Computer Science Curriculum Year 7 and Year 8

During Year 7 and Year 8 Students will study Computer Science throughout the year.

Computer Science Curriculum Overview Year 7

- Unit 1: E-safety
- Unit 2: Bletchley Park and Understanding Computers
- Unit 3: Computational Thinking and Algorithms
- Unit 5: Scratch
- Unit 6: Introduction to Python

Science Curriculum Overview Year 8

- Unit 1: Understanding Computers
- Unit 2: Cryptography
- Unit 3: Introduction to Python
- Unit 4: Networking
- Unit 5: Spreadsheets
- Unit 6: HTML

How can you help?

- ✓ Ensure your child puts their very best effort into their Homework.
- ✓ Encourage them to ask for help if they are stuck.
- ✓ Check your child's planner to see if they have any Homework.
- ✓ Make sure your child revises well for their tests and end of year exams.

Assessment

All topics are assessed and Students need to revise thoroughly before each test so that they have the best opportunity for maximising their chance of exceeding their target grades. Some experiments will also be assessed and the pupil graded according to the Assessment for Learning Focus which is being used. Students will know in advance if the experimental write up is being marked as just Homework or if it is being graded a level.

All Students will sit an end of year exam which will be used as their final progress indicator.

Year 7 Computer Science Curriculum TKAW
Autumn Term

Unit 1: E- safety

- Understands the importance of communicating safely and respectfully online, and theneed for keeping personal information private.
- Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact whenonline.
- Shows an awareness of, and can use a range of internet services e.g. VOIP.

-Recognises what is acceptable and unacceptable behaviour when usingtechnologies and online services.

- Demonstrates responsible use of technologies and online services, and knows a range of ways to report concerns.
- Uses technologies and online services securely, andknows how toidentify and report inappropriate conduct.

Unit 2: Bletchley Park and understanding Computers

-Understand that computers have no intelligence and that computers can do nothing unless a program is executed.

-Recognises that all software executed on digital devices is programmed.

- Recognises and can use a range of input andoutput devices.
- Knows that computers collect data from various input devices, including sensors and application software.

-Understands the difference between hardware and application software, and their roles within a computer system

- Understands the concepts behind the fetch-execute cycle.
- Knows that there is a range of operating systems and application software for the same hardware.
- Knows that processors have instruction sets and that theserelate to low-level instructions carried out by a computer.
- Knows that digital computers use binary to represent all data.

-Understandshow bit patterns represent numbers andimages.

-Knows that computers transfer data in binary.

-Understands the relationship between binary and filesize (uncompressed).

- Understands and can explain Moore's Law

Year 7 Computer Science Curriculum TKAW
Spring Term

Unit 3: computational thinking/ Algorithms

-Understand that computers have no intelligence and that computers can do nothing unless a program is executed.

- Designs solutions by decomposing a problem and creates a sub-solution for each of these parts.
- Can identify similarities and differences in situations and can use these to solve problems (pattern recognition).

-Recognises that some problems share the same characteristics and use the same algorithm to solve both.

- Understands the notion of performance for algorithms and appreciates that some algorithms have different performance characteristics for the same task.
- Recognises where information can be filtered out in generalizing problem solutions.

-Designs a solution to a problem that depends on solutions to smaller instances of the same problem (recursion).

-Understandsthat some problems cannot be solved computationally.

Year 7 Computer Science Curriculum TKAW
Summer Term

Unit 5: Scratch

-Executes, checks and changes programs.

-Understandsthat programs execute by following precise instructions

- Uses arithmetic operators, if statements, and loops, within programs.

-Uses logical reasoning to predict the behaviour of programs.

-Detects and corrects simple semantic errors i.e. debugging, in programs.

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-Uses logical reasoning to predict the behaviour of programs.

-Detects and corrects simple semantic errors i.e. debugging, in programs.

-Creates programs that implement algorithms to achieve given goals.

-Declares and assigns variables.

-Uses post-tested loop e.g. 'until', and a sequence of selection statements in programs, including an if, then and else statement.

Understands the difference between, and appropriately uses if and if, then and else statements.

-Uses a variable and relational operators withina loop to govern termination.

-Designs, writes and debugs modular programs using procedures.

- Understands that programming bridges the gap between algorithmic solutions and computers.

-Uses nested selection statements.

-Knows the difference between, and uses appropriately, proceduresand functions.

-Detects and corrects syntactical errors.

-Understandsand applies parameter passing.

-Understandsthe difference between, and uses, both pre-tested e.g. 'while', and post-tested e.g. 'until' loops.

-Applies a modular approach to error detection and correction.

-Understands the difference between 'While' loop and'For' loop, which uses a loop counter..

Unit 6: Introduction to Python

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-Declares and assigns variables.

-Understandsthe difference between, and appropriately uses if and if, then and else statements.

-Uses nested selection statements.

-Designs, writes and debugs modular programs using procedures.

Year 8 Computer Science Curriculum TKAW

Autumn Term

Unit 1: Understanding computers

-Understand that computers have no intelligence and that computers can do nothing unless a program is executed.

-Recognises that all software executed on digital devices is programmed.

- Recognises and can use a range of input and output devices.
- Knows that computers collect data from various input devices, including sensors and application software.

-Understands the difference between hardware and application software, and their roles within a computer system

- Understands the concepts behind the fetch-execute cycle.
- Knows that there is a range of operating systems and application software for the same hardware.
- Knows that processors have instruction sets and that these relate to low-level instructions carried out by a computer.

-Knows that digital computers use binary to represent all data.

-Understands how bit patterns represent numbers and images.

-Knows that computers transfer data in binary.

-Understands the relationship between binary and file size (uncompressed).

- Understands and can explain Moore's Law

Unit 2: Cryptography

-Recognises different types of data: text, number

-Uses technologies and online services securely, and knows how to identify and report inappropriate conduct.

-Recognises that persistence of data on the internet requires careful protection of online identity and privacy.

Year 8 Computer Science Curriculum TKAW
Spring Term

Unit 3: Introduction to Python (Python next steps for 7’s into 8’s)

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-Understands that programs execute by following precise instructions.

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-Uses nested selection statements.

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Unit 4: Networking

- Understands the difference between the internet and internet service e.g. World Wide Web.

-Understands data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching.

-Knows the names of hardware e.g. hubs, routers, switches, and the names of protocols e.g. SMTP, iMAP, POP, FTP, TCP/ IP, associated with networking computer systems.

-including how dynamic web pages use server-side scripting and that web servers process and store data entered by users.

-Understands the hardware associated with networking computer systems,including WANs and LANs, understands their purpose and how they work, including MAC addresses.

Year 8 Computer Science Curriculum TKAW Summer Term
Unit 5: Spreadsheets -Recognises different types of data: text, number -Recognises that data can be structured in tables to make it useful -Understands the difference between data and information -Knows why sorting data in a flat file can improve searching for information. -Uses filters or can perform single criteria searches for information. Analyses and evaluates data and information, and recognises that poor quality data leads to unreliable results, and inaccurate conclusions -Distinguishes between data used in a simple program (a variable) and the storage structure for that data -Knows the relationship between data representation and data quality **Unit 6: HTML** - Understands how to construct static web pages using HTML and CSS. -Uses a variety of software to manipulate and present digital content: data and information. -collects, organises and presents data and digital content in a variety of ways. - Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging. -Recognises the audience when designing and creating digital content. Evaluates the trustworthiness of digital content and considers the usability of visual design features when designing and creating digital artefacts for a known audience. -Effectively designs and creates digital artefacts for a wider or remote audience.