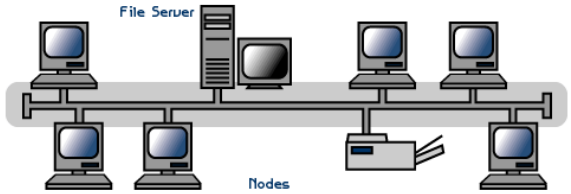
Year 8 – Autumn Term 1: Network Hardware

Key Vocabulary…

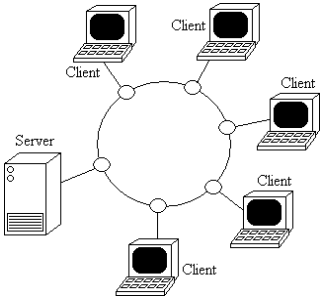
Term	Definition
Network	A collection of devices joined either by cable or wirelessly.
LAN- Local Area Network	Devices connected over a smalll geographical area such a school.
WAN – Wide Area Network	Devices connected over a wider geographical area such as the internet.
WPAN – Wireless Private Area network	Used to connect devices to your PC without wires. Bluetooth is a good example of this.
Server	Stores all user data in a network in a central location. This means that you can log on any computer in the network and get your files.
Switch	Connects the individual computers (workstations) with the server.
Router	Responsible for connecting different networks together. Routers will connect LANs to the internet.
Topology	How the network has been designed to be connected.
Network interface card	A piece of hardware in your device that lets you connect to the internet.
Ethernet	A cable that connect devices together on a LAN.
Data packet	Bits of data that are split up and sent along a network.
Malware	A piece of malicious software created to damage or gain illegal access to devices.

Picture This…

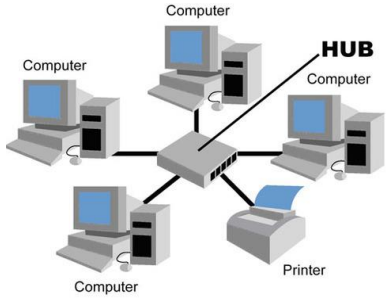
Three types of computer networks.



Bus Network - data packets are sent in both directions along a central cable.



Ring Network – data packets are sent in one direction around the circle.



Star Network - Each PC is connected to the server by a cable.

Network Attacks & Security

Networks can be attacked by the following:
Malware: Malicious software designed to harm your computer.
Virus – copies itself on your computer and can steal data and slow your computer down.
Trojan – a piece of software that pretends to be something else but has a virus in it. Usefully spread by email attachments and torrent sites.
Spyware – software that records your actions on the internet.

Network security:
The following can help to protect a network.
Anti-virus software – scans your computer and removes any viruses.
Firewall – prevents unathourised access to your network.
Encryption software – scrambles data so hackers can't read it.

Questions

1. Define the term network.
2. Name two pieces of hardware that make a network.
3. Explain what bandwidth is.
4. What is the name of the process that transfer data across the internet?
5. Name two threats to a network.
6. Name one way to remove malware.
7. Name three ways you can make a password stronger.

Deeper Learning…

The diagrams above are called network topologies. They show how the network is configured. This means it shows which devices are connected to other hardware such as routers and servers.
Depending on the type of place the network is being installed, will determine the way the network is configured. For example, in hospitals it is important that the network does not fail if one device fails, therefore ring topologies would not be appropriate.

Activity – Explain threats to a network and identify security measures that would help protect from malicious software.

Year 8 – Autumn Term 2: Data Representation

Key Vocabulary…

Term	Definition
Computational Thinking	Designing and planning out a solution in an organised way.
Abstraction	Removing all of the unnecessary information from a problem to make it easier to solve.
Decomposition	Breaking a difficult problem down into easy to manage steps.
Bit	A binary unit – 0 or 1.
Binary	A 2 digit number system used by computers which uses the digits 0 and 1.
Denary	A 10 digit number system used by humans which uses the digits 0,1,2,3,4,5,6,7,8,9.
Hexadecimal	A 16 digit number system used by humans which uses the digits 0,1,2,3,4,5,6,7,8,9 and the letters A, B, C, D, E, F Used to identify colours.
Overflow error	An error when the computer tries put a bigger number in a smaller number of bits.
Character	A single letter, number or a punctuation such as !, ? .
Character set	A group of characters such as ASCII, extended ASCII and Unicode.

Char	Binary	Hex	Denary
B	01000010	42	66
b	01100010	62	98
3	00110011	33	51

Picture This…

Converting Binary to Denary

128	64	32	16	8	4	2	1
0	1	0	1	0	1	1	0

1. Add the place value of the 1s.
   64+16+4+2 = 86

Converting Denary to Binary

164

1. Minus the placeholder from the 164.
2. *164 – 128 = 36 (place a 1 under 128 placeholder)*
3. *Is 36 bigger than 64?*
4. *If no , put 0 under 64.*
5. *36 – 32 = 4 (put a 1 under the 32 placeholder*
6. *Is 4 bigger than 16?*
7. *If no, put a 0 under the 16.*
8. *Repeat the steps until you get to the end of the placeholder list.*

128	64	32	16	8	4	2	1
1	0	1	0	0	1	0	0

Always Remember…

Computers can only store data as 0s or 1s.

When adding binary together, use the following rules:
0 + 0 = 0
0 + 1 = 1
1 + 0 = 1
1 + 1 = 10 **(Carry the 1)**
1 + 1 + 1 = 11 **(Carry the 1)**

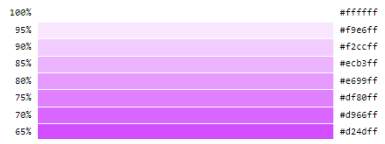
$$\begin{array}{r} 1\ 0\ 1\ 0 \\ +\ 1\ 1\ 1\ 0 \\ \hline 1\ 1\ 0\ 0\ 0 \\ \not{1}\ \not{1}\ \not{1} \end{array}$$

Questions

1. Define the term computational thinking.
2. Define the term decomposition.
3. Define the term abstraction.
4. Which numbers make up binary?
5. What binary number do you get when you add 1 and 1 together?
6. What binary number do you get when you add 1 and 1 together?
7. Name two threats to a network.
8. Name three ways you can make a password stronger.

Deeper Learning…

Hexadecimal numbers are used to store a wide range of colours and shades in the computer. These can used in web design which will be looking at in the next unit of work to change the colour of various parts of a website such as the background and the text.



Activity – Write a message in Ascii code. Remember you need to add spaces in.