
Knowledge Retrieval Booklet

GCSE Computer Science (9-1)

J277/01 – Computer Systems

Name:

Class:

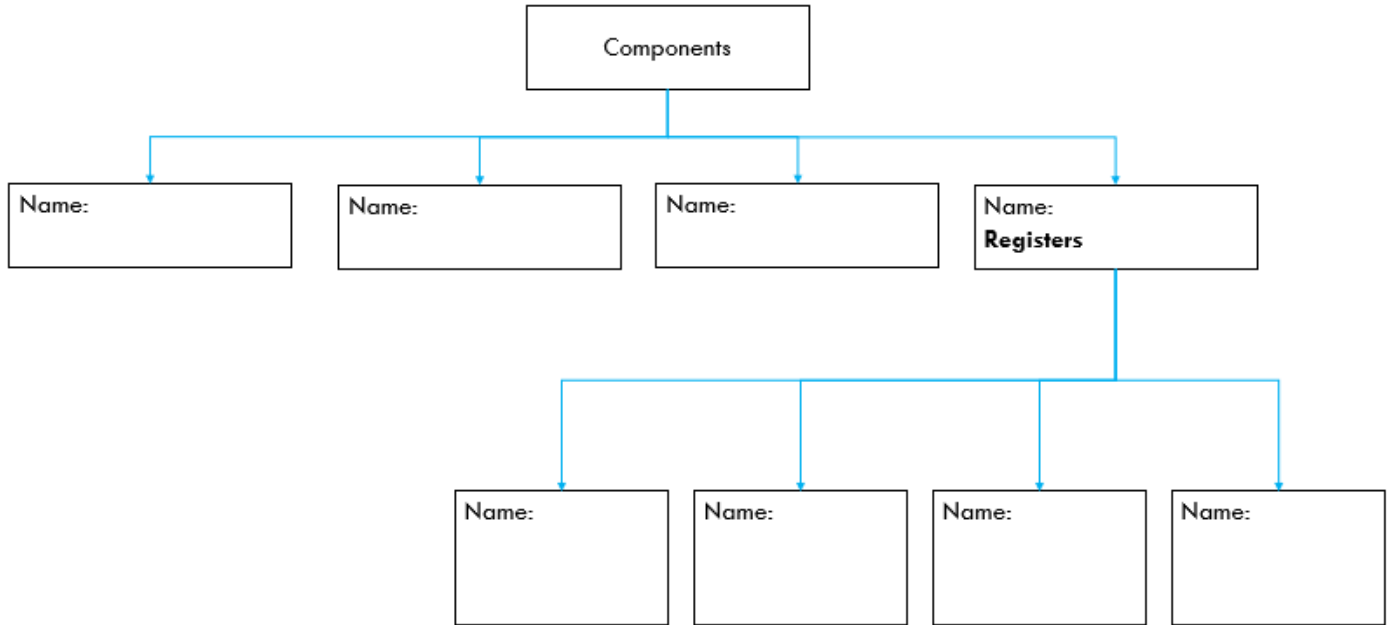
Date:

1.1. Systems Architecture

Lesson 1

Activity 1:

Complete the concept map below (1 point each)



Activity 2:

Identify the registers and components from the descriptions shown below. (1 point each)

Registers:			
_____	_____	_____	_____
Stores the address/location of the next instruction to be run	Stores the address/location where data will be read/written/accessed/fetched	Stores the data/instruction that is fetched/read from memory	Stores the results of the arithmetic calculations.

Components:		
_____	_____	_____
Decodes instructions and sends signals to other components.	Performs arithmetic calculations and logical decisions.	Stores frequently used instructions so they can be accessed later on.

Total points	
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1.1 Systems Architecture

Lesson 2

Activity 1:

Use the words below to complete each sentence. (1 point each)

Billion Cycle Efficient Frequently Simultaneously Second Split

Clock speed is the rate at which a processor can complete a processing _____. It is measured in Hz and will help to determine how many instructions are executed per _____. For example, a 3.4 GHz CPU will be able to process 3.4 billion cycles per second.

Cores are responsible for executing instructions. If a CPU has more than one core then it has the ability to _____ up tasks between the cores so they can be executed _____. For example, a dual-core CPU can split instructions between the two processors.

Cache is memory that has the ability to store _____ used instructions. The more it can hold means there is less need to go back to the main memory to fetch it. As a result, the entire fetch, decode, execute cycle is more _____.

Activity 2:

What do all these devices have in common? (1 point)



Answer: _____

Total points

1.1 Memory

Lesson 3

	Last lesson (1 point)
	Two lessons ago (2 points)

Activity 1:

What can you remember so far?

Name one CPU component	Name one CPU Register	Identify one factor that affects CPU performance.	Identify one factor that affects CPU performance.	Name one CPU Register
Identify one factor that affects CPU performance.	Name one CPU component	Name one CPU Register	Name one CPU Register	Name one CPU component

Activity 2:

Tick whether each statement relates to RAM or ROM. – 1 point each

	RAM	ROM
Stores data currently in use.		
Read-only data		
Expandable		
Stores data required to boot up the computer.		
Non-volatile memory		
Volatile memory		
Read and write data		

Bonus point:

What is used when the RAM gets full?

Total points	
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1.2 Storage (Part 1)

Lesson 4









Activity 1

Identify which **two** statements below are **incorrect**. (1 point each)

The accumulator stores the results of the arithmetic calculations	The cache stores frequently used instructions	RAM stores data required to boot up the computer.	Virtual Memory is used when the RAM is full.	The Control Unit stores the next instruction ready to be used.	ROM is non-volatile memory.
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Activity 2

Name the device and whether they're optical, magnetic or solid-state storage. (1 point for each device, 1 point for each correct classification)

			
Device:	Device:	Device:	Device:
Type:	Type:	Type:	Type:
			
Device:	Device:	Device:	Device:
Type:	Type:	Type:	Type:

Activity 3

Name the **six** storage characteristics. (1 point each)

Co	Ca	D	R	P	S
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Total points	
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1.2 Storage (Part 2)

Activity 1:

What can you remember so far?

	Last lesson (1 point)		Two lessons ago (2 points)		Three lessons ago (3 points)		Four lessons ago (4 points)
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One type of Primary Storage	What is used when the RAM is full?	Name ONE CPU component	Name ONE factor that affects CPU performance.
Name two CPU registers	Name one storage characteristic	One type of Magnetic Storage	Name one storage characteristic
One type of Solid-state Storage	One type of Primary Storage	One type of Optical Storage	Name one CPU component

Activity 2

Re-arrange these units of data in order – smallest to largest (1 point each)

Nibble	KB	PB	GB	Byte	Bit	TB	MB

Activity 3

Use the strips below to complete formulas (2 points for each correct and complete formula)

Colour depth

Sample rate

Number of characters

Bits per character

Height

Bit depth

Duration (seconds)

Width

Text file size =	
Sound file size =	
Image file size =	
Total points	

1.2 Storage (Part 3)

Lesson 6

Activity 1

Using this cipher. De-cipher to identify the keywords below (1 point each)

Plain Text	A	B	C	D	E	F	G	H	I	J	K	L	M	O	N	P	Q	R	S	T	U	V	W	X	Y	Z
Cipher text	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Z	Y	A	B	X

UHJLVWHUV	UDP	QSWLFDO	UQP	FDFKH	VWQUDJH

Activity 2

Complete the missing parts of the Hexadecimal table. (1 point each)

Denary	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hex	0	1	2	3	4	5	6	7								

Activity 3

Complete the following questions (1 point each -max 3 points per part)

Part A: Binary to Denary

Denary	32	86	143
Binary			

Part B: Denary to Binary

Binary	00010100	10001100	11011011
Denary			

Part C: Binary to Hex

Binary	00010100	10001100	11011011
Hex			

Part D: Hex to Binary

Hex	1F	7A	DD
Binary			

Part E: Denary to Hex

Denary	123	77	211
Hex			

Part F: Hex to Denary

Hex	2C	9B	EC
Denary			

Activity 4:

Complete these sentences (1 point each)

- a) A bit shift to the left will _____ the current value
- b) A bit shift to the right will _____ the current value
- c) A number that exceeds 255 will cause a _____

Total points	
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1.3 Storage (Part 4)

Lesson 7

Activity 1:

What can you remember so far?

1 lesson ago (1 Point)	2 lessons ago (2 Points)	3 lessons ago (3 points)	4 lessons ago (4 points)	5 lessons ago (5 points)	6 lessons ago (6 points)

Name two types of Primary Storage	What is used when the RAM is full?	Name three CPU components	Name three factors that affects CPU performance.
Name four CPU registers	Name six storage characteristics	Formula used to calculate size of a text file.	Formula used to calculate size of an image file.
Name three types of storage	Convert 01010110 in Denary	Formula used to calculate size of a sound file.	Convert 6F into an 8-bit binary number.

Activity 2

What's the question? (1 point each)

This character set only uses 7-bits	The character set range goes from 0-255	Stores most languages from around the world.

Activity 3

Match up the keywords with the definition (1 point each)

1. Pixel
2. Bitmap
3. Vector
4. Metadata
5. Resolution

A. An image that is made up of lines and curves.
B. The range of colours that a pixel can represent based on the number of bits stored per pixel.
C. Known as a picture element, represents a small square on a screen.
D. The number of pixels that can be stored per inch.
E. An image that is made up of series of pixels.

6. Colour depth

F. Information about the image itself.

Activity 4

Complete this sentence by re-arranging the anagrams. (1 point each)

OnegaUla sounds are created by causing vibrations in the air which create **downs suave**
These sounds can be made **gladiti** by recording **alpmess** into a **ribyan** format.

Total points

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1.2.5 Compression

Lesson 8

Activity 1

Guess the password from the clues provided. (2 points per correct password)

Clue 1	Clue 2	Password
Stores the results of arithmetic calculations	Number of hexadecimal values.	
ROM and ROM are what types of storage?	Denary number of 00010111	
CD is what type of storage?	Denary number of the hexadecimal number 7C.	



Activity 2:

Tick whether each statement relates to Lossy or Lossless Compression. (1 point each)

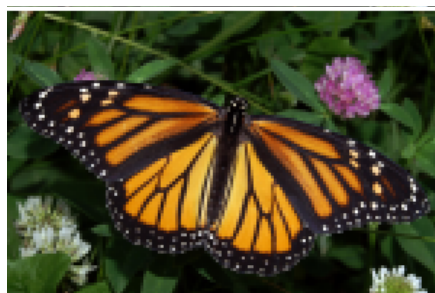
Statement	Lossy	Lossless
Because data is retained, it's reversible so changes can continue to be made.		
The overall quality of the graphic is retained.		
It reconstructs all the original data but this means data is lost during the compression process.		
Data is reconstructed and doesn't remove any data.		
Once data is removed, it's permanent and cannot be restored. It's irreversible.		
This can impact the overall quality of the graphic.		

Activity 3

Label which ones are Lossy and Lossless in the examples below. (1 point each)

 cafe wonderland teaparty	08/09/2020 12:38	JPG File	84 KB	<input type="text"/>
 cafe wonderland teaparty	10/05/2019 10:51	Adobe Photoshop...	2,449 KB	<input type="text"/>





1.3.1 Networks and topologies (Part 1)

Lesson 9

Activity 1:

What can you remember so far?

1-2 lessons ago. (1 point)	3-4 lessons ago (2 points)	5-6 lessons ago (3 points)	7-8 lessons ago (4 points)
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Name two types of primary storage	Name two types of compression	Name six storage characteristics	Name three character sets
Smallest unit of data	Name three CPU components	Name the type of digital graphic that is made up of pixels.	Name three types of secondary storage
Name three factors that impact CPU performance.	Convert EA into a denary number.	Name four CPU registers	How many nibbles in a byte?

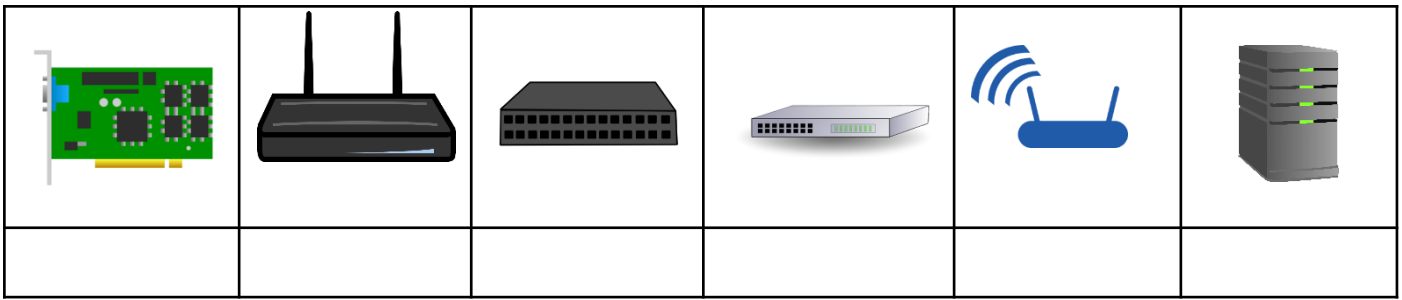
Activity 2

Identify the key terms from these descriptions below (1 point each)

_____	_____	_____	_____
A network that covers a small geographical area.	A network that covers a large geographical area.	A network where each device has equal responsibility.	A network in which a server acts as the centralised location in which resources can be shared.

Activity 3

Name these types of network hardware based on the images below. (1 point each)



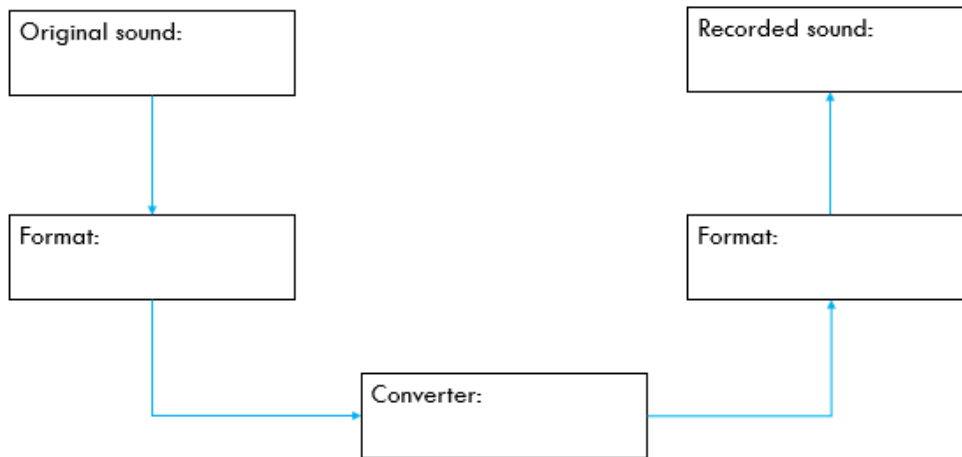
Total points	
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1.3.1. Networks and topologies (Part 1)

Lesson 10

Activity 1:

Complete the concept map below (1 point each)



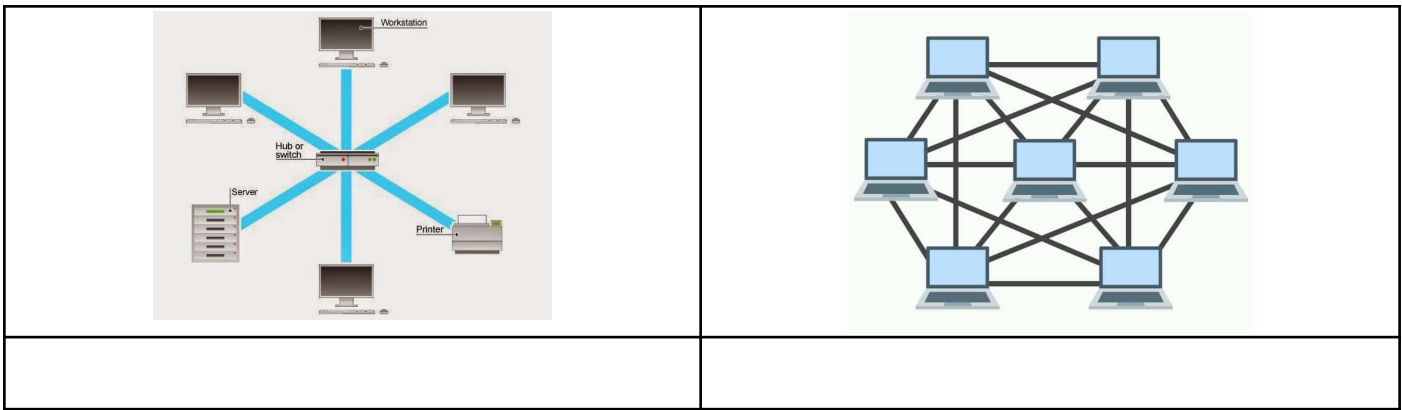
Activity 2

Re-arrange the stages processed by the DNS in order (1 = Start 6 = End) – 1 point each

A.	If the domain name doesn't exist, it will try a second server.	
B.	User enters the domain name into the web browser.	
C.	Client contacts the host using the IP address.	
D.	The server returns the IP address to client.	
E.	Client contacts DNS to find domain name.	
F.	The second server finds the domain name and returns to first server.	

Activity 3

Name the two network topologies shown below (1 point each)



Total points	
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1.3.2 Wired and wireless networks, protocols and layers (Part 1)

Lesson 11

Activity 1:

What can you remember so far?

Last week (1 point)	2-4 weeks ago (2 points)	5-8 weeks ago (3 points)	9-10 weeks ago (4 points)
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Name two network topologies	Which CPU component decodes the instruction?	Which type of storage is non-volatile and stores files for later use?	Name two types of network hardware.
Which type of compression permanently removes data?	Name two examples of solid-state storage	Name the system that uses a URL address to locate the IP address of the website.	Name six storage characteristics
Convert 144 into a hexadecimal number	What type of network covers a small geographical area?	Which type of storage is used to store the instructions required to boot up the computer?	Which CPU register stores the next instruction ready to be used?

Activity 2

Using the code below, decipher to identify these three types of connection. (1 point each)

A	B	C	D	E	F	G	H	I	J	K	L	M	O	N	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

2	9	6	9				
3							
5	20	8	5	18	15	5	20

2	12	21	5	20	14	14	20	8

Activity 3

Name these two types of addresses shown below (1 point each)

172.16.254.1	E4-BC-E9-8D-45-7A

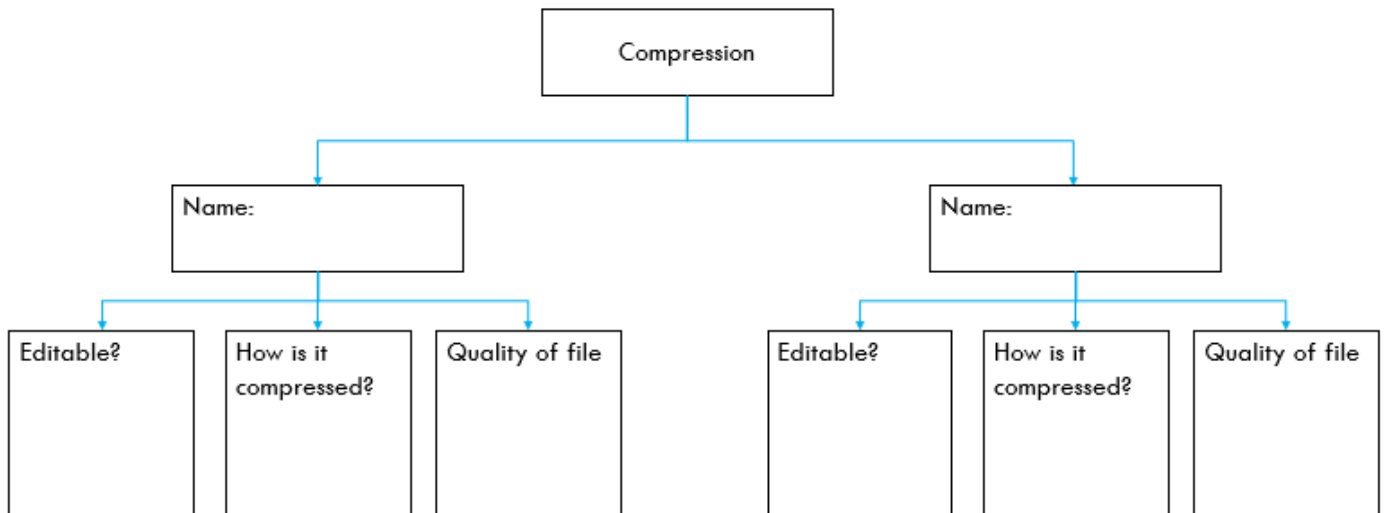
Total points	
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1.3.3 Wired and wireless networks, protocols and layers (Part 2)

Lesson 12

Activity 1:

Complete the concept map shown below (1 point each)



Activity 2

Find the network protocol acronyms in the word search below and identify what they stand for. (1 point each)

<h2>Network Protocols</h2> <p>J C Z F U J I X Y A I B G O E G P W R F H N B H T T P S P W G H V S O H O S O K</p>	<p>List your answers below:</p> <ul style="list-style-type: none">• IP – Internet Protocol
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Total points	
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1.4.1 Threats to computer systems and networks

Lesson 13

Activity 1

How much can you remember?

Name one type of connection (1 point)	List two network topologies (1 point each)	List three character sets (1 point each)	List the four CPU registers (1 point each)	List five types of network hardware (1 point each)	List the six storage characteristics (1 point each)	List the seven network protocols (1 point each)	List the eight units of data from smallest to largest (1 point each)
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Activity 2

Identify the different types of Malware by re-arranging the anagrams shown below (1 point each)

Mr Ow	Jar Not	Irvus
Name Arrows	Wad Ear	Raw Yeps
Grey Elk Go	Tob	Kit Or To

Activity 3

Use the statements below to identify additional threats to a network (1 point each)

Statement	Brute force attack	Denial of service attack	Packet sniffers	SQL Injection	Social engineering
I like to use tracing software to intercept data as it passes along the network.					
I like to use automated software to generate as many password combinations as possible. I will then use this trial and error method to gain unauthorised access to an account.					
I like to use bots to spread useless requests to multiple devices on a network, to a point where the server becomes unresponsive.					
I like to use special commands to test the robustness of a websites validation, in the hope that I can gain access to their database.					
I don't use to use code to gain access to sensitive data. I target people as they can be 'the weak point'.					

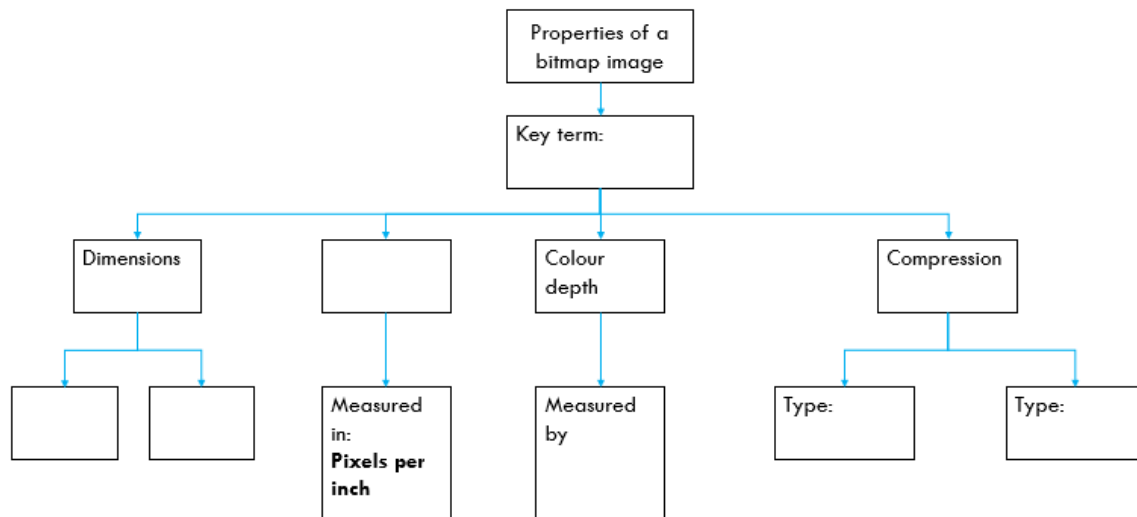
Total points	
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1.4.2 Identifying and preventing vulnerabilities

Lesson 14

Activity 1

Complete the concept map shown below. (1 point each)



Activity 2

Identify the method used to identify and/or prevent vulnerabilities based on the descriptions below. (1 point each)

Used to monitor what is coming in and out of a network and notify the user of an unknown source.

.....

Responsible for monitoring network activity (e.g. who has logged on, when etc.)

.....

Manage the permissions to make sure all users do not have access to every file.

.....

An ethical hacker will intentionally try and hack into a website to see how secure it is.

.....

An algorithm designed to scramble words into a form that makes them unreadable to others.

.....

A written document that can be outline what users can and cannot do on the school network.

.....

Activity 3

Rank the passwords below in order of strength (1 = weakest 5 = strongest) - 1 point for correct order

12345	
jessica	
Je.SSica1987	
jessT87	
Jess87	

Total points	
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1.5.1 Operating systems

Lesson 15

Activity 1

How much can you remember?

Last week (1 point)	2 weeks ago (2 points)	3 weeks ago (3 points)	4 or more weeks ago (4 points)
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Name two methods used to identify and prevent network vulnerabilities.	Name three social engineering techniques	Name three types of malware
Name two threats to the security of a network.	Name the seven network protocols.	Formula used to calculate the size of a sound file.

Identify three factor that affects CPU performance.	Name two network topologies.	Name three CPU components
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Activity 2

Read the OS functions below together with their meaning. Circle the ones that are incorrect and write the corrected version underneath. (1 point each)

User interface	User management	Folder management	Peripheral device management	Memory management
It will manage data by allocating memory to applications currently in use. As a result, this allows multitasking to take place.	To allow administrator to manage users access to a variety of resources such as devices, settings, applications etc.	The purpose is to create a logical structure in which files can be stored to make it easier for the user to locate.	Designed to provide a platform that will allow the user to interact with the computer.	It allows the operating system to control how hardware functions and they do this by using device drivers.

Activity 3:

Match the images with the correct interface. (1 point each)

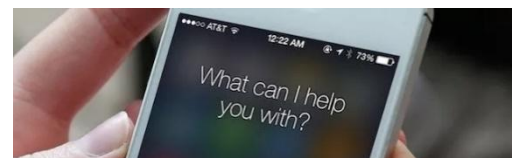
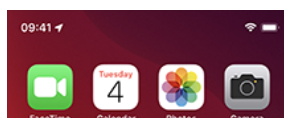
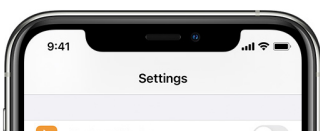
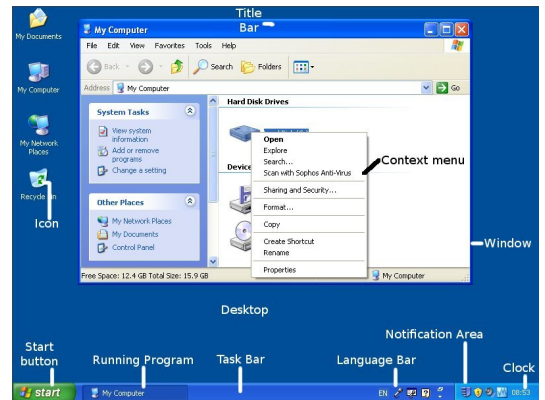
1	2	3	4	5
Command line interface	WIMP interface	Natural language interface	Menu-driven interface	Graphical user interface

```

Welcome to the iVoantl platform command line for
advanced configuration and triage capability.

For a list of commands type help or ? followed by return.
[0]>?
[0] filedirector - File Director commands
[0] lookup       - Lookup host
[0] ping        - Test connection through ICMP
[0] restart     - Restart the system
[0] shutdown    - Shutdown the system
[0] logout      - Logout of the command line
[0] help        - Get help about a command
[0] shell       - Switch to shell
[1] ping dn-play-01
[1] PING dn-play-01 (10.0.32.211): 56 data bytes
[1] 64 bytes from 10.0.32.211: icmp_seq=0 ttl=64 time=0.128 ms
[1] 64 bytes from 10.0.32.211: icmp_seq=1 ttl=64 time=0.048 ms
[1] 64 bytes from 10.0.32.211: icmp_seq=2 ttl=64 time=0.085 ms
[1] 64 bytes from 10.0.32.211: icmp_seq=3 ttl=64 time=0.057 ms
[1] 64 bytes from 10.0.32.211: icmp_seq=4 ttl=64 time=0.104 ms
[1]
[1] --- dn-play-01 ping statistics ---
[1] 5 packets transmitted, 5 packets received, 0.0% packet loss
[1] round-trip min/avg/max/stddev = 0.040/0.084/0.126/0.030 ms
[2]>

```



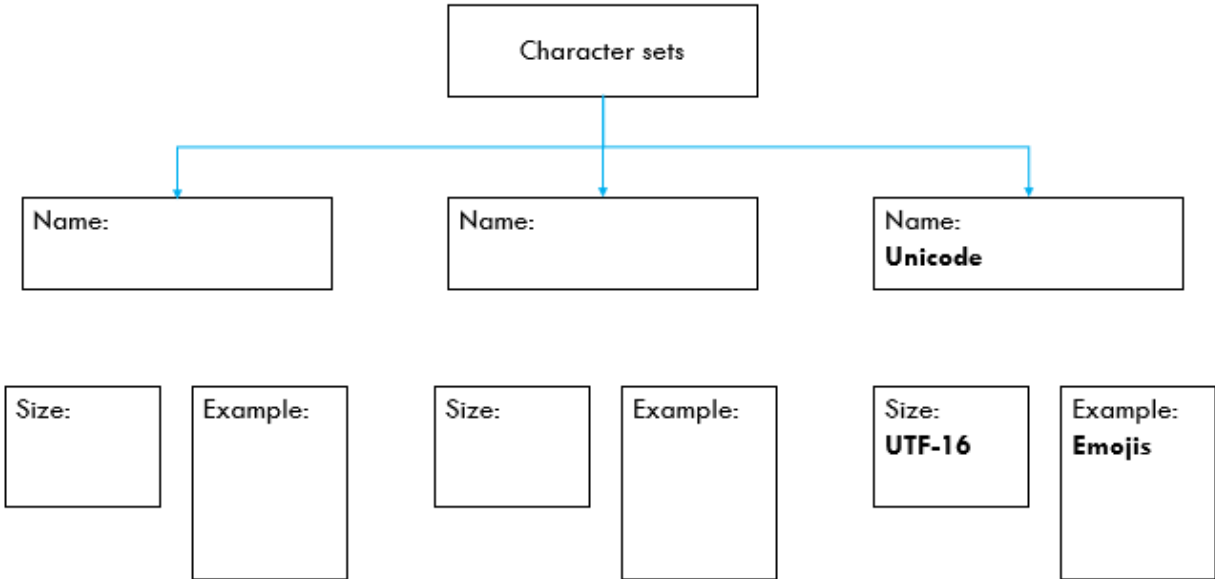
Total points	
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1.5.2 Utility software

Lesson 16

Activity 1

Complete the concept map below (1 point each)



Activity 2

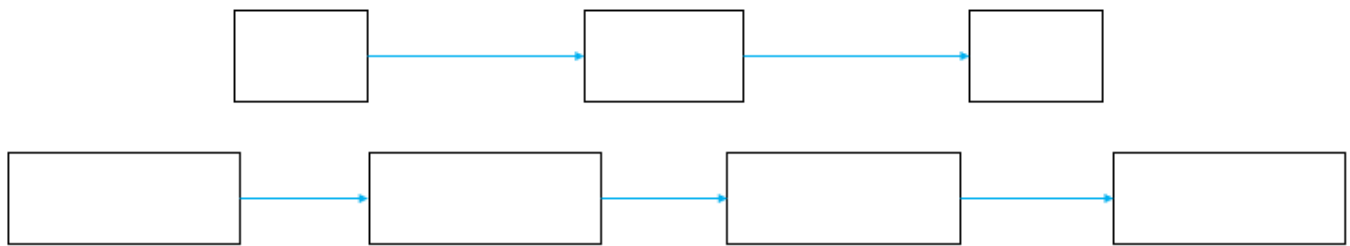
Name each type of utility software based on the acronym ABDCDEF (1 point each)

A	B	C	D	E	F

Activity 3

Complete the concept map below, using the keywords provided. (1 point each)

Ciphertext	Decrypt	Encrypt	Plaintext	Plaintext	Receiver	Sender
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Total points	
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1.6.1 Ethical, legal, cultural and environmental impact

Lesson 17

	Last lesson (1 point)
	Two lessons ago (2 points)

Activity 1:

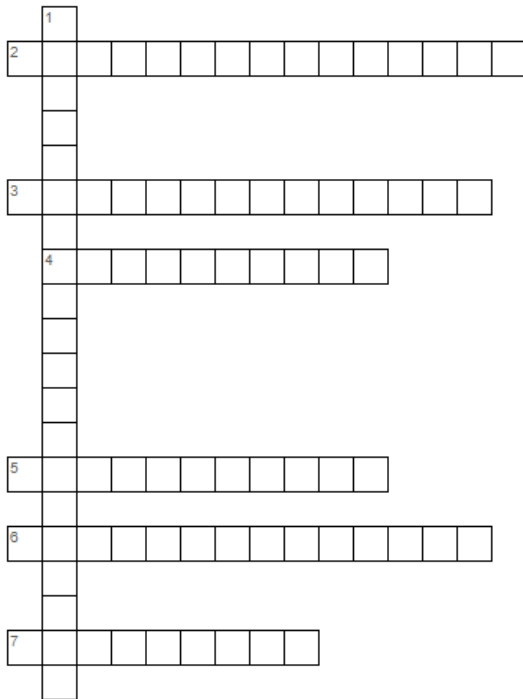
What can you remember so far?

Name one function of the operating system.	Name one type of user interface	Name one type of utility software.	Name one type of utility software.	Name one function of the operating system.
Name one type of utility software.	Name one function of the operating system.	Name one type of user interface	Name one function of the operating system.	Name one type of user interface

Activity 2

Complete the crossword below (1 point each)

Computer legislation & Software licenses



Across

- 2 One of several public copyright licenses that enable the free distribution of an otherwise copyrighted 'work'.
- 3 An Act to make provision for securing computer material against unauthorised access or modification; and for connected purposes.
- 4 Commonly refers to software that uses an open development process and is licensed to include the source code.
- 5 Software that legally remains the property of the organisation, group, or individual who created it.
- 6 Controls how personal information can be used and your rights to ask for information about yourself.
- 7 Protects your work and stops others from using it without your permission.

Down

- 1 An Act to make provision for the disclosure of information held by public authorities

Total points	
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Final Challenge!

Score as many points as you can.

Name five pieces of legislation linked to technology (1 point)	Name two software licenses (1 point)	Name six types of utility software (2 points)	Name five types of user interface (3 points)
Name five functions of the operating system (3 points)	Name four methods used to identify and prevent network vulnerabilities (4 points)	Name three types of threats to the security of a network (5 points)	Name three examples of social engineering (5 points)

Name five types of malware (5 points)	Name all seven network protocols (6 points)	Name three methods of connecting to a network (7 points)	Name two network topologies (8 points)
Name five types of network hardware (9 points)	Name two types of compression (10 points)	Name three character sets (11 points)	Write the formula used to calculate the size of an image file (11 points)
Convert 182 into an 8-bit binary number <u>and</u> a hexadecimal number. (12 points)	Name the units of data from smallest to largest (12 points)	Name three types of secondary storage (13 points)	Name six storage characteristics (13 points)
Name two types of primary storage (14 points)	Name three factors that impact the performance of the CPU (15 points)	Name three CPU components (16 points)	Name four CPU registers (16 points)