



Singapore Examinations and Assessment Board



Cambridge Assessment
International Education

**Singapore–Cambridge General Certificate of Education
Normal (Technical) Level (2024)**

Computer Applications (Syllabus 7018)

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AIMS

Through the CPA curriculum, students learn a range of software application, how computer systems and networks work, and basic programming concepts. Students also gain awareness of the ethical, legal and security issues relating to the use of computers. Specifically, the aims of the syllabus are to:

- 1 acquire skills in using a variety of computer application software and hardware to accomplish tasks and communicate ideas;
- 2 appreciate the ethical, legal and security issues relating to the use of computers and ICT in society;
- 3 recognise the impact of ICT on society and people; and
- 4 develop basic computational thinking and problem-solving skills.

ASSESSMENT OBJECTIVES

The examination will assess candidates'

- AO1** Knowledge and understanding of computing concepts, application software and the impact of computer technology on everyday life
- AO2** Application of knowledge and understanding of computing concepts, computer application software, basic computational thinking and problem solving skills to
- analyse computational problems, and
 - communicate computational solutions
- AO3** Skills in using a range of application software to accomplish specific tasks

Students will demonstrate understanding of a range of computer applications and the responsible use of information. They will be able to use relevant application software to solve problems in everyday context, represent their problem solutions via data tables, flowcharts and programming statements as well as to demonstrate basic computational thinking through simple programming and debugging. They will be able to use typical office productivity application software for document processing, multimedia presentations, spreadsheet calculations and charts. Students will also be able to demonstrate their skills in user interface design, computer drawing, image, audio and video editing, as well as creating animations and games.

SCHEME OF ASSESSMENT

All candidates will offer Paper 1, Paper 2 and Paper 3 in the year of the examination.

All questions in all the three papers are compulsory.

Paper 1 (Written, 1 hour 15 minutes, 60 marks)

This paper will assess candidates' knowledge, understanding and application of concepts and skills in all the six modules:

- Computer Fundamentals (CPF)
- Media Elements (MEL)
- Document Processing (DOP)
- Spreadsheets (SST)
- Interactive Multimedia Communication (IMC)
- Animation and Game Making (AGM)

The paper contains two sections. Section A (20 marks) contains 20 multiple-choice questions with 4 choices per question. Section B (40 marks) contains a variable number of short-structured questions of variable mark values. There will be at least one question on representing programming instructions using flowcharts. This paper carries 30% of the subject grade and covers assessment objectives AO1 and AO2.

Paper 2 (Practical, 1 hour 30 minutes, 70 marks)

This paper will assess candidates' skills in carrying out related tasks covering three modules:

- Media Elements (MEL)
- Document Processing (DOP)
- Interactive Multimedia Communication (IMC)

The Practical Paper 2 examination will assess candidate's ability to carry out three tasks using appropriate application software: a computer graphics software to create a drawing, a word processing software to edit and format a given document and perform mail merge using a given source data, and a presentation software to create a multimedia slide presentation with given media elements. The allotted time includes time for saving the required work in the candidates' computers. This paper carries 35% of the subject grade and covers assessment objective AO3.

Paper 3 (Practical, 1 hour 30 minutes, 70 marks)

This paper will assess candidates' skills in carrying out a series of tasks covering three modules:

- Media Elements (MEL)
- Spreadsheets (SST)
- Animation and Game Making (AGM)

The Practical Paper 3 examination will assess candidate's ability to carry out three tasks using appropriate application software: a video editing software to create a video file, a spreadsheet software to edit a spreadsheet and create charts, and a programming software to create a game. The allotted time includes time for saving the required work in the candidates' computers. This paper carries 35% of the subject grade and covers assessment objective AO3.

Summary of details for each paper:

Paper	Mode	Duration	Weighting	Marks	Format	Modules Assessed
1	Written	1 h 15 min	30%	20	<u>Section A:</u> 20 MCQ	All the six modules
				40	<u>Section B:</u> Variable no. of Short-Structured Questions (SSQ)	All the six modules
2	Practical	1 h 30 min	35%	70	3 related tasks	MEL, DOP, IMC
3	Practical	1 h 30 min	35%	70	3 tasks	MEL, SST, AGM

Written Examination

The written paper (Paper 1) tests candidates' knowledge with understanding (~60%) and application (~40%) of concepts and skills learnt in all the six modules. Section A (20 marks) contains 20 multiple-choice questions with four options per question. Section B (40 marks) contains a variable number of short-structured questions of variable mark values.

Table of Specification for Paper 1:

Name of Module	Percentage of Paper	Marks		
		AO1	AO2	TOTAL
Section A (20 MCQ) – 20 marks				
Computer Fundamentals	~8%	~5	–	~5
Media Elements	~5%	~3	–	~3
Document Processing	~5%	~3	–	~3
Spreadsheets	~5%	~3	–	~3
Interactive Multimedia Communication	~5%	~3	–	~3
Animation and Game Making	~5%	~3	–	~3
Section B (Variable number of SSQ) – 40 marks				
Computer Fundamentals	~26%	~9	~7	~16
Media Elements	~5%	~2	~1	~3
Document Processing	~7%	~2	~2	~4
Spreadsheets	~7%	–	~4	~4
Interactive Multimedia Communication	~7%	~3	~1	~4
Animation and Game Making	~15%	–	~9	~9
TOTAL		~36	~24	60
		~60%	~40%	100%

Practical Examinations

The practical papers (Papers 2 and 3) test candidates' skills in using a range of application software to accomplish specific tasks. The maximum mark for each practical paper is 70 and each paper contributes 35% to the whole examination for Computer Applications.

Marking is based on the submitted softcopies. The format of the work submitted must be in the format specified in the questions. For Paper 2 Task 1 on Media Elements (Graphics), the graphic files submitted must be in the raster format. For Paper 3 Task 1 on Media Elements (Video), the video files submitted must be in the mp4 format.

Table of Specification for Paper 2:

Module	Description of Task	Weighting	Marks
Media Elements (Graphics)	Candidates will use computer graphics software to create a given drawing according to specifications given in the question paper; fill the drawing with colours; and submit the exported drawing. The drawing will be used for the 2nd or 3rd task.	~30%	~21
Document Processing	Candidates will use word processing software to format and edit a given document according to specifications given in the question paper. Candidates are expected to demonstrate skills like importing text and images; formatting page layout with columns, tables and/or text boxes; adding headers, footers and footnotes; and submit the required work.	~40%	~28
Interactive Multimedia Communication	Candidates will use presentation software to create a multimedia slide presentation with given media elements according to specifications described in the question paper and submit the required work.	~30%	~21
TOTAL		100%	70

Table of Specification for Paper 3:

Module	Description of Task	Weighting	Marks
Task 1			
Media Elements (Video)	Candidates will use video editing software to create a video file with given still images and videos with text, transitions and sounds according to specifications described in the question paper; and submit the exported video.	~20%	~14
Task 2			
Spreadsheets	Candidates will use spreadsheet software to work on a given data table by creating and completing columns in the data table and performing specified tasks like: <ul style="list-style-type: none"> • using operators, formulas and functions for calculations • plotting and labelling charts • data validation • conditional formatting • sorting and manipulating data; and submit the required work.	~40%	~28
Task 3			
Media Computing	Candidates will use programming software to work on a given game scenario to demonstrate skills in selecting suitable pictures for background pictures and characters, editing sound clips, creating scripts to animate characters, allowing user interaction through keyboard and/or mouse; and submit the required work.	~40%	~28
TOTAL		100%	70

SPECIFICATION GRID

	AO1	AO2	AO3	TOTAL
Paper 1	~18%	~12%		30%
Paper 2			35%	35%
Paper 3			35%	35%

USE OF A CALCULATOR

An approved calculator may be used in Paper 1, Paper 2 and Paper 3.

CENTRE INFRASTRUCTURE FOR PRACTICAL EXAMINATION

The Centre will ensure adequate hardware and software facilities to support the examination of its candidates for Paper 2 and Paper 3, which will be administered, in shifts where necessary, on the day of the examination for each of the papers. Each candidate should have the sole use of a personal computer during the examination. The hardware and software recommended by the Ministry of Education should be used for the examination. The candidates should be able to access software applications for computer graphics, word processing, presentation, spreadsheet, video editing, sound editing and programming. The Centre will be required to declare the name and version number of the software at least two years before the cohort using the software sits for the examination.

CONTENT OUTLINE

The syllabus consists of six modules: Computer Fundamentals, Media Elements, Document Processing, Spreadsheets, Interactive Multimedia Communication and Animation and Game Making. Each module is further divided into units of study. The mnemonics and descriptions of these six modules are as follows.

MODULE 1 – COMPUTER FUNDAMENTALS (CPF)

This module introduces students to the essential ideas of computer fundamentals through the study of computer systems, responsible use of computers, computer networks and communication and impact of ICT. Students will learn that a computer system is made up of both hardware and software to allow it to perform a wide range of useful tasks. Students will also learn that the development of computer networks, particularly the internet, has extended the usefulness of computer systems by allowing users to share resources, and to communicate and collaborate remotely. Students will learn that this advancement, however, has also opened up avenues for malicious activities to be carried out.

MODULE 2 – MEDIA ELEMENTS (MEL)

This module introduces students to create and edit different types of media elements through the study of vector graphics, raster graphics as well as audio and video elements. Students will learn that media elements are widely used in many applications to engage the target audience and communicate messages effectively. Students will also learn that common media elements include photographs, graphics, sounds and videos. They will learn that although there is dedicated software for specific types of media elements, many application software also come with built-in features that allow users to edit multiple types of media elements.

MODULE 3 – DOCUMENT PROCESSING (DOP)

This module introduces students to use the features of a word processing software to create effective documents for different purposes through the study of body text, page properties, graphics and textboxes as well as working with tables. Students will learn that documents such as letters, brochures, information sheets and reports are widely used to communicate messages and ideas. Students will also learn that to achieve this, documents need to present the information clearly and be visually appealing to catch the attention of readers. They will learn that this can be done through the appropriate use of page layout, tables, charts and graphics. They will also learn that at times, documents are addressed to specific persons or groups and thus need to be customised.

MODULE 4 – SPREADSHEETS (SST)

This module introduces students to use the features of a spreadsheet software to store, process, analyse and present data through the study of data display, data processing as well as data validation and analysis. Students will learn that spreadsheet software is widely used to tabulate and collate data. They will also learn that the data can then be organised, processed and analysed easily using features such as formulas, functions and charting tools.

MODULE 5 – INTERACTIVE MULTIMEDIA COMMUNICATION (IMC)

This module introduces students to use the features of a presentation software through the study of components and applications of interactive multimedia, storyboarding and creation of interactive slide presentations. Students will learn that presentation software is commonly used to create multimedia presentation slides. They will also learn that with the appropriate use of navigation features, the presentation slides can be made interactive and allow users to explore and navigate the content easily. They will learn that to achieve this, the sequence of slides and the user interface should be thoughtfully planned.

MODULE 6 – ANIMATION AND GAME MAKING (AGM)

This module introduces students to use a visual programming language to develop animations and games through the study of visual programming language, planning, programming and debugging as well as documentation. Students will learn that the development of animations and games is a highly creative activity. They will also learn that in visual programming languages, instructions to a computer are given using blocks of code instead of text. Through the planning and creation of animations and games, students will learn about algorithms and programming. Students will also learn how to break down a computational problem into simpler parts and come up with solutions for each part.

LEARNING OUTCOMES

The learning outcomes for each module are as follows:

Module 1 – Computer Fundamentals (CPF)

Units of study

- 1.1 Computer systems
- 1.2 Responsible use of computers
- 1.3 Computer networks and communication
- 1.4 Impact of ICT

1.1 Computer systems

Candidates should be able to:

- 1.1.1 Define computer hardware.
- 1.1.2 Name the key components of a computer system such as its processor, memory and secondary storage.
- 1.1.3 State the difference between volatile and non-volatile memory and give examples of each.
- 1.1.4 Compare computers in terms of system specifications such as processor speed, memory capacity and secondary storage capacity.
- 1.1.5 Distinguish between input, process and output operations.
- 1.1.6 Identify the input, process and output of a computer application.
- 1.1.7 Understand that meaningful information is output only after a computer has processed the correct input data.
- 1.1.8 Give examples of common input and output devices.
- 1.1.9 Define computer software.
- 1.1.10 Describe the functions of operating systems.
- 1.1.11 Give examples of common application software and describe their functions.
- 1.1.12 Distinguish between operating systems and application software.
- 1.1.13 Give examples of common features of graphical user interfaces such as windows, icons, menus and pointers.
- 1.1.14 State the benefits of file compression such as reducing file size and making transfer easier by combining multiple files into a single file.
- 1.1.15 Compare the sizes of data units such as bits, bytes, kilobytes, megabytes, gigabytes, terabytes and petabytes.
- 1.1.16 Distinguish between primary and secondary storage.
- 1.1.17 Give examples of secondary storage media.

1.2 Responsible use of computers

Candidates should be able to:

- 1.2.1 Give examples of simple troubleshooting techniques such as rebooting and ending processes.
- 1.2.2 Give examples of ways to properly handle and care for computer equipment.
- 1.2.3 Give examples of measures to prevent data loss such as making backups for possible recovery in case the originals are damaged.
- 1.2.4 Give examples of ways in which computer equipment can be damaged.
- 1.2.5 Show awareness of copyright issues.
- 1.2.6 Understand the dangers of the internet (including cyber-wellness).
- 1.2.7 Give examples of safety and security measures to follow when using the internet.
- 1.2.8 Give examples of types of malware.
- 1.2.9 Describe the effects of malware.
- 1.2.10 Give examples of measures to protect computers against malware.
- 1.2.11 Give examples of computer crimes.
- 1.2.12 Give examples of measures to prevent computer crimes.
- 1.2.13 Show awareness of data privacy.

1.3 Computer networks and communication

Candidates should be able to:

- 1.3.1 State and understand that computers in a network can facilitate communication and sharing of resources such as documents, hardware and software.
- 1.3.2 Give examples of common computer network devices (such as network interface cards, wireless access points, routers and modems) and state their purposes.
- 1.3.3 Differentiate between local area networks (LANs) and wide area networks (WANs) based on their geographical scope.
- 1.3.4 Understand the difference between intranets and the internet.
- 1.3.5 Understand the difference between wired and wireless communications.
- 1.3.6 Send and reply emails with one or more attachments.
- 1.3.7 Perform online searches efficiently using an internet search engine (including advanced search options such as searching for images by labelled usage rights).
- 1.3.8 State examples of how the internet can be used for communication.
- 1.3.9 State the advantages of using web pages as a form of communication.
- 1.3.10 Collaborate on shared resources through the internet.
- 1.3.11 Create custom web-based forms for data collection.

1.4 Impact of ICT

Candidates should be able to:

- 1.4.1 Describe situations where computers are used in society.
- 1.4.2 State how the use of computers has affected the way people live and work.

Module 2 – Media Elements (MEL)

Units of study

2.1 Vector graphics

2.2 Raster graphics

2.3 Audio and video

2.1 Vector graphics

Candidates should be able to:

- 2.1.1 Explain that vector graphics are created using nodes and paths.
- 2.1.2 State that vector graphics can be resized without loss of details.
- 2.1.3 Create drawings using objects such as lines, curves, text, ellipses, rectangles and polygons/stars.
- 2.1.4 Move, resize, rotate, skew and flip objects.
- 2.1.5 Duplicate/copy and delete objects.
- 2.1.6 State that objects are arranged in a front to back order and be able to rearrange the order of objects.
- 2.1.7 Group multiple objects into a single object and ungroup them again.
- 2.1.8 Recognise common fill styles such as solid, gradient and pattern fill.
- 2.1.9 Set the fill of objects using a specified colour and style.
- 2.1.10 Set the transparency of objects such that objects underneath them are visible.
- 2.1.11 Set the stroke of objects using a specified colour and thickness.
- 2.1.12 Put text to follow the outline of an object.
- 2.1.13 Export vector graphics as raster graphics.
- 2.1.14 Plan how complex shapes can be formed using simpler shapes.
- 2.1.15 Create complex objects by using union and/or difference on simpler objects.
- 2.1.16 Transform one path into another path over a specified number of steps (i.e. interpolate).
- 2.1.17 Modify objects by manipulating their nodes and node handles directly.

2.2 Raster graphics

Candidates should be able to:

- 2.2.1 State and recognise that raster graphics are composed of individually coloured pixels.
- 2.2.2 Give examples of different file formats for raster graphics and state if transparency is supported for each file format.
- 2.2.3 State that resizing raster graphics can result in a loss of quality.
- 2.2.4 Explain that the output resolution of raster graphics is measured in dots per inch (dpi) or pixels per inch (ppi) when printed on paper or displayed on a screen respectively.
- 2.2.5 Use built-in raster graphics editing functions in word processing/multimedia presentation software to enhance raster graphics.

2.3 Audio and video

Candidates should be able to:

- 2.3.1 Edit sound clips by performing trim, insert and volume control operations.
- 2.3.2 Understand that frames are individual images in videos.
- 2.3.3 Create a video file from still images and videos with text, transitions and sound.
- 2.3.4 State that videos with higher frame rates can take up more space but can also appear smoother than videos with lower frame rates.

Module 3 – Document Processing (DOP)

Units of study

- 3.1 Body text
- 3.2 Page properties
- 3.3 Graphics and text boxes
- 3.4 Working with tables

3.1 Body text

Candidates should be able to:

- 3.1.1 Recognise serif and sans-serif typefaces.
- 3.1.2 Use decorative text such as word art and drop caps to improve the appearance of a document.
- 3.1.3 Use the find and replace feature.
- 3.1.4 Differentiate between paragraphs that are left-aligned, centred, right-aligned and justified.
- 3.1.5 Set paragraphs to be left-aligned, centred, right-aligned or justified.
- 3.1.6 Set line spacing to a specified value.
- 3.1.7 Set the spacing before or after a paragraph to specified values.
- 3.1.8 Insert soft breaks to start new lines without starting new paragraphs.
- 3.1.9 Differentiate between paragraphs which have their left, right, first-line and/or hanging indents set.
- 3.1.10 Set the left, right, first-line and/or hanging indents of a paragraph to specified values.
- 3.1.11 Use pre-set tab stops to align different lines of text (left-align only).

3.2 Page properties

Candidates should be able to:

- 3.2.1 Recognise portrait and landscape orientations and give examples of what each orientation is used for.
- 3.2.2 Set the orientation of a page.
- 3.2.3 Set page margins to specified values.
- 3.2.4 Use text boxes and tables to lay out a document.
- 3.2.5 Give examples of scenarios where single-column or multiple-column layouts may be used.
- 3.2.6 Create single-column and/or multiple-column layouts using text boxes, tables and/or the built-in columns feature.
- 3.2.7 Insert page borders.
- 3.2.8 Describe the purpose of headers and footers.
- 3.2.9 Insert headers and footers.

- 3.2.10 Insert footnotes.
- 3.2.11 Insert page numbers and set the starting page number to a specified value.
- 3.2.12 Insert or remove page breaks.
- 3.2.13 Use section breaks to format a document, including allowing page layout in both portrait and landscape orientation.

3.3 Graphics and text boxes

Candidates should be able to:

- 3.3.1 Insert shapes such as lines, curves, ovals, rectangles, polygons and stars.
- 3.3.2 Move, resize, flip and rotate shapes.
- 3.3.3 Insert text into shapes.
- 3.3.4 Import vector or raster graphics into a document.
- 3.3.5 Move, resize, flip and rotate imported graphics.
- 3.3.6 Crop imported raster graphics and discard the cropped area.
- 3.3.7 Embed charts created using spreadsheet software.
- 3.3.8 Create picture or text watermarks.
- 3.3.9 Create text boxes and import text into them.
- 3.3.10 Link text boxes so that text flows from one to another in a specified order.
- 3.3.11 Modify the borders of a text box.
- 3.3.12 Set the wrapping style of a text box or graphic.

3.4 Working with tables

Candidates should be able to:

- 3.4.1 Insert or remove table rows and columns.
- 3.4.2 Format and shade table cells.
- 3.4.3 Merge table cells.
- 3.4.4 Modify table cell borders.
- 3.4.5 Set tables to be left-aligned, centred or right-aligned.
- 3.4.6 Align text and graphics in table cells vertically and horizontally.
- 3.4.7 State the advantage of using mail merge.

- 3.4.8 Use the mail merge feature with data from a table in a word document.
- 3.4.9 Use the mail merge feature with data from a table in a spreadsheet.
- 3.4.10 Filter the recipient list when using the mail merge feature by setting criteria¹ on specified fields.

¹Limited to 'greater than', 'less than', 'equal to' and 'not equal to'.

Module 4 – Spreadsheets (SST)

Units of study

4.1 Data display

4.2 Data processing

4.3 Data validation and analysis

4.1 Data display

Candidates should be able to:

- 4.1.1 Set cells to use either a number, currency or percentage format with a specified number of decimal places.
- 4.1.2 Set cells to use a specified date format.
- 4.1.3 Wrap and align text in cells vertically and horizontally.
- 4.1.4 Use conditional formatting to change the fill and/or font colour of cells based on their contents².
- 4.1.5 State the purpose of different chart types such as bar charts, column charts, pie charts and line charts.
- 4.1.6 Create bar charts, column charts, pie charts or line charts with data from either a continuous or non-continuous range of cells.
- 4.1.7 Recognise that modifying a chart's data table will cause a corresponding change to the chart.
- 4.1.8 State the purpose of combination charts.
- 4.1.9 Create combination charts³.
- 4.1.10 Set the print area of a spreadsheet to a specified range of cells.
- 4.1.11 Scale the width and/or height of a spreadsheet to fit a specified number of pages when printed.

4.2 Data processing

Candidates should be able to:

- 4.2.1 Use mathematical operators (+, –, * and /) in formulas.
- 4.2.2 State the advantages of using cell referencing in formulas for calculations.
- 4.2.3 Recognise that the value of cells which use formulas will be automatically recalculated when their referenced cells are changed.
- 4.2.4 Change the view of a spreadsheet to display formulas.
- 4.2.5 Differentiate between absolute and relative cell referencing.

² Limited to 'greater than', 'less than' and 'equal to'

³ Limited to the combination of a line chart and a column chart.

- 4.2.6 Use absolute and relative cell referencing.
- 4.2.7 Use functions to find the minimum, maximum, sum and average of values in a range of cells.
- 4.2.8 Use functions to find the mode⁴ and median of values in a range of cells.
- 4.2.9 Use a function to get a random integer between two specified integers (both inclusive).
- 4.2.10 Use functions to round positive values either by rounding to the nearest whole number, by always rounding up or by always rounding down.
- 4.2.11 Use functions to get either the current date or the current date and time.
- 4.2.12 Use functions to extract a range of characters from the left or middle of some specified text.
- 4.2.13 Use a function to find the number of characters in some specified text.
- 4.2.14 Use functions to count the number of cells in a range of cells that meet a specified criterion⁵.
- 4.2.15 Use conditional if functions in formulas.
- 4.2.16 Use relational operators (>, >=, <, <= and =) to compare values in formulas.
- 4.2.17 Use a function to look up data in a specified range of cells and return the value of another cell from the first row that matches the data exactly.
- 4.2.18 Sort cells in ascending or descending order based on the contents of a particular column.
- 4.2.19 Filter data by setting criteria⁶ on a column.

The list of 20 examinable functions are:

MIN, MAX, SUM, AVERAGE, MODE.SNGL, MEDIAN, RANDBETWEEN, ROUND, ROUNDUP, ROUNDDOWN, TODAY, NOW, LEFT, MID, LEN, COUNT, COUNTA, COUNTIF, IF and VLOOKUP

4.3 Data validation and analysis

Candidates should be able to:

- 4.3.1 Restrict input to a range of cells.
- 4.3.2 State why input data may need to be validated.
- 4.3.3 Set validation criteria for cells.
- 4.3.4 Display custom error messages when invalid input data is keyed in.
- 4.3.5 Determine the value needed in a cell for another cell to reach a specified target value.

⁴ Limited to data set with a single mode.

⁵ Criterion includes whether the cell has numeric values only, is non-empty or has a specified value only.

⁶ Limited to 'greater than', 'greater than or equal to', 'less than', 'less than or equal to', 'equal to' and 'not equal to'

Module 5 – Interactive Multimedia Communication (IMC)

Units of study

- 5.1 Components and applications of interactive multimedia
- 5.2 Storyboarding
- 5.3 Creation of interactive slide presentations

5.1 Components and applications of interactive multimedia

Candidates should be able to:

- 5.1.1 State that text, graphics, animation, sound and video are media elements.
- 5.1.2 State that multimedia content consists of multiple media elements.
- 5.1.3 Identify the different types of media elements used in some specified multimedia content.
- 5.1.4 State the advantages of using multimedia in communication.
- 5.1.5 Give examples of interactive use of multimedia.
- 5.1.6 State that slide presentations are an example of interactive multimedia communication.
- 5.1.7 Give examples of applications where interactive multimedia is used in daily life, such as a shopping mall directory.

5.2 Storyboarding

Candidates should be able to:

- 5.2.1 Create storyboards to show the flow of content and layout of media elements for a proposed interactive slide presentation.

5.3 Creation of interactive slide presentations

Candidates should be able to:

- 5.3.1 Adjust the relative dimensions of media elements and use white space appropriately.
- 5.3.2 Use appropriate fonts (including serif and sans-serif typefaces) and colours to enhance readability.
- 5.3.3 Use appropriate font styles and sizes to distinguish between headings and body text.
- 5.3.4 Use appropriate backgrounds for a slide presentation to enhance contrast with media elements.
- 5.3.5 Use the slide master feature to achieve a consistent style and layout.
- 5.3.6 Insert media elements into a slide presentation.
- 5.3.7 Insert navigation buttons for moving to the first, next, previous or last slide in a slide presentation.
- 5.3.8 Create text or graphic hyperlinks between slides in a slide presentation.
- 5.3.9 Create text or graphic hyperlinks to external resources.
- 5.3.10 Produce interactive slide presentations based on storyboards.

Module 6 – Animation and Game Making (AGM)

Units of study

- 6.1 Visual programming language
- 6.2 Planning
- 6.3 Programming and debugging
- 6.4 Documentation

6.1 Visual programming language

Candidates should be able to:

- 6.1.1 Recognise that visual programming languages use graphical symbols to develop programs.
- 6.1.2 State that visual programming can be used to create animations and games.

6.2 Planning

Candidates should be able to:

- 6.2.1 Describe the key ideas of a proposed animation or game.
- 6.2.2 Represent the sequence of events in a proposed animation or game using words and/or sketches.
- 6.2.3 Identify the backdrops needed for the stage based on a storyboard.
- 6.2.4 Identify the sprites needed for a storyboard.
- 6.2.5 Recognise the need to have different costumes for a sprite.

6.3 Programming and debugging

Candidates should be able to:

- 6.3.1 State that the area where the animation or game takes place is called the stage.
- 6.3.2 Recognise that points on the stage can be represented using their x and y coordinates.
- 6.3.3 State that scripts are instructions executed by an object⁷.
- 6.3.4 Recognise that multiple scripts can be executed at the same time.
- 6.3.5 Position sprites at a specified location and orientation.
- 6.3.6 Move and rotate sprites.
- 6.3.7 Start and stop the execution of scripts.
- 6.3.8 Insert wait time between the execution of two instructions.
- 6.3.9 Use basic loops (repeat, forever).

⁷ Object refers to either a sprite or the stage.

- 6.3.10 Change the brightness of the stage.
- 6.3.11 Insert additional backdrops to the stage by choosing from the library, importing from a file or drawing with the built-in editor.
- 6.3.12 Switch between the stage's backdrops.
- 6.3.13 Create and name sprites.
- 6.3.14 Change the brightness, transparency and size of sprites.
- 6.3.15 Insert additional costumes for a sprite by choosing from the library, importing from a file or drawing with the built-in editor.
- 6.3.16 Switch between a sprite's costumes.
- 6.3.17 Show and hide sprites
- 6.3.18 Display text as either a speech or thought bubble.
- 6.3.19 Play sounds for an object.
- 6.3.20 Display and hide the values of variables.
- 6.3.21 Prompt for and accept text input.
- 6.3.22 Send a message to trigger other objects to start executing scripts.
- 6.3.23 Set key presses and/or mouse clicks to trigger actions.
- 6.3.24 State that the purpose of variables is to store values.
- 6.3.25 Create and name variables.
- 6.3.26 Initialise and update the values of variables.
- 6.3.27 Use conditional instructions (if and if-else)⁸.
- 6.3.28 Use conditional loops (repeat-until)⁸.
- 6.3.29 Use relational operators (>, < and =) in conditional instructions and/or loops.
- 6.3.30 Use contact between sprites and/or coloured areas of objects in conditional instructions and/or loops.
- 6.3.31 Generate and use random numbers in scripts.
- 6.3.32 Use mathematical operators (+, -, * and /) in scripts.
- 6.3.33 Identify and correct errors in scripts written using a visual programming language.

⁸ Limited to the use of one condition per conditional instruction.

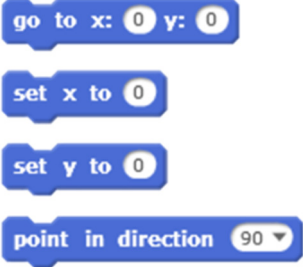

6.4 Documentation





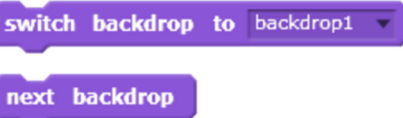
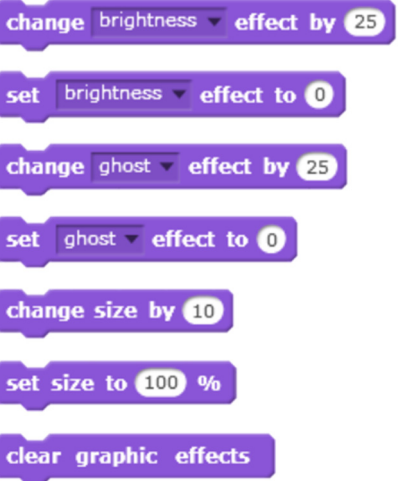
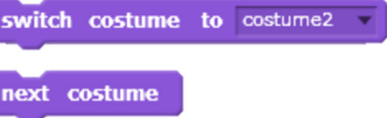
Candidates should be able to:



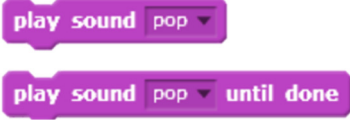

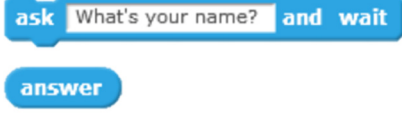

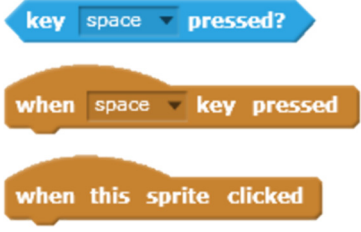

- 6.4.1 Identify common flowchart symbols.
- 6.4.2 Represent the instructions executed by an object using flowcharts.
- 6.4.3 Write game instructions on how a game is to be played.

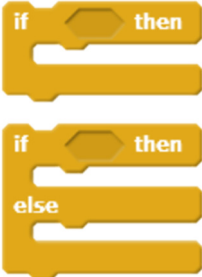
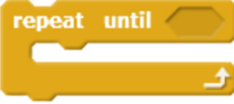

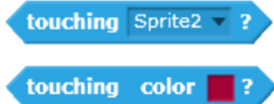


Please see [Table 4](#) for the list of examinable Scratch blocks.

Table 4: List of examinable Scratch blocks

Topic	Learning Outcomes	Blocks
[6.3] Programming and debugging	Students should be able to:	
<input type="checkbox"/> Motion	<p>[6.3.5] Position sprites at a specified location and orientation.</p>	
	<p>[6.3.6] Move and rotate sprites.</p>	

Topic	Learning Outcomes	Blocks
<input type="checkbox"/> Control	[6.3.7] Start and stop the execution of scripts.	 <p>(note: the stop block is not always required to stop execution of scripts)</p>
	[6.3.8] Insert wait time between the execution of two instructions.	
	[6.3.9] Use basic loops (repeat, forever).	
<input type="checkbox"/> Appearance	[6.3.10] Change the brightness of the stage.	
	[6.3.12] Switch between the stage's backdrops.	
	[6.3.14] Change the brightness, transparency and size of sprites.	
	[6.3.16] Switch between a sprite's costumes.	

Topic	Learning Outcomes	Blocks
<input type="checkbox"/> Input and Output	[6.3.17] Show and hide sprites.	
	[6.3.18] Display text as either a speech or thought bubble.	
	[6.3.19] Play sounds for an object.	
	[6.3.20] Display and hide the values of variables.	
	[6.3.21] Prompt for and accept text input.	
<input type="checkbox"/> Events	[6.3.22] Send a message to trigger other objects to start executing scripts.	
	[6.3.23] Set key presses and/or mouse clicks to trigger actions.	
<input type="checkbox"/> Variables	[6.3.26] Initialise and update the values of variables.	

Topic	Learning Outcomes	Blocks
<input type="checkbox"/> Conditions	[6.3.27] Use conditional instructions (if and if-else).	
	[6.3.28] Use conditional loops (repeat-until) ⁹ .	
	[6.3.29] Use relational operators (>, < and =) in conditional instructions and/or loops.	
	[6.3.30] Use contact between sprites and/or coloured areas of objects in conditional instructions and/or loops.	
<input type="checkbox"/> Operators	[6.3.31] Generate and use random numbers in scripts.	
	[6.3.32] Use mathematical operators (+, -, * and /) in scripts.	

⁹ Limited to the use of one condition per conditional instruction.