Information Processing 10, 20, 30 Curriculum Guidelines

A Practical and Applied Art

Saskatchewan Learning

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Contents

Introduction

Within Core Curriculum, the Practical and Applied Arts (PAA) is a major area of study that incorporates five traditional areas of Home Economics Education, Business Education, Work Experience Education/Career Education, Computer Education and Industrial Arts Education. Saskatchewan Education, its educational partners and other stakeholders have collaborated to complete the PAA curriculum renewal. Some PAA curriculum guidelines have been updated by integrating, adapting or deleting some components; some Locally Developed Courses have been elevated to provincial status; and some new guidelines have been developed.

A companion, the *Practical and Applied Arts Handbook* , provides background on Core Curriculum philosophy, perspectives and initiatives. The Handbook provides a renewed set of goals for PAA. It presents additional information about the PAA area of study, including guidelines about work study and related transition-to-work dimensions. A Practical and Applied Arts Information Bulletin provides direction for administrators and others. Lists of recommended resources from all guidelines will be compiled into a PAA Bibliography with periodic updates.

Philosophy and Rationale

All young people need to understand the interrelationship among individuals, the business world, and government. All young people need competencies that will enable them to manage their own lives and careers effectively. They should be able to manage personal finances; act appropriately according to their rights and responsibilities as citizens; process information effectively and efficiently; make sound decisions about life choices and careers; and, participate constructively as both consumers and producers. These general competencies should be coupled with those that may lead to employment in business and to taking advanced business studies at the post-secondary level.

With the escalating availability of data and information, the Canadian marketplace is an increasingly complex and changing forum of which every member of society is a part. Individuals preparing for all types of adult responsibilities require a sound understanding of how to create, access, use, and manage information. The integration of keyboarding, communication, management, and computer applications proposed in this curriculum will assist students to make the transition to adulthood and lifelong learning.

Aim, Goals and Foundational Objectives

Aim

The aim of Information Processing is to provide students at the Middle and Secondary Level with the basic skills to process information in four broad areas:

- keyboarding
- computer applications
- communications
- management of information

Goals

Awareness: To develop an awareness and understanding of the various information processing competencies required for problem solving and personal economic decision making.

Business Environment: To respond to learning, productivity, and change when processing information within the business environment.

Personal-Use Skills: To develop work habits, attitudes, communication skills, problem solving skills, and independent thinking skills that will enhance personal, school, and work experiences.

Self-Image and Business Attitudes: To develop a positive self-image and essential business attitudes necessary for the workplace.

Communications: To develop effective social and written communication skills desirable in the business environment.

Employment Skills: To acquire business skills to facilitate success in post-secondary education or the work force.

Foundational Objectives

Foundational objectives are the major, general statements that guide what each student is expected to achieve for the modules of the PAA curriculum guidelines. Foundational objectives indicate the most important knowledge, skills/abilities, attitudes/values for a student to learn in a subject. Both the Foundational Objectives and the Common Essential Learnings (CELs) Foundational Objectives to be emphasized are stated in this document. Some of these statements may be repeated or enhanced in different modules for emphasis.

The student will

- be familiar with hardware and software terminology and features
- recognize the importance that computer technology has in our society, and how it has become integral in our everyday lives.
- be able to use computer hardware and word processing software to produce simple personal use documents.
- develop an appreciation for information processing technology.
- develop the ability to use a computer system for personal or business use when the environment requires.
- use touch keyboarding skills in the efficient use of the computer keyboard.
- apply keyboarding skills to both personal and school situations whenever the opportunity arises.
- develop personal goal setting and time management skills.
- develop information processing skills that will be helpful in one's personal life.
- be able to apply information processing skills and knowledge to other areas of study.
- examine the efficiency of information processes, considering efficiency and productivity.
- examine ergonomic principles that may be considered in preparing business and personal workspace.
- understand the uses of several information distribution systems.
- use a variety of computer software applications efficiently and productively.
- develop an understanding and appreciation of the capabilities and potential of software integration.
- develop communications skills needed for information processing.
- demonstrate ability to use word processing and formatting knowledge to produce written business communications for various audiences.
- examine the importance and use of records management.
- understand the managerial roles, responsibilities, procedures, and methods necessary for the efficient management of common information processing activities.

- be able to utilize electronic communication systems effectively.
- understand the positive value of business in the community by linking the worlds of school and work.
- examine and understand the role of the employee in the processing of business information.
- be able to maintain computers and troubleshoot common problems.
- prepare for information processing career opportunities.
- be aware of the career and development opportunities in the field of information processing that exist in Saskatchewan and other provinces.

Note: Integration of learning from core and optional modules will occur throughout the Information Processing program. Teachers are encouraged to seek opportunities to integrate student learning from the modules chosen for a 100-hour course. Integration that takes place should facilitate student acquisition of the foundational objectives of each selected module.

Common Essential Learnings

The incorporation of the Common Essential Learnings (CELs) into the instruction of the Practical and Applied Arts (PAA) offers many opportunities to develop students' knowledge, skills and abilities. The purpose of the CELs is to assist students with learning concepts, skills, and attitudes necessary to make the transition to post-secondary education, career, work and adult life.

The CELs also establish a link between the Transition-to-Work dimensions and Practical and Applied Arts curriculum content. The Transition-to-Work dimensions included in the PAA courses are: apprenticeship, career exploration/development, community project, employability skills, entrepreneurship, occupational skills, personal accountability, processing of information, teamwork, and work study/experience. Throughout the PAA Curricula, the CELs objectives are stated explicitly at the beginning of each module. The CELs are coded in this document, as follows:

COM = Communication

NUM = Numeracy

CCT = Critical and Creative Thinking

TL = Technological Literacy

PSVS = Personal and Social Values and Skills

IL = Independent Learning

It is anticipated that teachers will find additional ways to incorporate the CELs into their classroom instruction.

Related Documents

Saskatchewan Learning produced the following documents to support the Information Processing 10, 20, 30 curriculum guide:
Information Processing 10, 20, 30: An Initial List of Implementation Materials (2003) contains an annotated listing of resources that can be used to support and to enrich the curriculum. The bibliography assists in implementing Resource-Based Learning in the classroom. Each annotation contains a recommendation about how the resource supports the curriculum. Check recent department Updates for additional resources.

Course Components and Considerations

Information Processing includes more than keyboarding, office procedures, or computer applications. This curriculum outlines a new program that uses the computer as a tool to integrate important

business components of these and other courses.

Information Processing provides students at both the Middle Level and the Secondary Level with the basic skills to use the computer to process many types of information effectively and efficiently. The Information Processing program is developed within four board areas or strands that are integrated throughout the curriculum:

- Touch Keyboarding provides student with the opportunity to use the computer keyboard efficiently to process information
- Computer Applications are used as tools to assist in the application of learned processes, knowledge, and skills for the production of solutions to problems
- Communications includes written communications, verbal/nonverbal communication, human relations, and electronic communication processes
- Management of Processing Information focuses on increasing the efficiency and productivity of processing information and includes topics such as time management, ergonomics, records, and information management.

Each Information Processing course actively involves students in using the computer and learning the processes, skills and attitudes necessary to follow the information processing cycle. The activities within the cycle include: Input; Process; Output; and Distribute.

Information Processing is defined as a Practical and Applied Art (PAA). It is recognized that exposure to information processing is occurring and required at the middle level as well as the secondary level. This curriculum is available for use at both levels. The curriculum focuses on using the computer in creating, accessing, and processing information. One of the most important design features of the Information Processing program is the modular approach that provides flexibility in offering a program suitable to all students. Modules also allow for ease in curriculum updating. The core modules at each of the secondary grade levels have a specific focus:

Information Processing 10: Personal Use Focus

Information Processing 20: Business Focus

Information Processing 30: Managerial Focus

Recommended course configurations can be found just before the beginning of the modules in this guide. Many modules within this curriculum are available for use in a survey course. However, Module 2: Learning to Keyboard by Touch is a prerequisite for all modules other than Module 1, so it must be taught before the others can be used in a survey course.

It is important for students to develop an awareness and understanding of the value and importance of touch keyboarding and the impact this skill may have on productivity in school, personal, and future work and learning environments. The keyboarding strand of the program is essential for the efficient use of the computer keyboard. At least until voice input is perfected and easily available, and arguably after that, the keyboard will remain the most common input device.

The management strand of Information Processing focuses on the management of the vast amounts and types of information. Management elements include time management (organizing and planning), ergonomics, filing, information access, revision and management, and others. Management is integrated within all modules with an optional module designed specifically for records and information management.

It is extremely important to have effective communication skills to ensure that information is accessed, processed, and/or distributed appropriately. The communications strand of this document includes all forms of communication. Composition and written communications are integrated throughout the course. Oral communication can be accommodated through the use of various media including modems, telephones, and tele- or video-conferencing. Various hardware and software means for this exist.

Computers and computer applications software are the tools used to process information. The curriculum accommodates any hardware and software applications. Optional modules for the advanced use of various software applications and integrated software applications are included to accommodate the needs of students.

The optional Work Study modules provide opportunity for students to gain actual experience in information processing in the business world. To accommodate technological advancements in the ways information is processed or to extend student knowledge and skills learning in Information Processing, a 5-20 hour optional extended study module developed locally is included. This will allow schools to adapt the curriculum to immediate needs at each of the 10, 20 and 30 level.

Teacher creativity and advances in technology should make the design and delivery of Information Processing futuristic. The curriculum allows teachers the flexibility to adapt and focus on generic skills, as students complete activities following the information processing cycle throughout the Information Processing program. This will enhance students' abilities to adapt to future situations.

The activity-based learning and "process-oriented" approach to Information Processing provides opportunities for students to learn by doing, and assessing and evaluating their progress as they acquire information processing skills and abilities. Program organization and instructional strategies should simulate processes individuals use when dealing effectively with real life situations. The learning environment should support student activities by being organized to accommodate the use of computers, small and large group activity, and in-class and out-of-class activities such as field trips and job shadowing.

The assessment and evaluation of students should be designed to encourage students to apply their information processing skills continually to analyze real-life problems critically and to prepare solutions efficiently. Through their classroom experiences, students can build self-confidence and self-esteem by developing a greater awareness of their own expectations, attitudes, and perceptions of adapting to an information-based, technological society.

Where possible, the teacher should work cooperatively with business and community associations, interest groups, and other individuals when planning units of study, activities, and applications.

Within the Information Processing curriculum guide, many references are made to business and the community. Individuals in the business community are closest to the changes that take place in the business environment and they are the individuals who will hire students from the education system. An open dialogue between business and education is advantageous to business education curriculum implementation.

Community involvement through the use of resources such as speakers, field trips, community-based research assignments, and cooperative work study programs should be incorporated into the program. Community involvement can increase public acceptance of educational offerings and ensure a more contemporary treatment of current trends, ideas, and technology.

Information Processing and Practical and Applied Arts in general will provide both broad, general skills for all students and specific skills for a select group of students who plan business careers. These skills and this knowledge will prepare students for a variety of everyday experiences in the economic sector, for employment after high school, for post secondary pursuits, and lifelong learning.

Work Study Component

This module permits the student to apply school-based learning to workplace settings in the community. Students are provided with an opportunity to experience the optional work study component through appropriate placements. Module 24: Work Study Preparation and Follow-up

Activities must be covered prior to and following the work study module. The *Practical and Applied Arts Handbook* has detailed information in the "Work Study Guidelines" section. Students who have previously taken a work study module may cover content developed by Saskatchewan Labour found in the *Career and Work Exploration Curriculum Guide* and the *Practical and Applied Arts Handbook*.

These content references include:

- Labour Standards
- Occupational Health and Safety Act
- Workplace Hazardous Materials Information System (WHMIS).

Creating Partnerships for Work Study

Partnerships are important to the success of the work study component. There are three distinct partners that play an important role: the industry/business, the school and the student. Personal contact is the best approach to building partnerships. One should begin by making a presentation to colleagues within the school, to the student body, to school board members, to parents and to local businesses. It is important to outline the curriculum and the benefits and responsibilities for each of the partners.

See the modules outlined in the curriculum and the "Work Study Guidelines" in the *Practical and Applied Arts Handbook* for further information on work study.

Portfolios

A personal career portfolio is a valuable organizer of student projects and assignments. It encourages students to collect examples of their work as they progress through the various activities, labs and projects. Selecting particular items to include in a portfolio encourages students to reflect on what they have learned or accomplished and what they have yet to learn. Portfolio items may include: journal notes; drafts; photographs; audio or video tapes; computer discs; sketches and drawings; etc. Portfolios may be used for peer, teacher, self-assessment and as a format to present selected works to parents, post-secondary institutions or potential employers. In addition, the portfolio can demonstrate the link between home, school and community in the student's education. Each student should have a portfolio representing his or her work during the course.

The portfolio helps students:

- reflect on personal growth and accomplishment
- see links between home, school and community education and activities
- collect materials to prepare applications for post-secondary education and scholarship program entrance
- collect materials to prepare for employment applications
- focus on career planning.

The portfolio helps teachers:

- provide a framework for independent learning strategies for the student
- communicate student learning from one school year to another in a specific area of study
- identify career planning needs for students
- assess and evaluate the student's progress and achievement in a course of study.

The portfolio helps post-secondary institutions:

- determine suitable candidates for awards and scholarships
- evaluate candidates for program entrance
- evaluate prior learning for program placement.

The portfolio helps the community:

- reflect on the involvement in a student's education and the support offered to learners
- demonstrate the link between the home, school and community in education.

The portfolio helps potential employers:

- identify employable skills desired in future employees
- provide evidence of knowledge and skill development of potential employees.

Working Portfolio

Students collect work over time in a working folder. Each student should also keep a journal of observations, critiques, ideas and reflections as part of his or her working portfolio. Items in this portfolio may be used for the purpose of reflection, for ongoing and summative evaluations, peer, teacher and self-evaluations, for documenting skill development and mastery.

Working portfolios may be used for purposes of conferencing between student and teacher, teacher and parent, teacher and teacher or student and student. When a teacher examines a student's portfolio in order to make a decision regarding student progress the information it contains may become documented evidence for the evaluation.

A daily journal may also become a part of a working portfolio as a means of tracking the student's use of time and to record progress on ideas that are being developed. This will provide the student with a focus for self-directed or independent learning as well as an anecdotal record for part of the course evaluation.

Presentation Portfolio

To compile a presentation portfolio, students should select items from their working portfolio. The presentation portfolio should cover the range of students' experiences and should display their best efforts. The preparation of a presentation portfolio can be an assessment strategy. It is strongly suggested that students at the 30 level prepare a presentation portfolio suitable for submission to potential employers or post-secondary institutions.

Through collecting, selecting and reflecting, students are able to compile presentation portfolios that display their best collection of work.

Extended Study Modules

The extended study module is designed to provide schools with an opportunity to meet current and future demands that are not addressed by current modules in the renewed PAA curriculum.

The flexibility of this module allows a school/school division to design one new module per credit to complement or extend the study of existing pure core modules and optional modules. The extended study module is designed to extend the content of the pure courses and to offer survey course modules beyond the scope of the selection of PAA modules.

The list of possibilities for topics of study or projects for the extended study module approach is as varied as the imagination of those involved in using the module. These optional extended study module guidelines, found in the *Practical and Applied Arts Handbook*, should be used to strengthen the knowledge, skills and processes advocated in the Practical and Applied Arts curriculum in which the extended study module is used.

It is recommended that a summary of any extended study module be sent to the Regional Superintendent of Curriculum and Instruction to establish a resource bank of module topics.

For more information on the extended study module, refer to the *Practical and Applied Arts Handbook*.

Instructional Resources

To support the principle of Resource-based Learning, a variety of instructional resources have been evaluated and recommended for the teaching and learning of Information Processing 10, 20, 30. Teachers should also consult the comprehensive PAA bibliography. The annual *Learning Resource Materials Update* can also provide information about new materials evaluated since the curriculum was produced.

Assessment and Evaluation

Student evaluation is an important part of teaching as it allows the teacher to report the successes and challenges of the student to the parent. Evaluation also provides valuable feedback about how a student learns best. It is important that teachers use a variety of evaluation strategies to evaluate student progress. Additional information on evaluation of student achievement can be found in the Saskatchewan Education documents *Student Evaluation: A Teacher Handbook, 1991* and *Curriculum Evaluation in Saskatchewan, 1991*.

It is important that the teacher discuss the evaluation strategies to be used in the course, when the evaluation can be expected to occur and the weighting of each evaluation strategy and how it relates to the overall student evaluation. The weighting of the evaluation should be determined in relation to the amount of time spent and emphasis placed on each area of the course, as suggested in the curriculum guide.

The Information Processing 10, 20, 30 curriculum provides many opportunities for teachers to use a variety of instructional and evaluation strategies. Evaluation instruments that may be used in the teaching of this course are included the Practical and Applied Arts Handbook. Sample copies of overall evaluation for the course, evaluation for general student skills and work study are included for teachers to adapt and use.

Here is a sample evaluation scheme:

Tests (written)	20%
Project work	15%
Homework and Assignments	10%
Classroom Presentations	5%
Work Study	25%
Final Examination	25%

Regular program evaluation could include a survey involving parents, students and employers to determine program effectiveness and needs for change, if any. Information specific to program evaluation is found in Saskatchewan Education's *School-Based Program Evaluation Resource Book (1989)* and the *Practical and Applied Arts Handbook*.

For more information about student evaluation refer to the *Practical and Applied Arts Handbook (Saskatchewan Learning, 2002)* or *Student Evaluation: A Teacher Handbook (Saskatchewan Education, 1991).*

For information about curriculum evaluation refer to *Curriculum Evaluation in Saskatchewan (Saskatchewan Education, 1991)*.

Apportioning Emphasis Within a Module

There are four areas of importance within the modules of this curriculum where teachers will collect data on student progress. **The four areas are: content, process, keyboarding skills, and attitude.**

Information Processing will enable students to adapt to personal-use applications and the business world. Students use content and keyboarding skills to process information throughout the information processing cycle. Attitudes acceptable for business will need to be formed to facilitate student success in personal endeavours and future employment.

Straight-Copy Timed Writings

Historically, straight-copy timed writings (timings) have been a major tool in determining the keyboarding progress of students. In the past, students have been penalized for errors made during the typing of timed writings. Because word processing software allows for easy and immediate correction of errors during the input phase, and because this is the way students will eventually use their keyboarding skills, it is suggested that error correction during timed writings be allowed and encouraged. As the skill of immediate error recognition and correction is important, students should make corrections during a timed writing session, not after the designated time period has elapsed.

Timed writings begin in Module 2. The following is a suggested maximum timed interval for straight-copy timed writings at each grade level.

Information Processing 10.....3 mins.

Information Processing 20.....5 mins.

Information Processing 30.....5 mins.

Students may be given opportunities to attempt the same timed writing more than once in a timed session, two attempts may be appropriate. The goal of a succeeding attempt should be improving the previous keyboarding rate.

Calculating Keyboarding Rates

A keyboarding rate is determined by taking the total number of keyed words divided by the predetermined time interval in minutes. A word is defined as any five keystrokes.

If an error is not corrected at the conclusion of the timed writing, one word per uncorrected error may be deducted from the student's keyboarding rate. It is recommended that the product of such a timed writing be designated as "correct words a minute," abbreviated CWAM.

$$\frac{Words}{time\ (minutes)} - \ number\ of\ errors = CWAM$$

Assessing Keyboarding Skill Improvement

Students should be evaluated on their individual achievements in the skill of touch keyboarding.

In order for touch keyboarding to be a useful skill, it is strongly recommended that students strive to exceed a minimum of 25 CWAM by the end of the core module for Information Processing 10. Teachers of senior students are encouraged to investigate current industry standards for entry level positions in the work place. Touch keyboarding skills will be used throughout the Information Processing program and should improve with regular practice. Assessment on keyboarding skill development should be collected regularly.

The following three-phase plan can be used to collect data for evaluating skill improvement:

- Determination of an Entry Rate: To measure improvement in keystroking ability, a base or entry rate must be determined for each student. A pre-test could take a variety of forms. For example, the student may be given two three-minute timed writings of the same copy at the 10 level or five-minute timed intervals at the 20 and 30 levels. The highest rate achieved of the two timed writings would become the student's entry rate.

- Development and Improvement: Once an entry rate has been established, the student may begin to develop keystroking proficiency and improve touch keyboarding skill. Development and improvement can be achieved through exercises and tasks suggested within the curriculum.
- Determination of an Exit Rate: Upon completion of the development and improvement phase, a final or exit keystroking rate can be determined. The exit rate could be determined by selecting the highest timed writing rate obtained in the student's final three timed sessions.

Information on progress in extending the keyboarding rate can be determined by comparing the student's entry rate with the exit rate.

When determining the entry rate or exit rate, careful consideration should be given to ensure that the conditions established to determine the exit rate be identical to those established for the entrance rate. The following considerations will apply:

- The duration or length of the timing used to determine the exit rate should be the same as that used to determine the entry rate.
- The copy selected for the exit level timing should be of the same level of difficulty as the copy used to establish the entry rate. The type of copy and its syllabic intensity should be similar.
- The method used for calculating the exit rate should be the same as that used to establish the entry rate. For example, if the entry rate was established in correct words a minute, the exit rate should be determined applying the same standards in correct words a minute.

Timed writing information may be recorded in a timed writing log. This log can be used to chart a student's progress in keyboarding speed development and can be inserted into a student's portfolio of work. Timed writing information may be recorded by both the student and teacher. The information collected in the timed writing log, along with other information collected on student progress in keyboarding achievement, can be used in making an evaluation of keyboarding skill improvement.

The Skill of Keyboarding by Touch

Students need touch keyboarding skills in order to process information efficiently and effectively. Therefore, it is important for touch keyboarding skills to be developed and used throughout the Information Processing program. Teachers are encouraged to refer to Appendix A: Acquiring and Developing the Skill of Keyboarding, for support.

Three keyboarding modules are offered for skill development and maintenance. Module 2 focuses on acquiring the skill of keyboarding. This module is a core module and **must be successfully completed prior to beginning any other module except Module 1** in a pure or a survey course. Module 5 is a 10-15 hour, repeatable module designed to be used in **each term** where Module 2 has not be completed. Students will enhance their keyboarding skill in terms of speed and accuracy. Module 6 is a 5 hour module designed for use in a survey course after Module 2 has been successfully completed. The objectives of this module require learners to recall, maintain and improve the skill they developed in Module 2.

Module Overview

Module Code	Modules	Suggested Time (hours)
INFO101	Introduduction to Computer Technology (Core)	5-10
INFO102	Learning to Keyboard by Touch (Core)	15-20
INFO103	Information Processing Activities (Optional)	5-10
INFO104	Information Processing Projects (Optional)	5-10
INFO105 A, B, C	Intermediate Keyboarding (Core)	10-15
INFO106	Intermediate Keyboarding For Survey (Optional)	5-10
INFO107	Developing IP skills for Personal Use (Core)	5-10
INFO108	Introductory Word Processing and Formatting (Core)	20-25
INFO109	Business Information Processing (Core)	15-20
INFO110	Managerial Information Processing (Core)	15-20
INFO111	Introduction to Spreadsheets (Core)	10-15
INFO112	Introduction to Database Software and Their Applications (Core)	10-15
INFO113	Skills for Entry-Level Employees (Optional)	15-20
INOF114	Intermediate Word Processing (Optional)	20-25
INFO115	Intermediate Database: Management of Information and Records (Optional)	15-20
INFO116	Intermediate Spreadsheet Applications (Optional)	15-20
INFO117	Integrating Software Applications (Optional)	15-20
INFO118	Effective Business Writing and Document Production (Optional)	15-25
INFO119	Desktop Publishing (Optional)	20-25
INFO120	Internet Theory, Use and Exploration (Optional)	10-15
INFO121	Intermediate Computer Technology (Optional)	10-15
INFO122	Troubleshooting and Technical Assistance (Optional)	10-20
INFO123	Career Opportunities in Information Processing (Core)	2-5
INFO124 A, B, C	Work Study Preparation and Follow-Up Activities (Optional)	5-10
INFO125 A, B, C	Work Study (Optional)	25-50
INFO199 A, B, C	Extended Study (Optional)	5-20
PHGA09	Introduction to Digital Photography (Optional)	7-10
PHGA16	Intermediate Digital Photography (Optional)	10-15
PHGA17	Digital Manipulation (Optional)	10-15
PHGA28	Advanced Digital Photography (Optional)	5-10
PHGA29	Advanced Digital Manipulation (Optional)	5-10
PHGA37	Computer-Aided Graphic Design (Optional)	10-15
PHGA39	Scanning and Design (Optional)	4-6
PHGA50	Cover Design (Optional)	5-10
PHGA51	Scanning and Colour Correction (Optional)	2-5
CPTE07A	Introductory Multimedia Production (Optional)	10-20
CPTE07B	Intermediate Multimedia Production (Optional)	10-20

Suggested Course Configurations

Module Code	Information Processing 10	Suggested Time (hours)
INFO101	Module 1: Introduction to Computer Technology	5
INFO102	Module 2: Learning to Keyboard by Touch	20
INFO107	Module 7: Developing IP Skills for Personal Use	10
INFO108	Module 8: Introductory Word Processing and Formatting	20
INFO111	Module 11: Spreadsheets and their Applications	15
INFO120	Module 20: Internet Theory, Use and Exploration	15
CPTE07A	CPT Module 7A: Introductory Multimedia Production	15
	Minimum	100

Module Code	Information Processing 20	Suggested Time (hours)
INFO105A	Module 5A: Intermediate Keyboarding	15
INFO109	Module 9: Business Information Processing	15
INFO112	Module 12: Introduction to Database Software and Applications	10
INFO113	Module 13: Skills for Entry-Level Employees	15
INFO119	Module 19: Desktop Publishing	25
PHGA09	PHGA Module 9: Introduction to Digital Photography	7
CPTH07B	CPT Module 7B: Intermediate Multimedia Production	13
	Minimum	100

Module Code	Information Processing 30	Suggested Time (hours)
INFO105B	Module 5B: Intermediate Keyboarding	10
INFO110	Module 10: Managerial Information Processing	15
INFO114	Module 14: Intermediate Word Processing	20
INFO116	Module 16: Intermediate Spreadsheet Applications	15
INFO121	Module 21: Intermediate Computer Technology	15
PHGA16	PHGA Module 16: Intermediate Digital Photography	10
PHGA39	PHGA Module 39: Scanning and Design	5
PHGA17	PHGA Module 17: Digital Manipulation	10
	Minimum	100

Note: These are suggested configurations only.

Core and Optional Modules

Module 1: Introduction to Computer Technology (Core)

Suggested Time: 5-10 hours
Level: Introductory
Prerequisites: None

Module Overview
This module will give students a basic overview of the hardware and software that will be utilized in Information Processing. Terminology related to computers will be introduced, and the information processing cycle will be studied.

Foundational Objectives

- To be familiar with basic hardware and software terminology and features
- To recognize the importance that computer technology has in our society, and how it has become integral in our everyday lives.

Common Essential Learnings Foundational Objectives

- To develop an appreciation of the importance of the information processing cycle in many aspects of students lives and in society in general. (COM, PSVS)
- To establish a general understanding of computer components to prepare students for efficient use of computers in their private life and in school. (TL)

Teachers should note that the nature of Information Processing presumes the integration of previous learning and should consider student's previous experience and knowledge.

Learning Objectives	Notes
1.1 To identify, define, and describe the features and terminology related to computers, hardware and software.	The depth of instruction required in this learning objective will be dependent on the background of the students. It is important that students be familiar with the operating system they will be using prior to its introduction. Aspects of terminology and features of the system may be introduced throughout the course, as used and needed. Identify the main elements of the microcomputer that students will be using. As students will be using the computer and software applications throughout IP, it is suggested that they be familiar with some computer terms and the operation of their equipment. It will be important for students to recognize that the efficient use of the keyboard will expedite productivity.

Learning Objectives	Notes
	Terms and concepts that may be included in the explanation of computer hardware include: input devices; central processing unit (CPU); data storage devices; output devices; video display terminal (VDT); printer; and, keyboard. Provide opportunities for students to learn the features of the keyboards they will use. Establish names for keys.
1.2 To identify the changes and trends in the evolution of computer as well as the differences in current technology.	Students may be provided with a brief overview of how computers have evolved to the microcomputer generation. Students may distinguish between different types of computers identifying similarities and differences between computers having different operating systems.
1.3 To demonstrate understanding of the terminology and skills necessary to operate a computer effectively.	Computer terms, concepts and procedures that are important to review or to teach include: ICON, window, screen scroll, how to power up the computer, loading a program, using a menu, using special function keys, using a mouse, file management (storing a file, preparing a backup file, naming and renaming files, deleting files, copying files, recalling files, creating, naming and renaming folders), and formatting storage media. Co-operative learning groups may be jigsawed as students review the concepts around computer hardware and software. A handout of the terms to be reviewed may be given to each group. Each member of the group could be assigned an equal number of terms and concepts to define and describe. Each student would be responsible for the definition and purpose of the term or concept and would share the knowledge with the other members of the group. To familiarize students with computer hardware and software applications, students may work individually, be paired, or placed in small groups and given a tutorial or learning activity package to complete at the computer station. A checklist identifying the specific functions and skills that students will demonstrate at the computer may be provided to the student for self-assessment.

Learning Objectives	Notes
1.4 To demonstrate the ability to manage desktop/workspace properties.	Students should be able to create, rename, delete and arrange desktop icons. Students should be required to create shortcuts and place them in the appropriate location (not always the desktop) and should be able to change certain properties of their display.
1.5 To identify, describe and use various types of software packages.	Examples of operating systems, utility software (such as defrag, compression and virus protection) and applications software (such as word processing, spreadsheets, databases, communication software) should be discussed and explored. Concept attainment activities could be used to establish an understanding of the differences and function of each type of software.
1.6 To demonstrate consistently the appropriate use and care of all hardware and software.	A videotape that provides an overview of a computer system and software applications may be used to review the basic fundamentals of use and care of computer hardware and software. Alternatively the teacher may use a lecture combined with a demonstration of the desired procedures for the start up, shut down, use and care of the computer equipment the students will be using. Students may model the demonstration on their equipment. Basic maintenance software such as defrag, virus protection and disk clean up may be re-visited and demonstrated at this time. Students should also be able to troubleshoot simple hardware problems such as poor cable connections, and distinguish hardware problems from software problems.

Module 2: Learning to Keyboard by Touch (Core)

Suggested Time: 15-20 hours
Level: Introductory
Prerequisites: None

Module Overview
This module is the foundational module for keyboarding skills that are essential for students to be successful in Information Processing. The skills developed in this module should be maintained and enhanced throughout the course, as well as in future Information Processing courses. This core module, which focuses on acquiring the skill of keyboarding, has been designed so that students with little or no previous touch keyboarding skills may acquire these skills. To assess students' entry-level touch keyboarding skills, teachers may pretest touch keyboarding performance. This assessment of students' initial performance assists in determining the appropriate keyboarding skill development program for each student.

Teachers should note that the nature of Information Processing presumes the integration of previous learning. The acquisition and demonstration of touch keyboarding skills learned in this module should be demonstrated further in the activities completed in the other selected modules of the course.

Foundational Objectives

- To use touch keyboarding skills in the efficient use of the computer keyboard.
- To develop communication skills needed for information processing.

Common Essential Learnings Foundational Objectives

- To understand the benefits that proficient keyboarding skills will have in their lives. (PSVS)
- To establish goals and carry out activities required to reach those goals. (IL)

Learning Objectives	Notes
2.1 To recognize and demonstrate the elements of good touch keyboarding technique.	The elements of good keyboarding technique include the display of correct body posture, correct arm and hand position, and correct keystroking. It is important that students know that using good keyboarding technique is crucial to the development of maximum keyboarding skill and that it facilitates the processing of information at the computer. A technique checklist to be used for assessment may be placed in the student's reference manual or notebook and students may be asked to refer to it daily. Invite the school nurse or health district representative to discuss the potential health risks of poor technique (carpal tunnel syndrome, neck and back aches). Students could key a summary of this presentation. Have students research repetitive stress injuries.

Learning Objectives	Notes
2.2 To execute and practise the skill of touch keyboarding the alphabetic, numeric, punctuation and basic service keys.	Touch keyboarding requires the operation of the alphanumeric keyboard without looking at the keyboard. Touch operation is desirable in using the keyboard for the following: • alphabetic keys • punctuation keys including the semicolon, colon, apostrophe, quotation mark, comma, period, diagonal, and question mark • basic service keys including the enter (return), space bar, left and right shift keys, and tab key • number keys located on the numeric keyboard (above the letter keys). Refer to **Appendix A: Acquiring and Developing The Skill of Keyboarding** for support. As touch keyboarding is a cumulative skill, what is learned at each level is heavily dependent upon what has been learned previously. It is recommended that adequate practice time be given prior to the introduction of additional new keys. Keyboarding instruction should begin with the home row keys. A typical keyboarding lesson may include a comprehensive review of learned keys, drills to build keystroking proficiency of the previously learned keys, introduction of new keys, keyboarding practice including the new keys, with encouragement and reinforcement for keyboarding technique improvement. The number of new keys presented during each lesson should be limited to two. In addition, it is recommended that every third or fourth lesson be a review lesson where no new keys are presented. It is strongly recommended that students be given a variety of keyboarding activities with the activities changed frequently to help reduce fatigue and boredom. As soon as possible, students' practice material may include word, phrase, and sentence content. At this stage, students can be encouraged to keyboard correctly and use punctuation such as the comma, colon, semicolon, period, quotation marks, apostrophe, and question mark. The teacher should constantly monitor and reinforce the elements of good technique throughout the information processing course. Errors are acceptable in the initial learning of the location of the alphabetic and numeric keys. The teacher may encourage students to concentrate completely on incorporating the elements of good technique and discourage correcting errors (but be aware that an error was keyed).

As a general guideline at the introductory level, to attain an acceptable level of skill in touch keyboarding for personal use, students should be able to key at least as fast as they hand write. Encourage students to develop and practise their keyboarding skill to surpass this goal.

When learning to use the keyboard by touch, it is recommended that no penalty be assessed for uncorrected errors. This allows the learner to concentrate on improving keystroking skill and using proper technique. The improvement of accuracy will be encouraged at a later stage in the skill development phase (when students are introduced to Correct Words a Minute as an assessment tool). In the initial learning stages, video display terminals may be turned off to encourage "eyes on copy" and discourage students from focusing on the correction of errors.

Assessment data on student keyboarding technique, attitude, and effort may be collected as students practise their touch keyboarding skills using the following suggested activities or drills:

- individual letter and short words drills
- upper and lower "reach" drills such as juj and fvf
- composition at the keyboard
- keying from dictation
- keyboarding games that encourage skill building (Appendices)
- flash cards with numbers or alphabet
- mathematical equations requiring students to key the answer
- concentration drills such as keying the word from left to right and then from right to left
- word play, limericks and poetry requiring the student to fill in missing words.

Keyboarding skill needs to be maintained throughout the course by regularly encouraging proper technique, and by providing brief, regular practice.

Punctuation Notes: Traditionally, there are two spaces following a period at the end of a sentence, but only one space follows a period after an abbreviation. However, it is becoming common in industry to use only one space after a period at the end of a sentence. Both are considered acceptable, but must be consistent. A colon (:) is followed by two spaces, a semicolon (;) is followed by only one. A question mark at the end of a sentence is followed by two spaces, whereas a question mark within a sentence is followed by one space (Did you go, Jane? Fred? Nancy?).

Module 3: Information Processing Activities (Optional)

Suggested Time: 5-10 hours
Level: Introductory
Prerequisite: Module 1

Module Overview
These activities are designed to introduce the students to the types of activities that will be done in Information Processing. They will also develop skills that they will be able to transfer into work in other subject areas. The teacher will need to consider the experience of the students when using this module. The activities of this module should combine touch keyboarding and introductory formatting skills, while integrating these skills into other areas of study.

Foundational Objectives

- To apply keyboarding skills to both personal and school situations whenever the opportunity arises.
- To use computer hardware and word processing software to produce simple personal-use documents.

Common Essential Learnings Foundational Objectives

- To enable students to think for themselves and integrate the skills they have developed to design and produce appropriate personal use documents. (CCT)
- To recognize the capabilities and limitations of application software, and how those capabilities can be best utilized. (TL)

	Learning Objectives	Notes
3.1	To demonstrate the ability to compose at the keyboard.	Provide students with a topic, or the beginning sentence of a story, such as “I was very surprised when I opened the trunk of our car and found . . . “and have them complete the story or essay.
3.2	To demonstrate competence in the application of introductory formatting skills.	Provide students with a simple unbound one page report example. Consider having students annotate the formatting rules on their copy of the sample. Key a report together as a class. Have students complete at least two reports. Consider having students select a topic, gather research, draft and then key the report in the specified format. Consider integrating relevant English, Social Studies or Science, etc. objectives and work with a colleague to synthesize an assignment.

Learning Objectives		Notes
3.3	To correctly format and produce a personal letter and a one page unbound report.	Provide students with a simple personal letter example. Have students complete at least two personal letters, one which may be composed to a friend or relative.
3.4	To demonstrate the ability to proofread documents competently, identifying all uncorrected errors and revising accordingly.	Students should always be encouraged to proofread their own documents on the computer before they are printed. Peer editing of documents produced in class, or editing prepared files that have errors will also build this skill.
3.5	To demonstrate understanding of the purpose and contribution of graphics.	Once students have learned to touch keyboard and format work using word processing software, the addition of graphics may motivate and captivate learners. They should use the font and graphics features of word processing or desktop publishing software. If available, image-processing programs could be used in this module.

Module 4: Information Processing Projects (Optional)

Suggested Time: 5-10 hours
Level: Introductory
Prerequisite: Module 2

Module Overview
This module aims to integrate the keyboarding, wordprocessing and other computer skills that have been developed into a major project. Opportunity for developing time management skills also arises.

Foundational Objectives

- To apply and integrate touch keyboarding and word processing skills into other areas of study.
- To develop personal goal setting and time management skills.

Common Essential Learnings Foundational Objectives

- To integrate information processing skills with other subject material in such a way that the value of those skills is recognized. (CCT)
- To develop a time line and recognize the importance of time management skills. (IL)

Learning Objectives	Notes
4.1 To apply and integrate touch keyboarding and word processing skills into other areas of study to complete an information processing project.	This module should challenge students. Teachers may assist students in choosing an appropriate project topic, perhaps from other areas of study. In addition to applying touch keyboarding and word processing skills, teachers may introduce and reinforce the concepts of organization and time management. It is recommended that students be encouraged to make use of all the available technology while working on their projects. Students may be encouraged to consider accessing graphics applications, communications software, desktop publishing software, digitizing technology, the Internet and CD ROM information as they carry out the processes necessary to complete their project. Although this module allows teachers the flexibility to allow students to determine a topic for the information processing project, a team approach to topic selection could ensure meaningful learning for the students and the effective use of class time.

As students work on their project, they may be involved in all or some of the following activities:

- Creating, designing, and publishing a set of guidelines or a set of questions or topics to be researched
- Accessing and using all available resources, including print and non-print (electronic encyclopedias, the Internet, audio-visual media, or resource personnel in the community)
- Composing at the keyboard combining keyboarding, word processing, and formatting knowledge and skills
- Printing final document(s) in acceptable form (possibly integrating graphics and desktop publishing)
- Sharing information with class members, possibly in small groups
- Preparing documents for community groups, school groups, sports teams
- Preparing thank-you letter(s) or notes to community and or/school personnel involved in the project.

Module 5A, B, C: Intermediate Keyboarding (Core)

Suggested Time: 10-15 hours
Level: Intermediate/Advanced
Prerequisite: Module 2

Module Overview
This module is designed to advance skill development of keyboarding for students in a pure Information Processing course. **This module must be repeated in each pure course in which Module 2 is not taught.**

Foundational Objectives

- To use touch keyboarding skills in the efficient use of the computer keyboard.

Common Essential Learnings Foundational Objectives

- To develop an appreciation for the benefits of having good keyboarding skills (PSVS)

Learning Objectives	Notes
5.1 Recall and demonstrate the skill of touch keyboarding (alphabetic, numeric, punctuation, and basic service keys)	The current skills of the students should be evaluated to determine the type and amount of practice required on the basic touch keyboarding skills. Adaptations should be made to accommodate students at various levels of proficiency.
5.2 Assess beginning touch keyboarding skill development to determine individual touch keyboarding practice	Remind students that keyboarding is a developmental skill that improves with practice and use. Each student will need to provide evidence of touch keyboarding skills in order to determine areas to target for improvement. Refer to **Appendix A: Acquiring and Developing The Skill of Keyboarding**, for support. As touch keyboarding is a cumulative skill, it is recommended that early in the course a block of class time be devoted for a complete review of all alphabetic, numeric, punctuation and basic service keys on the keyboard. It is important to ensure that students have adequate time to practise and review the keyboard early in the course, as this time should help facilitate the completion of information procession tasks required throughout the course.
5.3 Develop and improve cursor movement and error correction techniques.	Students should be aware of the difference between backspace and delete, they should be able to switch between strikeover and insert mode, and use these when appropriate.

Learning Objectives	Notes
5.4 Complete timed writings using correct words a minute (CWAM) as a measure of keyboarding rate.	For IP 20 and IP 30, survey the community to determine the minimum keyboarding rate expected of the entry level employees. Use this information to set goals for the students to attain or surpass. Rates at this level should be based on 5 minute timings.
5.5 Use keyboarding rates to assist in applying the three phases of the keystroking proficiency development plan.	The keystroking proficiency development plan has three phases, as described in the introduction of this document.
5.6 Develop keystroke proficiency and improve touch keyboarding skill in the execution and application of the keys listed in 5.1.	Symbol keys and function keys can be reviewed as classroom activities and software applications require. Students are expected to use their touch keyboarding skills throughout the course thereby continuing to develop their keyboarding skills with use. However, it is recommended that a regulated time be allocated throughout this module for keyboarding skill-building activities such as drills and timed writings, so that students are able to devote time to meet their individual keyboarding goals (perhaps the first five minutes of each class). Keyboarding software and programmed learning packages may be used for remediation and reinforcement of keyboarding skills, depending on the needs of the individual. Suggested activities include having students perform practice and drill exercises, completing warm-up lines that vary in complexity, keying journal or diary entries on a daily basis, keying in newspaper articles on current events, stories, classroom notes or assignments from other courses of study.
5.7 Practise the skill of keyboarding the basic symbol keys, using the designated finger of the correct hand, and use the appropriate symbol as required.	It is important for students to know what the various symbol keys represent, when they are used and the correct finger to be used for each.

Learning Objectives	Notes
5.8 Practise the skill of touch keyboarding the figures of the numeric keypad, entering figures rapidly and accurately.	It is recommended that the student demonstrate proper operation position and technique in using the numeric keypad by touch. Students may begin by entering data using the numeric keypad home row keys (4, 5, 6) progressing to keying numbers involving upward reaches (7, 8, 9) and finally moving to the downward reaches (1, 2, 3, zero and decimal). It is desirable for practice material to include numbers of various sizes, including decimals and numbers representing various amounts. Numerical calculations may focus initially on addition, then subtraction, followed by division and multiplication.
5.9 Demonstrate good technique and improved speed and accuracy in the keyboarding of various copy including alphabetic, handwritten, rough draft, and statistical copy.	Students should be reminded and encouraged to demonstrate proper technique throughout the course, during all activities requiring keyboarding. Short timed intervals may be used to encourage speed and accuracy in processing and producing the final product. Have students compose at the keyboard for at least five minutes using a story starter like “I slowly walked into the room only to find . . . “ Have students print their composition and trade with another student with a similar keyboarding rate and key a three minute timing. Students could create a collection of timings to be collated and used for future Information Processing classes.

Module 6: Intermediate Keyboarding (Optional)

Suggested Time: 5-10 hours
Level: Intermediate/Advanced
Prerequisite: Module 2

Module Overview
This module is designed to be used only in a survey course. For intermediate keyboarding development in a pure course, module 5 should be used. The focus is on maintaining the skill acquired in Module 2. Teachers are encouraged to spend two to three hours of the module reviewing the skill and proper technique of touch keyboarding , ensuring that students are using the proper finger for each key. The Horizontal Sequence approach outlined in Appendix A: Acquiring and Developing the Skill of Keyboarding is suggested. The remaining time may be interwoven with other selected modules for skill maintenance.

Foundational Objectives

- To use touch keyboarding skills in the efficient use of the computer keyboard.
- To demonstrate improved and expanded keyboarding skills that were developed in Module 2.

Common Essential Learnings Foundational Objectives

- To develop an appreciation for the benefits of having good keyboarding skills. (PSVS)

	Learning Objectives	Notes
6.1	Recall and demonstrate the skill of touch keyboarding (alphabetic, numeric, punctuation, and basic service keys).	The current skills of the students should be evaluated to determine the type and amount of practice required on the basic touch keyboarding skills. Adaptations should be made to accommodate students at various levels of proficiency.
6.2	Assess beginning touch keyboarding skill development to determine individual touch keyboarding practise.	Remind students that keyboarding is a developmental skill that improves with practice and use. Each student will need to provide evidence of touch keyboarding skills in order to determine areas to target for improvement. Refer to **Appendix A: Acquiring and Developing the Skill of Keyboarding** for support. It is important to ensure that students have adequate time to practise and review the keyboard.

Learning Objectives	Notes
6.3 Develop and improve cursor movement and error correction techniques.	Students should be aware of the difference between backspace and delete, they should be able to switch between strikeover and insert mode, and use these when appropriate.
6.4 Complete timed writings using correct words a minute (CWAM) as a measure of keyboarding rate.	For IP 20 and IP 30, survey the community to determine the minimum keyboarding rate expected of the entry level employees. Use this information to set goals for the students to attain or surpass. Rates at this level should be based on 5 minute timings.
6.5 Use keyboarding rates to assist in applying the three phases of the keystroking proficiency development plan.	The keystroking proficiency development plan has three phases, as described in the introduction of this document.
6.6 Develop keystroke proficiency and improve touch keyboarding skill in the execution and application of the keys listed in 6.1.	Students are expected to use their touch keyboarding skills throughout the course thereby continuing to develop their keyboarding skills with use. However, it is recommended that a regulated time be allocated throughout this module for keyboarding skill-building activities such as drills and timed writings, so that students are able to devote time to meet their individual keyboarding goals. The first five minutes of each class might be appropriate. Keyboarding software and programmed learning packages may be used for remediation and reinforcement of keyboarding skills, depending on the needs of the individual. Suggested activities include practice and drill exercises, completion of warm-up lines that vary in complexity, keying journal or diary entries on a daily basis, keying in newspaper articles, stories, classroom notes, or assignments from other courses of study.

Module 7: Developing Information Processing Skills for Personal Use (Core)

Suggested Time: 5-10 hours
Level: Introductory
Prerequisite: Module 2

Module Overview
This module introduces and develops a variety of skills that students will be able to make use of in their personal lives. Communication skills and positive work habits are emphasized.

Foundational Objectives

- To examine the efficiency of the information processes considering efficiency and productivity.
- To develop information processing skills that will be helpful in their personal life.

Common Essential Learnings Foundational Objectives

- To use language for differing audiences and purposes that are relevant to information processing for person applications. (COM)
- To develop an appreciation of the importance of the information processing cycle in many aspects of life and in society in general. (COM, PSVS)
- To gain a general understanding of information processing tasks that will prepare students to use computers efficiently in their private life and in school. (TL)

Teachers should note that the nature of Information Processing presumes the integration of previous learning and should consider student's previous experience and knowledge.

Learning Objectives	Notes
7.1 Explain the importance of information processing in personal life and business activities.	Information processing refers to a process whereby data are transformed into some form of desired communication. Information processing follows a cycle that may include many stages such as origination, input, process, output, storage, replication, and distribution. The students should be able to describe the basic information processing cycle (input, process, output, distribution) and be aware of how activities that may be completed throughout the cycle apply to personal and business information processing. A basic information processing cycle is illustrated in Appendix A.

Learning Objectives	Notes
	Students will use the information processing cycle throughout the course. It is suggested that students explore and discuss the societal impact of computer technology in business and in the home. They may examine how the computer has been used and is being used as a tool to increase productivity in processing information. Future trends in information processing may also be discussed. Students may be asked to: • brainstorm a definition of information processing and report to the group • design posters illustrating the IP cycle components • prepare an oral presentation explaining the importance of the cycle and the activities related to the cycle that may take place in personal life or in business • in cooperative groups, discuss ways that computer technology is affecting the processing of information in the home and in the community.
7.2 Describe the components of communication and demonstrate the use of effective written and oral communication.	Effective communication is extremely important. The students may describe the importance of communication in personal life by giving examples of how communication is used daily. The emphasis may be placed on giving and receiving clearly stated messages in oral and written communication. Students may note problems that can occur with poor communication. It is important for students to be aware that written and oral communication skills are skills that may be developed and that people often take these skills for granted when communicating. Students may be provided with a data set of “yes” and “no” examples of effective communication. To assess student learning of the concept, each student may be asked to identify the critical attributes for effective communication and revise the “no” examples to become “yes” examples. Students may work in pairs, one giving the other oral instructions. As an example, a student could orally communicate instructions to a partner to reproduce an exact figure on paper. Peer and self-assessment of the communication process may be conducted on the sent and received message.

Learning Objectives	Notes
7.3 Demonstrate proper usage, and recognize improper usage of basic grammar and punctuation rules.	Time in the classroom may be used to review the rules for capitalization. Basic grammar rules such as language usage, proper sentence structure, and punctuation may also be reviewed. It is important for students to know the rules for using and spacing punctuation such as: period, question mark, exclamation mark, comma, semicolon, colon, hyphen, dash, parentheses, diagonal/slash, and apostrophe. It is also desirable for students to use the provincial abbreviations, metric symbols, and the decision-making process for keying numbers as words or figures appropriately. Students having previous knowledge in this area may require less time for review and may use their time to develop their oral and written communication skills further. A student handout may be used to review the basic grammar rules. The printed material may contain grammatical errors that could be corrected by the student. The accuracy of the answers in the written assignment may be assessed. Teachers should collaborate with the ELA teacher to meet this objective.
7.4 Recognize and develop work habits and positive attitudes that will enhance future educational and work experiences, including employability skills.	It is strongly recommended that teachers encourage positive attitudes and work habits at the beginning of the module and reinforce those habits and attitudes throughout Information Processing. Students could brainstorm a list of desirable attitudes and work habits for employability. Teachers can refer to the Employability Skills 2000+ produced by The Conference board of Canada, which is Appendix D.
7.5 Apply the principles of ergonomics and time management by demonstrating their use in information processing activities and other daily activities	Ergonomics is the study of factors that deal with humans, the physical work environment, and job performance. It is important that students understand how to organize their work environment for comfort and efficiency. This should be reinforced throughout. Invite a guest speaker to discuss ergonomics. Ergonomic factors that may be discussed include: adjustment of the height of the chair, uncluttered work area, screen height and image adjustments, room lighting, and proper placement of copy material. Students should be introduced to time management tools such as dayplanners and electronic calendars.

Learning Objectives	Notes
	The teacher may wish to have students prepare and use a "student reference manual" throughout the Information Processing course or program. The student-prepared reference manual could contain a variety of materials including notes, course outline, evaluation scheme, daily planner/diary/to do list, assessment tools, keyboarding skill development charts, and completed assignments. The use of a "student reference manual" throughout information processing provides opportunities for students to demonstrate their time management and organization skills. Pages in the manual could be numbered, illustrations and hard copies annotated or "labelled" with important information, and title pages prepared to introduce each new section within the document. In addition to developing organizational and time management abilities, students' reference manuals could become a valuable student reference, not only for the duration of Information Processing, but also for future learning and work experiences.
7.6 To proofread for errors in hard and soft copy and use the most commonly applied proofreaders marks.	It is recommended that students proofread all tasks completed throughout the Information Processing course. Students may be encouraged to proofread a document slowly, comparing it word for word to the original copy. Other proofreading techniques students may use include proofreading for spelling and keyboarding errors, proofreading for punctuation and grammatical errors, and checking for meaning. Electronic proofreading tools such as the spell checker or grammar checker may be used; however, students will need to be fully aware of their limitations. Some common proofreaders' marks can be found in Appendix H, and students should become comfortable with using these. Modelling by the teacher when assessing student work will make students aware of the common marks more quickly.

Module 8: Introductory Word Processing and Formatting (Core)

Suggested Time: 20-25 hours
Level: Introductory
Prerequisite: Module 2

Module Overview
This module may be used in conjunction with Module 2. The 20-25 hours offered in this module would provide students with the opportunity to apply touch- keyboarding and word processing skills to produce a variety of personal-use documents.

Foundational Objectives

- To use computer hardware and software to produce simple personal use documents.
- To understand the positive value of business in the community by linking the worlds of school and work.

Common Essential Learnings Foundational Objectives

- To explore the capabilities of the word processing software and determine when to apply those features to documents. (CCT)
- To engage in active involvement in decision-making and problem solving related to word processing in Information Processing. (TL)
- To develop an understanding of how knowledge is created, evaluated, refined, and changed within Information Processing. (CCT)

Learning Objectives	Notes
8.1 Identify and demonstrate the use of a variety of word processing functions that may be used in word processing personal documents.	Students can be expected to manipulate data efficiently and effectively to enter text, create documents, display text, edit and revise documents, manage and print files. The following are some examples of functions that may be used to process personal documents: • insert, delete, replace, and revise text • copy and move text from one page to another within the same document and to other documents • various display techniques like centre, underscore, italics, bold, fonts • page breaks • header and/or footer • “help” feature • spell check, grammar check • edit software defaults.

Learning Objectives	Notes
	The application of touch keyboarding skills throughout the completion of activities is required. Students will continue to be required to proofread, edit, save, and manage files. Students will demonstrate the following skills: creating, editing, saving, printing and recalling documents. It is important that students know when and how to perform a function. Memorization of the keystrokes required to perform all functions may not be required. Allowing students to use reference materials to assist with the use of software functions is acceptable. Students should also be encouraged to explore alternatives and determine the most efficient method to execute each function. Ensure that students are aware that each word processing program may require different keystrokes or manipulations in order to attain the same function.
8.2 Annotate and produce correctly-formatted single-page and multiple-page reports.	Given a printed copy of a two-page unbound report, students could identify and label the document indicating the parts of a report. Students could also annotate the document, recording pertinent formatting information such as the appropriate internal spacing, margins, and line length. The document could be placed in students' reference manuals. Depending on the references used, differences may exist in the particulars of document formats. Teachers and students will need to be aware of these differences, select appropriate guidelines to follow, and be consistent in applying the guidelines. Students may word process outlines to organize information in the preparation of a report. The outline facilitates the process for conducting research, developing the material to be included in the document, and editing the final draft. Students should be encouraged to continue to proofread and check their own and each other's work. Remind students that the use of a software's spell-checking function does not identify all errors. Students could key, correctly format, and produce an unbound one-page report and/or a multiple-page report. Alternatively, students could create a one-page report, then recall it, extending and revising the document so that it becomes a multiple-page report.

Learning Objectives	Notes
	After students have had experience in correctly formatting reports, they could key, format, and produce a multiple-page report from conducted research and composition. The content of the report may result from a joint project with another area of study. The subject area teacher may assess the content of the report. After proofreading their own or a classmate's printed document, students could use proofreaders' marks to indicate any necessary corrections and proceed to make revisions.
8.3 Prepare a title page for a report recognizing the need for essential elements of a title page.	On a hard copy of a sample title page, the students could identify and annotate the elements of the document. The title page of a report may contain the title of the report, the author's name, the name of the course for which the report is prepared, the name of the institute, and the current date or the due date. Graphics may also be placed on a title page to enhance its appearance. An important concept to address in formatting a title page is the balance of information with the white space of a page. Recognize that information on a title page may be displayed in a variety of ways. Depending on the references used, differences may exist in the particulars of formatting title pages. Students will need to be aware of these differences. Students may produce title pages to accompany one or more of the reports produced earlier in the module.
8.4 Annotate and produce correctly formatted reference pages.	The reference page or bibliography is an alphabetic listing of all the sources of information used by the author in preparing a report. Students should be aware that acknowledging the work of others they have used in their work is considerate and necessary. Neglecting to do so is plagiarism. Sources of information may include books, websites, electronic encyclopedias, magazines, government publications, and newspaper articles. It is recommended that the reference page be prepared as a separate page. Depending on the reference used, recognize that variations in formatting of reference pages may exist.

Learning Objectives	Notes
	Students may be provided with a data set of "yes" and "no" examples of acceptable reference pages that would accompany reports. Once the concept is attained, in pairs or small groups, students could use proofreaders' marks to indicate the revisions required making the "no" examples become "yes" examples. Students may process the corrections. Students may produce reference pages to accompany previously completed report assignments. On hard copy of a reference page, students could identify the elements of the reference page and annotate the document to indicate formatting rules. This page could be placed in the students' reference manuals.
8.5 Annotate, produce, and compose correctly formatted personal-business letters in extreme block letter style with open punctuation and accompanying envelopes.	The basic parts of the personal-business letter may include the following: writer's address (return address); date line; mailing notations (as required); inside address (the receiver of the letter); salutation (or greeting); body; complimentary closing; and the writer's identification (writer's name, title [if any], and signature). This may also be known as the originator's identification or the signer's identification. A variety of formats of personal-business letters exist. At this level, students will be expected to use one letter style and punctuation pattern in their letters. Given a printed copy of a personal-business letter formatted in extreme block style with open punctuation and the accompanying envelope, students could note techniques for proper formatting, such as line length, starting line and internal spacing. In addition, students could identify and label basic parts of the letter and the envelope. These items could be placed in the students' reference manuals. Students may be provided with a set of "yes" and "no" examples of personal-business letters. In pairs or small groups, students could separate the letters into "yes" and "no" groups and then use proofreaders' marks to revise the "no" examples to become "yes" examples. Students may prepare the letters. Having the students create the proper and improper letters for other students to work with would be an interesting variation.

Students could key parts of the personal-business letters addressed to each other. Working in pairs, students could key and format the parts of the letter using their own address as the return address, the current date, their partner's name and address as the inside address, a suitable salutation, a complimentary closing, and their own name as the signer of the letter. The accompanying envelope could also be prepared.

The basic parts of the envelope include the return address (writer of the letter), the inside address (receiver of the letter) and required mailing notations. The return address and inside address should be printed on the envelope according to Canada Post standards. If available, students may process labels to prepare envelopes.

Students could key, correctly format, and produce personal-business letters in extreme block style with open punctuation and accompanying envelopes. They could fold letters and insert them into the accompanying envelopes and send them.

Students may compose a wide variety of letters at the keyboard. Some suggestions include letters of application, letters requesting travel information, and thank-you letters to organizations. Students could also partake in a letter writing campaign regarding an issue of concern to them. Letters to members of Parliament require no postage. Activities completed on the computer may be assessed from soft copy or as hard copy.

Students may use a letter-planning chart to plan and organize their thoughts. Anecdotal notes may be recorded for students who attempt to use the chart.

Learning Objectives	Notes
8.6 Distinguish between the personal-business letter and the personal letter, recognizing the differences while composing and formatting the personal letter.	The basic parts of the personal letter are similar to those contained in the personal-business letter. Major differences may include: the omission of the inside address; the salutation of the letter usually refers to the receiver on a first name basis; a personal complimentary closing may replace the business-like complimentary closing; and the message conveyed is friendlier and more personal in tone. Given a printed copy of a personal-business letter and a copy of a personal letter, have the students analyze each to determine the similarities and differences in formatting and in purpose. They might key their response in the form of a letter to the teacher or prepare to orally present their findings to the group. Personal letters can be formatted using the letter styles and punctuation patterns that other letters may adopt (business or personal-business letters). Students will need to be made aware of the acceptable variations in formatting personal letters but they should be encouraged to follow the guidelines adopted in the classroom consistently. Once personal letters have been prepared, students may be given the opportunity to distribute their correspondence. Methods of distribution include using the postal system, hand delivery or sending the correspondence electronically via facsimile (FAX) or electronic mail (e-mail). Electronic mail (E-mail) messages may be prepared and communicated to classmates as students practise composing messages with a personal tone. This activity could be extended to include distribution of personal messages to individuals in other schools or organizations. Some suggested activities for personal letters may include correspondence prepared for pen pals, friends, or relatives. For example, a Christmas letter may be prepared. Students may import graphics to their personal letters.

Learning Objectives	Notes
8.7 Interact with the business community integrating the knowledge, processes, attitudes, and keyboarding skills attained to complete a personal project.	A focus of this objective is to provide students with a culminating activity that would give them a meaningful opportunity to extend the application of the skills and processes acquired in information processing to a meaningful personal application. This learning objective may be facilitated through a simulation or project that students follow through the information processing cycle. Students may be actively involved in using their communication and management skills in addition to the application of keyboarding, word processing, formatting, editing, composing, and proofreading skills to complete the required documentation. Students may be given choice in selecting a topic for this culminating activity. The Interview Project offered in Appendix J is one example of an activity that could be used. Although this project suggests that students visit a work site to interview someone who is employed in a career area that is of interest to them, the interview may be adapted to reflect other interests of a student. Alternatively, the selection of a topic may depend on the accessibility of resources.
8.8 Compose at the keyboard, a letter of application and a résumé.	The purpose of a letter of application is to introduce yourself to a prospective employer, to reinforce/state your strengths as a prospective employee, and obtain an interview. A résumé is a summary of all the education, skills, experience, and qualifications of a potential employee. It is often attached to a letter of application when applying for a job. The résumé can help a potential employer assess one's suitability for particular jobs. Ideally a résumé should be concise and not too detailed. There are numerous formats for résumés and students should be shown a number of simple format styles. It is important that students realize that all résumés contain basically the same information and there is no one correct format. There are numerous websites that provide help with writing résumés. Students may compose a letter of application and a résumé for an actual job position. Students may bring to the classroom a selected position for which they might apply. Students should suggest sources of potential job offering.

Module 9: Business Information Processing (Core)

Suggested Time: 15-20 hours
Level: Introductory
Prerequisite: Modules 2, 7
Module 5 is to be completed in conjunction with this module.

Module Overview
This core module introduces students to the roles, responsibilities, and expectations of employees processing information in the work environment. Students may be completing activities under simulated work conditions. Teamwork, interpersonal skills, communication skills, time management, organization, composition, proofreading, and correspondence are just some of the aspects that students will consider while processing information. All aspects of the information processing cycle will be experienced, relating efficiency and productivity to the workplace. Students will be involved in team building, problem solving, and decision making while meeting the expectations of the business world.

Foundational Objectives

- To examine and understand the role of the employee in the processing of business information.
- To develop personal goal setting and time management skills.
- To develop communication skills needed for information processing.
- To examine ergonomic principles that may be considered in preparing business and personal workspace.
- To understand the uses of several information distribution systems.
- To examine the importance and use of records management.

Common Essential Learnings Foundational Objectives

- To develop an understanding that technology both shapes and is shaped by business. (TL)
- To enable students to use language (listening, speaking, reading, and writing) for differing audiences and purposes that are relevant to business. (COM)
- To expose students to and familiarize them with methods and practices commonly used in modern business information processing. (COM)

Learning Objectives	Notes
9.1 Describe the role of the office worker in processing information in a business setting.	The Information Processing Cycle can be used as an advance organizer throughout this module. Students may refer to the cycle easily if it is illustrated on a bulletin board. Today's office workers have new responsibilities and roles. Some employees may become specialists in processing specific data such as word processing, desktop publishing, or the generation of files using spreadsheet or database software applications. Other roles in information processing may involve individuals in receiving, researching, creating, processing, distributing and storing of information; generating correspondence and reports; handling databases and client inquiries; organizing and arranging meetings; problem solving; decision making; summarizing; and delegating work. A discussion of the fact that information accessibility and rapid technological change are impacting the nature of the workplace would be worthwhile. Students may review the information processing cycle and examine how businesses integrate people and technology to facilitate the processing of data into useful information for communication. Business aims to produce communication with the most efficient use of time and resources. Students are encouraged to do the same. As information may be easily processed and distributed with the use of computers, students must realize that decision making and problem solving can be completed more efficiently. Office workers are actively involved in the decision-making process. Being able to function as part of an office team is important. It is recommended that students address teamwork and develop teamwork skills throughout the course. Students may compare and contrast the roles of information processing for personal use with that performed in business, describing the similarities and differences between the two. An oral presentation or a written report may be used to summarize the information. Students may conduct research in the business community to determine the role and changes to the role of the office worker. An interview with an office worker may be conducted. Students may tour an electronic office or business within the community to see office workers processing information. The tour may include a discussion of how technology has changed business environments and the role of the office worker.

Learning Objectives		Notes
		A speaker from the community may be invited to the classroom to speak to the students about the role of the office worker in processing information. Prior to the speaker's arrival, students may prepare questions for the speaker.
9.2	Organize and arrange documents in the preparation and presentation of a student reference manual.	Review from Module 7 the purpose and ideas for the students' reference manuals (Learning Objective 7.5). Students may keep a daily log or calendar within their manuals to assist in organizing work and time. The teacher may wish to have students continue developing the student reference manual as initiated in Module 7. If students have their personal reference manuals developed in Module 7, they may add to their manuals with work completed throughout the course. Examples of material students may add to their reference manuals are annotated examples of letters, memoranda, reports, and other production work. Handouts on language usage and proofreaders' marks may also be entered into the students' reference manuals. Alternatively, students may develop a reference manual with the materials developed from this module. It is recommended that students be encouraged to decide on the materials that may be included in their manuals, the organization of the materials, and the structure the reference manual will take. Providing flexibility in the decision-making process for the student reference manual is desirable. It is important that the manual represent a meaningful, organized system.
9.3	Develop work habits and attitudes that will enhance future educational and employment experiences.	Review Learning Objective 7.3. Expectations for desirable attitudes and behaviours that will be reviewed include: attendance, effort, cooperation, time management, organization, initiative, and punctuality. Students must realize the importance of a positive attitude and strong personal and professional skills in maintaining a career in business.

Encouraging students to work ethically is extremely important. It is strongly recommended that students attempt all assigned activities and tasks before collaborating with others. This is not to discourage teamwork. Technology facilitates ease in replicating information. It is important that students gain experience in becoming independent learners and seek assistance only when they have exhausted other possibilities. Copying another's work without permission and proper crediting is wrong and students must be aware of the consequences of such transgressions.

Students should be reminded of the law regarding copyright protection and the use of royalties to ensure compensation for the intellectual property of the originator. Digital copyright is of concern when students are downloading information from the Internet.

Students may review case studies in print or video format exhibiting both positive and negative work habits and attitudes in the workplace. After analyzing and identifying the habits and attitudes, students could suggest a likely outcome/future for that employee. Students could suggest changes the employee should undertake.

In journal writing, students may record how they have developed the desirable attitudes and skills needed to be successful in the business world and identify the attitudes and skills they feel could be improved further. The content of the journal would not be assessed; however, teachers may keep a log indicating the students that completed the activity.

Students may job shadow a person in business and summarize the skills and attitudes demonstrated by that person into a brief written report. The student may prepare a list of criteria to observe and discuss with the employee. The student may conclude the written report with a self-assessment and personal recommendations for self-improvement based on the criteria used in the job shadow experience. Students and teacher may determine the skills and attitude criteria to be explored.

See the Business-Like Attitude Rating Scale and the Employability Skills Profile at the conference Board of Canada Website for criteria that may be adapted and/or used. This job shadowing activity may be combined with activities of optional Module 13: Skills for Entry-Level Employees.

Learning Objectives	Notes
9.4 Use proofreading skills and proofreader's marks in editing completed work.	Review the commonly used proofreaders' marks previously learned in Information Processing (Learning Objective 7.5). See also Appendices G and H. In business, proofreading is extremely important to the communication process. It is important to review and stress the importance of good proofreading, developing good proofreading skills, and the benefits of using different methods for proofreading. The students should proofread their work on the screen before it is printed and proofread the hard copy as well. Some typical errors that may be encountered include: spelling, grammar, syntax, format, or spacing. The "not so obvious" errors that students will need to be aware of include the inclusion or exclusion of words and phrases, incomplete sentence structure, improper use of punctuation, and the improper use of words. Word processing software packages may include a spell checker and grammar checker feature. While these are useful, it is important that students are aware of the limitations of them. Continuous development of proofreading skills through practice and use should be stressed. Students may be provided with a hard copy that contains a number of different errors such as errors in keying, spelling, grammar, and punctuation. Individually or in pairs, students could proofread and mark all corrections using the acceptable proofreaders' marks. Individual students or pairs may share their results, discussing similarities and differences. Content may be assessed from the final copy. Continuing with the above activity, students could upload the document, edit all errors, and print a corrected copy. Process skills, including data on student efficiency in using the software and ability to interpret the proofreaders' marks, could be collected. Throughout the course, students may proofread their work and ask a partner to proofread it before it is submitted to the teacher for final assessment. Peer, teacher, and self-assessment of proofreading skills should be conducted. Students may collect examples of documents proofreading errors. These may be discussed in class. This activity could be a class project with the documents displayed in the classroom as reminders of the importance of good proofreading skills.

Learning Objectives		Notes
		Appendix H contains a listing of commonly used proofreaders' marks and activity. Appendix G contains tips on building proofreading skills. Proofreading is a strong part of the authoring cycle in English Language Arts. Collaborate with the teacher concerning review and reinforcement.
9.5	Summarize and demonstrate the importance of ergonomics for employee productivity.	Review ergonomic factors from Module 7. Students are encouraged to demonstrate good ergonomic practices. In a business environment, ergonomic concerns of space, furniture, equipment, temperature, noise, humidity, air quality, colour, and light may affect personal productivity. Guidelines stipulated in the Occupational Health and Safety Regulations may be discussed and examined as to how these regulations contribute to employee productivity. The Saskatchewan Labour Website and the Ready for Work website at www.readyforwork.sk.ca is an excellent reference site. Discuss the importance of taking rest breaks from a computer screen for employees who use computers all day. Discuss carpal tunnel syndrome and practices to prevent it. The students may prepare a bulletin board display that illustrates the ergonomic topics and safety in the work environment. Visit an office in the community to have students evaluate the site in terms of ergonomics.
9.6	Relate the issues of computer ethics and security to employee responsibility in the use of computers in business.	Computers have no ethics, no morals and are anonymous. Because of these factors, students must realize that people can abuse a computer's power and capabilities. Pirating of proprietary software and "hacking" of computer systems or networks in businesses are common computer crimes. Other computer crimes such as computer fraud, information theft, or unauthorized data revision may be discussed. Students must be aware of the criminal nature of these activities and the consequences of such.

Learning Objectives	Notes
	In business, computer security poses major problems as there is no guaranteed protection of computer data or software from unauthorized users. Students must realize a computer cannot identify an individual who is accessing information even if access codes or secret passwords are given and security personnel are employed. Ensure that students know their responsibility and loyalty to business when they are given access to company data and records. The computer will be viewed as a tool to help increase productivity and can provide enjoyment when used appropriately and with respect. How might students feel if the information on their school records were altered? Students may collect articles that deal with computer ethics or security, bank frauds, computer viruses, unauthorized data revisions, and theft of personal data for misrepresentation of personal identity. A variety of case studies involving concerns about computer security and ethics may be examined by students. Ways to prevent or eliminate risk should be explored.
9.7 Be aware of ecological concerns and be able to demonstrate the ability to address ecological concerns in personal life and in the workplace.	To reduce the amount of paper used in the output of work, students should be encouraged to proofread and edit their work on the screen before outputting it to the printer. Paper waste may be reduced and possibly eliminated as students compose and complete their work at the computer. Computers and other equipment should be turned down or off when not in use, to conserve energy. Hard copy may be requested from students for only selected assignments. The hard copy may be placed into the students' reference manuals. To reduce the amount of paper, teachers may ask students to transfer their work to the teacher electronically for assessment. Students may research and determine which products used in the classroom or business are recyclable and how they may be reused. As an independent project, each student may prepare a 5-minute oral presentation on a new use for a product that would normally be discarded.

Learning Objectives	Notes
	Students may initiate and organize a paper recycling program for the school by installing recycle bins, collecting, and transporting the paper to a recycle centre. Other recycling programs may also be undertaken.
9.8 Express and demonstrate the importance of time management within a business organization.	Review from Module 7, Learning Objective 7.4, the concept of time management and tools and techniques for efficient management of time. Use the advanced organizer of the information processing cycle to have a reflective discussion of the problems that may occur when time is not managed efficiently in business. Alternatively, the students may use focused imaging to explore the problems. Students may justify their answers to the class. Guide students in a discussion as to why time is a limited commodity, and why people are so often searching for more time. Have students consider the personal benefits of being organized. In business, time wasted is considered money wasted as employees are paid to be productive. Unproductive time interferes with ”efficient processing of information and decision making”. As time management deals with the organizing and scheduling of work, students should realize that good time management requires skill in organizing time, tasks, and work materials to ensure maximum output. The demonstration of an efficient workstation, the maintenance of to-do lists and the completion of assignments on time are indicators that the student is managing time effectively. It is recommended that students be given ample opportunities to establish work priorities and learn to be flexible in organizing their daily schedules. Using the computer for integrating data from a variety of files and sharing files has assisted in “saving time” on the job. These concepts and activities are further discussed in optional Module 17: Integrating Software Applications. Also, students can be expected to maintain and manage their paper and electronic files for ease of information access, thus reducing the time required to attain them.

Learning Objectives	Notes
	Some materials commonly used in business to assist with managing time include day-planning books, daily desktop calendars, electronic organizers, and planning calendars. Students may also be made aware of and could use electronic time management systems or personal information management (PIM) systems. Students may research the marketplace to identify and analyze the various tools for time management available to consumers. Teachers may ask students to keep a personal daily log throughout the course charting the date and the time used to complete each activity. The students may analyze their "logs", recognizing gains made in time management and areas showing weakness. Logs may include the following categories: date, job code, time in, time out, and total minutes. The log sheet may be placed in students' reference manuals. The time log may be kept on the computer. The students may design and develop their own to-do lists. The word processor may be used to aid in this process. When creating their forms, students may include sections such as: date, work description, time estimate, and rank. The to-do lists may be used daily and the students encouraged to transfer uncompleted tasks to the list for the next day. See Appendix C for a sample time management log that may be used.
9.9 Identify and apply knowledge of the importance of good human and business relations skills by demonstrating their use daily.	Personal and interpersonal skills are often referred to as the backbone of human relations. It is desirable for students to define personal skills and explore the important role personal skills will play when they assume a position in business. Personal skills that may be discussed and practised include: punctuality, loyalty, dependability, maturity, confidentiality, personal pride, dress, grooming, attitude, manners, and business etiquette. Check with the community to determine any special considerations or restrictions with respect to these areas. Verbal (oral) and nonverbal communication skills should be discussed including behavioural factors such as: eye contact, posture and movement, facial expression and gestures, dress and appearance, voice and vocal variety, use of language, listening, humour, and naturalness. Other communication factors that may be considered include: appropriate timing of conversation, understanding and accepting others' differences and opinions, interpreting messages, questioning for clarification, and providing feedback.

Students must realize that teamwork and group dynamics are very important aspects of job satisfaction. Opportunities for the development of personal and interpersonal skills should be facilitated throughout the course with the use of a variety of instructional methods and activities that promote interaction among a variety of individuals.

Students may review the basic communication process and be encouraged to use the four forms of basic language skills effectively: speaking, listening, writing, and reading. The Employability Skills Profile accessible on the Conference Board of Canada Website further illustrates the importance of these skills for the world of work.

A variety of photographs and illustrations from magazines and journals illustrating acceptable and unacceptable personal business skills may be collected. In small groups, students may sort the illustrations and photographs into the two categories. Each small group may share its categories with another group to clarify the criteria to determine the categories. A reflective discussion may follow concluding with the concept of acceptable personal skills. Once the acceptable and unacceptable categories have been established, students may use the illustrations and photographs to prepare a bulletin board display. Students may be encouraged to find further examples of acceptable and non-acceptable personal skills to add to the display.

A series of classes may be declared “work day” where students would dress and be groomed as if they were going to work in an office. Using focused imaging, students could imagine themselves at work in an office, reflecting on the personal and interpersonal skills they would be using. Students may also imagine the types of work they would be doing and the role they would play on the office team. Copies of dress code policies from local businesses would assist students in a self-assessment of their appearance and skills.

Students may role play a job interview. A script may be composed by students or the teacher. Time management and organizational skills may be incorporated into this exercise.

Learning Objectives	Notes
9.10 Select and use resources to assist in processing information.	The students may access and use a variety of commonly-used resources to assist in processing information throughout the course. Some resource material that students may use includes: directories; handbooks; reference manuals; CD ROM; electronic bulletin board systems and communication networks; microfiche; indexes; almanacs; government publications; media; and, resource personnel. Students may be made aware of reference materials that to suit the needs of specific business environments. For example, large offices may have internal phone directories and medical office workers may access medical reference materials. The students may describe when each reference would be consulted, the nature of the information it contains, and why the resource is important. It is strongly recommended that students be encouraged to work independently and consult references whenever the need arises. Teachers are encouraged to seek opportunities to provide student learning activities that will require the student to access and use a variety of resources. The students may explore the resource centre in the school and community. The resource centre staff may provide students with an orientation in the use and availability of the reference materials there. Students may be given a research assignment that would require them to access and consult a number of reference materials including print and non-print. For example, the activity could be in the form of a research report or a series of assigned questions to complete requesting information about various reference materials. This could be done in collaboration with a teacher in another subject area. If students have an interest in working for a particular type of business or office, arrangements could be made so that students may visit that type of office and be orientated to any special reference materials and knowledge associated with it. Examples include: automotive businesses, real estate and insurance agencies, and legal, medical, town council, or government offices. Students could be encouraged to make their own arrangements with assistance from the teacher. Student motivation, initiative, and knowledge gained could be documented.

Learning Objectives	Notes
	Each student may compose a set of questions to be answered by another student. Answers to the questions will involve the use and access of a number of selected reference materials. One question per reference to be accessed may be asked. Students could randomly trade questions with other students and proceed to compose the answers. Activities meeting this objective may be integrated with a number of other modules.
9.11 Demonstrate the use of basic business writing skills and the cycle for composition.	Business communication involves the exchanging of information in the workplace. Because technology is making written communication easier, students must realize the importance of good writing skills and attractively displayed documents. A product will be judged on its appearance as well as on its content and organization. Students may review: capitalization, language usage and sentence structure, punctuation and the spacing for punctuation, abbreviations and their acceptable forms, metric symbols, and numbers keyed as words or figures. Industry standards and differences in spacing for punctuation may exist. It is important that teachers inform students that flexibility in the business environment exists but consistency will be maintained within the classroom. While composing at the computer, students may be encouraged to use the cycle for composition that could include the preparation of an outline, a rough draft, editing the rough draft, and preparation of a final version. Composition at the keyboard may be reviewed beginning with one-word responses and progressing to phrases, sentences, and paragraphs. Encourage students to keep the cursor moving forward as they compose their thoughts, correcting errors or revising text later. With word processors, students should be encouraged to strive to produce the best communication possible, as revisions are facilitated by computer software. Composition containing a positive, courteous tone is desirable. Composed draft is not expected to be formatted as students compose, edit and revise their work. The use of special tools such as a spell checker or grammar checker and the formatting of the work may become some of the final tasks of the composition and writing process. Proofreading must be reemphasized.

Learning Objectives	Notes
	Students may be asked to compose new manuscripts for familiar stories. Students could compose the manuscript of Little Red Riding Hood from the wolf's perspective. Students may compose a variety of communications in response to a simulated situation. Students may simulate working as a member of an office team, a support person, or an independent entrepreneur. The communication may be assessed for process and content. There is opportunity for collaboration with the language arts teacher in activities for this objective. Students may be asked to compose correspondence or manuscripts for various audiences. If students are conducting research for another area of study, they may compose correspondence requesting information. Opportunities for composition activities to be integrated with activities from other modules may be available.
9.12 Understand and practise the use of the telephone and other business communication technology.	Many different types of communication systems are used by business. Telephone systems, voicemail, facsimile (fax), electronic mail (e-mail), and the other Internet communication systems are just some examples of communication systems that may be used. Students may explore these and other technologies that facilitate business communication processes. Students also need to be aware of the appropriate communication form to use in various scenarios. Telephone systems with enhanced capabilities, equipment such as a private branch exchange (PBX), key systems, and interactive telecommunication systems may be discussed. Students will need to be aware of the variety of features of different systems and know how the features are used to facilitate and conduct business in an office. "Behind the scene" services such as network services and custom calling services may be examined. When possible, students should practice using or experiencing the special features of a telephone system. In order to be able to communicate in a global marketplace, students should understand time zones and long distance cost controls. Remind students that reference materials are available to assist and that they should access these materials as needed.

Learning Objectives	Notes
	The phone system in the school may be explored. Students could spend time "job shadowing" in the school office, observing the use and function of the telephone system. Students may tour a facility in the community and gain exposure to telephone systems and other communication systems being used. A video that illustrates and discusses telecommunication equipment and features may be a useful resource. The students may be given case studies that would require decision making on how and when to conduct communication over data networks. Distance education may offer opportunities to experience telecommunications such as a video conference. Data transmission, transfer, and retrieval may also be discussed. When reference materials are accessed and used to help determine a solution to the problem, the activity can be combined with Learning Objective 9.10. Work study may provide opportunities for students to access and use different communication systems. A representative from the telephone company can present, explain and demonstrate the features available for business telephones including voicemail. If possible, arrange e-mail accounts for each student. Network with a teacher in another school/community/province/country to exchange class e-mail lists. Set up partners and use this opportunity for students to compose at the keyboard, while developing new friendships and gaining knowledge. Students may also send assignments to the teacher as attachments to messages.
9.13 Develop and demonstrate basic telephone etiquette and techniques, and understand their importance to the success of a business.	The telephone is frequently used to contact clients and other organizations locally, nationally, or internationally. It is imperative that students realize the importance of their role in using it. Similar rules of etiquette and professionalism for face-to-face communication apply to telephone use. Students will need to realize that the lack of facial and body expressions make courteous, clearly-spoken communication crucial in telephone conversations. A positive attitude, and respect for self, company image and the correspondent are important. Students should be given practice in answering routine calls and in anticipating responses to difficult situations when possible.

The following basic rules of business telephone etiquette are recommended for use:

- Answer the telephone within three rings whenever possible.
- Use a pleasant, clear and distinct voice. Vary the expression and tone.
- Identify the company and/or yourself when answering a call.
- Listen attentively and always be of service to the caller.
- Be discreet.
- Return to the line within a minute after putting a caller on hold.
- Remain professional. Refer to the caller by title (for example, Mr. Smith).
- Allow the caller to say "Goodbye" first (remember to say "Goodbye" and "Thank you for calling").
- Keep social calls to a minimum.
- Transfer calls efficiently and courteously.

It is desirable for students to gain knowledge about the effective use of the telephone system, including proper procedures for the following telephone techniques:

- answering incoming calls
- screening calls
- placing outgoing calls
- leaving and returning to the telephone line
- transferring calls
- answering routine questions
- taking clear, concise messages
- dealing with difficult clients.

Students may role play placing and receiving routine long distance and local calls. In pairs, students may devise role play situations that would deal with positive and difficult telephone situations. The teacher may provide ideas such as someone recommending a product or complaining about faulty merchandise; a customer who has been short changed; or an example of excellent customer service. Students could complete telephone message forms during the exercise. As students build confidence in their telephone techniques, the role plays may include difficult situations and the use of a variety of telephone message forms.

From the community, students could interview, conduct a survey, arrange a field trip or invite a guest speaker to discuss the importance and use of good telephone techniques for the success of their business.

Learning Objectives	Notes
	Teachers may integrate this learning objective with learning objectives from optional Module 13: Skills for Entry-Level Employees.
9.14 Distinguish among and make decisions regarding information distribution systems used in business.	Remind students that the distribution of information is part of the information processing cycle. While the speed of distributing paper-based information relies upon the transportation system, large volumes of electronic information can be distributed easily and quickly. It is desirable for students to be aware of the various methods used by business to distribute information and to be able to select a method appropriate for the situation. Cost and time factors must be considered. Students should explore postal, messenger, courier, and transport services, electronic mail (e-mail), facsimile and others. The costs incurred when using each service should be discussed and scenarios where each is the best choice explored. Other topics that may be discussed may include internal networks or local area networks (LAN), modems and communications software, telecommunications, satellites, and desktop facsimile transmission. Students may complete concept webbing of the various methods of information distribution. Content assessment information may be collected. The webbing may be prepared and displayed on the bulletin board. Case studies requiring students to solve problems involving comparisons of costs and means for distributing information could be done. Students may tour an organization to observe the distribution of information and explore how the organization identified and justified the costs and means for its information distribution. Students may prepare a diagram of the networks they observe. The diagram may be annotated and put in the student reference manual. Students may observe and experience information distribution within the school building, both paper based and electronically on a local area network.

Learning Objectives	Notes
9.15 Examine and select the appropriate services provided by the postal system.	Canada Post Corporation has a variety of classes of mail with different rates. Comparisons should be made between the Canada Post, private courier and electronic delivery systems. Students should be aware of: different classes of mail; standard letter sizes; classifications of oversize mail; parcel mail rates; special mail products and services; trace mail services; electronic mail services; and, other services such as redirection of mail, insurance, and different methods of paying for postage. Provide opportunities for students to compare different services and select the appropriate service making decisions about the types of service to use considering the type of document to be sent, cost, and time constraints. Provisions for the effective packing and marking of materials to be sent may also be discussed. Computerized systems that calculate and compare services for the user may be examined. Explore “in-house” mail systems and their purpose. For example, mail systems within a school division or within a large corporation or organization. Postal information may be available from the local post office. Materials may be displayed in the classroom for reference. A visit to or a speaker from the post office could be arranged. A discussion about the mail services that are provided and how they may be selected could be included. The students may observe the operations of the postal system including how teamwork skills are applied to ensuring that the incoming mail is sorted and distributed. In pairs or cooperative learning groups, students may examine case studies, determining the appropriate postal services or other distribution methods required to facilitate distribution of materials. Have students create a bulletin board display featuring various forms of communication and distribution of information. Use a team approach, with each member responsible for part of the whole project.
9.16 Distinguish among and outline the important aspects of reprographic methods used in business, comparing cost and features.	Reprographics deals with the duplication or reproduction of documents. It is recommended that students know the role reprographics play in to the distribution process of the information processing cycle.

Learning Objectives	Notes
	When dealing with reprographics, it is strongly recommended that students be aware of and respect the terms of the Canadian Copyright Act. Where copyright restrictions apply, students may be guided to follow the proper procedures for obtaining permission to reproduce. If there is time, investigate the implications of CANCOPY. Different types of reprographic methods include: in-house or external printing services, photocopying, print, typesetting, desktop publishing, and facsimile. Students may be given an exposure to each of these reprographic means. When selecting the appropriate reprographic method to use, the student will need to be able to determine the balance between cost, convenience, and quality of the job that must be maintained in the reproduced documents. As photocopying is extensively used by business, students should be familiar with the general features, operation, and costs of photocopying. Students will need to be aware that many businesses log the use of their photocopy machines to ensure that the service is not abused. Ways to reduce costs such as double-siding, and care with number of copies should be explored. The costs of photocopy use in the school could be examined and broken down as a class project. The photocopier salesperson for the school may provide a demonstration on the use and features of the school photocopier. Arrangements may be made to rotate the students on the photocopier, completing routine and non-confidential photocopying jobs within the school. In cooperative groups, students may be given problems dealing with selecting the appropriate reprographic methods given cost factors, quantity and quality needed, and time restraints. Each group could suggest a reprographic method and justify its use to the large group.
9.17 Examine the purpose of records management and describe the features of an efficient records management system.	Records management refers to an organized and controlled way in which created information is retained and safely stored for ease of retrieval. It also involves the determination of the answers to the following: where to store, whether to store, how long to store, and how to store? Files may be stored as hard or soft copy. Common hard copy formats include paper, microfiche, or microfilm. Electronic means have facilitated the storage and retrieval of files and has reduced the room needed to store information safely.

Students must understand the importance of a systematic record management system to the efficiency of business decision making and operation. Remind students that managing their documents and naming or renaming their files for ease of retrieval is a part of their personal records management system.

Although companies have differing guidelines for filing and maintaining systems, general guidelines for records management apply to most situations. Some of these guidelines include:

- Not all pieces of information need to be filed–some may be disposed of after use while others may need to be redistributed.
- Filing should be completed daily whenever possible.
- Organizational steps for filing should be followed.
- Care to avoid misfiling of records is crucial.

Some terminology related to record management systems that students may need to know includes: manual filing, electronic filing, check-out systems, out guide, recall system, follow-up system, file maintenance, file index, file reference, access code, cross-referencing, filing, misfiling, release marks, classifying, coding, and sorting.

The advance organizer of the information processing cycle may be used to initiate inquiry and a discussion of how efficient records management may aid information processing and business decision making.

Students may be divided into two groups. One group of students may use focused imaging of an organized, efficient work establishment to determine how the efficient records management system aids the processing of information in that organization. The second group of students may use focused imaging of an unorganized business establishment and identify problems or concerns that may arise in this organization. The two groups of students may compare and contrast the findings, determining the important features of an efficient records management system.

A tour of an organization that has records management as a top priority may be valuable. Typically insurance companies, financial institutes and health facilities focus on high-quality record management.

A more thorough examination of record management will be done in Module 15: Management of Information and Records.

Learning Objectives	Notes
9.18 Examine and outline the common filing systems used in business.	The five major filing systems that are common in business include: alphabetical, geographical, numerical, and chronological and by subject. It is strongly recommended that students learn to identify and describe the use of these filing systems and how they assist in the storage and retrieval of information. **Alphabetic** systems arrange records in alphabetic order based on indexing (rearranging for filing purposes) of the key word(s) in the document to be filed. All users of alphabetic filing system consistently apply a series of indexing rules. Students may apply indexing rules to index correctly a variety of names, including names with prefixes, hyphens, apostrophes, titles, degrees, and abbreviations; foreign names; company names; geographic names; articles, conjunctions, prepositions; and numbers. **Geographic** systems are established based on the geographic location referred to in the content of the data to be stored. **Numeric filing** systems allocate a number to each file, while **chronological** systems arrange information by date. **Subject filing** systems organize records into categories according to the subject of the document. Each filing system has advantages and disadvantages that could be discussed. Time permitting, opportunities for students to determine the system that may be appropriate for handling information of different types and situations could be provided. Cooperative learning groups using the jigsaw method may be used, with each member of the group responsible for learning about one filing system and sharing the information with the others. Students may brainstorm how businesses may use each of the five major filing systems, or which types of businesses would likely use each type. Examples of personal filing systems may be found such as how one stores family recipes, clothing, and other belongings. Activities requiring students to file items alphabetically could be introduced.

Module 10: Managerial Information Processing (Core)

Suggested Time: 15-20 hours
Level: Advanced
Prerequisite: Modules 2,7
Teachers are reminded that Module 5 is to be completed in conjunction with this core module.

Module Overview
This core module of IP 30 introduces students to the roles, responsibilities, opportunities, and challenges for the manager of the future. Successful future office employees will need to be familiar with, and be able to adapt to the varied processes and functions within an organization. The increasing use of technology has implications for those entering and managing the business office. This module will assist students to prepare themselves for the transition to the world of work as decision makers in business, government, and industry. Students will also gain experiences that will facilitate post-secondary education.

This module will provide opportunities for students to develop and apply problem-solving and decision-making skills. Planned activities will integrate concepts of business communication, office management, keyboarding, and computer applications. These skills and experiences will facilitate students' abilities to adapt to changing workplace situations and will be reinforced throughout this module. All completed processes and activities can be related to managerial decision making and the efficient processing of information through the information processing cycle.

Foundational Objectives

- To understand the managerial roles, responsibilities, procedures, and methods necessary for the efficient management of common information processing activities.
- To prepare for information processing career opportunities.

Common Essential Learnings Foundational Objectives

- To provide opportunities for students' active involvement in decision making related to technological developments in business. (TL)
- To promote both intuitive, imaginative thought and the ability to evaluate ideas, processes, experiences.
- To practise the processing of information in meaningful contexts. (CCT)
- To support the development of a positive disposition to life-long learning. (IL)

Learning Objectives	Notes
10.1 Summarize and explain the importance and use of information processing for managers, recognizing changing office environments.	Information processing includes all the activities involved from the origination of information to its distribution in final form. The activities follow the basic components of the information processing cycle including input, process, output, and distribution. (See Appendix B). Students should review the phases of the information processing cycle. Throughout the course, students will relate the processes, activities, and decisions they make to phases of the information processing cycle. As this module addresses managerial aspects of information processing, students should be aware of the general roles and responsibilities of managers in offices. For example, managers are becoming more responsible for originating, processing, storing, and distributing their own information and documents. Students may examine how technological advancements have created trends enabling individuals to telecommute and work at home. Implications of these and other schemes may be discussed. Time permitting, students may examine different forms of business organizations and determine the differences among the organizational structures and the adaptations that may be required in managerial decision making to facilitate information processing. Students may interview an individual in the community who works in a managerial position to discuss that individual's role and responsibilities and any changes that have occurred due to office automation. Students may research the changing nature of the office, future trends, and the office manager role. Students may conduct research in small groups and work cooperatively to produce the final product. The research project may be integrated with aspects of learning objectives found later in the module. Continue to stress proofreading and time management. Students may log the time used to conduct and prepare their project.

Learning Objectives	Notes
10.2 Identify and demonstrate professional work habits and attitudes through developing and conducting performance appraisals.	The importance of good work habits and positive attitudes will be reinforced and reviewed throughout the Information Processing course. It is expected that students will continually demonstrate the behaviours acceptable in an office environment. Elements such as punctuality, showing respect for others, developing a positive attitude, cooperatively working with others, business etiquette, grooming, and time management may be discussed. Students must realize that managers deal with difficult issues such as discrimination, sexual harassment, and verbal harassment. Ensure that students are aware of these elements and their relationship with, and responsibilities to, the manager. Students may research the Occupational Health and Safety regulations and the Labour Standards regulations for more in depth information. The bibliography provides web-site addresses for this reference material. Dress codes for offices vary; appropriate dress for the office environment is an important aspect to discuss. Students could investigate dress codes suitable for business offices in their community. To increase awareness of possible diversity in dress codes, students may be informed of different dress codes in businesses outside their community. Establishing a good working relationship with co-workers is very important to one's success on the job and for promotion. Students may discuss different management styles and may look at how they may make conscious efforts to manage their personal efforts in building relationships. Accepting and viewing constructive criticism as a means of self-improvement is important to teamwork. Performance appraisals and evaluations are means of providing this feedback. Students should discuss performance evaluations as a means of giving and receiving criticism for improvement. Students may examine various performance appraisal forms and discuss the valuable information it contains. Included in the discussion should be how they are used in the business world to help develop professional work habits and attitudes. Students may be referred to Appendix D which contains the Employability Skills Profile of the Conference Board of Canada. Teachers: Please note that the Employability Skills are directly correlated with the Common Essential Learnings (CELs). This may be an opportunity to discuss with students the relevance of what they learn in this course to what they could do in an employment situation.

Students may brainstorm criteria to be included in a performance appraisal for the course. The criteria may be developed into a performance appraisal form that may be used throughout the course. Students may use the performance appraisal form as a self-evaluation instrument, and to assess how ready they are to do entry-level work in an office situation.

Case studies may be given to the students to examine. Topics to discuss within the case studies may include punctuality, getting along with others, harassment, discrimination, grooming, and others.

Invite human resources personnel or an individual responsible for the hiring and management of staff to provide resource information on topics such as grooming, etiquette, acceptable job behaviours, and policies dealing with sickness, tardiness, discrimination, or harassment issues. Performance appraisals and how they are conducted and used could also be discussed.

A “dress for the office day” may be held where students would come to the classroom dressed appropriately for the office environment. Student participation and the appropriateness of the “grooming” may be assessed by the teacher and students.

Performance appraisal forms may be collected from various businesses inside and outside of the community. Students could compose letters to different businesses requesting a copy of their performance appraisal forms and information on how the organization conducts the evaluation.

Learning Objectives	Notes
10.3 Use organization and management strategies to assist in problem solving and the completion of tasks.	Organizing and managing refers to how one can make the best use of resources to carry out a plan. Throughout this module and the course, students will be expected to demonstrate organized work habits and the efficient management of resources. Ensure that students analyze problems and access, receive, process, and distribute communication and information in an organized and efficient manner. Students should be required to demonstrate these skills by taking part in a class project such as putting together a school phone book, or producing a regular newsletter. Some steps that may be followed include: determining a clear idea of what the final product is to be; developing a plan of action; determining and accessing required resources; carrying out the plan; and, evaluating the final product. Productivity is increased by having an organized workplace and personal concentration. Students may independently experience managing workloads for maximum productivity. The management may include keeping daily work plans, prioritizing work, making to-do lists, and keeping a log of time used. Students may explore computer software that is available to help managers improve communication processes and coordinate resources to make more effective decisions. If available, students should be encouraged to use the computer software capabilities to help organize and manage their work. For example, a word processing file may be kept for daily work plans or students may use an electronic calendar or scheduler to manage time and dates. Remind students that an organized filing system saves time in the retrieval of stored information. Refer students to their management of computer files and to the management of their hard copy (paper-based). On an ongoing basis, students may keep a daily log to establish priorities for tasks and to indicate the time used to complete each task. See Appendix C for a sample log that may be used.

Learning Objectives	Notes
10.4 Review information regarding the proper use and care of computer equipment, relating it to management decision making.	Prerequisite knowledge and experience in the proper care and use of computer equipment from previous courses may be reviewed. Student demonstration of respect for classroom equipment is expected daily. Lack of respect for the care and use of equipment can lead to repairs that not only cost money but also would cost lost hours of productivity. Obsolescence of hardware and software and the costs of replacements should also be investigated and discussed. These aspects are of great concern to a manager. Teachers may discuss with the students a process and procedure for the management of the classroom equipment. It is recommended that the needs and decisions for equipment management in the classroom be related to the many procedures and management decisions that would be necessary in the office environment, considering aspects such as time and resources. When equipment is nonfunctional, productivity is reduced. Teachers may use didactic questioning or guided inquiry to discuss with the students the importance of good management decisions in maintaining equipment in business and in the classroom.
10.5 Use computer hardware and software applications recognizing the efficiency of integrated office information systems.	An integrated office system refers to the automation of offices where many types of technology may be joined together electronically to make the best use of personnel and equipment resources. Integrated software applications has accelerated the efficiency in how information may be processed through the information processing cycle. The integration of systems is important in determining how all personnel may use technology effectively in accessing, generating, communicating, and managing information. With knowledge of integrated office systems, managers can make decisions about how to integrate and use the resources available to meet information processing needs. File sharing and the potential of file sharing may be discussed. The importance of an efficient file management system can be reviewed, reminding students that they are expected to manage all their work and files with efficiency. Choosing appropriate file names to ensure easy access to the stored information is a necessity.

Students may brainstorm ideas on how integrated office systems have increased efficiency in processing information. Students may compare and contrast the various brainstormed ideas with former methods of processing information and compose an article identifying the efficiency provided by integrated information systems.

Students with experience and background in using integrated software applications and systems may be paired with students who have not experienced integrated processes.

Students may complete a tutorial or learning activity package that reviews the use of different software applications. The activity may start with a review of the technical skills of manipulating software functions, progressing to activities that require the application of those functions.

A synectics activity may be developed. Students may discuss how an integrated office system may be like a city map. Students may develop their own analogies.

Students with experience from optional Module 17: Integrating Software Applications may be very familiar with system integration and its potential.

Additional time for practice and reinforcement of integrated software applications may be planned for activities fulfilling other learning objectives. Optional Module 17: Integrating Software Applications focuses on the practice and use of integrated applications.

Learning Objectives	Notes
10.6 Design a productive office environment considering the ergonomic, human, and environmental issues.	Proper design must consider work station layouts, prevention computer-related health problems and environmental concerns. Office lighting and office furniture must address human factors such as eye, wrist, hand, and posture strain. Students may discuss the environment and how office practices can attend to these concerns. Initiatives may include reducing, reusing and recycling waste. It is desirable for students to demonstrate their understanding of environmental concerns at home and in the classroom. Students may participate in activities such as using the back side of paper for rough draft work, printing hard copies only when necessary and only after careful proofreading, setting up and using recycling bins, replicating only the required number of copies of a document, and turning down or turning off computers and other electrical equipment when they are not in use. Students may design an ergonomic environment for the school or an office. Ensure that students consider the general requirements of workplace and work flow standards with respect to the development of an efficient environment. Include discussion of the occupational health and safety standards. The correlation between productivity and the value of health-enhancing practices such as the management of stress in the workplace (personal, change, social, and work-related stressors), a healthy diet, the value of regular breaks and physical exercise, and other measures that are available to help manage stress may be considered. As potential managers, students will need to examine and consider a variety of factors when planning for employee productivity in the work environment. When preparing to design an ergonomic office environment, students may research and collect the necessary information from a variety of sources. Students may tour ergonomically designed workplaces. Suitable areas in the school may be examined and discussed. Local personnel such as an interior designer may be interviewed or invited to speak to the class.

Learning Objectives		Notes
		In pairs, small groups, or individually, students may redesign the classroom area. The teacher may allow the students to explore the dimensions and factors within the classroom, giving students the opportunity to complete the project in the medium of their choice. For example, students may prepare a scaled drawing using software drawing tools, a desktop-published report combined with an oral presentation, a multi-media presentation, or a scaled model. Those students who have experience with computer-assisted drawing software programs may use them as a tool to assist in designing their office environment. Students may use focused imaging to examine stress they may foresee in their future work environment and to plan the management techniques they may use to manage the stress. Information is available from Saskatchewan Labour on the Labour Standards and Occupational Health and Safety Regulations. Free brochures and information on stress management, diet, nutrition, and exercise are available from the Saskatchewan Department of Health in Regina. See also the *Wellness 10* and *Life Transitions 20/30* curriculum guides for resource information on stress management techniques and stress management for the workplace.
10.7	Use a variety of communication skills.	The use of effective communication enhances the positive relationships that are important to the successful management of the office environment. Building the working relationships and teamwork that contribute to success in the work environment can be addressed. This would include the importance of self-development of effective listening, speaking, and personal skills. Appropriate business attire, office etiquette, assertiveness, company loyalty, confidentiality, self-motivation, and performance appraisals may be discussed in relation to one's self-development.

Ensure that students know the acceptable behaviours and individual responsibilities for avoiding or rectifying situations such as harassment, discrimination, and conflicts. Examples of harassment and violence policies could be studied. Issues including handling complaints, dealing with difficult staff members, maintaining a positive office tone, and confidentiality may also be examined and discussed. Students could role play different circumstances.

Communication in the global marketplace takes on a new meaning as communication technology expedites the communicating and processing of information. The telephone, electronic mail, voice mail, facsimile transmission, teleconferencing, and videoconferencing are some of the technological communication networks in today's office environment. Students should be given the opportunity to discuss the implications of these technologies from a manager's perspective, particularly in managing the information generated by them. For example, letters may need to be filed and kept but what about e-mails?

Students should be provided with opportunities to apply a variety of communication skills, including verbal, non-verbal and written skills, using the available technology to communicate.

The teacher and students may develop a list of criteria for appropriate communication skills. The criteria may be listed on a rating scale or checklist template. The template may be placed in the student reference manual for self-assessment on a continuous basis.

Students may be given case studies that deal with the discussion and examination of various human relations and communication problems that can occur in the work environment. Case studies may be examined by students individually, in pairs, or in small groups.

Students may compose a script and perform a role play that would demonstrate the use of a variety of communication skills. Examples of role plays may include handling awkward situations over the telephone or corresponding to initiate international customer relations.

Learning Objectives		Notes
10.8	Summarize various methods of processing information.	Technological advances in the area of inputting information promote efficiency and thus are becoming increasingly more desirable for business. Students should be aware of image processing, prerecorded dictation, facsimile, voice-activation, handwritten copy, shorthand, rough-draft printed copy, optical and digital scanners, digital cameras, voice recognition, touch screens, graphics tablets, and others. Although keyboarding is a major tool used for inputting and manipulating information, technological advances in other time-saving inputting devices should not be overlooked and need to be discussed. Advantages and disadvantages for each system should be explored. Students should be aware of reprographic and distribution costs of products generated through various output devices. Included in the discussion could be the potential of electronic communication, telecommuting, and the paperless office. Students will need to be updated on the input and output technology that is currently available on the market and that may be used within their community. They may discuss the impact of this technology on managerial decision making with respect to the comparison of costs, efficiency, and potential use. Whenever possible, it is desirable for students to experience and be able to adapt to various methods used for the input and output of processed data, especially those methods that are currently being used. Students may take a tour of a local office to view demonstrations of various methods of information input and output. Technological advances for inputting information may be viewed through product demonstrations in community trade shows, conferences, or through the services of a vendor. Teachers may explore the possibility of obtaining videotapes, films, or other media that illustrate the use of technological advances in information input. Students may compose letters to businesses requesting promotional materials about technology that is available. A web search will also help locate resources. The information from the materials received may be presented by the students and discussed in class. The materials may be displayed in the classroom.

Learning Objectives	Notes
10.9 Plan, organize, announce, and conduct a meeting or conference.	Meetings are important aspects of business that are conducted regularly to accomplish specific needs. They typically involve a selected group of people. Ensure that students are aware that meetings may be conducted in either informal or formal sessions and are usually conducted in short periods of time, often not exceeding one day. “Conference” is a term that refers to a meeting of a large group of people. Conferences usually take place over a period of days and may include social and business activities. Often conferences are accommodated in hotels and convention centres and may be attended by any interested individuals. Students should be aware that when a face-to-face meeting with people is not possible, electronic communication may facilitate the process. For example, teleconferencing or videoconferencing may be used. Students should be given opportunities to distinguish between meetings and conferences. Students should also know that the procedures for planning, announcing, conducting, and recording the procedures of meetings and conferences is similar. Announcements of meetings may be informal (verbal) or formal (notice of meeting). A notice of a meeting is communication that provides information such as the date, time, location, and purpose. It may be distributed in a variety of forms with a variety of formats. An agenda is the specific plan for a meeting. It lists items of business to be discussed with a predetermined order. Guidelines for organizing, formatting, and distributing agendas should be discussed. It is recommended that students experience the process of planning, announcing, and conducting at least one activity, possibly a meeting. Content information may include: identifying a purpose, starting and ending time, date, location, and the parties involved; selecting an appropriate time and means to announce the meeting; and the manner in which the activity is to be carried out. It is important that leadership roles be identified and discussed. Students may prepare and distribute a notice of meeting and an agenda for their planned activity.

Students may attend a meeting (band, city, or town council) to experience the proceedings. A summary identifying and describing the roles of the people in the meeting and identifying the process for planning, organizing, announcing, and conducting the meeting may be prepared. Students may be given choice in determining how they would like to prepare the summary (report, presentation, or newspaper article).

Students may plan, organize, and announce meetings or conferences that could be held within the school or community. Suggestions include: student council meetings, pep rallies, staff meetings, school tours, cultural events, or sporting events. Announcements may be composed, prepared, and distributed for these or other meetings.

Case studies may be used for which students would plan and organize a meeting, identifying items for the agenda, and announcing the meeting. If desired, in small groups, students may role play their meeting, identifying roles for each person involved. Content and application skills may be assessed.

Students may role play a mock meeting by planning, organizing, announcing, and conducting it. Ensure that an equal representation of females and males are in leadership roles; however, students may volunteer for these positions. The documentation necessary to announce and conduct the meeting should be completed.

Remind students of the flexibility allowed in formatting documents. Some organizations may have a preferred format to follow.

Learning Objectives	Notes
10.10 Distinguish between the important and unimportant information necessary to process minutes of meetings.	The minutes of meetings are official records of what took place during meetings. They may include decisions made at a meeting, proposals that are presented or rejected, and other important facts. Students should recognize the need for minutes of meetings to be taken and distributed. Also, students need to realize that minutes of meetings may be considered a legal document for an organization and should be accurate. Ample practice in taking notes or minutes of meetings is recommended. Students may word process their notes and edit the notes or minutes, making decisions on the important information to include. Students may require a review of summarizing and note making skills. Practice may be given to students in deciding important and unimportant information to be included in the communication, encouraging students to take more notes than necessary. Practice may begin with sentences from which students would pick out key ideas, working to paragraphs and conversations. Students should use word processing to facilitate the process. Opportunities to discuss the important ideas identified or the notes taken should be given as reinforcement for students. As note making is personal and will be edited, students should be encouraged to include only the important information in the final draft. Formatting of the communication follows editing. Ask the students to compare the recording of the minutes of a meeting to making lecture notes. Ask the students to come up with their own analogy.

Learning Objectives	Notes
	Relate the recording of minutes of meetings to the recording of lecture ideas or verbal instructions from the classroom. Lectures, lecturettes, verbal instructions, and non-print media provide opportunities for students to practise summarizing and recording important information. Content of the summaries may be assessed for accuracy. Students may be given a full transcript of a meeting and asked to identify and extract the important information. The transcript may be provided in print or non-print media. For example, students may view a videotape of a meeting and word process minutes of the proceedings. Content and process skills may be assessed. As students word process, information could also be collected on student use of the word processing software and touch keyboarding skills. Students may format the minutes of meetings in a variety of attractive ways. Discuss and work with the English teacher regarding note making, summarizing, and paraphrasing skills.
10.11 Synthesize the procedures for organizing and planning business travel arrangements by preparing a travel itinerary.	Students should compare the advantages and disadvantages of various methods of travel including cost and time factors, availability, and personal preference. When travel arrangements are made for others, considerations of factors such as the preferred mode of transportation and accommodations need to be discussed with the people involved. Students must also realize that there may be restrictions to the provision of personal preferences that may need to be addressed. An itinerary is a comprehensive and organized listing of a trip that includes information such as when, where, and how a traveller will be proceeding. Draft itineraries are prepared before a final itinerary is distributed. Students may discuss the procedures for scheduling appointments and for making the necessary reservations for travel and accommodation. Students should be able to establish a draft and prepare final itineraries. The formatting and distribution of itineraries should also be discussed. As students organize and plan itineraries, it is suggested that activities include research requirements such as the consideration of toll-free reservation numbers, international travel, time-zone differences, special travel documents, cultural differences, foreign currency and exchange, and budgeting. Students should use up-to-date resource materials, including web resources, for planning and organizing the itinerary to reflect current costs and time for transportation, accommodation, and planned activities.

Learning Objectives	Notes
	Students may be given simulations or case studies involving making transportation and/or accommodation reservations, beginning with arrangements for travel within the province and progressing to travel outside the province and country. Students may plan and prepare an itinerary for their own dream trip. Mode of transportation, arrival and departure date and times, accommodations, and leisure activities may be listed. This information is readily available on the web. See Appendix K for sample activities that could be used. If a school is planning a school-sponsored trip or a family vacation is forthcoming, students may be involved with planning the itinerary. A travel agent familiar with business travel arrangements may be invited to speak to the students. Information shared could involve aspects of a travel agent's career and the processes of organizing and planning travel itineraries for others. The agent may also provide resource information on the information processing skills and abilities that are required to prepare itineraries.
10.12 Make decisions for replicating and distributing information respecting copyright.	Learning in this objective should draw students to the decision-making processes required for the final stages of completing the information processing cycle. For students that have completed Module 9, the following only needs to be briefly reviewed. Reprographics is a term describing any type of copying or duplicating process used to replicate an exact copy of an original. The photocopying machine is one of the most commonly-used methods of duplicating hard copy. Duplicating refers to processes that involve the preparation of a master that is placed in a duplicating machine so that copies can be made from it. Students may be introduced to a variety of reprographic equipment and processes that are available.

The reproduction of documents for distribution can be costly and burdensome; therefore, students should be aware that some businesses have in-house services or may send the reprographic work to outside commercial establishments. Students should be able to contrast different reprographic processes, consider and compare the costs involved, and make judgments on the value of reprographic methods in different situations. Factors that may be considered in selecting reprographic methods may include cost, speed, quality of copies, quantity of copies, space requirements, and the needs of the business.

Copyright and copyright laws are important considerations when dealing with reprographics and they must be discussed. It is strongly recommended that students know how to identify and work with copyright material. They may be given an orientation on how to request permission to replicate copyrighted material. Information on the Copyright Act is available free of charge from Consumer and Corporate Affairs Canada. Most schools and public institutions have copyright information prominently displayed near photocopy equipment. Computer ethics and the legality of copying software and files may be reviewed. Because of the ease of use and availability of web resources, it is important to discuss copyright issues focusing on the use of information and images found on the web.

One of the final steps in the information processing cycle is the distribution of the information that has been processed. Students should be aware of the different means of distributing information, comparing costs, efficiency, and availability. Some methods that may be discussed include on-line communication, facsimile transmission (fax), electronic mail (E-mail), and the internal and external distribution of mail. A discussion of information storage may be appropriate at this time.

Students may complete a class project for the school or another organization that may involve the processing of information through the entire information processing cycle. The project could culminate with replicating, binding, and distributing the project. Students could develop their entrepreneurial skills by producing a project as a fund-raiser for the school. For example, a booklet of recipes, graduation memories, poems, stories, or legends written by students may be produced and given or sold to family and friends.

Learning Objectives	Notes
	Brochures on the postal system or a courier company and their available services may be distributed and shared in the classroom. A guest from the local post office may be invited to speak about the information in the brochures. Students may tour the local post office and experience its operations. This activity could be integrated with desktop publishing activities. The activity could include keeping a spreadsheet file of the budget and sales and maintaining a database of customers. Poems, stories, or legends may have been composed in another area of study such as English Language Arts or Social Studies.
10.13 Justify the potential of the paperless office, recognizing system security concerns.	Students could brainstorm the advantages and disadvantages of moving toward a paperless office. Concerns and complications in terms of permanent records, compatibility of electronic forms and obsolescence of technology should be addressed. Unauthorized entry to confidential files is a concern of many organizations; therefore, students should examine the safeguards that may be used to prevent this unauthorized entry. Computer security applies to the prevention of theft, damage, or loss of computer hardware and software. Problems facing many offices may include computer viruses, “hackers”, natural disasters (fire), and disgruntled employees. In addition, managers will also need to be aware of the potential of violating copyright in paperless office environments. Students may research the current, state of the art, internal and external controls and safeguards against threats to system security. They should investigate a number of hardware and software security measures. Students may also examine some commercial virus-protection packages. Students may examine the consequences that a manager might impose for the unlawful entry of property. Examples from within the community could be used. For example, students may discuss a computer crime such as illegal pirating of software and the possible consequences.

Learning Objectives	Notes
	As many computer systems may be networked or electronically linked for sharing resources to increase productivity level in processing information, students will need to realize that they, as potential managers, will need to take more responsibility and make more decisions regarding work efficiency and system security. As students are likely to become a valued part of a working team, confidentiality and the acceptable sharing of project work should be discussed. Electronic communication is becoming increasingly popular. Concerns regarding the security of information sent and received electronically should be discussed. Students may be introduced to various methods that businesses have adopted to restrict information access to employees and outsiders through the computer systems and hard copy files.
10.14 Demonstrate the effective use of information processing processes and skills by planning, preparing, and giving a presentation to an audience.	This final objective of the module integrates all the activities involved with the processing of information through the information processing cycle. A function of today's managers is to process and present information to a variety of audiences. Students will process, produce, and present a major project on a selected topic. It is recommended that students plan to demonstrate the use of various skills and presentation media to facilitate the presentation. Students may be given choice in topic selection and presentation format. It is recommended that students use a variety of resources and media to provide an audio visual presentation portraying how managers present information in the work world. Students should use a balanced mix of verbal and visual elements to organize and emphasize specific ideas. Students may be encouraged to synthesize information accessed from a variety of resources. They may make use of all available technology to facilitate the process. Students may choose to: use presentation software; give a slide show; use multimedia; use an authoring environment; or, present a desktop published manuscript or brochure.

It is recommended that students choose topics for presentations that are related to information processing and the learning objectives and modules of Information Processing being studied. However, the topic a student chooses for a project could include a community initiative or be combined with content from another area of study. Emphasis should be on student ability to follow through the decision-making process and other processes required to complete the information processing cycle culminating in an effective final product. The teacher will be a facilitator throughout the process.

Some topics that students may choose for their project are:

- Office Automation: Today and Tomorrow
- Managing Today's Office Environment
- Ergonomics
- Stress Management
- Technology and System Security
- The Home Office
- Increasing Office Productivity
- Open Source Software
- Detecting and Eliminating Computer Viruses
- Voice-Activation
- Reprographics
- Electronic Communication
- Office Etiquette
- Integrated Office Systems
- Telecommunications: Today and Tomorrow
- Computers and Information Processing
- Effective Communication Skills
- Computer Crime
- The Future of Videoconferencing
- Networking Businesses for Efficiency
- The Future of the Electronic Superhighway

This learning objective integrates many of the processes and abilities learned in the module including: communication skills, composition skills, technological literacy, organization, decision making, management, and keyboarding skills. Practice and reinforcement of student ability to choose and access appropriate resources, composition, proofreading, and editing can also be accomplished as students are involved in processing the final product.

In order for students to integrate fully all the skills and knowledge they have developed, the assignment could be given towards the end of the course.

Module 11: Introduction to Spreadsheets (Core)

Suggested Time: 10-15 hours
Level: Introductory
Prerequisites: Modules 2, 7

Module Overview
This module will introduce students to the use of spreadsheet software. Teachers may need to assess student prerequisite knowledge and skills to determine the proportioning of content and process emphasis for this module. Students may have gained experience with spreadsheets from other areas of study and may extend their knowledge and skills within this module.

Foundational Objectives

- To be familiar with basic hardware and software terminology.
- To use a variety of computer software applications efficiently and productively.
- To develop information processing skills that will be helpful in their personal life.

Common Essential Learnings Foundational Objectives

- To enable students to understand and use the vocabulary structures and forms of expression that characterizes spreadsheet software. (COM)
- To enable students to think for themselves and recognize the limits of computer applications software, and the need to contribute to and build upon understandings. (CCT)

Learning Objectives		Notes
11.1	To understand the purpose, characteristics of, and the terminology associated with the use of spreadsheet application software.	Students should investigate the layout of the spreadsheet they are using and understand the terms: column, row, cell, cell address, active cell, current cell, label, value, constant, formula, function, range, workbook and sheet. Students could use the program's help function to learn about its features and share their observations with classmates. Students may create an empty spreadsheet form, move the cursor to designated cells and practise entering labels and constants. A class discussion of potential uses of a spreadsheet would be worthwhile. In pairs or small groups, students may compare and contrast manual and electronic spreadsheets. For example, the manual spreadsheet could be a payroll register, contrasted with an electronic spreadsheet containing the same information. Students may focus on the similarities and differences between the items and suggest situations when the use of spreadsheet applications software may be more advantageous than the use of manual calculations and vice versa. Oral reports on students' findings could be presented.

Learning Objectives		Notes
		A game called “beat the computer” may be played by performing calculations and recalculations manually while the teacher uses spreadsheet applications software to perform the same calculations. Students could annotate a hard copy of a spreadsheet screen, labelling terminology. This annotated document could be a page in a student’s reference manual.
11.2	Explain and use the mathematical features characteristic of spreadsheet application software.	Students should change and interpret numerical data to recognize the power of spreadsheet software’s assistance in the decision-making process. In order to use and understand mathematical features of spreadsheet software, students will need to know that a cell can contain one of four types of information: **label**, **value**, **formula**, or **function**. A label is words providing descriptive information. A value is a number that is entered into a cell. A formula is an instruction to perform a calculation. A function is a preprogrammed formula. Distinguishing a formula from a label, value or function may require the use of a special character. The special character may be an arithmetic symbol or parenthesis. For example, formulas may be entered into a cell by using an equation like (+J1+J2+J3). A function may be entered into a cell by using a special character like the @ symbol. For example, (@AVE) may be the characters necessary to have the software calculate the average of a given range of numbers. It is recommended that students be aware that spreadsheet applications software packages may vary in the characters used to denote a particular function. Encourage students to refer to the software application’s help function as necessary. The formulas used in spreadsheet applications can be very complex. The students should review the mathematical concept of order of operations and be able to enter and use simple and complex formulas in a spreadsheet. Students should be able to copy formulas from one cell to another, using both the relative and absolute options. It is recommended that activities be related to the previous experiences of students. Initial student assignments may require only simple mathematical calculations and grow in complexity over time. Assigned questions may be given requiring students to give the appropriate formula or function to use to determine a predetermined outcome.

Learning Objectives		Notes
		Students should have enough practice to become proficient at using the mathematical functions of a spreadsheet. Consult the Mathematics teacher(s) to coordinate resource information and activities. Handouts and activities completed throughout the module or course may be inserted and organized as pages in the students' reference manuals and/or placed in students' portfolios.
11.3	Use spreadsheet software to process information.	Features of spreadsheet applications software that should be understood and experienced by students include: creating files, deleting files, saving files, entering labels, entering values, entering formulas, entering functions such as sum and average, filling ranges of cells automatically, making corrections, inserting and deleting rows or columns, moving and copying formulas, rows and columns, expanding cell sizes, formatting label and value entries in cells, adapting an existing spreadsheet template, performing calculations and recalculations, and printing spreadsheet reports. Initial examples and assignments chosen to illustrate the software features should be kept simple. It is recommended that students be provided with ample practice on each new feature to ensure that students build confidence in using the features and are comfortable with manipulating the software. Students may be given case studies to demonstrate the use of features of spreadsheet applications management software. Recognize that acceptable solutions may vary. This activity may be assessed as soft copy or as hard copy in the form of reports. Students may bring data that may be entered into an electronic spreadsheet file. Newspapers, periodicals, magazines and other resources may provide interesting data for students. For example, information on the performance of a particular athlete or sports team may be available in the newspaper. In pairs or independently, students may use spreadsheet applications software to create a new spreadsheet file, enter formulas and values, manipulate and revise data, and perform calculations and recalculations.

Learning Objectives	Notes
11.4 To format spreadsheets to produce attractive documents.	Students should be able to use common formatting features such as changing column width, row height, colour of cells, type and appearance of borders, font, and cell attributes. Activities such as creating a commercial invoice or customized business forms will require students to demonstrate these skills.
11.5 Prepare and analyze statistical graphs using spreadsheet application software.	Statistical graphs may be created from entered spreadsheet data. These can help make numerical information more easily understood. The processes of comparing, analyzing, and extrapolating information can be assisted using graphical information. The use of graphics and colour increases audience interest when used in presentations. Students should consider how the use of graphs facilitates the decision-making process. It is desirable for students to be given opportunities to determine the appropriate graphical representation of their data as activities are completed. When students change spreadsheet data, they may view the results of the changes on the appropriate graph. While interpreting the effects of changes within the spreadsheet, remind students of the power of the software in assisting business and personal decision making. The teacher may demonstrate the generation of graphs from application software using data retrieved from previously saved spreadsheet files. Illustrations of the effects of changing data within the spreadsheet and the changed results may also be shown. Simulations or case studies requiring previously stored spreadsheet data to be changed, represented graphically, and evaluated may be assigned. Students could analyze the graphs and extrapolate the information to make decisions or predictions for desired outcomes. Consult the Mathematics teacher(s) to coordinate spreadsheet resource information and activities.

Module 12: Introduction to Database Software and Applications (Core)

Suggested Time: 10-15 hours
Level: Introductory
Prerequisites: Modules 2, 7

Module Overview
A variety of powerful computer software programs are available to a wide range of computer users in the home, school, and workplace. This module will introduce students to an introductory, practical, hands-on approach to the use of database software applications.

Foundational Objectives

- To be familiar with basic hardware and software terminology.
- To use a variety of computer software applications efficiently and productively.
- To develop information processing skills that will be helpful in their personal life.

Common Essential Learnings Foundational Objectives

- To enable students to determine the end use of a database and plan the structure accordingly. (CCT)
- To enable students to understand and use the vocabulary structures and forms of expression that characterizes database management. (COM)
- To enable students to perform queries effectively using logical criteria (NUM)

	Learning Objectives	Notes
12.1	To describe the purpose, characteristics, and terminology associated with database management applications software and justify its use.	A database is a broad term that refers to an organized collection of related information. Database management software is computer software that is designed to organize data in a way that allows fast and easy access to it. A manual database is one that allows for the storage and accessing of information by hand. Paper-based filing systems and libraries allow for storing and accessing information manually. The information in an electronic database is stored electronically helping a user to access and manipulate the information efficiently. As an introduction to databases students could spend time considering the school library database, whether manual or electronic, and the features and capabilities of the database, and how the function is related to the structure.

Learning Objectives	Notes
	Electronic databases perform many of the same basic tasks as manual databases. Both systems require decisions as to what information will be stored, how it will be stored, and the method of accessing information. Computer software organizes, locates and manipulates entered data easily in comparison to the more cumbersome tasks of finding and manipulating data manually. Increasingly, information is being stored in electronic databases so that information may be retrieved when needed. Electronic databases require relatively small amounts of physical storage space. Terminology with which students should become familiar includes: records, fields, forms, field names, character fields, numeric fields, time fields, date fields, entries, file, file structure, logical field, field width, relational operators, searches, queries, sorting, key fields, calculated fields, and data modification. Provided with hard copies of electronic database records, students could identify, label and describe specific database terminology. Students may answer questions concerning the database records, for example: How many records are shown? What types of fields are illustrated? Students may be provided a telephone directory or a school telephone book. In pairs or small groups, students could identify examples of database terminology. For example, they may be asked to identify fields, records, character fields, and numeric fields. Isolating a single record, students may describe the separate fields in the record and the information each field contains. They could choose appropriate field names and types.
12.2 Plan and design computer database files.	Students should be aware that the structuring of a database file is vital to the user's ability to identify and process data into meaningful information. The power of database applications software lies in the user's ability to extract the required information. Students should be encouraged to devote sufficient time and thought to the planning stage when beginning design.

In order to create a database file, the student must be able to visualize the structure of the file and set up the file so that meaningful output can be generated from the data. A database file may be considered a collection of records. Students must understand the relational concepts of rows and columns found in database applications software. Columns in a database file represents field data. Record data is given in a row with each record having a fixed number of predetermined fields.

When planning records and fields, students should consider the information that will be stored and the possible operations or searches that could be performed on that information in the future. Who will access information from the database? What specific information might the user want?

Steps for planning and designing a database may include: determining the data to be stored; examining the specific operations to be performed on the database; and creating a list of fields with appropriate field names.

In the initial planning stages, it is recommended that students use pencil and paper to sketch database designs. This process will assist students in the initial selection and organization of data to be input into the database. Once students have gained confidence in database file structuring, they may create a database file.

Students could brainstorm why it is important to plan the structure of a database carefully.

It is desirable for student activities requiring the use of software to reflect the focus of the accompanying Information Processing core module. With respect to business or managerial functions, have students brainstorm when and why business managers would use databases. Applications such as inventory control, employee records and clientele/customer records would be considered. Students could create ficticious companies and useful computerized databases.

In a guided inquiry students may use pencil and paper to design and sketch the file structure for a database file, perhaps of the students in the classroom. They should consider the number of records and different types of fields needed, depending on the information they decide to include in the database.

Learning Objectives		Notes
		Students may bring a collection of related “records” from home. Personal databases may include collections such as sports cards, coins, stamps, magazines, books, music, or photographs. Examples of databases that could be provided or developed also include the school students, school inventories, music or movie collections, records of farm animals, athletes from a particular sport, books, or data about nations. Students may plan and design a database structure for their collection.
12.3	Use features of database management applications software to process information.	Students should create, delete, search, retrieve, sort, modify, and store data within their database. Some modifications that students may learn include how to: insert and delete fields, insert and delete records, sort records, and select specific records. Students may print selected reports and provide output suitable for different sizes of paper. Teachers may need to reemphasize selection of meaningful field names from source data to facilitate the process of future data retrieval. Students should be able to generate a variety of questions and parameters for searching data from databases to select meaningful output to solve problems. It is recommended that students be given opportunities to conduct a variety of searches of database information from internal and external systems. Provide students with ample opportunity to practise using each of the features of database software. Students who have had previous experience with database application software may be encouraged to extend their existing skills. They may be given the opportunity to use advanced software features. In Learning Objective 12.2, students designed and produced pencil sketches for a classroom database. From a pencil sketch, the teacher may demonstrate the creation of an electronic database file structure. Students could model the demonstration of creating the database file. The entry of a few records would be shown by the teacher. Students could model the demonstration, entering all or a few records. Specific features of database management applications software could be demonstrated.

Learning Objectives		Notes
		Teachers should be prepared to provide students with a fairly large, well developed database, or give sufficient time for students to gather information and create their own. Larger databases will allow more variety of suitable activities in later objectives. In Learning Objective 12.2, students designed and produced pencil sketches for their own personal databases. Students may follow their pencil sketches to create the database file structure. Students may enter, manipulate, and modify the data. Using case studies and database management application software, students should practise manipulating and modifying data. Program functions such as numeric or alphabetic sorting should be explored.
12.4	Use commands to format and manipulate data.	Formatting fields with respect to size, type, alignment, number format, font, borders and shading should be explored. Students could be given a raw database, with a hard copy or instructions of what it needs to look like after formatting. Students should be able to sort data, change order of records, and select records using queries. Students may use databases they have created, or may be given prepared databases.
12.5	Create well formatted and appropriate reports.	Students should be required to create a variety of reports in order to demonstrate that they can select fields and records appropriately. They should also be able to put in titles, format the text, control sequence and size of columns, and print the reports. Emphasis should be put on creating useful, attractive reports.

Module 13: Skills for Entry-Level Employees (Optional)

Suggested Time: 15-20 hours
Level: Introductory
Prerequisites: Modules 2, 7

Module Overview
Many of the Module 13 learning objectives extend the learning and business focus of Core Module 9. If Module 13 is used with students who have experience with Core Module 9, teachers may choose to use a practice set or simulation.

Foundational Objectives

- To prepare for information processing career opportunities.
- To develop communication skills needed for information processing.
- To apply information processing skills and knowledge to other areas of study.

Common Essential Learnings Foundational Objectives

- To support the development of a positive disposition to life-long learning and develop students' abilities to meet their own learning needs. (IL)
- To enable students to understand and use the vocabulary, structures and forms of expression that characterize general office skills. (COM)

Learning Objectives	Notes
13.1 Examine and describe the role of an entry-level office worker in processing information for business.	The nature of the role of the entry-level office worker is changing with the use of technology in the business setting. In this module, students will considering their role as a potential entry-level office worker and the expectations of that role. Students may examine how businesses integrate people and technology to facilitate the processing of information. As information may be easily input, processed, and distributed with the use of technology, students must realize their potential role within the system and be open minded and adaptable to change. The processing stage of the information processing cycle may involve the entry-level employee in calculating, summarizing, and organizing data as well as completing a variety of routine office tasks. The output may be transmitted electronically or distributed as paper copy. Throughout this module, students will use their knowledge, and skills, and the technology available to explore the processing tasks expected of entry-level employees.

Learning Objectives	Notes
	Students may work in cooperative learning groups to develop an employee manual for the entry-level office worker. The manual could describe the worker's roles and responsibilities. Each group could present their manual to the other members of the class, simulating a company presentation. Research could be conducted into the roles and responsibilities of the entry-level office worker. Research may also include examination of the various methods and equipment that may be used for processing information in the business setting. Focused imaging may be used to assist students to visualize what working in business would be like. Students may take a field trip to observe and collect data on the roles and responsibilities of the office worker. Although a manual is suggested, choice in the format of the final product may be given to the students. For example, students may choose to produce a multi-media presentation, a slide show, or a desktop published manual.
13.2 Demonstrate time management, ergonomics, work ethics, and attitudes desirable for workplace success.	Many organizations conduct employee performance appraisals to assess an employee's success in meeting the standards and objectives of an organization. Students should examine and discuss the criteria of performance appraisals. Discussion could focus on individuals ideas about which criteria would be easy to achieve and which would be difficult. Students may keep a log, tracking their use of time. To simulate workplace situations throughout the module, a variety of tasks may be given to the students. Students should establish priorities by determining the urgency of task completion. It is recommended that students be shown how to develop flexible schedules for organizing and completing daily routines, expecting and accepting interruptions. Students may review techniques such as avoiding procrastination, establishing task priorities, keeping an organized workstation, and using to-do lists. Electronic tools such as electronic schedulers or personal information management systems may be used, if they are available.

Learning Objectives		Notes
		Students will need to know that unproductive time may interfere with the efficient processing of business information that may lead to interference with business decision making. Remind students that ergonomic considerations are important in facilitating the interaction of people, work, and the work environment. Students may survey the working community to determine the work habits and attitudes expected of entry-level office workers. The survey questions may be word processed as a form. The results of the survey may be organized in a database or spreadsheet. Performance appraisals collected from a variety of businesses could be examined. Students may identify and extract the common criteria from the performance appraisals to list on a rating scale or checklist template. The Life Transitions 20 course contains a module on time management that may be used as a resource.
13.3	Analyze and complete a variety of basic business forms.	Business forms are developed to record details of business transactions. Forms help reduce time used in identifying and recording repetitious information, thus facilitate the processing segment of the information processing cycle. Students may analyze and complete a variety of business forms, determining the repetition eliminated or shortcuts provided by the form's design and use. Businesses may use generic pre-printed forms as opposed to custom-printed or custom-designed forms. Commonly used forms may differ in appearance from organization to organization. It is recommended that students experience completing handwritten and computer processed forms. Some common business forms that may be completed include: receipts, bank deposit slips, withdrawal slips, current account cheques and cheque stubs, expense vouchers, petty cash vouchers, purchase orders, invoices, credit and debit memoranda, account statements, and requisition forms. Forms specific to a business such as employment application forms, accident reports or membership forms may also be examined.

Learning Objectives		Notes
		General guidelines that students may follow for handwritten business forms are: forms should be completed accurately and neatly; all forms are numbered sequentially and prepared in duplicate; the original form goes to the customer with a copy remaining at the business for control purposes such as for future reference and for accounting; "void" should be put across the face of a spoiled form that is completed in handwriting to ensure that all numbered forms are accounted for; forms should be completed in permanent ink to eliminate changes of information; any change to information written on a form must be stroked out with a single line and initialled; each section of a form should be completed in order–from the top to the bottom or in order of the numbered sections; all words and terms should be spelled out in full; and, numerical dates should be standardized and clear. Students may collect a variety of different business forms from community businesses or organizations. The students may analyze, compose, and word process information describing each of the forms collected. They could present ways in which forms could be improved. The forms and the information about the forms may be displayed in the classroom. Students may provide a brief oral presentation outlining the content and processes used in preparing their display. Accounting resources may contain information and descriptions of many common business forms. They may also contain resource information on procedures for completing forms. Petty cash vouchers, deposit slips, withdrawal slips and other forms are included in Learning Objective 13.5. Activities may be integrated.
13.4	Design and complete computer processed forms.	In the previous learning objective, students analyzed a variety of business forms. Students should be able to identify the repetition eliminated or the shortcuts that were developed to expedite the processing of information. In this learning objective, students will design and complete forms using the computer, applying their knowledge of business forms. Students may use the word processor or other available technology and tools to design forms to facilitate the processing of information. Macros and boilerplates may be developed and saved to reduce the keystrokes that are frequently repeated. Prior to using a designed form, it is recommended that teachers assess the form to determine its accuracy.

Learning Objectives		Notes
		The guidelines provided for the procedures to follow in completing handwritten forms should be adapted for use with completing forms on the computer (Learning Objective 13.3). Because information may be changed and accessed easily using the computer, computer ethics and security issues may need to be reviewed and extended here, with an emphasis on the responsibilities of an entry level employee. Accounting resources may contain resource information on the procedures for completing forms. An electronic file of business forms may be recalled and completed as activities of this module. Students should be made aware that forms on the Internet are often used to gather information to be placed into databases. Students should be aware of how information gathered this way may be used with or without their knowledge. Students may design forms for activities in the school or community. Examples may include attendance records, registration forms, or a requisition.
13.5	Analyze the function of basic financial forms and experience the procedures for handling cash.	As an entry-level employee, students will need to recognize their potential role in the management and handling of cash. Petty Cash: Proper procedures for handling petty cash (including petty cash vouchers, petty cash registers and the petty cash fund itself) should be discussed, modelled and practiced. Accounting resources will have information regarding these procedures. Students may organize and be given experience in using a cash drawer. The documentation that may be required to acquire cash for a drawer could be examined. Banking: An entry-level employee may be involved in attending to the basic banking procedures. Students will need to know the function of and be able to complete basic banking forms such as deposit slips, withdrawal slips, and cheques. Other banking terms and concepts that students may become familiar with include: cheque endorsements, credit memo, debit memo, passbook, chequebook register, current account, service charge, interest, bank statement, bank reconciliation, automated teller service, non-sufficient funds, certified cheque, and post-dated cheque. See Learning Objective 13.4.

For cash control purposes, students need to recognize that people who handle cash in a business are not normally allowed to reconcile the bank statement or complete the accounting journals and ledgers. Students should be able to fill out receipts that would be completed for the possession of all incoming funds. Students may discuss the responsibilities, concerns, and procedures of dealing with non-sufficient funds cheques, and cash short and cash over situations.

Students may establish a contract with the teacher, taking responsibility for arranging a personal experience handling cash and completing any accompanying forms that may be required. The experience may take place in the school or the community. For example, students may volunteer to handle admissions to a drama, musical, sporting or other school event. Students may handle cash and complete the necessary forms when purchases of food products, school clothing, or any number of items are sold in the school.

A speaker from a bank, trust company, credit union or other financial institution may be invited to the class. The speaker may provide information on the banking forms and services that an entry-level worker or an individual may use. The speaker may discuss and demonstrate the proper procedures for completing banking forms such as withdrawal and deposit slips. Students may model the demonstration in completing the forms. The guest may expand the discussion to include the use of computer technology to facilitate banking procedures in processing information.

Banks, trust companies, credit unions and other financial institutions may provide free resource materials that outline the procedures for completing bank forms and describe a variety of financial services.

Learning Objectives	Notes
13.6 Identify and demonstrate the human relations and oral communication skills commonly used in a business setting by entry-level employees.	In business, effective communication skills and interaction with people are important in building working relationships. As students become employees, roles in the communication process will affect the communication skills needed. Remind students that all communication consists of three basic components: sender, message, and receiver. Personal and interpersonal skills are very important human-relations components of the communication processes, for building business relationships and for personal professional growth. It is recommended that students demonstrate skills such as loyalty, dependability, a sense of pride, voice control (including enunciation and tone), positive body gestures, grooming, and facial expressions, effective listening, and effective speaking. Entry-level workers use oral communication skills in a variety of situations such as making introductions, greeting visitors, addressing inquiries, and the handling of routine and difficult telephone calls. Learning Objectives 9.12 and 9.13 discuss telephone techniques and the use of the telephone. Students may need to be reminded that tone and enunciation of the voice is of prime importance when using the telephone because body language cannot assist in the presentation of the message. Practice in using or experiencing the special features of a telephone system may be given to the students. Students should gain an exposure to a variety of telecommunications equipment and experience the processes of sending and receiving information using a multi-line telephone system. This experience should include holding and transferring calls. Practice in writing telephone messages may be completed using a variety of forms (Learning Objective 13.3). Students may examine and practise telephone techniques using simulated business telephone equipment that would include multi-line systems and other special features. Students may role play a variety of telephone conversations. A work study for personal experience answering a telephone for a business may be established. For example, students may spend some time answering the telephone and recording messages for a business office. The office in the school, community church, or the band office may be selected as locations to conduct the experience.

Learning Objectives		Notes
		Brochures, booklets, and visuals illustrating appropriate telephone techniques and responses may be available from a variety of sources.
13.7	Develop written communication skills by composing, editing, and formatting business letters and memoranda.	Students should be aware of the differences between personal, personal-business, and business letters. Business correspondence and the distribution of written correspondence are means of maintaining communication with clientele. Students may examine the importance and function of business correspondence and the role an employee has in composing and processing correspondence. Entry-level workers may be expected to compose, edit, and format their correspondence. However, in some cases, the worker may be responsible for editing and formatting the correspondence of others. Students may be given experience with both. Review with the students the cycle for composition: rough draft, editing, and final version. Students may compose business letters and memoranda at the keyboard. Accompanying envelopes or mailing labels may be produced. It is important that the composed correspondence be of the correct tone, be free of grammatical or keying errors, and meet the objective or purpose for which it was intended. For example, does a letter written requesting information clearly request information? Students may communicate by composing and keying letters and memoranda to one another and/or to outside agencies. Depending upon available technology, the messages may take various forms. For example, students may use word processing software to compose letters on behalf of the resource centre staff to request free materials. If technology permits, students may compose and send messages using available communications media such as electronic mail (E-mail) or facsimile technology (fax).

Learning Objectives	Notes
13.8 Describe the procedures for handling incoming and outgoing correspondence, distinguishing among a variety of methods for distributing correspondence.	In a large organization there is usually a specialized mail department with a trained staff to deal with all incoming and outgoing correspondence. In a small business, usually one person is responsible for handling and processing incoming correspondence. Electronic data transmission is becoming more prevalent, although many businesses still use a paper-based distribution system. Students will need to be aware that businesses may use a combination of electronic and paper-based distribution systems and students should be given an exposure to both. The processes adopted for handling incoming and outgoing mail are important to the overall efficiency in the processing of information. The urgency of response to incoming correspondence and its storage and distribution are factors that may be discussed. These factors reflect time and information management. Inform students that the procedures for handling incoming mail may differ among organization although the purpose for the procedures would be similar. Processing of all incoming mail includes accepting, sorting, coding (date stamping, indexing), reading, making notes, and distributing (or filing) the correspondence to the appropriate destination(s). The procedures for handling electronic mail are much the same as those above except the computer may complete some of the manual tasks automatically, such as recording the date and time received. Outgoing correspondence also requires decision making in choosing the most appropriate and most cost-effective means for distributing it. This issue is examined in more detail in Module 10 and need not be dealt with in depth here. It is desirable for students to examine a variety of methods that are available for the distribution of correspondence and select appropriate methods for the distribution of outgoing correspondence comparing costs and convenience. For example, students may select the postal service, a messenger service or electronic data transmission for the distribution of urgent information. An awareness of how to wrap and protect parcels from damage during the distribution process is valuable. Students may need to review how to address an envelope properly and transfer that knowledge to addressing parcels. Mailing labels may be discussed and prepared. Encourage students to access and use the necessary materials and information to address and send correspondence properly.

Learning Objectives	Notes
13.9 Assess from experiences of this module, the role and expectations of entry-level employees.	Provide students with the opportunity to re-examine all the knowledge and skills developed throughout this module, relating them to the roles and expectations of entry-level workers. If students have been involved in a work study or have had job experience, a more meaningful discussion can be held. Working in pairs or individually, students may job shadow an office employee for a full or partial working day to assess and experience the role of the worker. Alternatively, students may interview an employee or use other communication methods to obtain information. Students could prepare a list of questions that would enable the collection of information on topics included in this module such as time management and other desirable work habits and attitudes; processing business forms and documents; human relations and other communication skill requirements; management of incoming and outgoing correspondence; and, any other routine office tasks expected of entry-level employees. Students may summarize their collected information to be presented to the class.

Module 14: Intermediate Word Processing (Optional)

Suggested Time: 20-25 hours
Level: Intermediate
Prerequisite: Module 9

Module Overview
This module will provide students with the opportunity to increase the development of word processing applications software.

Module 14 student assignments may be patterned after simple, straightforward keyboarding and word processing tasks performed in the world of work. Assigned tasks should focus on the development of planning, formatting, and editing skills. Teachers intending to teach Module 18: Effective Business Writing and Document Production should consider integrating Module 14 and 18. Teachers are reminded that the nature of Information Processing presumes the integration of learning from core and optional modules. For example, knowledge and skills from the core modules such as the ethical use and care of computer equipment, business-like attitudes, proofreading, ergonomics, touch keyboarding, and time management skills will continue to be demonstrated and extended throughout this module. Teachers and students are encouraged to seek opportunities and develop activities to integrate the objectives from this module with the objectives from accompanying modules.

Foundational Objectives

- To develop the ablility to use a computer system for personal or business use when the environment requires.
- To use a variety of computer software applications efficiently and productively.

Common Essential Learnings Foundational Objectives

- To enable students to use language (listening, speaking, reading and writing) for differing audiences and purposes that are relevant to the students and to word processing document production. (COM)
- To develop students' appreciation of the value and limitations of technology for information processing. (TL)
- To develop an understanding of complex functions of the word processing software. (TL)

Learning Objectives	Notes
14.1 To identify and name elements of, and activities involved in, the word processing document cycle.	The word processing document cycle is an adaptation of the information processing cycle that may involve all or some of the following steps: Origination: The origination of a document involves putting thoughts into words. Those thoughts may appear in a variety of ways, including handwritten, printed, rough draft, statistical, dictated (using shorthand, machine, or voice technology), revised, or prerecorded form. Prerecorded form may refer to a previously- stored document that now requires revision, such as a form letter that was previously recorded on a word processor, or a memorandum entered by an optical character recognition (OCR) scanner. Production: Production involves converting the originator's text into readable form by keying and printing the document. Business demands that the cost of producing documents be kept to a minimum. Quality documents must be produced as quickly as possible and with perfect accuracy, thus involving a joint application of efficient keyboarding proficiency and effective word processing and decision-making skills. Revision: After a document has been keyed and printed for the first time, the originator may use proofreaders' marks to indicate corrections and changes to be made. A document may be revised or edited more than once with the focus on producing the most effective communication. Reproduction: When copies of a document that has been produced in final form are required, reprographics may be used to produce additional copies. Distribution: Whether the distribution system is manual or electronic, the goal of distribution is to get the finished document to the receiver. Storage: Records management includes classifying, arranging, and storing documents so that they can be easily retrieved. Storage systems may be paper based or electronic, or a combination.

Learning Objectives	Notes
	Using focused imaging and imagining themselves as word processors in any number of businesses, students could create and word process their own case studies. Working individually, in pairs, or small groups, students could determine different methods of information origination, production, revision, reproduction, distribution, and storage. The case studies may involve some or all of the steps of the word processing document cycle. Throughout this module, annotated assignments and activities completed by the students may continue to be placed into students' reference manuals.
14.2 Demonstrate the word processing and document preparation skills necessary to prepare a wide variety of documents.	Students can be expected to manipulate data efficiently and effectively, to enter text, create documents, display text, edit and revise documents, and to manage and print files as required. The following are some guidelines for features of word processing software that may be used to process documents: Merging two documents (such as mail merge/list processing/document assembly); print enhancements (such as bold, italics, font sizes); tabulation features (such as decimal, absolute, relative); tables including math calculation (such as column add, column subtract, column total); open and closed leaders; insertion and manipulation of graphics; columns; page formatting (such as page division, size and orientation); display features (such as print enhancements, centred information); format/phrase storage (such as macro, boilerplates); formatting (such as margins, justification, hyphenation, widows, orphans, automatic page numbering, headers, footers); search and replace; and, proofreading features (such as spell check, grammar check, thesaurus). Students will need to have sufficient time to experience documents that require the use of these features. A variety of documents can be used, including business documents such as reports, letters, tables, and tabular displays, but could also include documents such as posters, invitations, menus, programs for special events and greeting cards. Students should be encouraged to explore and experiment with features of the word processing program and share their discoveries with classmates.

Challenge students by providing them with hard copy documents that they are required to reproduce. This will require them to plan and execute the necessary steps to achieve a particular appearance.

Students should continue to proofread, edit, save, and manage files. It is important that students know how, why, and when to perform and use word processing features. Memorization of the keystrokes required to perform all word processing functions may not be required but should be encouraged, particularly for frequently used features. Allowing students to access and use the help function, reference materials and templates to assist with the use of software functions is acceptable, although students should be aware that additional time required to consult such reference material may detract from document production.

Document preparation may involve planning, formatting, keying, proofreading, revising, producing, and saving a document. The objective of document preparation is to produce a quality product. Document preparation must be mastered before students transfer their skills to document production where time becomes an important factor. Students should be provided with ample opportunity to plan, format, and proofread documents.

If integrating this module with Module 18, there are opportunities to integrate word processing and document preparation skills to prepare business documents that may include: business letters in extreme (full) block, block (modified block), semi-block, and simplified letter styles; no-point (open), two-point (standard), and all-point (closed) punctuation patterns, business memoranda, multiple-page letters and memoranda, open-style tabular displays, form letters, and bound reports.

Annotated samples of documents may be in the students' reference manuals providing a visual resource to assist with production tasks.

Remind students that different word processing software applications may use different keystrokes to perform similar tasks. Emphasis should be placed on student retention of what the specific tasks of the word processor are rather than the specific keystrokes to perform the task.

Learning Objectives	Notes
	Students may experience all steps of the word processing document cycle by working cooperatively with school groups to produce documents such as the school newspaper, newsletter, yearbook articles, and programs for drama, musical, or sporting events. Use all available technology and tools to assist in processing information through the word processing document cycle.
14.3 Demonstrate skills necessary to produce long documents.	Students should already be familiar with automatic page numbering, headers and footers, but long documents may require various extensions of these features. Students should be able to set page numbers to allow for addition of pages into document, such as hand drawn pictures. Page number location, headers and footers need to be formatted on facing pages in long documents. For example, a long report or book may have the document title as a header on one page, but the chapter heading on a facing page. Page numbering may also indicate current chapter (section) and page number within that chapter. Where software has the capability, students should be able to mark the text to produce a table of contents and an index automatically. Text from long documents such as articles from an encyclopedia lend themselves to making a table of contents and an index and may be provided for formatting. Alternatively, cooperation with another teacher may have students producing a long report that may be evaluated by both teachers. A class project such as a cookbook or compilation of student writing may allow students to meet this objective and could be integrated with other modules.

Learning Objectives	Notes
14.4 Master and apply formatting skills to enable efficient and effective production.	Production skills involve a joint application of keyboarding and word processing skills in planning, keying, editing, and formatting documents within specified time limits. Production skills involve producing quality documents as quickly as possible. Students should be provided with the opportunity to practise efficient keyboarding and producing of documentation. Documents should be presented in the variety of ways they may originate in the business world. Students could be provided with the opportunity to practise planning, keyboarding, and formatting documents originated in printed, handwritten, rough draft, statistical, dictated, revised, and prerecorded form. Once a new format has been introduced and practised, students should have the opportunity to master the format by developing speed and automating the processes of producing the document and by making appropriate decisions about the format. Once students are confident in efficient formatting of a document, they should move to producing error-free documents as quickly as possible. This may be referred to as production proficiency. Classroom activities should progressively become more complex, and provide fewer directions with less guidance from the teacher, thus encouraging independent learning.

Module 15: Intermediate Database: Management of Information and Records (Optional)

Suggested Time: 15-20 hours
Level: Intermediate
Prerequisites: Modules 7, 12

Module Overview
This module provides students with the opportunity to examine and experience some commonly used manual and electronic records management systems. Students will learn to use a variety of paper-based filing systems and transfer knowledge of paper-based filing to electronic information management. For example, students will be actively involved in setting up and manually organizing filing systems and will transfer these files to an electronic system using a database management software application. Students may access information from a variety of sources, categorize information for management, and determine the most efficient means for managing the information. It is recommended that students complete paper-based filing procedures prior to transferring this knowledge to an electronic format. Students with experience and knowledge of database software functions and features may devote more time to the application of electronic information management systems than to learning the use of the software. To facilitate this module, teachers may consider pairing experienced and inexperienced students when reviewing or learning database software functions.
For the purposes of this module, records management is considered to be the systematic control of information throughout the entire information processing cycle.

Foundational Objectives

- To examine the importance of information and use of records management.

Common Essential Learnings Foundational Objectives

- To provide opportunities for students' active involvement in decision making related to technological developments in the management of information and records. (TL)
- To promote both intuitive, imaginative thought and the ability to evaluate ideas, processes, experiences, and objects as they relate to information and records management. (CCT)

Learning Objectives		Notes
15.1	Review the terminology associated with records management systems while analyzing the purpose and features of efficient information management systems.	Information management is the systematic control of various forms of information throughout all phases of the information processing cycle. The existence and maintenance of an efficient method of storing and retrieving information is critical to information processing and informed decision making.

Records management refers to the management of the specific pieces of information that combine to form an information management system. These specific pieces of information may be referred to as “files” or “records”. Terminology related to records management that students may describe include: indexing, alphabetic filing system, subject filing system, numeric filing system, geographic filing system, chronological filing system, vital records, important records, useful records, retention schedule, active records, inactive records, contact management files, and cross-referencing.

Features of information management may include the different types of filing systems used, the schedule for the retention and disposal of records, the type of contact management system used, and the methodology used for cross-referencing files.

A filing system is a set of rules for arranging, storing, and retrieving documents in a systematic and orderly manner. The rules of a filing system can be applied to either a paper-based or an electronic system. An efficient filing system is an important component of records management, allowing documents to be accessed easily for problem solving or decision making. Remind students that in business, reducing the amount of time to complete simple tasks such as accessing information is important to productivity. Inform students that a variety of filing systems and rules may be used in business to assist with the management of information.

Students could retrieve a stored word processing file containing a list of statements with respect to the terminology of this module. The statements would contain errors such as misspelled words, incorrectly-used terms, incomplete statements, or incorrect definitions of terms. Students could rekey the statements, eliminating any identified errors.

Businesses develop schedules for the retention and disposal of documents. The retention schedule helps organize the orderly transfer of documents from the active files (those documents that require frequent, convenient access) to the inactive files (those records that are of value but do not need to be immediately available) to the outdated files (those records that lack value and can be destroyed).

In pairs or small groups, students may be provided with a listing and brief descriptions of several documents commonly found in business. Students may be asked to classify each document according to its retention category. Students could also recommend the length of time each document should be kept.

A contact management file reminds individuals of upcoming events and is essential for successful time management and organization. Such files may be maintained using a desktop calendar, a series of folders, or through an electronic calendar management system, as found on a personal digital assistant (PDA), many of which can be synchronized with a personal computer.

Cross-referencing is a system that assists in keeping track of information pertaining to two or more files. A reference to the document is placed into all relevant files.

Throughout this module, it is strongly recommended that students manage all their electronic and manual information, keeping a follow-up file of their class assignments and activities. Students may use a calendar or choose from a variety of electronic or manual planners. Students could: list all activities for the upcoming week; break large tasks into smaller more manageable units; establish task priorities by numbering tasks in order of importance; and schedule time for relaxation or leisure activities. Students should also make decisions about the retention and disposal of files.

A case study or a video illustrating an efficient paper-based or electronic filing system may be provided. In pairs or small groups, students may discuss the specific filing systems employed; how documents were classified for retention and disposal; the use of contact management files; and the cross-referencing system used. After examining the case study or video situation, students may compose a summary identifying and explaining the terminology identified from the activity and how it was used in the overall system. Students may also focus on the efficiency of the system employed. Assessment information on content, process, keyboarding, and attitude could be recorded from this activity.

Learning Objectives	Notes
15.2 Describe and experience a variety of filing systems.	Teachers may need to assess prerequisite experience with the five main filing systems of this learning objective. Paper-based filing systems include alphabetical, numerical, geographical, chronological and by subject. The type of filing system that is chosen depends upon the needs of each individual or business. It is strongly recommended that students be aware that all users of a system must understand and follow the same set of rules consistently . The alphabetic system arranges records in alphabetic order based on indexing (rearranging for filing purposes) of the key word(s) in the document to be filed. A series of indexing rules may be consistently applied by all users of the alphabetic filing system. Students may apply indexing rules to index a variety of names, including names with prefixes, hyphens, apostrophes, titles, degrees, and abbreviations; foreign names; company names; geographic names; articles, conjunctions, prepositions; and numbers. Geographic systems are established based on the geographic location referred to in the content of the data to be stored. Numeric filing systems allocate a number to each file, while chronological systems arrange information by date. Subject filing systems organize records into categories according to the subject of the document. After a teacher or student demonstration of the application of indexing rules, students may complete assigned questions and problems that may involve the direct application of the filing rule(s) to be reviewed or learned. Paper and pen, index cards, or word processing software may be used. Problems may include the integration of the new rule(s) and the knowledge of previously-learned rules. A simulation involving integration of all of the indexing rules may be assigned. Several examples of correctly- and incorrectly-indexed names may be presented to students. Students may discuss each example in pairs or small groups to determine which indexing rule has been applied and whether it has been applied correctly. Students may indicate their understanding of the rule by correcting incorrect examples. Student knowledge and experiences with each of the paper-based filing systems of this learning objective will be applied to electronic filing system use or design.

Learning Objectives	Notes
15.3 Examine the purpose, characteristics, and terminology associated with database management applications software.	Students who have completed optional Module 12 may require only a brief review of database management applications software. Ensure that students understand that business offices and other organizations must maintain records. These records may be maintained to keep track of business transactions, inventory, creditors, customers, and employees. A number of microcomputer software programs have been developed to make the task of recordkeeping faster and easier. These programs are called database managers or database management systems (DBMS). A database is information of a common nature that has been collected and stored. A database management system is a software application that organizes and provides fast and easy access to electronic data. Terminology that may be taught or reviewed: input, security, data processing, output, source document, data classification, alphabetic, numeric, alphanumeric, data, database, database management system (DBMS), field, record, file, file structure, field name, field types, character field, numeric field, date field, logical field, memo field, field width, calculated field, rational operators, and query. Assigned questions, problems, notes, and demonstrations may be used to teach or review the purpose, characteristics, terminology, and the use of software applications to manage information. Students may model demonstrations. Provided with a sample database, such as a student telephone book, correct and incorrect examples of concepts such as alphanumeric fields, records, character fields, and numeric fields may be illustrated. Students may prepare a glossary of terminology. The glossary may be continually updated for student reference. The class may visit business organizations to examine the ways in which documents are stored, ascertain the type of records management system used, and determine why it was chosen. With assistance from the employees, students may assess the systems and hardware used. A rating scale may be used during the field trip. Criteria may include: efficiency of the system, system security, input, output, classification, ease of access, information transfer from active to inactive information, and length of time inactive files are retained. On the field experience, students could also investigate the use of paper-based and electronic records management systems and the ways in which electronic records management systems are integrated with other office technologies.

Learning Objectives		Notes
		Students with previous experience and knowledge of database management software applications can transfer their knowledge and skills to this module, especially if a new software application is used.
15.4	Assess and justify the use of database management applications software in processing information.	For more information, see Learning Objective 12.1. This learning objective may provide a brief review for students who have prior experience and knowledge of database management software from the previous modules of Information Processing. To make students aware of the power of database management software, the teacher may contrast a paper-based and an electronic database. For example, a paper-based database could be demonstrated by a collection of gas receipts inside an envelope. The same data could be entered as records on a computer database. Students should be aware that in some situations a paper-based system may be more efficient than an electronic system. Emphasis should be placed on the user's ability to locate and retrieve specific records within the paper-based and the electronic systems. It is strongly suggested that students be aware of how the structuring of a database file is vital to the students' ability to identify and process data on the computer into meaningful information for use. Students should be able to query a database file, extrapolate ideas, evaluate, and make judgments from the information. Students could brainstorm the advantages and disadvantages of paper-based and the electronic management systems. Provided with a series of both personal and business situations, students could determine the most appropriate system to be used. A video may be used to illustrate the capabilities of a database management system used in a business. Students could compare and contrast the illustrated database management system with a paper-based system. Students could discuss and ascertain the advantages and disadvantages of both paper-based and database management systems. Anecdotal notes may be used to record assessment information collected from the discussion.

Learning Objectives	Notes
	Working in pairs, students may contact a community business to discover what types of filing systems are currently being used; whether the system is paper-based, electronic, or a combination of both; what types of software are being used; and future plans for keeping records. Students may be interested in examining the use of image processing. Each pair of students could determine a list of questions to be asked prior to contact with the business. Pairs could report their findings to another pair or to a large group. Students should be reminded that sometimes a paper-based filing system is less costly to maintain and more efficient than an electronic one.
15.5 Use database management applications software to manage data electronically, applying the alphabetic, numeric, geographic, chronological, and subject filing systems.	For more information, see Learning Objectives 12.2 and 12.3. It is recommended that the instruction manual that accompanies database management applications software be consulted. Using database management software, students should create, delete, retrieve, sort, modify, and store data. They should be able to create a database that includes forms, multiple tables and reports. With the data, they will conduct a variety of searches; change the size and location of fields; and use calculated fields. Tables should be related with key fields, and students should be able to explain how and why this would be done. Advanced features such as graphics within records and macros should be explored. In order to create and enter data into a computer database, students must be able to visualize a file structure. Students will require an understanding of the relational concepts of rows and columns in addition to the value of choosing meaningful field names. Modifications to designed databases that students may experience include inserting and deleting fields; inserting and deleting records; sorting records; selecting specific records; searching the database (possibly using sequential record searches, specific search criteria, and wild-card searches); changing the size and location of fields; using calculated fields; and formatting reports. Students may select procedures for printing selected reports and provide output suitable for different sizes of paper and different types of reports. The manual accompanying the software should be consulted by the students as a reference when they are working with the software.

Provided with simple data relevant to students, for example, a schedule for a school sporting activity, students could manually plan the management of the information to be included in an electronic database. A layout or planning sheet may be used as an organizer. Students could enter the data into database management applications software. Students could then be guided through the manipulation of data, incorporating teacher or student demonstration with the possible pairing of those students with previous knowledge of database management software with those students who have little or no previous experience in this area. Assessment information on content and process skills may be collected.

Students could bring a sample paper-based database from home. Examples may include personal telephone directories, membership lists from a team or group, or a list of items in a collection. Working independently or in pairs, students may create a layout sheet by manually planning the arrangement and size of fields within the database record. Using database management software, a database may be created, and records may be added, listed, edited, inserted, deleted, and printed. Files may be searched, sorted, and altered. If students require further practice in order to become confident in using the software, sample databases may be exchanged and the activity repeated.

In Learning Objective 9.17 and 9.18, it was suggested that students file manually, applying all five commonly-used filing systems to a comprehensive simulation. Using this simulation and database management software, students could apply their knowledge of paper-based filing systems to designing an electronic database. Students may use software to enter, sort, and manage data. For example, students could prepare a list of members according to each of the following filing methods: alphabetically by name, numerically in descending or ascending order; by subject according to type of policy; geographically by address; and chronologically by expiry date. Students could time the application of each filing method, comparing the time required for electronic and for paper-based filing. Students could also compare the results and examine any discrepancies among the final products. Final products could be placed in students' portfolios for contrast and comparison with manually-generated products.

Learning Objectives	Notes
15.6 Design and present solutions to business problems using database management applications software.	In addition to reviewing filing systems, the final learning objective of this module could offer students the opportunity to use database management applications software to apply knowledge of filing systems to: design an electronic file; input and proofread data; list and proofread data; add records; delete records; make changes in records; answer inquiries; print a listing of the file; and prepare a variety of reports. Students may transfer their knowledge of databases and information management to access information to assist in producing solutions. Depending on the type of information that is to be managed, it is desirable for students to apply knowledge of the subject, geographic, chronological, and numeric filing systems to the design of the electronic information management system. The application of knowledge of the alphabetic, subject, numeric, geographic, and chronological filing systems to the electronic systems should be applied to planning and organizing the electronic information. This could be accommodated through the recognition and selection of appropriate field names when organizing and designing the database. Planning for electronic information management must consider information access, retrieval, and transfer. It is recommended that emphasis be placed on the selection of appropriate field names in the designing of databases so that potential users of the database may generate questions and query the database to access, extract, manipulate, or produce meaningful reports and information from its contents. For example, if information to be managed may be accessed alphabetically, geographically, numerically, chronologically, or by subject, the system design should allow for access by these designations. Learning contracts may be used, requiring students to determine a project they wish to complete. Provided with a project or a simulation, students could use database management software to produce a solution. Students could design a database, enter and manipulate data, sort data in a variety of ways according to specified criteria, complete a variety of searches according to specified criteria, add fields, complete calculations, and create reports. Process skills may be assessed using the forms provided in this guide. Final products could be placed in students' portfolios.

Module 16: Intermediate Spreadsheets (Optional)

Suggested Time: 15-20 hours
Level: Intermediate
Prerequisite: Module 11

Module Overview
This core module will expand the skills and knowledge students have of spreadsheet application software. Wherever possible, teachers should focus on the problem solving capabilities of spreadsheets.

Foundational Objectives

- To develop information processing skills that will be useful in their personal life.
- To use a variety of computer software applications efficiently and productively.

Common Essential Learnings Foundational Objectives

- To develop an understanding of a number of logical and numerical functions of a spreadsheet. (NUM)
- To enable students to further develop problem solving skills using spreadsheets. (CCT)
- To enable students to produce documents that effectively communicate information. (COM)

	Learning Objectives	Notes
16.1	Review the basics of terminology, data entry and manipulation of information in spreadsheets.	Having been through Module 11, students should have a good understanding of the purpose and function of a spreadsheet. Teachers may want to do a pre-assessment to determine the level of review necessary. As a refresher, students may be asked to develop a simple spreadsheet that incorporates a number of the features covered in Module 11.
16.2	Use complex functions of spreadsheet software to process information.	Functions that go beyond the sum and average functions should be explored. In particular, students should be able to use lookup tables, choose functions and logical functions such as IF, OR, AND, FALSE. Students could research variable income tax rates, volume discounts offered by retailers or wholesalers, or shipping charges based on weight or quantity, and incorporate this information into lookup tables. It is recommended that financial functions such as payment, future value, present value, rate and term are incorporated into activities. Discussions and activities related to loans, credit cards, investments and other money management issues could take place.

Learning Objectives		Notes
		A teacher may take a different focus to explore complex functions, and could have students work with math functions or with text functions. The specific functions are not critical, but the development of an appreciation of the power of the spreadsheet software, and the ability to work with these less common, complex functions is the underlying purpose of this objective.
16.3	Create attractive and effective spreadsheets and charts using spreadsheet data.	A spreadsheet to be formatted could be a commercial invoice. This could require different fonts, column widths, graphics, coloured cells around the perimeter, various types of borders around blocks of cells and columns. This invoice, once created can be used again in Objective 16.4. Students should be able to customize spreadsheets by changing row and column size, borders and lines, as well as colours and patterns. Students should also be able to customize charts to make them visually appealing as well as functional and informative. Students should also become comfortable with choosing the appropriate type of chart, changing marker shapes, using 3-D or exploding charts, modifying the colours used on the charts, and customizing the titles, labels and legends. Understanding the way data transfers from the spreadsheet to charts will help students plan their spreadsheets so that the desired charts are more easily created. A variety of activities requiring use of a number of different types of charts should be provided. There is opportunity to collaborate with teachers from other disciplines to use data generated in activities in other classes to be applied to activities in this module.

Learning Objectives	Notes
16.4 Students will be able to organize spreadsheets that require or utilize a number of different tables of data using multiple worksheets.	Although worksheets can be very large and capable of holding enormous amounts of data, it is often more suitable to use multiple worksheets. An activity that might make use of multiple worksheets would be a yearly budget that has one month on each worksheet, with the format on each worksheet identical. Students could also have lookup tables or other reference material on separate worksheets. Have students create an invoice that automatically puts in customer name and address based on the customer number, item description , price and weight based on the part number, calculates shipping and handling charges based on weight and then calculates taxes and totals. Using lookup tables for customers and parts, an entire invoice could be completed by only entering the customer number and the part numbers. Students should be aware of the advantages of using a process like this, because updating prices or customers is very simple. Students should be encouraged to design a functional and useful spreadsheet.
16.5 Students will be able to create complex spreadsheets that will be useful in problem solving or used to make predictions in “what if” scenarios.	Students should be required to create a realistic spreadsheet that could be used by an individual or business to solve problems and make decisions. A simulation of a small retail business with inventory purchases and sales, monthly expenses, employee wages and advertising expenses can be used. The spreadsheet should be to be able to have all data related, but should never have to be entered more than once. Another simulation could be to create financial books for a farm, in which they can easily see changes to yearly profit if productivity is changed, if commodity prices or interest rates change. Challenge students to develop formulas that will realistically make appropriate changes to things like sales based on advertising expenses, or productivity based on fertilizer expenses. For items like this there should be some benefit to the expense, but this benefit is limited and as the expense goes up a point is reached where the expense exceeds the return. The challenge for a business is to maximize this return, and “what if” scenarios are an excellent way of predicting this, providing the assumptions built into the spreadsheet are valid.

Module 17: Integrating Software Applications (Optional)

Suggested Time: 15-20 hours
Level: Intermediate
Prerequisite: Modules 2, 8, 11 and 12

Module Overview
This module has been developed to provide students with the opportunity to gain familiarity and practice with integrating a variety of data from different computer software applications. Word processing, spreadsheet, database, graphics, and communications software applications are used by individuals in personal, school, or work-related applications. This module will promote familiarity and experience with the processes involved in combining information from different sources to produce new documents or communications. It is recommended that students use an integrated software package; however, the use of software applications that will allow the integration and manipulation of data between files from different software applications may be used.

Throughout the module, students may use a problem-solving approach (identify the problem; list alternatives; list consequences of each alternative; and, select an appropriate solution) to produce a solution using the most effective means. Students will apply their knowledge and skills to use the computer and software applications to produce solutions to problems. It will be important for teachers and students to be flexible and adaptable in accessing, integrating, and determining the processes necessary to produce the most effective final product. Students can be encouraged to create, access, and use information from a variety of resources.

Teachers may need to assess student prerequisite skills and confidence in using a variety of software applications. This will assist in determining the appropriate review of computer applications that must take place prior to completing integration tasks. It is recommended that the majority of time in this module be devoted to problem-solving and integration activities. If students will be introduced to and using new software programs, they will need to demonstrate an understanding of the similarities and differences between the new software programs and those used previously.

Foundational Objectives

- To develop an understanding and appreciation of the capabilities and potential of software integration.

Common Essential Learnings Foundational Objectives

- To provide opportunities for students' active involvement in decision making related to technological developments in information processing. (TL)
- To promote both intuitive, imaginative thought and the ability to evaluate ideas, processes, experiences, and information in meaningful contexts. (CCT)
- To support the development of a positive disposition to information processing for lifelong learning. (IL)

Learning Objectives	Notes
17.1 Review and apply the features and applications of word processing, database management, spreadsheet, graphics, and communications software.	This learning objective provides an opportunity for students to review prerequisite skills and knowledge about each computer software application. It is recommended that each software application be reviewed independently in preparation for integration activities. The degree of review required will depend on students' previous experiences and the modules chosen to accompany this optional module. In order to complete integrations in this module, students require a basic understanding of each of the different software applications. It is recommended that students be confident in their ability to create, process, and output word processing, database, spreadsheet, and graphics files. Students can use communications software to access, use, and distribute information. The management, output, and storage of files may need to be reviewed and reinforced. Graphics applications enable the creation of visuals including graphs, charts, diagrams, drawings, videos, still photos, visual animation, or slides. These programs may allow the use of a library of clip art. Students may review the creation and use of graphics for enhancing textual information. Libraries of public domain clipart are available on the web. Provided with simulations or case studies, students could work in pairs or small groups and use a problem-solving approach to prepare solutions. The solutions may involve the composition and creation of a word processed document, the need to design and produce a database file, the design and production of an electronic spreadsheet, and the design of a graphic. The solutions could be sent online to peers and the teacher for assessment. Throughout this learning objective, students may use word processing software to prepare a glossary of information processing features and terminology. For example, terminology and features of computer software specific to word processing, database, spreadsheet, graphics, and communications software may be included. Students could save their glossary as soft copy for recall when revisions to the file are necessary. A hard copy could be placed in their reference manual.

Learning Objectives	Notes
17.2 Investigate and describe the features, advantages, and limitations of integrating software applications.	The integration of software applications refers to combining data from files in different software applications to produce a new document. Software integration can take place between standalone software applications or through an integrated software program. Integrated software programs may feature several software programs that have been combined into one package. For example, word processing, spreadsheet, database, and communications software programs may be offered to the computer user as one integrated package. Integrated software programs enable the user to retrieve information that was previously stored within one software application to use in another. For example, a portion or all of the numeric data from a spreadsheet program may be easily and quickly combined with text from the word processor to generate a unique report. Numerical spreadsheet data may be represented as graphs. The use of integrated software can eliminate the need to input information that has already been processed and stored. Software programs in an integrated package often share a common methodology and command structure. In addition, data may be transferred easily and quickly among programs in an integrated package. If standalone software programs are used, moving data from one program to another may be more difficult and perhaps impossible. Ease of information transfer among programs and a common command structure are definitely major advantages of integrated software packages. Independently or in pairs, students may contact an organization to gather information on the use of integrated software applications. Students may interview employees to ascertain features, advantages, and limitations of the integrated software system. Contact with the employees could be made on the telephone, in person, using the facsimile or by electronic mail message. In small groups, students may jigsaw the features, advantages, and limitations of integrating software applications. If students are being introduced to an integrated software package for the first time, they may compare and contrast the features of the individual software programs previously experienced, to the software applications of the integrated package they will be using.

Learning Objectives	Notes
17.3 Describe terminology and features associated with integrated software applications and demonstrate the use of these features in classroom activities.	Some terminology that may be introduced includes: cut and paste; clipboard/buffer; integrated software; integration; source file; transfer file; destination file; upload and download. Electronic data and files to be transferred and integrated must initially be prepared for transfer by moving the desired information or range of information to another area, buffer, or clipboard. Procedures for this process will vary depending on the software being used. It is important for students to understand that the overall processes for information transfer would be similar; however, depending on the software, it may be necessary to make adjustments to accommodate the transfer of information. It is desirable to provide students with some examples of accommodations that may be necessary. One example may be the need to delete extra page breaks that appear as a result of file integration. Students may demonstrate and use software capabilities to experience a variety of integrations. These may include copying and transferring data from a variety of forms using a variety of software applications. Students may be provided with experience in integrating a variety of different files from a variety of software applications and sources. This would include the uploading and downloading of files from storage devices and through communication links. Provided with an illustration of a spreadsheet and a database that have been integrated into a word processing document, guided inquiry may be used to discuss the concept of integrated software and the integrations used. Students can recall and integrate previously saved word processing, spreadsheet, and database files, revising as required to produce a suitable solution. Using previously saved material, students may practise transferring data from one software application into another. For example, students may recall a letter that they have keyed using word processing software. They may copy or transfer all or part of a spreadsheet into their word processing document, saving the new document with a new name.

Learning Objectives	Notes
17.4 Integrate information accessed from a variety of sources to complete projects efficiently and solve a variety of problems.	Once students are comfortable with all aspects of integration, they may be provided with challenging case studies or simulations that will require them to work with a variety of files from a variety of information sources and software applications. It is desirable for students to complete many related tasks to experience the efficiency of integration and "linking" files to produce a final product or communication. For example, students may design and prepare a spreadsheet using data downloaded from an online source; design a database using related information from the spreadsheet file; compose a report that would incorporate the database and spreadsheet information; and compose a letter that could accompany the distribution of the report. The letterhead for the letter may be designed, incorporating graphics and the appropriate textual information. This learning objective can provide students with the opportunity to determine the extent of their ability to apply and integrate the knowledge and skills they have acquired. Teachers should take on the role of facilitators, allowing students the opportunity to explore, input, retrieve, and manipulate a variety of information sources to produce effective and efficient solutions to problems or projects. Encourage students to be comfortable in using all available technology to input, process, and output their work or documents as required. Students and teachers may design and use learning contracts to facilitate a project that integrates information from a variety of sources. Students may be given choice in the topic of the project. The contract would involve students using the integrations suggested within this module. An example of a project follows. Students may create a database of students including pertinent school information. For example, student names, addresses, phone numbers, parent names, registered grade, current registered classes, marks obtained, and credits obtained may be some of the fields that could be recorded for each database record. Student names, registered classes and the marks obtained may be imported to a spreadsheet file so that student and class averages may be calculated. A word processed letter may be composed. The letter may be addressed to each student's parents. Integrated into the letter may be database and spreadsheet information about the respective student. For example, names, addresses, registered classes, marks, average marks, and class averages could be inserted into the word processed letter. The final products of the project could be electronically mailed to the teacher for assessment.

Learning Objectives	Notes
	Students may conduct research into how the use of integrated software applications facilitates information processing. Allow students to select the area of technology they wish to research. It is expected that students will conduct research by accessing a variety of sources of information. Some examples of information sources include human, print, visual, and electronic. Reports could be prepared using an authoring language, hypermedia, or presentation software. Completed reports may be assessed for process and content. Sample assessment tools with criteria that may be used in the assessment are provided in this guide.

Module 18: Effective Business Writing and Document Production (Optional)

Suggested Time: 15-25 hours
Level: Intermediate
Prerequisites: Modules 8, 9

Module Overview
This module will provide students with the opportunity to experience the three stages of the writing process to produce effective communication including letters, memoranda, agendas, minutes, itineraries,and reports.

Teachers are reminded that the nature of Information Processing presumes the integration of learning from core and optional modules. For example, knowledge and skills from the core modules involving work habits, attitudes, organization, composition, touch keyboarding, and time management will continue to be demonstrated and extended throughout this module.

Foundational Objectives

- To demonstrate the ability to use word processing and formatting knowledge to produce written business communications for various audiences.
- To develop communication skills needed for information processing.

Common Essential Learnings Foundational Objectives

- To enable students to use language (listening, speaking, reading, writing) for differing audiences and purposes that are relevant to the student and written business communications. (COM)
- To promote both intuitive, imaginative thought and the ability to evaluate ideas, processes, experiences and objects as they relate to written business communications. (CCT)

Learning Objectives		Notes
18.1	Identify the stages in the writing process.	The writing process may be broken down into smaller, more manageable parts by the use of a writing process model. There are many different models for writing. Students may be familiar with this process through their work in English Language Arts. It is important to work with an ELA teacher to insure consistency in this area. The following three-stage writing process model could be adapted and used in this module. **Stage One** - Prewriting (planning and researching) **Stage Two** - Writing (organizing, outlining, and writing the first draft). **Stage Three** - Revising (reworking and editing the draft, proofreading, and document output). A bulletin board could display the three stages of the writing process.

Learning Objectives	Notes
	Although the main focus in this module will be on writing for business using word processing skills and formatting knowledge, students can easily adapt and apply what they learn about the writing process to more personal formats, such as stories, journals, or poems. The activities can also be adapted if computers and word processing software is not available. Provided with an advance organizer of the three stages in the writing process, students could discuss activities that may be involved at each stage. Didactic questioning may be used. In small groups, students could examine questions similar to the following. What types of activities might be involved in prewriting? What do the terms "revise" and "proofread" mean? What activities do students think take place at each stage of the writing process? In what ways might students assist one another with their writing? Students could use word processing software to create and produce a checklist of activities that may be involved in each of the three phases of the writing process. These checklists could become pages in students' reference manuals and could be used with each writing activity. Throughout Module 18, students should be encouraged to use touch keyboarding skills and formatting knowledge to word process their writing whenever they are composing. Activities may be planned in conjunction with Language Arts activities.
18.2 Analyze and experience the steps in the prewriting stage of the writing process.	Before students begin any writing project, they should decide what they want to accomplish and how they wish to accomplish it. Prewriting involves defining the concept and gathering ideas and facts by planning and researching. Students should be encouraged to prewrite by contemplating their purpose, audience, and format, considering the scope of their topic and the research that may be required.

Plan by identifying the following:

Purpose. For example, the purpose of the written communication may be to tell a story, to inform, to describe, to entertain, to explain, to persuade, to educate, or to convince.

Audience. Students may consider age, interests, and background of their audience. Depending upon their intended audience and the purpose of the communication, students should select an appropriate level of language. Levels of language range from the formal, which may be used in preparation of legal documentation, to the casual, which may be used for interoffice memos.

Limiting the topic. Students may need to limit their subject and focus on specific topics.

The format. Sometimes the choice of format will be made for students. When the choice is theirs, students may consider transacting communication through a variety of formats such as stories, lists, outlines, essays, summaries, poems, business letters, advertisements, scripts, reports, publications, editorials, notes, charts, graphs, surveys, interviews, broadcasts, printed advertisements, memoranda, or speeches.

Research. Research is necessary when further information, such as facts or statistics, is required. Good planning will determine what information students need for their writing. Students should understand that mistakes and errors can cast doubt on the credibility of the entire finished document. Students should be reminded to identify and credit sources when used.

In pairs or small groups, students may be provided with case studies that will allow the contrasting and comparing of business and personal prewriting activities. For example, students may initially consider prewriting a business communication, such as a letter of application. Students may then consider a more personal scenario, such as the task of rewriting a well-known fairy tale or story. For both personal and business communication, students may experience prewriting by discussing, identifying, and recording their purpose, audience, and format, considering the scope of the topic and research that may be required. Students may contrast and compare business and personal prewriting activities by discussing the similarities and differences from the case studies provided.

Students could choose a subject of interest to them, with the goal of preparing a written communication. For example, students could prepare a short report, perhaps limited to 200-300 words in length. In this learning objective, students will focus on prewriting activities by discussing, considering, and recording prewriting information. For example, students may discuss and record answers to the following questions: What is their topic? Who is their intended audience? What special characteristics does their audience have? What is the purpose of their communication? What format do they wish to use? Is research required? If so, what sources of information may be accessed? Students may be reminded to limit their topic as required.

Working independently or in pairs, students may be provided with a list of questions that require them to access various sources of information to discover the answers. Sources of information may be electronic or paper-based. Accuracy of content and process skills may be assessed.

Students may be given a topic and asked to prepare communication for different audiences. Students could compare and contrast language choices (choice of words, organization of ideas, and tone of the communication) needed to facilitate effective communication.

It is suggested that students use this communication again in Learning Objectives 18.3 and 18.4, extending the activity to include all stages of the writing process.

Learning Objectives	Notes
18.3 Analyze and experience the steps in the writing stage of the writing process.	Writing involves organizing, outlining, composing, and writing the first draft. Students should refer to all of the information that they have gathered and organized during the prewriting stage. They should be reminded to keep in mind their purpose, audience, and format. During this composing stage, students may be encouraged to get their ideas keyed as quickly as possible. The process of writing may include the following activities: • List general points and details. By this time, students will have a clear purpose for the communication in mind and an understanding of their audience. Students should begin to elaborate on their ideas and purpose by recording general points and details. • Arrange general points and details. Now that students have generated a significant amount of useful information about their topic, they can organize these ideas to produce an effective written document. Students should organize so that the reader will understand the message clearly. Students may become aware that professional writers may use a variety of organization systems such as lists, concept maps, cross-classification charts, tree diagrams, flow charts and ladder plans to help organize thoughts. At this level, it is recommended that students use lists and concept maps to assist in arranging points and details. • Write the outline. An outline may be considered to be a list of points in the order in which they will be presented. Students may prepare general or very specific outlines, depending on the nature of the document that is to be written. At this level, students may use point-form outlines and/or note cards for an outline. • Compose the rough draft. If hard copy will be output for proofreading and revision (next stage of the writing process), students should double space their material to provide room for marked changes. In a suggested instructional activity of Learning Objective 18.2, students participated in prewriting activities necessary to develop written communication. Students may use this same written communication to experience the writing stage. Activities in this module may be coordinated, jointly-taught, and assessed with Language Arts activities. Topics could involve children's short stories, ballads, and poems.

Learning Objectives	Notes
18.4 Review the importance of proofreading and the use of proofreaders' marks in identifying and correcting errors in the production of error-free copy.	Review Learning Objective 7.5. Students must realize that in business, errors in copy can be easily misinterpreted as being work processed by an uncaring or an incompetent individual. As managers move towards inputting and processing more of their own information on the computer, further emphasis can be made on proofreading by having students read their work for meaning, check spelling and punctuation, and ensure appropriate formatting and visual appeal of the final presentation. Extra care may be required in communication that is composed. It is recommended that students use different methods of proofreading and accept responsibility for their work. Students should be encouraged to proofread from soft copy. Spell check and grammar check capabilities should be utilized when possible, but students must be aware of the limitations, and that they still must proofread manually. Some tips for proofreading are in Appendix G. Recognize that proofreaders' marks may be used in other classes. A standard set of proofreaders' marks and a sample activity are in Appendix H. Students and teachers should use proofreaders' marks to indicate revisions on hard copy. The teacher may review and demonstrate the use of proofreaders' marks using an overhead transparency of copy with errors. A hard copy containing a variety of proofreading errors could be used for students to indicate errors using the proper proofreaders' marks. The copy may be handed in and assessed to determine whether students were able to identify a variety of errors and used the proper proofreaders' symbols in marking corrections. A list of all the proofreaders' marks may be kept in the student's reference manual for reference throughout the course. Students could proofread each others work. Error-Free Copy: It is recommended that students be given up to two attempts to produce an acceptable or "error-free" document. When revisions to a document submitted for evaluation are needed, students may be asked to attach the revised copy of a document to the copy containing proofreaders' marks for ease in assessing the required changes. Also, teachers should inform students that some "errors" in documents may be accepted by the originator. For example, an error such as the rewording of a sentence that does not result in a change in the intent of the communication, is often acceptable.

Learning Objectives		Notes
		Whenever changes are required in student work, students and the teacher should mark hard copy using proofreaders' marks to reinforce their use. Activities could be combined with assignments from other subject areas. Students may key their writing assignments during Information Processing class and teachers from the specific subject areas may indicate the changes individual students require and the students would make the changes in information processing class. The IP teacher may assess this activity for process skills such as efficiency in using a variety of software features and knowledge of how to format the document properly.
18.5	Analyze and apply the steps in the revising stage of the writing process and edit composed documents for content, conciseness, and clarity.	Editing is like proofreading with emphasis on reading for meaning. As the ability to communicate well is essential to success, communication must be clear, concise, and understood by the receiver exactly the way it is intended by the sender. Students can be encouraged to put themselves in the receiver's position when editing their compositions. It is recommended that students ensure their compositions adopt the right tone and use simple words. Students need to know that a range of responses may be acceptable and appropriate to a situation. Students could be provided with a hard copy or a previously word processed copy of the first draft of a document or could use their own product to use for editing practice. If first drafts are provided in the form of prerecorded word processed documents, students could recall and revise the document using their keyboarding, word processing, and formatting skills to produce a final copy. If hard copies of first drafts are provided, students should use their knowledge of proofreaders' marks to indicate revisions.

Reread and revise the rough draft, checking mechanics, content, and style. At this stage, students should be encouraged to read carefully, correcting and improving the work. Students should understand that they may revise their draft copy more than once. They should examine their rough draft from the reader's point of view. Students should review their work on the basis of content, style, organization, and mechanics, striving to communicate their message clearly and concisely, including all necessary information. Students should consider the beginning, middle, and ending of their communications, vary the length and construction of sentences and choose appropriate words to express their thoughts. When editing for mechanics using hard copies, students should use their knowledge of proofreaders' marks for legibility.

Students should be able to differentiate and access a variety of reference and resource materials such as a dictionary, thesaurus, the World Wide Web, CD ROM, directories, and software manuals. and use them as necessary to edit and clarify their compositions. Students should note that specialized reference materials such as medical or legal dictionaries are used in specific organizations.

Students should understand and discuss the importance of concise, clear communication for effective, efficient information processing. The preparation and presentation of effective communication in business is of such importance that often further inservice training in this area may be provided by businesses to update and refresh employees while employed.

To ensure students are able to identify and correct errors in composition, assigned questions containing incomplete sentences, incorrect use of punctuation, cliches, spelling errors, grammatical errors, and other problems that would need to be identified and corrected may be used.

Output the final document. Reread the final copy to ensure that it is ready for distribution.

Learning Objectives	Notes
18.6 Incorporate word processing functions effectively to produce a variety of business documents.	Students should review and be comfortable using word processing features from Module 8. Students can be expected to manipulate data efficiently and effectively to enter text, create documents, display text, edit and revise documents, and manage and print files as required. The types of documents should include business letters, memoranda, tablular displays, unbound and bound reports, agendas, minutes, and itineraries. Students should be able to use the following features of word processing software: merging two documents (such as mail merge/list processing/document assembly), print enhancements (such as bold, italics, font sizes), tabulation features (such as decimal, absolute, relative), math calculation (such as column add, column subtract, column total), open and closed leaders; display features (such as print enhancements, centred information), format or phrase storage (such as macro, boilerplates), formatting (such as margins, justification, hyphenation, widows, orphans, automatic page numbering, headers, footers), search and replace, and proofreading features (such as spell-check, grammar-check, thesaurus). Word processing skills may be integrated to produce the following business documents: business letters in extreme (full) block, block (modified block), semi-block, and simplified letter styles; no-point (open), two-point (standard), and all-point (closed) punctuation patterns; business memoranda; multiple-page letters and memoranda; open-style tabular displays; form letters; and, reports. It is important that students know when these documents may be used. These exercises may be annotated and placed into the students' reference manual. In the preparation of reports, students may produce title pages; tables of content (including leaders); headings; headers and footers; footnotes or endnotes; and, a reference page. Students can be encouraged to eliminate the use of orphans and widows (the leftover lines at the bottom and top of pages). Most word processors have the capability of doing this automatically.

Learning Objectives	Notes
18.7 Apply the three stages of the writing process, integrating writing strategies to produce letters, interoffice memoranda, and reports.	Students may practice composing small sections of correspondence (introductory paragraph) and then move to composing an entire document. In previous learning objectives, students were introduced to a three-stage writing process model in which they were given opportunities to develop knowledge and skills within each stage. In this learning objective, students will be involved in extending their knowledge of the writing process to include simple writing strategies to enhance their writing. See Appendix O for instructional notes on writing strategies and suggested activities that may be used. Students may compose and produce business letters, memoranda, and reports. Appendix I is a letter planning chart that can be used for composing at the keyboard. This can also be applied to other correspondence. Ensure that students can distinguish between these forms of communication and can determine when each form should be used. Students may compose a variety of communication in response to a simulated situation. Students may simulate working as a member of an office team, as support personnel, or as an independent entrepreneur. The communication may be assessed for process and content. If students are conducting research for another area of study, they may compose correspondence requesting information, or compose final reports. They could compose an e-mail message requesting permission to quote from a web page and send it after getting teacher approval. Students may bring samples of another author's writing to class. Working in pairs or small groups, they may examine the writing for clarity, completeness, conciseness, and the directness of the message, answering questions such as: Is the writing clear? Does the reader understand the message? Is the message complete and direct? Is the writing concise? Is the reader informed without unnecessary words, phrases, sentences, or repetition? Is the writing coherent? Is all relevant information expressed in a concise manner? Is the writing interesting? Does the message keep the reader involved? This activity may culminate in a reflective discussion of methods students may use to make their own writing clear, complete, concise, and direct.

Learning Objectives	Notes
	Working in pairs or small groups, students may experience the stages of the writing process by composing and producing a communication, integrating touch keyboarding, word processing, and formatting skills. Communications could be shared with other pairs or classmates for the purpose of providing feedback for revision. Final communications may be shared with others and may be submitted for publication in the school newspaper, yearbook, local newspaper, or magazine. Simulations or case studies requiring students to solve problems in order to compose and prepare written communication could be used. The planning and preparation of a response to an editorial in the local newspaper is one suggested activity. Appendix O contains more suggestions. As a class project, students could collate and publish selected samples of their writing.

Module 19: Desktop Publishing (Optional)

Suggested Time: 20-25 hours
Level: Intermediate
Prerequisite: Module 8

Module Overview
This optional module will provide students with an introduction to desktop publishing and give students experiences in the preparation of some desktop published documents. It is recommended that dedicated desktop publishing software be used. However, this module may be adapted to use software applications that will accommodate desktop publishing features.

Foundational Objectives

- To use a variety of software applications efficiently and productively.

Common Essential Learnings Foundational Objectives

- To develop an understanding of how knowledge is created, evaluated, refined and changed within the information processing cycle and a desktop publishing environment. (CCT)
- To develop students' appreciation of the value and limitations of technology within society. (TL)
- To develop students' abilities to meet their own learning needs. (IL)

Learning Objectives	Notes
19.1 Define desktop publishing and describe the desktop publishing cycle.	Desktop publishing may be defined as the use of a personal computer, special software, and a laser printer to produce high-quality documents that combine text and graphics. Desktop publishing is also referred to as "electronic publishing". Desktop publishing is the application of the computer to the composition, editing, and layout of both text and graphics to produce an original layout of material for copying or reproducing. Desktop publishing software is dedicated to designing and producing professional-looking documents. Students should know that the desktop publishing cycle is very similar to the information processing cycle. A document is originated, input, desktop published (processed) and output for copying or reproduction. The desktop publishing cycle involves writing, editing, designing, producing, and printing. It is expected that students will apply their touch keyboarding, composition, research, editing, and proofreading skills throughout this module. Students may publish documents using the available technology. For example, when special software for desktop publishing is unavailable, students may use word processing software that allows combining of text and graphics.

Learning Objectives		Notes
		Students may contrast and compare the information processing and the desktop publishing cycles. Synectics (analogy) may be used in discussing questions similar to the following: How is the desktop publishing cycle like the information processing cycle? Name three ways in which the desktop publishing cycle is like the information processing cycle. How is it different? Content (accuracy of answers) and process may be assessed. Module 19 student activities should reflect the focus of the accompanying core module. For example, if this module accompanies Module 7, the activities may have a personal-use focus.
19.2	Identify and describe the desktop publishing hardware and software requirements.	Students should be introduced to the system that will be used in the classroom. A basic system consists of a computer and accompanying desktop publishing software attached to input and output devices. Some input and output devices that may be discussed include the keyboard, mouse, scanner, digital camera, monitor (high resolution, colour), graphics capabilities, and printer. As input and output devices vary with advancements in technology, students will need to be updated on current technology and be prepared to adapt to advances that may be available in the near future. Dedicated desktop publishing software is recommended for student use in this module. However, software that will enable students to experience the concepts of desktop publishing may include word processing, graphics (art and drawing) and page-makeup (layout) applications. Students should know that “true” desktop publishing software allows the integration of these applications, and can import files such as scanned images. Students should be informed as to how desktop publishing systems may differ from organization to organization but that the basics of desktop applications and reasons for use are fairly consistent. This should help students adapt to the various environments that they may be required to use. Students should also be aware that some word processing software applications have provisions for desktop publishing capabilities (such as providing for various fonts, the import of graphics files, and the selection of varying page layouts).

Learning Objectives	Notes
	Students may compare the advantages and disadvantages of software applications that provide desktop publishing capabilities with respect to features and cost. Students with previous experience using desktop publishing software may conduct demonstrations. Local vendors may have current information on desktop publishing resources suitable for a variety of situations.
19.3 Describe the advantages and terminology associated with desktop-published documents.	Some documents that students can produce include business cards, letterheads, newsletters, booklets, manuals, brochures, advertisements, business forms, reports, magazines, catalogues, programs, flyers, posters, and invitations. Desktop publishing offers individuals and organizations the advantage of being able to publish materials faster and cheaper than in the traditional way. It also offers a high level of confidentiality and control over the presentation of text and the integration of visuals. Students may discuss other advantages such as the ability of an individual to perform the final production and assembly of a professional-looking document. Desktop publishing is more economical for short runs of documents that would otherwise be expensive if sent to a publishing house for production and assembly. Speed in producing a final document is important, and desktop publishing allows more speed than the traditional publishing methods. Students may examine traditional publishing processes and may compare and contrast the differences between the two methods of publishing. Students may also consider the facilities available for documents that are sent out of the office for desktop publishing as well as the facilities for desktop publishing within an organization.

Learning Objectives		Notes
		Some desktop publishing terminology with which students may become familiar includes: page layout (balance), type size, typeface (set of characters of same design), weight (such as boldface), style (such as italics), font (complete set of characters in a particular size, typeface, weight, and style), templates, mastheads, leading (adjusting the space between lines of text), kerning (adjusting space between characters), halftones (photographs made of black dots on white paper), camera-ready, and resolution. Terminology unique to font selection may include x-height, base line, ascenders, descenders, and serifs. Students may take a field trip to a community business where desktop publishing is used. A guest from a printing and publishing establishment may be invited to discuss the changes in the publishing world with the advancements in desktop publishing. The guest may discuss the reasons and advantages for changes in the systems being used today.
19.4	Use a planning process for preparing desktop published projects.	A well-designed page communicates effectively and is pleasing to the eye. Consideration for facing pages and the flow of information throughout a desktop-published document is also important. Students should know that a well-designed page integrates important elements in a simple, attractive format. Considerations may include design elements and aesthetics such as balance of white space, type styles, sizes, graphics, colour, and placement of text or artwork. The use of headings, subheadings, illustrations, captions, and footnotes may also be discussed. Students should be aware that some organizations have a visual identity for the presentation of information that must be followed. Students may use the following stages for planning and preparing desktop-published documents: • identify the purpose of the communication • prepare text (research, compose, import) • select illustration(s) (clip art, draw, paint, import) • layout page(s) (choose typeface, colours; place text, illustrations) • produce sample page(s) • edit and proofread • produce the final copy.

In business, numerous page layouts may be designed and submitted for feedback and constructive criticism. When completing assignments, students may be invited to submit various page layouts for a project and be willing to accept constructive criticism for each layout designed. Remind students that constructive criticism provides positive feedback for improvement.

Some activities that students may plan and design include a letterhead for correspondence they compose, a business card for an entrepreneurial venture (for students in Entrepreneurship class), or a promotional brochure for the school or other organizations within the community.

Students may examine and critique documents on the use of good design principles. Working in pairs or small groups, students could discuss how to improve bad design. Criteria that may be used for assessment could include: Does the page layout suit the intended audience? Does the document satisfy the identified problem? Is the graphic in a suitable position? Is the line length selected for the text suited to the document? The design elements may be listed on a checklist or rating scale and used to assess the examples.

Students may work in pairs or small groups, planning and arranging text and graphics for a desktop publishing project. The interaction between students simulates the decision-making processes involved in a team environment.

Visual identity may be illustrated through the use of a number of different documents that have been produced by one organization, that have followed a visual identity in design. In small groups, students may examine samples of such documents to determine the identity that was followed and discuss why.

Yearbook seminars may provide valuable information on publishing. Consult with the yearbook coordinator.

Learning Objectives	Notes
19.5 Demonstrate the use of desktop publishing software features in preparing projects.	In this learning objective, students may complete projects that would involve them in experiencing and working with the different features of the desktop publishing software. As examples, students could be given opportunities to experience working with multiple columns of text, using a variety of fonts, generating and importing text and graphics, manipulating text and graphics (character-manipulation), and preparing page layouts. Teachers will need to adapt their expectations as software capabilities evolve, but should always try to incorporate as much of the functionality of the software as possible. Each activity that students complete should involve them in using the mechanics of the software to experience the functions. This will help prepare students for the final learning objective of this module which will require students to examine and evaluate various situations requiring the design of desktop publishing documents. Students may learn and practise specific functions of desktop publishing software by recalling and editing previously stored files and making changes which address the features of desktop publishing. For example, students may start with recalling a text file of a manuscript and practise selecting and changing fonts and font sizes within the title, subtitle and body. Students may practise importing stored files of text or graphics that are to be included into another stored file. A manuscript may be edited into multiple columns of text. Text may be wrapped around a graphic. Teachers may assess student ability to work with the features of the software package by using a performance test. The performance may be observed with data recorded on a rating scale. Criteria may include student ability to select fonts, change fonts, centre headings, import files, enter text, delete text, and others. Teachers may wish to record student ability to generate a solution using an anecdotal note.

Learning Objectives	Notes
19.6 Design and produce documents using desktop publishing application software.	Students may create pages using imported text and graphics, modify text and graphics within a page, demonstrate their knowledge of design, and link pages and text boxes. They should identify and choose appropriate fonts for their projects. Students may select, import, and manipulate graphics, formatting pages appropriately for presentation. Students may begin with very basic applications and progress to increasingly challenging projects. To ensure a variety of experiences, documents that students may publish should vary in type, purpose, and audience. Students should be reminded that the planning process is a crucial step to success in design and that various layouts for the final project may be produced. Students may work independently, in pairs, or in small groups to design and produce a wide variety of communications using desktop publishing software. Newspapers, periodicals, magazines, and other resources may provide interesting ideas for students to use in designing and producing posters, menus, brochures, flyers, invitations, résumés, books, manuals, or forms. Students may design and produce documents for the school such as the yearbook, newspaper, or parent newsletter. Students could publish documents for cultural and/or community events. Examples of events may include dances, pow wows, graduation activities, or sporting events. The following are ideas for desktop publishing projects: • a booklet of stories told by kindergarten students • biographical profiles of Elders or other groups in the community • a book of favourite recipes • tickets, posters and programs for an event • genealogy • pamphlet of community events. Time may limit the number of projects and activities that may be completed. If students are involved in a publishing project for the community or school, the Extended Study module could be used to extend the time.

Module 20: Internet Theory, Use and Exploration (Optional)

Suggested Time: 10-15 hours
Level: Introductory
Prerequisite: Module 2

Module Overview
This module will familiarize students with the background and general operation of the Internet. A focus will be accessing, using and transmitting information over the Internet. Throughout this module teachers should remind students of the privacy, confidentiality, copyright and security issues that are involved with Internet use.

Foundational Objectives

- To be able to utilize electronic communication systems effectively.

Common Essential Learnings Foundational Objectives

- To appreciate the impact that the Internet has had on society and the world. (TL)
- To understand and use the common functions of the Internet. (TL, C)
- To support the development of a positive disposition to life-long learning. (IL)

	Learning Objectives	Notes
20.1	Know and follow the school Acceptable Use Policy for Internet use.	Students should review and discuss the Acceptable Use Policy (AUP) that has been developed for their school. They should be able to explain why the policy is necessary and why each section is included.
20.2	Explain the development of the Internet, the changes that have happened since the inception and the control (or lack of control) of it.	Students should be familiar with the origins of the Internet and the purpose for which it first was introduced. A key point in the development of widespread use was the introduction of the world wide web, which allowed a very user-friendly interface. There are many websites that can be used as resources.

Learning Objectives	Notes
20.3 Understand the operation of search engines and perform efficient searches to access suitable information.	One of the paradoxes of the Internet is that there is a vast body of information available, but it is often difficult to find what is wanted. Students should research the advanced search techniques on a number of different search engines, and in particular should be familiar with Boolean searches. Effective search techniques allow more efficient access to information. Students could compare the results of a number of different search engines doing the same searches. They should realize that some search engines are more effective at some searches than others, but none are better at everything, therefore a variety of search engines should be utilized. It would be helpful if students understood the various ways that search engines make their decisions, and the way sites are placed in a search engine's database. Students could register a website, such as the school website, with different search engines. Students could discuss how and why seemingly unrelated websites appear in search results.
20.4 Explain the way websites are made accessible on the Internet.	Students should understand the concept of IP addresses, and that a website name, or domain name is simply connected to an IP address. Information that is stored on a computer that has been given an IP address, and has been made public on that computer, is available to the world through the Internet. Web servers may be as simple as individual computers that have a permanent connection (a static IP address) to the Internet, or very complex arrangements of servers. Computers with a dial-up connection usually have a dynamic IP address, which means they get a different one assigned to them every time they connect. Many websites are hosted by companies that provide dedicated space on their web server. A website can be hosted at a very reasonable cost, and in some cases, the web space may be offered free of charge, but on the condition that advertisements may be placed in your website. Domain name servers and their role in making the net function could be explored. The system through which users register domain names and the costs of maintaining a domain name would be an interesting research project. Students could research web hosting companies, and compare the features and prices of each host.

Learning Objectives		Notes
		Because of the ease and low cost of making and maintaining a website, students should be aware of the potential for extremely biased or incorrect information to be found on the website. They should be reminded that there is no regulatory body that controls the information on the Internet. Students could explore a variety of websites, and evaluate them on the accuracy, or potential bias of information.
20.5	Use an e-mail program efficiently.	Many students will have experienced using e-mail, and teachers should assess their skills to determine the depth of instruction needed. Students should be able to send and receive e-mail, send and receive attachments, forward and reply to e-mail, add entries to the address book, create groups of addresses, organize mail into folders they create, format the text of e-mail being sent, and use features that track the receiving and reading of sent e-mail. If students are given their own e-mail account, they can use it to exchange assignments with the teacher. Numerous opportunities to establish e-pals can be found on the Internet. Establishing contact with students in another part of the country or world can be a rewarding experience, and this could be done in collaboration with a project from within another subject area, such as Social Studies or English Language Arts. Students should understand that messages are traceable and that objectionable messages are unacceptable.
20.6	Discuss the security of information that is accessed or sent over the Internet.	Students should research the types of security that is provided on different websites. They should be aware of the difference between secure and unsecured websites and of the use of encryption and its effectiveness. The potential for virus infection and ways to prevent or reduce the impact of viruses should be investigated. Students could research the effectiveness of various virus protection programs. The use of Internet security programs that limit the content available could be explored and discussed in terms of appropriate use of these programs in places like schools, public libraries, or places of employment. Their capabilities and limitations should also be considered.

Learning Objectives		Notes
20.7	Download and install necessary files to use the Internet and computer effectively.	Students should be able to download and install plug-ins when necessary, patches and service packs for programs, updates for virus protection, software demos and freeware. They should be able to unzip compressed files, run executable files, and know the difference. If not practical to have the students carry out these activities on school computers, the process should at least be discussed and demonstrated by the teacher. Students should explore websites with downloadable software to become aware of the variety of software that is available on the Internet. They should be reminded of copyright issues, and should understand the difference between freeware and shareware. Although there may be security and administration issues encountered, it would be good practice for students to have to regularly download updates for school computer software, or updates for virus protection. This regular activity should lead to the good practice of regular maintenance of the same things on their home computer.

Module 21: Intermediate Computer Technology (Optional)

Suggested Time: 10-15 hours
Level: Advanced
Prerequisites: Module 1, 7

Module Overview
This module will extend students knowledge about hardware and software configurations, so that they can utilize and expand the capabilities and recognize the limitations of their hardware.

Foundational Objectives

- To be familiar with hardware and software terminology and features.

Common Essential Learnings Foundational Objectives

- To recognize that changing technology will require that end users be capable of adapting to those changes (IL)
- To understand how computers can be adapted to accommodate changes in technology (TL)

	Learning Objectives	Notes
21.1	Identify and connect components of a computer system including peripherals	Students should be given opportunity to disconnect the components of a computer system, and be required to reconnect to the original state. They should be able to identify such items as serial port, parallel port, SCSI port, USB port, video card, sound card, network card and modem. Students should be comfortable making connections with monitors, keyboard, mouse, speakers, printer, scanner, digital camera hardware and network hub or router. With the many different components available, it will be important for the teachers to develop instructions suitable for the equipment available. Teachers may choose to use older computers that are no longer being utilized, or they may choose to use the more up to date computers so that students are exposed to more modern components. Another option would be for the students to write connection instructions while taking a system apart. Another student could test the instructions.
21.2	Perform regular maintenance on computer components.	Students should be able to clean mice and keyboards, as well as know how to remove dust from the interior of the computer case properly. Students could be required to demonstrate these skills by performing these tasks on the school computers. One or more students may elect to perform these types of duties as part of a work study module, or as a work placement for a Career and Work Exploration credit.

Learning Objectives		Notes
21.3	Install and change various internal components of a computer.	Students should be aware of the situations that would require them to make changes inside the computer and should be instructed on proper precautions to take when opening the computer and working on the internal components. They should be able to identify different types of RAM, and to determine the configurations of RAM suitable on a particular motherboard, and install or replace units of RAM. Students should be able to identify different types of slots available on the motherboard (ISA, PCI, AGP) in order to choose proper components to be installed. They should be able to remove and replace cards such as sound cards, video cards, and network cards. Installation or replacement of drives such as CD drives or floppy drives should be practised. Time should be spent identifying the CPU, CPU fan, power supply and connections to the motherboard, and connections from keyboard and mouse ports to the motherboard, but it is not suggested to disassemble and reconnect these unless there is a need for those parts to be changed. Monitors can present a serious shock hazard when taken apart. Under no circumstances should students be allowed to remove the outer case of a monitor. Teachers that are responsible for the maintenance of the computers are encouraged to involve students in the maintenance when possible. The school or division computer technician could work with one or two students at a time.
21.4	Remove, install, and format a hard drive and install an operating system and software.	Teachers may want to have an older computer designated as a computer that students will perform this function on. Students should be introduced to startup disks, and utilities used for re-formatting hard drives. While this is not commonly done to hard drives being currently used, it may have to be done to new hard drives, and is occasionally done to clean up and start fresh on a hard drive already being used. Teachers are encouraged to discuss options such as partitioning the hard drive, and options available while installing the operating system. Depending on the components and operating system being used, it may also be necessary to install drivers for items such as printers, sound cards or network cards. These may be supplied with the components or found on the Internet. Students should practise installing and un-installing programs properly.

Learning Objectives	Notes
21.5 Connect and configure a computer to a network and/or configure a modem to use a dialup connection to the Internet.	Students should be able to explain various types of network configuration, and explain the role of a server, hub and router in a network. When possible, students should be given an opportunity to take part in the installation of a new computer on a network, or at least observe the procedure. Depending on the network and the operating system, this procedure will range from very simple to somewhat complex. If possible, students should have the experience of configuring and connecting a computer to the Internet through a dial up connection, or through other types of connections that are available to users of home computers in the area (for example cable, high speed or satellite). Regardless of availability, discussion of all the options should be discussed.
21.6 Configure and customize the operating system features such as menus, video settings, desktop appearance, security features and power management.	Many students will be familiar with common settings such as selection of background, screen saver and wallpaper, but should be able to determine when it would be necessary or preferable to change number of colors and screen size, and how to perform those changes. Students should be aware of the problems created when these settings are incorrectly or unnecessarily changed. Teachers should have the students work through and explore various advanced features that are available within their operating system. Ability to vary the video setting as required for different programs should be developed. Students should be given tasks which will require them to organize the start menu/program folders to be logical and efficient. Students could use cooperative learning skills to determine how to best organize their computer to make it user friendly and efficient. Security and power management features will vary with different computer systems, but the capabilities of the computers commonly used by students should be explored. This may include network security and access permissions on the network.

Learning Objectives		Notes
21.7	Identify and evaluate computer related products that are currently on the market.	Students should research current trends, specifications and prices for common computer related products. This could include, but should not necessarily be limited to, personal computers, home networking products, printers, scanners and digital cameras. An emphasis should be on developing skills to be able to find out and evaluate this information, as the facts themselves will change rapidly. Students could produce charts or rubrics to help them evaluate and compare various components, a skill that will transfer to many aspects of their lives. Students could create oral or written reports, slide shows, databases or web pages demonstrating the information they have researched. This should enable students to be aware of the technology available, as well as evaluate the appropriateness of various components for different types of end-users.
21.8	Make informed decisions related to the purchase of computer equipment.	Students should evaluate computers and related equipment that is currently advertised. They could be given various consumer scenarios and asked to make a purchase decision based on the scenario. Students could role play a situation in which a person is trying to purchase a computer, with various levels of integrity assigned to the salespeople, and various levels of knowledge assigned to the consumers. A bulletin board of advertisements could be created, and if this module is done early in the semester, it could remain in the classroom, with comparisons being made over the remainder of the course to see how much, if any, change takes place in specifications or prices. An alternative would be to find computer magazines that are not current and make comparisons to the current magazines. Information could be stored in a database to give students the opportunity to practise database manipulation.

Module 22: Troubleshooting and Technical Assistance (Optional)

Suggested Time: 10-20 hours
Level: Advanced
Prerequisites: Module 9 or 10

Module Overview
During this module, students will identify common problems that users will encounter while using computers. They will research solutions to those problems when necessary develop tools that can be used to assist users when they encounter those problems. They will develop tools that would be useful for a help desk situation, or as an independent resource.

Foundational Objectives

- To be able to maintain computers and troubleshoot common problems.

Common Essential Learnings Foundational Objectives

- To identify and analyze problems potentially encountered by computer users. (CCT, TL)
- To communicate solutions to users experiencing problems. COM
- To produce tools that can easily be used by users to solve problems. COM

Learning Objectives	Notes
22.1 Identify and categorize common problems and questions encountered when using a computer hardware, network and software.	Teachers may want to limit the breadth of this module to only hardware, or only one software application, or to have different groups work on different areas, and amalgamate all the information for learning objective 22.4. Students should have had enough experience with computers by this time to be able to identify problems that might occur. They should be encouraged to work in small groups to establish lists of problems, and categorize them as being primarily caused be software, hardware or users. The list could include items that they do not feel are problems, but that inexperienced users might need help with. For example, creating new folders to organize files is something that some computer users are not familiar with, but might seem very simple to the students. Tasks that are not commonly done by all people, but would be on occasion will make good examples for this objective. As another example, using the school's scanner might be something that more people would do, if instructions were available.

Learning Objectives		Notes
22.2	Create a list of common problems, questions or required procedures that have been encountered by end users in the school and community .	Students should create a survey that can be used to collect data about problems or questions that other people have encountered. These should be analyzed for recurring questions or problems, and categorized a being primarily software, hardware and user issues. Students could visit a computer repair shop, or have a technician visit the class to talk about the type of work they do, and the common problems that they have encountered that could typically be solved by an experienced user. Once students have compiled a list, the teacher may want to supplement it with items that they feel are missing. The lists should be organized into a format that makes locating an individual problem easy.
22.3	Develop written guidelines that will be used to define a problem or question, and instructions for answering each question or solving each problem.	For each problem, student will be required to search for solutions and develop a plan for dealing with the problem when it arises. They should create a written step-by-step set of instructions for each one, so that anyone experiencing the question or problem would be able to successfully come to a solution. The solutions should be organized in a way that would simulate a help desk service. As the customer or user describes the problem, there should be dichotomous questions that are asked to help in determining the problem, and once it has been established, the solution or answer is given in simple well defined steps. Students could practise and test their material by working through simulations with other students playing the role of the troubled consumer. They could also use their knowledge and developed solutions to assist younger students in their classes, teachers, or other community members.
22.4	Create a product, either a written manual or a computer based (web) solution set, that can be used either as a standalone product for consumers, or as a call-in help desk manual.	Before completing this task, students should be exposed to other similar manuals. First aid manuals are often arranged in such a manner, in which there are dichotomous questions, with directions depending on the answer. Troubleshooting sections in many manuals may also be organized in such a fashion.

A class trip to a call center that utilizes such a manual or computer system would be a valuable experience, so that students understand the type of procedures they will need to develop. Alternatively, you could invite a help desk operator to visit the class to discuss the procedures they follow, and to demonstrate the resources that are available to them. It will also demonstrate that an effective system needs to be quite complex and thorough. Telephone etiquette and procedures for dealing with unhappy customers should be discussed as well.

Students could work as groups or as an entire class on this task, as it has the potential to be a complicated project. If a manual is produced, it should be made available to teachers and students in the school, so that they can solve their own problems when they arise. If a web based solution, which lends itself to the dichotomy of questioning very well, is produced it could be made available on the school network and it could also be placed on a public server so that other members of the community, and the entire world, could access it. Not only will students become more knowledgable about the process of troubleshooting, they will also develop and learn skills from each other that will continue to be of value to them as they become more experienced with computers.

After a first product is made, teachers and students should be encouraged to document any questions or problems they encounter that are not dealt with during subsequent years. These will form the foundation for the revisions of the original product. This manual, whether in print or electronic form is something that can continue to grow and improve each year.

Depending on demand students could use this module as a stepping stone to a work study module, and could act as the school troubleshooter, or as an assistant for younger classes in the school. This would be particularly useful in elementary classes.

Module 23: Career Opportunities in Information Processing (Core)

Suggested Time: 2-5 hours
Level: Introductory
Prerequisite: None

Foundational Objectives

- To be aware of the career and development opportunities in the field of information processing that exist in Saskatchewan and other provinces.

Common Essential Learnings Foundational Objectives

- To identify personal interests and aptitudes in order to initiate career exploration. (IL, PSVS)
- To evaluate ideas related to occupational choices. (CCT)
- To develop technological skills to access career information. (TL, IL)

	Learning Objectives	Notes
23.1	To develop a list of career development opportunities related to the field of information processing.	Students may list many different career development opportunities in the professional, semi-professional and skilled trade areas related to the field of information processing and business. They should begin by listing all of the guest speakers who have made presentations throughout the course, then list workers within the field of information processing in the community or in the province. Students are encouraged to use a variety of sources of information such as guidance counsellors, career software packages, personal interviews and websites.
23.2	To identify personal skills and interests that may lead to career exploration.	Ask each student to create an inventory of favourite activities and interests. Have students examine their lists to determine how these activities and interests might be job-related. This task of creating an interest inventory may be done using a variety of computer program software packages. Once students have determined areas of interest related to information processing, they should research information processing and business careers using available resources in the library, community or Internet.

Learning Objectives		Notes
23.3	To determine skills and interests that would enhance occupational choices.	Using the interest inventory created, students may select two choices of possible occupations for further research. Investigate the career choices including: • description of work duties • personal qualities an individual must possess to succeed in the occupation • process to become certified within the occupation • length of education and training • school locations • cost of education and up-grading • trends within the business or career cluster • best and worst parts of the job • beginning salary • opportunities for advancement. If a work study is to be done, the student may investigate links within the community for possible work study placement. The student may interview individuals within the community as part of the career research. Refer to Appendix J: The Interview Project.

Module 24 A, B : Work Study Preparation and Follow-up Activities (Optional)

Note: If students have participated in a work study module in a previous Practical and Applied Arts course, a review of this module is still required but less time is needed.

Suggested Time: 5-10 hours
Level: Introductory
Prerequisite: None

Module Overview
Students will prepare for work study in the community. Expectations for the student, the teacher and the employer should be discussed. During follow-up, students will reflect on work study experiences.

Foundational Objectives

- To develop workplace skills, knowledge and attitudes in the information processing field that may lead to successful employment.
- To understand how skills acquired in school may transfer to the workplace.

Common Essential Learnings Foundational Objectives

- To demonstrate skills and attitudes that contribute to the development of positive human relationships. (IL, PSVS)

Learning Objectives		Notes
24.1	To be aware of the expectations of each of the partners in the work study component.	In order to establish a successful working relationship with all the partners involved in the workplace, it is important to define the expectations of each partner. For a list of roles and responsibilities of the business, personnel, manager, teacher monitor, school, parent and student, see the Work Study Guidelines for the Practical and Applied Arts included in the *Practical and Applied Arts Handbook.*
24.2	To determine the factors that may affect the student's contribution in the workplace.	Brainstorm a list, then verify through experience. The list may include previous work experience, volunteer work, teamwork activities and extra-curricular participation within the school.

Learning Objectives		Notes
24.3	To build good communication skills for the workplace.	Discuss verbal and non-verbal communication. List some ways in which negative and positive non-verbal communication may be displayed. Encourage students to role play ways of demonstrating effective techniques of verbal communication on the job when giving or receiving instructions and resolving conflict. Use case studies, and divide the students into groups to role play how effective communication may be used to resolve conflict on the job. Emphasize the Employability Skills (from the Conference Board of Canada) and compare them to the Common Essential Learnings of Saskatchewan's curriculum. Make the direct link between skill development in this course and the needs of employers. Development of skills and documentation of the skills leads to employment using those skills.
24.4	To develop a résumé using the correct format that may be forwarded to a potential employer.	The résumé may be used to introduce the student to the employer of a workplace site prior to an interview. Teachers are encouraged to work with other staff members to ensure résumé preparation is taught. Résumé writing is covered in English Language Arts 20 and A30, Information Processing 10 and Career and Work Exploration 20 curriculum guides. Students should save the résumé and update it as changes need to be made and as references are added. Skills that have been developed can also be added to the updated résumé.
24.5	To create a student guide in preparation for an interview.	Students should develop their résumés and update them during the course, as work placement references are accumulated. A discussion with students about the benefits of a portfolio of sample work is appropriate at this time. A personal website that highlights the student's skills and training might be created and referred to in the résumé. If students have already completed a résumé and cover letter in another course, the teacher may do a review and encourage students to update their information. Each student should submit a résumé for teacher approval prior to going to an interview or directly to the workplace.

Learning Objectives		Notes
24.6	To determine student guidelines in preparation for an interview.	Through a classroom discussion or in groups, students should compile a "guide" for job interviews. After the students formulate their guide, the teacher may prompt them for missing items. Outline and describe the three stages of an interview. Point out to students at which stage of the interview each of the guidelines previously discussed will be used. The greeting involves an introduction between the student and employer. Discuss or demonstrate how this should be done. The exchange is the longest part of the interview where the employer asks a series of questions and engages in a dialogue with the student about information on the résumé and other matters relating to the job. A student's portfolio may be examined by the employer as part of the exchange. The parting provides closure to the interview and may be just as important as the greeting. Explain how this may be done. Provide the students with a list of questions frequently asked by employers or ask students to make a list. Students may role play the stages of the interview.
24.7	To discuss the post interview.	After the student has completed the interview with the employer, do a follow-up activity. Review the interview with the student using the three stages above as points for discussion.
24.8	To develop a procedural guide for the work site.	Discuss the following work site items with students: • transportation • hours of work • absence and tardiness • procedures for conflict resolution • role of the student, teacher and workplace supervisor • dress code • job description • school and employer expectations.

Learning Objectives		Notes
24.9	To relate feedback from the work placement.	Students provide feedback about work placement including: location, type of business, duties, most rewarding experience, most difficult situation and how they handled it. Note: It is recommended that each student send a thank you note or card to the employer upon the completion of each work placement. If more than one placement has been made in the course, follow-up activities must be completed after each placement. Ensure that students understand these guidelines by asking students to describe each of these items. Look for opportunities to introduce and reinforce ideas about Labour Standards , Occupational Health and Safety and WHMIS . Use the *Career and Work Exploration 10, 20, 30 Curriculum Guide*, the *Practical and Applied Arts Handbook*, the Saskatchewan Labour website (www.readyforwork.sk.ca) and other resources recommended in the accompanying bibliography.

Module 25A, B: Work Study (Optional)

Suggested Time: 25-50 hours
Level: Introductory/Intermediate

Foundational Objectives

- To be aware of the career opportunities in the field of information processing that exist in Saskatchewan and other provinces.
- To integrate classroom learning with work-related learning.
- To increase awareness of employability skills as they relate to the work environment.

Common Essential Learnings Foundational Objectives

- To engage in a work study experience and develop entry level workplace skills that may lead to sustainable employment. (PSVS)
- To expand career research beyond the classroom setting. (IL)

For more information about implementing work study in schools, see the Work Study Guidelines for the Practical and Applied Arts included in the *Practical and Applied Arts Handbook* . Teachers need to use or design appropriate learning objectives for this module; for instance, to demonstrate ability to follow a "Training Plan". The training plan for the student should be designed to relate to the objectives of the course modules chosen in collaboration with the cooperating employer. Also see Appendix J in this guide.

Consult Saskatchewan Labour for content about Labour Standards , Occupational Health and Safety and WHMIS . If several work study opportunities are offered, these topics will add more depth to the next experience.

Module 99A, B, C: Extended Study (Optional)

The extended study module may be used only once for each 100 hour single credit course. It is important to record the title of the extended study module on the recordkeeping chart. Record 99A for the first extended study module offered in the course series, 99B for the second extended study module offered, etc.

Suggested Time: 5-20 hours
Level: Introductory/Intermediate/Advanced

Module Overview
Evolving social and personal needs of society, advances in technology and demands to solve current problems require a flexible curriculum that can accommodate new ways and means to support learning in the future. The extended study module is designed to provide schools with an opportunity to meet current and future demands that are not provided for in current modules in the renewed Practical and Applied Arts curriculum.

The flexibility of this module allows a school/school division to design one new module per credit to complement or extend the study of pure, core and optional modules configured to meet the specific needs of students or the community. The extended study module is designed to extend the content of the pure courses and to offer survey course modules beyond the scope of the available selection of Practical and Applied Arts modules.

The list of possibilities for topics of study or projects for the extended study module approach is as varied as the imagination of those involved in using the module. These optional extended study module guidelines should be used to strengthen the knowledge, skills and processes advocated in the Practical and Applied Arts curriculum.

For more information on the guidelines for the Extended Study module see the *Practical and Applied Arts Handbook.*

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Appendices

Appendix A: Acquiring and Developing The Skill of Keyboarding

Sequence of Keyboard Presentation

There are a number of acceptable sequences in which the keyboard may be presented. A common approach is to use the Vertical Sequence. In this sequence, the home row is taught first; then remaining letters are introduced finger by finger, beginning with the index fingers and moving outward.

Experience suggests that if you are using a particular resource for teaching keyboarding, it is best to follow the suggested sequence in the resource.

Emphases in Keyboard Skill Development

The Techniques-With-Appropriate-Speed Emphasis. In this approach, students are encouraged by demonstration and imitation to make individual keystroking motions speedily (continuously, without hesitation) from the beginning. Skillful technique is the best guarantee of combined speed and accuracy. Students must be guided progressively through a series of movements of eye, arm, hand, and finger sequences which culminate in the movements or motion patterns they are expected to used in keyboarding. The motion patterns students use are refined progressively throughout the skill-learning program. Students trained with the technique approach develop the kind of neuromuscular control that is essential for high speed and once the pattern is developed and controlled, it is relatively easy for them to attain a high level of keyboarding skill.

In the past, other emphases have been used but have proven to be less successful. The accuracy-first emphasis has proven ineffective for a couple of reasons. First, students found it necessary to practice for accuracy at slow speed, and skill learning research has shown that this practice definitely retards the attainment of higher rates of speed. Secondly, accuracy has proved to be a very unstable factor in keyboarding and training students for accuracy at slow speeds gives them little accuracy advantage at higher speeds.

Researchers have shown that emphasis on speed was superior to emphasis on accuracy from the beginning of instruction, but neither approach brought the combination of speed and accuracy that many teachers believed possible in keyboarding, and have been achieved using the Techniques-With-Appropriate Speed emphasis.

Critical Techniques in Keyboard Learning

The following critical techniques should be taught starting with the first day and improved and refined daily. Centre your observation of student practice more on the pattern of action (the hands and fingers) than on the results of that action (the typed line or page).

1. Position of Body and Hands

Correct position is natural, easy and relaxed. The following aspects should be taught (demonstrated), observed and corrected when necessary:
a. The feet should be on the floor, slightly apart for better body balance.
b. The elbows should be in a natural position at the sides of the body.
c. The fingers should be well curved over the guide keys.
d. Students should sit one hand span from their keyboards.

2. Correct Keystroking Technique

The following factors should be demonstrated and checked frequently during the keyboard learning phase:

a. The fingers should be well curved and in an upright position with the fingertips lightly touching the home of guide keys. The hands should be "turned in " toward each other slightly so that the fingers will be in an upright (not slanting) position.
b. The wrists and arms should be held in a relatively motionless position - most of the keystroking action should be in the movement of the fingers.
c. The keys should be struck with a direct, quick, snap stroke.

3. Spacing Technique

a. Only the right thumb should move. The other fingers should remain curved over their home keys.
b. Strike the space bar immediately after the last letter of the word is struck, just as if it were part of the word.
c. Keep the thumb close to the space bar to avoid excess motion of the thumb.

4. Shifting Technique

a. Operate the shift keys with the little fingers, while other fingers remain in position over their home keys.
b. Move the little finger from its position over the guide key outward and downward to the shift key. While holding down the shift key strike the letter to be capitalized WITH THE OPPOSITE HAND and then quickly release both keys and return to home row.

Teaching the Top Row

Empirical evidence suggests delaying the introduction of figures until good techniques are consistently used in keying alphabetic copy, of presenting two figure keys per class period, and of delaying the introduction of frequently used "shifted" symbols until students show fair mastery of the figure reaches. Little, if anything, is gained and considerable breakdown in keystroking techniques can result if figures are taught along with letter keys or immediately after.

A Recommended Stroking Skills Program

The basic premise for building stroking skills is this: Build more speed than you can control; then release only such speed as you can control. The chief accompaniment of that principle is total individualization of all practice: of practice goals and of practice emphasis (speed and accuracy). The following describes the "Up 5, down 2" practice cycle. Since each student will be working at a different rate, it is important for them to maintain a simple record to show him whether to practice for speed or for accuracy and at what speed.

1. Speed Practice

Practice objective: Achieve the goal speed, regardless of errors. Type the same copy in repeated timing until you do so; then, move to new copy at the next higher wpm speed. Example; the student who succeeds at 20 wpm on practice materials X next attempts 21 wpm on practice materials Y.

2. Change from Speed to Accuracy Practice

Evidence favours substantial, rather than trivial, speed increases before changing to accuracy practice. Since first semester keyboarders average about 5 wpm faster when keying "all out for speed" as compared to keying at normal rate, achieving an increase of 5 or 6 wpm over one's previous best rate may be recommended as the criterion for changing to accuracy practice. Thus, the student whose

normal gross rate is 19 wpm practices for speed only from 20 to 24 wpm (1 wpm at a time) and then changes to accuracy practice.

3. Accuracy Practice
With stroking accuracy dependent on keying at the right speed and the right speed being one a little below the forced speeds (and high error rates) of speed practice, the student drops back 2 wpm and practices toward the dual criteria: type at the desired rate with no more than 2 errors per minute. Accuracy practice continues until success at one's previous highest speed (e.g., progressively at 22, 23, 24 wpm). Again, as many trials as the student may need at 22 wpm are involved before he moves to 23 wpm and then from 23 to 24 wpm.

4. Change from Accuracy to Speed Practice
When the student has met the dual goal of keying at his previous highest speed with no more than 2 errors per minute, he returns to speed practice toward another 5-wpm gain (1-2 wpm at a time).

Hints for building the skill of keyboarding with your students.

- Use media and methods that incorporate as many senses as possible.
- Vary the activities so that students are involved in many ways with the context and processes.
- Remember that the keyboarding skill is more controlled by the mind than the fingers. Concentration is necessary for skill development.
- Practice must not discourage learners.
- Practice only succeeds when the learner concentrates, knows purpose, practises in the correct way and knows the results of the practice immediately.
- Goals must be attainable and reasonable for each stage of skill development.
- Plateaus are normal for students.
- Skill develops more slowly as higher levels are encountered.
- Students should have the best possible equipment in the best possible condition.

Paced Paragraph Writing

In developing keyboarding skill, students must learn to control the pace of keying at specific speeds (at 20, at 24, at 28 words a minute, and so on). As soon as they know they can control their motion patterns at a specified speed level, they are ready to make the push to the next higher goal. Guided paragraph writing was designed to guide students in "reaching" for specified increments in speed. The teaching strategy consists of (1) individualized goal setting, (2) demonstrating selected goal rates, (3) time-interval pacing, and (4) supplying immediate knowledge of performance results.

Students first select individually the rate (32, 36, or 40 gwam for example) at which they wish to type for a specified time (usually 1-minute). They then divide their practice copy into four equal parts (8 words for each quarter minute in the case of a 32 gwam goal) and check the appropriate point in the copy (8,16,24,32 words). As they type, the teacher indicates by a signal the time that has elapsed. With the call of each guide, students, by noticing their checkpoints, know precisely whether they have reached their goals, have exceeded them, or have failed to reach them. The checkpoints may be light pencil marks, to be erased after they have served their purpose. "Noting the checkpoints" need not interrupt the keying as it can be done with a quick glance.

Teaching Procedure

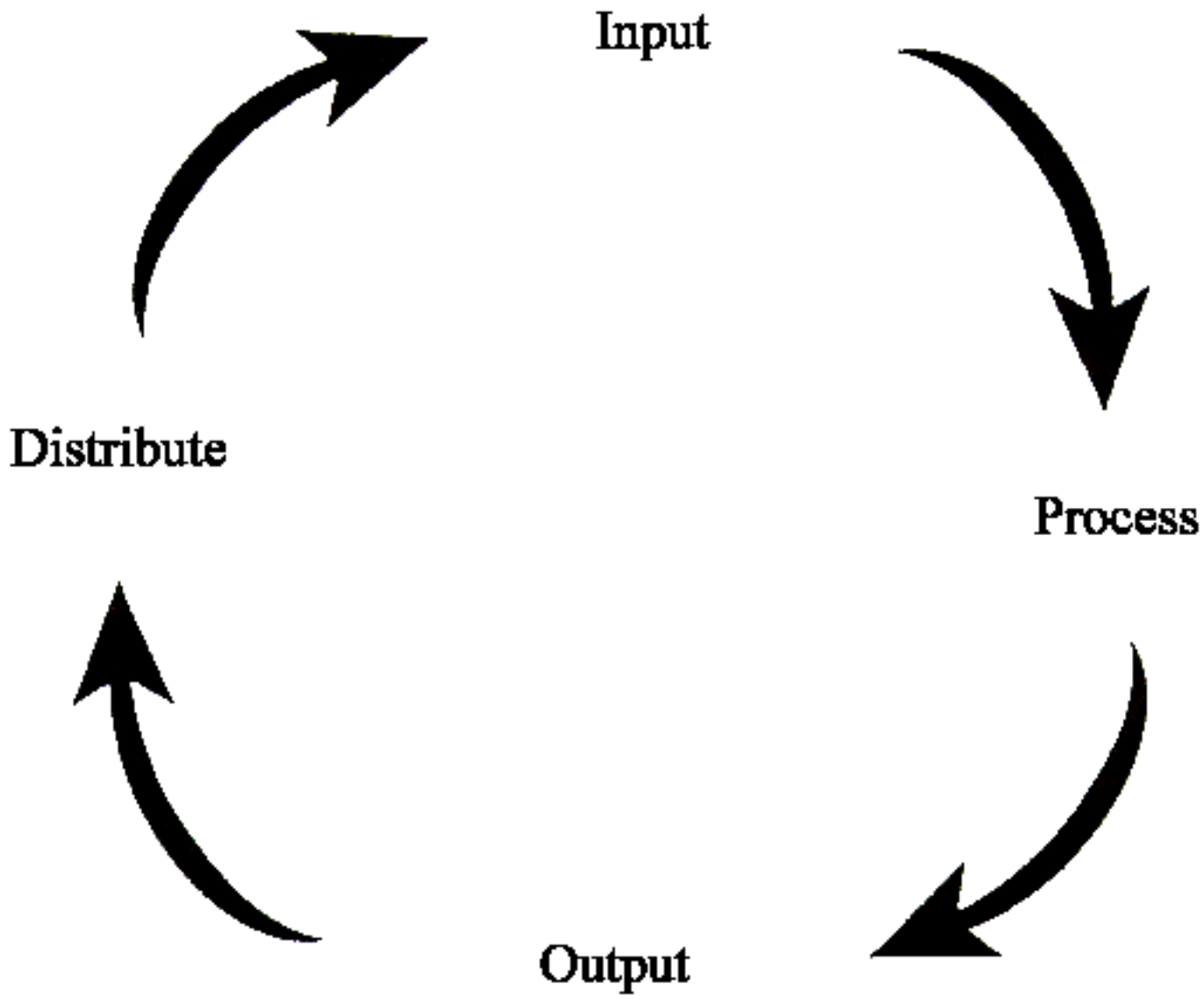
1. Administer a 1-minute writing on paragraph 1; have students determine a gwam for a base rate.
2. Have each student add 4 gwam to his or her base rate to determine a goal rate for the next writing.
3. Have students choose quarter-minute checkpoints.

4. Have students note from the work-count figures above the lines in paragraph 1 the checkpoint for each quarter minute for their goal rate.
5. Demonstrate how slow selected rates sound (20,24,28,etc.).
6. Administer two or more 1-minute writings on paragraph 1 with each student trying to reach each check point exactly as you call the guide: 1, 2, 3, Time) each quarter minute.
7. Between writings offer suggestions for improvement.
8. Have paragraph 2 typed in the same way.

Because speed built in 30-second and 1-minute efforts does not transfer at the 100 percent level to longer writings, students need to learn to cope with the periodic "sobering effect" of progressively lower rates on 3- and 5-minute writings. Students must learn through practice to sustain the short-interval rate to the eventual 5-minute effort that is the customary length of writing for measuring performance after the first ten to twelve weeks of instruction as well as in the employment testing situations.

Although the predominant speed-building emphasis is desirably implemented by short-interval writings, each speed drive can profitably end with a 3- or 5-minute writing to measure the skill gained through the 30-second and 1-minute efforts. Using 5-minute writings to build speed, however is not recommended because (1) knowledge of performance results is delayed too long, (2) goals cannot be adjusted often enough, and (3) speed-forcing rates cannot be maintained so long without undue tension and fatigue at early stages of skill development. It is recommended that 3- and 5-minute writings at a slight drop-back in rate are the culminating activity in a drive for increased speed.

Appendix B: The Information Processing Cycle



Appendix C: Daily Log

Date	Activity	Time Started	Time Completed	Job Code	Form of input	Total Lines	Time Used

You will be better prepared to progress in the world of work when you can:

Communicate

- read and understand information presented in a variety of forms (e.g., words, graphs, charts, diagrams)
- write and speak so others pay attention and understand
- listen and ask questions to understand and appreciate the points of view of others
- share information using a range of information and communications technologies (e.g., voice, e-mail, computers)
- use relevant scientific, technological and mathematical knowledge and skills to explain or clarify ideas

Manage Information

- locate, gather and organize information using appropriate technology and information systems
- access, analyze and apply knowledge and skills from various disciplines (e.g., the arts, languages, science, technology, mathematics, social sciences, and the humanities)

Use Numbers

- decide what needs to be measured or calculated
- observe and record data using appropriate methods, tools and technology
- make estimates and verify calculations

Think & Solve Problems

- assess situations and identify problems
- seek different points of view and evaluate them based on facts
- recognize the human, interpersonal, technical, scientific and mathematical dimensions of a problem
- identify the root cause of a problem
- be creative and innovative in exploring possible solutions
- readily use science, technology and mathematics as ways to think, gain and share knowledge, solve problems and make decisions
- evaluate solutions to make recommendations or decisions
- implement solutions
- check to see if a solution works, and act on opportunities for improvement

You will be able to offer yourself greater possibilities for achievement when you can:

Demonstrate Positive Attitudes & Behaviours

- feel good about yourself and be confident
- deal with people, problems and situations with honesty, integrity and personal ethics
- recognize your own and other people's good efforts
- take care of your personal health
- show interest, initiative and effort

Be Responsible

- set goals and priorities balancing work and personal life
- plan and manage time, money and other resources to achieve goals
- assess, weigh and manage risk
- be accountable for your actions and the actions of your group
- be socially responsible and contribute to your community

Be Adaptable

- work independently or as a part of a team
- carry out multiple tasks or projects
- be innovative and resourceful: identify and suggest alternative ways to achieve goals and get the job done
- be open and respond constructively to change
- learn from your mistakes and accept feedback
- cope with uncertainty

Learn Continuously

- be willing to continuously learn and grow
- assess personal strengths and areas for development
- set your own learning goals
- identify and access learning sources and opportunities
- plan for and achieve your learning goals

Work Safely

- be aware of personal and group health and safety practices and procedures, and act in accordance with these

You will be better prepared to add value to the outcomes of a task, project or team when you can:

Work with Others

- understand and work within the dynamics of a group
- ensure that a team's purpose and objectives are clear
- be flexible: respect, be open to and supportive of the thoughts, opinions and contributions of others in a group
- recognize and respect people's diversity, individual differences and perspectives
- accept and provide feedback in a constructive and considerate manner
- contribute to a team by sharing information and expertise
- lead or support when appropriate, motivating a group for high performance
- understand the role of conflict in a group to reach solutions
- manage and resolve conflict when appropriate

Participate in Projects & Tasks

- plan, design or carry out a project or task from start to finish with well-defined objectives and outcomes
- develop a plan, seek feedback, test, revise and implement
- work to agreed quality standards and specifications
- select and use appropriate tools and technology for a task or project
- adapt to changing requirements and information
- continuously monitor the success of a project or task and identify ways to improve

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Appendix E: Some Ideas for Keyboarding Instruction, Projects, and Activities

- Keyboarding skills may be used for many writing activities. Students may key their journal entries, key a passage from a favourite story, poem or book, and then illustrate it and present it to the class.
- Students may prepare a simple biography. The subject of the biography could be a student of the same school or a classmate. The document may be entitled "The Life Story of ....." In preparing the biography, the students can apply their touch keyboard and introductory formatting skills. In addition to information that students may gather about topics such as family background, hobbies, favourite things, and birth information, students could include pictures, photographs, and perhaps a section entitled "About the Author." The biographies can be printed.
- An autobiography may be composed, keyed, formatted, and printed by students.
- Students may explore and research current issues or topics of concern from science, mathematics, social studies, or other areas of study. A summary of the research can be composed, keyed, and printed for a classroom presentation.
- Students may plan, process, and produce a classroom newsletter. Once "reporters" have completed their interviews and research, they may compose individual newsletter articles at the keyboard. After the finished articles are processed, students may compile their classroom newsletter. The newsletter could include artistic touches such as cartoons that have been designed on the computer.
- Students may complete "story starters" with a partner. One example of a story starter is "It was a dark and stormy night. Suddenly...." Each student would alternate the roles of composing and keyboarding. The students may alternate roles after each sentence or paragraph. This activity could be adapted so that students could key and compose new story endings or new story beginnings for previously prepared stories.
- Students can combine touch keyboarding and word processing skills to compose and produce stories or legends. Cultural differences may be recognized by encouraging students to relate their family history or a cultural legend in story or poem format. The project can be extended to include graphics on the cover or title pages of the final work.
- Students could document the oral history of a First Nation, their personal culture, or their community.
- Students may compose and produce stories, songs or poetry highlighting their own lives and their experiences growing up in a multicultural environment. These stories can provide insights for fellow students and teachers.
- Students could pinpoint a certain time period in history and create a newspaper that highlights the tribal or cultural history of that period. They could also "modernize" an older tribal newspaper recreating it with today's technology.
- Words that students learn in vocabulary and spelling may be used for keyboarding practice during keyboarding skill development drills. Students may keyboard rhyming words, synonyms, antonyms, or homonyms.
- Poetry students are studying in English Language Arts may be copied. Alternatively, when given a theme, students may compose their own poetry and limericks.
- Students may key the days of the week, months of the year, their different colours, flavours of ice cream, or all the holidays they can think of within a certain time period.
- Advice Letters. Ask students to write a letter to "Dear Gabby." When letters are submitted, the most appropriate or the most outlandish letter can be copied and distributed to the students to respond as "Gabby". The response would be in the form of a personal letter. (Scaglione, 1989).
- Post Office. Students place their names and addresses on any piece of paper. These are collected and placed in a basket. Each member of the class retrieves one name, other than their own. Students then compose and key a personal letter, introducing themselves to the other student. Two or three paragraphs are suggested. Letters can be printed and delivered before the end of class. (Scaglione, 1989).
- Bingo. Choose a category, such as "Holidays." Ask students to key the category title and then any

five items that would fit into that category. For example, "Teachers" may be chosen as the category, with the students keying the category title followed by the names of any five teachers. Select a second category and repeat the process. Four or five categories should be sufficient. Then place the list of categories on the board. Ask the first student to pick a category. Select another student to determine any answer appropriate to that category. Continue the process. The student that has a category completed first would be the winner.

- Develop a bulletin board display illustrating proper care and handling of the hardware and software students will be using.
- Develop a display illustrating the basic parts of the hardware.
- Show a film or a video illustrating proper keyboarding technique.
- Videotape students so they can evaluate their own technique. This is also a good opportunity for peer evaluation.
- Use brightly coloured wall charts and/or overheads of the keyboard when teaching touch keyboarding.
- Introduce a new key to the students by having them find it on their keyboards. Encourage them to look down at their hands only during the introductory stage of learning each new key. Vocalize the strokes while the students key, using rhythm and a suitable pace. For example, call out "J space J" or "J U J" as the students key. For a change of pace, have students be the "callers" as they key. For the purposes of key location, allow your students to look down at their hands during the keying of one or two introductory lines accompanying each new key. Once the new key has been located, extensive drill work can be assigned with "eyes on copy" to promote confidence in key location.
- Use the overhead, board, or flash cards to focus student eyes on copy while teaching key location in touch keyboarding. The alphabet written on the board or on flash cards, a list of words written "backwards" (letters of a word spelled in the opposite direction and requiring the students to key them in the correct order), and writing the names of class members on the overhead are some of the ways that keying activities that focus attention away from looking at the keyboard can be used to keep students interested and challenged.
- Time the students for one minute while they copy a passage in longhand. It is desirable for the keyboarding rate of students to be at least equal to their handwriting speed by the conclusion of Module 2. This will emphasize the usefulness of keyboarding to the student.
- Thinking and composing at the keyboard can begin as soon as the keys have been introduced. Call out a word and have students key a one-word response. Ask one student to call out a word and have the class key as many rhyming responses as possible in a given time period. As abilities progress, students may enjoy composing and keying limericks or other short poems.
- Write all letters that students can key by touch on the board. Ask students to create words using only those letters. Test students' powers of concentration.
- Allow students to view a collage for two or three minutes, mentally identifying the objects it contains. Students may key a list of all the items that they can remember from the collage.
- Distribute a photograph to the students. Allow time for students to view and collect information about the photograph. Students may key sentences in response to a few questions about the photograph that are presented by the teacher.
- Ask each student to begin a composition with a common sentence, such as "Once, when I was little, ..." Allow two or three minutes for students to compose at the keyboard. Once time has elapsed, students move to the next computer station, read the story on the screen, and continue the story in the direction of the plot. This could continue for four or five sessions. At the conclusion of this exercise, students return to their original computer station and read the story. Compositions may be proofread, edited, spell checked, and printed for display on the bulletin board.
- Prepare a class list of students' first and last names in scrambled form. The students can decipher and key the names from the scrambled list in proper form, capitalizing as necessary. The activity can be adapted for names of sporting events, characters in a play, or science vocabulary.

Appendix F: Keyboarding Relay

This is a keyboarding skill development game that can be played throughout the year. A variety of keyboarding drills may be used. Some teachers may choose to follow a variety of themes when selecting the keyboarding practice.

Game Objective: To key as many lines as possible in a given timed interval.

Skill Objectives:

- To develop keystroking skill through repetition (drill and practice).
- To reinforce the use of touch keyboarding skills.
- To make the drill and practice of keystroking drills fun.
- To encourage the development of team-building skills.

Instructions:

1. Divide the class into teams of equal numbers, perhaps by rows. An alternative method is to divide them up in such a way so that the total words per minute performance of the students on each team is equal.
2. Select the copy (textual information, drill lines) that will be used.
3. In a predetermined time frame, such as 30 seconds, each student will key the text as many times as possible in the time interval.
4. When time is up, students will quickly proceed to the next computer, find where the previous student stopped keying, and continue keying the text/line from that position.
5. Repeat steps 3 and 4 until the final timed interval is called.
6. Total the number of lines produced by each team (total lines from each team member's computer).
7. The team with the largest number* of lines produced is declared the winner.

*Relay may be adapted to consider the largest number of accurate lines. The skill objective would then reflect keyboarding accuracy.

Appendix G: Building Skill in Proofreading

Proofreading is the skill of checking work to ensure its accuracy. Proofreading is a skill that can be developed. The following are some tips for developing good proofreading skill.

Reading Tips

1. Read the work slowly, word for word.
2. Read for spelling and keystroking errors.
3. Read for correct punctuation and grammar.
4. Read for meaning.

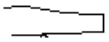
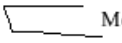
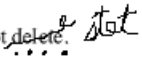
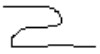
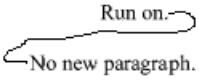
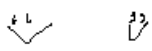
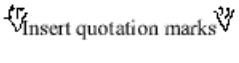
Eight Characteristics of Effective Proofreaders

He or she:

1. Is a good speller.
2. Knows the basics of punctuation and applies them.
3. Pays attention to detail.
4. Uses various methods of proofreading.
5. Recognizes frequently overlooked types of errors.
6. Takes the time to proofread.
7. Is conscious of errors.
8. Uses the dictionary and other reference materials when in doubt.

Appendix H: Commonly Used Proofreaders Marks

When submitting material for revisions, the correct proofreaders' marks should be used.

Symbol	Meaning	As Used
	**Insert**	 Insert here
	Delete	 Delete
	Lower case	TYPE in LOWER case
	Capitalize	Capitalize a letter or word
	Move right	Move right 
	Move left	 Move left
	Centre	 Title
	Transpose	Transpose letters words or
	Close up	Clo se up
	Space	Leave a space
	Let it stand	Do not delete. 
	New paragraph	End sentence. Start paragraph.
	No paragraph. Run on.	Run on.  No new paragraph.
	Insert period.	Insert period
	Insert comma	Insert comma
	Insert colon	Insert colon
	Insert semicolon	Insert semicolon
	Insert quotation marks	 Insert quotation marks
	Insert hyphen	Insert hyphen

Appendix I: Letter Planning Chart

A letter planning chart may be used to plan and organize thoughts for composing at the keyboard or in preparation for dictation. Although this chart specifically assists in the preparation of a letter, the phases may also be used when creating other correspondence.

Letter Planning Chart	
Phase	**Notes**
Phase 1: Primary Purpose Identify and record the primary purpose of the letter. Keep the secondary purpose in mind.	
Phase 2: Details Keeping the primary purpose of the letter in mind, brainstorm and include all the points to be covered in the letter. Remember to include items that may seem unimportant at this time.	
Phase 3: Edit Reflect on the points to be covered. Delete any unnecessary points, if there are any.	
Phase 4: Organize Arrange the remaining items in the order that you wish to present them to the reader.	
Last Paragraph. Develop the last paragraph. This paragraph often summarizes the message of the letter, striving to obtain the desired action of the reader.	
Dictate (Compose).	

Appendix J: The Interview Project

This project will allow you to visit a work site to interview someone who is employed in a career area that is of interest to you. You may choose someone that uses the computer to process information. For example, people you may be interested in interviewing could be a producer, banker, doctor, accountant, pharmacist, engineer, or clerk.

Note to Teachers:
It is suggested that the date of the interview be established well in advance - preferably one month from the introduction of the project. Students may collaborate on a calendar of timelines that will assist with the planning and completion of arrangements and tasks, in order of priority. The design and maintenance of "To Do" lists may be helpful in assisting with the completion of projects and covering all the required items during students' contact with the interview candidates.

Some of the considerations involved in the Interview Project are offered below.

Identification of Interviewee : Make a list of all the candidates that you may like to interview. Establish your priorities and contact the candidate at the top of your list. Introduce yourself and explain the project. Ask the candidate if he or she is willing to participate. Most interviews require no more than thirty minutes. Keep working through your list until you get a positive response! Once a candidate has agreed to participate, establish the date, time, and location of the interview. Your teacher may provide a form to record the interviewee's name, title, work place, address, telephone number, date and time of the interview. Be sure this information is correct!

Letter of Confirmation : Send a personal-business letter of confirmation to your interviewee. The letter should confirm the day, date, location and time of the interview appointment. You will need to prepare an envelope, too. Don't forget to sign your letter! Consult your reference manual for format.

Questions: Think about what you would like to know about this career. Prepare a set of questions to ask during the interview. (Note: If time is limited, teacher-prepared questions may be provided to the students*. Students should be encouraged to revise, add, or substitute questions as required, depending upon the individual situation. If time is not limited, teacher and/or student prepared questions could be generated and produced by class members.)

Interview: During the interview, ask your questions and clarify as necessary to get the detail required. Record the answers that the interviewee provides. You may wish to make a tape recording of the interview. Make a few notes about the work site itself.

Thank-you Letter: After returning to the classroom, send a thank-you letter or note thanking the interviewee and any other individuals who were involved in arranging the interview.

Presentation: Share what you have learned, either in a presentation to the entire class or with small groups of students.

Report: Prepare an unbound multiple-page report detailing the "Interview Project". Refer to your reference manual for correct format if necessary.
*The following offers sample interview questions for this project.

Sample Interview Questions
The following are some questions that you may ask during an interview with someone who is employed in a career area that is of interest to you.

1. What is your name, title, business or company name, mailing address, and telephone number?
2. What are your normal job duties?
3. What are your normal working hours?
4. Is working overtime required in your job? How often?
5. Do you ever work nights or weekends?

6. What aptitudes and abilities are needed for your career?
7. What education and training requirements are needed to enter and advance in your career area?
8. Can you give an approximate beginning salary for someone in your career area? What is the average salary after five years?
9. Does your company have a dress code for employees? What is considered suitable?
10. What are some things you enjoy about your job?
11. What are the fringe benefits of your career area? (sick leave, dental plans, life insurance)
12. Are there any disadvantages to your career area?
13. Do you think the demand for workers in your career will increase or decrease over the next five years? Why?
14. What advice would you offer to a young person making a career choice?

Conclusion: Student's Opinion
In conclusion, do you think you would like to work full time in this type of career? In this particular organization? Why? If not, why did you choose this particular interviewee?

Appendix K: Sample Student Projects

Student Project-A Whirlwind Trip

The following is a sample project involving the application of airline timetables and the twenty-four hour clock. Students will be actively involved in organizing and managing their air travel plans for a "whirlwind" trip.

Students may work independently or in pairs. They could present their information in the form of a written document or an oral presentation. Although locations are identified for the "whirlwind trip", they may be adapted to suit individual needs. The activity could be extended to include considerations for night accommodations. Information needed for this activity is readily available on the Internet.

The Whirlwind Trip of (Student Name)

Welcome to the corporate world. What a busy week you have coming up! You will be travelling all across Canada and into the United States to give company presentations and complete other work-related duties. Make the necessary airline reservations for your trip (see questions 1-6 below) and prepare a schedule of your airline flights. For each "question", provide the following information:

- Departure–place and time
- Name of Airline
- Flight Number
- Local Time Zone–at place of departure
- Arrival–place and time
- Local Time Zone–at place of arrival
- Number of Stops
- Name of Airport–only if more than one is in the city
- Cost of flights (and accommodation if included as part of the project)

1. This Sunday, you will need to be in Victoria and you decide to take the earliest flight.
2. On Monday and Tuesday, you need to work in the branch office in Victoria. On Wednesday, you have to travel to Montreal but need the earliest flight as you will need time Wednesday evening to set up your materials for Thursday's presentation.
3. Friday's meetings will be over before noon. On Saturday and Sunday, you are registered for an international convention in Los Angeles, California and plan to get some rest and relaxation in the sun. You determine that a Friday afternoon flight to Los Angeles is preferred.
4. The following Tuesday morning, you have an appointment with the regional manager in Calgary and will spend Wednesday working in the branch office there. A Monday evening flight is fine.
5. Thursday evening, you are the guest speaker at a dinner banquet in Saskatoon and need to stay in Saskatoon on Friday until mid-afternoon. You prefer a Wednesday evening flight.
6. Friday evening you travel home to see your family for the weekend!

Student Project–Travel Itinerary

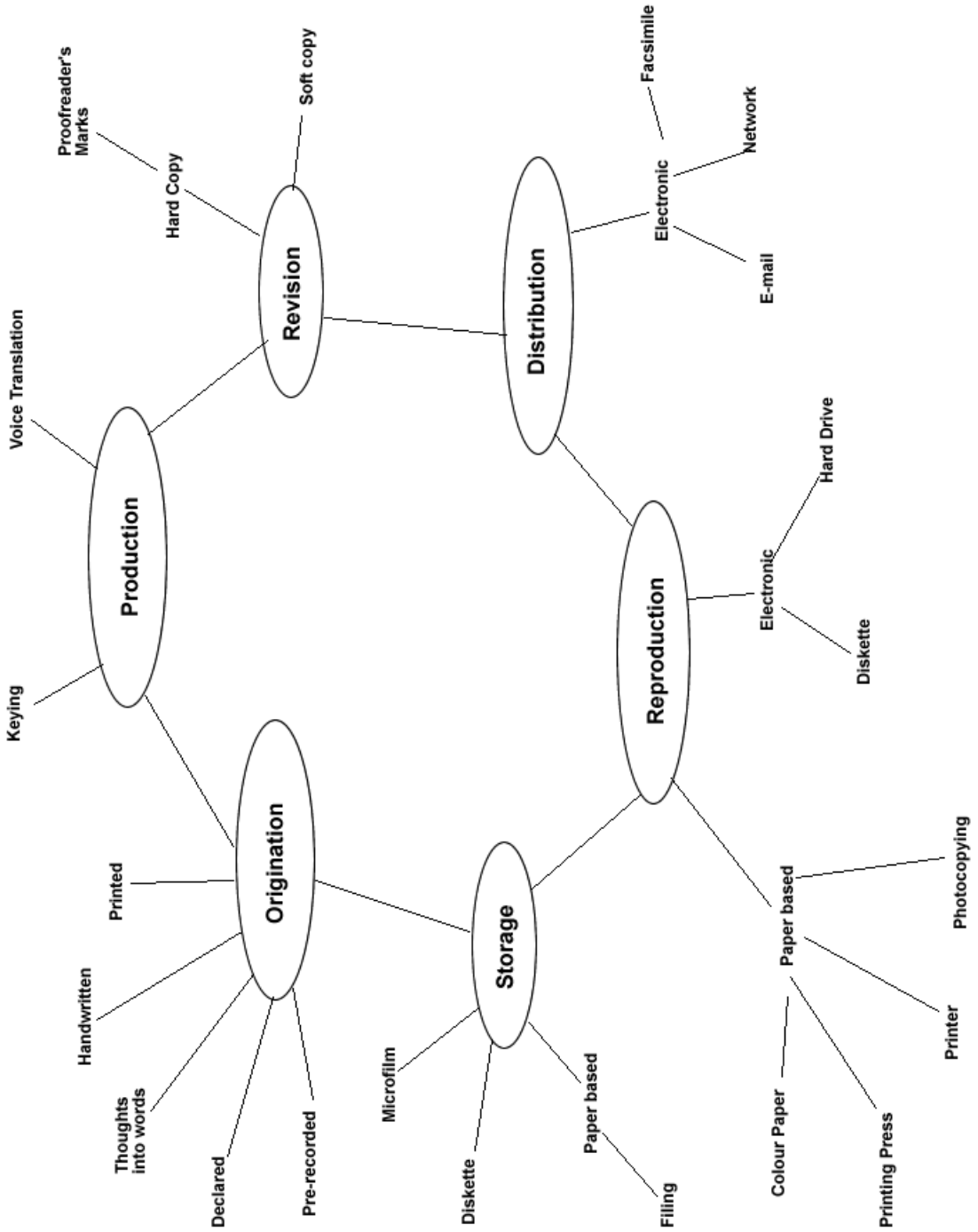
Once students have been introduced to travel itineraries and have formatted one, they may be challenged to prepare their own. The following is a sample project that involves students researching and preparing an itinerary for a trip to a destination of their choice. A limited time frame for travel is suggested in the sample project. However, students may choose to visit the site of the upcoming Olympics for a week, travel to the Orient for a month, or take a weekend ski trip to British Columbia. Teachers are encouraged to adapt the sample project as needed.

Your Dream Trip!

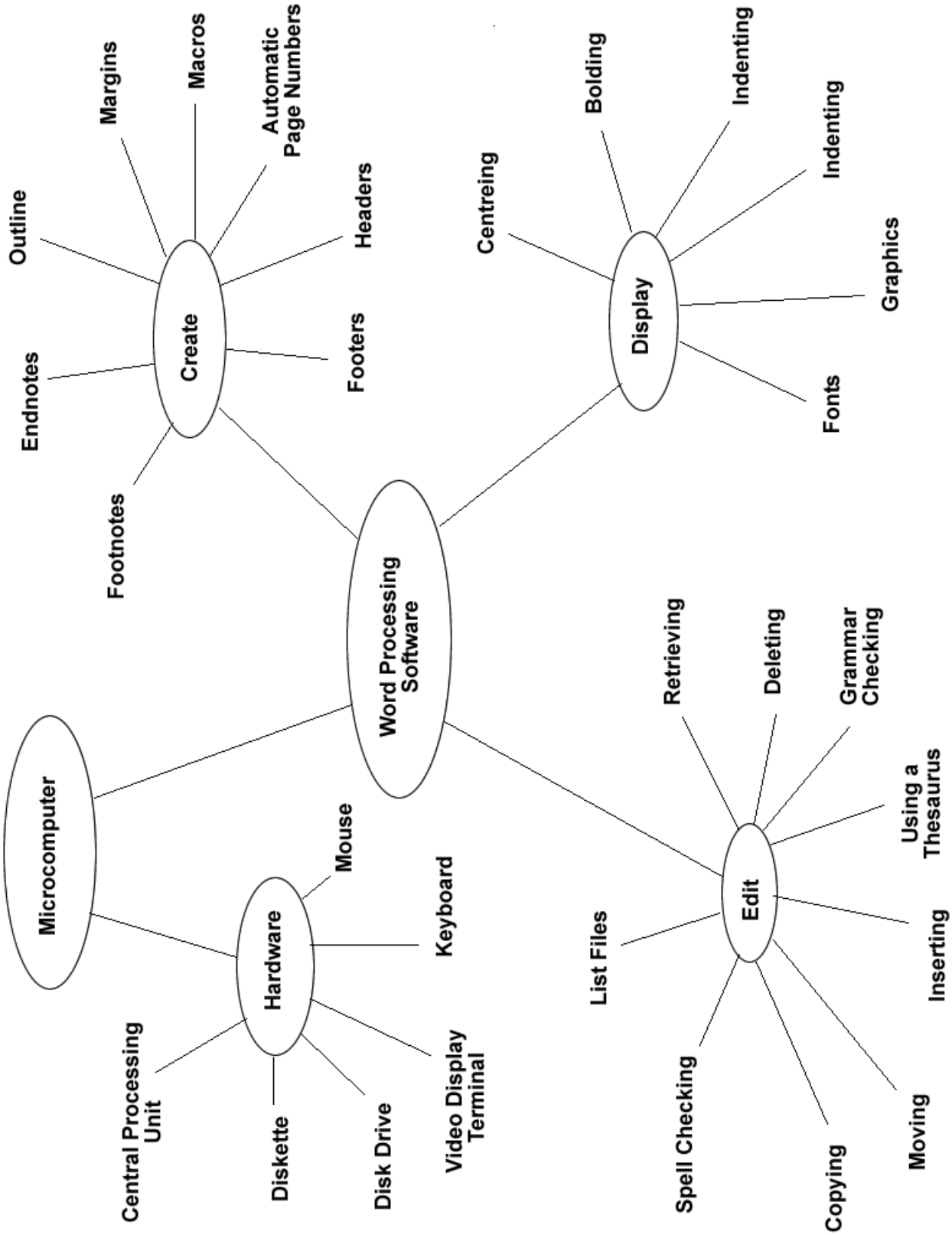
Plan a “getaway” weekend for yourself. Take along a friend or two, your family, or go alone. Cost is no object. If you wish, feel free to fly first class to your destination, rent a limousine . . . hire a personal tour guide! When planning and preparing your itinerary, allow for three days at your vacation destination, in addition to travel time. Schedule activities and visits to tourist attractions, restaurants, etcetera but be sure to allow time for rest and relaxation.
Some things to include in the itinerary are:

- names of travellers
- dates of travel
- times of all events
- types of transportation, dates, and times
- accommodation
- activities and attractions.

Appendix L: An Example of Concept Mapping a Word Processing Document Cycle



Appendix M: Concept mapping Illustration: Microcomputer and Word Processing Terminology



Appendix N: Designing and Using Stationery

Objectives:

To provide opportunities for students to:

- design and produce letterhead stationery;
- apply problem-solving skills;
- use word processing software applications; and,
- compose business correspondence.

Part One: Design and Produce Letterhead Stationery

Imagine that you are the owner or manager of a small business that offers a service or markets a product (your choice). Apply problem-solving strategies to design and produce letterhead stationery for your small business.

- **Identify the problem** by producing a simple written statement.
- **Explore alternatives** by examining several samples of business stationery. If you want, combine concepts you find from the samples with your own design. Use computer graphics, fonts, clip art, borders, calligraphy, hand-drawn art work, or other devices to enhance the design of the stationery.
- **Gather and organize information** to generate ideas and develop rough drafts of several alternative letterhead designs. Use your imagination and creativity to select and design the letterhead that includes the name of your business, the street address, city, province, postal code, telephone number, and business logo or trademark.
- **Act** by producing your letterhead design.
- **Evaluate** by reflecting upon your product and considering whether your letterhead design is suitable for the business world. Are there changes that you would like to make?

Include your company name, street address, city, province, postal code, and telephone number on your letterhead. You will need to design and place a logo or trademark, too. It may be necessary to limit the space used for the letterhead to the top ten lines of a standard sheet of paper. Side and bottom margins may also be used for displaying letterhead information. Remember that a letter will need to be attractively placed on the stationery. Clear and relevant logos or trademarks should be used. They should be eye-catching and interesting.

Part Two: Composition of an Accompanying Letter

Using the word processor, compose a letter announcing the opening of your new business, encouraging readers to attend the opening-day celebrations. Use a letter-planning chart (see Appendix I) to assist in planning and composing your letter. Be sure to schedule some exciting activities to help draw attention to your new business. For example, door prizes, free merchandise, discount coupons, complimentary beverages and snacks, or guest appearances by local celebrities may be offered. Prepare the final copy of the letter on your letterhead stationery.

Suggested Criteria for Assessing the Letterhead Stationery

- Content. Does the letterhead contain the name of the business, the street address, the city, province, postal code, telephone number, facsimile number and any other data network communication numbers, if available, as well as a logo or trademark?
- Placement. Is the letterhead appropriately placed on the paper within the guidelines given?
- Design. Is the logo or trademark relevant and clear? Is the letterhead eye-catching and interesting?
- Effort. Has the student included an extraordinary amount of detail deserving special recognition?

Suggested Criteria for Assessing the Application of the Problem-Solving Strategies in Designing the Letterhead

- Did the student clearly identify the problem?
- Did the student explore all relevant alternatives by examining several samples of business stationery to assist in idea generation?
- Did the student consider a variety of display techniques and tools?
- Did the student gather and organize all relevant information, considering all sources of information?
- Did the student apply the process of evaluation to eliminate alternatives and choose the best option?

Suggested Criteria for Assessing the Composed Letter

- Did the student identify the purpose of the letter?
- Did the student develop the first paragraph to capture the reader's attention and interest?
- Did the student include all points to be covered in the letter?
- Is there no evidence of redundant information?
- Did the student organize the important information in a logical sequence?
- Does the last paragraph indicate the desired action and summarize the ideas expressed?
- Has the letter been formatted in an acceptable business letter style?
- Has an acceptable punctuation pattern been used in the letter?
- Is the text of the document free of errors?

Appendix O: Writing Strategies, Suggested Activities, and Assessment Techniques

(Optional Module 18: Effective Business Writing)

Business Letters and Memoranda

The order in which the writer presents information in a business letter or memorandum may depend on the expected reaction of the reader. When writers expect their audience's reaction to be neutral or positive, the writer should communicate the message as clearly and briefly as possible. The following are some suggestions for using this approach:

- State briefly the main purpose of the letter or memorandum (usually in the first paragraph).
- Provide all the information and details that the reader needs (usually in the middle paragraph[s]).
- Close the document with positive reinforcement and a request for action (when appropriate).

Communication in this category may include letters or memoranda: of request or inquiry; ordering goods; for reservations; offering expressions of thanks, congratulations or sympathy; and acknowledging a request or an order.
The following writing strategies may be used when the writer anticipates that the receiver may resist the suggestions and information provided (a negative reaction):

- Begin the communication with a goodwill paragraph that touches on the "negative" subject but does not directly refer to it.
- Provide detailed information regarding the reasons for resistance of the request.
- State that the request has been refused in a positive tone.
- End with a goodwill conclusion. Suggest an alternative proposal (if possible) or a request for action.

Communication in this category may include letters or memoranda complaining about products or services, refusing a request, and dealing with credit and collection.

Reports

Reports may be used for sharing or presenting information, for the presentation of recommendations to solve problems, or to assist in decision making. Reports usually require research. Reports can be formatted as a bound or unbound manuscript. They usually include a cover page, a table of contents, and a bibliography. Endnotes may be included. Appendices, charts, graphs, lists, diagrams, maps and other visuals may be included.
When writing reports, students may incorporate the following guidelines:

- Choose a specific topic.
- Prepare questions. Ask what the receiver wants to know about the topic.
- Collect data. The complexity of the questions to be answered and the time limitations will determine the amount of data that will be collected.
- Organize information. Delete any redundant information. Pertinent information should be organized to prepare an outline for the writing.
- Compose and prepare the report, applying the stages of the writing process. Considerations should be given to formatting the report as a bound or an unbound manuscript.

Suggested Instructional Approaches and Assessment Techniques

Business Letters and Memoranda

The following are some suggested activities that may be adapted or used to facilitate the incorporation of writing strategies to produce business letters, memoranda, and reports.

- Students could examine several samples of business letters and interoffice memoranda. They could identify the following for each communication: the purpose; the intended audience; special characteristics of the audience; the topic; and, the format. They could discuss the message of each document and sort the correspondence into two categories, depending upon the expected reaction of the reader to the message. One category could include those communications that expect a neutral or positive reader reaction. The other category could be comprised of those documents that expect a negative reaction on the part of the reader.
- Students may be provided with a communication that expects a neutral or positive reaction on the part of the reader, such as a letter granting a credit adjustment or a letter thanking an interviewer. Students could examine the letter, discuss and record answers to questions similar to the following: What is the main purpose of the letter and is it clearly stated in the first paragraph? Has all the necessary information been provided? If so, in which paragraph(s)? Has the letter closed with positive reinforcement? How? Is there a request for action? If so, is it clearly stated? Provided with a communication that expects a negative reader reaction, such as a letter of complaint or a letter refusing a request, students may examine the document and discuss questions similar to the following: Has goodwill been demonstrated in the opening paragraph? How? What details have been provided justifying the refusal of the request? Is it clearly stated that the request has been refused? How? In your opinion, has the receiver been treated fairly? Why or why not? Has the sender created goodwill in the concluding paragraph? How? Is an alternative or a request for action suggested?

Reports

Students can integrate and combine the stages of the writing process and writing strategies experienced in this module to plan, research, write, and produce a report. They should select from business topics such as careers, dress codes, entrepreneurship, law and the office worker, or occupational health hazards. Students may be reminded to narrow their topic to one major idea. Students may conduct peer or self-assessment of their writing by considering the following questions: Is the topic specific enough? Is the purpose clearly stated in the introduction? Are pertinent questions answered clearly? Are the facts clearly presented? Are the facts reliable? Is all the information pertinent? Are sources indicated? Have headings and subheadings been used to organize the information? Is the report formatted correctly? Does the report achieve its purpose? The criteria listed on the Sample Criteria for Assessing the Application of the Writing Process template provided in this guide may also be adapted and used to assess the writing.

Appendix P: Record Keeping Template

Information Processing

Student Name:_____

School Name:_____

Module Code	Modules	Survey Hrs	IP10 Hrs	IP20 Hrs	IP30 Hrs	Date	Teacher Initials
INFO01	Intro to Computer Technology (Core)						
INFO02	Learning to Keyboard by Touch (Core)						
INFO03	Information Processing Activities						
INFO04	Information Processing Project						
INFO05 A, B, C	Intermediate Keyboarding (Core)						
INFO06	Intermediate Keyboarding (Optional)						
INFO07	Developing IP skills for Personal Use (Core)						
INFO08	Intro Word Pro and Formatting (Core)						
INFO09	Business Information Processing (Core)						
INFO10	Managerial Information Processing (Core)						
INFO11	Introduction to Spreadsheets						
INFO12	Intro to Database Software and Their Apps						
INFO13	Skills for Entry -Level Employees						
INOF14	Intermediate Word Processing						
INFO15	Intermediate Database						
INFO16	Intermediate Spreadsheet Applications						
INFO17	Integrating Software Applications						
INFO18	Effective Business Writing						
INFO19	Desktop Publishing						
INFO20	Internet Theory, Use and Exploration						
INFO21	Intermediate Computer Technology						
INFO22	Troubleshooting and Technical Assistance						
INFO23	Career Opportunities in Info Pro (Core)						
INFO24 A, B, C	Work Study Prep and Follow-Up Activities						
INFO25 A, B, C	Work Study						
INFO99 A, B, C	Extended Study						
PHGA09	Introduction to Digital Photography						
PHGA16	Intermediate Digital Photography						
PHGA17	Digital Manipulation						
PHGA28	Advanced Digital Photography						
PHGA29	Advanced Digital Manipulation						
PHGA37	Computer-Aided Graphic Design						
PHGA39	Scanning and Design						
PHGA50	Cover Design						
PHGA51	Scanning and Colour Correction						
CPTE07A	Introductory Multimedia Production						
CPTE07B	Intermediate Multimedia Production						