

# Year 7

## Computing Science

### End of Term 3

## Revision Guide

Student Name: \_\_\_\_\_



**Hardware:** any physical component of a computer system.

**Input Device:** a device to send instructions to be processed by the computer

**Examples of Input Devices:**

- Keyboard
- Mouse
- Microphone
- Web cam
- Touch screen

**Output Device:** a device to show the result of computer processing

**Examples of Output Devices:**

- Monitor
- Printer
- Speakers

**Software:** a set of instructions to allow a user to interact with a computer system

**Email:** A way of sending messages electronically

**Advantages of Email:**

- Free
- Fast
- Send Attachments
- Send to lots of people

**Email Etiquette:** a polite way to send and respond to emails

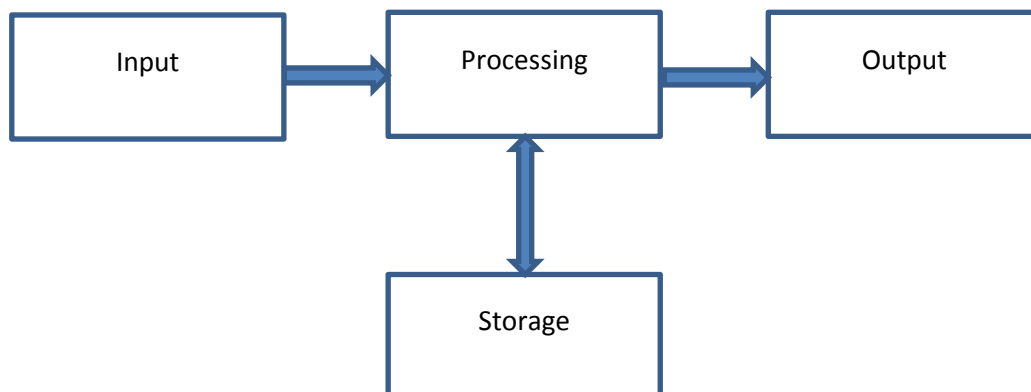
**Advantages** of using a computer? (2)

- Saves time
- Files can be stored
- Files can be reused
- Files can be shared
- Documents should look professional

**Components** of a Computer System

- All input devices
- All output devices
- CPU
- Hard drive (disk)
- Power supply
- RAM
- Motherboard
- Optical Disk Drive
- Video/Graphics Cards
- Sound Cards

**Computer System diagram:**



**Digital Footprint:** a record of what you do every time you go online

**General Purpose Computer System:** a computer system that can carry out many different tasks

**Embedded Computer System:** a computer system which has only one purpose

**Peripheral Device:** a device that can be connected to a computer system

**CPU:** Central Processing Unit

### **Types of Computer Memory**

- 1) Magnetic Storage: Hard Disk, Data Tape, Floppy Disks
- 2) Flash Storage: USB Device, SD Cards, Mini & Micro SD Cards, Solid State Storage
- 3) Optical Storage: CD, DVD

### **Video Conferencing (Communication via Video Link)**

Equipment Needed:

- Monitors
- Web Cameras
- Microphone
- Speakers
- Head sets

# BINARY/DENARY

**Binary:** a number system that uses 0's and 1's. It is also known as a Base2 number.

- **1 bit** = 1 binary number (1 or 0)
- **8 bits** = 1 byte (a standard binary number)
- **1024 bytes** = 1 Kilobyte (KB)
- **1024 Kilobytes** = 1 Megabyte (MB)
- **1024 Megabytes** = 1 Gigabyte (GB)
- **1024 Gigabytes** = 1 Terabyte (TB)

## Denary Number – Whole Number

There are 10 denary numbers that can be used in all numbers – 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

Denary is also known as a Base 10 number.

An 8 bit binary number will assign the following denary values to it.

<b>128</b>	<b>64</b>	<b>32</b>	<b>16</b>	<b>8</b>	<b>4</b>	<b>2</b>	<b>1</b>
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We can also **convert** denary numbers into binary.

For example:

56 > Binary

Step 1: Put the binary number into the table

<b>128</b>	<b>64</b>	<b>32</b>	<b>16</b>	<b>8</b>	<b>4</b>	<b>2</b>	<b>1</b>
<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

Add a “1” to the second row so you will be able to make up a binary number from it. Therefore to make up 56 we only need a “1” in the row under the 32, 16 and 8 column.

Answer=00111000

We can also **convert** binary numbers into denary.

For example:

10010010 > Denary

Step 1: Put the binary number into the table

<b>128</b>	<b>64</b>	<b>32</b>	<b>16</b>	<b>8</b>	<b>4</b>	<b>2</b>	<b>1</b>
<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>

Only add together the numbers that have a “1” in the second row of the table.

Answer=128+16+2

Final Answer=**146**

# BINARY ADDITION

There are four rules that you must know if you are to be successful at adding binary numbers.

**Rule 1:**  $0 + 0 = 0$

**Rule 2:**  $0 + 1 = 1$

**Rule 3:**  $1 + 1 = 10$  (Carry 1, drop 0)

**Rule 4:**  $1 + 1 + 1 = 11$  (Carry 1, drop 1)

Examples:

1011	10101101	11110011
0111	10001111	11111111
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<b>10010</b>	<b>101011100</b>	<b>111101100</b>

# CHARACTERS

When a character is input into a computer using a keyboard, the computer must convert the character into a binary number if the CPU is to process the character.

**ASCII Table** – Is a table that holds all the binary values that relate to each character on a keyboard.

For example:

## ASCII - Binary Character Table

Letter	ASCII Code	Binary	Letter	ASCII Code	Binary
a	097	01100001	A	065	01000001
b	098	01100010	B	066	01000010
c	099	01100011	C	067	01000011
d	100	01100100	D	068	01000100
e	101	01100101	E	069	01000101
f	102	01100110	F	070	01000110
g	103	01100111	G	071	01000111

### Sorting Letters

Eg: The letter “A” would come before “a”.

This is because the ASCII code is used when sorting. The letter “A” has an ASCII code of 065 and “a” has an ASCII code of 097. Therefore, the letter “A” would come before “a”.



# FLOWCHARTS

Process Symbol

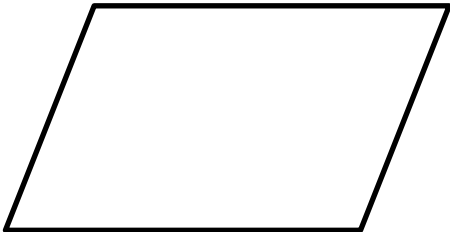
Eg: Delay 1 second



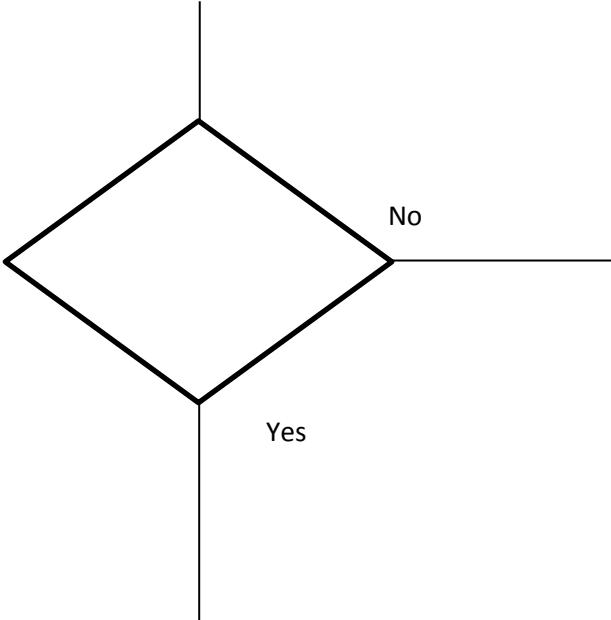
Start/Stop symbol



Output symbol



Decision symbol



# Problem Solving

When breaking a problem down the following process or model is useful in helping us to do so.



## Key Terms

**Algorithm:** the process of turning a problem into a set of broken down tasks.

**Stepwise Refinement:** Breaking a problem down into very small parts to describe the problem.

**A sequence of instructions:** These are instructions one after each other.

**Iteration:** when instructions can be repeated. (Also known as a loop)

There are 3 main **iteration** methods.

- 1) Infinite loops
- 2) Fixed number of loops
- 3) Condition controlled loops (until a condition is met)



**Selection:** checking to see if a condition has been met.

