Prince Edward Island
CANADA

Department of Education







Journey On

Working Toward Communication and Information Technology Literacy

Grade 9

September 2007 Draft

Preface

The document, A Journey (1997), first introduced the general concept of integrating technology into the curriculum at the elementary level in Prince Edward Island. As stated in this earlier document, using information technology in the schools was considered new and largely uncharted territory. We continue a journey into an interesting world of communication and information tools for teaching and learning. Journey On Grades 1-3 (1999) provided a framework and lesson plans for teachers at the primary level to integrate communication and information technology in their classrooms. Journey On Grades 4-6 (September 2000) and the document, Journey On Grades 7-9 (September 2000), continued with the same framework and specific grade level lesson plans intended for teachers in elementary and intermediate schools.

Journey On (2007), provides grade specific curriculum outcomes that have been assigned to core curriculum subjects. This grade 9 document contains specific technology outcomes, instructional considerations, teaching suggestions - activities and assessment strategies, lesson plans, and links to other curriculum areas.

These documents will serve as a guide for teachers. Lesson plans suggest specific exercises for classroom use and will serve as a starting point from which teachers may develop and enhance their own ideas and competencies in the area of communication and information technology (CIT).

Acknowledgements

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The communication and information technology committees were instrumental in providing input for the curriculum outcomes grades 1-12 framework on which Journey On (2007) is based. Past and present members of the committees are listed below:

Department of Education

Guy Albert
Gordon Bernard
Bruce Brine
Robert Bourgeois
Greg Bungay
Pauline Coady
Clayton Coe
Joan Connell
Don Craig
Judy Davis
Peter Grisebauer
Frank Hennessey
Linda Lowther
Doug MacDougall
Percy MacGougan
Lana MacIsaac
Edward MacLean
Ted Nabuurs
Danielle Plante-Bourgeois
Jeanette Scott
Elizabeth Tumblin
Kim McBurney

Eastern School District

Tami Jo Auld
Anne Campbell
Jason Campbell
Bethany Doiron
Lianne Garland
Robert Gaudet
Bob Gray
Marg Gray
Laurie King
Anne Ives
Lori Lavers
Debbie MacLean
Dr. Kevin MacLeod
Pam McIntosh-Whalen
Joe Murphy
Tim Murphy
Linda Shaw-Packard
Marg Stewart
Joanne Stubbs
Susan Westphal
Kevin Whitrow
B. J. Willis

Western School Board

Laura Brake
Laurie Callbeck
Ralph Carruthers
Nancy DesRosiers
Kent England
Mario Fiset
Marjorie Hunter
Sally MacDonald
Connie McCabe
Donald Mulligan
Sergine Ouellet
Gordon Ramsay
Mark Ronahan
Keith Tompkins
Kristin Trace

French School Board

Sylvain Gagné

University of Prince Edward Island

Dr. Martha Gabriel

Contents

Vision

Technology education for Atlantic Canada fosters the development of all learners as technologically literate and capable citizens who can develop, implement, and communicate practical, innovative, and responsible technological solutions to problems.

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Introduction

Purpose of Document

Journey On is a practical working guide which will provide educators and administrators at all levels, including schools, school boards/districts, and provincial departments, with a reference point for integrating communication and information technologies (CIT) into the Prince Edward Island school curriculum.

Journey On will be the basis for future decisions pertaining to human and physical CIT resources. These decisions will focus on personnel, professional development, instructional techniques, course development, student and teacher access to technology, and hardware and software purchases.

It is recognized that many disciplines have their own specialized technologies and technological processes. Students will have the opportunity to develop skills required to use these specialized technologies within the context of courses such as Computer Science, Science, Career Exploration, Visual Communication, Industrial Arts, and Home Economics. CIT differs from other technologies because of its vast and far reaching applications in all disciplines.

The purpose of *Journey On* is to focus on how CIT can be used from grade 1-12 and across all areas of the curriculum as part of a more global strategy that will contribute to the development of technologically competent and literate individuals graduating from our school system.

Journey On:

- provides strategies and concrete suggestions for effective integration of communication and information technologies into the Prince Edward Island curriculum in a way that enhances learning
- identifies the communication and information technologies that we wish our students to use
- identifies the knowledge and skills that students need to develop to be considered technologically competent in communication and information technologies

Terminology

Technology

The broad definition of technology includes the tools and processes we use to alter our surroundings, perform a task, discover more about ourselves, and communicate. For the purpose of this document *technology* refers to the tools used to access, gather, process, and share information. These communication and information technologies (CIT) pertain to computers and their peripherals such as scanners, printers, digital cameras, projection devices, and videoconferencing equipment.

Technological Competence

The Atlantic Provinces Educational Foundation (APEF) defines technological competence as "the ability to use a variety of technologies, demonstrate an understanding of technological applications and apply appropriate technologies for solving problems independently." Individuals competent in information and communication technologies have specialized knowledge and skills that enable them to use technology to access, gather, process, and share information.

Technological Literacy

Technological literacy encompasses technological competence but refers to a higher level of understanding of technology. Individuals literate in the area of CIT think critically about information gained through the use of technology, the application of specific technologies, and the impact of technology on individuals and society when formulating decisions, opinions and courses of action. These individuals apply problem solving strategies and creative thinking skills to independently learn how to use new technologies, or circumvent problems associated with older technologies. CIT literate individuals demonstrate confidence and a positive attitude as they adapt and use technologies for a beneficial purpose.

Philosophy

The use of technology in our educational system is based upon a number of underlying beliefs:

- as educators in Prince Edward Island we are committed to provide for the development of children so that each may take a meaningful place in society
- literacy extends beyond the traditional concept of the ability to read and write print materials to encompass media and information literacy
- technological competence is a requirement for literacy and lifelong learning in today's world
- students today require knowledge, skills and attitudes for dealing with the rapid pace of change and growth of our knowledge base
- technology, when used appropriately, enhances student-centred learning and the teacher's role as a facilitator

Technology Integration

Integrating communication and information technologies into the curriculum is a preferred strategy for developing technologically literate learners. Integration occurs when the technology is used as a tool to achieve existing curricular learning outcomes within the context of a theme or subject. Technology knowledge and skills are not acquired separately in an integrated approach but in the context of learning activities intended to address various outcomes across the curriculum. Integration means that the use of technology as a teaching tool should not be limited to specialist teachers but applies to teachers in all curricular areas.

Advantages of Technology Integration

Integration of technology into the curriculum

- ensures that curriculum is the principle focus, rather than technology
- promotes the development of creative thinking, critical thinking, research, communication, and problem solving skills
- provides access to rich resources and learning experiences that can extend far beyond those offered in traditional classrooms
- motivates students to complete learning tasks and become more readily engaged in their own learning
- supports current research which suggests that people learn in a holistic fashion rather than in a compartmentalized manner
- supports contemporary approaches to education such as cooperative learning, constructivism, resource-based learning and individualized learning
- provides teachers with an additional means to address multiple learning styles
- provides students with the opportunity throughout their school career to expand and reinforce their repertoire of technology skills
- enables the students to acquire a better understanding of how to use technology in meaningful ways
- ensures that all students have the opportunity to develop technological competencies
- prepares students to select appropriate technologies to complete tasks
- provides teachers with an opportunity to model lifelong learning as students witness teachers learning and using new skills for a purpose

ABCs of curriculum

An Outcome-based Curriculum

An outcome-based curriculum is a student-centred design which focuses on expectations of the student as a result of learning. It ensures that each student is provided with the time and assistance to meet his/her potential.

> A learning outcome is the result of learning for the student, something that the student *will know, be able to do,* or *be like.*

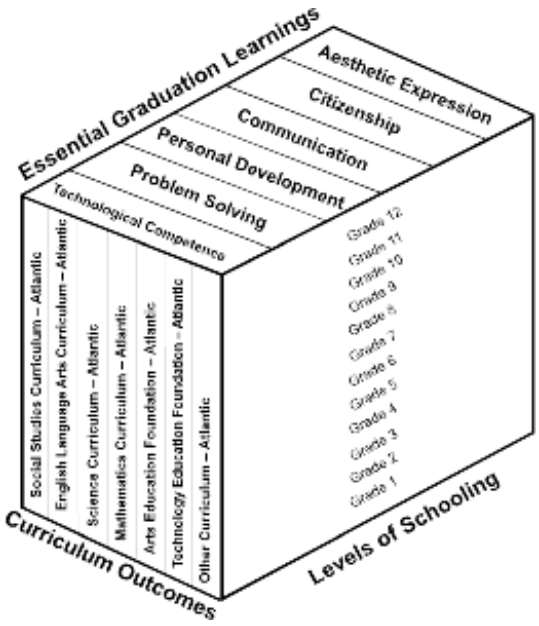
Essential Graduation Learnings (EGLs)

"The essential graduation learnings are statements that describe the knowledge, skills, and attitudes expected of all students who graduate from high school." (APEF/CAMET) These statements are the framework upon which curriculum for all subject areas is based. The six Essential Graduation Learnings include:

- Aesthetic Expression
- Citizenship
- Communication
- Personal Development
- Problem Solving
- Technological Competence

General and Specific Curriculum Outcomes

General curriculum outcomes are statements that describe what students are expected to know in a curriculum area upon graduation. Specific outcomes are statements that identify what students should know and be able to do at a particular grade level. These are used to guide the teacher in planning day to day activities. Students demonstrate the essential graduation learnings through accomplishing the outcomes.



Other Features of the Curricula

In addition to the six essential graduation learnings, there are a number of underlying concepts and strategies which are interwoven into the 1-12 curricula of Prince Edward Island, and which influence methods of delivery and instruction.

Cooperative Learning and Group Work

Small and large group work provide students with the opportunity to develop language (communication skills) and social skills.

Creative Thinking

"Creative thinking deals with combining elements of reality in novel ways to formulate new perceptions, enriched concepts and new understandings" (Nature of Thinking)

Critical Thinking

Critical thinking involves the analysis of statements or arguments and an evaluation of their worth or validity. Critical thinking skills include identifying and validating sources; determining what is being said, relevancy, and point of view or perspective; detecting bias; recognizing persuasive techniques; and drawing logical, well-supported conclusions.

Diversity/Equity Education

Diversity education encourages the understanding of diversity within our society and promotes a commitment to equity by fostering an awareness and critical analysis of individual and systemic discrimination.

Resource-based learning

Resource-based learning is an educational approach that actively engages the students in carefully structured learning activities that use a wide range of resources, and emphasizes skills and strategies needed to achieve information literacy.

Learning Styles

The Theory of Multiple Intelligences suggests that all people learn differently, with eight identfied intelligences. It is essential that educators make students aware of their learning styles and teach using a variety of methods to provide students the opportunity to learn in a number of ways.

Essential Grad

Aesthetic Expression **Citizenship**
Personal Development

Language Arts

Speaking and Listening

Students will be expected to
- speak and listen to explore, extend, clarify, and reflect on their thoughts, ideas, feelings, and experiences
- communicate information and ideas effectively and clearly, and respond personally and critically
- interact with sensitivity and respect, considering the situation, audience, and purpose

Reading and Viewing

Students will be expected to
- select, read, and view with understanding a range of literature, information, media, and visual texts
- interpret, select, and combine information using a variety of strategies, resources, and technologies
- respond personally to a range of texts
- respond critically to a range of texts, applying their understanding of language, form, and genre

Writing and Other Ways of Representing

Students will be expected to
- use writing and other forms of representation to explore, clarify, and reflect on their thoughts, feelings, experiences and learnings; and use their imaginations
- create texts collaboratively and independently, using a variety of forms for a range of audiences and purposes
- use a range of strategies to develop effective writing and media products and to enhance their clarity, precision and effectiveness

General Curri

Mathematics

Number Concepts/Number and Relationship Operations
- Students will demonstrate number sense and apply number theory concepts
- Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations

Patterns and Relationships
- Students will explore, recognize, represent and apply patterns and relationships, both informally and formally

Shape and Space
- Students will demonstrate an understanding of and apply concepts and skills associated with measurement
- Students will demonstrate spatial sense and apply geometric concepts, properties, and relationships

Data Management and Probability
- Students will solve problems involving the collection, display and analysis of data

- Students will represent and solve problems involving uncertainty

Ot

Health, Music, Physical Education and Visual Arts
These guides contain general curriculum outcomes

uation Learnings

Technological Competence

Communication **Problem Solving**

culum Outcomes

Science

Science, technology, society, and the environment (STSE)

- Students will develop an understanding of the nature of science and technology, the relationships between science and technology, and the social and environmental contexts of science and technology

Skills

- Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions

Knowledge

- Students will construct knowledge and understanding of concepts in life science, physical science, and Earth and space science, and apply these understandings to interpret, integrate, and extend their knowledge

Attitudes

- Students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge to the mutual benefit of self, society, and the environment

her

curriculum guides exist on Prince Edward Island.
and specific curriculum outcomes.

Social Studies

Citizenship, Power, and Governance

- Students will be expected to demonstrate an understanding of the rights and responsibilities of citizenship; and the origins, functions, and sources of power, authority, and governance

Culture and Diversity

- Students will be expected to demonstrate an understanding of culture, diversity, and world view, recognizing the similarities and differences reflected in various personal, cultural, racial, and ethnic perspectives

Individuals, Societies, and Economic Decisions

- Students will be expected to demonstrate the ability to make responsible economic decisions as individuals and as members of society

Interdependence

- Students will be expected to demonstrate an understanding of the interdependent relationship among individuals, societies, and the environment - locally, nationally, and globally, and the implications for a sustainable future

People, Place, and Environment

- Students will be expected to demonstrate an understanding of the interactions among people, places, and the environment

Time, Continuity, and Change

- Students will be expected to demonstrate an understanding of the past and how it affects the present and the future

Effective Use of Technology with

Language Arts

The Foundation for the Atlantic Canada English Language Arts Curriculum (1996) identifies technological advances in our society as a contributing factor to the revision of the concept of literacy. Literacy now encompasses print literacy, visual literacy, media literacy, and other literacies required to use technology in our culture. This APEF foundation guide suggests that students use a range of information retrieval, and information processing technologies to meet their own information needs. Specific examples of student experiences should include

- using a word processor to develop a piece of writing
- constructing simple databases and spreadsheets to organize information
- exploring the applications of interactive CD-ROM software
- using graphic communication software
- producing a variety of desk top publishing texts
- using multimedia
- using e-mail
- using listservs and web browsers
- using appropriate technologies to organize and create complex information with multiple textual and graphic sources
- distinguishing sources which are central, reliable and relevant among the vast number of choices offered by technologies

Adapted from APEF Foundation Guide for English Language Arts Curriculum (1996) page 40

Mathematics

The Foundation for the Atlantic Canada Mathematics Curriculum guide (1996) supports the recommendations of National Council of Teachers of Mathematics (NCTM) curriculum standards to use technology i) to enhance the teaching and learning of mathematics and ii) to relate school mathematics to the world in which students live through developing and interpreting mathematical models. APEF suggests that technology has altered the nature of what mathematics is important to learn and has made possible the development of new problems and innovative ways of investigating these problems. Specifically, it is recommended that technology should be used to

- explore situations with complicated numbers which previously would have been beyond their capabilities
- quickly and easily explore individual or groups of related computations or functions
- create and explore numeric and geometric situations for the purpose of developing conjectures
- perform simulations of situations which would otherwise be impossible to examine
- easily link different representations of the same information
- model situations mathematically
- observe the effects of simple changes in parameters or coefficients
- analyze, organize, and display data

Adapted from APEF Foundation Guide for Mathematics Curriculum (1996) page 39

in the Core Curriculum Areas

Science

The Foundation for the Atlantic Canada Science Curriculum guide (1998) states that technology can be used to facilitate the learning of science and recommends that technology should have a major role in the teaching and learning of science. APEF proposes the following guidelines for the implementation of technologies in the teaching and learning of science

- tutorial software should engage students in meaningful interactive dialogue and creatively employ graphs, sound, and simulations to promote acquisition of facts and skills, promote concept learning and enhance understanding
- simulation software should provide opportunities to explore concepts and models that are not readily accessible in the laboratory (e.g., those that require hazardous materials, unavailable equipment, or more time than is possible in real-time classroom.)
- analog-digital interface technology should be used to permit students to collect and analyse data as scientists do, and perform observations over long periods of time, enabling experiments that otherwise would be impractical
- databases and spreadsheets should be used to facilitate the analysis of data by organizing and visually displaying information
- networking among students and teachers should be encouraged to permit students to emulate the way scientists work and to reduce teacher isolation
- using tools such as the World Wide Web should be encouraged as it provides instant access to an incredible wealth of information on any imaginable topic

Adapted from APEF Foundation Guide for Science Curriculum (1998) page 44

Social Studies

The Foundation for the Atlantic Canada Social Studies (1998) recommends that technology have a major role in the teaching and learning of social studies but, that it enhance, not replace, essential social studies learning. APEF recognizes that Communication and Information Technologies have become important tools for the acquisition, analysis, presentation, and communication of data in ways that allow students to become more active participants in research and learning

- CD-ROMs and the Internet provide teachers and students with quicker and easier access to extensive and current information. Students and teachers should critically analyse such information to determine its validity, accuracy, bias, and interpretation
- students are enabled to directly employ inquiry skills by exposure to first hand information through direct e-mail conversations, student created Web sites, and listservs. These modes of communication provide connections to students and cultures from around the world.
- students can present their learnings to peers within their classroom and beyond in a wide variety of forms (graphics, maps, text, graphic organizers, Web sites, multimedia presentations, etc.) that fit their learning styles.
- technology can provide opportunity for students to become more actively involved in their learning by allowing students control of information gathering, processing, and presentation.

Adapted from APEF Foundation Guide for Social Studies(1998) page 40

Technology Curriculum Outcomes

GENERAL TECHNOLOGY OUTCOMES
(as per APEF Technology Foundation Document)

GTO A- Technology Problem Solving
Students will be expected to design, develop, evaluate, and articulate technological solutions.

GTO B- Technology Systems
Students will be expected to operate and manage technological systems.

GTO C- History and Evolution of Technology
Students will be expected to demonstrate an understanding of the history and evolution of technology and of its social and cultural implications.

GTO D- Technology and Careers
Students will be expected to demonstrate and understanding of current and evolving careers and of the influence of technology on the nature of work.

GTO E- Technological Responsibility
Students will be expected to demonstrate an understanding of the consequences of their technological choices.

Areas

1. **Computer Systems** - In general, a complete, working computer. The computer system includes not only the computer, but also any software, networking, and peripheral devices that are necessary to make the computer function. Every computer system, for example, requires an operating system such as Windows.

2. **Social, Ethical and Health** - General user guidelines for the responsible use of technology .

3. **Internet** - A global network connecting millions of computers. This network carries various information and services such as email, online chat, video, audio, web sites and other documents of the World Wide Web.

4. **Concept Maps** - Visual representations of relationships between ideas. Methods for grouping and organizing information. Visual learning allows new concepts to be more thoroughly and easily understood.

5. **Graphics** - Refers to display and manipulation of images (text, pictures and drawings)

6. **Spreadsheets** - A table of values (text, numeric, dates) or information arranged in rows and columns. Spreadsheets allow the computation of data with formulas and the creation of charts and graphs.

7. **Word Processing** - Using a computer to create, edit, and print documents. A word processor enables you to create a document, store it electronically, display it on a screen, modify it by entering commands and characters from the keyboard, and print it.

8. **Multimedia** -The use of computers to create and present several different media such as text, graphics, video, animation, and sound in an integrated way.

9. **Database** - A collection of data organized in such a way that a computer program can quickly select desired pieces of information from a search request. You can think of a database as an electronic filing system.

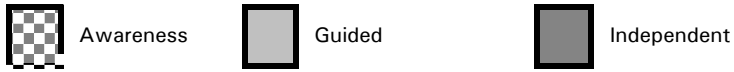
10. **Telecommunications** - Refers to all types of data transmission, from voice to video using a variety of media such as copper cable, fibre optics, satellites, wireless technology, etc.

11. **Web Authoring** - The act of developing a web site. Software is available that will generate the required HTML coding for the layout of the particular Web page.

Each skill area of the outcome continuum is identified by grade level and progress as follows:

Awareness - the student is exposed to the technology as it is being used by others.
Guided - the student begins to use the technology with the help of others.
***Summative Assessment**- beyond this grade level, students will be expected to meet the outcome independently.
Independent - the student uses the technology without assistance.

Computer Systems



	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A1.1	make use of help features to independently find solutions to problems													
B1.1	login, open and close a program, open, save and close a file with mouse													
B1.2	demonstrate proper use of login numbers and names, set-up and change passwords, and be aware of implications of multiple logins													
B1.3	begin to work with more than one file open at once (multi-task)													
B1.4	differentiate between "Save" and "Save as..."													
B1.5	be able to identify the common windows components of a given software screen (eg. menu bar, button bar, cursor, insertion point)													
B1.6	have an understanding of file management (drives and folders, rename, select, move, copy, paste, delete, display format, backup, etc.)													
B1.7	understand how to display file properties													
B1.8	understand the difference between software and hardware													
B1.9	identify system specifications and be aware of compatibility issues between the hardware and the software (processor speed and type, RAM, hard drive size, optical drive, connection types, video card, sound card, monitor, network cards)													
B1.10	understand how and when to re-boot (warm boot vs cold boot)													
B1.11	describe networks, file servers, connections (wireless, line types and speeds)													
B1.12	demonstrate proper use of network printing, choose proper printer, recognizes process and purpose of Print Queues													
B1.13	identify computer viruses, how they are transmitted and how anti-virus software is used to protect or clean a computer													
B1.14	identify SPAM, pop-up ads, spyware and other invasive software coding													
B1.15	modify and utilize master pages/templates													
B1.16	import and export files to other formats (.html, .pdf)													
C1.1	identify technologies that are found in everyday life													

Social, Ethical, and Health

 Awareness  Guided  Independent

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A2.1	identify aspects of an ergonomic workstation (lighting, monitor angle, work placement, keyboard height, seat height, posture, etc.)													
B2.1	demonstrate proper touch keyboarding techniques (ie: home row, quick key strokes, proper reaches)													
C2.1	examine current Canadian law governing the use of technology													
D2.1	determine the technological requirements for specific career goals													
E2.1	respect equipment and other student's work													
E2.2	work co-operatively at work station													
E2.3	adhere to acceptable use agreement for work station/network/Internet													
E2.4	use electronic communication etiquette													
E2.5	adhere to rules of freeware, shareware and commercial ware													
E2.6	adhere to copyright and privacy laws, give credit to sources of information (MLA, APA)													
E2.7	identify ethical issues involved with Internet content, awareness of inappropriate use of technology													
E2.8	demonstrate caution before sending personal information over the internet													
E2.9	follow publishing etiquette (suitable language, no discrimination, etc.). Adhere to the guidelines for school web pages as outlined by PEI Department of Education.													

Internet

 Awareness  Guided  Independent

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A3.1	demonstrate awareness of the Internet as a source of information													
A3.2	use various tools (search engines and directories) and strategies necessary to carry out research													
A3.3	obtain/download material (text, graphics, files) from Internet													
B3.1	Use the various browser navigation tools (back, forward, history)													
B3.2	manage bookmarks/favorites													
B3.3	distinguish among various file formats (file extensions), required plugins, file compression/decompression utilities													
C3.1	discuss ways in which the Internet is evolving													
E3.1	critically evaluate information and its source based on pre-determined criteria													

Concept Maps

 Awareness  Guided  Independent

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A4.1	use brainstorming techniques to generate ideas													
A4.2	create a web (i.e.: literary, concept, character, word, Venn Diagrams, and timelines)													
A4.3	categorize ideas graphically													
A4.4	create links between ideas, re-link or delete links between ideas													
A4.5	elaborate on ideas (i.e. adding notes, annotations, etc.)													
B4.1	add fonts, graphics, sound, and colours to enhance ideas													
B4.2	create hyperlinks to files, web sites, or multimedia content													

Graphics

 *Awareness*

 *Guided*

 *Independent*

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A5.1	create illustrations or graphics by using the various drawing tools													
A5.2	apply principles of design													
B5.1	demonstrate various object editing features (ie. select, unselect, resize, crop, area fill, add colour and pattern, size adjustment using the mouse or scale, various erasing techniques, object orientation, changing font and text size, colour or appearance, creating text blocks, change text wrap selection and other text manipulation functions)													
B5.2	carry out various object manipulations (ie. object alignment, creation of graphics in layers, grouping/un-grouping components of an image)													
B5.3	use other graphic creation tools (i.e. clone brush, colour replacements, effects and filters, hexidecimal (RGB and CMYK colour values)													
B5.4	convert various graphic formats between vector (ie: .png, .psp, .cdr) and bitmap images (ie: .wmf, .tif, .bmp, .gif, jpeg, .jpg), import a graphic file from another source													

Spreadsheets

 Awareness  Guided  Independent

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A6.1	plan / design a spreadsheet to organize and tabulate data from various sources (to make a schedule, tally/score sheet, solve a mathematical word problem)													
A6.2	correct errors, modify or delete data in a cell													
A6.3	design own formulas incorporating functions {if SUM(B1..D1)>0, @SUM(B1..D1), 0} and absolute / relative cell references													
A6.4	use different types of graphs / charts (line, pie, bar) to visually represent data; label graph components (legend, title, x-y axis, colour, fill pattern)													
B6.1	identify spreadsheet components and terminology (rows and columns, cell addresses, data entry bar)													
B6.2	identify different types of cell data (text, numeric, function, date)													
B6.3	enter data into simple preexisting spreadsheets, auto fill data, data entry bar, sort data													
B6.4	edit spreadsheet layout (insert and delete rows or columns, select a range of cells, alter column widths and row heights, locking row and column headings, lock and unlock cell(s), fixed titles)													
B6.5	enter formulas to perform calculations across columns, rows, cells, move/copy data or formulas from one area of spreadsheet to another													
B6.6	format numbers (decimal places, currency, etc.), format text (font, colour, size)													
B6.7	create links [between notebooks (tabs or sheets), external files, graphs, charts, website]													

Word Processing

 Awareness  Guided  Independent

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A7.1	create and edit data files and form documents to perform a merge													
A7.2	identify examples of desktop publishing (i.e. newspaper, catalogue, ads, brochure)													
B7.1	use a grade level appropriate wordprocessor to create and edit written work													
B7.2	locate characters on a keyboard and identify functions of word processing (ie. cursor, insertion point, enter key, space bar, upper case, backspace, shortcut key)													
B7.3	use editing tools to revise work (i.e. spell check, thesaurus, find and replace)													
B7.4	change font, size, colour, style (ie. bold, italics, underline, insert special characters, drop capitals)													
B7.5	format text (ie. justification, line spacing, outlines and bullets, text wrap)													
B7.6	format documents (ie. using margins, tab rulers, indents, page center, border, watermark)													
B7.7	insert a graphic and manipulate, (ie. resize, add borders and fill, create text art)													
B7.8	insert and format tables and text boxes (ie. lines, fill, columns, rows, borders, alignment)													
B7.9	format multi-page documents with headers, footers, page numbers, page breaks and keep text together function, change page orientation/size (ie. text presentation features)													
B7.10	insert automated features (ie. date and file stamp)													

Multimedia

 Awareness  Guided  Independent

	Students are expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A8.1	apply planning strategies, (storyboards, scripts, graphic organizing, brainstorming)													
A8.2	create an age/grade appropriate slide show presentation that may contain one or more of the following objects (text, graphics, images, animations, audio and video)													
A8.3	describe situations where streaming video and audio is appropriate													
A8.4	create graphics, audio and video special effects (animation, virtual reality, panorama)													
A8.5	select appropriate medium to convey a message (be conscious of file size, formats and storage location)													
B8.1	navigate multimedia resources such as slide shows, online resources or CD rom interactive educational activities													
B8.2	use multimedia creation and editing tools (screen captures, scanner, sound recording, digital image editing software: still and video)													
B8.3	convert file formats for a particular application (.jpg, gif, .bmp, mp3, wav, avi, mpeg, mov, etc.)													
B8.4	use proper tools and procedures to enhance product quality. (Microphones, lighting, camera movement, instrumentation, teleprompters, assign various responsibilities to a production team.)													

Database

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A9.1	use an existing database (CD ROM, Microcat, Dynex, Internet search engine) to find information (sign up for Provincial Library Card - Abbycat)													
A9.2	perform searches on a database file using logical and Boolean operators (understands commands, scope, filters, and conditions)													
A9.3	design/plan a database to use as a method of organizing information													
A9.4	create and modify a form (add graphics, and error checking routines)													
A9.5	use databases to analyze data and look for trends													
B9.1	enter data into a pre-existing database, edit data, and use automated text													
B9.2	create fields and with variable field types (numeric, text, date) and properties (color, width, font, etc.)													
B9.3	restructure database (add / delete fields, change field width)													
B9.4	sort records alphabetically, numerically and by multiple fields													
B9.5	create a report from the entire database or selected records													
B9.6	create a report with automated summaries and calculations (understand logic, date and summary field types)													
B9.7	bring database information into a word processing environment ie: (Mail Merges)													
B9.8	distinguish between the two general types of database management systems (flat and relational)													
E9.1	examine functions and implications of database driven websites (ie: online purchasing, searching, and password secured sites)													

Telecommunications

 Awareness  Guided  Independent

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
	Email:													
B10.1	send messages													
B10.2	open messages													
B10.3	manage mail/folders													
B10.4	manage address books													
B10.5	use distribution lists													
B10.6	send and open attachments													
B10.7	create signatures													
B10.8	apply filters and rules													
B10.9	use calendar features such as appointments, tasks, reminder notes/memos													
	E-Learning/Collaborative tools:													
	Students will be expected to:													
A10.1	collaborate using software: (ie. whiteboard, slideshow, application sharing, chat, messaging, send and receive files, photos, group file sharing, resource sharing (links), online content creation and sharing, assignment drop box, video and audio, discussion forums, journal.)													
B10.10	use the organizational features of collaborative tools such as scheduling, calendaring, and interactive syllabus													

Web Authoring

 *Awareness*

 *Guided*

 *Independent*

	Students will be expected to:		1	2	3	4	5	6	7	8	9	10	11	12
A11.1	identify web page creation possibilities													
A11.2	create appropriate text and image file formats													
A11.3	create an interactive webpage. (online surveys, forms, interactive database, polls)													
B11.1	examine html tags													
B11.2	create a basic web page (may include backgrounds, images, hyperlinks, tables)													
B11.3	indicate where file or page is hosted (server, web server, hosting service)													
B11.4	apply website file management and transfer files to and from web servers (ftp), edit pages online													
B11.5	use special features (image maps, cascading style sheets, frames, rollovers, layers)													
B11.6	embed objects (audio, video, pdfs, animation, Flash, Java Script Applet,)													
E11.1	describe standards which guide web based publication (W3C accessibility guidelines)													

How to Use this Document

Paper Document

The first section of the document includes background material, definitions, philosophy, advantages of technology integration, an overview of the APEF curriculum, and grade 1-12 general outcomes for information and communication technologies.

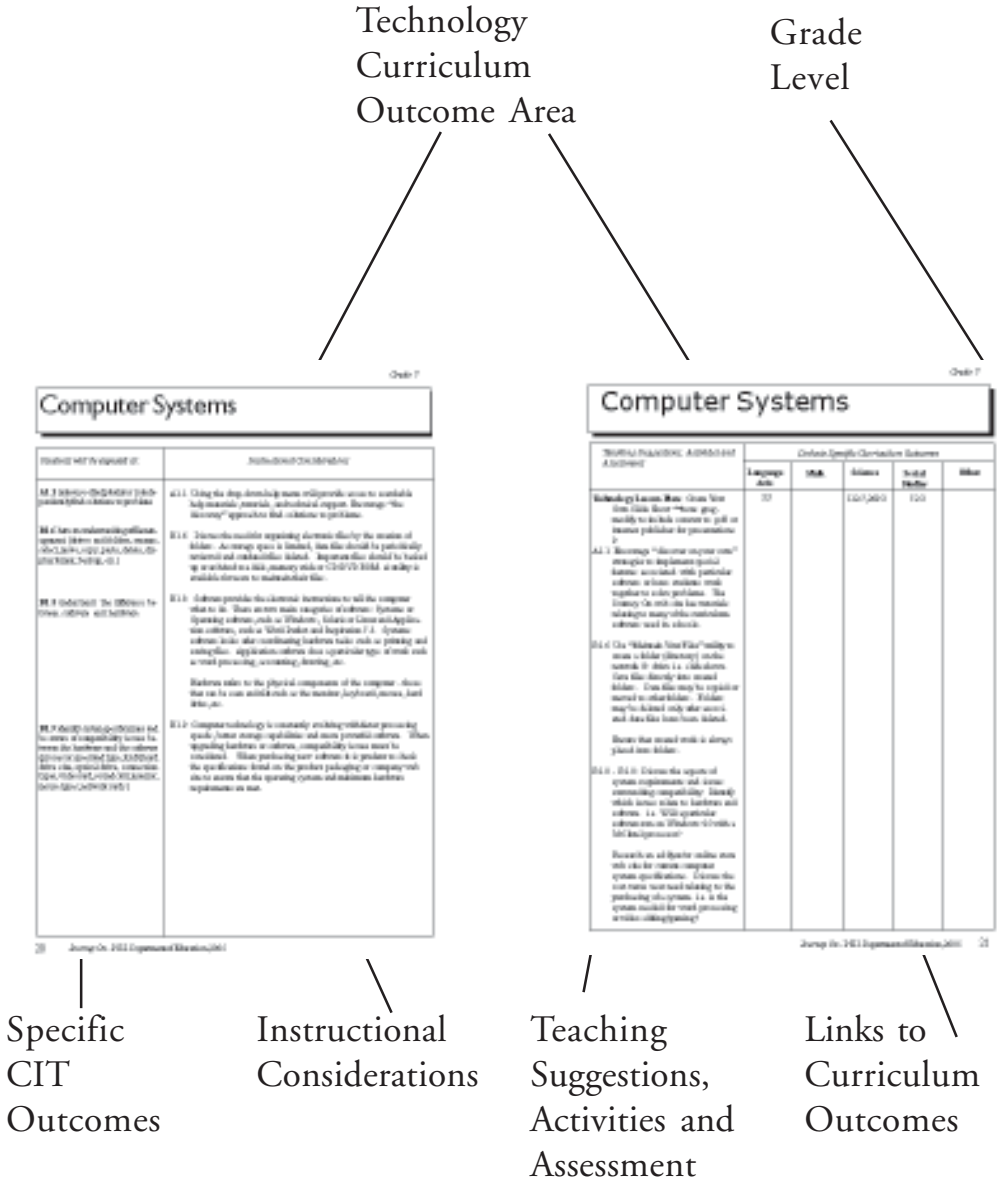
The remainder of the document addresses the level and defines specific knowledge and CIT skills expected of students as they work toward technology competency. Practical considerations are given for incorporating CIT into the curriculum and accompanying lesson plans. The information is presented in a two-page layout as outlined on the following pages.

On-line Document

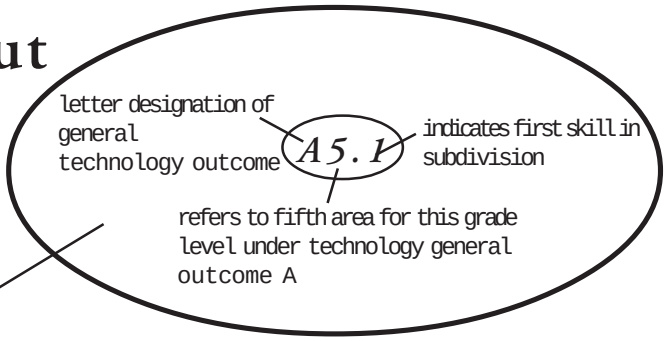
An on-line version of this document will be developed. Having a document on-line has a number of advantages. It enables teachers to easily cross-reference material in the document with on-line help manuals and curriculum documents. It can encourage a greater level of collaboration among all educational partners. An on-line document can be easily revised and updated without having to copy and redistribute. It is our intent to revise, modify, and add new materials in the future only to the on-line version of *Journey On* (www.edu.pe.ca/journeyon).

Two Page-Layout

Four major sections are found on these pages as you go from left to right: 1) specific CIT outcomes, 2) instructional considerations, 3) teaching suggestions or names of grade specific lesson plans, and 4) links to curriculum outcomes. The applicable technology curriculum outcome area is found in a box at the top of each page along with the grade level.



Two Page-Layout in Detail



Specific Outcomes
- are steps towards accomplishing the general technology outcomes and lettered as subdivisions of GTOs

Grade 7

Computer Systems

Students will be expected to:	*Instructional Considerations*
A1.1 make use of help features to independently find solutions to problems	A1.1 Using the drop-down help menu will p… help materials, tutorials, and technical… discovery" approach to find solutions…
B1.6 have an understanding of file management (drives and folders, rename, select, move, copy, paste, delete, display format, backup, etc.)	B1.6 Discuss the need for organizing electr… folders. As storage space is limited, d… reviewed and outdated files deleted. I… up or archived to a disk, memory stick or CD/DVD ROM. A utility is available for users to maintain their files.
B1.8 understand the difference between software and hardware	B1.8 Software provides the electronic instructions to tell the computer what to do. There are two main categories of software: Systems or Operating software, such as Windows, Solaris or Linux and Applica…

Instructional Considerations
- useful information for teachers on terminology and/or purpose and background of specific technologies

Teaching Suggestions, Activities and Assessment
- readiness considerations
- may be suggestions for activities or name of lesson plan

…aluate and select information using…

Teaching Suggestions and Activities	*Links to Specific Curriculum Outc…*			
	Language Arts	**Math**	**Science**	
Grade 2 **Language Arts Theme**: *New Perspectives* **Lesson Plan**: *Through a Bug's Eyes*	**A1, A3, A4, D1, D3 E1, E1.3, E1.5 G1, G1.1, G2, G2.1, G2.2, G3, G3.1**			
Grade 3 **Language Arts Theme**: *Vanishing Animals* **Internet Sites**:	**A1, A3, A4 D1, D3 E1, E1.3, E1.4, E1.5 G1, G1.1, G2, G2.1, G2.2, G3, G3.1 H2, I1, J5**			

Links to Curriculum Outcomes
- letters and numbers representing curriculum outcomes as defined in other APEF (CAMET) documents

Computer Systems

Students will be expected to:	***Instructional Considerations***
B1.7 understand how to display file properties (Independent)	B1.7 Files have properties such as associated program, physical location, size, date created, last modified and accessed, and attributes. Associated program indicates the program with which the file may be opened. Physical location refers to the drive and folder where the file is stored. Attributes are security settings such as read-only, hidden and archive that the user may change. Access to file properties, using right mouse click, for student and teacher level accounts is restricted. On occasion, an email will be received with an attachment with an association property that the computer does not recognize. A dialogue box will appear asking the user to "open", "save" or "view". If "open" is selected the user will be asked to select the appropriate program. This information is then added to the files' property.
B1.9 identify system specifications and be aware of compatibility issues between the hardware and the software (Guided*)	B1.9 Computer technology is constantly evolving with faster processing speeds, better storage capabilities and more powerful software. When upgrading hardware or software, compatibility issues must be considered. When purchasing new software it is prudent to check the specifications found on the product packaging or company web site to ensure that the operating system and minimum hardware requirements are met (processor speed and type, RAM, hard drive size, optical drive, connection types, video card, sound card, monitor, mouse types, network cards).

Computer Systems

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan: **Making use of "Free" software for Science pg. 87** Anonymous Survey on Bullying pg. 83 B1.7 Explain situations where a read-only or hidden file attribute would be useful. Read-only is used for a final copy of a document or for templates that further changes should not be made. Read-only will prevent files from being accidentally deleted. Hidden files may be used, for example, to provide security for confidential information stored on CD/DVD or other removeable storage media. Users need to become familiar with the more common file extensions such as .wpd, .cwk, .isf (Word Perfect, Appleworks, Inspiration) B1.9: Discuss the aspects of system requirements and issues surrounding compatibility. Identify which issues relate to hardware and software. i.e. Will a particular software run on Windows 98? Research an ad flyer/or online store web site for current computer system specifications. Discuss the cost versus user need relating to the purchasing of a system. i.e. is the system needed for word processing or video editing/ gaming?			**308-16, 308-17**		Health (Choices for Positive Youth Relationships)

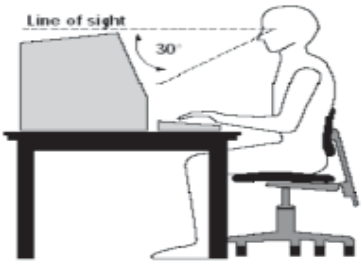
Computer Systems

Students will be expected to:	*Instructional Considerations*
B1.11 describe networks, file servers, connections (Guided*)	B1.11 A network is the connection of two or more computers to share files, software, printing and other resources. Classroom computers connected within a school is referred to as a local area network (LAN). All schools are connected together in a wide area network (WAN). Within the school, computers are connected with category 5 twisted pair copper wires and linked through hubs and switches. Among schools a variety of communication technologies may be used. Fibre optic lines are rented from telecommunication providers where line speeds such as 10, 100 megabit or 1 gigabit per second capacities may be purchased, depending upon need. Schools outside the fibre optic service area may be connected using Symmetric Digital Subscriber Line (SDSL) which is a technology similar to a home high speed connection. Where several schools are in line-of-sight, wireless transmission may be used.
B1.13 identify computer viruses, how they are transmitted and how anti-virus software is used to protect or clean a computer (Guided*)	B1.13 Programs designed to damage the data on a computer or disrupt its use fall into one of the following categories: Virus: a program that spreads from computer to computer by attaching itself to an executable file. When this file is activated the virus supplies instructions to the computer. These instructions can range from a mere nuisance (eg. a message on your monitor) to the very destructive (eg. erasing the hard drive). Worm: a program that is written in segments and spawns copies of itself in the computer's memory until eventually it causes a crash. Trojan horse: a program disguised as a game or useful application but when executed destroys information on the computer, or gives access or control of the computer to another. Care must be exercised when installing files or opening e-mail. The best methods for prevention are: (a) to only accept programs from reliable sources and (b) to install a reputable virus checker on the system which scans all imported data files, diskettes and CD's for possible viruses.
B1.14 identify SPAM, pop-up ads, spyware and other invasive software coding (Guided)	B1.14 Spyware is coding that transmits information to external parties about a users' browsing habits. Spyware and popup screens may also take control of the users browser and automatically redirect to an unwanted website.

Computer Systems

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
B1.11 Discuss careers in the networking communications field. Identify job descriptions, educational requirements and salary levels. What skills and equipment would be required to network two computers together at home? (Research this from the Internet, ask someone who has done this, invite a guest speaker, etc.)					Cooperative Education: 1.3 Health: L-9.4, L-9.5, L-9.6 Visual Arts: Career Units
B1.13 Ensure that files transferred from home are virus checked. School email attachments are automatically scanned for viruses. Precautions must be taken at home when using private email services such as Yahoo or Hotmail which may not scan attached files. Private email services must not be accessed in school.					
B1.14 Should spyware or popups occur, delete the offending popup. If the computer continues to automatically visit the offending page, consider having the computer re-imaged. Should a site be considered a threat or contain unacceptable information contact the Service Centre at IT Shared Services. Help the user refine search terms.					

Social, Ethical and Health

Students will be expected to:	***Instructional Considerations***
A2.1 identify aspects of an ergonomic workstation (Independent)	A2.1 Ergonomics or the relationship between people and their work is a science with a growing body of evidence. Applying ergonomics by adjusting your chair, work surface, monitor, keyboard, mouse, lighting and modifying your work habits with lifting techniques all have reduced the risk of injury at our workplaces. Furthermore, it increases productivity. (Occupational Health and Safety Manual, 2005) Teaching students to position themselves properly at the computer and using good posture is essential to prevent the future development of serious injury.  To prevent eye strain, encourage students to look away from the screen every few minutes to rest their eyes. Stretching and shaking their hands at regular intervals are also good habits.
B2.1 demonstrate proper touch keyboarding techniques (Independent)	B2.1 Typists must practice using proper fingering and home row position. Encourage students to use the piano position (arms at right angles and wrists flat) when they can. Initially, students will key very slowly using proper keyboarding techniques (i.e.: home row, quick keystrokes, proper reaches). After practice students will be able to key more quickly than they can write with pen or pencil.

Social, Ethical and Health

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan:					
My Experience with Technology...An Autobiography pg. 74	**8.1, 8.2, 8.3, 9.1, 10.3, 10.5**				Career Futures: FLW3 Health: Smart Start Workplace Safety Visual Arts: Safety Units
Do you want to be in a Rock Band? pg.76	5.1, 10.3, 10.5				
A2.1 Visit Options Incorporated (http://www.oiweb.com/ergo/workstation-setup.html) or use a search engine to find guidelines for workstation setup, proper posture and stretching routines. Remind users of the importance of following these guidelines. Adherence to the above principles may be incorporated into an assessment strategy. See appendix for a diagram of an ergonomic workstation. (Occupational Health and Safety Manual, 2005) Discuss and model good posture and work habits required to reduce the risks of computer associated injury. Observe position at the computer and provide feedback to users. Create a checklist or rubric for assessment.					
B2.1 Adhereance to the proper touch keyboarding techniques. Software permits monitoring of student progress.					

Social, Ethical and Health

Students will be expected to:	***Instructional Considerations***
C2.1 examine current Canadian law governing the use of technology (Guided*)	C2.1 Many changes to Canadian laws governing technology use are "reactive" in nature as new technology and applications are developed. Extensions to laws have been made related to Electronic Contracts; Copyright; Trademarks; Internet Consumer Protection; Internet Advertising; Personal Information Protection; Criminal Law and Securities Law.
D2.1 determine the technological requirements for specific career goals (Guided*)	D2.1 Technology competence is identified as an "Essential Skill" by Human Resources and Skills Development Canada. Statistics Canada has identified technology skills as important as numeracy and literacy to career success. Earning potential of persons possessing numercy, literacy, and technological skills is five fold higher than those who have equivalent numeracy and literacy skills. *(Murray, T. Scott. Statistics Canada. A Presentation To Cabinet, Charlottetown, PE. January 28, 2005)*
E2.6 adhere to copyright and privacy laws, give credit to sources of information (Independent)	E2.6 Most materials on the Internet are copyright protected. Ideas or quotes must be properly cited and authors' permission must be obtained for the use of graphics or images taken from online sources. The following illustrations and examples have been obtained from University online publications citing the Modern Language Association (MLA) and the American Psychological Association (APA) publication manuals. MLA - Humanities Style: (format for Internet journal publication) Generic format: Author(s). "Title of Article." Title of Journal Volume. Issue (Year): Pages/ Paragraphs. Date of Access <electronic address>. Specific example: Stach, Michael. "Introduction to Blogs and Blogging." Tech Learning. 24. 9 (2004): 23 pars. 10 March, 2005 <http://www.techlearning.com/story/showArticle.jhtml?articleID=18400984> APA - Style: (format for Internet journal publication) Generic format: Author, A. (Date of publication). Title of article. Title of journal, volume number (issue number if available). Retrieved month day, year, from http://Web address Specific example: Stach, Michael (2004). Introduction to Blogs and Blogging. *Tech Learning 24 (9).* Retrieved March 10, 2005 from http://www.techlearning.com/story/showArticle.jhtml?articleID=18400984

Social, Ethical and Health

Teaching Suggestions, Activities and Assessment	***Links to Specific Curriculum Outcomes***				
	Language Arts	**Math**	**Science**	**Social Studies**	**Other**
C2.1 Visit sites such as IT.Can Web resources (http://www.it-can.ca/en/resources.html). Discuss a particular area of law that required revision because of advances in technology. Debate the merit of these changes made to Canadian law. D2.1 Visit http://www15.hrdc-drhc.gc.ca/english/general/home_e.asp and determine technical (computer use) requirements of careers in particular areas i.e. tourism, hospitality, travel. List at least ten ways technology is used in the selected career. E2.6 Cite references to web sites used to locate information using the MLA style.					Career Futures: WR3 Cooperative Education: 1.3, 1.6, 3.2 Health: L-9.4, L-9.5, L-9.6 Visual Arts: Career Units

Social, Ethical and Health

Students will be expected to:	***Instructional Considerations***
E2.9 follow publishing etiquette. Adhere to the guidelines for school web pages as outlined by PEI Department of Education. (Guided*)	E2.9 The Journey On website (http://www.edu.pe.ca/journeyon/tech_support_pages/GuidelinesforSchoolWebPages.html) provides many suggestions and guidelines for online publishing. Note that pictures and full student names should never appear together in an online document. Parental release forms must be signed for student names, pictures or works to appear in an online document. Release forms may be downloaded from the Journey On site. Etiquette refers to suitable language, no discrimination, etc.

Social, Ethical and Health

Teaching Suggestions, Activities and Assessment	***Links to Specific Curriculum Outcomes***				
	Language Arts	**Math**	**Science**	**Social Studies**	**Other**
E2.9 Discuss with students the criteria for publishing content and have them apply these standards. Ensure that all published work meets the "Guidelines For School Web Pages" from the Journey On website.					

Internet

Students will be expected to:	***Instructional Considerations***
A3.2 use various tools and strategies necessary to carry out research (Guided*)	A3.2 Regardless whether one searches a database, the Internet, a digital encyclopedia or similar digital containers of information, the quality of information will be contingent upon the formulation of the query. This observation gives rise to the consideration that "new age intelligence" does not depend upon the knowledge of a particular piece of information but instead depends upon the skill with which one can obtain required information. The tools(search engines and directories) and/or strategies employed in a query will depend upon the source of information (Internet, database, etc.) Boolean operators (AND, OR, NOT, AND NOT and for the Internet: ADJ, and NEAR) are common to each. In databases, queries often require the use of Logic operators, such as: less than (<), greater than (>), less or equal (<=), greater or equal (<=), not equal (<>), and equal (=). Utilize the various Help features of Internet search engines. Search engines may differ among each other in the way a query must be formulated. For example, a number of search engines require Booleans to be written in capitals.
A3.3 obtain/download material from	A3.3 Material (text, graphics, files) may copied and pasted, downloaded to the users computer, or "captured" with a screen capture feature of a graphics program from the Internet. Be aware of copyright issues when doing this.

Internet

Teaching Suggestions, Activities and Assessment	***Links to Specific Curriculum Outcomes***				
	Language Arts	**Math**	**Science**	**Social Studies**	**Other**
Technology Lesson Plan: **Using EBSCO to Research pg.**77 Understanding Math Plus pg.80 A3.2 Other Search engines, such as Google, Yahooligans, and Ask Jeeves will provide links to sites. Key the search term, such as *Atlantic Canada*, *Canadian Fishery or Immigration.* Possible links to thousands of sites related to each word will be returned. Narrow the search by determining key words closely related to your chosen topic and place quotation marks around these i.e. "Immigration to Canada". Look in the search engine results for ideas on other search terms i.e. early 20th century, pier 21, etc. Information can be downloaded but be aware of copyright issues when wishing to use text and graphics.	4.1, 4.3, 5.1, 7.1	For a complete list of curriculum links see page 103	209-5	**Gr.9 Draft outcomes 9.2.2, 9.3.3, 9.3.4**	Health: L-9.6 Visual Arts: Historical Units

Internet

Students will be expected to:	*Instructional Considerations*
B3.3 distinguish among various file formats, required plug-ins, file compression/decompression utilities (Guided*)	B3.3 When downloading or accessing remote files, users must be familar with conventions used with that particular file format (file extension). The software program with which the file was created must be located on the user's computer. Many software vendors will provide a viewer or browser "plug-in" which extend the capability of the user to view creations formatted with their particular software applications eg. Powerpoint, Shockwave, Flash, Quicktime, etc. In addition,vendors may use a file compression/decompression utility (codec) so that files can be made smaller when sending over the Internet. Once the file has been transferred to the user's computer it is decompressed or "expanded" when viewed.
E3.1 critically evaluate information and its source based on pre-determined criteria (Guided*)	E3.1 The validity of information contained in a particular web site may be evaluated by critically examining several factors. Dalhousie University Library provides a summary and evaluation checklist at http://www.library.dal.ca/how/criteval.htm that breaks the evaluation process into the following six general areas: (Sue Hunter, 1999) Authority or creditials of the author: Has he/she written other articles? Is he/she educated or have experience in the area? Is the author writing for an organization, such as a university or government? Purpose: Who is the intended audience? eg. adults, toddlers or teens? Is the site trying to persuade or sell something? Is there a hidden agenda or bias? Coverage: Is information factual, detailed and presented in its full and proper context? Does the presentation seem to make sense? Currency. Is the site up-to-date and references recent research or facts on the topic? Objectivity: Is material presented with balanced and fair arguments? Is there consistency in that arguments do not contradict one another? Accuracy: Is the information provided in the site corroborated or supported in other sources? Is a bibliography provided? Should a weakness be found in any one of the above areas, the reader should be careful about relying on information found on that particular site. Stress that anyone can easily create a professional looking web site without it being edited or supported by factual information. There are many "fringe groups" who use the Internet to convey their "message" or "view of the world" to an unsuspecting public.

Internet

Teaching Suggestions, Activities and Assessment	***Links to Specific Curriculum Outcomes***				
	Language Arts	**Math**	**Science**	**Social Studies**	**Other**
B3.3 Search for a topic related file on the Internet containing the extension .pdf This file will automatically open with Adobe Acrobat Reader on school computers. Research the .pdf format to explain why the author chose to save the file in this manner. E3.1 Vist the Media Awareness Network site to critically assess the validity of online resources. (http:// www.media- awareness.ca/english/ teachers/wa_teachers /fact_or_folly_ teachers/index.cfm) Search for sites which contain fictitious information using terms such as "critical literacy", "fact or fiction", "online", in a search string. Teachers should preview selected sites carefully, and provide the URL of pertinent pages. Using the criteria found under "Instructional Considerations", judge the validity of these sites.					

Graphics

Students will be expected to:	*Instructional Considerations*
A5.2 apply principles of design (Independent)	A5.2 The appearance of a document can be greatly influenced by the font, text size and layout of the text as well as the choice of graphics and the layout of the graphics on the page. There are certain basic rules of effective page design which are easy to implement and which can have a huge impact on the appearance of the final product. For a document, use a consistent font size and style for body text. Titles can be from a different font family and larger in size. It is advisable to use no more than three font styles per document.
B5.3 use other graphic creation tools (Guided*)	B5.3 Creators must consider the medium being used when designing web pages, print publications, etc. Special tools (i.e. clone brush, color replacements, effects, and filters) allow the selection of formats that are particular to the final product. For example, RGB (Red, Green, Blue) format is used to view colour on a computer screen with the use of light. CMYK (Cyan, Magenta, Yellow and Black) are pigment colours that provide all colour combinations in printed publications. Not all colours that may be produced in RGB on the computer screen can be reproduced using pigments when printing.

Graphics

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan: **Atlantic Canada and the National Interest pg. 78** A5.2 Prepare an assessment rubric relating to guidelines for graphics as follows: graphic selection, incorporates visual elements, fonts clear, text colour and background agree, consistency, spelling, etc. B5.3 Use "dropper tool" to match foreground color to an area of the image. "Clone brush" one area of the image to another to remove unwanted objects.				**Gr. 9 Draft outcomes 9.4.1, 9.4.2**	Industrial Technology: GCO C Visual Arts: Elements and Principles Unit, Theory Unit

Graphics

Students will be expected to:	***Instructional Considerations***
B5.4 convert various graphic formats between vector and bitmap images, import a graphic file from another source (Guided*)	B5.4 Vector-based images (i.e: .png, .psp, .cdr) are created as distinct objects recorded as mathematical formulae. Each shape is combined to form a graphic ie. a house. The user can add, remove, and modify individual pieces of the image (such as the roof of the house). Images may be resized without the loss of resolution and the file size will remain relatively constant. Bitmap (Raster) images (i.e: .wmf, .tif, .bmp,.gif, .jpeg, .jpg) are created as a series of small dots called pixels. To visualize this, imagine drawing a picture on graph paper by colouring in each individual square. If you draw a house in bitmap format, all of the shapes used to create the house become one shape composed of many small squares. The result is that it is more difficult for the user to modify individual components of an image. The computer must track each individual pixel and record its colour information and location. As a result, bitmap images are very large. As the user increases the image size, the file size becomes much larger. Resolution will also deteriorate as the image is increased in size. Programs such as Front Page and Word Perfect allow the user to resize images. Users must be aware that the displayed size changes but that the actual file size remains unaffected. For example, large files that are used in .html documents will result in wasted resources in that the file must be stored on the server and will also result in longer wait times for images to be viewed. Always use a graphics program to resize images. Image editing software can be used to open and convert images to the format necessary for a particular application. Many graphic file formats are developed privately and are copyright protected. For example, .psp is a format that is used by Paint Shop Pro. For these files to be used in other applications, they must be converted to a format recognized by the specific application where it will be used. ie. .jpg for Internet pictures, .gif for Internet graphics, .bmp for bitmap, etc.

Graphics

Teaching Suggestions, Activities and Assessment	***Links to Specific Curriculum Outcomes***				
	Language Arts	**Math**	**Science**	**Social Studies**	**Other**
B5.4 Convert the completed graphic from its native format (eg. .psp) to one that is compatible with the program being used (eg. .jpg). This is done by selecting the .jpg "file type" with the "Save As" command from within Paintshop Pro. It is good practice to maintain the .psp file and create another in the desired format. All formatting and layers are kept in the .psp file which allows the graphic to be easily changed. Files that are converted to another format have all effects merged together into one graphic.					

Spreadsheets

Students will be expected to:	***Instructional Considerations***
B6.2 identify different types of cell data (Independent)	B6.2 It is important to have an understanding of the various types of data which can be stored and manipulated using a spreadsheet. Numbers, text, dates and times, or formulas may be entered into a cell. Each type of data has a distinct purpose and advantage. Numeric: Consists of the numbers 0 through 9, and the minus sign (-) for negative numbers. Numeric data may be sorted, or it can be used for calculations or to produce charts. Dates and Times: Consists of dates entered as numbers (for example, 8/24/95) and times entered as numbers in either 24-hour clock format (for example, 17:20) or 12-hour clock format (5:20 PM). Dates and times may be sorted and different formats selected. Text: Consists of all letters, numbers, and symbols. Text may be sorted alphabetically, but calculations can not be performed. Formula: Consists of a set of instructions that the spreadsheet follows to produce a value for a cell. i.e. =sum(A1..A10) will provide a total of all numbers in cells A1 to A10 in the current cell (the cell where the formula is entered)
B6.5 enter formulas to perform calculations across columns, rows, cells, move/copy data or formulas from one area of spreadsheet to another (Independent)	B6.5 Formulas may calculate down columns or across rows and may be entered manually or a "speed sum" feature may be envoked from the task bar. Formulas may also be replicated for cells where similar results are required. When this is done the formula will adjust automatically for the new cell. i.e. a formula =sum(A1..A10) replicated from cell A11 to B11 will automatically change to =sum(B1..B10) Formulas may also be copied and pasted from one cell to another.

Spreadsheets

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan: **The Line of Best Fit pg.90** B6.2 Enter three dates into a spreadsheet i.e. birthdays, special events, holidays. Change the display format of selected dates. Sort dates by ascending or descending order. Enter 10 numbers in consecutive cells. Use the "auto sum" (appleworks) or "quick sum" (Quattro Pro) Demonstrate that formulas may be placed as =A1+A2+A3 or as a function =sum(A1..A3) [In Quattro Pro @sum(A1..A3) is used] B6.5 Randomly enter two columns of five numbers each. Create a formula using "auto sum" to add the first column. Copy and paste that formula to sum the second column. "Auto sum" the total of row 1 in cell C 1. Select C 1 to C 6 with the mouse and "Calculate" from the pull-down menu and "Fill Down" option. Formulas should appear in the empty cells and should have updated themselves to reflect the address of the cells to their left. Note: A tutorial on Appleworks (Clarisworks) spreadsheets exists on the Journey On website at: http://www.edu.pe.ca/journeyon/tech_support_pages/help_manual/ssheet/default.html		**F1, F2**			

Word Processing

Students will be expected to:	*Instructional Considerations*
B7.9 format multipage documents with headers, footers, page numbers, page breaks, and keep text together function, change page orientation/size (Independent)	B7.9 Headers, footers and page numbers may be formatted to appear automatically on each page. A page break is a code that places the insertion point at the top of the next unused page without needing to use many "enter" commands. Page breaks may be inserted with the use of the [ctrl] + [enter key] in Word Perfect and using the "Format" pull-down menu and "Page Break" in Appleworks. By convention, writers are not to place one line of a paragraph by itself on a following page or separate headings from corresponding text. "Keep Text Together" allows the user to specify how many lines of a paragraph may be placed between the bottom of one page and the top of the next. In Word Perfect, select the text that must remain together and click "Format" and "Keep Text Together" and "Widows and Orphans" to specify how many lines maybe left at the bottom or top of a page.

Word Processing

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan: **My Experience with Technology...An Autobiography pg. 74** B7.9 Demonstrate how to insert headers, footers and page numbers. Explain why the "Keep Text Together" feature would be used. Set this feature to allow no less than two lines to appear alone at the top or bottom of a page.	**8.1, 8.2, 8.3, 9.1, 10.3, 10.5**				Health: Life Learning Choices L-9.5 Career Futures: FLW3 Cooperative Education: 1.2

Multimedia

Students will be expected to:	*Instructional Considerations*
A8.3 describe situations where streaming video and audio is appropriate (Guided*)	A8.3 Multimedia files may be viewed by downloading or streaming them from the Internet. "Downloading" involves placing a hyperlink on a web site whereby the whole file is downloaded to the users computer before it becomes viewable. This may involve a long wait depending on the file size and line speed. "Streaming" allows the media to commence playing after partial download and is appropriate for very large files. There are several formats for the creation of streaming video (Windows Media, Macromedia, Real Media, Quicktime, MPEG-4) Streaming is also used in the delivery of "live events" through web casting.
A8.4 create graphics, audio and video special effects (Guided)	A8.4 Digital cameras have the capacity to create digital stills with special effects and short audio/video segments. Network software has the capacity to create animations and video clips (i.e. Paintshop Pro [Animation Shop], Corel Presentations, Movie Maker [XP]).
A8.5 select appropriate medium to convey a message (Guided*)	A8.5 Select a medium to convey the message. Text is used to present a poem. Audio would be appropriate for providing emphasis or a dialect for the poem. Still images would be added to the text or the audio to provide a particular atmosphere. Video may be used to relate the poem to real life situations. Animation may be used to illustrate the poem in ways that would be impossible in real life. Not only must the medium (file size, formats, storage location) be considered, but also the intended audience.
B8.2 use multimedia creation and editing tools (Guided*)	B8.2 Hardware resources such as digital cameras (that can capture still as well as video/audio footage), video cameras, web cams, microphones, and scanners are reasonably priced and widely available. Graphics programs allow the user to capture screen shots from the computer monitor, edit digital pictures, create animations and combine graphics and text. Video/audio editing capability is available on Windows XP computers. Home computer systems are now being marketed with multimedia features and software that appeal to the multimedia consumer.

Multimedia

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan: **Do you want to be in a Rock Band? pg.76**	**5.1, 10.3, 10.5**				Visual Arts: Theory Unit Equipment Unit
A8.3 Visit the Kidzonline multimedia and lesson plan resource (http://www.kidzonline.com) to view streaming and downloadable video resources.					
A8.4 Locate animated content from the Internet. Discuss how the use of graphics, audio and video special effects enhance the presentation and support the "message".					
A8.5 Justify the medium chosen for multimedia content.					
B8.2 Review one or more of the following multimedia creation tools to support an activity. Use Paintshop Pro to capture a screen image. A microphone may be used to create a 30 second audio file with Inspiration 7.5. Scan a source document, modifying dimensions. Take a digital photograph or video and edit it.					

Multimedia

Students will be expected to:	***Instructional Considerations***
B8.3 convert file formats for a particular application (Independent)	B8.3 Multimedia technologies have been developed by a number of companies and have evolved over time. Therefore, there is not one file format or standard for the different multimedia components. Software utilities allow for conversion of the more widely used applications from one format to another (i.e: .jpg, .gif, .bmp, .mp3, .wav, .avi, .mpeg, etc). This allows users to view multimedia content that has been created in another format with their specific software and hardware configuration. File formats may need to be converted to allow for presentation in a particular media such as on a web site or on a CD/DVD.
B8.4 use proper tools and procedures to enhance product quality (Guided*)	B8.4 Skill in multimedia development will continue to evolve as equipment becomes available at lower grade levels and in the home. The experiences of individual group members (and expertise of other colleagues in the school) must be taken full advantage of to create quality multimedia content.

Multimedia

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
B8.3 Completed media must be compatible with the equipment available to the intended audience. Test media early in project cycle to anticipate any challenges. B8.4 Encourage alternative assignment options that promote creativity and problem solving through the use of "new media".					

Database

Students will be expected to:	***Instructional Considerations***
A9.2 perform searches on a database file using logical and Boolean operators (Independent)	A9.2 The primary purpose of any database file is to store information so that it can be retrieved quickly and accurately. A database query can range from the simple (eg. Show all the records which are located in Charlottetown) to the complex (eg. Show all the records located in Charlottetown, who are younger than 35 and are females). The second example demonstrates the use of logic operators (less than, less or equal than, greater than, greater or equal than, not equal and equal) as well as the use of Boolean operators (AND, OR, NOT, AND NOT).
A9.3 design/plan a database to use as a method of organizing information (Independent)	A9.3 When planning a database keep in mind the type of information that is to be extracted when the database is complete. The creation of the fields and the type of fields used will influence the information that can be extracted later. For example in the creation of an address book, fields would be created for a name, address, telephone number, and email address. Fields must be included which will allow for the entry of such information. It is also important to create fields that contain only one bit of information rather than several. For example, should the user want to sort the records by last name s/he will need two fields for the name - first and last name.
A9.4 create and modify a form (Independent)	A9.4 Appleworks adds fields to a form and allows the user to specify the type of data that will be placed in a particular field i.e. text, number, date, calculation, etc. Error checking routines may be built into the field by selecting "pop up menu", "radio button" or "check box" allowing the user to select only from within a data range. Data may be entered into the database using the "form view" or "list view" from the layout pull-down menu after the fields have been created. The form may be customized under the "layout" menu by moving the field labels and names. Graphics and colour may be added to the form or fields. Fields may be added or deleted from a form at any time. Should a field be added to an established database, the user must revisit all records to update the data for the new field. Data must be entered consistently and accurately for later data retrieval. If spelling errors occur, search strategies will not be reliable. Some databases have features that help reduce the occurrance of errors such as drop-down menu choices i.e. Mr., Mrs., Ms. or a rule that will check to make sure that data is not outside a certain range i.e. age is not over 100.

Database

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan: **Star Study Database pg. 72**			**209-4, 211-1, 211-3**		
A9.2 Visit a search engine such as Altavista (www.altavista.com). This is a very large database. Practice searching for statistics for PEI using Boolean operators in the "advanced search" area. eg. pei "lobster OR shellfish", pei tourism NOT guide, pei AND rockets (note that using "quotations" is the same as using AND to limit a search)					
A9.3 A database provides a way to record information about a subject i.e. CD or hockey card collection. Brainstorm possible fields. Choose that will be required to provide useful information about a collection. Identify the field types necessary.					
A9.4 Create the data input form for the activity in A9.3. Add a graphic relating to the selected activity, a title such as "My CD Collection" and colours for the field data entry box. Identify fields for which drop-down or error checking routines may be applied. i.e.: pull-down menu for genre and error checking for date falling within 1900-2005 range, "field cannot be empty" or "field must be unique" i.e.: catalogue number					

Database

Students will be expected to:	***Instructional Considerations***
A9.4 create and modify a form ... continued (Independent)	A9.4 Terminology: All data about a particular topic is known as a file or database (i.e. all books); data is grouped into records (all data concerning one book); records are divided into fields (individual pieces of data about a book i.e. title, author, etc).
A9.5 use databases to analyze data and look for trends (Independent)	A9.5 A school student management system (Trevlac) is an example of a large database. Users may obtain various pieces of information from this tool. For instance, attendance reports may be produced by number of absentees such as 5 days, 10 days, etc. or by class. The database may also provide the classes that each student is enrolled in, the classes taught by a particular teacher or the individual students taught by a teacher. Databases created in Appleworks use similar query techniques. Layouts may be created that contain specified fields. Records may be sorted into ascending or descending order. Particular records may be searched through the "find", "match records" or "omit" features. See the Journey On online tutorial relating to Appleworks databases (http://www.edu.pe.ca/journeyon/tech_support_pages/help_manual/database/default.html)
B9.2 create fields and with variable field types and properties (Independent)	B9.2 Appleworks allows the user to specify the type of data that will be placed in a particular field i.e. text, number, date, calculation, etc. The label text for a field i.e. font, colour, size and for the input box may be changed separately through the "layout" screen.
B9.3 restructure database (Independent)	B9.3 Fields may be added or deleted from a form at any time. Should a field be added to an established database, the user must revisit all records to update the data for the new field. Should a field be deleted all associated data for that field stored in the database is erased.
B9.4 sort records alphabetically, numerically and by multiple fields (Independent)	B9.4 In the address book example, the records may be sorted by "last name" as key one. Should two people have the same last names a second key "first name" sort can be specified. For a numeric sort to be accurate, the field type must be defined as numeric when it was created.

Database

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	**Math**	**Science**	**Social Studies**	**Other**
A9.5 Refer to the lesson plan "Student Census". Review the chosen fields for this database. Under "Suggestions For Further Activities" a number of questions are provided. Use these as an assessment or as a resource to brainstorm further questions/trends. B9.2 Assign field types to match the data that will be placed in the fields i.e. First Name, Date of Birth, Age. Change text colour and font. Provide any prompts for the user as to the format in which data should be entered. B9.3 Add a new field to the lesson plan database ie: e-mail address; Remove a field from the database. B9.4 Once students have entered data records for the lesson plan activity demonstrate multiple field sorting with the following examples: sort the data by age, last name, first name and middle initial. sort the data by city, favorite activity, last name.					

Database

Students will be expected to:	***Instructional Considerations***
B9.5 create a report from the entire database or selected records (Independent)	B9.5 Users may create a report from the database. These reports will contain parts of the information arranged in some particular fashion. To create a report, a layout containing the necessary fields is prepared. Once this layout has been created, and sort and match criteria specified, the report can be printed in this format. Alternatively, the information can be cut and pasted into another wordprocessor as part of a larger written report or presentation.
B9.6 create a report with automated summaries and calculations (Guided)	B9.5 A database may be used to track the receipts issued for a school fundraiser such as citrus sales. A report may be generated with specific fields i.e. seller, customer, product, amount and reciept number. A field may be selected to group information in the report with summaries, such as seller in alphabetical order with automated summaries for product and amount columns. e.g. all orders taken by seller A are listed followed by totals for product and amount, Seller B is listed next, etc. At the end of the report, final total summaries may be calculated. Grouping information in this manner would be useful for determining top sellers for prizes or to provide sellers a listing of customers for which they must deliver orders.

Database

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
B9.5 Create a report from the data in the lesson plan. Create a new layout and select the fields for the second sort from B9.4 - city, favorite activity and last name. From the pull-down menu select "Layout" - "New Layout" - "Columnar Report". Enter a name for the report i.e. Favorite Activity. Set the field order as city, favorite activity and last name. To sort the records for this report select "Organize" - "Sort Records". Move the city, favorite activity and last name field names into the sort order box and specify ascending or descending. Click OK. Observe progress and check that records are in specified sort order. Specify records to be included in the report by selecting "Organize" - "Show All Records" and "Layout" - "Find" and specify the field data you would like i.e. key the name of the community where you live. Only the records from that community will be displayed. B9.6 Discuss various ways data may be organized/summarized to provide useful information. E9.1 Visit an online business site such as Veseys Seeds (http://www.veseys.com) and search for a product. Identify the features that are associated with a database application. Examine the information requested from online customers. Debate if all pieces of information are justified.					

Telecommunications

Students will be expected to:	***Instructional Considerations***
A10.1 collaborate using software (Guided*)	A10.1 Within the classroom, collaborative tools (i.e. whiteboard, slideshow, application sharing, chat, messaging, send and receive files, photos, group file sharing, resource sharing (links), online content creation and sharing, assignment drop box, video and audio, discussion forums, journal.) make it possible for students and teachers to work together in a virtual workspace. This is particularly useful when students are involved in groupwork outside of class time and live a distance apart. These tools may also make it possible for students with illness to stay in touch with peers and class activities. Establishing connections with classrooms in different parts of Canada or the world can be a powerful tool for the classroom teacher in all subject areas. Student assignments take on another level of authenticity when they are shared with other classes via telecommunications. Every student is issued a web accessible email account. With use their abilities will evolve and they will make more use of this tool for collaboration.
B10.9 use calendar features such as appointments, tasks, reminder notes/memos (Independent)	B10.9 Encourage users to maintain the dates for tests, assignments, meetings and upcoming events in their electronic calendars. Some calendars allow appointments, tasks and reminder notes to be sent to others. The receiving person must "accept" or "reject" this electronic communications.
B10.10 use the organizational features of collaborative tools such as scheduling, calendaring, and interactive syllabus (Awareness)	B10.10 Online content management systems rely on specific instructions linking content to activities and completion dates (interactive syllabus). These tools ensure that activities are performed in sequence and are not overlooked. They allow larger activities to be subdivided into smaller, manageable parts.

Telecommunications

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan: **Anonymous Survey on Bullying pg. 83** A10.1 Use of collaborative tools expands the resources available to the classroom. The teacher and students can communicate with each other regarding questions from discussion in class. Teachers can model the information process by accessing online experts. This demonstrates that teachers, just like students, do not have all the answers but have the skills to find out. During an author study, students may correspond with the author by e-mail. Questions concerning the publication could be directed to the author and the response reported. B10.9 Model the use of appointments, tasks or reminder notes. These may be sent to others. B10.10 Ensure that timelines and instructions for assignment are complete. Post assignments / homework on the school web page. E-mail assignments/instructions (.pdf files are useful for attachments) Carbon copy parents.					**Health: (Draft Unit Relationships)** Visual Arts: Historical Unit

Web Authoring

Students will be expected to:	*Instructional Considerations*
A11.2 create appropriate text and image file formats (Guided*)	A11.2 Use a maximum of two fonts. Use one font for text passages and one for accents such as titles, buttons, etc. Use common fonts on web pages as speciality fonts are replaced when viewed on the users' computer. Designers can provide the font for download, however, they must be aware of copyright for the fonts. Most people will leave a site rather than download the font as it takes time and they often are concerned about downloading files. A second consideration is that each installed font will consume computer memory. Gif, .png and .jpeg are the main graphics file formats for web publishing. To reduce download times, use the smallest graphic size possible (file size not physical size) Use .jpeg for graphics (photographs, art, images with shadows and shading). Use .gif for graphics with a few colours and transparency.

Web Authoring

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
Technology Lesson Plan: **Do you want to be in a Rock Band? pg.76**	**5.1, 10.3, 10.5**				Visual Arts: Theory Unit, Career Unit, Historical Unit
A11.2 Identify criteria and create a rubric or checklist to critique sites for effective/ non-effective use of media. Save a graphic file in various formats and note the size vs image quality. The image property dialogue box of some software programs provides information on file size. Web editors will give an estimated download time for entire web pages. Create text in a graphics program (eg.Paintshop Pro) and save as a .gif file. Insert this into a web editor, such as Front Page Express, for use as a heading. Save as an .html file and view in a browser.					

Web Authoring

Students will be expected to:	***Instructional Considerations***
A11.3 create an interactive webpage (Guided*)	A11.3 Interactive components of webpages require databases and server side scripting which are unavailable to students. However, there are various online companies that offer free services that may be incorporated into a static website. i.e. polls, surveys, web counters, guest books, etc.
B11.1 examine html tags (Guided)	B11.1 While web editors are easy to use and automate many web page construction tasks there are times when a knowledge of html coding is helpful for trouble shooting and customizing pages. Web page editors allow pages to be displayed in webpage and html views.
B11.2 create a basic web page using a WYSIWYG editor (Guided*)	B11.2 "What you see is what you get" web editors are much like a word processor that will display to the screen exactly the way it is keyed. They automate many functions, such as linking, inserting graphics and making tables, which results in huge time savings.
B11.3 indicate where file or page is hosted (Guided*)	B11.3 The anatomy of a URL demonstrates the entire site structure. The initial section after http:// is the server address (eg. www.edu.pe.ca) Folders and subfolders are separated by a backslash (www.edu.pe .ca/journeyon/). Individual files finish the URL with a file extension (eg. .htm, .asp, .php, .jpg, .avi, etc.) www.edu.pe.ca/journeyon/pd.htm Files are initially created and the structure is maintained locally on the users' computer system. This structure is transferred to a web file server. The web file server is owned by the department of education, but they pay a fee to the Internet Service Provider (ISP) to connect to the Internet.

Web Authoring

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
A11.3 Search for free interactive online tools using such terms as *online polls interactive web page tools* to find online companies providing these services. Incorporate the required coding necessary to embed the selected interactive tool within the web page. B11.1 Web editors allow the user to view the html coding. Create a table and view the resulting code. Discuss the characteristics of html coding. Locate further information on particular .html tags by referring to an online source or tutorial. International standards for web page development can be found on the World Wide Web Consortium (W3C) page at http://www.w3c.org B11.2 Create a basic webpage relating to a curriculum topic. Provide criteria. B11.3 Draw the file structure, using Inspiration 7.5, for the following URL: http://www.edu.pe.ca/ journeyon/ pro_d_pages/frontpage/ class_webpage_exercise.htm The structure of a web URL is [server], [folder], [subfolder], [file]. The server address (www.edu.pe.ca) would be found at the top level of an organizational chart structure.					

Web Authoring

Students will be expected to:	***Instructional Considerations***
B11.4 apply website file management and transfer files to and from web servers, edit pages online (Guided*)	B11.4 Web Site Structure consists of one main images/graphics folder. In this folder images which are re-used throughout the website are stored. The main file, which should always reside in the root folder, will be named index.htm. Subfolders are built from a category, department or project. Subfolders should contain separate folders for graphics, video or audio. Files are initially created and the structure is maintained locally on the users' computer system. This structure is transferred to a file server by using File Transfer Protocol (FTP). Some web page editors allow the user to edit files directly on the remote server.
B11.5 use special features (Guided*)	B11.5 Image maps are a combination of image and HTML coding. The code creates "hot spots" on the image which may be linked to files or web pages. Often hot spots are used as navigation elements in web pages. Should this be done, the designer must include an alternative navigation bar in case the image map does not work with a particular browser. Large images can be "sliced" into smaller portions held together by an invisible table. Each part of the image loads at the same time and encourages the visitor to remain as the image is revealed. Elements of the image can be used to link to files, webpages, popups, etc. similar to a hot spot. A Cascading Style Sheet may be defined and placed in the header of an HTML document to automatically apply formatting to the page ie. spacing, font, colour, etc. Frames break the page into areas that load from separate HTML files. A disadvantage of using frames is that a page cannot be printed as displayed. Rollovers and mouseovers may be programmed using script or automatically through the use of a web editor such as Front Page or Dreamweaver. Layering techniques are used to overlap images or other elements on a web page.

Web Authoring

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
B11.4 General File Management Skill Review. Demonstrate how to store a file, copy, paste, move, and delete. Brainstorm the content for a webpage project. Outline the main ideas within a written down file structure consisting of appropriate files, names, and subfolders. B11.5 View examples of websites that have a combination of sliced images and hot spots. Determine where the hot spots are and where the slices are. Critique a web site created with hot spots: Recognize and describe the hot spots. Identify the function of the hot spot. Does the site provide a text based navigation? Evaluate the effectivenesss of these special features. Examples of special graphic features may often be found in news, weather, arts and government sponsored websites. Here are some current examples: Royal Academy of Arts: www.royalacademy.org.uk/ CBC news: www.cbc.ca/local/ Weather: www.weatheroffice.ec.gc.ca/canada_e.html					

Web Authoring

Students will be expected to:	*Instructional Considerations*
B11.6 embed objects (Guided*)	B11.6 An embedded object is multimedia content or simply a file (.pdf) created with one application and placed into a webpage with HTML coding. Embedding the object, ensures that the object retains its original format. Video that is included on a site must include information about its size so that users can decide whether or not they want to wait the time required to view the media. Provide a link to a plugin source for a downloadable file (e.g. Quicktime). Never incorporate the automatic downloading of a video/audio file into the loading of a page. Audio must be produced on the best quality sound equipment the user can obtain. Reeves and Nass (1996) found that users will tolerate poor video but are very affected by poor audio. Care must be taken not to overload the user with competing visual and audio information. People have difficulty reading text and listening to unrelated audio at the same time.

Web Authoring

Teaching Suggestions, Activities and Assessment	*Links to Specific Curriculum Outcomes*				
	Language Arts	Math	Science	Social Studies	Other
B11.6 Search for free java applets from the Internet for displaying stylized text, images, and video. Download the selected .zip file, uncompress and insert original works. Embed or link audio, video, animation or data files (.pdf, .wpd, etc.). Remember to describe the contents of the linked files as well as their file size.					

Lesson Plan Layout

Curriculum Outcomes

Activity Resources, Instructions and Suggestions

Lesson Plan: Illustrating Stories

Outcomes

Technology (Awareness) E2.9, A5.1, A 11.1, E6.1

Language Arts:
10.4 (Early), 9.1 (Transitional)
10.4 (Transitional)

Visual Arts 2.1.1, 2.8.1, 2.7.2

Activity

Students can use computer graphics to illustrate stories, poems, journal entries and reports. Any graphics program can be used for this exercise; Color Magic, AppleWorks, or Windows Paint Brush. Ultimate Writing Creativity Center is also a very useful program which allows the students to add graphics to their stories. Graphic programs are a great way to assist students in developing hand-eye co-ordination and enhance mouse skills. Young children quickly learn by exploration to use the different graphic tools and adapt very readily to expressing themselves using this medium.

Resources

art materials
graphics software
Ultimate Writing Creativity Center

Instructions

1. There are several ways to approach this activity. Students can have the story prepared first and then illustrate it, or they can create a drawing and then write a story based on the drawing (see sample at end of exercise). You may wish to fit the written work and illustration into a theme that you are currently exploring in your class.

2. Let students explore the medium. If using a program such as *Color Magic*, limit the amount of clip art (stamps) used and encourage as much freehand drawing as possible. Students may need to be reminded that pictures are created with shapes and briefly (2- 5 minutes) shown how to create different shapes, erase an object or page, and add color to an object. Having a volunteer in your classroom, pairing novices with more experienced users, or having student computer mentors may help you with this aspect, especially if you have a one-computer classroom.

3. Students can save their work if they haven't completed it by the end of their allotted time, and come back to it at a later date. When they have completed their work, have each student print out a hard copy

Lesson Plan Index

Lesson Plan: Star Study Database

Outcomes

Technology: (Guided) B9.6, B9.8

Science: 209-4, 211-1, 211-3

Activity

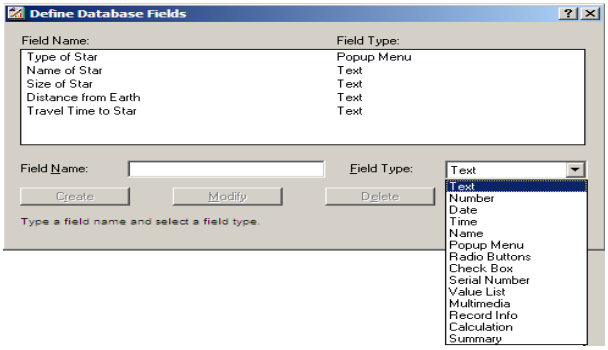
Students will research information on 10 different stars from the various galaxies and create a database of information on each star.

Resources

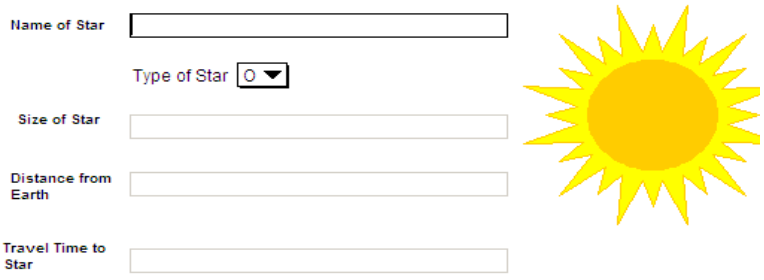
Appleworks Database
Internet

Instructions

For the purposes of this lesson plan, it might be advisable to have the students work in groups of 2.
Open Appleworks Database. The following fields may be used to set up your database.
Name of Star
Type of Star
Distance from Earth
Size
Travel Time to Star



There are also several options that students may use when creating the Field Types.
When the Field Types have been created, the database is ready to have information placed in it.



Lesson Plan: Star Study Database

Instructions

This type of database is known as a “flat” database. This means that it contains a single table of data. A “relational” database is one which contains multiple tables of data. An example to provide to students might be the online company “ebay”.
Using the Internet as one source , the students will then begin to research information on 10 different stars.
This information will then be placed in the appropriate database field. By clicking on the “New Record” button at the top right of the toolbar, the fields will be duplicated and information on the next star can be added.
When all 10 stars have been researched, a report can be generated using the field types.
Database users have two functions which allow them to pull information from a database.These are SORT and FIND functions. When students begin to manipulate the data in their database, they should be in the columnar layout view. The student can then decide what fields may be in the report.For example, a report can be generated that has the "Name of Star, Distance from Earth, and Travel Time to Star".
To enhance the look of the database, graphics from within Appleworks “Library” may be inserted.
Assessment could take the form of a Comparison Chart in which similiarities and differences could be discussed.
The groups could be assessed on their cooperative learning ability. This could be a form of formative assessment.
For more information on Appleworks Database, visit the following website:
http://www.edu.pe.ca/journeyon/pro_d_pages/appleworks.htm

Lesson Plan: My Experience with Technology and where do I want to go ...An Autobiography

Outcomes

Technology: (Guided) C2.1, D2.1
(Independent) B7.9

Language Arts: 8.1, 8.2, 8.3, 9.1
10.3, 10.5

Activity

Students see technology as part of their daily experience. Because of this, sometimes technology is taken for granted and is unexplored. Students are asked to take a step back and pay attention to how they interact with technology.

Resources

Word Processor such as Appleworks or Word Perfect
Internet

Instructions

In this activity, students will list their interactions with technology. They will also examine career goals and determine the technology requirements for reaching their goal.
The following questions may be used to generate discussion.
1. What technology do you see in the classroom?
2. What technology do you have in your backpack or locker?
3. What technology do you use at home?
4. What technology do you see at the mall?
5. What technology do you see in the workplace?
6. In your career choice, what technology do you think you will need?

If students choose a specifc career in Information Technology, for example, what skills will they need to have in order to be a Programmer, Web Designer, Video Game Developer, etc.
If students choose a career in the professional field, what skills will they need to be a doctor, lawyer, etc.
If students choose a career in the Trades, what technology skills will they need to be a mechanic, carpenter, etc.
From their list, the students will compose a narrative that deals with their most significent experience with technology. By sharing these experiences with others, they may be able to think critically about the usefulness of technology.
As in any piece of writing, discussion might involve the issue of plagiarism. Students need to be aware that any information taken from another source such as the Internet needs to be referenced and that there are laws concerning plagiarism.
Because an autobiography is a personal piece of writing, plagiarism may be very difficult. Discussion of the laws concerning the use of technology during the writing may make the students aware of some of their current technology practices. (ie: downloading music, software, visiting online chat rooms, etc)
If students wish to reference any sources in their writing, footnotes for quotes may be added.
Other formatting may include page numbers, text size, or orientation.
In Appleworks: click on “Format”, “Document” to format the document.
In Word Perfect: click “Insert” for headers/footers. Click “Format” for other features such as page numbering, etc.
Assessment could take the form of an Oral Presentation, Peer or Self-Evaluation.

Lesson Plan: Take a look at the World

Outcomes

Technology: B1.9, B1.13, B1.14, A3.2, A3.3

Social Studies:(Draft) 9.1.1, 9.1.4, 9.1.5

Activity

This is an optional lesson plan as it requires the xp operating system in order to properly run "Google Earth".
Students will run Google Earth to better understand the Atlantic Canada perspective in the global community.

Resources

Internet
Google Earth- Free downloadable software

Instructions

Open up the Google search engine at **www.google.com** and click on "More". This will take you to the Google Tools page. Scroll down until you find the icon "Google Earth". This is a free download although there are versions that you may purchase.
Click on the download button and the following specification page will appear.

PC System Configuration

Minimum configuration for PC:

- Operating System: Windows 2000 or Windows XP
- CPU: Pentium 3, 500Mhz
- System Memory (RAM): 128MB
- Hard Disk: 400MB free space
- Network Speed: 128 Kbits/sec
- Graphics Card: 3D-capable with 16MB of VRAM
- Screen: 1024x768, "16-bit High Color"

If your system meets the requirements, click on the "Download Google Earth" Button.
As with all software obtained from the Internet, users should be aware of viruses, spyware and other invasive software coding that could be downloaded onto the computer. The school network does have an antivirus system in place, but if users download any software at home, it is advisable to run anti-virus software on the program before installing it.
Open Google Earth and zoom in to Atlantic Canada. There is also a search field where students may type in the location and the program will zoom in to the area requested. By holding down the left mouse, the earth can be rotated to the desired area. There are also zoom tools that will increase or decrease the area. By using the compass rose function, you can rotate the earth in the desired direction.
Because this is the free version of the software, there are some gaps in terms of detail. Most countries will have a section that is detailed, but the rest is not. This version will give the students the idea of where to locate general areas on the globe.

Lesson Plan: Do you want to be in a Rock Band?

Outcomes

Technology: (Guided) A8.3, A8.4, A8.5, B8.2, B8.3, B8.4, A11.2, A11.3, B11.1, B11.2, B11.3, B11.4, B11.5, B11.6, E11.1

Language Arts: 5.1, 10.3, 10.5

Activity

Advertising on the web is very popular with musicians. Quite a few artists rely on websites to get information out about their music. Information such as gig dates, cds available, FAQs are readily available. Students will create a website advertising their fictional rock and roll band.
This activity would be linked to the grade 9 Language Arts theme "Media and Communication".

Resources

Web authoring software such as Front Page Express
Internet
Other suggested software: Paintshop Pro 6

Instructions

In order for the students to get ideas for their web page, have them visit the website of a band. To decrease the chances of visiting a website that may have inappropriate material, the teacher should choose the website that the students will view.
Students may wish to brainstorm for the content of the website. Following are suggestions for content:
Name of the band,graphics, members and the instruments they play, songs,tour dates
Discussion could also occur on whether or not the band has a video and could it be included on the website. Some band websites do have streaming video. Does this enhance the website or is it just a distraction?
Open Front Page Express. Add text, graphics, etc. Some students may be more comfortable working in html. Using the html tab, the page can then be viewed from the code perspective.
For more information on Front Page Express, visit the following site:
http://www.edu.pe.ca/journeyon/pro_d_pages/frontpage.htm
If a digital camera is available, students may wish to use it to create images for their site. As most websites have pictures using .jpg format, students may have to convert their images to the appropriate format. Students will also have to be aware that their website must not be too elaborate, as there may be account space issues.
Paintshop Pro 6 is a program available in schools that has the tools to convert images to the correct format. Other tools will allow image manipulation. An image may also be "captured" from the web by using the capture tool in the program. For more information on Paintshop Pro 6, visit the following site:
http://www.edu.pe.ca/journeyon/pro_d_pages/using_psp/using_psp6/index.htm
If the final project is going to be posted on the school website, make sure that the guidlines for webpages are followed. These guidlines may be found at the following site:
http://www.edu.pe.ca/journeyon/tech_support_pages/GuidelinesforSchoolWebPages.html
Also keep in mind that the school webmaster is responsible for uploading content on the school web page.
An example of an assessment rubric is given below.

Purpose of website is clearly stated.	1	2	3	4	5
Information is useful.	1	2	3	4	5
How this website compares in content to similar websites.	1	2	3	4	5
Good use of graphics and color.	1	2	3	4	5

Lesson Plan: Using EBSCO to Research

Outcomes

Technology: (Guided) A3.2, A3.3, B3.3, E3.1

Social Studies: (Draft) 9.2.2, 9.3.3, 9.3.4

Language Arts: 4.1, 4.3, 5.1, 7.1

Science: 209-5

Activity

EBSCO is the print and electronic journal subscription service purchased by the Department of Education for grades 1 to 12. This particular resource contains Canadian magazines, journals, newspapers, newswires, and reference books as well as International magazines, newspapers, reference books, biographies, and image collections.

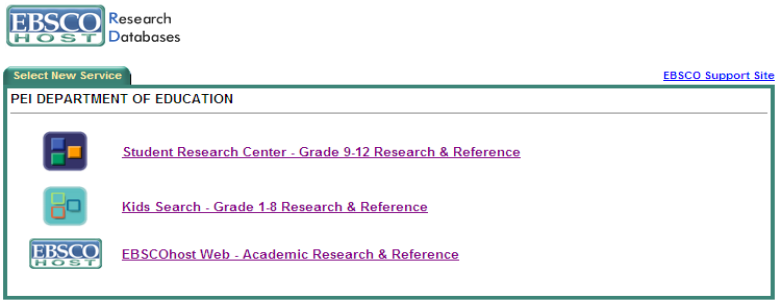
Resources

Internet

Instructions

To login to the EBSCO service: **http://search.ebscohost.com**
Username: **peiebsco**
password: **level2**

When you login, there is a choice of what service is offered.



For the purposes of this lesson plan, students will click on the **Student Research Center- Grade 9-12 Research and Reference.**
In the search field, the students will type in the name of a newspaper such as "The New York Times", "The Guardian", "The London Times", etc. An event from a paper will be chosen and read. Some of this information is in .pdf format. This allows the viewing of the document without needing the software it was created in. Adobe Reader will open automatically to read the document.
Students will then analyse this event under the following headings:
1. How does this event affect Canada?
2. How does this event affect Atlantic Canada?
3. How does this event affect me?

Examples of events could be environmental, political, or cultural.
As with any document, students should check the source and critically evaluate the information by asking "Who, What", Where", "Why, "When".
Students will then present their event to the class and explain its importance.
Because this service is web based, teachers and students are able to access this both in school and at home.

Event

How does this affect Canada ?	How does this affect Atlantic Canada?	How does this affect me?

The above table was created with Word Perfect.

Lesson Plan: Atlantic Canada and the National Interest

Outcomes

Technology: (Guided) C 2.1, B5.3, B5.4, A 8.4, B8.2

Social Studies: (Draft) 9.4.1, 9.4.2

Activity

Students will create a visual representation of similarities and differences between Atlantic Canada interests and the interests of the nation of Canada.

Resources

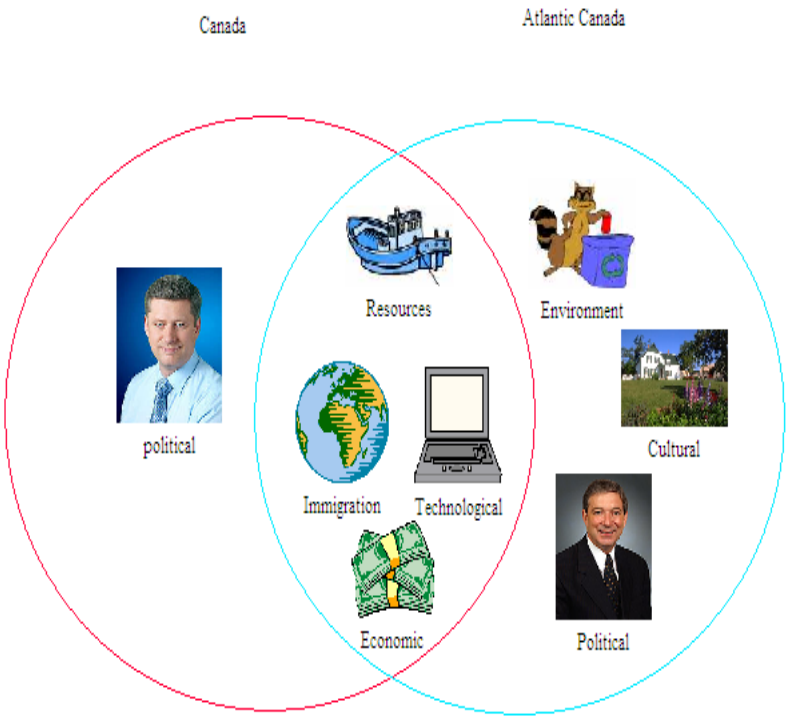
Inspiration 7.5
image editing software such as Paint Shop Pro

Instructions

Using Inspiration 7.5, students will brainstorm the connections between the region of Atlantic Canada and the country of Canada.
Some of the connections could be:
Resources
Environment
Immigration
Cultural
Political
Economic
Technological
Students will then create a Venn Diagram using the program Inspiration 7.5 to create a visual representation of these connections.
Graphics are to be used in the visual representation. The program does contain a library of graphics, but may not meet all the needs of the students.
If the students select graphics from another source such as the Internet. There are a number of factors that they must consider.
1. Are the graphics under copyright? If so, permission must be obtained from the author in order to be used.
2. What format are the graphics? If students copy/paste the graphic, there may be formatting and/or space considerations. Paint Shop Pro will allow students to change the format of a graphic (for example, from .bmp to .psp or .jpg). This program will also resize the graphic so that it will not take up as much of the students' hard drive space.
Assessment could take the form of a discussion in terms of who has jurisdiction over what area. For example, who has control over the country's resources such as oil, natural gas, fisheries?
The final product could also be assessed in terms of the computer project and how the students made use of the technology.
For more information on Inspiration 7.5, visit the following website:
http://www.edu.pe.ca/journeyon/pro_d_pages/Using_Inspiration/inspiration7.htm
For further information on Paint Shop Pro, visit the following website:
http://www.edu.pe.ca/journeyon/pro_d_pages/using_psp/using_psp6/index.htm

Lesson Plan: Atlantic Canada and the National Interest

Following is an example of how a Venn Diagram could be created along with the graphics.



Lesson Plan: Understanding Math Plus

Outcomes

Technology: (Guided) A3.2, A3.3, E3.1

Math: For a complete listing of correlations to the grade 9 math curriculum, see page 103.

Activity

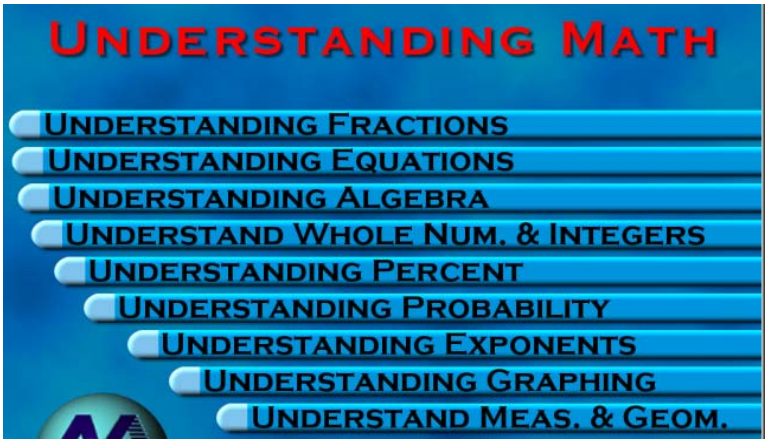
The purpose of this activity is to provide an overview of the software "Understanding Math Plus" which is available in all elementary and intermediate schools. This software closely matches the math outcomes for grade 9.

Resources

Understanding Math Plus software

Instructions

Understanding Math Plus is actually a bundle of 9 separate math programs. When you click on the icon, you will get the following screen.



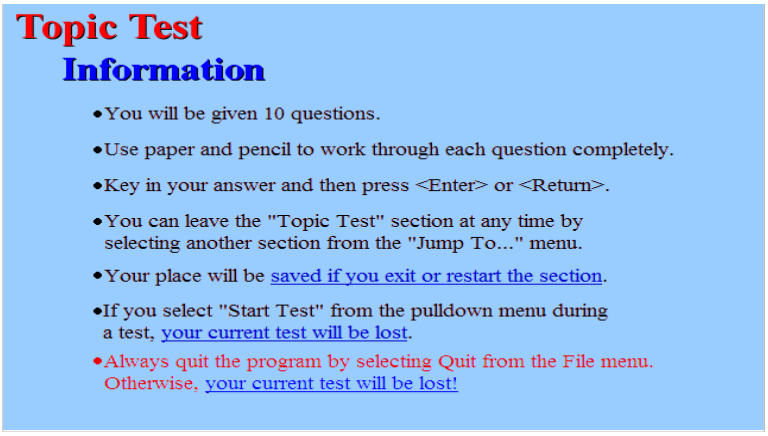
By clicking on one of the sections, a specific window focussing on the chosen area. In this case, Understanding Fractions was chosen. There is an introductory page that teachers may go through with their students the first time.
By clicking on the "Jump to" drop-down menu, at the top of the page and clicking "Main Menu", the following page can be viewed.

Lesson Plan: Understanding Math Plus

Instructions

If you choose topic 1 "The Meaning of Fractions" for example, there are a number of activities including practice and a topic test. By clicking on the "Jump To " menu again, you will be able to access all the activities that go with the topic.

The student must interact with the program in order to proceed. Students must also answer every question. Hints are provided.
When a student is ready to take a "Topic Test", they will be asked if they have ever taken a test in "Understanding Fractions" before. The first time, they will answer "NO" and be required to provide a login name and password. Make sure that the student remembers the login/password as they will need it for every topic test within the Understanding Fractions program. Once you provide the required login/password, an information window concerning the test will appear.



Lesson Plan: Understanding Math Plus

Instructions

The results from the test is tracked using the Teacher Tracking Utility. The test results may also be printed using the network printer and stored in a student file. The test may be used by the teacher as formative or as part of summative assessment.

For more information on the Teacher Tracking Utility, please refer to the "Understanding Math Plus" manual that is available in schools. The manual is also online at: **http://www.neufeldmath.com/support/**

The company website can be found at: **http://www.neufeldmath.com**

Lesson Plan: Anonymous Survey on Bullying

Outcomes

Technology: (Guided) B1.13, B1.14, A10.1
(Awareness) B10.10

Health: (Draft unit on **Relationships**)

Activity

In an effort to gain information and at the same time, respect the students' reluctance to openly discuss their personal situations , a survey on bullying has been developed and placed on Atutor. Students will be given this survey in the hope that they will fill it out anonymously. The teacher can then analyse the results and though no names would be given, it gives an opportunity to openly discuss bullying without singling anyone out.
By using an accompanying discussion forum, students may feel free to give voice to their thoughts and feelings on the matter.

Resources

Atutor collaborative software

Instructions

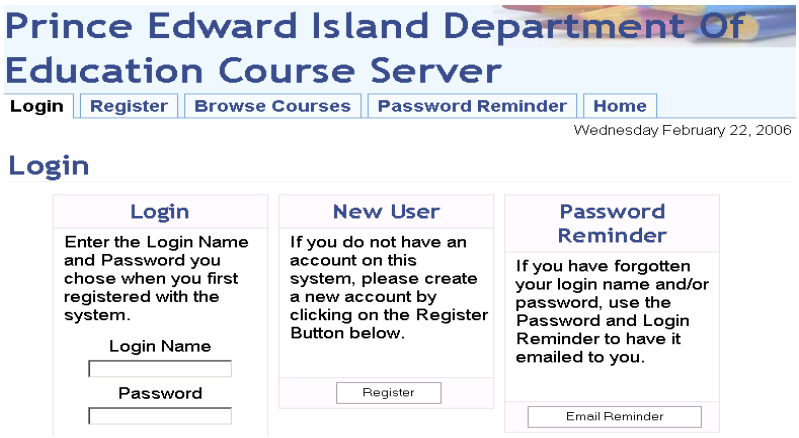
Atutor is a closed password protected software that enables students and teachers to engage in threaded discussion, and collaborate by sharing resources.
Teachers create the classes and issue a login-password to students. Access to the discussion forum is strictly monitored. Threaded discussion is recorded.
To access Atutor, go to the following URL:
http://atutor.edu.pe.ca/atutor/login.php
When you give this url to the students, they may ask why there is no "www." in front of the address. Atutor is housed on a server owned by the Department of Education. It is password protected and all information in the program remains on PEI.
Students who use such services as MSN or Blogs for chat and discussion should be aware that the information is stored on a server from outside PEI. Making use of such services can open the door to viruses , spam and other invasive software.
Information placed on Atutor is monitored for invasive software.
Within the network system on PEI, files with certain file extensions are currently blocked. for a list of blocked file extensions, visit the following site:
http://www.edu.pe.ca/sats/standards/
Under the heading "Documents", click on the link that says " **Attachment extensions blocked by the Groupwise Antivirus Agent"**. This list is similar to the file extensions blocked by Atutor.
As a new user, you will be asked to register for an account. Fill in the required information and register. Atutor accounts are maintained by the Department of Education. Provide a username and a password. Your username should be the same as your Groupwise user account.(eg. jrteacher) Make sure that you use a password that you will remember.
When you login, there is a tab that indicates "create course". Here is where you will create the space for you and your students.
Make sure that you contact the manager of the site (in this case, a Department of Education Technology Specialist) to be assigned an Instructor Level Account.
When you create a course, it will appear on the Start Page. This will make it easy for your students to find their space.
When students have logged in and selected your "course", there is an area that you as a teacher may create. In this area, there are a number of choices of activities that you may want to add. There is the discussion forum, chat, links, tests and surveys, etc. Each teacher may personalize their own "course". For the purpose of this lesson, you may just want to allow students into the discussion forum.

Lesson Plan: Anonymous Survey on Bullying

An easy to fill out survey is already set up on Atutor. Teachers can import the survey when they set up their own courses. If the teacher wishes to make changes, they may do so.
Once the teacher has registered the students in the course, they may go ahead and fill out the survey. The results will be known only to the teacher.
Using the data from the survey, discussion can be generated on the serious nature of bullying.
Further discussion can be in class or through the discussion forum that will be set up for this purpose.
Following are some guidlines for the discussion forum.

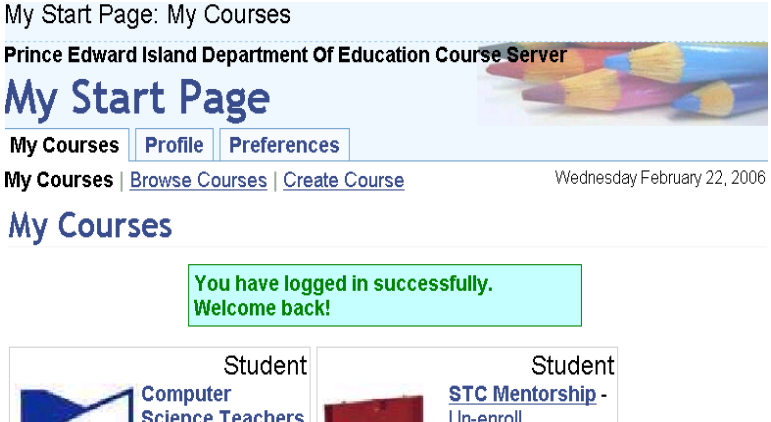
1. Timelines could be established to do a posting.
2. Students will read all class postings and respond to at least 2.

Featured below is an illustration of the login screen for Atutor.

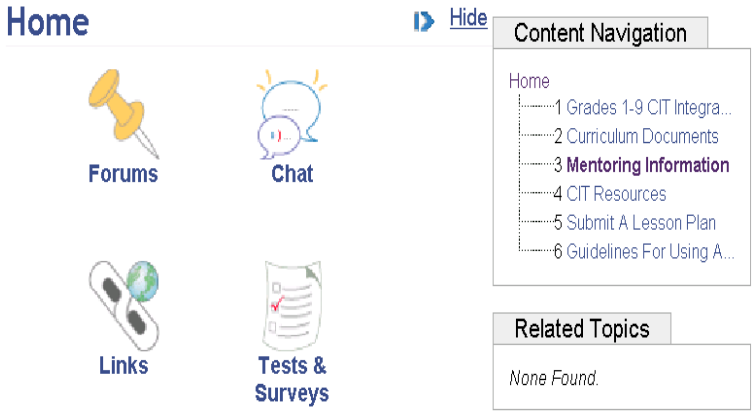


Lesson Plan: Anonymous Survey on Bullying

The Start Page is indicated with courses created along with the option of creating and browsing a course.



This is what the course workspace would look like. Students simply click on the icons. Teachers may choose which icons the students have access to. Through the "Manage" tool, go to "Forums" and "create Forums". Also through the "Manage" tool, click on "Student Tools" and assign only the discussion forum.



Lesson Plan: Personal Safety on the Web

Outcomes

Technology: (Guided) A3.3, B3.3, E3.1, A8.3

Health: (Draft unit on **Relationships**)

Activity

The purpose of this activity is to increase the safety awareness of students when using Communication Information Technology.

Resources

Kit 101 an educator's guide to Internet safety- available in all schools
Internet

Instructions

The kit contains a DVD, an information booklet, and two sets cue cards. One set is to use when presenting parents with information about the program. The other set is for presenting to students.
The DVD has scenarios that deal with cyberbullying, online gaming, use of webcams, and webpage safety.
It is advisable for the teacher to hold a parent information meeting to explain the nature of this program.
The students are shown each scenario. There are follow-up questions on each of the cue cards.
Supporting materials can be found at the following website:
www.internet101.ca

The DVD can be played on both a DVD player and a computer that has DVD software installed. The scenarios on the DVD are available online. Click on "Tools for Educators". Each of the scenarios is given. Media Player is available on the computers in all schools to view these videos. Fact sheets and cue cards are also available on the site.
Another resource that may be used is the website sponsered by Industry Canada:
www.cyberwise.ca
There are different sections for kids, teens, parents, teachers and professionals.

Lesson Plan: Making use of "Free"software for Science

Outcomes

Technology: B1.9, B1.11, B1.13, B1.14

Science: 308-16, 308-17

Activity

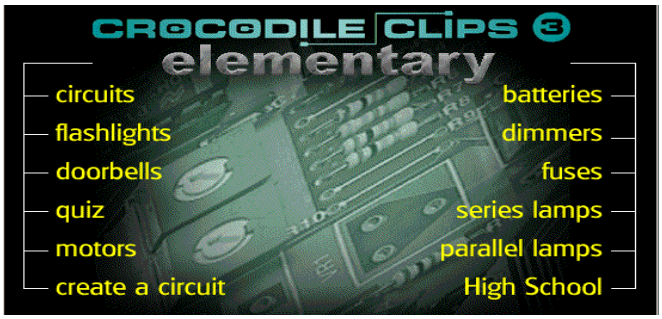
The Internet has a wealth of information that students and teachers can access. A great deal of this information is presently "free". There are factors that users may have to consider when attempting to access this information.
1. System specifications: Do I have the proper hardware to run these programs?
For downloading software, whether it be free or not, there are minimum specifications that are needed in order to run the software. When you go to the site, specifications are usually stated.
2.Downloading software to use on the school system:Special rights are needed in order to do this. Software can be downloaded and placed on the desktop of individual machines. If a request has been made to place software on the network server, software evaluation must then take place. This process ensures that curriculum and technical resquirements have been met.
Any software that is downloaded outside of this evaluation process is in danger of being wiped from the computers when they are re-imaged.
3. Danger of viruses: There is always a risk of downloading a virus along with a "free" program. The network has an antivirus system, but a home system may not. It is advisable to have an antivirus program on your system and run it on the software before you install it.
4. Spam and other invasive software: The majority of sites offering free downloads will first ask you to register a name and an email address before they will allow you to download. Crocodile Clips download found at **http://www.crocodile-clips.com/s3_4.htm** asks you for a name and email address. Once you give this information, a company may use it or sell it. This could open the door for unsolicited ads or emails from unrelated companies. A possible solution to this is to set up an account on a free email service such as hotmail, g-mail, or yahoo mail. You can then give this email address in order to download the software.

Resources

Internet
Crocodile Clips electricity simulation software
Online video series such as PBS NOVA

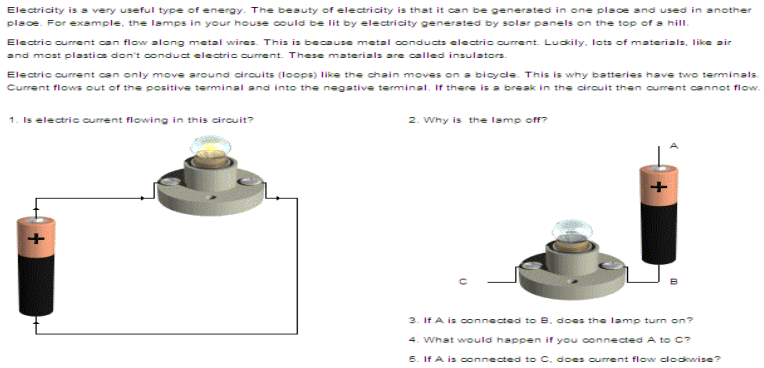
Instructions

Crocodile Clips is an example of free software that was downloaded and sent through the software evaluation process and placed on the school network. This software is available in schools that have both grade 6 and grade 9 as it supports both the grade 6 and grade 9 electricity units.



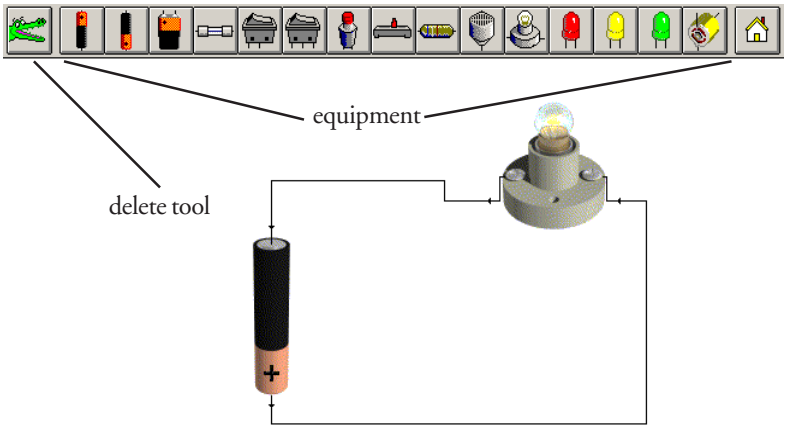
Lesson Plan: Making use of "Free" software for Science

By clicking on one of the terms in the main menu, a completed example will appear. For example, when you click on the word "circuits", the following graphic will appear. The same window will open when you click on the "Home" icon.



Accompanying this graphic are questions that can be used for assessment purposes.

When you click on "File", "New", a blank screen will open with all the electrical tools at the top. Click and drag the tools that you need down onto the screen. To complete the circuit with wires, click on the connection ends of the tools. A wire will appear. By clicking and dragging the mouse, connections can be made.



The example shown is a simple circuit. Grade 9 students will be asked to create series, parallel circuits with multiple resistors, switches, fuses, etc.
Have the students save the file in the "G" drive for reference when they construct an actual model. Students could also place their file in the "hand-in" folder of the Multi use drive (M:Drive) so that the teacher may evaluate it.
If the students wish to have the program on their home computers, here is the site for a free download:
http://www.crocodile-clips.com/s3_4.htm

Lesson Plan: Making use of "Free" software for Science

Schools that have Smart Boards are aware that there is supporting educational software available.
This software can be downloaded at the following site:
http://www2.smarttech.com/st/en-US/Support/Downloads/default.htm
Though this software is free to download, Smart does have conditions and terms in its user licence agreements. It is understood that users of this software are doing so in conjunction with any Smart products that the school may have purchased.

Videos from such sources as the PBS series NOVA may be viewed on school computers. Go to the following website:
http://www.pbs.org/wgbh/nova/programs/
Using Media Player, which is available in all schools, students will be able to view programs on various topics in science. For example, on the menu button, there are topics on Space.

There is a factor to consider when wishing to view a video other than technical specificatons. If you are unable to view a video, it may be because there is a high volume of traffic and you may have to try it another time.

Lesson Plan: The Line of Best Fit

Outcomes

Technology: (Independent) B6.2, B6.5

Math: F1, F2

Activity

Students will construct a scatterplot graph and determine the line of best fit from the data.

Resources

Appleworks Spreadsheet
Appleworks activity file: **linefit9.cwk** (template)

Instructions

Open Appleworks Spreadsheet and in the appropriate cells, add the following data:

Students	allowance	spending
1	11.00	3.50
2	13.00	2.70
3	14.00	2.50
4	12.00	3.70
5	12.50	3.70
6	16.00	1.90
7	14.00	2.00
8	15.00	1.50
9	15.00	1.50
10	11.50	3.00
11	10.50	3.80
12	15.00	1.90
13	16.00	1.40
14	12.00	1.60
15	13.50	2.50
16	12.00	3.40
17	17.00	1.70
18	15.00	1.60
19	11.00	3.20
20	12.00	3.80

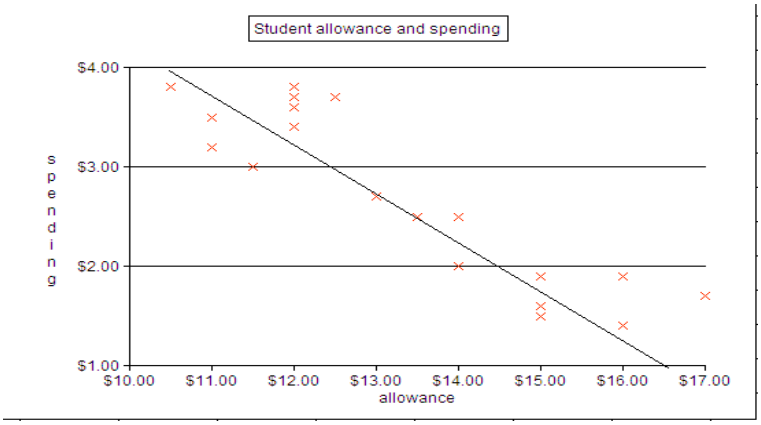
	A	B	C
1	Student	allowance	spending
2	Stu 1	$11.00	$3.50
3	Stu 2	$13.00	$2.70
4	Stu 3	$14.00	$2.50
5	Stu 4	$12.00	$3.70
6	Stu 5	$12.50	$3.70
7	Stu 6	$16.00	$1.90
8	Stu 7	$14.00	$2.00
9	Stu 8	$15.00	$1.90
10	Stu 9	$15.00	$1.50
11	Stu 10	$11.50	$3.00
12	Stu 11	$10.50	$3.80
13	Stu 12	$15.00	$1.90
14	Stu 13	$16.00	$1.40
15	Stu 14	$12.00	$3.60
16	Stu 15	$13.50	$2.50
17	Stu 16	$12.00	$3.40
18	Stu 17	$17.00	$1.70
19	Stu 18	$15.00	$1.60
20	Stu 19	$11.00	$3.20
21	Stu 20	$12.00	$3.80

* note that this data is for example only and teachers may wish to use their own data to illustrate this concept.

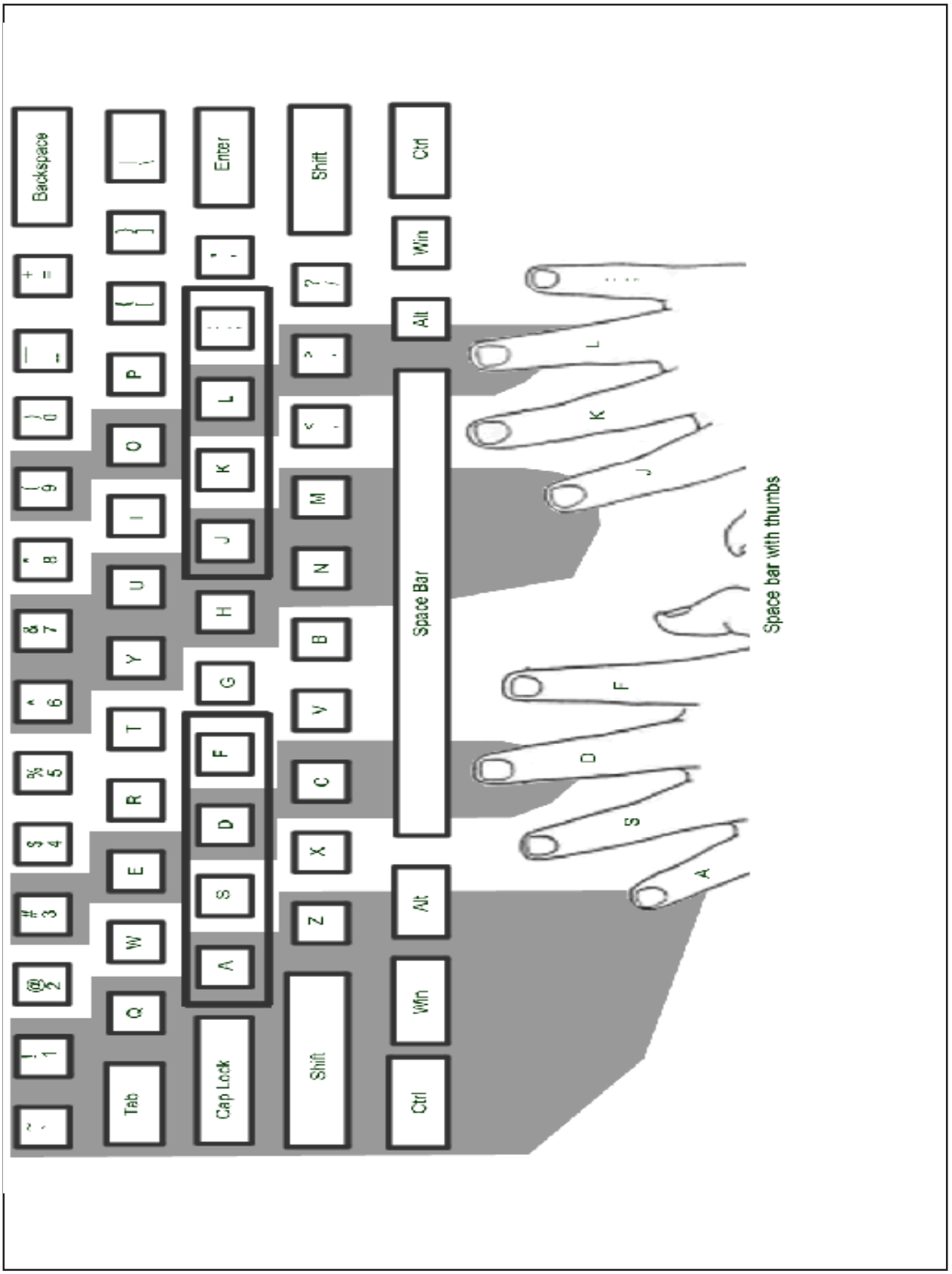
Select Column B and C by clicking and dragging the mouse to highlight the data.
Click on Options/Make Chart.
In the Chart Options window, choose X/Y Scatter graph and click on OK.
A graph will appear on the screen. It is a graphic object and it is now selected because there are handles surrounding it.
To size the graph, click directly on one of the black handles and drag.
To move the graph, click anywhere on the graph and drag the mouse.
To delete the graph, click anywhere on the graph and hit the delete key.

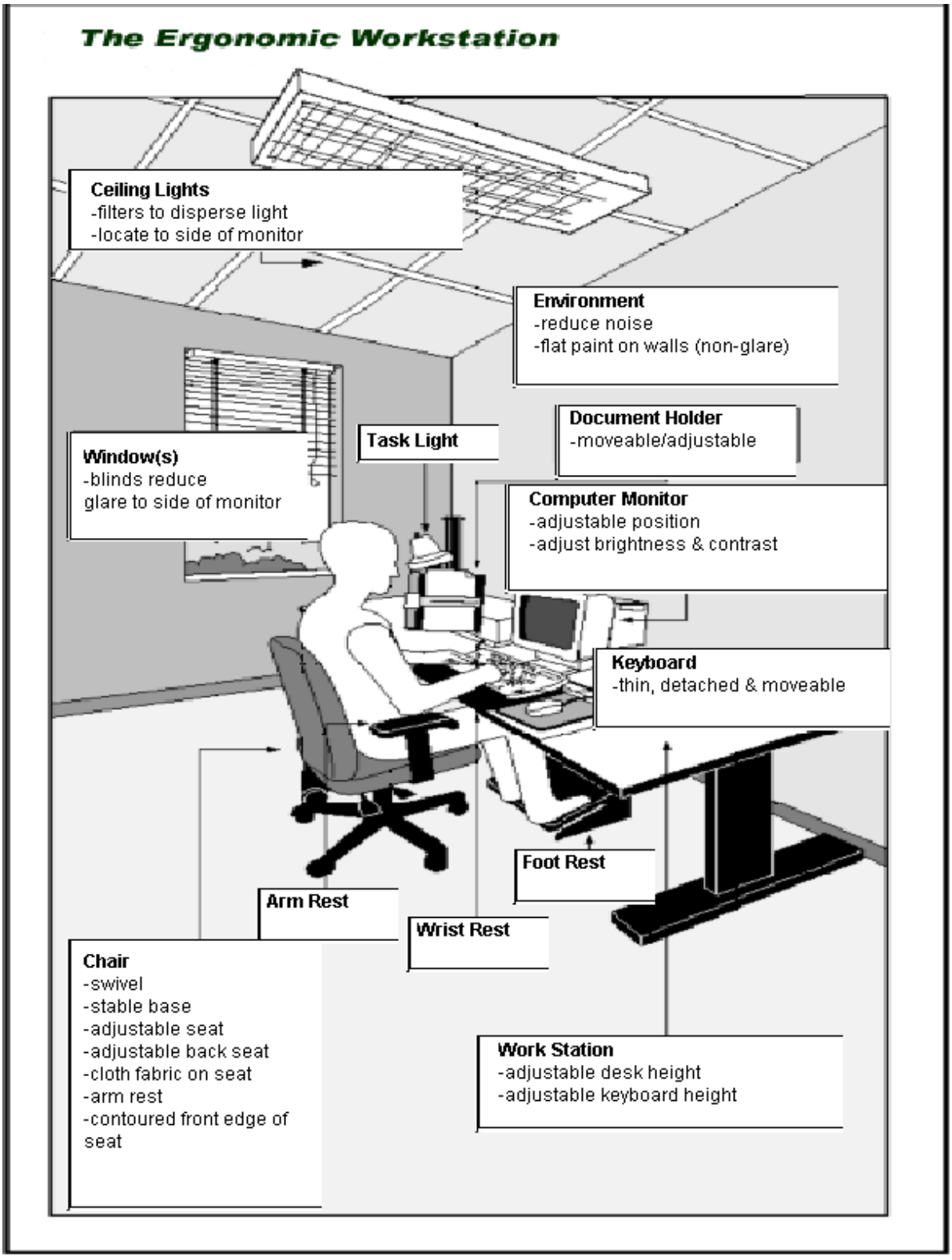
Lesson Plan: The Line of Best Fit

On the scatter plot graph, using the Line Draw tool, draw a line of best fit.
The line draw tool can be found in the Toolbox.
Determine the slope of the line.



The Appleworks activity file **linfit9.cwk** contains a template. Teachers may use this as an example of a completed activity or change it to fit their needs.
In this particular activity, there is no reason to use a formula for calculations. Should you wish, for example to find the average allowance spent, a formula such as "**=average(C2...C21)**" may be inserted into cell 22.
For more information on Appleworks Spreadsheet, visit the following site:
http://www.edu.pe.ca/journeyon/tech_support_pages/help_manual/ssheet/default.html
Understanding Math Plus also has a number of activities that teachers can use with their students to reinforce this concept. The appendix in this document contains lessons that will address the math outcomes stated.


Backspace
Enter
Shift
Ctrl
Win
Alt
Space Bar
Space bar with thumbs


The Ergonomic Workstation
Ceiling Lights
-filters to disperse light
-locate to side of monitor
Environment
-reduce noise
-flat paint on walls (non-glare)
Document Holder
-moveable/adjustable
Task Light
Window(s)
-blinds reduce
glare to side of monitor
Computer Monitor
-adjustable position
-adjust brightness & contrast
Keyboard
-thin, detached & moveable
Foot Rest
Arm Rest
Wrist Rest
Chair
-swivel
-stable base
-adjustable seat
-adjustable back seat
-cloth fabric on seat
-arm rest
-contoured front edge of seat
Work Station
-adjustable desk height
-adjustable keyboard height

WHAT CAN I DO TO ADAPT THE COMPUTER TO MEET THE NEEDS OF ALL STUDENTS?

Listed below are some quick, easy, no cost strategies that teachers can use to make the computer more accessible to students of all needs. Most of the suggestions below are options that are available through Windows, the computer's operating system. Teachers may request the assistance of the School Technical Contact or your school's technician to implement these strategies. The following strategies have been divided into four areas for clarification; however, they may apply to many situations.

Most of the strategies listed below are available on Windows XP, while only some of them are available on Windows 98. In Windows XP, the strategies can be activated through the Accessibility Wizard (Start-Programs-Accessories-Accessibility-Accessibility Wizard). In Windows 98, they can be activated through the Control Panel: the Mouse, Keyboard and Display icons

It is important to note that if any of the following strategies are implemented on a particular computer, these settings will be enabled for all users of that computer.

Visual

• Windows Magnifier -Windows XP

• Increase size of monitor (17 inch or larger)

• Lower the screen resolution (ex. 800 x 600) - Windows XP and 98

• Enlarge icons - Windows XP and 98

• Enlarge the mouse, change its color, and assign mouse pointer trails - Windows XP and 98

• Change the speed of the mouse pointer - Windows XP and 98

• Slow down the cursor blink rate - Windows XP and 98

• Customize the size of font on desktop and menu bars - Windows XP

• Maximize the window to fill the screen - Windows XP and 98

• Customize the colour of screen, font and window title bars - Windows XP and 98

• Increase the size of the scroll bars and window borders - Windows XP

Hearing

• Display captions for speech and sounds - Windows XP

• Play sounds when you press CAPS lock, NUM lock or SCROLL lock. - Windows XP

• Make sure all students are facing you when giving instructions in the computer lab

• Use of personal headphones

Mobility

- Changing the response rate of the keyboard so that letters will not be repeated if the student holds down too long on a key - Windows XP and 98
- Ensure that the mouse is on the appropriate side of the computer depending on the dominant hand of the student. For left handed users, change the left and right mouse click buttons so that it matches with the students left hand. - Windows XP and 98
- On Screen keyboard - Windows XP
- Use sticky keys - this enables a user to press key combinations like CTRL+ALT+DEL that usually have to be held down at the same time to press them one keystroke at a time. - Windows XP
- Use keystrokes to perform mouse functions ie. use the numeric keypad to move the mouse up and down and to the left and right. - Windows XP

Other

- Develop peer support programs or buddy systems that involve classmates helping classmates, students with disabilities can play role of helper as well.
- Colour code the keyboard using small dot stickers. For example, right of centre is green, left of centre is red. Small stickers can be placed on the back of the student's hand, corresponding to the side of the keyboard.
- Use a slant board to position the keyboard (1" or 2" binders can be used as slant boards)
- Seat the student facing the computer monitor with keyboard and computer monitor at the appropriate height.
- Identify specific function keys such as Spacebar, Enter, Backspace, Tab and Shift, etc. with coloured dot stickers to highlight their position on the keyboard.
- Some software such as Ultimate Writing and Creativity Center, Inspiration 7.5, Understanding Numeration, ATutor have accessibility features. Check the help section of these programs to determine how to access available.

Glossary

Abbycat: PEI Public library database system

Absolute: a cell reference that remains constant in a formula. Dollar signs are used to force the spreadsheet to keep the cell reference in a formula the same when it is copied. (i.e. when the formula =A6/B6 is copied the numerator A6 will change to A7, A8, etc. while the denominator B6 will stay the same)

APA: abbreviation of American Psychological Association. The APA standard is used for quoting references for the sciences.

Applet: An application, written in Java, that can run inside a web page but is not limited by the functionality of HTML. Java applet and Java script differ that a Java applet needs to be downloaded. Java script is incorporated in a web page with HTML tags.

Application sharing: a program that is installed on the server computer which allow all computers on the network to have access to that software.

Assignment drop box: a mechanism for uploading electronic assignment files for an instructor using an online content management system such as WebCT or ATutor.

Attachment: file that is attached to an email

Auto fill data: spreadsheet feature that will complete a series of entries such as the "days of the week" or "months of the year". (i.e. enter January, February and select the corresponding cells with the mouse and select "auto fill". The remaining 10 months will be automatically entered)

Automated text: database input form feature that will automatically fill a field with a predetermined value (i.e. current year, telephone area code, etc.)

Background: display behind graphics and text on a web page. A background can be a colour or a tiled graphic.

Bitmap: pixel (picture element) representation of a graphic. The image is made by small dots (pixels) of different colors.

Bookmark (**Favorite**): a saved link to a specific place on the Internet.

Boolean operators: logic system that returns "true or false", "yes or no", "AND", "OR", "NOT". These terms are used to set parameters for searching.

Browser: a program that accesses and displays files and other data available on the Internet and other networks. (i.e. Internet Explorer, Netscape)

Bullets: a symbol appearing before items in a list.

Button bar: a bar of graphical buttons found in a program that contain "short cuts" for commonly used tasks.

Cascading style sheet (CSS): a feature of HTML that allows users to create style templates (sheets) that specifies how different text elements (paragraphs, headings, hyperlinks, etc.) appear throughout a website.

Cell address: coordinate of a cell. It is represented by a letter and a number such as A2

Cell: the area in a spreadsheet where rows and columns intersect. Data and formulas are placed in cells. Cells are identified by the alphabetical column and numeric row i.e. A1

Clone brush: a graphics tool used to copy all or part of an image.

CMYK: a subtractive color model used in color printing. This color model is based on mixing pigments of cyan, magenta, yellow and black in order to make other colors.

CODEC: abbreviation for COmpression/DECompression. Software or hardware that compresses and decompresses audio and video data streams into smaller sizes while maintaining the quality. (.wmv, .ra, SVCD, MPEG, mp3, etc.)

Cold boot: powering off the computer completely and restarting it.

Column: vertical section of a spreadsheet, identified by a letter

Commercial ware: commercial software which requires purchase and registration.

Compatibility: whether or not hardware or software will work on a computer.

Compression: process of encoding data, video, or audio in order to reduce its size (.zip, .jpg).

Connection line type: how a computer is linked to a network (i.e. T3, modem, DSL, etc.)

Connection speed: the speed of information transfer among networked devices.

Cursor (Pointer): the symbol used to represent the movement of the mouse. (i.e. arrow)

Data entry bar: space in the spreadsheet to enter the cell data or formulas.

Database report: data from fields specified in a search query sorted into a particular order. Calculations and formatting may be applied to the reports generated.

Database: collection of structured, searchable electronic data (i.e. search engines are data bases)

Decompression: process of decoding or reading encoded data.

Desktop publishing: combination of text, images and graphics to produce publications such as newsletters, posters and brochures

Display format: the way the files and folders are being displayed in the windows (i.e. thumbnails, icons, details, etc.)

Distribution list: a list of email addresses that are grouped together so that one email message may be sent to all members of the group. (i.e. all students in a class, all teachers on a particular committee)

Download / Upload: refers to the transfer of information between computers. The person/computer sending the information refers to the transfer as an upload, while the person/computer receiving the information refers to it as a download.

Drive: name that refer to a storage location such as C:, G:, or A:

Dynex: PEI (French) school library database system

Effect: graphical manipulation that applies special effects to objects (i.e. chrome, neon).

Embed object: objects (audio, video, animation, etc.) that load with the HTML tags when the page is visited. Those items will be downloaded and run automatically

Ergonomic: workplace designed for maximum comfort, efficiency, safety, and ease of use.

Error checking routine: features in a database input form that checks to see that entered data corresponds to some pre-defined criteria (i.e. ticket number must fall within the range of 1-500, and no two records may have the same ticket number)

Export: to transfer information to another format for use in a different program.

Field types: identifies the type of information that is to be entered into a field in a database (i.e. date, numeric, text)

Fields: different categories in a database (i.e. first name, middle initial, last name, street)

File extension: alphanumeric characters located after the period at the end of a filename. This identifies the type of software than can open the file. (i.e. .mp3, .wpd, .gif, .html, etc.)

File management: process of organizing files into folders and sub-folders and selecting storage medium (i.e. hard disk, floppy disk, CD)

File properties: detailed information on the file. (i.e. size, date, extension)

File size: storage space taken by a file in the computer system (i.e. kilobytes - kb, megabytes - mb, gigabytes - gb)

Filter (graphic): graphical manipulation that applies special effects to images (i.e. blur, sharpen).

Filters: search criteria that allow particular emails to be located. Filters may be set with "rules" that provide directions on tasks to perform with selected emails.

Fixed/locked titles: feature in spreadsheet program to keep certain cells showing (i.e. headings) while scrolling

Flash: developed by Macromedia, Flash is a software used to create web content that interacts with the users by providing animations, audio, games, etc.

Flat database: is a single database table structure (i.e. Appleworks, MS-Works) Searches can be performed within this table but it is not capable of organizing complex applications.

Folder (Directory): an electronic storage area that can contain a group of files and/or other directories.

Font: the style of text characters. (Times New Roman, Arial, Garamond, etc.)

Footer: text placed automatically at the bottom of each page in a document

Frame: a webpage that has separate divisions (windows) within the web browser. The content for each frame area comes from a different .html file.

Freeware: software distributed by the creator free of charge under certain conditions.

Functions: pre-defined mathematical rules that are available in spreadsheet programs i.e. mean, round, standard deviation, exponents, payment amount, etc.

Graphics in layers: objects placed over other objects to create one image. This allows for easier editing and manipulation.

Group file sharing: a specific network folder that a workgroup member can share

Grouping: creating one single object made up of several other objects. This allows for resizing the object as a whole.

Hardware: all physical parts of a computer (i.e. monitor, mouse, keyboard, etc.).

Header: text placed automatically at the top of each page in a document

Hexadecimal: a numbering system with base of 16 includes only the digits 0 through 9 and the letters A, B, C, D, E, and F. Used to identify large numbers accurately i.e. identify colors, network addresses.

Hosting service: service that companies provide to store data on their server

HTML tags: Hypertext Markup Language tags are instructions within brackets < > that tell the web browser how to display the page information.

Image map: an alternative navigational structure whereby an image on a webpage has "programmed coordinates" that allow the user to navigate the site intuitively, using the mouse.

Import: to bring in external information

Insertion point: the insertion point is where the next character typed from the keyboard will appear. (i.e. "I beam")

Interactive syllabus: an electronic course outline

Java Script: a scripting language developed by Netscape to enhance the capability of HTML language

Justification: adjustment of text to ensure that margins will align throughout the document (i.e. left, center, right)

Layer: visualized as electronic "transparencies" which allow users to display and manipulate information separately.

Link (Hyperlink): a clickable link to another file (i.e. web page).

Lock cell: locking a cell will prevent any changes on its content. It doesn't hide the content of the cell.

Logical operators: used to compare variables such as greater (>) greater or equal (>=), equal (==), less or equal (<=) and less (<).

Macro: a group of repeated commands that are recorded and saved for later use.

Mail merge: a word processing feature that allows a user to create a "data records" database to record information about a number of people, and a form letter template. Based upon a search criteria, names, addresses and other recorded data are combined with fields found in the form letter. Completed forms may be displayed on the screen or sent directly to a printer.

Menu bar: a horizontal bar at the top of a window, below the title bar, that contains drop-down menus.

Microcat: PEI (English) school library database system

MLA: abbreviation of Modern Language Association. The MLA standard is used for quoting references for the humanities.

Multimedia: the use of several media to convey information (text, audio, graphics, animation, video).

Multiple logins: simultaneously logging into multiple computers on the same network using the same username.

Network: a communication system connecting two or more computers.

Notebook: another name for an individual spreadsheet.

Object alignment: positioning of an object with respect to other objects.

Panorama: a series of picture "stitched" together using software to create a picture wider than what the camera is normally capable of capturing. Some panorama can offer user a 360 degree view.

Plug-in: an auxiliary program that works within a browser to enhance its capability. The plug-in can be a third party product. (adobe reader for .pdf, Real Audio, Shockwave, etc.)

Pop-up ads: a form of online advertising that open a new window automatically to display advertisements.

Principles of design: five universally recognized principles are contrast, unity, pattern, movement, and rhythm. Used in combination these principles create a esthetically pleasing product.

Print queues: set of printing tasks waiting to be processed.

Publishing etiquette: acceptable guidelines for publishing. (i.e. non-biased, inclusive language).

Record: all fields relating to one "object" in a database (i.e. all information regarding one student)

Relational database: is the creation of multiple tables linked to each other through a common "key" such as a customer number. (i.e. a travel agency may have customer contact information in one table, airline reservations in a second, hotel and car reservations in a third. If any piece of information changes only one table needs to be updated.)

Relative: a cell reference that will automatically update itself in a formula when it is copied. (i.e. a formula =A6/B6 will update itself to =A7/B7, =A8/B8, etc. as it is copied downward in a column)

Rename: change the name of the file or folder to another name.

RGB: a color model that utilizes the additive model in which red, green, and blue light are combined in various ways to create other colors (i.e. pixels on a computer monitor). Colours created on the computer monitor sometimes may not be able to be reproduced when printed.

Rollover (**mouse over**): a "change of state" when the mouse is positioned above an object.(i.e. colour changes, cursor changes, image changes)

Row: horizontal section of a spreadsheet, identified by a number

Rule: a task to perform on emails that meet a particular criteria. (i.e. send a return message for all incoming emails, such as "on vacation until ..", delete message from particular sources, or automatically place mail in a particular folder)

Save as: same as "Save" but allows user to save a copy of current file under a new name or location.

Save: permanently record data to a storage medium such as a floppy disk or hard disk.

Screen capture: saving a portion of the current screen as an image file to be inserted into a document. Paintshop Pro includes a screen capture utility.

Search engine: a program designed to help find information on the Internet. (i.e. Google, Ask Jeeves, Yahooligans)

Server: the central computer in a network. (i.e. contains shared data, programs, etc.)

Shareware: trial version of any commercial software.(i.e 30 days) Shareware is also known as demoware, trialware and many other names.

Signature: text added automatically at the end of an email (i.e. name, position, return address, phone/fax number, email address)

Software: program or application that runs on a computer.

SPAM: acronym of the words: Stupid Pointless Annoying Messages. These messages are often advertising emails sent out massively on the internet.

Spreadsheet: a grid which helps you organize data in rows and columns. Calculations may be performed by inserting formulas. Charts or graphs may be generated from the data.

Spyware: computer software that gathers and reports information about the computer usage without the user's knowledge or consent.

Streaming video and audio: refers to a technique of transferring media over the Internet to the user's computer so that it is available without having to download the whole file. The media will begin to play once a predetermined amount of data is transferred to the computer "buffer"

Tab rulers: guides found in word processors allowing the user to graphically set and delete tab indents

Template (**Master page**): a model page that provides a basic structure for adding content

Text art: tool found in Word Perfect that allows the user to create text in 2D and 3D formats in a variety of shapes

Text wrap: word processing feature that automatically places the text on the next line

Touch keyboarding: the ability to type without looking at the keyboard.

Un-grouping: separating objects that were previously grouped.

Unlock cell: this allows modification be to performed on cells that were previously "locked"

Vector: mathematical representation of a graphic. The image is made from mathematical equations that represent the curves, lines, area, color, etc. This form of representation allows for small file sizes while maintaining detail when increasing picture size.

Virtual reality: an artificial environment created with computer technology

Virus: a virus is a program or piece of code that causes an unexpected, usually negative, event.

W3C accessibility guidelines: World Wide Web Consortium organization that provides standards for web page creation. These include accessibility issues (challenged users, slow line speeds, older processing equipment) and equipment compatibility.

Warm boot: restarting the computer using reset button, Ctrl+Alt+Del, etc.

Watermark: a graphic or text appearing in the background of a page (i.e. the word "Draft" or a graphic of a soldier in a Remembrance Day poem)

Web Server: a computer that stores data (i.e.: web sites) for the world wide web

Whiteboard: a whiteboard is a shared electronic workspace. Each participant can add text, make drawings or paste pictures on the whiteboard. Other participants can immediately see the result on their workstation.

Wireless connection: connection to another device without physically connecting a wire.

WYSIWYG: Acronym for"What You See Is What You Get". WYSIWYG is used to describe applications that let you see what documents will look like

Understanding Math Plus
Grade 9 Math Correlations

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GCO A: Students will demonstrate number sense and apply number theory concepts.	
A1: solve problems involving square root and principal square root	**Understanding Math PLUS** **Understanding Exponents** Topic 5. Square Root Squaring Numbers Square Roots Radical Signs Square Roots of Negative Numbers Example Questions 1. Radicals First 2. The Four Equations 3. Lawn Question 4. Make a Square Practice Questions Topic Test
A2: graph and write in symbols and in words the solution sets for equations and inequalities involving integers and other real numbers	**Understanding Math PLUS** **Understanding Equations** Topic 4. Solving Multi-Step Equations Our Problem Concepts – Examples with Tiles Concepts – Examples without Tiles Examples 1, 2, 3, 4, 5 Summary Literal Equations What Are They? How do you solve them? Why Solve the Literal Equations? A Perimeter Example A Temperature Example Practice Questions Topic 5. Problem Solving Words and Symbols The Translation Machine Examples 1, 2, 3, 4 The Trick Machine Instructions The Machine Explanation with Pictures Explanation with Symbols Area of Walls Chemistry Pool Puzzler – The First Problem Perimeter Problem with Diagram Money Problem with Chart Age Problem with Chart Buying CDs Meat Mixture Coffee Mixture Rate of Work Summary: Problem Solving Using Equations

Understanding Math Plus
Grade 9 Math Correlations

GCO B Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.

B2: add, subtract, multiply, and divide rational numbers in fractional and decimal forms using the most appropriate method	**Understanding Math PLUS** **Understanding Fractions** Topic 8. Adding Fractions Adding Fractions on a Number Line Examples 1, 2, 3 The Lowest Common Denominator Examples 1, 2 Word Problems Alexander's Friends Eating Candy Goal Scoring Taking a Walk Fraction Card Game Topic 9. Subtracting Fractions Subtracting Fractions on a Number Line Examples 1, 2, 3 The Lowest Common Denominator Examples 1, 2 Topic 9. Subtracting Fractions The Clock Examples 1, 2 Fraction Strips Concepts 1, 2 Percent Strips Examples 1, 2 Decimal Strips Examples 1, 2 Subtracting Fractions on a Number Line Examples 1, 2, 3 The Lowest Common Denominator Examples 1, 2 Topic 10. Multiplying Fractions Order in Multiplying Examples 1, 2 Multiplying Fractions with Large Numbers Examples 1, 2 Practice Questions Topic Test Topic 11. Dividing Fractions Patterns from Examples Another Explanation Examples 1, 2 Examples without Diagrams Numerical Examples 1, 2 Central High School Practice Questions

Understanding Math Plus
Grade 9 Math Correlations

GCO B Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.

B2: add, subtract, multiply, and divide rational numbers in fractional and decimal forms using the most appropriate method	**Understanding Math PLUS** **Understanding Fractions** Topic 14. Addition and Subtraction of Decimals Decimals Around Us Length in Metric Units The Tools Examples 1, 2, 3, 4, 5 Pencils Examples 1, 2, 3, 4, 5 Money Examples 1, 2, 3, 4, 5 Track Meet Examples 1, 2, 3, 4, 5 School Supplies Practice Questions Topic 15. Multiplication and Division of Decimals Recall the Basics Special Case: Multiply a Decimal by a Whole Number Distributive Method Examples 1,2 Questions 1,2,3 Standard Method Examples 1,2,3 Questions 1,2,3 Decimals Around Us-Word Problems Oranges Bananas Cycling Baseball Cards Cookies Running Apples
B3: apply the order of operations in rational number computations	**Understanding Math PLUS** **Understanding Fractions** Topic 12. Order of Operations Why Use Order of Operations? BEDMAS Example Questions Examples 1, 2, 3

Understanding Math Plus
Grade 9 Math Correlations

GCO B Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.

B4: demonstrate an understanding of and apply the exponent laws for integral exponents	**Understanding Math PLUS** **Understanding Exponents** Topic 3. The Exponent Rules Summary of Exponent Rules Powers with Rational Bases Examples 1, 2, 3 In General Example Questions Examples 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 Practice Questions
B5: model, solve, and create problems involving numbers expressed in scientific notation	**Understanding Math PLUS** **Understanding Exponents** Topic 4. Scientific Notation Scientific Notation for Large Numbers Introduction Chart The Rule The Steps Scientific Notation for Small Numbers Introduction Chart The Steps Examples 1. Number Question 2. Park Question 3. Sun Question 4. Kitchen Question Practice Questions
B6: determine the reasonableness of results in problem situations involving square roots, rational numbers, and numbers written in scientific notation	**Understanding Math PLUS** **Understanding Fractions** Topic 8. Adding Fractions Word Problems Pedro and Alex Race Washing the Cars Planting a Garden Practice Questions Topic 9. Subtracting Fractions Word Problems Pedro and Alex Race Washing the Cars Planting a Garden Topic 10. Multiplying Fractions Examples without Diagrams Numerical Examples 1, 2 Central High School Practice Questions

Understanding Math Plus
Grade 9 Math Correlations

GCO B Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.	
B6: determine the reasonableness of results in problem situations involving square roots, rational numbers, and numbers written in scientific notation	Topic 11. Dividing Fractions Examples without Diagrams Numerical Examples 1, 2 Central High School Practice Questions **Understanding Exponents** Topic 4. Scientific Notation Examples 1. Number Question 2. Park Question 3. Sun Question 4. Kitchen Question Practice Questions
B8: add and subtract polynomial expressions symbolically to solve problems	**Understanding Math PLUS** **Understanding Algebra** Topic 5. Adding Expressions Our Problem Adding Expressions with X and Y Tiles Examples 1, 2, 3 Adding Expressions with X-Squared Tiles Examples 1, 2, 3 Adding Expressions without Tiles Examples 1, 2 Practice Questions with Tiles Practice Questions without Tiles Topic 6. Subtracting Expressions Our Problem Subtracting Expressions with X and Y Tiles Concept Examples 1, 2 Subtracting Expressions with X-Squared Tiles Examples 1, 2 Subtracting Expressions without Tiles Practice Questions with Tiles
B9: factor algebraic expressions with common monomial factors, concretely, pictorially, and symbolically	**Understanding Math PLUS** **Understanding Algebra** Topic 8. Factoring Expressions Common Factoring With Tiles Examples 1, 2 – Methods 1, 2 Without Tiles GCF Examples 1, 2 Factoring Trinomials With Tiles - Examples 1, 2 The Pattern

Understanding Math Plus
Grade 9 Math Correlations

GCO B Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.	
B9: factor algebraic expressions with common monomial factors, concretely, pictorially, and symbolically	Without Tiles – Examples 1, 2, 3, 4 Difference of Squares Examples 1, 2, 3,
B11: find products of two monomials. a monomial and polynomial, and two binomials, concretely, pictorially, and symbolically	**Understanding Math PLUS** **Understanding Algebra** Topic 7. Multiplying Expressions Our Problem Recall Tile Concepts Multiplying Monomials Like Terms With Tiles Without Tiles Multiplying Monomials and Polynomials With Tiles... Examples 1, 2, 3, 4 Without Tiles Multiplying Binomials With Tiles... Examples 1, 2 Without Tiles Pattern Examples... True or False Examples 1, 2, 3
B12: find quotients of polynomials with monomial divisors	**Understanding Math PLUS** **Understanding Algebra** Topic 9. Dividing Expressions Dividing a Monomial by a Monomial Examples 1, 2, 3, 4 Dividing a Polynomial by a Monomial Concept Examples 1, 2, 3 Summary Dividing a Polynomial by a Binomial Examples 1... Methods 1 Examples 1... Methods 2... Long Division Examples 2 Examples 3... Methods 1 Examples 3... Methods 2... Long Division Examples 4... Methods 1 Examples 4... Methods 2... Long Division Combination Questions Examples 1, 2, 3, 4

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GCO B Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.	
B15: select and use appropriate strategies in problem situations	**Understanding Math PLUS** **Understanding Algebra** Topic 5. Adding Expressions Practice Questions with Tiles Practice Questions without Tiles Topic Test Topic 6. Subtracting Expressions Practice Questions without Tiles Topic Test Topic 7. Multiplying Expressions Examples... True or False Examples 1, 2, 3 Practice Questions Topic 8. Factoring Expressions Summary Examples 1, 2, 3, 4 Practice Questions Topic 9. Dividing Expressions Combination Questions Examples 1, 2, 3, 4 Practice Questions
GCO C Students will explore, recognize, represent, and apply patterns and relationships, both formally and informally.	
C2: interpret graphs that represent linear and non-linear data	**Understanding Math PLUS** **Understanding Graphing** Topic 6. Linear Relations In This Topic What is a Linear Relation? Graphs of Linear Relations Concept Examples 1, 2, 3, 4, 5, 6 The Taxi Example – Setup Equation – Graph Equation The Elastic Example – Setup Equation – Graph Equation Lightning Example – Setup Equation – Graph Equation Line of Best Fit Examples 1, 2 Practice Questions
C3: construct and analyse tables and graphs to describe how changes in one quantity affect a related quantity	**Understanding Math PLUS** **Understanding Graphing** Topic 5. Relations, Equations, and Functions Relations What is a Relation? Domain and Range Example 1 – Triangles Example 2 – Tiles, Part 1 Example 3 – Tiles, Part 2 Example 4 – Running Example 5 – Hit the Ball

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GCO C Students will explore, recognize, represent, and apply patterns and relationships, both formally and informally.	
C3: construct and analyse tables and graphs to describe how changes in one quantity affect a related quantity	Functions What is a Function? – Examples 1, 2, 3 Vertical Line Test Examples 1, 2, 3 Function Notation Examples 1, 2 Patterns to Words to Equations Examples 1, 2, 3, 4
C4: determine the equations of lines by obtaining their slopes and y-intercepts from graphs and sketch graphs of equations using y-intercepts and slopes	**Understanding Math PLUS** **Understanding Graphing** Topic 8. Equation of a Straight Line Graph y = mx + b Examples 1, 2, 3, 4 Patterns to Summary Examples 5, 6, 7 Slope y - intercept Equation Concept Examples 1, 2, 3, 4 Parallel and Perpendicular Lines Concepts 1, 2 Examples 1, 2, 3, 4 Slope – Point Form of the Equation Example 1: Solutions 1, 2 Example 2: Solutions 1, 2, 3, 4 Special Cases Example 1 – Zero Slope Example 2 – Undefined Example to Summarize
C5: explain the connections among different representations of patterns and relationships	Understanding Math PLUS Understanding Algebra Topic 3. Patterns, Patterns, Patterns Introduction... Math is Patterns Geometric Patterns Examples 1, 2, 3, 4, 5, 6, 7, 8 Number Patterns Examples 1, 2, 3, 4, 5, 6 Number and Geometric Patterns Examples 1, 2 Patterns to Formulas Examples 1, 2, 3

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GCO C Students will explore, recognize, represent, and apply patterns and relationships, both formally and informally.

C6: solve single-variable equations algebraically and verify the solutions	**Understanding Math PLUS** **Understanding Equations** Topic 4. Solving Multi-Step Equations Our Problem Concepts – Examples with Tiles Concepts – Examples without Tiles Examples 1, 2, 3, 4, 5 Summary Literal Equations What Are They? How do you solve them? Why Solve the Literal Equations? A Perimeter Example A Temperature Example
C7: solve first-degree single-variable inequalities algebraically, verify the solutions, and display them on number lines	**Understanding Math PLUS** **Understanding Equations** Topic 7. Solving Inequalities Comparing Integers The Integer Line Example 1... Greater Than; Example 2... Less Than Explanation Example 3... Greater Than; Example 4... Less Than Greater Than or Less Than Inequalities What Are They? Inequality vs. Equation Summary of Relationships Inequality on the Number Line Examples 1, 2, 3, 4 Solving Inequalities Examples 1, 2, 3, 4, 5, 6
C8: solve and create problems involving linear equations and inequalities	**Understanding Math PLUS** **Understanding Equations** Topic 6. Solving Linear Systems The Meaning of a Linear System The Meaning of Solving a Linear System Solve a Linear System by Graphing Examples 1, 2 – Intersecting Lines Examples 3, 4 – Intersecting Lines Involving Fractions Example 5 – Parallel Lines Example 6 – Coincidental Lines

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GCO D Students will demonstrate an understanding of and apply concepts and skills associated with measurement

D1: solve indirect measurement problems by connecting rates and slopes	**Understanding Math PLUS** **Understanding Percent** Topic 4. Ratios and Proportions Writing Ratios Concept Examples 1, 2, 3, 4 What is a Proportion? Proportions Example 1 Example 2 – Lemonade Example 3 – Marbles Example 4 – Trout Example 5 – Tree Height **Understanding Graphing** Topic 7. Slope of a Line Formula Parallel Lines Examples 1, 2, 3 Perpendicular Lines Examples 1, 2, 3 Positive and Negative Slopes Examples 1, 2, 3, 4 Pattern Special Slopes Examples 1, 2, 3, 4 Pattern
D2: solve measurement problems involving conversions among SI units	**Understanding Math PLUS** **Understanding Measurement and Geometry** Topic 1. An Introduction to Measurement Metric and U.S.A Standard Measurement Systems Searching for the Standard Unit Related Units from Metric Prefixes Metric Prefixes at Work Converting Between Metric Units
D3: relate the volumes of pyramids and cones to the volumes of corresponding prisms and cylinders	**Understanding Math PLUS** **Understanding Measurement and Geometry** Topic 4. Solids…Volume and Surface Area Volume of a Solid The Concept Volume of a Prism: Examples 1, 2 Volume of a Cylinder Volume of a Pyramid Volume of a Cone Summary Practice Questions

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GCO D Students will demonstrate an understanding of and apply concepts and skills associated with measurement	
D4: estimate, measure, and calculate dimensions, volumes and surface areas of pyramids, cones, and spheres in problem situations	**Understanding Math PLUS** **Understanding Measurement and Geometry** Topic 4. Solids…Volume and Surface Area Surface Area of a Solid The Concept Surface Area of a Pyramid Surface Area of a Cylinder Surface Area of a Sphere Volume of a Solid The Concept Volume of a Prism: Examples 1, 2 Volume of a Cylinder Volume of a Pyramid Volume of a Cone Volume of a Sphere
D5: demonstrate an understanding of and apply proportions within similar triangles	**Understanding Math PLUS** **Understanding Measurement and Geometry** Topic 6. Angles and Polygons Angles in Triangles Exploration An Explanation Exterior Angles – Example
GCO E Students will demonstrate spatial sense and apply concepts, properties, and relationships	
E3: make informal deductions using congruent triangle and angle properties	**Understanding Math PLUS** **Understanding Measurement and Geometry** Topic 6. Angles and Polygons Angles in Triangles Exploration An Explanation Exterior Angles – Example
E6: use mapping notation to represent transformations of geometric figures and interpret such notations E7: analyse and represent transformations and combinations of transformations using mapping notation E8: investigate, determine, and apply the effects of transformations of geometric figures on congruence, similarity, and orientation	**Understanding Math PLUS** **Understanding Graphing** Topic 4. Transformations Translations Object to Image We Say We Write Reflection Mapping Rule Examples Examples 1, 2, 3 Rotations Object to Image We Say We Write Rotation Mapping Rule Examples Examples 1, 2 Dilatations

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GCO F Students will solve problems involving the collection, display, and analysis of data	
F1: describe characteristics of possible relationships shown in scatterplots	**Understanding Math PLUS** **Understanding Graphing** Topic 2. Statistics Presenting Data Scatter Plot Example 1... The T-Shirt Tailor Example 2... Matching
F2: sketch lines of best fit and determine their equations	**Understanding Math PLUS** **Understanding Graphing** Topic 6. Linear Relations Line of Best Fit Examples 1, 2
F4: select, defend, and use the most appropriate methods for displaying data	**Understanding Math PLUS** **Understanding Graphing** Topic 2. Statistics Presenting Data Stem-and-Leaf Diagram Example 1... Ages of Fans Example 2... Heights of Students Bar Graph Example 1... Energy Example 2... Lengths of Rivers Histogram Example 1... Heights of Students Example 2... Roll a Die Line Graph Example 1... Life Expectancy Example 2... Software Profits Circle or Pie Graphs Example 1... Radio Station Example 2... Health Survey Scatter Plot Example 1... The T-Shirt Tailor Example 2... Matching
F5:draw inferences and make predictions based on data analysis and data displays	**Understanding Math PLUS** **Understanding Graphing** Topic 2. Statistics Collecting Data Throw a Die Throw 2 Dice Voting Primary Data - Gathering Methods Secondary Data - Gathering Methods

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GCO G Students will represent and solve problems involving uncertainty

G1: make predictions of probabilities involving dependent and independent events by designing and conducting experiments and simulations	**Understanding Math PLUS** **Understanding Probability** Topic 7. Independent Events In This Topic What Are They? Examples 1. Toss Two Coins 2. Replacing Marbles Probability 1. Coin and Die 2. Balls 3. Letter Tiles Patterns and Summary 1. Summary 2. Spinner 3. Cards Practice Questions Topic 8. Dependent Events In This Topic What Are They? Independent Events Dependent Events Examples 1. Keep the First Marble 2. Choose the Flowers Probability 1. Keep the First Ball 2. Keep the First Tile 3. Plant the First Flower Patterns and Summary 1. Summary 2. Money 3. Socks 4. Names Practice Questions
G2: determine theoretical probabilities of dependent and independent events G3: demonstrate an understanding of how experimental and theoretical probabilities are related	**Understanding Math PLUS** **Understanding Probability** Topic 6. Pascal's Triangle Pascal's Neighborhood Tasks 1, 2, 3, 4 Pascal's Triangle... A Beginning Pascal's Triangle... Row One Experimental Theoretical Pascal's Triangle... Row Two Experimental Theoretical

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GCO G Students will represent and solve problems involving uncertainty

G2: determine theoretical probabilities of dependent and independent events G3: demonstrate an understanding of how experimental and theoretical probabilities are related	**Understanding Math PLUS** **Understanding Probability** Pascal's Triangle... Row Three Experimental Theoretical Pascal's Triangle... Row Four Experimental Theoretical Patterns Patterns 1, 2, 3 Pattern Summary

Lesson Plans by Subject Area

Subject Area	SCO Area	Lesson Plan	Outcomes
Math	Spreadsheet	The Line of Best Fit	B6.2, B6.5
Math	Internet	Understanding Math Plus	A3.2, A3.3, E3.1
Language Arts	Web Authoring Multimedia	Do you want to be in a Rock Band?	E2.9, A8.3, A8.4, A8.5, B8.2, B8.3, B8.4, A11.2, A11.3, B11.1, B11.2, B11.3, B11.4, B11.5, B11.6, E11.1
Language Arts	Social, Ethical and Health	My Experience with Technology...An Autobiography	C2.1, D2.1
Science	Computer Systems	Making use of "Free" software for Science	A8.3, B9.1, B1.11, B1.13, B1.14
Science	Database	Star Study Database	B9.6, B9.8
Social Studies	Graphics	Atlantic Canada and the National Interest	C2.1, B5.3, B5.4, A8.4, B8.2
Social Studies	Internet	Using EBSCO to Research	A3.2, A3.3, B3.3, E3.1
Social Studies	Computer Systems Internet	Take a Look at the World	B1.9, B1.13, B1.14, A3.2, A3.3
Health	Telecommunications	Anonymous Survey on Bullying	B1.13, B1.14, A10.1, B10.10
Health	Internet	Personal Safety on the Web	A3.3, B3.3, E3.1, A8.3