

Knowledge Organiser

Computing Fundamentals

Computer System	A system in which you can input data, process data, output data and store data digitally
Input Device	A hardware device used to input data into a computer system for processing
Interface	The boundary between systems or between systems and humans
Keyboard	A device that uses labelled keys to enable data input into a computer.
Microphone	A device for capturing sound
Monitor	A device which displays images and text.
Mouse	A device that controls the movement of a pointer on the screen based on its own movement and allows the user to select an object by pressing a button.
Output Device	A piece of hardware that is used to output/display data which has been processed or has been stored onto the computer
Printer	A device which produces physical copies of output of a computer system.
Sensor	A device that can detect physical conditions such as temperature, weight, light etc.
Speaker	A device to output sound
Touch Screen	A touch sensitive surface that allows the user to select, control or move object by touching icons etc. using their fingers or a stylus.
User Interface -	The boundary between the computer and the user

Knowledge Organiser: Internal Components

Accumulator	A CPU register which stores data in current use by the CPU
ALU	Arithmetic Logic Unit. Performs arithmetic and logical operations in the CPU.
Bus	A part of the computer architecture that transfers data and signals between the components of a computer.
Cache Memory	Special high speed memory used by a computer
Control Unit	Works with the CPU to control the flow of data through the CPU.
Clock Chip	The electronic device in a computer which controls the timing of signals
Computer Architecture	The internal logical structure and organisation of a computer
Control Unit	Works with the CPU to control the flow of data through the CPU.
CPU	Central Processing Unit. Fetches, decodes and executes instructions.
Dual/ Quad Core	A CPU with multiple cores.
Fetch Execute Cycle	The process of fetching instructions from the cache, decoding them and then executing them in the CPU
Motherboard	The central PCB that holds the crucial components of the system
Operator Assembly	This is the part of the instruction that tells the CPU what to do.
Program Counter	A register in the CPU that keeps the address of the next instruction.
RAM - Random Access Memory.	Main memory of a computer that stores programs and data that are currently in use. You can read data from the RAM and write data to the RAM. It is volatile memory which means when the computer is switched off the RAM will lose all of its data.
ROM - Read Only Memory	Storage for data on a computer which cannot be overwritten. ROM data is always available and non-volatile.
Register -	Special fast access part of the CPU that stores data currently in use.
Virtual Memory	A section of the hard disk is used as if it was RAM to supplement the amount of main memory available to the computer when the main memory is insufficient.

Knowledge Organiser: Storage

Bit	Binary digit, 1 or 0
Nibble	4 bits – Half a byte
Byte	8 bits
Kilobyte	1024 bytes
Megabyte	1024 kilobytes
Gigabyte	1024 Megabytes
Terabyte	1024 gigabytes
Secondary Storage	Non-volatile storage used to store programs, files and data.
CD	Compact Disk. An optical device with a capacity of 700MB
DVD	Digital Versatile Disk. An optical storage device with a capacity of 4.7GB
Flash Memory	Solid-state memory used as low cost secondary storage in portable devices and as removable memory.
Magnetic Hard Disk	Secondary storage device using magnetised platters to store data and files.
Optical Disk	Secondary storage device using lasers to read and write to a reflective surface.
Solid state	Technology based on electronics with no moving parts, for example transistors and capacitors as used in memory chips
Address	Location in main memory used to store data or instructions
Bit Rate	The space available for each sample measured in kilobits per second.
Compression	The process of reducing the size of a file for download or storage purposes
File	Stored data on a suitable media

Knowledge Organiser: Networks

Client	Software or hardware which requests data from a server
Domain Name	A human readable name for a resource on a network. It is changed into an IP address by a DNS server
Hub	A device for connecting multiple network devices in one segment.
IP Address	A 32 Bit number that identifies a device on a TCP/IP network e.g. 194.66.82.11
Intranet	A private data resource using the same technology as the internet, such as browsers and protocols.
LAN	Local Area Network. Confined to one location.
Peer – to – Peer	A networks arrangement where all computers are equal.
Protocol	A set of rules or standards that control communication between devices
Switch	A device for connecting multiple network devices and multiple segments
TCP/IP	Transmission Control Protocol/Internet Protocol. A set of standards which control how data is sent across networks
WAN -	Wide Area Network. Covers larger geographical area
Web Server	A server that handles requests for a website

Knowledge Organiser: Programming

Algorithm	Set of precise instructions to solve a problem/achieve a goal
Array	A data structure containing multiple variables under a single name. Fixed length.
Assembler	Program which translates assembly code into machine code
Assembly Language	Low level programming language which uses mnemonics and labels to represent machine level code. One line of assembly code translates into one line of machine code
Assignment	Setting the value of a variable
Boolean	A value that can only be true or false
Command line	Where instructions can be given directly to the operating system
Comparison	Comparing two values and returning TRUE or FALSE.
Compiler	A program which translates a whole program into machine code before executing it.
Concatenation	Combining two strings into a single string
Constant	A label referring to a memory location containing a value which cannot be changed by a program.
Debugger	A tool provided by an IDE to identify syntax errors
Decision	A flow diagram symbol used to show a decision stage, usually a yes/no. The symbol used to represent a decision is a diamond
Declaration	Identifying a variable or constant or array to a program so that memory space can be allocated.
Decomposition	The process of breaking down a problem into more manageable parts.
Flowchart Diagram	A diagram which represents a algorithm, showing the structure and flow of data, solving a problem.
High Level Language	A Programming language which resembles natural language. One line of high level language is equal to many lines of machine code
Identifier	The name given to the variable
Initialisation	Giving a starting value to a variable e.g. guess = 0
Input (Flowchart Symbol)	The symbol used for an input is a parallelogram. This symbol should be used when data/information should be input into the algorithm
Integer	Any whole number.
Float	A number containing a decimal point.
Invalid	Data used to test a program that should be rejected.

Iteration	Instructions repeated until a condition is met.
Low Level Language	A programming language that is directed at controlling each machine operation
Machine Code	Instructions in binary used by the CPU
Object Code	The machine code produced by a compiler
Operator	A logical (Boolean), arithmetic or comparison (relational) operator used by the program
Output (Flowchart Symbol)	The symbol used for an output is a parallelogram. This symbol should be used when data/information should be output
Process	A flow chart symbol which defines any processing to be completed at that stage. The symbol used to represent a process is a rectangle
Program	A stored set of instructions for a computer to execute.
Programming Language	A way of writing instructions for a computer to execute.
Pseudo Code	A method for describing an algorithm using structured English. Not language specific
Selection	The pathway through a program selected using a condition to decide on whether an instruction is executed or not.
Sequence	A list of instructions to be carried out in order, one after the other.
Source Code	The program written by the user in a high level language prior to translating it to machine code
String	A string of alphanumeric characters
Start/Stop (Flowchart Symbol)	This symbol is used at the beginning and end of a flowchart to show where the flowchart starts and finishes. The symbol used for start/stop is a oval.
Syntax Error	An error in the source code which violates the grammar of the programming language
Translator	A program that converts source code into machine code
Trojan	Malicious software which is disguised as a useful program.
Verification	The process of checking that data entered is true or correct.

Knowledge Organiser: Representation of data

ASCII	American Standard Code for Information Interchange. 7-bit system to code the character set of a computer
Binary	A number system using only 2 digits, 0 and 1.
Character	Single alphabetic or numeric character
Character set	The characters available to a computer
Denary	A number system which uses base 10, or 10 digits
Erroneous	Data that would not normally be expected – for example, the wrong data type.
Extreme	Data which is at the extreme limit of valid or invalid to check boundary conditions
Hexadecimal	Base-16 number system
Logic Circuit	A circuit made by combining a sequence of logic gates.
Logic Error	The logical structure if the program produces unexpected results
Logic Gates	A circuit that produces an output based on the input. Examples: AND, OR, NOT
Metadata	Information about the image data that allows the computer to recreate the image from the binary data in the file. This must contain the height and width in pixels, and the colour depth.
Non Volatile	Data is retained even after the power is switched off.
Pixel	The smallest element of an image. Pixels are the dots that make the image on screen.
Resolution	The number of pixels per unit. E.g. ppi or dpi
Sample Rate	Number of times the sound is sampled in a second. Measured in Hertz.
Truth Table	A method for recording all the possible input combinations and their output.
Unicode	Up to 32-bit system for encoding characters
Valid	Data used in testing that represents normal data
Validation -	The process of checking that data as it is input to ensure that it is as expected.
Variable -	A memory location with a label, containing a value.
Volatile -	Data is lost when there is no power

Knowledge Organiser: Software

Application	Software designed to carry out a real world task
Custom Written software	Software specifically developed for a person or company.
Defragmenter	Tool provided by an operating system as part of a disk management suite. A utility program which brings file fragments together , collecting free space into one area of the disk.
Failover	Automatic switching to a backup computer system in the event of a failure.
Firewall	Software and/or hardware which limits access to and from a computer system.
GUI	Graphical User Interface. Provides interface with the Operating System.
HTML	Hypertext mark-up language. A text based system for defining web pages
Hyperlink	An item on a webpage that directs the user to another location when clicked.
Icon	A picture on screen that represents a file, program or action.
Instructions	A set of commands that a processor can recognise and act upon
IDE	Integrated Development Environment. Program providing a number of tools to assist development of programs.
Interpreter	A program which translates source code into machine code and executes it one line at a time.
Interrupt Signal	A signal to the operating system to stop what it is doing and perform a different task instead
Off the shelf software	Software that is aimed at many users and sold “as is”
OS - Operating system	Controls the hardware and acts as an interface between the user and the computer, and also between applications and the hardware.
PDF - Portable document format	A file standard that allows documents to be displayed accurately on any platform.
Software	The programs that run on a computer.
Spyware	Malicious software designed to detect what the user is doing and send this information back to the originator.
Utility Software	A small program designed to carry out a limited maintenance task
Virus Detection	The process of detecting possible malicious software and files in a computer system

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