

Computing and ICT PoS: Year 9 HT1

Students will colour code as they work through the scheme of work.

<p>Students will learn about ... Students will learn the risks of phishing attacks and explore social, moral issues related to e-safety. They will also recap learning in programming: Variables, Integers, Loops, Strings (data type recognition), If, If, then, else.</p>		
Grade 1-3	Grade 4-6	Grade 7-9
<p>Information Technology:</p> <p>Use technology with increasing independence to purposefully organise digital content.</p> <p>Show an awareness for the quality of digital content collected.</p> <p>Use a variety of software to manipulate and present digital content: data and information.</p> <p>Share their experiences of technology in school and beyond the classroom.</p> <p>Talk about their work and make improvements to solutions based on feedback received.</p> <p>Programming and Development:</p> <p>Use arithmetic operators, if statements, and loops, within programs.</p> <p>Use logical reasoning to predict the behaviour of programs.</p> <p>Detect and correct simple semantic errors i.e. debugging, in programs.</p>	<p>Information Technology:</p> <p>Collect, organise and present data and information in digital content.</p> <p>Create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging.</p> <p>Make appropriate improvements to solutions based on feedback received, and be able to comment on the success of the solution.</p> <p>Programming and Development:</p> <p>Understand the difference between, and appropriately use if and if, then and else statements.</p> <p>Use a variable and relational operator within a loop to govern termination.</p> <p>Design, write and debug modular programs using procedures.</p> <p>Know that a procedure can be used to hide the detail with sub-solution.</p>	<p>Information Technology:</p> <p>Make judgements about digital content when evaluating and repurposing it for a given audience.</p> <p>Recognise the audience when designing and creating digital content.</p> <p>Understand the potential of IT for collaboration when computers are networked.</p> <p>Use criteria to evaluate the quality of solutions, be able to identify improvements making some refinements to the solution, and future solutions.</p> <p>Programming and Development:</p> <p>Use nested selection statements.</p> <p>Appreciate the need for, and write custom functions including use of parameters.</p> <p>Use and manipulate one dimensional data structures.</p> <p>Detect and correct errors.</p>
<p>Assessment</p> <p>Assessment will take the form of an end of unit test and a practical task.</p>		

Computing and ICT PoS: Year 9 HT2

Students will colour code as they work through the scheme of work.

<p>Students will learn about ... Students will investigate binary coding systems and the basics of encryption. They will develop an understanding encryption and decryption. Finally, they will explore the different types of software and hardware.</p>		
<p>Grade 1-3</p>	<p>Grade 4-6</p>	<p>Grade 7-9</p>
<p>Data and Data Representation:</p> <p>Understand the difference between data and information.</p> <p>Know why sorting data in a flat file can improve searching for information.</p> <p>Use filters or be able to perform single criteria searches for information.</p>	<p>Data and Data Representation:</p> <p>Understand how numbers, images, sounds and character sets use the same bit patterns.</p> <p>Perform simple operations using bit patterns e.g. binary addition.</p> <p>Understand the relationship between resolution and colour depth, including the effect on file size.</p> <p>Distinguish between data used in a simple program (a variable) and the storage structure for that data.</p>	<p>Data and Data Representation:</p> <p>Perform operations using bit patterns e.g. conversion between binary and hexadecimal, binary subtraction etc.</p> <p>Understand and be able to explain the need for data compression, and perform simple compression methods.</p> <p>Know what a relational database is, and understand the benefits of storing data in multiple tables.</p>
<p>Assessment</p> <p>Assessment will take the form of an end of unit test and a practical task.</p>		

Computing and ICT PoS: Year 9 HT3

Students will colour code as they work through the scheme of work.

Students will learn about ... Students will explore logic switches and gates, Semiconductors, Integrated circuits. Translators, The Von Neumann and Harvard architectures.		
Grade 1-3	Grade 4-6	Grade 7-9
<p>Data and Data Representation:</p> <p>Understand the difference between data and information.</p> <p>Know why sorting data in a flat file can improve searching for information.</p> <p>Use filters or be able to perform single criteria searches for information.</p> <p>Hardware and Processing:</p> <p>Know that computers collect data from various input devices, including sensors and application software.</p> <p>Understand the difference between hardware and application software, and their roles within a computer system.</p>	<p>Data and Data Representation:</p> <p>Know that digital computers use binary to represent all data. Understand how bit patterns represent numbers and images. Know that computers transfer data in binary.</p> <p>Understand the relationship between binary and file size (uncompressed). Define data types: real numbers and Boolean. Query data on one table using a typical query language.</p> <p>Hardware and Processing:</p> <p>Understand the von Neumann architecture in relation to the fetch-execute cycle, including how data is stored in memory.</p> <p>Understand the basic function and operation of location addressable memory.</p>	<p>Data and Data Representation:</p> <p>Know the relationship between data representation and data quality.</p> <p>Understand the relationship between binary and electrical circuits, including Boolean logic.</p> <p>Understand how and why values are data typed in many different languages when manipulated within programs.</p> <p>Hardware and Processing:</p> <p>Have practical experience of a small (hypothetical) low level programming language.</p> <p>Understand and be able to explain Moore's Law.</p> <p>Understand and be able to explain multitasking by computers.</p>
<p>Assessment</p> <p>Assessment will take the form of an end of unit test and a practical task.</p>		

Computing and ICT PoS: Year 9 HT4

Students will colour code as they work through the scheme of work.

<p>Students will learn about ... Students will investigate the Internet protocol suite and the application layer. Networks. Web forms and client-side scripting. Web servers and server-side scripting, web server databases.</p>		
Grade 1-3	Grade 4-6	Grade 7-9
<p>Data and Data Representation:</p> <p>Recognise that digital content can be represented in many forms.</p> <p>Distinguish between some of these forms and be able to explain the different ways that they communicate information.</p> <p>Communication and Networks:</p> <p>Understand the difference between the Internet and Internet services e.g. world wide web.</p> <p>Show an awareness of, and be able to use a range of Internet services e.g. VOIP.</p> <p>Recognise what is acceptable and unacceptable behaviour when using technologies and online services.</p>	<p>Data and Data Representation:</p> <p>As for Grade E</p> <p>Communication and Networks:</p> <p>Know 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.</p> <p>Use technologies and online services securely, and know how to identify and report inappropriate conduct.</p> <p>Understand how search engines rank search results.</p> <p>Understand how to construct static web pages using HTML and CSS.</p> <p>Understand data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching.</p>	<p>Data and Data Representation:</p> <p>Perform operations using bit patterns e.g. conversion between binary and hexadecimal, binary subtraction etc.</p> <p>Understand and be able to explain the need for data compression, and perform simple compression methods.</p> <p>Know what a relational database is, and understand the benefits of storing data in multiple tables.</p> <p>Communication and Networks:</p> <p>Understand the hardware associated with networking computer systems, including WANs and LANs, understand their purpose and how they work, including MAC addresses.</p> <p>Know the purpose of the hardware and protocols associated with networking computer systems.</p> <p>Understand the client-server model including how dynamic web pages' use server-side scripting and that web servers process and store data entered by users.</p> <p>Recognise that persistence of data on the internet requires careful protection of online identity and privacy.</p>
<p>Assessment</p> <p>Assessment will take the form of an end of unit test and a practical task.</p>		

Computing and ICT PoS: Year 9 HT5

Students will colour code as they work through the scheme of work.

<p>Students will learn about ... Students will the structure and implementation of different types of algorithms. They will explore BubbleSort, Implementing BubbleSort, SelectionSort, Implementing SelectionSort and compare sorting algorithms.</p>		
Grade 1-3	Grade 4-6	Grade 7-9
<p>Algorithms:</p> <p>Show an awareness of tasks best completed by humans or computers.</p> <p>Design solutions by decomposing a problem and create a sub-solution for each of these parts (decomposition).</p> <p>Recognise that different solutions exist for the same problem.</p> <p>Programming and Development:</p> <p>Recognise that digital content can be represented in many forms.</p> <p>Distinguish between some of these forms and be able to explain the different ways that they communicate information.</p>	<p>Algorithms:</p> <p>Understand that iteration is the repetition of a process such as a loop.</p> <p>Recognise that different algorithms exist for the same problem.</p> <p>Represent solutions using a structured notation.</p> <p>Be able to identify similarities and differences in situations and be able to use these to solve problems (pattern recognition).</p> <p>Programming and Development:</p> <p>Understand the difference between, and appropriately use if and if, then and else statements.</p> <p>Use a variable and relational operator within a loop to govern termination.</p> <p>Design, write and debug modular programs using procedures.</p> <p>Know that a procedure can be used to hide the detail with sub-solution.</p>	<p>Algorithms:</p> <p>Understand a recursive solution to a problem repeatedly applies the same solution to smaller instances of the problem.</p> <p>Recognise that some problems share the same characteristics and use the same algorithm to solve both (generalisation).</p> <p>Understand the notion of performance for algorithms and appreciate that some algorithms have different performance characteristics for the same task.</p> <p>Programming and Development:</p> <p>Use nested selection statements.</p> <p>Appreciate the need for, and write, custom functions including use of parameters.</p> <p>Know the difference between, and use appropriately, procedures and functions.</p> <p>Understand and use negation with operators.</p> <p>Use and manipulate one-dimensional data structures.</p>
<p>Assessment</p> <p>Assessment will take the form of an end of unit test and a practical task.</p>		

Computing and ICT PoS: Year 9 HT6

Students will colour code as they work through the scheme of work.

<p>Students will learn about ... Students will learn how to implement a linear search. Program a binary search. Compare a binary search to a linear search. Implement a binary search. Create a spell checker.</p>		
<p>Grade 1-3</p>	<p>Grade 4-6</p>	<p>Grade 7-9</p>
<p>Algorithms:</p> <p>Understand that iteration is the repetition of a process such as a loop.</p> <p>Recognise that different algorithms exist for the same problem.</p> <p>Represent solutions using a structured notation.</p> <p>Be able to identify similarities and differences in situations and be able to use these to solve problems (pattern recognition).</p> <p>Programming and Development:</p> <p>Recognise that digital content can be represented in many forms.</p> <p>Distinguish between some of these forms and be able to explain the different ways that they communicate information.</p>	<p>Algorithms:</p> <p>Understand a recursive solution to a problem repeatedly applies the same solution to smaller instances of the problem.</p> <p>Recognise that some problems share the same characteristics and use the same algorithm to solve both.</p> <p>Understand the notion of performance for algorithms and appreciate that some algorithms have different performance characteristics for the same task.</p> <p>Programming and Development:</p> <p>Understand the difference between, and appropriately use if and if, then and else statements.</p> <p>Use a variable and relational operator within a loop to govern termination.</p> <p>Design, write and debug modular programs using procedures.</p> <p>Know that a procedure can be used to hide the detail with sub-solution.</p>	<p>Algorithms:</p> <p>Recognise that the design of an algorithm is distinct from its expression in a programming language (which will depend on the programming constructs available).</p> <p>Evaluates the effectiveness of algorithms and models for similar problems.</p> <p>Recognise where information can be filtered out in generalizing problem solutions.</p> <p>Use logical reasoning to explain how an algorithm works.</p> <p>Represent algorithms using structured language.</p> <p>Programming and Development:</p> <p>Appreciate the effect of the scope of a variable e.g. a local variable can't be accessed from outside its function.</p> <p>Understand and apply parameter passing.</p> <p>Understand the difference between, and use, both pre-tested e.g. 'while', and post-tested e.g. 'until' loops.</p> <p>Apply a modular approach to error detection and correction.</p>
<p>Assessment</p> <p>Assessment will take the form of an end of unit test and a practical task.</p>		