

Year 8 – Computer Systems

Knowledge Organiser



Inside a computer Input (I) = puts data into a computer system.

Output (O) = feedback from a computer system (out)

Hardware:

<u>Internal</u>	<u>External</u>
Processor RAM (Random Access Memory) Fan ROM (Read Only Memory) Graphics Card Sound Card Hard drive	Monitor <u>(O)</u> Keyboard <u>(I)</u> Printer <u>(O)</u> Mouse <u>(I)</u> Speakers <u>(O)</u> Headphones <u>(O)</u> Scanner <u>(I)</u> Touch screen <u>(Both)</u> Microphone <u>(I)</u>

Software:

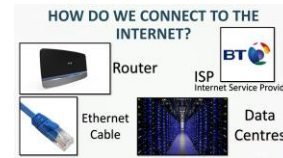
<u>Application Software</u>	program designed to carry out a specific task	Word PowerPoint
<u>Utility Software</u>	programs designed to perform specific tasks - cleaning up your hard drive, organizing files, protecting your computer from viruses.	
<u>Operating System Software</u>	allow for application software to communicate with the hardware	Windows iOS

Network

- A network is two or more linked or connected computer systems.
- It is there to exchange or share information, data and resources (printers, programs).

LAN – Local Area Network (over a small area/building).

WAN – Wide Area Network Internet is example of a WAN.



Simulation

VR



Faster processors

Artificial Intelligence

Nano Technology

Wearable Tech

Malware

- Malware stands for malicious code.
- Malicious code is created by cyber criminals/hackers to gain access to systems/data that can then be used for financial gains.
- Examples include; ransomware, viruses, Trojans, spyware
- To prevent malware - antivirus software, software updates, testing etc.

VIRUS

Form of self-replicating software and can cause damage by modifying computer programs and inserting code.

WORMS

Worms replicate themselves and spread through a network and use the system's resources. Can slow a network down.

SPYWARE

Software that monitors and gathers information on a person and how they use their computer. Includes keyloggers.

Social Engineering

Social engineering is a set of methods used by cybercriminals to deceive/manipulate people into handing over information.

- Shouldering (also known as shoulder surfing) - attack designed to steal a victim's password or other sensitive data by watching the victim/looking over their shoulder.
- Phishing attack - the victim receives an email disguised to look as if it has come from a reputable source to trick them into giving up valuable data.
- Blagging (also known as pretexting) - the cyber criminal invents a scenario in order to convince the victim to give them data or money.



IDE - Integrated Development Environment (the place where you write the code).

Statement - is a line of code that carries out a specific function within the program.

Sequence – this is the logical order in which the statements are carried out (executed) in Small Basic.

Selection - This is an important programming technique that is used when we want to ask questions in our code.

Condition – this is a statement or sum that is either true or false (password = “123” or age > 12 or year <=2020)

Iteration – this means a loop.

Input - is when data is entered into a computer system to be processed, manually or automatically. Devices = mouse, keyboard, microphone.

Output – is when some sort of feedback is being given out from the system. Devices = monitor, printer, speakers

Object - Items that can be controlled using instructions (Turtle, TextWindow)

Operation – these are the actions the object can perform.

Debugging

This means checking a program for errors and putting any errors right. **Syntax errors** could be incorrect spelling or not using the right brackets or punctuation. **Logical errors** are when a program does not do what you expect it to do and this could be commands in the wrong order.

Selection

This is when a question needs to be asked in a program or a condition needs to be checked.

```
variable → score = 9
            IF score < 10 THEN
condition →   OUTPUT "FAIL"
            ELSE
               OUTPUT "PASS"
```

If the result of the score is less than 10 (condition) then the word FAIL will appear because it means the condition is True. **Else** (otherwise) if the score is 10 or more then the word PASS will appear because the condition is False. Can add extra conditions by using **Elseif**.

Iteration

This means a sequence of instructions or code that is repeated. In other words, it is a programming term for a loop.

There are 2 types of iteration – **Count Controlled Loop (For Loop)** and **Condition Controlled Loop (While Loop)**

```
For i = 0 To 4
  TextWindow.Write("Loop")
  TextWindow.Pause()
  TextWindow.WriteLine(i)
EndFor
```

i is a variable that keeps count how many times the loop has repeated

Anything below the “For” command and indented will be repeated

Tells Small Basic the loop has ended and do any other statements below

For

While

```
TextWindow.WriteLine("What is the month?")
month = TextWindow.Read()
While month = "December"
  TextWindow.WriteLine("Happy Christmas")
  TextWindow.WriteLine("What is the month?")
  month = TextWindow.Read()
endwhile
```

This asks the user to type in the month and stores it in the variable called month.

Anything below the “While” command and indented will be repeated if the user keeps typing in December.

If any other month is typed in or December is spelt incorrectly the loop ends and the program continues.

Variables

A variable is a location in a computers memory that can be used to store one or more values. It can be used to store different types of data for example: strings(text) and integers(whole numbers). The value of a variable can change as the program executes(runs). To create a variable, you use a suitable name and then an equals sign.

```
1 TextWindow.WriteLine("Who is your favourite team?");
2 faveTeam = TextWindow.Read()
```

faveTeam is the **variable name** and it stores the answer the person types in to the question “Who is your favourite team?”.