SYLLABUSES
FOR
SECONDARY SCHOOLS

COMPUTER LITERACY
(SECONDARY 1-3)

PREPARED BY
THE CURRICULUM DEVELOPMENT COUNCIL
RECOMMENDED FOR USE IN SCHOOLS BY
THE EDUCATION DEPARTMENT
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CONTENTS

PREAMBLE

This syllabus is one of a series prepared for use in secondary schools by the Curriculum Development Council, Hong Kong. The Curriculum Development Council, together with its co-ordinating committees and subject committees, is widely representative of the local educational community, membership including heads of schools and practising teachers from government and non-government schools, lecturers from tertiary institutions, officers of the Hong Kong Examinations Authority and those of the Curriculum Development Institute, the Advisory Inspectorate and other divisions of the Education Department. The membership of the Council also includes parents and employers.

This syllabus is recommended for use in Secondary 1 to 3 by the Education Department. Once the syllabus has been implemented, progress will be monitored by the Advisory Inspectorate and the Curriculum Development Institute of the Education Department. This will enable the Computer Studies Subject Committee (Secondary) of the Curriculum Development Council to review the syllabus from time to time in the light of teaching and learning experiences.

All comments and suggestions on the syllabus may be sent to:

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1. INTRODUCTION

This syllabus is recommended for use in Hong Kong secondary schools at junior secondary level. It is written with the understanding that contact with computers is now a daily fact of life and that a general education curriculum should provide chances for students to learn about computers, to become "computer literate" and to be better prepared for the fast changing information society. This syllabus intends to build in students a general awareness of the ranges of tasks that computers can do, how computers are used to solve daily-life problems, and to what extent computers affect individuals and society.

This is a revised edition of the previous syllabus published in 1993. The revision is based on the recommendation of the Joint Working Group (JWG) comprising members of the Curriculum Development Council and the Hong Kong Examinations Authority Computer Studies Subject Committees. The JWG was set up to carry out an overall review of the syllabuses of computer subjects in secondary schools in October 1995 and to develop a set of computer syllabuses for students of the 21st Century. Based on the evaluation reports of computer subjects from various sources and the review on the current trend of computer technology, new applications such as Internet access and multimedia are included in the syllabus.

The revised syllabus adopts a modular approach. It is organized into 12 basic modules which cover three major areas of study: computer systems, information technology, and programming. 12 additional enrichment modules are also recommended in the course. Schools may enhance their Computer Literacy curriculum by allocating additional teaching periods to cover some or all of the enrichment module(s).

It is strongly recommended that the teaching of this syllabus should adopts a "task-oriented" approach, in the sense that, students are given many practical tasks and features of the applications system are then introduced gradually to help students to tackle the task. Many practical tasks have been suggested to enable students to practise what they have learned. It is hoped that teachers will follow the suggestions and provide opportunities for students to explore and discover in a computing environment.

Bearing in mind that the subject Computer Literacy is intended to give students opportunities to play around with computers and gain some hands-on experience in using computers, teachers will be well aware that written examination may not be the most suitable means of assessment. For this subject, it is recommended that continuous assessment be used and grades, instead of marks, be awarded.

2. AIMS AND OBJECTIVES

AIMS

This syllabus aims to provide students with an opportunity to:

1. develop computer literacy with an understanding of fundamental concepts of computers;
2. appreciate the contemporary development of information technology;
3. develop problem solving skills;
4. cultivate positive attitudes towards the ever changing society with widespread utilisation of computers.

OBJECTIVES

After completion of the course, students should be able to:

1. understand common computing terminology;
2. understand the basic principles of operation for computer systems;
3. acquire fundamental knowledge about computer applications;
4. make use of common application software packages to carry out simple tasks;
5. understand basic features of a programming language;
6. write simple computer programs;
7. be aware of social issues related to computer applications;
8. appreciate the advancement brought about by the widespread use of computers in society.

3. SYLLABUS APPROACH AND MODELS OF IMPLEMENTATION

The revised syllabus adopts a modular approach which cover three major areas of study (with time allocation in percentages):

Computer Systems	(25%)
Information Technology	(58%)
Programming	(17%)

Logo was designed as an integrated learning environment in which students could learn important ideas in mathematics, computer science and problem solving while inventing and carrying out their own computer- based programming projects. Hence, programming in Logo is recommended in Computer Literacy. Modules PL01, PL02 and PL03 are included in the modules. School may opt either Logo or any other computer language for teaching programming. Alternative modules PA01, PA02 and PA03 are therefore suggested as substitutes for the purpose.

Schools may provide more computer training to their students. Hence, two models of implementation are recommended in the syllabus. Model I is a syllabus for schools wishing to allocate one teaching period per week. The syllabus consists of 12 basic modules.

Model II is a more comprehensive course for schools wishing to allocate two teaching periods per week. The syllabus consists of 24 modules, including 12 basic modules and 12 enrichment modules. For school taking 2 periods, they should complete 12 basic modules and some enrichment modules. The ratio of topics mentioned above should be maintained. It is highly recommended for schools to adopt Model II in implementing the syllabus.

MODELS OF IMPLEMENTATION

Model I: 12 basic modules

Level	Computer Systems	Information Technology	Programming
Secondary 1	CS01 Basics of Computer and Computer Operation	IT01 Areas of Computer Applications	PL01 Turtle Graphics
		IT02 Text Processing and Graphics Handling	PA01* Working in the Programming Environment
Secondary 2	CS02 Computer Hardware and Software	IT03 Calculations and Charts	PL02 Logo Procedures
		IT04 Multimedia Presentation	PA02* Input/output Statements and Arithmetic Operations
Secondary 3	CS03 Computers and Information Systems	IT05 Computer Communications and Internet Access	PL03 Simple Logo Programming
		IT06 Using Databases	PA03* Text and Sound

* Alternative modules on Programming

Model II: 12 basic modules and 12 enrichment modules

Level	Computer Systems	Information Technology	Programming
Secondary 1	CS01 Basics of Computer and Computer Operation	IT01 Areas of Computer Applications	PL01 Turtle Graphics PL02 Logo Procedures
	CS11 Chinese Computing	IT11 Control Technology IT02 Text Processing and Graphics Handling IT12 Integration of Text and Graphics	PA01* Working in the Programming Environment PA02* Input/output Statements and Arithmetic Operations
Secondary 2	CS02 Computer Hardware and Software	IT03 Calculations and Charts	PL03 Variables PL11 Flow Control
	CS12 Components of a Computer System	IT13 Reporting with Tables and Charts IT04 Multimedia Presentation IT14 Presentation with Animation	PA03* Text and Sound PA11* Flow Control Techniques
Secondary 3	CS03 Computers and Information Systems	IT05 Computer Communications and Internet Access	PL12 Circles, Drawing Arcs and Simple Tail Recursion PL13 Logo Projects
	CS13 Computer Networks	IT15 Employment and Health Issues of Computer Usage IT06 Using Databases IT16 Manipulating Databases	PA12* Looping Techniques and Random Number Generator PA13* Simple Programming Projects

* Alternative modules on Programming

4. ESTIMATED TIME ALLOCATION

The time allocated for the Computer Literacy Course in schools adopting Model I should be at least 35 minutes per lesson and 1 lesson per week. Taking an average school year as 26 teaching periods, a total of 78 periods should be allocated for this course.

The time allocated for the Computer Literacy Course in schools adopting Model II should be at least 35 minutes per lesson and 2 lessons per week. Taking an average school year as 52 teaching periods, a total of 156 periods should be allocated for this course.

BASIC MODULES

		No. of Periods
I.	**Computer Systems**	
CS01	**Basics of Computer and Computer Operation**	**6-7**
1.	Computer concept	
2.	Idea of stored data and stored program	
3.	File management	
4.	Operating a computer	
CS02	**Computer Hardware and Software**	**6-7**
1.	Computer hardware	
2.	Computer software	
CS03	**Computers and Information Systems**	**6-7**
1.	Computer systems	
2.	Computer networking	
3.	Information processing	
4.	Future computers	
II.	**Information Technology**	
IT01	**Areas of Computer Applications**	**7-8**
1.	Education	
2.	Recreation	
3.	Business and office applications	
4.	Industrial and scientific applications	
5.	Effects of computers on society	
IT02	**Text Processing and Graphics Handling**	**7-8**
1.	Text processing	
2.	Graphics handling	
IT03	**Calculations and Charts**	**7-8**
1.	Introducing spreadsheets	

No. of Periods

2. Using a spreadsheet for calculations
3. Generating charts

IT04 Multimedia Presentation **7-8**

1. Introducing multimedia
2. Developing multimedia presentation
3. Project with multimedia presentation

IT05 Computer Communications and Internet Access **7-8**

1 Computer communications
2 Internet access
3 Impact of computer communications on society

IT06 Using Databases **7-8**

1. Creating and using a database file
2. Manipulating a database file
3. Listing records

III. Programming

PL01 Turtle Graphics **4-5**

1. Meeting the turtle
2. Screen and pen control

PL02 Logo Procedures **4-5**

1. Repetitive actions
2. Defining and modifying procedures
3. Workspace and file management

PL03 Variables **4-5**

1. Ideas of variables
2. Using variables
3. Random number primitive

Alternative Modules on Programming

PA01 Working in the Programming Environment **4-5**

1. Introducing the working environment
2. Executing, saving and retrieving programs
3. Ideas of programming

PA02 Input/output Statements and Arithmetic Operations **4-5**

1. Basic input/output techniques
2. Arithmetic operations

No. of Periods

PA03 Text and Sound **4-5**

1. Manipulating text
2. Screen control and sound

ENRICHMENT MODULES

I. Computer Systems

CS11 Chinese Computing **6-7**

1. Basic concepts of Chinese character processing
2. Chinese character input methods
3. Inputting Chinese characters
4. Chinese computer systems

CS12 Components of a Computer System **6-7**

1. Input/output units
2. Central processing unit
3. Storage unit

CS13 Computer Networks **6-7**

1. Ideas of computer networks
2. Components of computer networks
3. Features of computer networks

II. Information Technology

IT11 Control Technology **7-8**

1. Introducing control technology
2. Features of a control system
3. Project with control technology

IT12 Integration of Text and Graphics **7-8**

1. Incorporating text into graphics
2. Incorporating graphics into text
3. Project with text and graphics

IT13 Reporting with Tables and Charts **7-8**

1. Reporting with tables
2. Reporting with charts
3. Project with tables and charts

IT14 Presentation with Animation **7-8**

1. Introducing animation
2. Capturing video images with a peripheral device

No. of Periods

3. Importing animated/video images into another software application

IT15 Employment and Health Issues of Computer Usage **7-8**

1. Trend of employment caused by the widespread use of computers
2. Health issues related to the use of computers

IT16 Manipulating Databases **7-8**

1. Linking two database files
2. Generating labels and reports
3. Project with databases

III. Programming

PL11 Flow Control **4-5**

1. Ideas of flow control
2. Uses of flow control

PL12 Circles, Drawing Arcs and Simple Tail Recursion **4-5**

1. Circles and drawing arcs
2. Simple tail recursion

PL13 Logo Projects **4-5**

1. Designing a programming project
2. Project assignment

Alternative Modules on Programming

PA11 Flow Control Techniques **4-5**

1. Ideas of flow control
2. Uses of flow control

PA12 Looping Techniques and Random Number Generator **4-5**

1. Looping technique
2. Random numbers

PA13 Simple Programming Projects **4-5**

1. Designing a programming project
2. Project assignment

5. NOTES ON TEACHING

The three major areas of study in the revised syllabus together with their time allocation in percentages are as follows:

Computer Systems	(25%)
Information Technology	(58%)
Programming	(17%)

As the aim of the subject is to provide an opportunity for students to understand fundamental concepts of computers, it should not be taught merely as transmission of factual knowledge and the training of skills. Throughout the course, the main emphasis is on the direct involvement of students in various activities such as viewing video tapes, movies, slides and photographs, newspaper clippings, collection of relevant information and materials, board display, small projects, visits, talks, group discussions, debates, essay competitions, etc. These activities may help motivate students and enliven the learning atmosphere in the classroom.

For teaching programming, teachers are recommended to adopt a student-centred approach. The syntax and command of the language should be taught through the process of guided discovery into the nature of a situation or problem. It is therefore essential for teachers to provide their students with an environment which allow them to explore and discover.

For teaching information technology, it is generally accepted that the understanding of these topics could be best derived form hands-on experience in using application programs. To achieve this goal, practical lessons should be appropriately organized so as to allow sufficient time for students to try out the programs with relevant daily life tasks. However, teachers should bear in mind that basic concepts involved in the use of application packages to complete the tasks are the theme for this section. Students should not be required to memorize the factual statements and commands used in the application packages. Follow-up discussions on the contemporary development of information technology are also considered valuable.

The order of presentation of topics in the models of this syllabus should not be interpreted as a rigid teaching sequence. Teachers may choose modules that best suited to the abilities of their student, but the proportion of time allocated to the major areas as mentioned above should be maintained.

Based on feedback from teachers, notes on teaching on specific topic(s) would be up-dated and issued from time to time in the form of supplementary information to schools in due course.

6. THE SYLLABUS

CS01 Basics of Computer and Computer Operation

Module Objective

After completing the module, students should be able to understand fundamental concept about computing and computer operation.

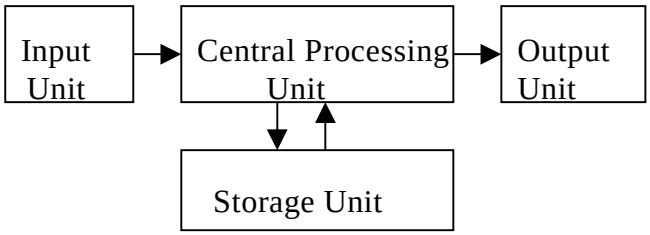
TOPICS	*EXPLANATORY NOTES*
1. Computer concept	By using daily life examples, teachers should lead students to recognise that the computer is a machine which operates according to the following sequence: "input → process → output" Teachers should also explain to students that computers need instructions to operate. The distinction between hardware and software and their interrelationship should be discussed.
2. Idea of stored data and stored program	Students should be aware of the importance of stored data in a processing task. By explaining the working of music box, washing machine or toy robot, etc., teachers should introduce the concept of program to students. Students should be aware of the importance of the stored program in an automated processing task.
3. File management	Students should know the basic idea of directories and sub-directories. Students should know how to save, retrieve, copy and delete files.
4. Operating a computer	Teachers should introduce the use of menus, icons and windows. Students should be familiarised with the operation of the equipment with which they are working, such as pointing devices. They should also be able to input English and Chinese characters.

CS02 Computer Hardware and Software

Module Objective

After completing the module, students should be able to describe basic ideas of hardware and software.

TOPICS	*EXPLANATORY NOTES*
1. Computer hardware	Teachers should use a microcomputer system to illustrate the components of a computer, i.e., input unit, storage unit, central processing unit and output unit.



Only simple description of these components and their interrelationship are required. The interconnections between various units and the directions of data flow between these units should be discussed.

Different types of input/output devices and storage devices such as keyboard, mouse, printer, visual display unit (VDU) and disk drives should be mentioned.

2. Computer software	Basic ideas of different types of computer software such as system software, programming languages and application software should be discussed.

System software may include operating system and Chinese operating system. Programming languages may include Logo and BASIC.

Application software may include spreadsheets, word processors, and database programs. Teachers may demonstrate the use of these application software.

CS03 Computers and Information Systems

Module Objective

After completing the module, students should be able to understand the high worth of the development of computer technology and the role of computers in information processing.

TOPICS	*EXPLANATORY NOTES*
1. Computer systems	Types of computer systems such as supercomputer, mainframe computer, minicomputer and microcomputer should be discussed. Students should realize that the classification of different types of computer systems are relative to the advancement of technology.
2. Computer networking	Students should realize that computers can be connected to each other to form a network. The needs and advantages of using computer networking should be discussed.
3. Information processing	Students should realize that : (a) information is data which has been given specific meaning; (b) data processing involves the transformation of data by means of a set of predefined rules; (c) computers process data by performing calculation, searching, sorting, deleting, inserting, updating, etc.; (d) the correctness of data is essential in data processing - the idea of "garbage-in garbage-out"; (e) output of data processing should be useful information. Students may acquire hands-on experience on (a) a real time system, for example, a simplified version of telephone enquiry system; (b) batch processing, for example, a simplified version of an examination system.
4. Future computers	Students should be aware that the role of computers in various fields is getting more important. Teachers should mention the current and future development of computer technology.

IT01 Areas of Computer Applications

Module Objective

After completing the module, students should be able to list and identify various areas of computer applications in the age of information.

TOPICS	*EXPLANATORY NOTES*
1. Education	The following topics should be covered: (a) The computer as a teaching and learning tool Students should be allowed to use computer assisted learning (CAL) programs on different subject areas. A discussion on their experiences gained from the learning activities could be held. The advantages of using CAL programs should be discussed. (b) The computer as a school administrative tool Computers may be used to keep student records, class list, examination results, etc. Related computer outputs may be shown to students.
2. Recreation	Teachers should provide opportunities for students to experience the feeling of challenge, fantasy and curiosity which a computer game can give. Teachers may select an appropriate computer game (e.g. action game) and let students play with it. Students should also be aware that computer equipment can be used to produce special effects in movies.
3. Business and office applications	The use of computers in business applications, such as banks and supermarkets should be mentioned. Students should be asked to collect printouts of these business applications for discussion. Office automation (OA) through use of the application software packages, such as word processing, spreadsheet, database, graphics, and communications should be mentioned.
4. Industrial and scientific applications	The use of computers in industry, such as design and manufacturing of cars, traffic control in Mass Transit Railway (MTR) should be mentioned. The use of computers in scientific applications, such as simulation of experiments, weather forecasting and modelling should be mentioned. In particular, teachers may demonstrate programs on experiments simulated by computers.

5.	Effects of computers on society	Students should develop an awareness of the impact of computers on society. The topics related to employment trends and copyright should also be discussed.

IT02 Text Processing and Graphics Handling

Module Objective

After completing the module, students should be able to demonstrate basic skills in processing text and handling graphics.

TOPICS	*EXPLANATORY NOTES*
1. Text processing	Students should be asked to type in a piece of text related to their experiences, such as letters, diaries or stories. The text will be saved, edited, formatted and printed. When editing the text typed, students should be able to: (a) add text at a desired insertion point; (b) select desired blocks or sections of text; (c) delete characters, words, lines and paragraphs; (d) move or copy a block of text from one location to another; and (e) search for or replace a word in the text. Students should be able to adjust the format typed according to its appearance on paper, such as set margins and justification of the text.
2. Graphics handling	Students should be provided with opportunities to draw colour pictures with figure of different shapes, such as circles, squares and rectangles. They should be able to move, copy, resize and delete these figures in the pictures. Students should be able to save and print the pictures.

IT03 Calculations and Charts

Module Objective

After completing the module, students should be able to demonstrate simple skills in manipulating and presenting numerical data by using spreadsheets.

TOPICS	*EXPLANATORY NOTES*
1. Introducing spreadsheets	Students should be introduced worksheets related to their experiences, such as examination mark sheets and records of personal monthly expenses. The advantages of using electronic spreadsheets should be discussed.
2. Using a spreadsheet for calculations	Students should be able to set up a worksheet through: (a) entering text and numbers, (b) entering formulas, and (c) copying formulas. Besides, students should be able to perform calculations by using functions, such as sum, average, maximum and minimum.
3. Generating charts	Using the worksheets created, students should be able to generate bar chart, pie chart and line chart with one set of data.

IT04 Multimedia Presentation

Module Objective

After completing the module, students should be able to demonstrate basic skills in developing multimedia presentation.

TOPICS		*EXPLANATORY NOTES*
1.	Introducing multimedia	Students should be aware of the basic ideas of multimedia presentation. The advantages of using multimedia presentation should be discussed. Teachers should introduce the use of multimedia in various areas of applications, such as computer assisted learning, electronic encyclopaedia and presentation graphics.
2.	Developing multimedia presentation	Teachers should introduce how to prepare graphics files through scanning, sound files through recording and animation files through using utility programs. Students should be asked to incorporate a number of multimedia elements, such as text, graphics, animation, sound and music into a presentation.
3.	Project with multimedia presentation	Teacher should prepare relevant files such as graphic files, sound files and animation files for students' use. Students are encouraged to develop a multimedia presentation project on topics related to their schools and their family life.

IT05 Computer Communications and Internet Access

Module Objective

After completing the module, students should be able to understand fundamental knowledge about computer communications and Internet access.

TOPICS		*EXPLANATORY NOTES*
1.	Computer communications	Teachers should mention basic ideas of the applications of computer communications, such as automatic teller machine, electronic payment system, point of sale, electronic money, electronic mail and Internet.
2.	Internet access	Student should be aware of basic ideas of the Internet and the hardware and software requirement for Internet access. They should have opportunities to exchange information through electronic mails. Teachers should guide their students to search for, access and download useful information through the Internet.
3.	Impact of computer communications on society	Students should be aware of the impact of the development of computer communications on society. Debates on topics such as cashless society, data privacy and data security may be held. Students may also be asked to complete project assignments on these topics.

IT06 Using Databases

Module Objective

After completing the module, students should be able to demonstrate simple skills in creating and manipulating databases.

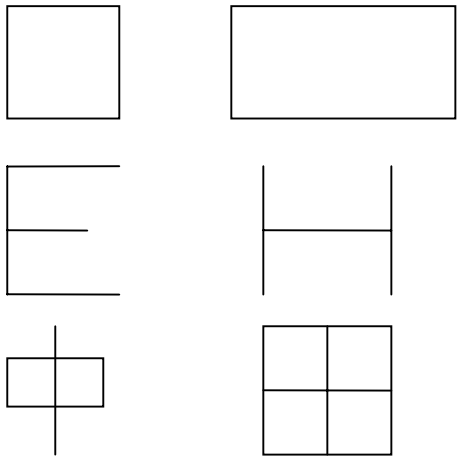
TOPICS		*EXPLANATORY NOTES*
1.	Creating and using a database file	Students should be aware of the basic concepts of database, file, record, and field. Students should be able to create and use a single database related to their experience, such as file of student records or library book records.
2.	Manipulating a database file	Students should be able to: (a) save and retrieve a database file, (b) display and edit records, (c) add and delete records, and (d) sort and search records.
3.	Listing records	Students should be able to display or print a list of selected data, such as a list of records of all boys in a class or geography books in library.

PL01 Turtle Graphics

Module Objective

After completing the module, students should be able to use fundamental Logo primitives and draw simple graphics with turtle commands.

TOPICS	*EXPLANATORY NOTES*
1. Meeting the turtle	Students should be able to enter and exit the Logo environment. Teachers should provide simple procedures for students to type into the computer to (a) move the turtle and turn it through an angle, (c) print picture to printer, (d) do arithmetic, (e) write sentence, and (f) produce sound.
2. Screen and pen control	Students should know how to control the turtle. Using the primitives learned, the following shapes and patterns may be constructed:

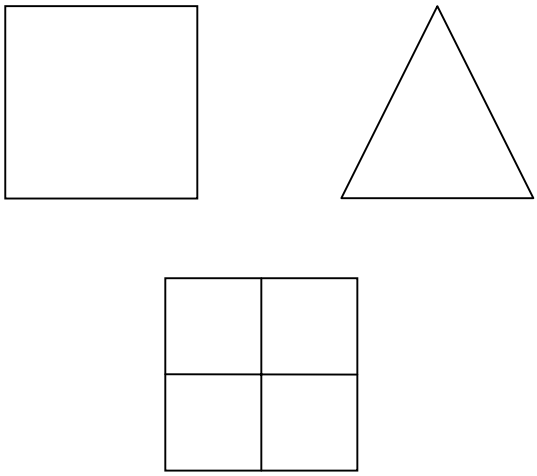


List of suggested Logo primitives or other related commands/methods for teaching this module:
FD, BK, RT, LT, PRINTPIC, +, –, *, /, PR, TONE, GOODBYE, HOME, CS, CT, TS, CLEAN, HT, ST, PU, PD, PE, SETPC, FILL, SETBG, and SETPOS.

PL02 Logo Procedures

Module Objective

After completing the module, students should be able to write simple Logo procedures and manage procedures in the workspace.

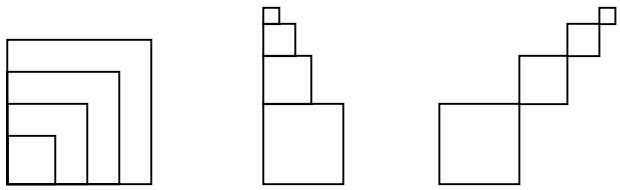
TOPICS	*EXPLANATORY NOTES*
1. Repetitive actions	Students may be asked to use Logo primitives to draw the following figures:  They may use the REPEAT primitive to shorten some of the steps in drawing the above figures.
2. Defining and modifying procedures	Students should be aware that the body of a procedure may contain Logo primitives and other user-defined procedures. They should use the Logo editor to modify a defined procedure. The advantages of the use of user-defined procedure should be discussed.
3. Workspace and file management	Students should be able to use primitives to manage procedures in workspace or disk files.

List of suggested Logo primitives for teaching this module:
REPEAT, TO, PO, POPS, POTS, ERASE, ERALL, CAT, ERASEFILE, LOAD, SAVE, LOADPIC and SAVEPIC.

PL03 Variables

Module Objective

After completing the module, students should be able to use variables in writing simple Logo procedures.

TOPICS	*EXPLANATORY NOTES*
1. Ideas of variables	Students are introduced to the concept of variables and how variables are used in procedures. For example: TO SQ :SIZE REPEAT 4[FD :SIZE RT 90] END
2. Using variables	The following shapes and patterns may be constructed:  Procedures involving basic arithmetic operations may be constructed, for example: TO AVERAGE :A :B PRINT (:A + :B)/2 END Procedures involving generation of sound may be constructed, for example: TO C :DURATION TONE 523 :DURATION * 10 END
2. Random number primitive	Teachers should provide examples for students to test the primitive RANDOM and observe the result. Students should be able to use the primitive in procedures.

List of suggested Logo primitives for teaching this module:

:, TONE and RANDOM.

PA01 Working in the Programming Environment

Module Objective

After completing the module, students should be able to use fundamental program statements in a programming environment.

TOPICS	*EXPLANATORY NOTES*
1. Introducing the working environment	Students should know how to enter and exit the programming environment. Program statements related to input (from keyboard), output (to screen, printer and speaker) and arithmetic operations should be introduced.
2. Executing, saving and retrieving programs	Teachers should provide simple programs for students to type into the computer, execute the programs, observe results of the programs and produce the program listings. Teachers should guide students to modify the programs and then execute the programs again. Students should save the programs for retrieval at a later stage.
3. Ideas of programming	Discussion on the ideas of writing programs to control the computer should be held.

PA02 Input/Output Statements and Arithmetic Operations

Module Objective

After completing the module, students should be able to write simple programs to handle assignments, input, output and arithmetic operations.

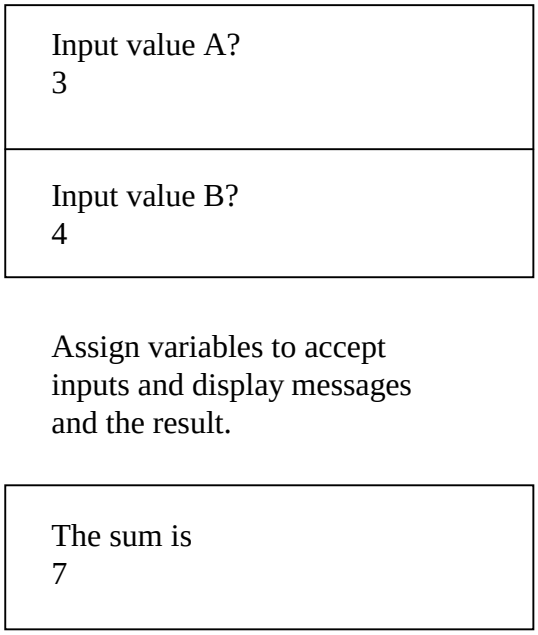
TOPICS	*EXPLANATORY NOTES*
1. Basic input/output techniques	Students should know how to use input/output features in their programs: to accept input from keyboard and output information to the screen. Students should be encouraged to write simple programs with input/output features. For example, i) Hi, welcome to the programming world. — *Output Screen* ii) What is your name? John — *Input Screen* Assign a variable to accept the input and display messages with the contents of the variable. — *Process* Hi, John. Nice to meet you. — *Output Screen*

2. Arithmetic operations

Students should know how to use variables in assignment tasks.

Teachers may use sample programs to demonstrate the use of variables and simple arithmetic operators in assignments.

For example,



PA03 Text and Sound

Module Objective

After completing the module, students should be able to write simple programs to manipulate text and sound.

TOPICS	*EXPLANATORY NOTES*
1. Manipulating text	Students should be able to use simple commands to manipulate text strings. For example, (a) to output "SUPER" from the string "SUPERMAN", (b) to output "BALL" from the string "BASEBALL", (c) to output "PUT" from the string "COMPUTER" and (d) to output "HK" from the string "HONG KONG", etc.
2. Screen control and sound	Students should be able to write program with simple layout to: (a) position the text to any row or column on the screen; (b) display text of different attributes, e.g. foreground and background colours; Students should be able to use simple commands to generate sound in the programming environment. Students are encouraged to write simple programs to manipulate and display text with interesting effects with the use of colours and sound.

CS11 Chinese Computing

Module Objective

After completing the module, students should be able to understand the characteristics of a Chinese computer system.

TOPICS	*EXPLANATORY NOTES*
1. Basic concepts of Chinese character processing	The characteristics of Chinese characters should be discussed, such as: (a) size of character set, (b) internal code, and (c) Chinese fonts.
2. Chinese character input methods	Students should realize that the Chinese characters can be inputted into the computer through the use of: (a) keyboard entry, (b) Chinese hand-writing recognition, (c) Chinese optical character recognition, and (d) Chinese speech recognition. Teachers should demonstrate how to input Chinese characters through keyboard with different methods, such as Tsang-jei, simplified Tsang-jei, phonetic-based or internal code input method.
3. Inputting Chinese characters	Students should be encouraged to type a simple document with a Chinese word processing package.
4. Chinese computer systems	The need for Chinese computing systems should be discussed. The need for constructing Chinese characters should also be mentioned but the actual operation is not required.

CS12 Components of a Computer System

Module Objective

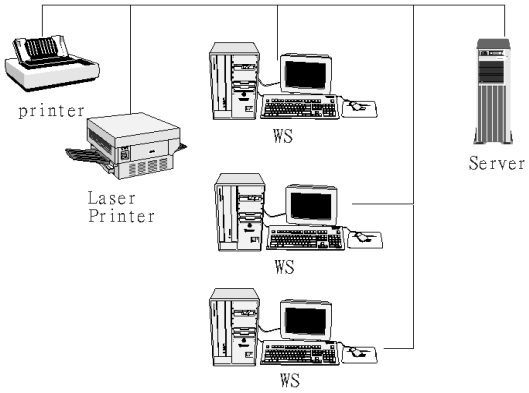
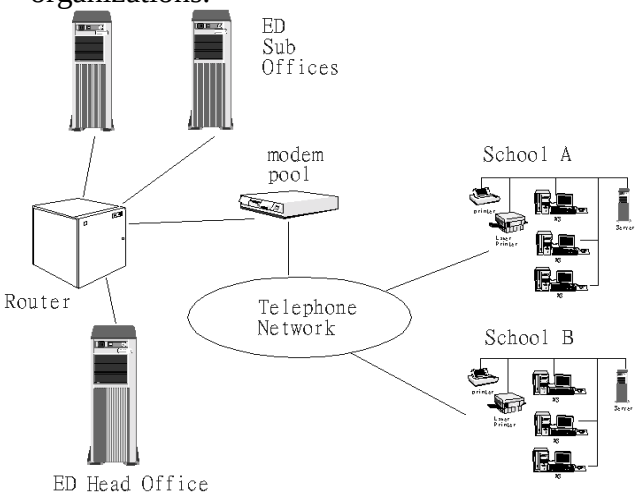
After completing the module, students should be able to understand basic feature of the components of a computer.

TOPICS	*EXPLANATORY NOTES*
1. Input/output units	The need for and functions of different input/output devices should be discussed. Input devices may include joystick, Chinese handwriting recognition system, microphone and scanner. Output devices may include colour printer, laser printer, colour monitor, liquid crystal display panel, and speaker. Teachers' demonstration on the use of different types of input/output devices would be helpful. The advantages and disadvantages of screen and printer output in different situations should also be mentioned.
2. Central processing unit	The basic units of a central processing unit and their roles should be discussed. These should include: (a) control unit, (b) arithmetic and logic unit. Teachers should demonstrate how instructions are picked up and executed sequentially by the central processing unit. Students should be aware that all information are stored and processed in binary codes.
3. Storage unit	Students should realize that there are two types of storage: main memory and backing store. The role of main memory and its size in terms of bits and bytes should be mentioned. The distinction between random access memory (RAM) and read only memory (ROM) should be discussed. The need for secondary storage should be discussed. Various storage devices such as disk drive and CD-ROM drive and their corresponding media should be mentioned.

CS13 Computer Networks

Module Objective

After completing the module, students should be able to understand simple concept of connecting computers together and realise the functions of a network.

TOPICS	*EXPLANATORY NOTES*
1. Ideas of computer networks	Basic ideas of two types of computer networks, local area network (LAN) and wide area network (WAN) should be discussed.
2. Components of computer networks	Teachers should introduce basic components of a computer network such as workstation, network interface card, cabling, hub, server, router, and modem. Only simple description of these components and their interrelationship are required. Examples of LAN and WAN are as follows: A typical local area network (LAN) for school administration.  A typical wide area network (WAN) for educational organizations. 
3. Features of computer networks	The advantages of computer networks should be discussed and demonstrated, such as, sharing of resources and exchanging of information.

IT11 Control Technology

Module Objective

After completing the module, students should be able to gain knowledge about control technology and appreciate its applications in the real world.

TOPICS	*EXPLANATORY NOTES*
1. Introducing control technology	Teachers should explain that a control system accepts input signals and then generates output signals after processing. Sources of input signals may include switch, or sensors which are light, sound, temperature and touch sensitive. Output signals may be used to control motors, heaters, lamps and buzzers.
2. Features of a control system	Students should be aware of the basic concepts of open loop and closed loop control systems. Teachers should introduce the use of control technology in different applications, such as operation of air-conditioner, iron and microwave oven. The need for control technology should be discussed.
3. Projects with control technology	Students may be asked to work with models which simulate operations of systems in daily life situations, such as traffic light control, light control, vending machine and cooling fan.

IT12 Integration of Text and Graphics

Module Objective

After completing the module, students should be able to produce outputs with text and graphics.

TOPICS	*EXPLANATORY NOTES*
1. Incorporating text into graphics	Students should be able to add text into graphics and make designs related to their experiences, such as birthday cards, posters and signs.
2. Incorporating graphics into text	Students should be able to: (a) insert graphics into a particular position of a document; (b) change the size of the graphics; (c) change the position of graphics; and (d) insert a graphic image with text surrounding.
3. Project with text and graphics	Students may be asked to complete a project assignment such as creating letterheads with logo, producing reports with graphics for illustration or writing newsletters with cliparts.

IT13 Reporting with Tables and Charts

Module Objective

After completing the module, students should be able to present numerical data by using spreadsheets.

TOPICS	*EXPLANATORY NOTES*
1. Reporting with tables	Students should be able to generate tables according to a format specified by teacher. Students should be able to change row height, column width, font, alignment, colours, border and shading, and format of date and numbers.
2. Reporting with charts	Students should be able to generate charts with two or more sets of data. They should also be able to add axis label, title and legend to charts.
3. Projects with tables and charts	Students may be asked to complete a project assignment, such as showing the monthly salaries of the male and female staff of a company quarterly, sales in two departments of a company, or average time spent on doing homework on each day of a week by two classes of students.

IT14 Presentation with Animation

Module Objective

After completing the module, students should be able to appreciate basic knowledge and skills in the presentation of information through computer animation.

TOPICS	*EXPLANATORY NOTES*
1. Introducing animation	The idea of animation and the need for animation in specific application areas should be discussed. Teachers should show the use of computer animation in computer assisted learning (CAL) packages and commercial movies.
2. Capturing video images with a peripheral device	With the help of the demonstration system, teachers should capture video images from various sources, such as a video cassette recorder (VCR) or a video camera. The effects of resolution, number of colours, screen size and frames per second should be discussed. Students should be aware of the basic hardware and software requirements for video capture.
3. Importing animated/video images into another application software package	Teachers should prepare animation or video clippings. Ways to import these clippings into the word processing package are illustrated. Students may be encouraged to incorporate one or more clipping(s) into their documents for presentation.

IT15 Employment and Health Issues of Computer Usage

Module Objective

After completing the module, students should be able to understand employment and health issues relating to the advancement of computer technology.

TOPICS	*EXPLANATORY NOTES*
1. Trend of employment caused by the widespread use of computers	Students should be aware that the wide range of applications of computers has brought about many career opportunities. Students should also be aware that information technology may displace human operation and lead to unemployment. Jobs associated with the computers such as computer operators, programmers and systems analysts should be discussed. Students may be asked to gather information on jobs in computing from the advertisements in newspapers and magazines. The trend of employment caused by the widespread use of the computers should be discussed. With the support of computers and on-line databases, it has become feasible for people to work at home. The pros and cons of this to the employer and the worker should be discussed. Students may be asked to produce a list of careers which the work can be carried out at home.
2. Health issues related to the use of computers	Students should be aware of the potential health hazard which may arise from frequent use of keyboard and VDU. These may include repetitive strain injury, eye strain and radiation effect. Teachers should introduce the ways to avoid the possible hazards to their health caused by prolonged use of computers, for example, taking regular breaks. Students should be encouraged to collect relevant information and materials from newspaper and magazines.

IT16 Manipulating Databases

Module Objective

After completing the module, students should be able to link up two database files for retrieving information from these databases.

TOPICS	*EXPLANATORY NOTES*
1. Linking two database files	Students should be able to link two different database files by using database program. Students should appreciate the need for linking files through examples such as linking student database file and student extra-curricula activity database file.
2. Generating labels and reports	Students should be able to generate labels and reports with different layouts.
3. Project with databases	Students should be encouraged to complete a project assignment by creating two database files and linking them together. Then, students may also be encouraged to generate useful labels and reports with information from the databases.

PL11 Flow Control

Module Objective

After completing the module, students should be able to write Logo procedures with relational and logical operators.

TOPICS	*EXPLANATORY NOTES*
1. Ideas of flow control	Relational operators (>, >=, <, <=, = and <>) and logical operators (AND, OR and NOT) should be introduced. Teachers may use daily examples to illustrate the use of flow control commands. For example, (a) In a school assessment system, if MARK<50 then output "FAIL, you should work hard." if NOT MARK>=50 then output " FAIL, you should work hard." if MARK<0 OR MARK>100 then output "The mark should be between 0 and 100." (b) In a cinema's booking office, if AGE<18 AND LEVEL=3 then output "Not allowed."
2. Uses of flow control	Students should be able to use logical operators in writing procedures. For example: TO DECIDE :A IF :A>5 [PR[NUMBER > 5][PR[NUMBER <= 5]]] END TO PICTURE PR [PRESS 1 TO DRAW A SQUARE.] IF RC="1 [SQUARE STOP] PR [YOU SHOULD PRESS 1.] END

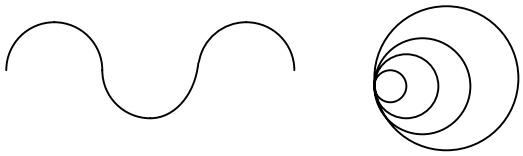
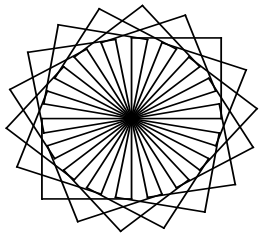
List of suggested Logo primitives for teaching this module:

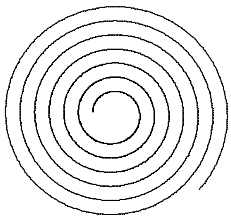
>, <, =, >=, <=, <>, NOT, AND, OR, RC, IF, STOP and REPEAT.

PL12 Circles, Drawing Arcs and Simple Tail Recursion

Module Objective

After completing the module, students should be able to use tail recursion programming techniques to draw circles, arcs and other interesting patterns.

TOPICS	*EXPLANATORY NOTES*
1. Circles and drawing arcs	Students should be able to draw circles and arcs of different radii by using Logo procedures. The following shapes and patterns may be constructed: 
2. Simple tail recursion	Students should use simple tail recursion to implement iteration, for example:  TO SPINSQ :SIZE :N IF :N>18 [STOP] REPEAT 4[FD :SIZE RT 90] RT 20 SPINSQ :SIZE :N+1 END The following shapes and patterns may be constructed:



PL13 Logo Projects

Module Objective

After completing the module, students should be able to apply their knowledge of Logo programming in the development of programming projects.

TOPICS	*EXPLANATORY NOTES*
1. Designing a programming project	A variety of projects may be assigned to students. Before the students actually start their projects, teachers should: (a) explain clearly the nature of the assignments, and (b) analyze the assignments using modular approach. When designing and writing their procedures, students should be encouraged to make full use of primitives which they have learned.
2. Project assignment	Students may be asked to complete an animation project, for example, simulation of a single-handed stopwatch. Students may also be asked to complete other projects. Some suggested topics are: (a) game, (b) pattern design, (c) picture drawing, (d) arithmetic quiz program, and (e) an easy computer assisted learning (CAL) program.

PA11 Flow Control Techniques

Module Objective

After completing the module, students should be able to write simple programs with flow control techniques.

TOPICS	*EXPLANATORY NOTES*
1. Ideas of flow control	Relational operators (>, >=, <, <=, = and <>) and logical operators (AND, OR and NOT) should be introduced. Teachers may use daily examples to illustrate the use of flow control commands. For example, (a) In a school assessment system, if MARK<50 then output "FAIL, you should work hard." if NOT MARK>=50 then output "FAIL, you should work hard." if MARK<0 OR MARK>100 then output "The mark should be between 0 and 100." (b) In a cinema's booking office, if AGE<18 AND LEVEL=3 then output "Not allowed."
2. Uses of flow control	Students should be encouraged to write simple programs with flow control statements. For example, (a) To decide the change of minute as seconds increment to 60 of a digital clock, (b) To decide the light signals of the traffic light system from one state to another, and (c) To decide the win situation of a STONE-PAPER-SCISSORS game.

PA12 Looping Techniques and Random Number Generator

Module Objective

After completing the module, students should be able to write simple programs with looping techniques and use random number generator in their programs.

TOPICS	*EXPLANATORY NOTES*
1. Looping technique	Teachers may use daily examples to illustrate the use of looping. Students should write simple programs with loops, for example (a) a program which prints a sentence 100 times repeatedly, (b) a program which accepts a positive integer number X and summing up values from 1 to X, and (c) a program which simulates a digital clock, etc.
2. Random numbers	Students should be able to print a set of integers using the random number generator to observe the randomness of the pattern. Students may be asked to write simple programs to: (a) simulate a dice, and (b) generate arithmetic quiz.

PA13 Simple Programming Projects

Module Objective

After completing the module, students should be able to apply their knowledge of programming in the development of programming projects.

TOPICS	*EXPLANATORY NOTES*
1. Designing a programming project	A variety of projects may be assigned to students. Before the students actually start their projects, teachers should: (a) explain clearly the nature of the assignments, and (b) analyze the assignments using modular approach. When designing and writing their program segments, students should be encouraged to make full use of commands which they have learned.
2. Project assignment	Students may be asked to complete an interactive project, for example, a quiz on simple arithmetic. Students may also be asked to complete other projects. Some suggested topics are: (a) game, (b) pattern design, and (c) an easy computer assisted learning (CAL) program.

7. MEMBERSHIP OF THE CDC COMPUTER STUDIES SUBJECT COMMITTEE (SECONDARY)

The membership since 1 September 1995 has been as follows:

Chairman	Mr YIP Chee-tim (until 31 Aug. 1997) Mr HO Lok-tin (from 1 Sep. 1997)
Vice Chairman	Senior Inspector (Curriculum Development/Computer Education)1, Curriculum Development Institute, Education Department (Mr LEUNG Shiu-keung, until 1 Feb. 1998) (Mr CHAN Hau-wing, from 2 Feb. 1998 to 14 May 1998) (Mr CHAN Hing-lam, from 15 May 1998)
Ex-officio Member	Senior Inspector (Computer Education), Advisory Inspectorate Division, Education Department (Mrs TANG Sabrina, until 31 Aug. 1996) (Mr SIN Tak-wah, from 1 Sep. 1996 to 31 Aug. 1997) Inspector (Computer Education)2 Advisory Inspectorate Division, Education Department (Mr NG Siu-kai, from 1 Sep. 1997)
Members	Dr CHANG Ming-yuen, Michael (from 1 Sep. 1997)
	Ms CHEUNG Fung-shan (from 1 Sep. 1997)
	Prof CHIN Yuk-lun, Francis
	Mr HO Lok-tin (until 31 Aug. 1997)
	Dr HUNG Sheung-lun (until 31 Aug. 1997)
	Mr KONG Siu-cheung (from 1 Sep. 1997)

	Mr KWAN Chi-wai, David (from 1 Sep. 1997)
	Mr LAU Kwok-kee (until 31 Aug. 1997)
	Mr LEUNG Ka-hung
	Mr LEUNG Min-wing, Raymond (until 31 Aug. 1997)
	Mr LEE Yee-wing, Bobby (from 8 Jul. 1998)
	Mr LI She-chai (until 31 Aug. 1997)
	Mr LUK Chung-fun (from 1 Sep. 1996 to 31 Aug. 1997)
	Dr MOON Yiu-sang (until 31 Aug. 1997)
	Mr NG Yat-ming (from 1 Sep. 1997)
	Mr SIT Yung-wah
	Mr TSANG Lai-keung (from 1 Sep. 1997)
	Mr TUNG Lai-sun (until 7 Jul. 1998)
Secretary	Curriculum Officer (Computer Education), Curriculum Development Institute, Education Department (Mr LUI Kam-ming)