



Programme of Study – Year 10 Computer Science

	Theme	Overview of key learning to take place	How learning will be assessed
Term 1	<p>Chapters 1, 2, & 4.</p> <p>(Including digital safety)</p>	<p>Key Topic 1: Introduction to computer science. In this section students will be introduced to a range of computer science concepts including computer systems and how computers affect our everyday lives.</p> <ul style="list-style-type: none"> a) I can explain how computers are used in the modern world. b) I can explain how computing technology is ubiquitous. c) I can briefly identify the changes computers have had in the modern world in terms with communication, entertainment, education and others. <p>Key Topic 2: Binary & Hexadecimal systems. In this unit students will understand how the binary number system is used as well as how to convert numbers from base 2, 10 and 16. Students will also understand how to use the hexadecimal system.</p> <ul style="list-style-type: none"> a) I can explain what binary and hexadecimal is. b) I can convert from binary to denary and vice versa. c) I can use the hexadecimal system to convert numbers. d) I can understand the different measurements of memory. e) I can explain how the ASCII table/code is used. f) I can explain how data represents images and sound. <p>In this unit students will learn about how data is transmit using different methods of data transmission techniques. This unit also covers a range of different error checking methods.</p>	<p>Formative Assessment: There will be two main Formative Assessments per term. Grades are not given for these pieces of work as the focus is on supporting students to make improvements to future pieces of work.</p> <ul style="list-style-type: none"> • Checklist (to check for understanding. These will be conducted over a series of lessons usually between 6 to 9 lessons or after every two-to-three-week period. • Class discussions will take place almost every lesson at the start/mid and end of lessons. • Review sessions – These can usually take place after a short pop quiz or upon completion of a certain topic e.g. binary/hexadecimal. <p>Other formative assessment examples: Fill in the blanks. Exam style questions. MCQ's Model to be created (using chosen software) Produce a presentation about findings. Creating a poster Mind map Storyboard Quizziz/Socrative.</p> <p>Summative Assessments: These will take place at the end of each unit studied in the Term. There will be a minimum of 2 End of Unit Assessments per Term.</p>

	<p>Key Topic 3: Communication & internet technologies.</p> <ul style="list-style-type: none"> a) I can describe what data transmission is. b) I can explain the different types of data transmission using examples e.g. simplex, duplex & full duplex. c) I can explain what parity checking is. d) I can explain and calculate checksum values. e) I can describe what an IP and MAC address is. <p>Key Topic 4: Operating systems In this section student will be learning about the CPU and operating systems. They will learn about the importance of operating systems and be able to describe the fundamental features of an operating system.</p> <ul style="list-style-type: none"> a) I can describe what an operating system is and how it is used. b) I can explain how operating systems are used and what interrupts and buffers are. c) I can explain how computer architecture is used with a real-life example. d) I can explain how to fetch-decode and execute cycle works. 	<ul style="list-style-type: none"> • First summative assessment will take place on week 4. The written test will be 30 marks and last about 30-40 mins of the lesson. • Second summative assessment will take place on week 9/10. The written test will be 30 marks and last about 30-40 mins of the lesson. (online/F2F) • An average will be given of both summative assessment which will generate their Termly report. • Additional assessment – Short piece of homework(SPEA approval needed). A written assignment or presentation of chosen topic in case of term 1 based on data representation (binary, denary, hexadecimal & ASCII)
Term 2	<p>Key Topic 1: Recap of chapters 1 - 3 In this section students will recap the topics below in order to retrieve and access previously studied topics.</p> <ul style="list-style-type: none"> a) Data representation (Binary, hexadecimal). b) Communication technologies c) Operating systems and computer architecture. <p>Key Topic 2: Logic gates and circuits. In this section students will be learning about a range of different logic gates and their corresponding Boolean truth tables. Logic gates are based on Boolean logic and mathematics.</p> <ul style="list-style-type: none"> a) I can recognise the 6 logic gates(AND, OR, NOT, NAND, NOT, XOR). b) I can recognise the truth tables of all six logic gates. <p>Chapters 3, 5 , 7 & 8.</p>	<p>Formative Assessment: There will be two main Formative Assessments per term. Grades are not given for these pieces of work as the focus is on supporting students to make improvements to future pieces of work.</p> <ul style="list-style-type: none"> • Checklist (to check for understanding. These will be conducted over a series of lessons usually between 6 to 9 lessons or after every two-to-three-week period. • Class discussions will take place almost every lesson at the start/mid and end of lessons. • Review sessions – These can usually take place after a short pop quiz or upon completion of a certain topic e.g. logic gates & input output devices.

	<p>c) I can identify and create small logic circuits and link them with its corresponding truth tables.</p> <p>d) I can write a logic statement by looking at a logic circuit.</p> <p>e) I can draw and identify how a logic gate can be used in the real world.</p> <p>Useful website for logic gates to create a visual demonstration (here).</p> <p>Key Topic 3: Input and output devices</p> <p>a) I can define what an input device is.</p> <p>b) I can define what an output device is.</p> <p>c) I can give examples of an input and output device.</p> <p>d) I can describe how printers are used (inkjet, LaserJet).</p> <p>e) I can explain the different types of printers.</p> <p>f) I can identify and explain how readers are used (OMR, OCR).</p> <p>Key Topic 5: High level and low-level languages</p> <p>In this section students will be looking at different types of programming techniques and languages that are available, they will practically look at the development environment and understand key concepts of how programming can be used to develop simple programs.</p> <p>a) I can explain the difference between high- and low-level languages.</p> <p>b) I can explain the functions of an IDE and demonstrate how it is used.</p> <p>c) I can define what a compiler and interpreter is.</p> <p>d) I can explain what it means by syntax errors.</p>	<ul style="list-style-type: none"> (if core) <p>Other formative assessment examples:</p> <p>Fill in the blanks.</p> <p>Exam style questions.</p> <p>MCQ's</p> <p>Model to be created (using chosen software)</p> <p>Produce a presentation about findings.</p> <p>Creating a poster</p> <p>Mind map</p> <p>Storyboard</p> <p>Quizziz/Socrative</p> <p>Summative Assessments: These will take place at the end of each unit studied in the Term. There will be a minimum of 2 End of Unit Assessments per Term.</p> <ul style="list-style-type: none"> First summative assessment will take place on week 4. The written test will be 30 marks and last about 30-40 mins of the lesson. Second summative assessment will take place on week 9/10. The written test will be 30 marks and last about 30-40 mins of the lesson. (online/F2F) An average will be given of both summative assessment which will generate their Termly report. Additional assessment – Short piece of homework(SPEA approval needed). A written assignment or presentation of chosen topic in case of term 1 based on data representation (binary, denary, hexadecimal & ASCII)
Term 3	<p>Key Topic 1: Recap of chapters – 3,5,7 & 8</p> <p>In this section students will recap the topics below in order to retrieve and access previously studied topics. This will also allow students and teachers to address misconceptions and missed lesson content.</p> <p>a) Operating systems and computer architecture.</p>	<p>Formative Assessment:</p> <p>There will be two main Formative Assessments per term. Grades are not given for these pieces of work as the focus is on supporting students to make improvements to future pieces of work.</p> <ul style="list-style-type: none"> Checklist (to check for understanding.

- b) Input and output devices.
- c) Logic gates and circuits.
- d) Memory, data, and storage.
- e) Security and ethics.

Key Topic 2: Memory & data storage.

In this section students will evaluate a range of file types and formats and understand how compression works. Students will also be able to create links with previous learning for how memory works and the different types of storage that is available.

- a) I can describe the difference between lossy and lossless compression.
- b) I can estimate the size of an image and text file.
- c) I can identify different storage mediums.
- d) I can explain the difference between RAM & ROM.

Key Topic 3: Databases

In this section students will be understanding the importance of how a DBMS can be used in the real world. This includes how databases have changed the world of data collection and management. Students will develop their own simple DBMS.

[Example content \(click here\)](#)

- a. I can explain how databases are used using real world examples.
- b. I can identify the structure of a database (records, fields, data, rows, forms and queries).
- c. I can practically create a simple database and use the correct data types.
- d. I can use basic validation techniques on my database table.

Key Topic 2: High level and low-level languages (practically)

Python programming will be used (using the IDE). Students will create simple small programs to help develop their programming skills and gain a deeper understanding of programming concepts.

[Example content \(click here\)](#)

These will be conducted over a series of lessons usually between 6 to 9 lessons or after every two-to-three-week period.

- Class discussions will take place almost every lesson at the start/mid and end of lessons.
- Review sessions – These can usually take place after a short pop quiz or upon completion of a certain topic e.g. binary/hexadecimal.
- (if core)

Other formative assessment examples:

Fill in the blanks.

Exam style questions.

MCQ's

Model to be created (using chosen software)

Produce a presentation about findings

Creating a poster

Mind map

Storyboard

Quizziz/Socrative

Summative Assessments: These will take place at the end of each unit studied in the Term. There will be a minimum of 2 End of Unit Assessments per Term.

- First summative assessment will take place on week 4. The written test will be 30 marks and last about 30-40 mins of the lesson.
- Second summative assessment will take place on week 9/10. The written test will be 30 marks and last about 30-40 mins of the lesson. (online/F2F)
- An average will be given of both summative assessment which will generate their Termly report.

		<ul style="list-style-type: none"> a. I can use an IDE (python) and use its basic features. b. I can explain the difference between a high level and low-level language (scratch & python). c. I can define compilers, interpreters, assemblers & translators. d. I can explain what causes syntax errors and logical errors. 	<ul style="list-style-type: none"> • Additional assessment – Short piece of homework(SPEA approval needed). A written assignment or presentation of chosen topic in case of term 1 based on data representation (binary, denary, hexadecimal & ASCII)
Term 3	Revision and End of Year Assessments	<p>End of year assessment Students will complete 3 mini quizzes which will go towards their end of year assessment. These assessments will include all the topics that have been covered in term 1,2 and 3. Students will use GCSEpod to help with revision and accessing previously taught lessons. Example material (click link) Revision topic 1 – Input and output devices. Revision topic 2 – CPU & computer architecture. Revision topic 3 – Low- and high-level programming languages. Revision topic 4 – Pseudocode and flowcharts. Revision topic 5 – Database applications.</p>	<p>End of year assessment will be calculated using a percentage grade for all summative assessments that have taken place.</p>