

Curriculum Area: Year 10 Computing

2017/2018

Topics	Year Curriculum	How you can support learning at home, eg. books, websites, family learning through visits
<p>Computer Systems Architecture</p> <p>You should understand:</p> <ul style="list-style-type: none">• the purpose of the CPU• Von Neumann architecture• common CPU components and their function• the function of the CPU as fetch and execute instructions stored in memory• how common characteristics of CPUs affect their cores• Embedded systems <p>Memory</p> <p>You should understand:</p> <ul style="list-style-type: none">• the difference between RAM and ROM• the purpose of ROM in a computer system• the purpose of RAM in a computer system• the need for virtual memory• flash memory.	AP1	<p>Computer Science Website from BBC introduces the topics which we will be covering in Y7.</p> <p>Please encourage your students to understand the main elements.</p> <p>http://www.bbc.co.uk/education/subjects/z34k7ty</p>

<p>Storage</p> <p>You should understand:</p> <ul style="list-style-type: none"> • the need for secondary storage • data capacity and calculation of data capacity requirements • common types of storage: devices and storage media for a given application, and the advantages and disadvantages of these, using characteristics: 		
<p>Data representation</p> <p>You should understand:</p> <ul style="list-style-type: none"> • bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, petabyte • how data needs to be converted into a binary format to be processed by a computer. <p>Numbers</p> <p>You should understand:</p> <ul style="list-style-type: none"> • how to convert positive denary whole numbers (0–255) into 8 bit binary numbers and vice versa • how to add two 8 bit binary integers and explain overflow errors which may occur • binary shifts • how to convert positive denary whole numbers (0–255) into 2 digit hexadecimal numbers and vice versa • how to convert from binary to hexadecimal equivalents and vice versa • check digits <p>Characters</p> <p>You should understand:</p> <ul style="list-style-type: none"> • the use of binary codes to represent characters • the term ‘character-set’ 	AP2	<p>Computer Science Website from BBC introduces the topics which we will be covering in Y7.</p> <p>Please encourage your students to understand the main elements.</p> <p>http://www.bbc.co.uk/education/subjects/z34k7ty</p>

<ul style="list-style-type: none"> • the relationship between the number of bits per character in a character set and the number of characters which can be represented (for example ASCII, extended ASCII and Unicode) <p>Images</p> <p>You should understand:</p> <ul style="list-style-type: none"> • how an image is represented as a series of pixels represented in binary • metadata included in the file • the effect of colour depth and resolution on the size of an image file <p>Sound</p> <p>You should understand:</p> <ul style="list-style-type: none"> • how sound can be sampled and stored in digital form • how sampling intervals and other factors affect the size of a sound file and the quality of its playback <p>Compression</p> <p>You should understand:</p> <ul style="list-style-type: none"> • need for compression 		
<p>You should understand:</p> <ul style="list-style-type: none"> • the use of variables, constants, operators, inputs, outputs and assignments • the use of the three basic programming constructs used to control the flow of a program: • the use of basic string manipulation • the use of basic file handling operations: • the use of records to store data • the use of SQL to search for data 	AP3	<p>Computer Science Website from BBC introduces the topics which we will be covering in Y7.</p> <p>Please encourage your students to understand the main elements.</p> <p>http://www.bbc.co.uk/education/subjects/z34k7ty</p>

- the use of arrays (or equivalent) when solving problems, including both one and two dimensional arrays
- how to use sub programs (functions and procedures) to produce structured code
- the use of data types:
- the common arithmetic operators
- the common Boolean operators

Algorithms

You should understand:

- computational thinking
- standard searching algorithms
- standard sorting algorithms
- how to produce algorithms using
- interpret, correct or complete algorithms

Translators and facilities of languages

You should understand:

- characteristics and purpose of different levels of programming language, including low level languages
- the purpose of translators
- the characteristics of an assembler, a compiler and an interpreter
- common tools and facilities available in an integrated development environment (IDE)
- editors
- error diagnostics



<ul style="list-style-type: none"> • run-time environment • translators 		
<p>You should understand:</p> <ul style="list-style-type: none"> • types of networks: • LAN (Local Area Network) • WAN (Wide Area Network) • factors that affect the performance of networks • the different roles of computers in a client-server and a peer-to-peer network • the hardware needed to connect stand-alone computers into a Local Area <p>Network:</p> <ul style="list-style-type: none"> • routers/switches 	AP4	<p>Computer Science Website from BBC introduces the topics which we will be covering in Y7.</p> <p>Please encourage your students to understand the main elements.</p> <p>http://www.bbc.co.uk/education/subjects/z34k7ty</p>
<p>Network topologies, protocols and layers</p> <p>You should understand:</p> <ul style="list-style-type: none"> • star and mesh network topologies • Wifi • frequency and channels • Control Protocol/Internet Protocol • the concept of layers • packet switching 	AP5	<p>Computer Science Website from BBC introduces the topics which we will be covering in Y7.</p> <p>Please encourage your students to understand the main elements.</p> <p>http://www.bbc.co.uk/education/subjects/z34k7ty</p>
<p>System security</p> <p>You should understand:</p> <ul style="list-style-type: none"> • forms of attack 	AP6	<p>Computer Science Website from BBC introduces the topics which we will be covering in Y7.</p>

- threats posed to networks:
 - 'weak point' in secure systems (social engineering)
 - interception and theft
 - the concept of SQL injection
 - poor network policy

- identifying and preventing vulnerabilities:
 - penetration testing
 - network forensics
 - network policies
 - anti-malware software
 - firewalls
 - user access levels
 - passwords
 - encryption

Please encourage your students to understand the main elements.

<http://www.bbc.co.uk/education/subjects/z34k7ty>