Tiverton High School Year 8 **Computing** **Spring Term** Knowledge Organiser

Communication and Networks (Unit 8-5)

A **network** is a collection of computers (two or more) and other devices that are connected together.

These connections are usually **copper wire cables**, but they may also sometimes be **fibre-optic cables**, **wi-fi** radio links, or long distance **micro-wave** satellite links.

A **Local Area Network** usually **covers a single site or building in a small area**.

Computer devices can be connected together by plugging them into a **switch** using a copper **Ethernet cable**.

Many devices can communicate without wires, using **radio-waves** (**wi-fi**) if you add a **wi-fi access-point** to your network.
Wi-fi access points send and receive **packets** of data through the air using radio signals.

The **internet** is a way of **connecting networks together**.
"**Internet**" means "**inter-networking**" – **communication BETWEEN networks**.
The internet joins Local Area Networks and Wide Area Networks from many different countries.

Most people access the Internet using a **broadband adaptor/router**.
You can then send and receive data, connecting to other computers using either **telephone lines** or **fibre-optic cables**.
To communicate with computers on the Internet you connect to a server called an **Internet Service Provider** (**ISP**).

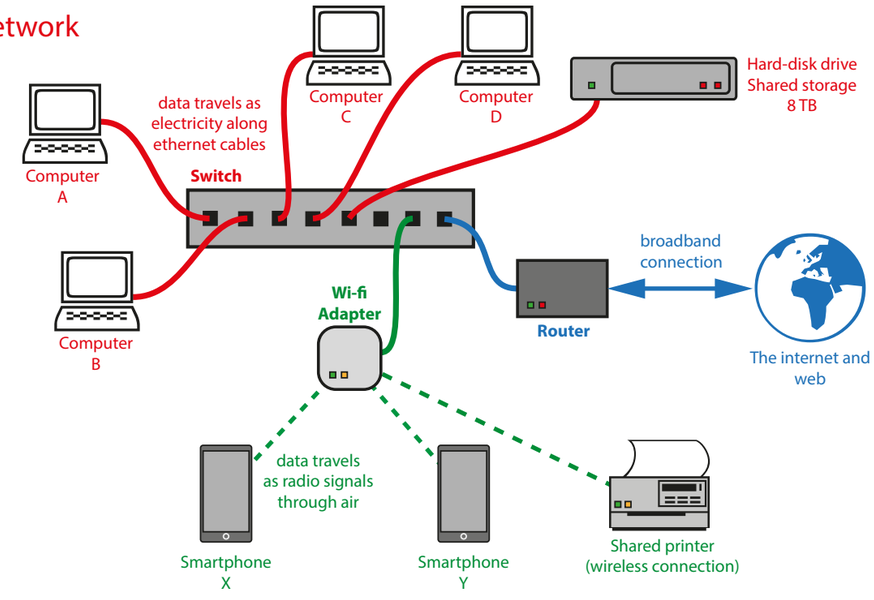
Files and data are split into small chunks of data called **packets**.
Packets can travel across the Internet using different **routes** to get to their destination.

Every device on a network has a special **IP address** (**Internet Protocol address**).
Every IP address needs to be **different**, so that devices don't get confused. It would be unclear where a packet needs to be sent.

An **IP address** is a **group of 4 numbers**, each number uses **8-bits** (between **0** and **255**).

Example: `168.0.192.1` Example: `192.70.12.65`

Local Area Network



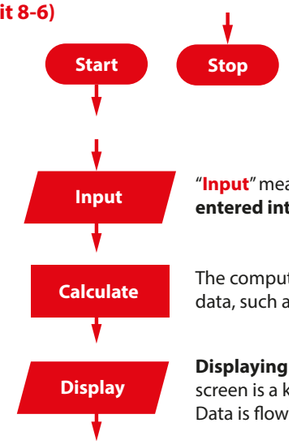
Problem Solving and Computational Thinking (Unit 8-6)

Decomposition means **breaking a problem down into smaller parts**, which are easier to solve.

Abstraction means **choosing only the most important details that are relevant to solving the problem**, while **ignoring** other details.

A **program** is a sequence of instructions that the computer will carry out (execute).
An **algorithm** is a precise set of written steps that describe exactly how to solve a problem.
A **flowchart** is a diagram that shows how an algorithm works.

Flowchart Symbols (Unit 8-6)



A flowchart always begins with a **"terminator"** shape to mark the **beginning** or **end** of the flowchart.

"**Input**" means **data is entered into the computer**.

The computer can **process** some data, such as use it in a **calculation**.

Displaying things on the screen is a kind of "**output**".
Data is flowing **out** of the computer.

A **decision** diamond often has different routes coming out of it, such as "**Yes**" and "**No**"

Writing Pseudo-Code (Unit 8-6)

You can **plan** out the steps of a new program using **pseudo-code**... "false" code. It is not a real **programming language**.

Input means gathering some data from the keyboard or other input device and storing it in a variable:

```
INPUT width
```

Output means displaying something on the screen:

```
PRINT "Your final score is"
PRINT score
```

A **sequence** is a group of program statements that are executed in the correct order, one after the other.

A **variable** is a **named value** that can **change** while your program is running e.g. **score**

Assignment means giving a value to a variable

```
x =  3                                  password = "arV$uSw"
```

Iteration means repeatedly executing parts of the program again and again (looping):

```
FOR time = 1 TO 10              WHILE time < 60
```

Selection means making a decision to select which part of the program code should be executed:

```
IF lives > 0 THEN
      PRINT "Lost a life"
ELSE
      PRINT "Game Over"
ENDIF
```

Arithmetic operators

`+`	**Addition**
`-`	**Subtraction**
`*`	**Multiplication**
`/`	**Division**

Relational Operator Symbols when making comparisons

`<`	**less than**	`>`	**greater than**
`<=`	**less than** or **equal to**	`>=`	**greater than** or **equal to**
`==`	**is the same as**	`!=`	**not** the same as