss cyberbullying, its impact on students and ways of preventing its occurrence

**ESTIMATED TIME:** 90 mins

**CLASS:** Form 1, Term 2

### **LEARNING OBJECTIVES:**

Students will be able to:

- share their awareness of the problem of cyberbullying.
- identify what motivates young people to participate in online cruelty.
- display their empathy for others.
- propose strategies for resisting peer pressure and communicating in positive ways online.

### **RESOURCES:**

1. Cyberbullying stories-
  - a. [http://archive.adl.org/education/curriculum\\_connections/cyberbullying/middle%20school%20handouts.pdf](http://archive.adl.org/education/curriculum_connections/cyberbullying/middle%20school%20handouts.pdf)
  - b. <http://nobullying.com/six-unforgettable-cyber-bullying-cases/>
2. Laptop, projector, Internet access



3. Video clip showing how quickly information can spread on the internet (eg. One from <http://www.netsmartz.org/Parents>)
4. Presentation and group rubric
5. Select a list of cyberbullying resources (links or print documents)

### **PREVIOUS KNOWLEDGE:**

Students are aware of social media like Facebook

### **PROCEDURE:**

**SET INDUCTION:** Play short clip of how quickly information can spread on the web. (Eg use video from NetSmartz Workshop).

<b>Time</b>	<b>Teachers activities</b>	<b>Student Activities</b>
	Teacher uses a cyberbullying story. (eg. Stories from - resource 1- or resource 2) Inform students that this happened to a real teenager. Ask them to close their eyes as they listen, and to imagine that they are a student at that school. Read one of the story aloud.	Students close their eyes, listen and imagine that they are a student at the school the incident took place.
	Discuss the following using: think/write/talk/compare: How did it make you feel to hear about this incident? What do you think motivated the students who started making comments on the Web? What about those who added comments or e-mails and those who chose not to tell anyone about what was taking place? What would you have done if you received a link to the Web site or a message inviting you to visit and join in?	Students participate in the discussions-by first thinking of the question, then writing their response on a shared space (on a wiki, Google docs) or in their notebooks. Then orally respond to the question when ready. Listening to each response and recording the names of students who had similar responses to them.
	Ask students to consider if cyberbullying, or online cruelty, is a common occurrence in their lives. Direct them to form a human continuum, standing to one side of the room if they feel it is extremely common, the other side if it is rare or somewhere in-between that reflects their experience.	Students reflect on their experiences of cyberbullying and stand somewhere in a line where one end is extremely common and the other end is rare.

	<p>Ask for volunteers at different points in the continuum to explain why they chose their position.</p> <p>Solicit specific examples from them (remind students to be respectful and to avoid offending or embarrassing their peers and that some information is confidential).</p>	<p>Students volunteer and share their experiences, giving examples.</p>
	<p>Have students return to their seats and play one or more of the following public service announcements which were created by the <u>BATCE Young Leaders 2013 Campaign</u> for its cyberbullying prevention campaign.</p> <p>STOP CYBER-BULLYING - We Can Be The Change! #1-3 (BATCE Young Leaders 2013 Campaign) (about - 45sec each)</p> <ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=R-qI_1e9CG8">https://www.youtube.com/watch?v=R-qI_1e9CG8</a></li> <li>2. <a href="https://www.youtube.com/watch?v=c9yenHX96xo">https://www.youtube.com/watch?v=c9yenHX96xo</a></li> <li>3. <a href="https://www.youtube.com/watch?v=AuKflzLIIdkk">https://www.youtube.com/watch?v=AuKflzLIIdkk</a></li> </ol>	<p>Students return to their seats Student look and listen</p>
	<p>Teacher use grouping technique to place students in groups of 4-5 students.</p>	<p>Students follow instructions and join their group.</p>
	<p>Teacher provides resources on cyberbullying. (links to web sites- see below).</p> <p>If no internet, print out two or three documents to handout.</p> <p>Students are asked to note answers to the following :</p> <p>Meaning of Cyberbullying;</p> <p>Forms of cyberbullying;</p> <ul style="list-style-type: none"> <li>o Ethics for Internet Communication</li> </ul> <p>Impact on the victim;</p> <p>What advice can be given to prevent or help someone cope with cyberbullying</p>	<p>Students look at resources (links/documents) and brainstorm, note answers to the questions, add other examples they can think of, and give advice for preventing /coping with each instance of cyberbullying.</p>
	<p>Teacher directs that each group will make a presentation to the class about their findings and gives out the rubric that will be used to grade:</p> <p>Product differentiation:</p> <p>Students could create a</p> <ul style="list-style-type: none"> <li>Brochure</li> <li>Poster</li> <li>Infographic (extension of lesson Presentation Video)</li> </ul> <p>Give deadline for final product.</p>	<p>Students work in groups to create an informative resource</p> <p>Brochure, poster, infographic on cyberbullying tactics and ways to deal with them.</p> <p>Students use rubric to self-evaluate the resource</p>

Lesson adapted from [http://archive.adl.org/education/curriculum\\_connections/cyberbullying/cyberbullying\\_lesson\\_2.html](http://archive.adl.org/education/curriculum_connections/cyberbullying/cyberbullying_lesson_2.html)

## **CLOSURE:**

Teacher suggests that students should think of how they want to be treated as this will help them to avoid participating in online cruelty. Teacher summarizes:

- Always use respectful language and avoid rumours.
- Ways to deal with cyberbullying -
  - report incidents, block offenders, do not respond or add to offensive comments, check privacy setting on all social media.

Ask students to share and reflect on examples regarding their conduct toward others online in their learning journals (blog/ word document).

## **EVALUATION:**

The following evaluation strategies can be used:

- Make notes when making observation of the process
- Informal consultations with each group to ensure that they keep on task.
- A rubric is used to evaluate student product and group work process
- An anecdotal record of students' reflections in their learning journals (class blog / word document)

## **LESSON EXTENSION**

Students do online quiz like -: the Dr. Phil quiz - Have you ever been cyberbullied?

<http://www.drphil.com/shows/cyberbullyquiz>

Have students create a 10-question on cyberbullying or use do online quizzes - examples:

The following are two (2) examples of a 10-question quiz:

[http://www.proprofs.com/quiz-school/story.php?title=cyberbullying-quiz\\_1](http://www.proprofs.com/quiz-school/story.php?title=cyberbullying-quiz_1)

<http://www.cyberbullying.us/quiz.php?QUIZNUM=1>

Term project - Students conduct a school campaign to stop cyberbullying by creating presentations, videos, posters and sharing them with the wider school committee online or at an open-day showcase.

## **FOLLOW UP CLASS:**

Demonstrate how to:

- block users (email, social media)
- check and change privacy setting

**MODULE:** 2 Computer Fundamentals and careers in ICT

**TOPIC:** 2.5 Compare various types of computers

**CLASS:** Form 1, Term 2

**ESTIMATED TIME:** 40 minutes

**LESSON GOAL**

Student will compare various types of computers.

**PREVIOUS KNOWLEDGE:**

Students are familiar with some types of computers and know that their mobile phones are computerized devices.

**RESOURCES:**

1. The Internet – Links to relevant sites
2. Computer systems: pc, desktop, laptops, netbook, pda, server, mobile smart phone
3. YouTube videos
4. Sticky notes
5. Multimedia projector

**LEARNING OBJECTIVES:**

Students will be able to:

- Compare various types of computers by use and functionality.

**PROCEDURE:**

**SET INDUCTION:** Teacher uses multimedia projector to show short video clips of a large mainframe computer followed by clips of raspberry pi (credit card-sized computer). Students are told that these are both computers and asked to share their thoughts and perceptions of these devices.

<b><i>Teacher activity</i></b>	<b><i>Student Activity</i></b>
Teacher uses question and answer technique to elicit responses on the type of computers shown - using multimedia slide presentation	Students give their opinions on the types of computers illustrated
Teacher shows composite picture of several types of computers and asks students to categorize them	Students work in small groups to categorize computer systems, giving reasons for their selections
In response to students' categorizations, teacher asks each group to explain to the call why they	After discussions with their groups, group leaders give rationale for their selections

<b>Teacher activity</b>	<b>Student Activity</b>
made their selections	
Teacher shows a video presentation that illustrates various types of computers and the scenarios/ conditions that they can be used, including Mainframes; Servers; Desktop computers; various mobile computers, Mobile devices; Embedded systems. The video is paused after each type/ scenario is presented.	Students are asked to give other possible conditions where the particular type of computer may be utilized, and what makes the type of computer best suited for its purpose.
Each groups asked to focus on one type of computer and discuss relevant features such as main function, size, storage capacity, capabilities.	Groups make oral presentations and demonstrate using digital or physical examples.

### **CLOSURE:**

Teacher does mind mapping with students soliciting from them an exhaustive range of computers and computerized devices.

### **EVALUATION STRATEGIES:**

Teacher distributes sticky notes to students, a different colour to each group and asks them to write on each note a type of computer that was discussed in the lesson. They are then asked to place the notes into defined sections on the whiteboard (or wall) effectively categorizing the various types.

### **RESOURCES**

Ten types of computers:

<http://computer.howstuffworks.com/10-types-of-computers.htm#page=10>

[http://teachmecomputers.tripod.com/lesson\\_1.htm](http://teachmecomputers.tripod.com/lesson_1.htm)

Jan's Computer Basics: Computer Types: Intro

<http://www.jegsworks.com/Lessons/lesson1-2/lesson1-2.htm>

## **PART 3: *Assessment Strategies***

## Structure of Assessment

Assessment of the ICT curriculum will be both internal and external. Internally, teachers will be required to assess various competencies formatively as a form of continuous assessment. Teachers will be guided by a range of authentic continuous assessment strategies to be implemented from Form 1 Term 1 up to Form 3 Term 2.

### Outline of Continuous Assessment

	<b>Term 1</b>	<b>Term 2</b>	<b>Term 3</b>	
<b>Form 1</b>	Journal on Netiquette and Cyberbullying	Portfolio of Word Processing and Presentation skills	Written exam	DERE To collect 15%
Form 2	Video Production Project	Portfolio of Spreadsheet Solutions	Social Media Project	DERE to collect 30%
Form 3	Research Project	Portfolio of Computational Thinking Activities	NCSE	15% DERE to collect

Teachers are advised that this constitutes prescribed continuous assessment activities by terms. This does not preclude teachers from administering other formative and summative assessment instruments.

For all continuous assessment components, students are required to present documented evidence of competence. Teachers are required to provide feedback and remedial guidance to students as they attempt to gain mastery. Teachers should not perform the tasks for students. Continuous assessment projects, journals and portfolios are to be marked out of 100. These percentage

scores must be submitted to the Department of Educational Research and Evaluation (DERE) who will in turn prorate the scores.

The internal assessment will account for 60% of students' overall grade (15% in Year 1, 30% in Year 2 and 15% in Year 3). Students will attempt a written exam administered by NCSE in the third term of Form 3.

The external assessment will be administered by the NSCE. The final summative exam will account for 40% of the student's overall grade.

Students' portfolios, journals, projects etc. must be retained for submission upon request by the Ministry of Education/ DERE/ NCSE. In addition, evidence of students' continuous assessment exercises must be produced upon request to School Supervisors, Curriculum Officers, Principals, Heads of Department or other Officials of the Ministry of Education.

Students should retain their work in softcopy, however final projects must be printed and hardcopy versions presented for assessment. Teachers are required to keep master digital copies of final versions of students' continuous assessment projects.

It is intended that the curriculum be performance driven and not test driven to allow for competency based assessment.

As far as possible, assessment must cater to the special education needs of learners in the formal system and in special schools.



## What is Assessment

Assessment is the ongoing process of gathering, analyzing and reflecting on evidence to make informed and consistent judgments to improve future student learning.

## Types of assessment

Formative assessment is a continuous and ongoing process, part of day to day teaching where teachers continually confirm or modify their activities and directions with their students.

Summative assessment is used at the end of a unit or term to determine what each student has achieved and learnt.

## Purpose of Assessment

Assessment **for** learning occurs when teachers use inferences about student progress to inform their teaching. (formative)

Assessment **as** learning occurs when students reflect on and monitor their progress to inform their future learning goals. (formative)

Assessment **of** learning occurs when teachers use evidence of student learning to make judgements on student achievement against goals and standards. (summative)

## Assessment tool for recording student achievement

Assessment tool	Description / Purpose
Anecdotal Record	Anecdotal record is a short narrative describing both a student behaviour and the context in which the behaviour occurred. It is used to: <ul style="list-style-type: none"><li>• provide ongoing written observations of student progress;</li><li>• register with objectivity significant observations that are not part of a formal assessment and that might otherwise be forgotten or remembered incorrectly;</li><li>• register observations of unanticipated performances, behaviours, incidents, or events;</li><li>• provide holistic assessment.</li></ul>
Check list	The checklist is a list of criteria that the teacher or student check off as each criterion is met.  It can be used to:

Assessment tool	Description / Purpose
	<ul style="list-style-type: none"> <li>• record the presence or absence of the components of a student's performance. This record can then be used to help the students see where improvement is needed;</li> <li>• diagnose an individual student's strengths and weaknesses;</li> <li>• obtain information about a student's improvement over time if the same checklist is used more than once</li> <li>• assist students in self and peer assessment</li> </ul>
Rating Scale	<p>Rating scale is similar to a check list except it uses a range or scale to assess the extent to which each criterion is performed.</p> <p>It may be used to:</p> <ul style="list-style-type: none"> <li>• provide diagnostic information about a student's performance, product, attitude and/or behaviour.</li> <li>• record the degree to which a student achieves a criterion;</li> <li>• describe students' performance along a continuum.</li> </ul>
Rubric	<p>A rubric is a scoring scale that consists of a set of achievement criteria and descriptions of levels of achievement for a particular task.</p> <p>It may be used to:</p> <ul style="list-style-type: none"> <li>• provide an effective means of assessing the particular level of student performance in the performance task;</li> <li>• allow for consistent scoring of student performance;</li> <li>• provide information to students on what is expected;</li> <li>• provide the basis of assessing an individual's performance to a specific performance standard;</li> <li>• allow for holistic and analytical scoring</li> </ul>

## Assessment Strategies

There are many different assessment strategies that can be employed to determine students' progress. The following outlines the purpose of the assessment strategies that were suggested in the curriculum guide.

<b>Assessment</b>	<b>Purpose</b>
<b>Classroom Presentations</b>	A classroom presentation requires students to verbalize their knowledge supported by visual presentation of their work. It may be used to provide the basis for summative assessment upon the student's completion of a project.
<b>Comparison Charts</b>	Comparison charts is a graphic organizer used to engage students individually or in groups as they seek to examine the similarities and differences of a given theme they are studying.
<b>Conferences</b>	A conference is a formal or informal meeting between the teacher and a student. They are often used to: <ul style="list-style-type: none"> <li>• explore the student's thinking and suggest next steps;</li> <li>• assess the student's level of understanding of a particular concept or procedure;</li> <li>• enable the student to move ahead more successfully on a particular piece of work;</li> <li>• review, clarify and extend what the student has already completed;</li> <li>• help the student to internalize criteria for good work.</li> </ul>
<b>Exhibitions/demonstrations</b>	In an exhibition/demonstration a student explains and applies a process, procedure, etc., in concrete ways to show individual achievement of specific skills and knowledge to an audience.
<b>Find tutorials</b>	Students are asked to find and present a tutorial on a given topic. This develops the student's self-directed skills. The type of tutorial and how it is presented will provide information of the students' learning style and their understanding.
<b>Misconception check</b>	Students are presented with common or predictable misconceptions about a topic and are asked whether they agree or disagree with an explanation.
<b>Observation</b>	Observation is a process of systematically viewing and recording students while they work. It can take place at any time during class and it provides information on students' strengths, weaknesses, learning styles, interests and attitudes.

<b>Peer Evaluations</b>	Peer evaluations consist of student's assessing each other using an established criteria.
<b>Performance tasks</b>	For a performance task, students create, produce, perform, or present works on "real world" issues. It may be used to assess a skill or proficiency. It can also be used to assess the process as well as the product.
<b>Portfolios</b>	A portfolio is a collection of samples of a student's work. It provides a record of a student's achievement, capabilities, strengths, weaknesses, knowledge, and specific skills over time and in a variety of contexts.
<b>Question-and-answer</b>	In question-and-answer, the teacher poses a question and the student answers verbally, rather than in writing. This strategy helps the teacher to determine whether students understand what is being taught, and helps students to extend their thinking, generate ideas or solve problems.
<b>Quizzes, tests, or examinations</b>	A quiz, test, or examination requires students to respond to prompts in order to demonstrate their knowledge (orally or in writing) or their skills (e.g., through performance). Quizzes, tests, or examinations can be adapted to students' ability.
<b>Reflections</b>	During the last five minutes of class, ask students to reflect on the lesson by writing down what they have learned and how it could be applied to their everyday lives in a learning journal or blog.
<b>Self-assessment</b>	Self-assessment is a process by which the students gather information about, and reflect on their own learning. It leads students to a greater awareness and understanding of themselves as learners.
<b>Summarization</b>	Have students summarize or paraphrase important concepts of a lesson. This can be done orally, visually, or otherwise.
<b>Think-pair-share</b>	Students take a few minutes to think about a given prompt. Next, with a partner, they compare thoughts before sharing with the whole class.

## Examples of Assessment tools

Anecdotal record should have at least the following fields

Observational anecdotal form
Date: _____ Time: _____
Student name: _____
Description of what is being observed:
Description of setting:
Action/recommendations:

Useful site for more information on anecdotal assessment

<http://www.learnalberta.ca/content/mewa/html/assessment/anecdotalnotes.html>

### Check list example

Checklist for a drawing for a basic computer system		
	Yes	No
Blocks labelled		
Input		
Output		
Processing		
Storage		
Interconnection between components		

line drawn between correct components		
Arrows in correct directions		
Finished drawing		
Drawing looks neat		
Drawing has a label		
Drawing done in pencil		

Useful site for check list of computer skills

[http://www.settlement.org/downloads/linc/LCG1to5/p8comp\\_checklist.PDF](http://www.settlement.org/downloads/linc/LCG1to5/p8comp_checklist.PDF)

### Rating scale example

Rating scale for assessing skills using PowerPoint

1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent

Skills	Rating
Creating a new presentation	
View slides in different views (normal, slider sorter)	
File operations (opening as saved PowerPoint, save, save as, New)	
Print and print preview(slides, handouts, notes page)	
Insert and edit text	
Cut, copy and paste	
Insert images / objects (clip art, charts, Shapes)	
Delete and reorder slides	
Insert new slide / duplicate slide	
Insert Sound	
Edit images / objects (clip art, charts, Shapes)	

Font types	
Bullets – insert bullets, numbers	
Apply design	
Change background	
Add animations	
Slide transitions	
Show a presentation – start from start / current slide	

Useful sites for rating scale

<http://www.versagivoice.com/Business/one%20to%20five%20rating.htm>

<http://blog.verint.com/common-rating-scales-to-use-when-writing-questions>

## Rubric example

Rubric for peer evaluations of group work

	Needs Improvement 1 pt	Good 2 pts	Very Good 3 pts	Excellent 4 pts
Involvement	hardly involved in the work	somewhat involved in the work	involved in the work	extremely involved in the work
Respect	hardly respected other group members' opinions	somewhat respected other group members' opinions	respected other group members' opinions	always respected other group members' opinions and offered positive feedback
Staying on task	hardly ever stayed on task	somewhat stayed on task	stayed on task	always stayed on task

Attitude	had a somewhat negative attitude about the assignment and working with group members	had an okay attitude about the assignment and working with group members	had a positive attitude about the assignment and working with group members	had an extremely positive attitude about the assignment and working with group members
Sharing the workload	hardly did any work	did some work	did equal share of the work	did a lot of work, and was very helpful to other students

Useful sites for rubrics

<https://www.rcampus.com>

<http://rubistar.4teachers.org>

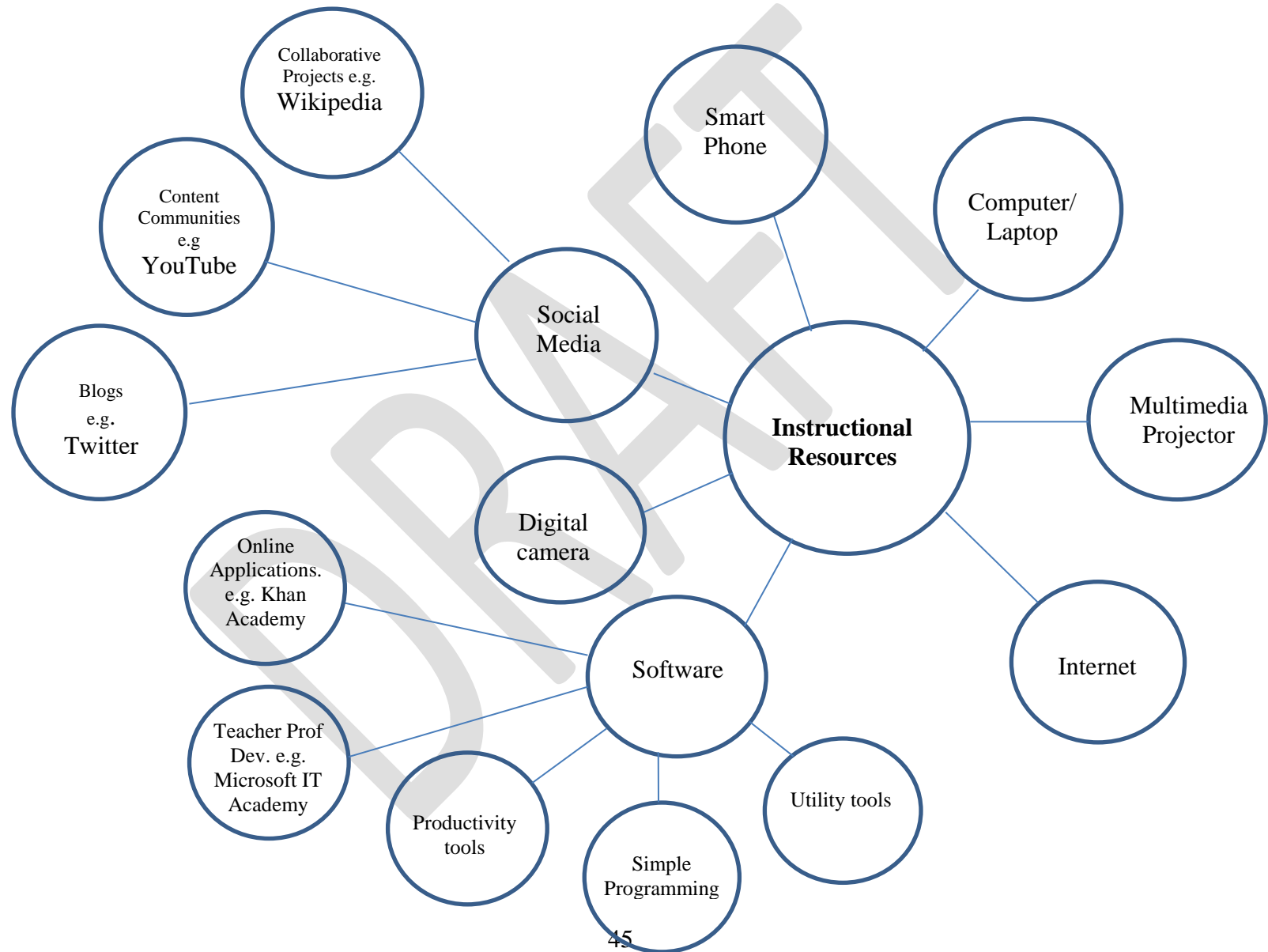
<b>Rubrics</b>	Consists of criteria and levels of competency (performance). Each level has clear descriptors against each criterion.
<b>Observation</b>	Observe students as they work to check for learning. Can be done through: <ul style="list-style-type: none"> <li>• Anecdotal Records</li> <li>• Rubrics</li> <li>• Checklists</li> </ul>
<b>Observation sheets (with criteria)</b>	Observation sheets are similar to checklists but they are used when observing students. Observations allow the teacher to focus on what the students are doing and how they are behaving in a particular activity or context.



## **Part 4: Useful Resources**

DRAFT

Suggested Resources for Teaching ICT



## Tips on Software Evaluation

There are software available for use in the classroom. Many of these applications can be accessed or downloaded on the Internet. Teachers are advised to evaluate application before exposure to students. The following tips can be used as a guide:

1. Is the software adaptive to students' needs?
2. Is it aligned to the syllabus/ does it contain topics relevant to the syllabus?
3. Does it contain assignable content/ can teachers can pick what students need?
4. Does it allow for data to be saved online and offline?
5. Is it compatible with students' desktops, computers, tablets?
6. Is it engaging, motivating to students?
7. Can student login, sign on easily?

The following is a list of URLs to useful resources on the Internet.

- Dreambox Learning. <http://www.dreambox.com/>
- The Educational Technology Site: ICT in Education. [http://terry-freedman.org.uk/artman/publish/article\\_1224.php](http://terry-freedman.org.uk/artman/publish/article_1224.php)
- Edutopia: <http://www.edutopia.org/>
- The Site for ICT Education. <http://www.teach-ict.com>
- ICT in Education: <http://www.ictineducation.org/home-page/2011/3/3/13-reasons-to-use-educational-technology-in-lessons.html>
- Teacher tools (grouping, seating chart, games). <https://www.superteachertools.net/>
- Links to sites on grouping techniques:  
techniques: <https://daretodifferentiate.wikispaces.com/file/view/Cooperative+Grouping+Strategies.pdf>  
<http://www.flipitconsulting.com/wp-content/uploads/2011/09/10-Creative-Ways-to-Form-Groups.pdf>  
<http://letsgetengaged.wikispaces.com/file/view/Creative-Ways.pdf>
- Graphite platform: apps, games, and websites for the classroom. <http://www.graphite.org>

- Activate Instruction platform is a free online tool that gives students an enriched, personalized learning experience through playlists created and shared by teachers.  
<http://www.activateinstruction.org/>
- Cyberbullying, Understanding and Addressing Online Cruelty, Supporting Materials for Teachers:  
[http://archive.adl.org/education/curriculum\\_connections/cyberbullying/middle%20school%20handouts.pdf](http://archive.adl.org/education/curriculum_connections/cyberbullying/middle%20school%20handouts.pdf)
- Cyberbullying Cases: <http://nobullying.com/six-unforgettable-cyber-bullying-cases/> NetSmartz Workshop, how children to be safer online and offline.  
<http://www.netsmartz.org/Parents>
- The rise of cyber bullying, Newsday Reporters Sunday, October 27, 2013  
[http://www.newsday.co.tt/sunday\\_special\\_report/0,185672.html](http://www.newsday.co.tt/sunday_special_report/0,185672.html)
- Stop Cyberbullying: NaomiJ Subscribe Channel: News: Trinidad and Tobago Monday, Apr 8, 13 at 11:58 AM <http://www.tv6tnt.com/u-report/201949411.html>
- STOP CYBER-BULLYING - We Can Be The Change! #1 (BATCE Young Leaders 2013 Campaign) [https://www.youtube.com/watch?v=R-qI\\_1e9CG8](https://www.youtube.com/watch?v=R-qI_1e9CG8)
- National Crime Prevention Council (USA) public service announcements, \_\_for its cyberbullying prevention campaign. Talent Show (video clip, 50 seconds)  
[http://www.adl.org/education/curriculum\\_connections/cyberbullying/Talent\\_Show\\_Final\\_Viral\\_Video.wmv](http://www.adl.org/education/curriculum_connections/cyberbullying/Talent_Show_Final_Viral_Video.wmv)
- Kitchen (video clip, 50 seconds)  
[http://www.adl.org/education/curriculum\\_connections/cyberbullying/Kitchen\\_Final\\_Viral\\_Video.wmv](http://www.adl.org/education/curriculum_connections/cyberbullying/Kitchen_Final_Viral_Video.wmv)
- How to Beat Cyberbullies  
[https://www.youtube.com/watch?v=Jwu\\_7IqWh8Y](https://www.youtube.com/watch?v=Jwu_7IqWh8Y)
- Internet Safe strategies for Students  
[http://archive.adl.org/education/curriculum\\_connections/cyberbullying/safety\\_strategies.pdf](http://archive.adl.org/education/curriculum_connections/cyberbullying/safety_strategies.pdf)

## Bibliography

Barrows, Howard S. (1996). "Problem-based learning in medicine and beyond: A brief overview". *New Directions for Teaching and Learning* **1996** (68):

3. [doi:10.1002/tl.37219966804](https://doi.org/10.1002/tl.37219966804)

Briggs, S (2014) 20 Simple Assessment Strategies You Can Use Every Day, retrieved from <http://www.teachthought.com/teaching/20-simple-assessment-strategies-can-use-every-day/> on 7/7/2014

Stronge, J. H. (2014, August 22). Retrieved from Association of Syllabus and Curriculum Development: <http://www.ascd.org/publications/books/105156/chapters/Planning-and-Organizing-for-Instruction.aspx>

The Ontario Curriculum Unit Planner; Assessment Strategies Companion© Queen's Printer for Ontario, 2002. [www.education.vic.gov.au/studentlearning/assessment/preptoyear10/tools/](http://www.education.vic.gov.au/studentlearning/assessment/preptoyear10/tools/)

## **Glossary**

### **Access point**

An access point is a wireless connection device. This point is used to connect a wireless computing device to a wired network.

### **Active Cell**

An active cell is the cell in which you are working currently. There can be only one active cell at a time.

### **Active Content**

Active content is a small program that gets installed on a computer while browsing the Internet. The basic function of active content is to provide an interactive Internet experience through videos and toolbars.

### **Applications**

Applications, also called programs, use the platform to perform tasks.

### **Authentication**

Authentication is the process by which the computer system validates a user's logon information.

### **Authorization**

Authorization is the process by which the user can associate specific permissions to each username.

### **Back Up**

To back up is to make a duplicate copy of a program, a disk, or data. The duplicate copy is called a backup.

### **Bit**

A bit is the smallest unit of information that a computer handles. A single bit can hold only one of two values, 0 or 1.

### **Byte**

A byte is a combination of eight bits arranged in sequence.

### **Cache Memory**

Temporary memory on your computer that is sometimes used to store local copies of files opened when you browse the Internet.

### **Camcorder**

A digital video camera used to record and store video.

### **Cell**

A cell is formed by the intersection of a row and a column. You can use a cell to store and display different types of data such as text, numbers, or formulas.

**Cell address**

Each cell in a worksheet is identified by a cell address. A cell address is made of the column letter and row number of the cell. For example, the cell formed by the first column and first row has the cell address A1. The cell address indicates the exact location of a cell in a worksheet.

**Cell phone**

A cell phone (or smartphone) is a wireless device that has the capabilities of a traditional wired phone and helps you to make a call from almost any location.

**Cell pointer**

A cell pointer is the highlighted rectangular border formed around an active cell.

**Cell range**

A cell range is a block of cells selected to implement a formula in a worksheet.

**Cell value**

Cell value is the actual numeric value of the data in a cell. This value might not be the same as the data displayed in the cell.

**Central Processing Unit (CPU)**

The central processing unit (CPU) is the primary hardware device that interprets and runs the commands you give to the computer.

**Chat Program**

Chat programs help you send and receive messages instantly. You can use a chat program to communicate with several people at the same time.

**Columns**

The vertical divisions in a worksheet are called columns. Each column is identified by a letter. For example, the first column in a worksheet is A.

**Commands**

A command is an instruction, which you give to a computer, which causes an action to be carried out. Commands are either typed by using a keyboard or are chosen from a menu.

**Communication Channel**

A communication channel is a path or a link that connects computers or peripheral devices, such as printers and disk drives, to transfer information.

**Communication Programs**

Communication programs are used by computers to exchange messages and files with other people in a digital format.

**Compact disc (CD)**

A storage device used to store data in a digital format.

**Computer Privacy**

Keeping a user's data, including personal files and e-mail messages, such that the data is not accessible by anyone without appropriate permission.

**Computer Security**

The protection of a computer system and its data from accidental or intentional loss and tampering.

**Cookie**

A small file on a computer that is created when a user visits a Web site. A Web site uses cookies to identify users who visit the site, and also track the preferences of the users.

**Copyright**

A method of protecting the rights of an originator of a creative work, such as text, piece of music, painting, or computer program, through law.

**CPU speed**

The CPU speed is the rate at which the CPU can perform a task, such as moving data to and from RAM, or performing a numerical calculation.

**Data**

Data is the plural for the Latin word datum, meaning an item of information.

**Database**

A database contains objects that help you to store, edit, and format information.

**Database Programs**

Database programs are used to store and manage data in an organized way. You can also use these programs to sort or search for information stored in a database.

**Database programs**

You use database programs to store and manage data in an organized way. By using these programs, you can also sort or search for the information stored in a database.

**Decryption**

The process of reconvertng the encrypted data into a readable and usable form.

**Desktop**

The desktop is an on-screen work area that uses a combination of menus and icons.

**Desktop Computers**

Desktop computers are made up of individual components such as a monitor, a keyboard, a system unit, and a printer.

**Desktop publishing (DTP) programs**

DTP programs are used to combine text and graphics to create documents such as brochures, greeting cards, annual reports, books, or magazines.



**Digital camera**

A camera that stores images digitally on a memory device, such as a flash memory card or a mini hard disk.

**Digital versatile disc (DVD)**

A storage device used to store data in a digital format.

**E-commerce**

E-commerce refers to the business transactions, such as buying and selling items, that are made over the Internet.

**Electronic mail (E-mail)**

The exchange of text messages and computer files over the Internet. An electronic mail (e-mail) is the electronic form of the traditional postal mail. E-mail allows you to exchange messages and files over a network.

**Encryption**

The process of converting data into an unreadable and unusable form. Encryption is done to prevent unauthorized access of data, especially during data transmission over the Internet.

**Firewall**

A filter that blocks unreliable information from the Internet before it reaches your computer or a private network. It provides additional protection against threats such as hackers and viruses. A firewall also helps to ensure computer privacy by restricting external access by any unauthorized user.

**Flat file database**

A flat file database contains all the data in a single table.

**Folder**

A folder is a container for programs and files in GUI interfaces.

**Formula bar**

The formula bar is used to enter or modify data in a worksheet. When you type data in a cell, the data is displayed simultaneously in the active cell and in the formula bar. However, when you enter a formula in a cell, the formula is displayed in the formula bar, whereas the numeric value of the formula is displayed in the corresponding cell.

**Gigabyte**

One gigabyte (GB) is equal to 1,024 MB, which is approximately equal to one billion bytes.

**Graphical User Interface (GUI)**

A graphical user interface (GUI) displays images and pictures that allows a computer user to interact with a computer easily.

**Graphics Programs**

Graphics programs are used to create and edit drawings. You can also use these programs to enhance photographs.

**Hacker**

A person who uses computer expertise to gain unauthorized access to a computer, and then misuses or tampers with the programs and data stored on the computer.

**Handheld Computer**

Handheld computers are smaller than laptops computers and provide fewer features compared to than desktop computers or laptops computers. They are used for specific everyday tasks, such as managing personal data.

**Hardware**

Hardware refers to all the physical components of a computer.

**Home office**

An arrangement that allows people to work from home.

**Icon**

An icon is a small image displayed on the screen to represent an object.

**Input Devices**

An input device is used to provide information to a computer. A keyboard is an example of an input device.

**Insertion point**

The insertion point is a blinking vertical bar on the screen that marks the location at which the inserted text appears. You can also use the insertion point to select text or graphics in a document.

**Intellectual Property**

Any information available on the Internet is an intellectual property, which is legally owned by the person who created it. The owner of an intellectual property has the exclusive rights to control the use of this information.

**Internet**

The Internet is a worldwide collection of public networks that are linked to each other for information exchange.

**Internet Service Provider (ISP)**

An ISP is a company that provides Internet connectivity to individuals, businesses, and organizations.

**Intranet**

A special type of network used to communicate and share information within an organization.

**IP address**

An Internet Protocol (IP) address is a numeric address that specifies the exact location of a computer on the Web.

**Kilobyte**

One kilobyte (KB) is equal to 1,024 bytes.

**Label**

A label is a text entry that is used to identify the type of information in a row or a column of a worksheet. Labels do not have any cell value associated with them.

**Laptop Computers**

Laptop computers are lightweight and portable personal computers. Laptop computers are also called notebook computers.

**Libel**

Written defamation that has been published. Libel is a punishable offense.

**Local Area Network (LAN)**

A LAN connects devices within a limited area, such as a home or a small group of offices.

**Megabyte**

One megabyte (MB) is equal to 1,024 KB.

**Menu**

A menu is a list of options from which a user can select an option to perform a desired action, such as choosing a command or applying a particular format to part of a document. Many programs, especially those that offer a graphical interface, use menus as a means to provide the user with an easy-to-use alternative to memorizing program commands and their appropriate usage.

**Menu bar**

The menu bar displays a list of commands that are grouped into sections. Some of these commands have images next to them, so that you can quickly associate the command with the image. This image is also on the button that corresponds to that command.

**Modem**

A modem is a connection device that allows you to connect your computer to the Internet. It converts digital information into analogue information and transmits the analogue information over a phone line.

**Mouse pointer**

The mouse pointer is an on-screen arrow or other shape that moves when you move the mouse or other pointing device.

**MPEG Audio Layer 3 (MP3)**

A format developed by Motion Picture Expert Group to enable compression of audio and video for digital distribution.

**Network**

A network is a group of computers that are connected to share resources and exchange information.

**Network Drives**

A network drive is a disk drive that is shared with other computers on a network.

**Notification Area**

The notification area is located on the right side of the taskbar when the taskbar is located at the bottom of a screen. The notification area displays the time, a volume icon, and icons of some programs that are running on a computer.

**Online**

When a computer is connected to the Internet, it is said to be online.

**Online communities**

Online communities are formed by groups of computer users who have common interests and purpose to communicate with each other over the Internet.

**Online Predator**

An individual who develops contact with Internet users, through chat rooms, online forums, or e-mail messages, to exploit them financially or involve them in dangerous relationships.

**Operating System**

The operating system controls the computer's hardware and provides services and access to the hardware to programs. It also manages the computer's operations and tasks, such as logging on, logging off, and shutting down.

**Password**

A unique string of characters that a user types in as an identification code. It is a security measure used to restrict access to computer systems and sensitive files.

**Personal digital assistant (PDA)**

A handheld computer that is used as a personal organizer. A traditional PDA includes features such as an address book, task list, and a calculator.

**Phishing**

The act of extracting personal information, such as passwords and credit card details, from computer users and then use the information for malicious purposes.

**Pixel**

Refers to small units that make up a picture. The higher the number of pixels, the better the quality of the picture.

**Plagiarism**

The act of copying someone's work and using it as if it is your own work, without mentioning the source.

**Platform**

The hardware and the operating system together are referred to as a platform.

**Plug-in**

A component that provides added functions by enabling the Web browser to access and execute files that are included in Web pages. Plug-ins are programs that help you view files, such as animations, audios, or videos, which are included in Web pages.

**Portal**

A portal is a Web site that offers information that is related to a specific topic in the form of a directory. A portal acts as a starting point to a number of resources on the Web.

**Power surge**

A sudden increase in line voltage, which may lead to the damage of electronic devices, such as computers.

**Presentation Programs**

Presentation programs are used to present information in the form of slides.

**Presentation software**

You can use presentation software to combine graphics and text to create presentations.

**Processing Devices**

Processing devices are used by computer users to process the input data and generate the desired output.

**Productivity software**

These are specialized programs that help you create and work with various types of documents. Common categories of productivity software are word processors, spreadsheets, presentation software, and databases.

**Programs**

A sequence of instructions that can be executed by a computer. A program is also known as software.

**Protocol**

A protocol is a standard method of transferring data between different computers.

**Publishing Programs**

Publishing programs are used to combine text and graphics to create documents such as brochures, greeting cards, annual reports, books, or magazines.

**Query**

A query is a database object that allows you to locate the desired information in a database.

**Regional work center**

A remote office that is connected to the company's head office by either the company's network or the Internet.

**Relational database**

A relational database stores data in multiple tables.

**Reports**

You can create reports in a database program, such as Microsoft Office Access, to organize, summarize, and perform calculations on data stored in a database.

**Resolution**

Refers to the clarity and sharpness of a picture.

**Rows**

The horizontal divisions in a worksheet are called rows. Each row is identified by a number. For example, the first row in a worksheet is 1.

**Scroll bars**

Scroll bars are vertical and horizontal bars located at the side or at the bottom of a display area. You can use scroll bars to move to a specific location in the work area.

**Search engine**

A search engine is a program that helps you search and retrieve information over the Internet.

**Secure Sockets Layer (SSL)**

An Internet security protocol that ensures secure data communication by encrypting the information transmitted. The SSL protocol certifies that a Web site is genuine and ensures that the data provided to the site is not misused.

**Server**

The server is the main computer on a network that provides services to other computers on the network. A server decides which computers are allowed to access the hardware and software on the network.

**Setup Wizard**

Setup wizards are provided by Windows 8. They guide the user through each step of a particular task, such as installing hardware or software.

**Slander**

Verbal defamation. Slander is a punishable offense.

**Software**

Software is a sequence of instructions that a computer can execute. It is also referred to as programs.

**Software Piracy**

Unauthorized copying of copyrighted software without obtaining the license or permission of its copyright owner is software piracy.

**Spam**

An irrelevant and unsolicited e-mail message sent by an unknown sender. A spam is sent to distribute a message to many recipients at one time.

**Speech recognition**

A technology that helps you to communicate with a computer by using only your voice to enter data and to issue commands.

**Speech synthesis**

A technology that allows the computer to speak to you. In speech synthesis, the computer communicates to you by converting text to digital audio.

**Spreadsheet Programs**

Spreadsheet programs are used to create budgets, manage accounts, perform mathematical calculations, and convert numerical data into charts and graphs.

**Spyware**

A computer program that is installed on your computer without your knowledge. Spyware can secretly send out information about your Web browsing habits or other personal details to another computer through the network.

**Status bar**

The status bar is a horizontal bar that is at the bottom of some productivity programs. This bar displays information about the current status of the program or document that you are viewing.

**Storage Devices**

Storage devices are used to store data. A hard disk is an example of a storage device.

**System Unit**

A system unit refers to the box that holds the processor, motherboard, disk drives, power supply, and the expansion bus.

**Tablet Computer**

Tablet computers are computers that help you write directly on the screen by using a tablet pen.

**Taskbar**

The taskbar is a rectangular bar that is usually located at the bottom of the screen. You can use the taskbar to select a program running on your computer.

**Telecommuting**

An arrangement that allows people to work from home or from a remote office.

**Terabyte**

One terabyte is equal to 1,024 GB, approximately equal to trillion bytes.

**The Web**

The Web, also known as the World Wide Web (WWW), is a collection of information that is accessible on the Internet. This information is arranged logically and stored on computers known as Web servers.

**Title bar**

The title bar is the horizontal bar that contains the name of the window. Most title bars also contain buttons to close, minimize, and resize the window.

**Toolbar**

The toolbar is a block of buttons or menus that you can use to quickly perform common tasks.

**Trojan Horse**

A destructive computer program disguised as a game, utility, or software. When run, a Trojan horse does something harmful to the computer system while appearing to do something useful.

**Universal Serial Bus (USB) cable**

A cable that helps you connect digital devices to a computer without turning off the computer.

153

**Username**

The name by which a user is identified to a computer system or network. To access a computer protected by username and password, a user needs to enter the correct combination of username and password.

**Virus**

A computer program that is designed to cause malfunctioning of a computer or damage the data stored on the computer.

**Wallpaper**

Wallpaper is a pattern or picture on the screen background that you can choose.

**Web address**

A Web address specifies the protocol to be used for transferring data between different computers and the exact location of the Web site. A Web address is also known as the URL.



**Web browser**

A Web browser is a program that helps you view and interact with various resources on the Web.

**Web page**

A Web page is a formatted text document on the Web.

**Web site**

A Web site is a collection of one or more Web pages that are linked together and made available through a Web server.

**Wide Area Network (WAN)**

A WAN is a network that connects devices in geographically separated areas.

**Window**

In Windows 8, a window is a rectangular area on the monitor that displays a program. Each program has its own window.

**Windows audio wave (WAV)**

An audio format developed by Microsoft. This format is used to store audio files in a digital format.

**Windows media audio (WMA)**

An audio format developed by Microsoft. This format is used to store digital audio files.

**Word processors**

Word processors are used to create and modify text-based documents.

**Word-processing Programs**

Word-processing programs are used to create and modify text-based documents.

**Work area**

The work area is the blank space within the program where you enter information.

**Workbook**

A workbook is a file created in Microsoft Excel. A workbook can contain one or more worksheets and related items.

**Worksheet**

A spreadsheet is called a worksheet in Microsoft Excel.

**Workstation**

A workstation refers to a computer connected to a network. You use a workstation to access the hardware and software on a network.

**Worm**

A computer program that propagates itself across computers, usually by creating copies of itself in each computer's memory. A worm might duplicate itself in one computer so often that it causes the computer to crash.