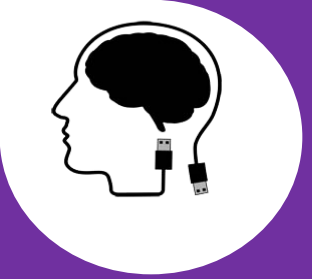


OCR GCSE Computer Science (9-1)
Unit 1: Computer Systems

Bumper Revision Guide

Topic 1.1.1 – Architecture of the CPU

Activity 2: The Von Neumann Architecture

Identify the purpose of each register by filling in the gaps.

Difficulty level:

Program Counter	Stores the _____ of the _____ instruction to be run.
Memory Address Register	Stores the _____where the next item of data will be _____ from.
Memory Data Register	_____ an item of _____ that has just been fetched.
Accumulator	Stores the _____ of _____ _____

Topic 1.1.1 – Architecture of the CPU (Answers)

Activity 2: The Von Neumann Architecture

Difficulty level:

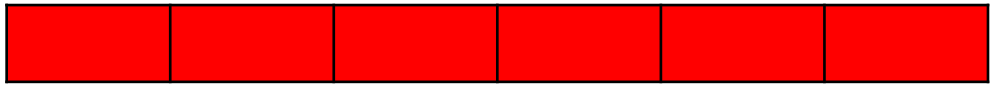
Identify the purpose of each register by filling in the gaps.

Program Counter	Stores the **address** of the **next** instruction to be run.
Memory Address Register	Stores the **address** where the next item of data will be **fetched** from.
Memory Data Register	**Stores** an item of **data** that has just been fetched.
Accumulator	Stores the **results** of **arithmetic calculations**.

Topic 1.1.1 – Architecture of the CPU

Activity 3: Common CPU components and their function:

Difficulty level:



Answer the following exam style questions.

Q1. State the purpose of the CPU **(1 mark)**	
Guidance What does it do with the instructions?	

Q2. State the purpose of the Arithmetic Logic Unit (ALU). **(2 marks)**	
Guidance What does arithmetic and logic mean?	

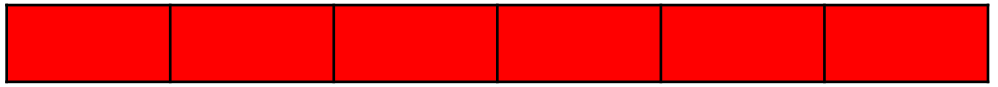
Q3. Describe the role of the Control Unit (CU). **(3 marks)**	
Guidance What does it do with the instructions and where do they go?	

Q4. Explain the role of the cache and how it affects the fetch-decode-execute cycle. **(3 marks)**	
Guidance What does it do with the instructions? How does it affect the use of main memory?	

Topic 1.1.1 – Architecture of the CPU (Answers)

Activity 3: Common CPU components and their function:

Difficulty level:



Answer the following exam style questions.

Q1. State the purpose of the CPU **(1 mark)**	
Guidance What does it do with the instructions?	To fetch, decode and **execute** instructions

Q2. State the purpose of the Arithmetic Logic Unit (ALU). **(2 marks)**	
Guidance What does arithmetic and logic mean?	To perform **arithmetic calculations** and **logical decisions.**

Q3. Describe the role of the Control Unit (CU). **(3 marks)**	
Guidance What does it do with the instructions and where do they go?	To **decode instructions** and **send signals** to **other components** in the CPU.

Q4. Explain the role of the cache and how it affects the fetch-decode-execute cycle. **(3 marks)**	
Guidance What does it do with the instructions? How does it affect the use of main memory?	It can **store frequently used instructions** which r**educes the need to go back to main memory** to fetch the data. As a result, this makes the **fetch-decode-execute cycle more efficient.**

Topic 1.2.1 – Primary Storage

Activity 1: Characteristics of Primary Storage

Difficulty level:

In the statements below, write whether the characteristic best fits RAM or ROM.

Read only data ……	Read and write data ……
Stores volatile data which is lost when power is switched off. ……	Stores non-volatile data which is retained when the power is switched off. ……
Virtual memory is used once this becomes full. ……	Stores data temporarily. ……
Stores data permanently that cannot be changed. ……	Stores software called the BIOS which is used to identify and configure the hardware in a computer. ……

Topic 1.2.1 – Primary Storage (Answers)

Activity 1: Characteristics of Primary Storage

Difficulty level:

In the statements below, write whether the characteristic best fits RAM or ROM.

Read only data ROM	Read and write data RAM
Stores volatile data which is lost when power is switched off. RAM	Stores non-volatile data which is retained when the power is switched off. ROM
Virtual memory is used once this becomes full. RAM	Stores data temporarily. RAM
Stores data permanently that cannot be changed. ROM	Stores software called the BIOS which is used to identify and configure the hardware in a computer. ROM

Topic 1.2.1 – Primary Storage

Activity 2: Why is Primary Storage needed?

Difficulty level:

Answer the following exam style questions.

Q1. Identify why primary storage is needed. **(1 mark)**	
Guidance What does it allow quick access to?	

Q2. Identify the purpose of Random Access Memory (RAM). **(1 mark)**	
Guidance What does it store?	

Q3. Identify the purpose of Read Only Memory (ROM). **(1 mark)**	
Guidance What does it store?	

Q4. State where Virtual Memory and identify why it is needed. **(2 marks)**	
Guidance Where is virtual memory located? When is it used? What has to be full?	

Topic 1.2.1 – Primary Storage (Answers)

Activity 2: Why is Primary Storage needed?

Answer the following exam style questions.

Difficulty level:

Q1. Identify why primary storage is needed. **(1 mark)**	
Guidance What does it allow quick access to?	Fast access (for data) to the CPU.

Q2. Identify the purpose of Random Access Memory (RAM). **(1 mark)**	
Guidance What does it store?	To store data/programs currently in use.

Q3. Identify the purpose of Read Only Memory (ROM). **(1 mark)**	
Guidance What does it store?	To store instructions required to boot up the computer.

Q4. State where Virtual Memory and identify why it is needed. **(2 marks)**	
Guidance Where is virtual memory located? When is it used? What has to be full?	Virtual memory is managed by the operating system/installed on secondary storage. It is used when the main memory/RAM becomes full.

Topic 1.2.2 – Secondary Storage

Activity 1: Types of secondary storage.

Use the images below to identify the device and it's storage type.

Difficulty level:

Device

Type

Device

Type

Device

Type

Device

Type

Device

Type

Device

Type

Topic 1.2.2 – Secondary Storage (Answers)

Activity 1: Types of secondary storage.

Use the images below to identify the device and it's storage type.

Difficulty level:

Device: CD

Type: Optical

Device SD Card

Type Solid-state

Device USB Flash drive

Type Solid-state

Device Solid-state drive

Type Solid-state

Device Blu-ray

Type Optical

Device Hard drive

Type Magnetic

Topic 1.2.2 – Secondary Storage

Activity 2: Why is Secondary Storage needed?

Answer the following exam style questions.

Difficulty level:

Q1. Explain why secondary storage is needed. **(2 marks)**	
Guidance What can it do with data so we can access it again? What type of storage allows data to be retained when switched off.	

Q2. Match up each storage characteristic with the correct description. **(6 marks)**

A. Cost	1. Measured by cost per GB to see if users get value for their money.
B. Capacity	2. The rate in which data can be read and transferred from the storage device.
C. Durability	3. Transport of a device from one place to another.
D. Portability	4. Measures how well a device performs over a long period of time.
E. Speed	5. Resistance to external factors such as being dropped, scratched and how it responds to being in extreme conditions.
F. Reliability	6. The amount space is available on the storage device.

Topic 1.2.2 – Secondary Storage (Answers)

Activity 2: Why is Secondary Storage needed?

Difficulty level:

Answer the following exam style questions.

Q1. Explain why secondary storage is needed. **(2 marks)**	
Guidance What can it do with data so we can access it again? What type of storage allows data to be retained when switched off.	It can store data that can be accessed later on. This is because it's a form of non-volatile storage which means the data is retained even when the computer is switched off.

Q2. Match up each storage characteristic with the correct description. **(6 marks)**

A. Cost	1. Measured by cost per GB to see if users get value for their money.
B. Capacity	2. The rate in which data can be read and transferred from the storage device.
C. Durability	3. Transport of a device from one place to another.
D. Portability	4. Measures how well a device performs over a long period of time.
E. Speed	5. Resistance to external factors such as being dropped, scratched and how it responds to being in extreme conditions.
F. Reliability	6. The amount space is available on the storage device.

Topic 1.2.2 – Secondary Storage

Activity 3: Suitable storage devices and storage media for a given application

Large organisations need to back-up their data every evening.

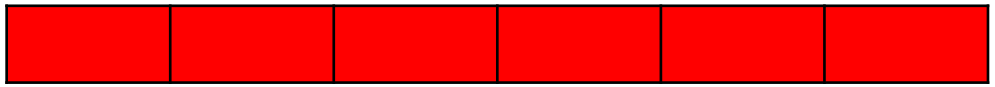
Discuss whether a magnetic or solid-state device is the most appropriate media to back up these files every evening.

You may want to consider the following characteristics in your answer:

- Reliability
- Speed
- Capacity
- Cost

2 FOR RELIABILITY **2 FOR SPEED** **2 FOR CAPACITY** **2 FOR COST**

Difficulty level:

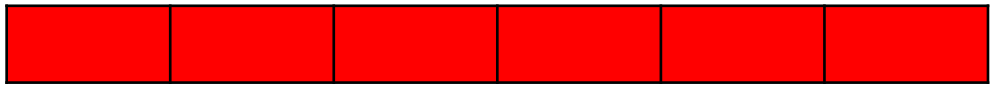


When approach an extended writing question of this nature, you need to focus on the bullet points. In this case there are 4 bullet points. As this is an 8-mark question you should treat these are 4 2-mark questions.

Topic 1.2.2 – Secondary Storage

Activity 3: Suitable storage devices and storage media for a given application

Difficulty level:



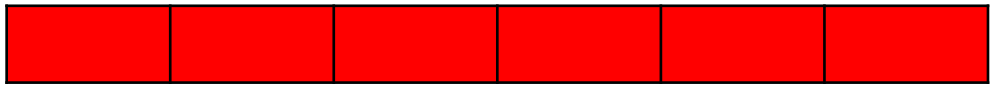
2 FOR RELIABILITY **2 FOR SPEED** **2 FOR CAPACITY** **2 FOR COST**

Reliability How reliable is magnetic storage? How reliable is solid-state storage?	
Speed How quickly does data load up using magnetic storage and solid-state storage?	

Topic 1.2.2 – Secondary Storage (Exemplar)

Activity 3: Suitable storage devices and storage media for a given application

Difficulty level:



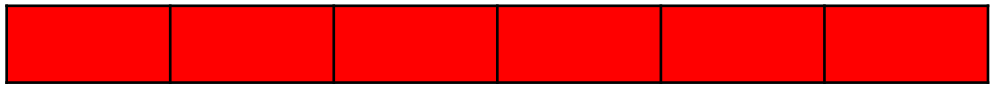
2 FOR RELIABILITY **2 FOR SPEED** **2 FOR CAPACITY** **2 FOR COST**

Reliability How reliable is magnetic storage? How reliable is solid-state storage?	Magnetic storage devices such as a hard drive can last up to five years and only deteriorate in performance because it becomes defragmented over time. Solid-state storage devices may not last as long because it has a limited number of read/write cycles. Magnetic storage might be a preferred option for backing up data that may need to archived for a long period of time.
Speed How quickly does data load up using magnetic storage and solid-state storage?	Magnetic storage is quick to load up files and programs until it becomes defragmented. It uses an actuator arm to read up and down the disk which means it could take longer to load up. Whereas Solid-state storage uses flash memory chips that are soldered onto the circuit board, there are no moving parts which means it's quicker to access data.

Topic 1.2.2 – Secondary Storage

Activity 3: Suitable storage devices and storage media for a given application

Difficulty level:



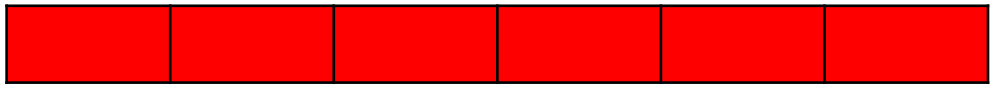
2 FOR RELIABILITY **2 FOR SPEED** **2 FOR CAPACITY** **2 FOR COST**

Capacity How much data can each type of store? Which would be best suited to large organisations?	
Cost How quickly does data load up using magnetic storage and solid-state storage?	

Topic 1.2.2 – Secondary Storage (Exemplar)

Activity 3: Suitable storage devices and storage media for a given application

Difficulty level:



2 FOR RELIABILITY **2 FOR SPEED** **2 FOR CAPACITY** **2 FOR COST**

Capacity How much data can each type of store? Which would be best suited to large organisations?	Magnetic storage devices have provided large volumes of storage for a long time. For large organisations this is useful because it allows more data to be archived over time. It can offer more than solid-state but as technology evolves, capacity of solid-state has increased significantly over the years.
Cost How quickly does data load up using magnetic storage and solid-state storage?	The cost of magnetic storage per GB works out far cheaper than solid-state storage which makes magnetic storage good choice if storing large amounts of data. Although as the cost per GB for solid-state storage reduces then this could become a feasible option for backing up data.

Topic 1.2.3 - Units

Activity 1: Units of data storage

Difficulty level:

Re-arrange these units of data storage in order from smallest to largest.

Bit	Byte
Gigabyte (GB)	Kilobyte (KB)
Megabyte (MB)	Nibble
Petabyte (PB)	Terabyte (TB)

Order (1 = Smallest, 8 = Largest)	**Unit**
1	
2	
3	
4	
5	
6	
7	
8	

Topic 1.2.3 – Units (Answers)

Activity 1: Units of data storage

Difficulty level:

Re-arrange these units of data storage in order from smallest to largest.

Bit	Byte
Gigabyte (GB)	Kilobyte (KB)
Megabyte (MB)	Nibble
Petabyte (PB)	Terabyte (TB)

Order (1 = Smallest, 8 = Largest)	**Unit**
1	Bit
2	Nibble
3	Byte
4	Kilobyte (KB)
5	Megabyte (MB)
6	Gigabyte (GB)
7	Terabyte (TB)
8	Petabyte (PB)

Topic 1.2.3 – Units

Activity 2: Calculating storage requirements

Difficulty level:

Using the cards provided – create formulas to calculate the file size of images, text and sound.

Sample rate	Duration
Height in pixels	Number of characters
Colour depth	Bit depth
Bits per character	Width in pixels

Text	Image	Sound
Formula	Formula	Formula

Topic 1.2.3 – Units (Answers)

Activity 2: Calculating storage requirements

Difficulty level:

Using the cards provided – create formulas to calculate the file size of images, text and sound.

Sample rate	Duration
Height in pixels	Number of characters
Colour depth	Bit depth
Bits per character	Width in pixels

Text	Image	Sound
Formula Number of characters * Bits per character	Formula Height in pixels * Width in pixels* Bit depth	Formula Sample rate * Bit depth * Duration

Topic 1.2.3 - Units

Activity 3: Calculating storage requirements

Difficulty level:

Answer the following questions.

Q1. Convert the following file sizes shown into the appropriate units stated below.
Convert 3MB into KB. **(1 mark)**
Convert 24 KB into bytes **(1 mark)**
Convert 200 bytes into bits. **(1 mark)**

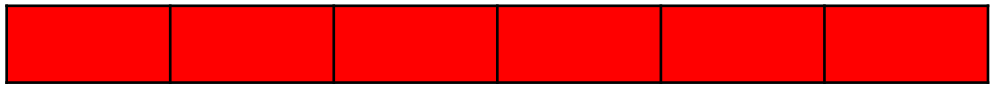
Q2. Jacob has a new solid-state drive which can hold 100 GB of data. Jacob wishes to save HD videos on his new solid-state drive. Each video is approximately 1.25 GB in size.
Calculate approximately how many videos Jacob can store on his new solid-state drive. Show your working. **(2 marks)**

Q3. Below are the properties of a text file. Bits per character = 10 , Number of characters = 240.
Using the properties above, calculate the size of a text file in bits. **(2 marks)**
Convert the size of the text file from bits to bytes. **(1 mark)**
Convert the size of the text file from bytes to kilobytes (KB) **(1 mark)**

Topic 1.2.3 – Units (Answers)

Activity 3: Calculating storage requirements

Difficulty level:



Answer the following questions

Q1. Convert the following file sizes shown into the appropriate units stated below.
Convert 3MB into KB. **(1 mark)**
3*1000 = 3000 KB
Convert 24 KB into bytes **(1 mark)**
24*1000 = 24000 Bytes
Convert 200 bytes into bits. **(1 mark)**
200 * 8 = 1600 Bits

Q2. Jacob has a new solid-state drive which can hold 100 GB of data. Jacob wishes to save HD videos on his new solid-state drive. Each video is approximately 1.25 GB in size.
Calculate approximately how many videos Jacob can store on his new solid-state drive. Show your working. **(2 marks)**
100/1.25 = 80 Answer = 80 Videos

Q3. Below are the properties of a text file. Bits per character = 10 , Number of characters = 240.
Using the properties above, calculate the size of a text file in bits. **(2 marks)**
10 * 240 = 2400 bits
Convert the size of the text file from bits to bytes. **(1 mark)**
2400/8 = 300 bytes
Convert the size of the text file from bytes to kilobytes (KB) **(1 mark)**
300/1000 = 0.3 KB

Topic 1.2.4 – Numbers

Activity 1: Denary and Binary

Difficulty level:

Answer the questions found in the table(s) below.

Denary number	8-bit Binary equivalent
25	
74	
102	
166	

Binary number	Denary equivalent
00001110	
00101111	
01011101	
10011010	

Topic 1.2.4 – Numbers (Answers)

Activity 1: Denary and Binary

Answer the questions found in the table(s) below.

Difficulty level:

Denary number	8-bit Binary equivalent
25	00011001
74	01001010
102	01100110
166	10100110

Binary number	Denary equivalent
00001110	14
00101111	47
01011101	93
10011010	154

Topic 1.2.4 – Numbers

Activity 2: Hexadecimal

Difficulty level:

Convert the following numbers shown below.

Q1. Convert the denary number 122 into a hexadecimal number. **(2 marks)**

Worked example 82/16 = 5 r2 Answer 52	

Q2. Convert the binary number 10110001 into a hexadecimal number. **(2 marks)**

Worked example 10101001 First nibble 1010 = 10 Second nibble 1001 = 9 10 = A 11 = B Answer = AB	

Q3. Convert 3F into a denary number. Show your working **(2 marks)**

Worked example 4D 4 * 16 = 64 D = 13 64 + 13 = 77	

Q.4. State **two** reasons why computer scientists use hexadecimal. **(2 marks)**

Topic 1.2.4 – Numbers (Answers)

Activity 2: Hexadecimal

Convert the following numbers shown below.

Difficulty level:

Q1. Convert the denary number 122 into a hexadecimal number. **(2 marks)**	
Worked example 82/16 = 5 r2 Answer 52	122/16 = 7 r 10 7 10 = A Answer: 7A

Q2. Convert the binary number 10110001 into a hexadecimal number. **(2 marks)**	
Worked example 10101001 First nibble 1010 = 10 Second nibble 1001 = 9 10 = A 11 = B Answer = AB	1011 = 11 0001 = 1 11 = B 1 = 1 Answer: B1

Q3. Convert 3F into a denary number. Show your working **(2 marks)**	
Worked example 4D 4 * 16 = 64 D = 13 64 + 13 = 77	3* 16 = 48 F = 15 48 + 15 = 63 Answer: 63

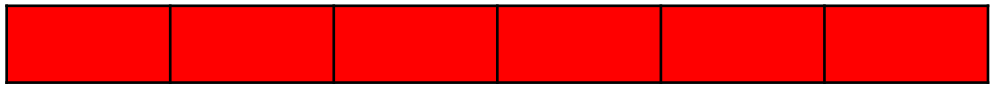
Q.4. State **two** reasons why computer scientists use hexadecimal. **(2 marks)**
Easier to write and easier to remember.

Topic 1.2.4 – Numbers

Activity 3: Binary shift and addition

Answer the questions shown below

Difficulty level:



01101001	
Perform a 2-bit left shift on the number above. **(1 mark)**	Perform a 2-bit right shift on the number above. **(1 mark)**
State the effect of a left bit shift **(1 mark)**	State the effect of a right bit shift. **(1 mark)**

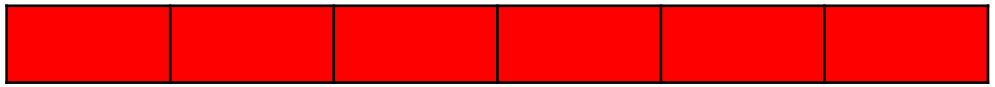
10110110 **10010100**
Add the two binary numbers above together. **(2 marks)** Guidance – 0+0 =0, 0 + 1 = 1, 1 + 1 = 0 carry 1, 1 + 1+ 1 = 1 carry 1
Identify the problem this binary addition has created and why. **(2 marks)**

Topic 1.2.4 – Numbers (Answers)

Activity 3: Binary shift and addition

Answer the questions shown below

Difficulty level:



01101001	
Perform a 2-bit left shift on the number above. **(1 mark)**	Perform a 2-bit right shift on the number above. **(1 mark)**
10100100	00011010
State the effect of a left bit shift **(1 mark)**	State the effect of a right bit shift. **(1 mark)**
Shifting left by 1 will multiply by a power of 2.	Shifting right by 1 bit will divide by two

10110110 10010100
Add the two binary numbers above together. **(2 marks)** Guidance – 0+0 =0, 0 + 1 = 1, 1 + 1 = 0 carry 1, 1 + 1+ 1 = 1 carry 1
0101001010
Identify the problem this binary addition has created and why. **(2 marks)**
A binary overflow has been created which means the number cannot be stored because it exceeds 8 bits.

Topic 1.2.4 – Characters

Activity 1: ASCII character codes

Difficulty level:

Complete the missing gaps in the table below.

Character	ASCII code	Binary representation
N		
	79	
		01010000
Q		
	82	

Topic 1.2.4 – Characters (Answers)

Activity 1: ASCII character codes

Difficulty level:

Complete the missing gaps in the table below.

Character	ASCII code	Binary representation
N	78	01001110
O	79	01001111
P	80	01010000
Q	81	01010001
R	82	01010010

Topic 1.2.4 – Characters

Activity 2: Character sets

Difficulty level:

In the statements below, write whether the characteristic best fits the ASCII character set or Unicode character set.

Stores up to 8 bits ……	Uses emojis as part of their character set. ……
Can store more than 256 characters. ……	Can store more than 8 bits. ……
Stores numbers, punctuation symbols and letters. ……	Stores up to 256 characters. ……

Topic 1.2.4 – Characters (Answers)

Activity 2: Character sets

Difficulty level:

In the statements below, write whether the characteristic best fits the ASCII character set or Unicode character set.

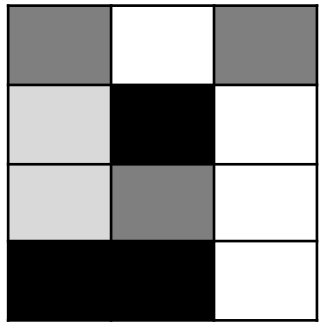
Stores up to 8 bits ASCII	Uses emojis as part of their character set. Unicode
Can store more than 256 characters. Unicode	Can store more than 8 bits. Unicode
Stores numbers, punctuation symbols and letters. ASCII	Stores up to 256 characters. ASCII

Topic 1.2.4 – Images

Activity 1: How a bitmap image is stored on a computer.

Difficulty level:

Complete the missing gaps in the explanations below.



10	00	10
01	11	00
01	10	00
11	11	00

Keyword Bank

Pixel(s)	16
Metadata	Binary
Bits	8

Any of these keywords can be used more than once!

Every bitmap image is made up a series of _____
Each _____ contains a digit known as a _____ number
This number corresponds and represents a unique _____

The colour depth of an image is measured in _____ per pixel.
The number of _____ indicate how many colours are available for each pixel.

For example:
1 bit per pixel represents 2 colours.
2 bits per pixel represents 4 colours.
3 bits per pixel represents _____ colours.
4 bits per pixel represents _____ colours.

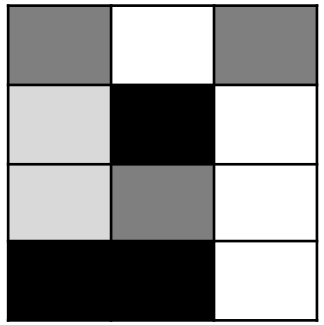
_____ is information about the image itself. This can include file size, file format, timestamp, resolution, colour depth etc..

Topic 1.2.4 – Images (Answers)

Activity 1: How a bitmap image is stored on a computer.

Difficulty level:

Complete the missing gaps in the explanations below.



10	00	10
01	11	00
01	10	00
11	11	00

Every bitmap image is made up a series of **pixels**
Each **pixel** contains a digit known as a **binary** number
This number corresponds and represents a unique **colour**

The colour depth of an image is measured in **bits** per pixel.
The number of **bits** indicate how many colours are available for each pixel.

For example:
1 bit per pixel represents 2 colours.
2 bits per pixel represents 4 colours.
3 bits per pixel represents **8** colours.
4 bits per pixel represents **16** colours.

Metadata is information about the image itself. This can include file size, file format, timestamp, resolution, colour depth etc..

Keyword Bank

Pixel(s)	16
Metadata	Binary
Bits	8

Any of these keywords can be used more than once!

Topic 1.2.4 – Images

Activity 2: Resolution and Colour depth

Difficulty level:

Complete the boxes below to describe the impact the change in resolution and colour depth can have on an image.

Keyword: Resolution	What does it mean?	What happens when resolution is increased?	How does it impact the quality?	How does it impact the size of the file?
Keyword: Colour depth	What does it mean?	What happens when colour depth is increased?	How does it impact the quality?	How does it impact the size of the file?

Topic 1.2.4 – Images (Answers)

Activity 2: Resolution and Colour depth

Difficulty level:

Complete the boxes below to describe the impact the change in resolution and colour depth can have on an image.

Keyword:	What does it mean?	What happens when resolution is increased?	How does it impact the quality?	How does it impact the size of the file?
Resolution	**The number of pixels stored in an image (per inch)**	**More pixels are present in the image.**	**Improves the quality/Image is sharper.**	**Increases the size of a file.**

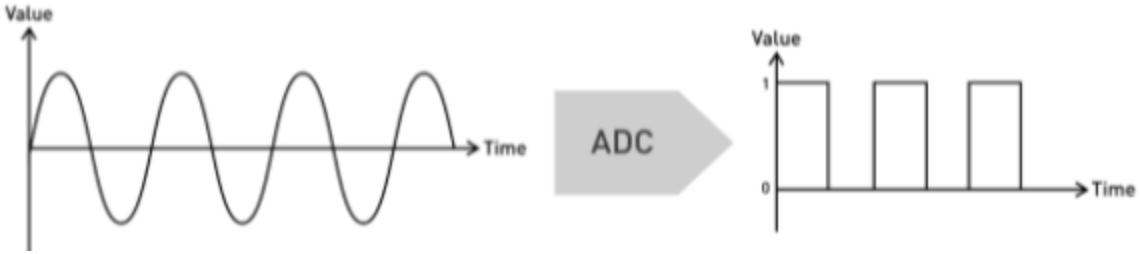
Keyword:	What does it mean?	What happens when colour depth is increased?	How does it impact the quality?	How does it impact the size of the file?
Colour depth	**More bits stored per pixel**.	**A wider range of colours can be represented.**	**Improves the quality of the image.**	**Increases the file size.**

Topic 1.2.4 – Sound

Activity 1: How sound is stored on a computer.

Difficulty level:

Complete the missing gaps in the explanations below.



Keyword Bank

Sound waves	Bits
Regular intervals	Samples
Binary	Analogue

Any of these keywords can be used more than once!

_____ _____ are created by vibrations in the air. This means the current format of the sound is _____.

When _____ sound is recorded, it measures the _____ _____ by taking _____ at _____ _____ and are then converted into a digital sound which is represented in _____ form.

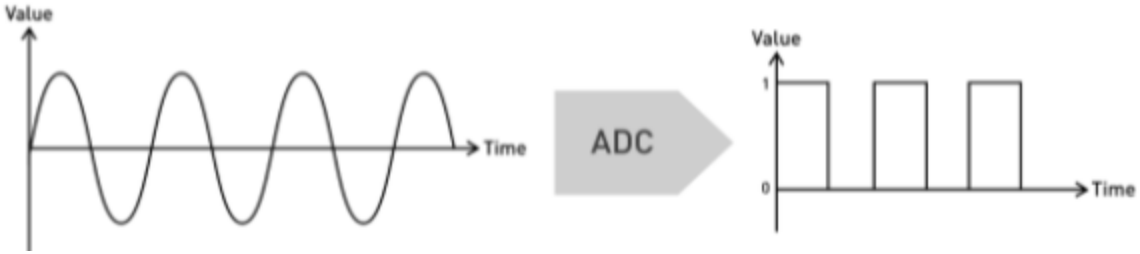
When _____ are taken, each one will store a number of _____ which determines how much detail is in the sample itself.

Topic 1.2.4 – Sound (Answers)

Activity 1: How sound is stored on a computer.

Difficulty level:

Complete the missing gaps in the explanations below.



Sound waves are created by vibrations in the air. This means the current format of the sound is **analogue**.

When **analogue** sound is recorded, it measures the **sound waves** by taking **samples** at **regular intervals** and are then converted into a digital sound which is represented in **binary** form.

When **samples** are taken, each one will store a number of **bits** which determines how much detail is in the sample itself.

Keyword Bank

Sound waves	Bits
Regular intervals	Samples
Binary	Analogue

Any of these keywords can be used more than once!

Topic 1.2.4 – Sound

Activity 2: Sample rate and bit depth

Difficulty level:

Complete the boxes below to describe the impact the change in sample rate and bit depth can have on a sound file.

Keyword:	What does it mean?	What happens when sample rate is increased?	How does it impact the quality?	How does it impact the size of the file?
Sampling				

Keyword:	What does it mean?	What happens when bit depth is increased?	How does it impact the quality?	How does it impact the size of the file?
Bit depth				

Topic 1.2.4 – Sound (Answers)

Activity 2: Sample rate and bit depth

Difficulty level:

Complete the boxes below to describe the impact the change in sample rate and bit depth can have on a sound file.

Keyword:	What does it mean?	What happens when sample rate is increased?	How does it impact the quality?	How does it impact the size of the file?
Sampling	**Recording of analogue sound into digital form.**	**Samples taken at more regular intervals.**	**More accurate representation of the original sound.**	**Increases the file size.**

Keyword:	What does it mean?	What happens when bit depth is increased?	How does it impact the quality?	How does it impact the size of the file?
Bit depth	**The detail found in each sample.**	**More detail in the sample.**	**Improved playback quality**.	**Increases the file size.**

Topic 1.2.4 – Sound

Activity 3: Calculate the size of a sound file.

Difficulty level:

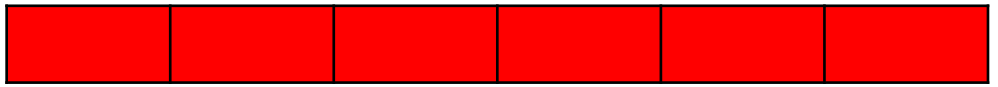
Answer the question below

Q1. Calculate the file size on a sound file in KB. The properties of the image are shown below. You must show your working. **(4 marks)** Sample rate = 20 , Bit depth = 10, Duration = 2 minutes	
Guidance Sample rate * Bit depth * Duration (BP1) Convert to bytes (Divide by 8) (BP2) Convert to KB (Divide by 1000) (BP3) Correct answer (BP4)	

Topic 1.2.4 – Sound (Answers)

Activity 3: Calculate the size of a sound file.

Difficulty level:



Answer the question below

Q1. Calculate the file size on a sound file in KB. The properties of the image are shown below. You must show your working. **(4 marks)** Sample rate = 20 , Bit depth = 10, Duration = 2 minutes	
Guidance Sample rate * Bit depth * Duration (BP1) Convert to bytes (Divide by 8) (BP2) Convert to KB (Divide by 1000) (BP3) Correct answer (BP4)	20 * 10 * 120 = 24,000 24,000 / 8 = 3,000 3,000/1,000 = 3 KB

Topic 1.2.5 – Compression

Activity 1: Lossy and Lossless Compression

Difficulty level:

Tick one or boxes in each row to identify if the statement matches with Lossy or Lossless compression.

Statement	Lossy	Lossless
Reduces the size of the file.		
File becomes irreversible, meaning it cannot be edited.		
Uses an algorithm to group data together so it can be restored to it's original form.		
File is reversible and can be edited.		
Permanently removes data.		

Topic 1.2.5 – Compression (Answers)

Activity 1: Lossy and Lossless Compression

Difficulty level:

Tick one or boxes in each row to identify if the statement matches with Lossy or Lossless compression.

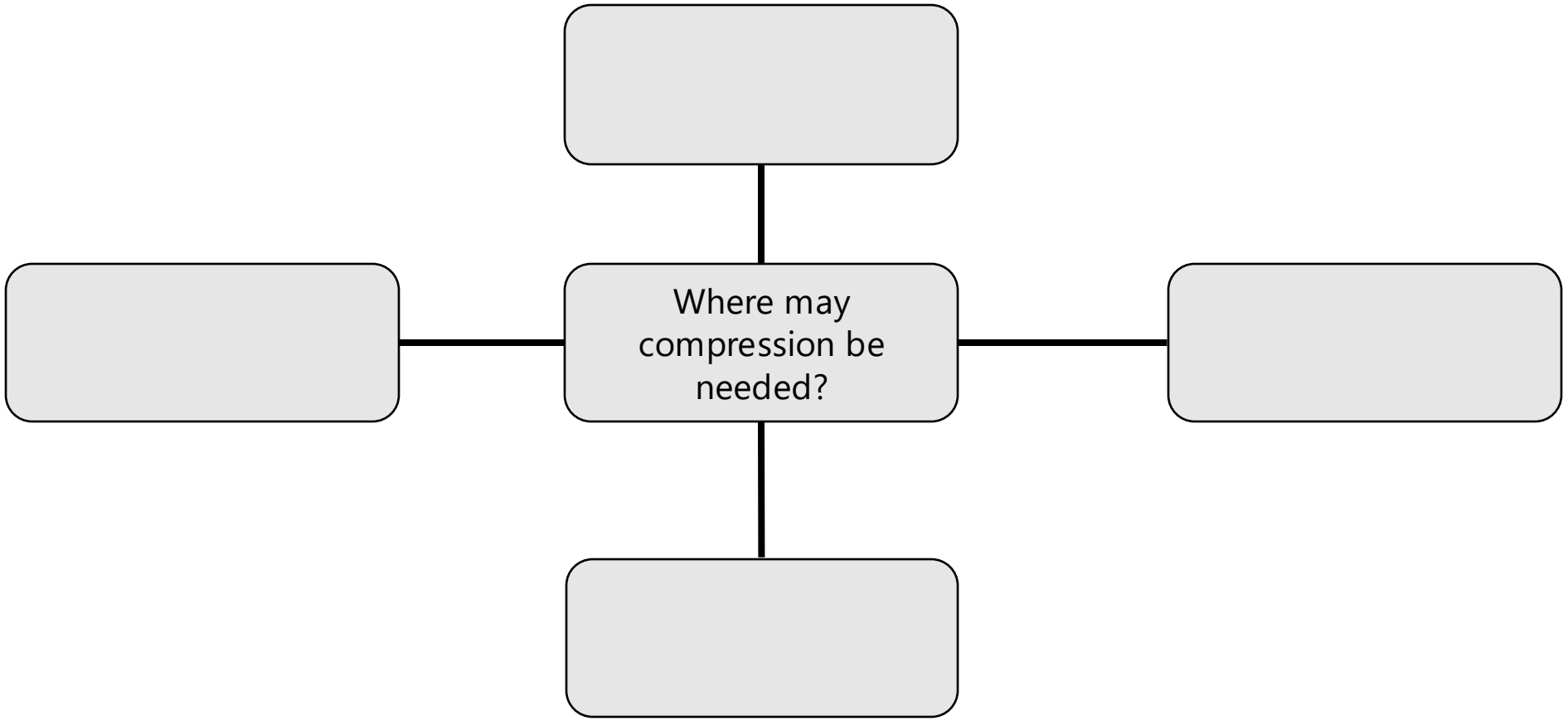
Statement	Lossy	Lossless
Reduces the size of the file.	✓	✓
File becomes irreversible, meaning it cannot be edited.	✓	
Uses an algorithm to group data together so it can be restored to it's original form.		✓
File is reversible and can be edited.		✓
Permanently removes data.	✓	

Topic 1.2.5 - Compression

Activity 2: Why is compression needed?

Difficulty level:

In the mind map below, outline common scenarios where compression may be needed

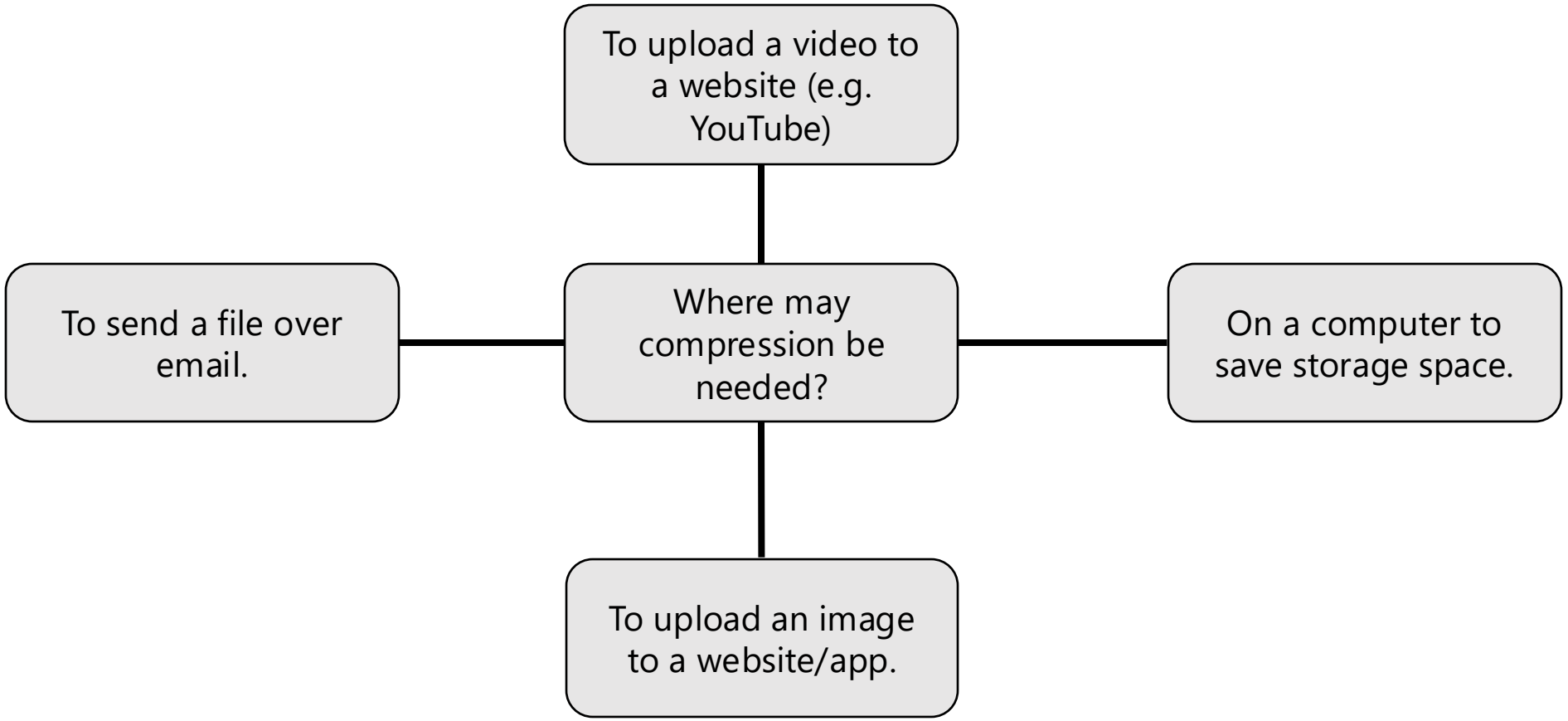


Topic 1.2.5 – Compression (Answers)

Activity 2: Why is compression needed?

Difficulty level:

In the mind map below, outline common scenarios where compression may be needed



Topic 1.3.1 – Network types and models

Activity 1: Types and models

Difficulty level:

Using the descriptions below, identify the network types and models.

Types of network

Covers a small geographical area.	Covers a large geographical area.

Topic 1.3.1 – Network types and models (Answers)

Activity 1: Types and models

Difficulty level:

Using the descriptions below, identify the network types and models.

Types of network

Covers a small geographical area.	**Local Area Network (LAN)**
Covers a large geographical area.	**Wide Area Network (WAN)**

Topic 1.3.1 – Network types and models

Activity 2: Network and it's performance.

Difficulty level:

Tick one box in each row to identify if the statement matches with LAN or WAN.

Statement	LAN	WAN
Covers a small geographical area.		
Typically used to set up a home network.		
The type of network used to access the World Wide Web (Internet)		
Covers a large geographical area.		
Hardware is owned by the user/organisation.		
Hardware used to create the network is provided by a third party.		

Factors that affect network performance include…..

Topic 1.3.1 – Network types and models (Answers)

Activity 2: Network and it's performance.

Difficulty level:

Tick one box in each row to identify if the statement matches with LAN or WAN.

Statement	LAN	WAN
Covers a small geographical area.	✓	
Typically used to set up a home network.	✓	
The type of network used to access the World Wide Web (Internet)		✓
Covers a large geographical area.		✓
Hardware is owned by the user/organisation.	✓	
Hardware used to create the network is provided by a third party.		✓

Factors that affect network performance include…..

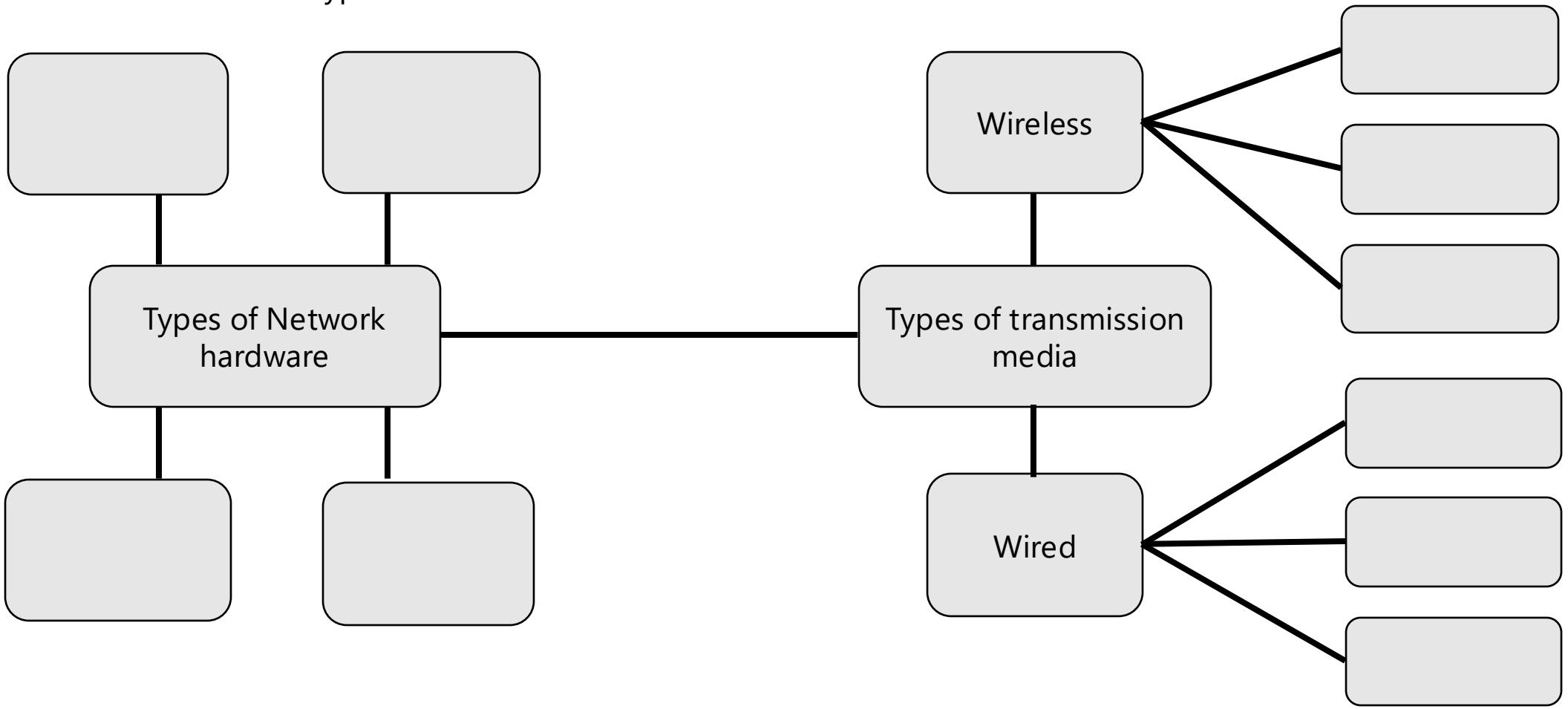
Bandwidth
Number of users
Use of VPN
Time of the day
Streaming 4K/HD videos
Choice of transmission
Interference
Distance from the router.

Topic 1.3.1 – Network hardware

Activity 1: Network hardware and transmission media

Difficulty level:

Complete the mind map below to identify different types of network hardware and different types of transmission media.

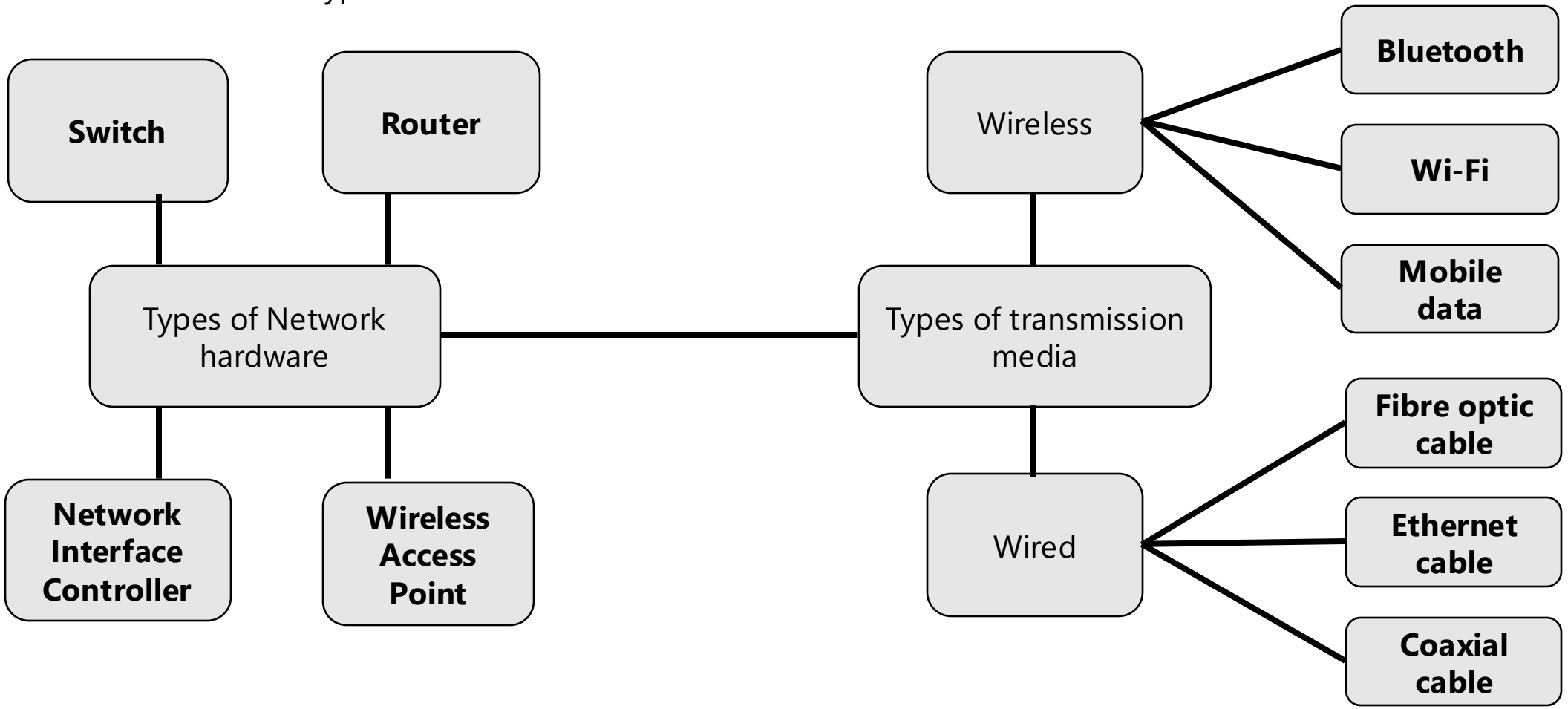


Topic 1.3.1 – Network hardware (Answers)

Activity 1: Network hardware and transmission media

Difficulty level:

Complete the mind map below to identify different types of network hardware and different types of transmission media.



Topic 1.3.1 – Network hardware

Activity 2: The role of network hardware

Difficulty level:

Tick one or more boxes in each row to identify the statements that best fit with each type of hardware.

Statement	Router	Switch	Wireless Access Point	Network Interface Controller
To create a wireless network from a wired network.				
A chip that allows devices to connect to a network.				
A device used to create networks.				
A device used to connect to other networks.				

Topic 1.3.1 – Network hardware (Answers)

Activity 2: The role of network hardware

Difficulty level:

Tick one or more boxes in each row to identify the statements that best fit with each type of hardware.

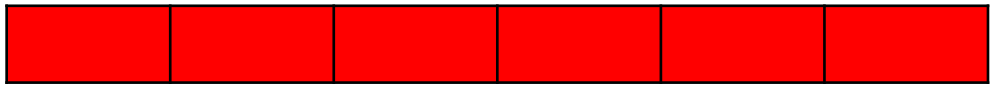
Statement	Router	Switch	Wireless Access Point	Network Interface Controller
To create a wireless network from a wired network.	✓		✓	
A chip that allows devices to connect to a network.				✓
A device used to create networks.		✓		
A device used to connect to other networks.	✓			

Topic 1.3.1 – Network hardware

Activity 3: 1-2-3-4

Answer four describe questions that progressively include more key points.

Difficulty level:



Q1. Describe the purpose of a Network Interface Controller **(1 mark)**	
Guidance: Why is it needed?	

Q2. Describe the role of a Wireless Access Point. **(2 marks)**	
Guidance: What does it do? How does it work? Why is it used?	

Q4. Describe the role of a switch **(4 marks)**	
Guidance: Why is it needed? What does it store? What does it do with data? Why is it useful?	

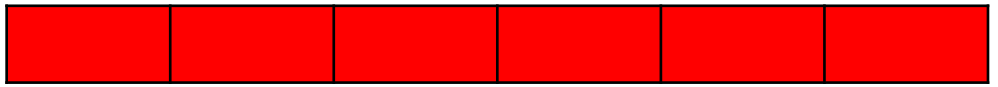
Q3. Describe the role of a router. **(3 marks)**	
Guidance: What is it used for? What does it check for/inspect? What does it do with the data?	

Topic 1.3.1 – Network hardware (Answers)

Activity 3: 1-2-3-4

Answer four describe questions that progressively include more key points.

Difficulty level:



Q1. Describe the purpose of a Network Interface Controller **(1 mark)**	
Guidance: Why is it needed?	To enable devices to access the network.

Q4. Describe the role of a switch **(4 marks)**	
Guidance: Why is it needed? What does it store? What does it do with data? Why is it useful?	A switch will create networks and store the MAC addresses of devices connected to it. When data packets arrive they are redirect to the intended recipient. This helps to reduce unnecessary network traffic.

Q2. Describe the role of a Wireless Access Point. **(2 marks)**	
Guidance: What does it do? How does it work? Why is it used?	It allows a wireless network to be created from a wired network. It can act as an extender which increases the distance a connection can cover.

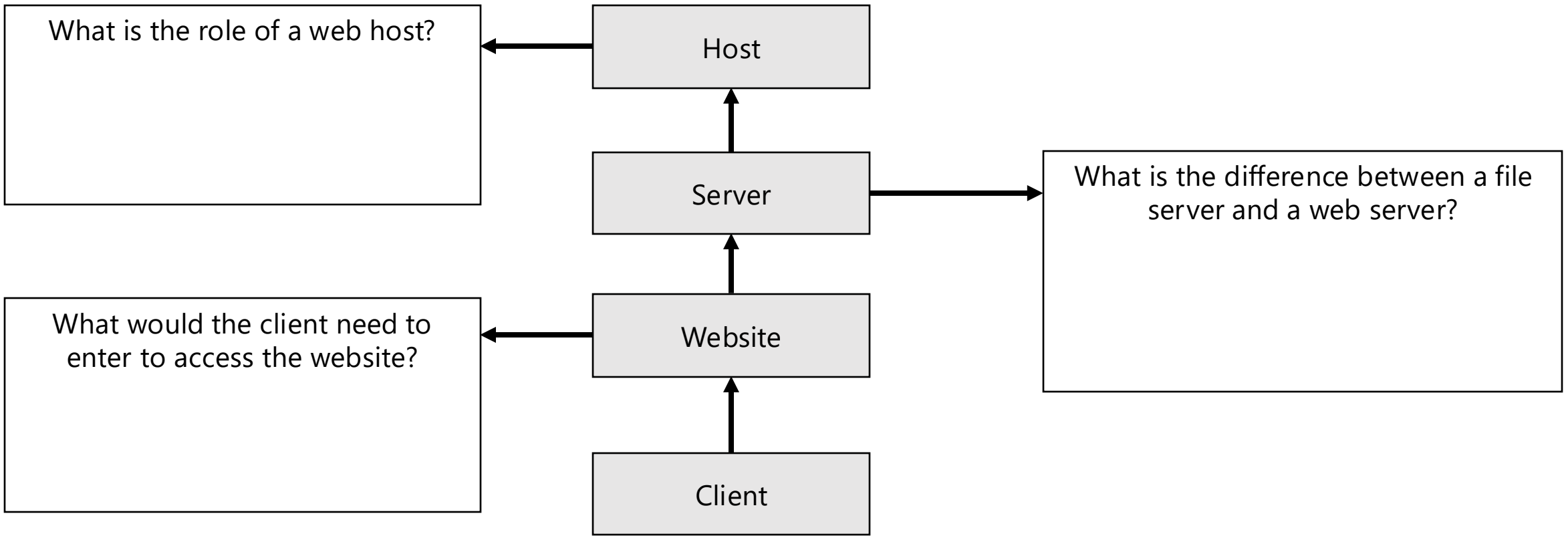
Q3. Describe the role of a router. **(3 marks)**	
Guidance: What is it used for? What does it check for/inspect? What does it do with the data?	A router will connect to other networks such as the internet and it will inspect IP addresses and forward data packets to the correct destination.

Topic 1.3.1 – The Internet

Activity 1: Hosting and Servers

Difficulty level:

Below is a concept map that shows how clients can access websites on the internet. Answer the questions provided below.



Topic 1.3.1 – The Internet (Answers)

Activity 1: Hosting and Servers

Difficulty level:

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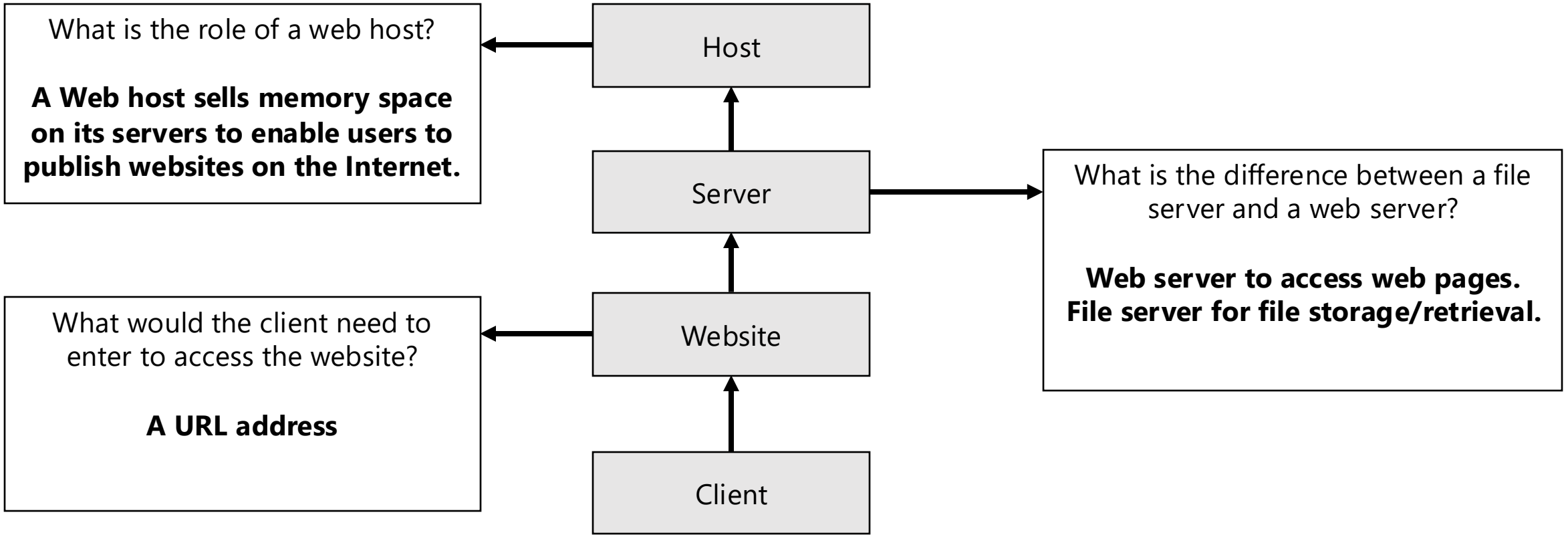


Topic 1.3.1 – The Internet

Activity 2: Cloud services

Difficulty level:

In the table below, identify the advantages and disadvantages to using cloud services.

Advantages	Disadvantages
`	

Topic 1.3.1 – The Internet (Answers)

Activity 2: Cloud services

Difficulty level:

In the table below, identify the advantages and disadvantages to using cloud services.

Advantages	Disadvantages
Access data remotely (anywhere with an internet connection.)	Dependent on a good internet connection.
Share data with other users in other locations.	Need a good internet connection.
Access to software remotely.	Concerns over network security.
Backing up data is the responsibility of the provider.	

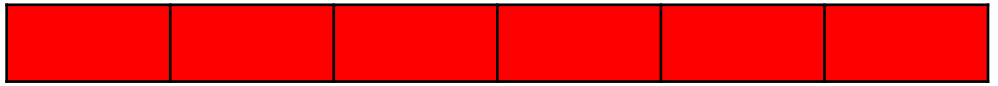
Topic 1.3.1 – The Internet

Activity 3: Domain Name System (DNS)

Re-arrange the steps below to illustrate the DNS process and answer the exam style questions. (1 = Start and 5 = Finish)

Client is able to access the page.	
If the URL exists, it will find the IP address (to see which network this website is assigned to)	
The database (DNS) is checked so see if the URL address exists.	
The server returns IP address to client.	
User(client) enters the URL address into the browser.	

Difficulty level:



Q1. State the purpose of the DNS. **(1 mark)**	
Guidance: What does it look for?	

Q2. Identify what happens when the DNS server doesn't instantly recognise the URL address. **(1 mark)**	
Guidance: What does it do to try and find the URL?	

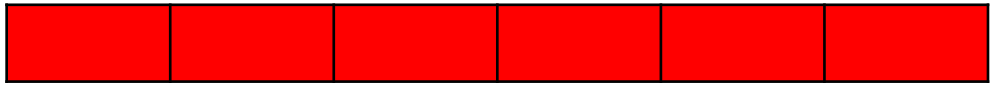
Topic 1.3.1 – The Internet (Answers)

Activity 3: Domain Name System (DNS)

Re-arrange the steps below to illustrate the DNS process and answer the exam style questions. (1 = Start and 5 = Finish)

Client is able to access the page.	5
If the URL exists, it will find the IP address (to see which network this website is assigned to)	3
The database (DNS) is checked so see if the URL address exists.	2
The server returns IP address to client.	4
User(client) enters the URL address into the browser.	1

Difficulty level:



Q1. State the purpose of the DNS. **(1 mark)**	
Guidance: What does it look for?	To look up URL addresses and their associated IP address.

Q2. Identify what happens when the DNS server doesn't instantly recognise the URL address. **(1 mark)**	
Guidance: What does it do to try and find the URL?	It will try other DNS servers to see if the URL address exists.

Topic 1.3.2 – Modes of connection

Activity 1: Wired v Wireless networks

Difficulty level:

Tick one box in each row to identify if the statement matches with a Wired connection or Wireless connection.

Description	Wired	Wireless
More likely to be affected by interference.		
Shorter transmission range before data is lost.		
Bluetooth and Wi-Fi are common examples.		
Ethernet and Fibre optic are common examples.		
Data can be transmitted at a faster speed.		

Topic 1.3.2 – Modes of connection (Answers)

Activity 1: Wired v Wireless networks

Difficulty level:

Tick one box in each row to identify if the statement matches with a Wired connection or Wireless connection.

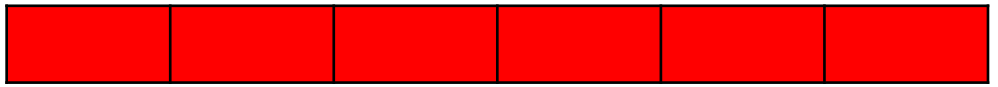
Description	Wired	Wireless
More likely to be affected by interference.		✓
Shorter transmission range before data is lost.		✓
Bluetooth and Wi-Fi are common examples.		✓
Ethernet and Fibre optic are common examples.	✓	
Data can be transmitted at a faster speed.	✓	

Topic 1.3.2 – Modes of connection

Activity 3: Ethernet

Answer the following question

Difficulty level:



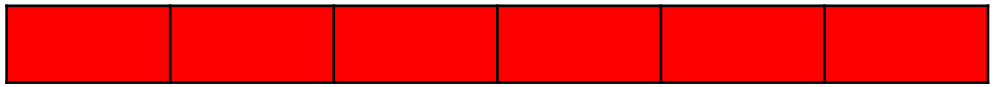
Q1. Describe the characteristics of an Ethernet cable. **(4 marks)**	
Guidance What system is Ethernet part of that determines the rules that should be followed when communicating over a network? What type of transmission does Ethernet use? How does it compare to Wi-Fi when transmitting data? Ethernet is part of which network layer model?	

Topic 1.3.2 – Modes of connection (Answers)

Activity 3: Ethernet

Answer the following question

Difficulty level:



Q1. Describe the characteristics of an Ethernet cable. **(4 marks)**	
Guidance What system is Ethernet part of that determines the rules that should be followed when communicating over a network? What type of transmission does Ethernet use? How does it compare to Wi-Fi when transmitting data? Ethernet is part of which network layer model?	Ethernet is a protocol that uses wired transmission to send data over a network. Ethernet has the ability to transmit more data per second than Wi-Fi is part of the TCP/IP stack.

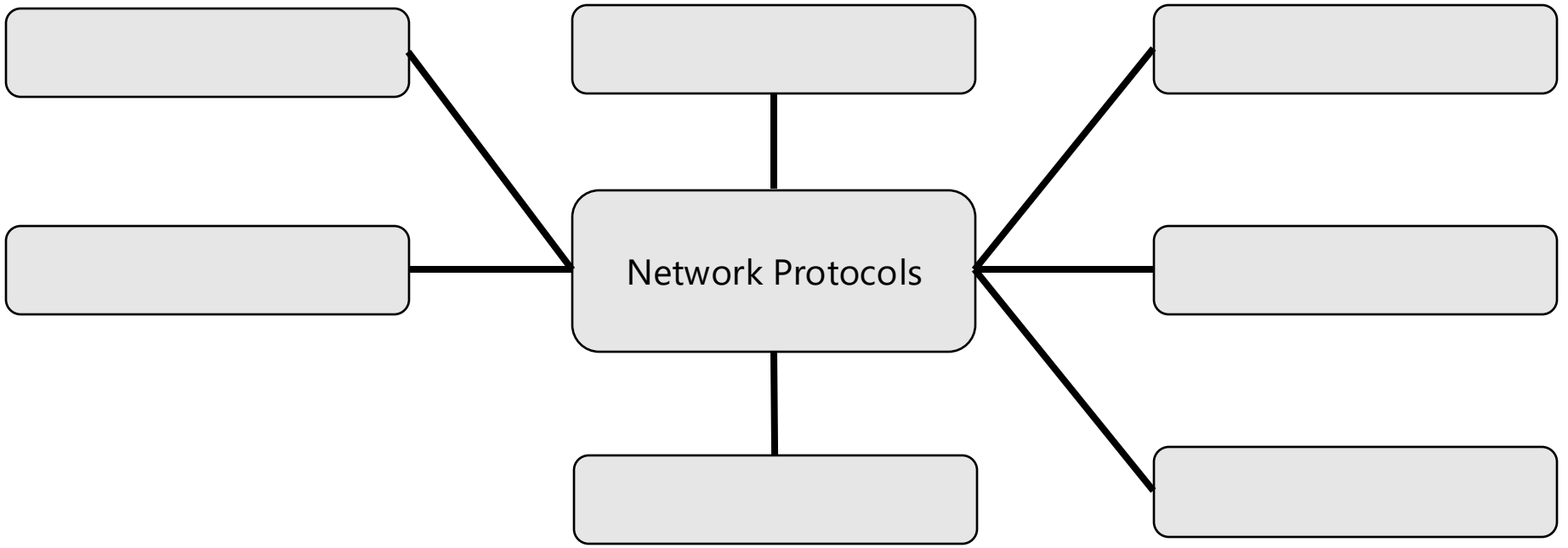
Topic 1.3.2 – Standards

Activity 1: Network protocols

Difficulty level:

Standards allows hardware/software to interact across different manufacturers/producers. This is implanted by a set of rules used to transmit data over a network, known as protocols.

In the mind map below, name each network protocol.



Topic 1.3.2 – Standards (Answers)

Activity 1: Network protocols

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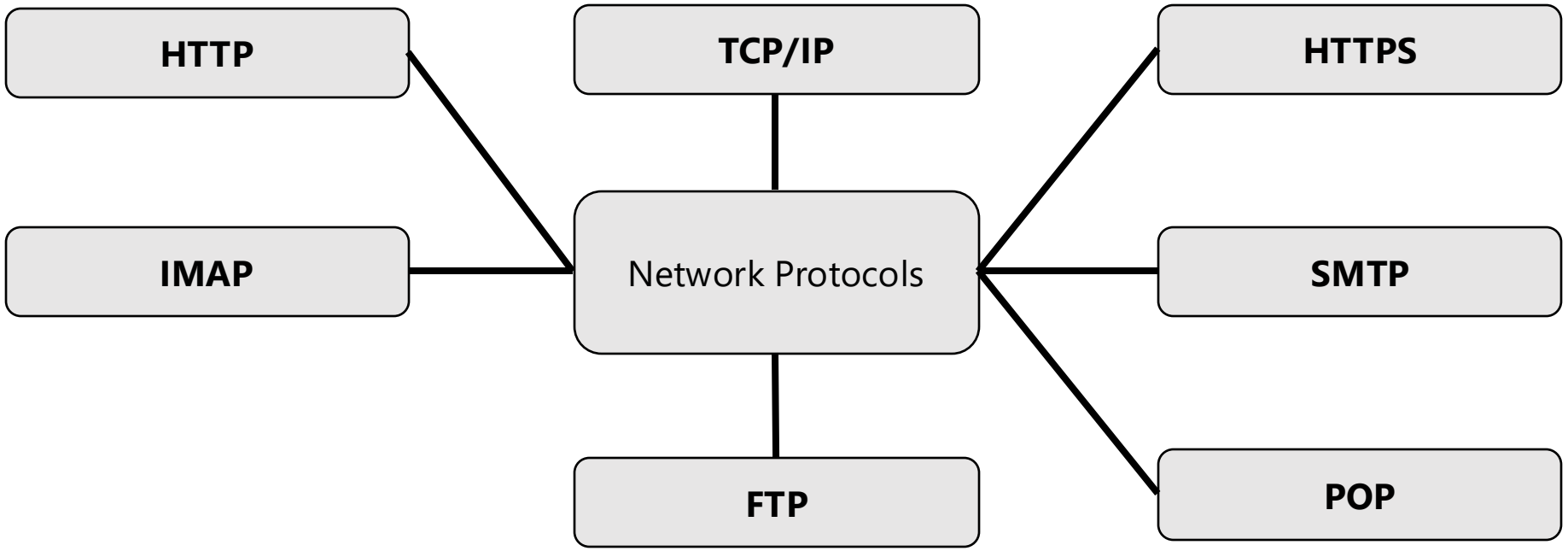


Topic 1.3.2 – Standards

Activity 2: The purpose of network protocols

Difficulty level:

Tick one box in each row to identify which description best fits each protocol.

Description	POP	IMAP	FTP	HTTP	HTTPS	SMTP	TCP/IP
Data sent between web browser and server which may not be encrypted.							
Data sent between web browser and server securely using encryption.							
Transfer files between computers.							
To send emails.							
To retrieve/store emails on a device.							
To retrieve/store emails on a server.							
Data packets sent to the intended location.							

Topic 1.3.2 – Standards (Answers)

Activity 2: The purpose of network protocols

Difficulty level:

Tick one box in each row to identify which description best fits each protocol.

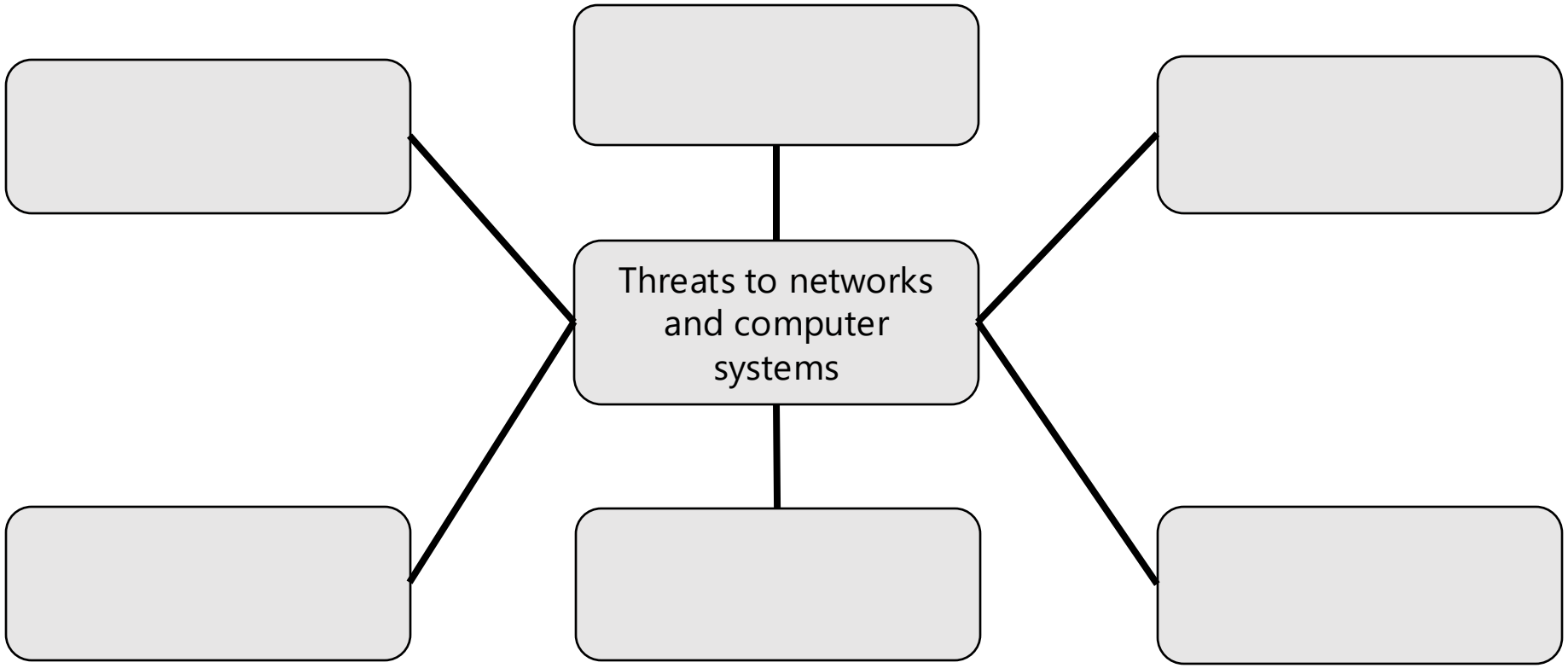
Description	POP	IMAP	FTP	HTTP	HTTPS	SMTP	TCP/IP
Data sent between web browser and server which may not be encrypted.				✓			
Data sent between web browser and server securely using encryption.					✓		
Transfer files between computers.			✓				
To send emails.						✓	
To retrieve/store emails on a device.	✓						
To retrieve/store emails on a server.		✓					
Data packets sent to the intended location.							✓

Topic 1.4.1 – Network threats

Activity 1: Threats to networks and computer systems

Difficulty level:

In the mind map below, identify different threats posed to computer systems and networks.

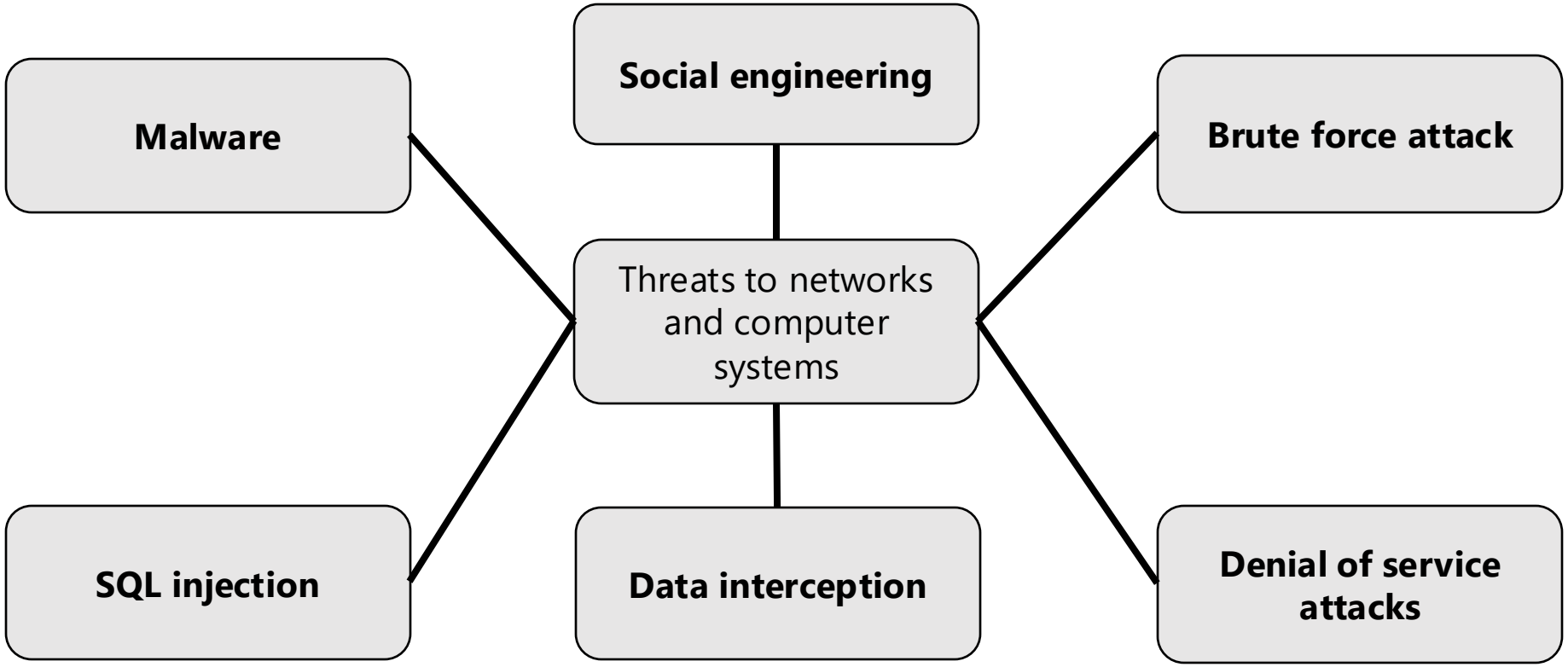


Topic 1.4.1 – Network threats (Answers)

Activity 1: Threats to networks and computer systems

Difficulty level:

In the mind map below, identify different threats posed to computer systems and networks.



Topic 1.4.1 – Network threats

Activity 2: The purpose of different attacks

Describe how each network threat works.

Difficulty level:

Threat:	Threat:	Threat:	Threat:	Threat:	Threat:
How does it work?	How does it work?	How does it work?	How does it work?	How does it work?	How does it work?

Topic 1.4.1 – Network threats (Answers)

Activity 2: The purpose of different attacks

Describe how each network threat works.

Difficulty level:

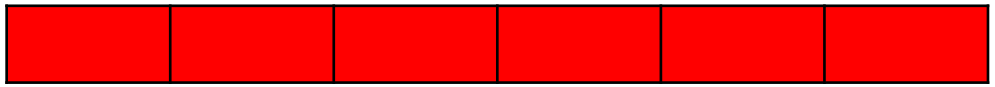
Threat: **Malware**	Threat: **Social engineering**	Threat: **Brute force attack**	Threat: **Denial of service attack**	Threat: **SQL injection**	Threat: **Data interception**
How does it work? **Intrusive software that is design to cause harm to computers and networks.**	How does it work? **A manipulation technique that exploits human error to gain private information.**	How does it work? **Automated software that uses a trial and error method to try as many different password combinations in a given time.**	How does it work? **Bots are used to flood servers with useless requests until they become unresponsive.**	How does it work? **Allows an attacker to interfere with the queries that an application makes to its database.**	How does it work? **The use of packet analysers (packet sniffers) These are used to intercept data packets on a network.**

Topic 1.4.1 – Network threats

Activity 3: Case study

A local hospital stores hundreds of patients details on it's network. The hospital have employed an ethical hacker because they're concerned about the security of it's patients sensitive medical data.

Difficulty level:



Q1. Identify **three** errors that the hospital's staff could make, that may endanger the security of the network and outline a procedure that could be put in place to prevent each error. **(6 marks)**	
Guidance: 3 marks for errors, 3 marks for prevention strategies **1-2 marks** What could staff use to transport data from one device to another? How could this be prevented? **3-4 marks** What could staff download from the internet? How could this be prevented? **5-6 marks** How can unauthorised users gain access to the computers? How could this be prevented?	

Topic 1.4.1 – Network threats (Answers)

Activity 3: Case study

A local hospital stores hundreds of patients details on it's network. The hospital have employed an ethical hacker because they're concerned about the security of it's patients sensitive medical data.

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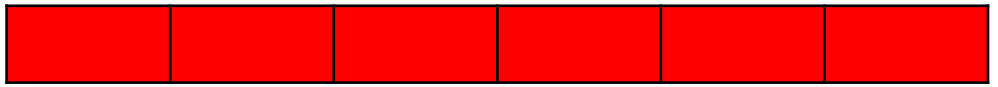


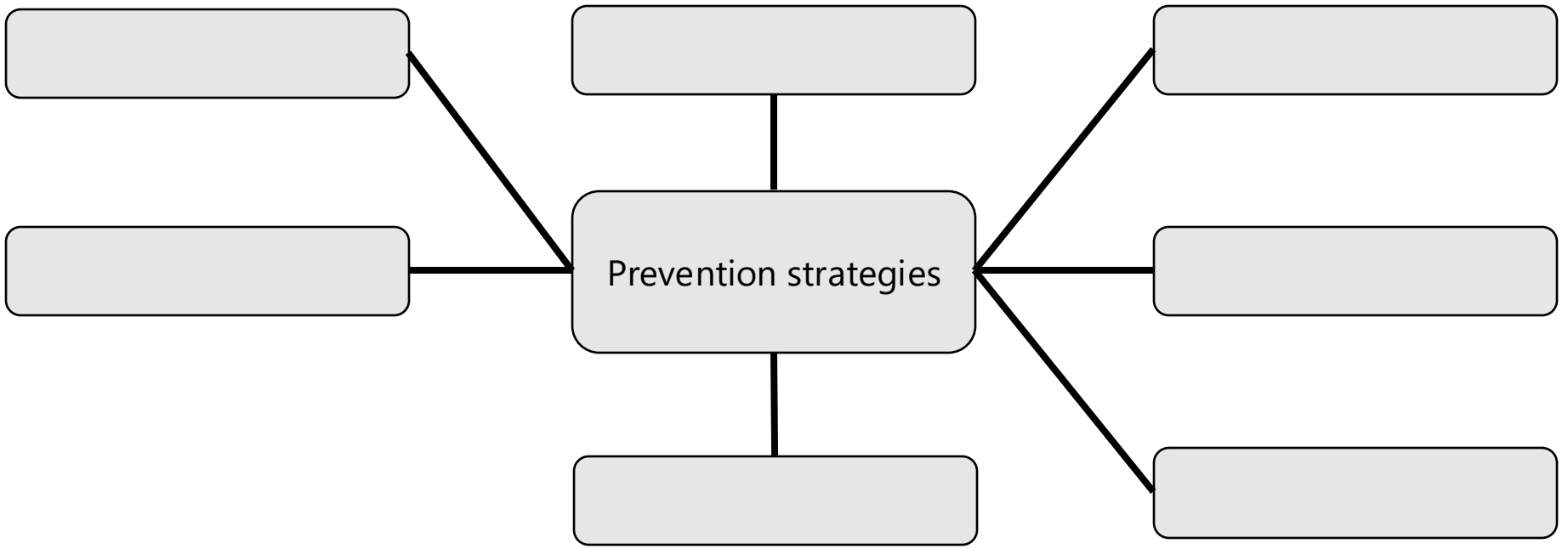
Q1. Identify **three** errors that the hospital's staff could make, that may endanger the security of the network and outline a procedure that could be put in place to prevent each error. **(6 marks)**	
Guidance: 3 marks for errors, 3 marks for prevention strategies **1-2 marks** What could staff use to transport data from one device to another? How could this be prevented? **3-4 marks** What could staff download from the internet? How could this be prevented? **5-6 marks** How can unauthorised users gain access to the computers? How could this be prevented?	Brings in files via any medium such as a USB flash drive/CD and one procedure could be to stop external devices being used on the network. Downloading infected files from the internet and this can be prevented by blocking/restricting access to secure websites. Allowing physical access to the hospital's network which can be prevented by locking of doors, key cards or any physical security procedure.

Topic 1.4.2 – Identifying & preventing vulnerabilities

Activity 1: Prevention strategies

In the mind map below, name each prevention strategy.

Difficulty level:

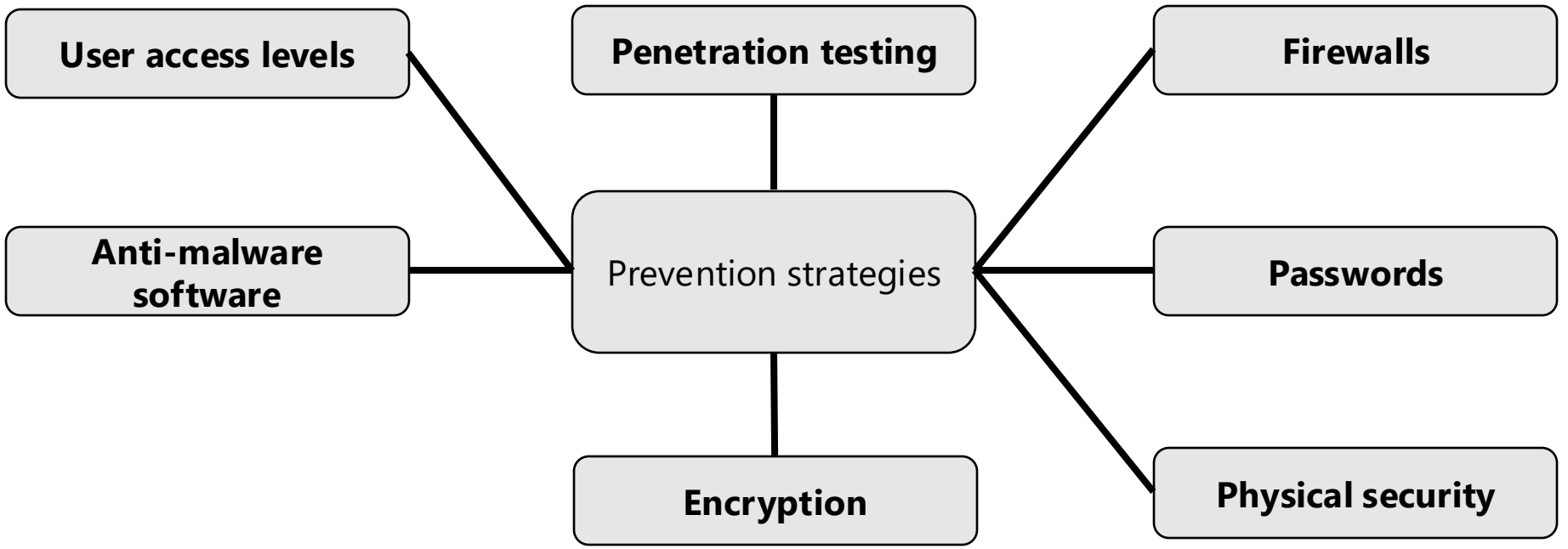


Topic 1.4.2 – Identifying & preventing vulnerabilities (Answers)

Activity 1: Prevention strategies

Difficulty level:

In the mind map below, name each prevention strategy.



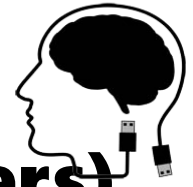
Topic 1.4.2 – Identifying & preventing vulnerabilities

Activity 2: The purpose of each prevention strategy

Difficulty level:

Describe how each prevention strategy works.

Prevention:	Prevention:	Prevention:	Prevention:	Prevention:	Prevention:
How does it work?	How does it work?	How does it work?	How does it work?	How does it work?	How does it work?



Topic 1.4.2 – Identifying & preventing vulnerabilities (Answers)

Activity 2: The purpose of each prevention strategy

Describe how each prevention strategy works.

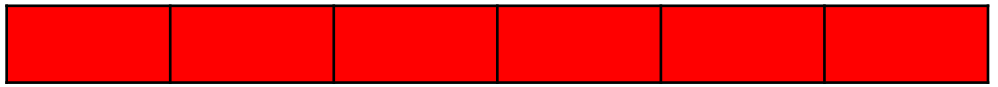
Difficulty level:

Prevention: **User access levels**	Prevention: **Encryption**	Prevention: **Penetration testing**	Prevention: **Passwords**	Prevention: **Physical security**	Prevention: **Firewalls**
How does it work? **When a user is allocated account, certain levels of permissions may be set to restrict access to files.**	How does it work? **Uses an algorithm to scramble data in order to make it unreadable.**	How does it work? **The use of an ethical hacker to purposely test network vulnerabilities and provide feedback.**	How does it work? **To authenticate the identify of a user. Passwords are typically made up of letters, numbers and symbols.**	How does it work? **The protection of personnel, hardware, software, networks and data from physical actions.**	How does it work? **To monitor data coming in and out of a computer.**

Topic 1.4.2 – Identifying & preventing vulnerabilities

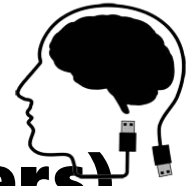
Activity 3: How to identify and prevent vulnerabilities.

Difficulty level:



Using the network threats provided, suggest a suitable strategy that will identify and/or prevent this form of attack.

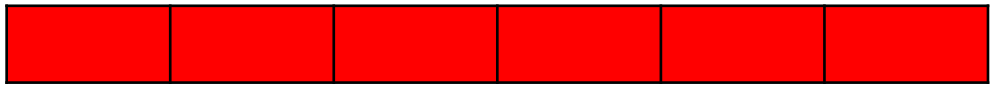
Threat	**How to identify/prevent vulnerability.**	**Justification**
Malware		
Social engineering		
Brute force attack		
Data interception		
SQL injection		
Denial of service attack		



Topic 1.4.2 – Identifying & preventing vulnerabilities (Answers)

Activity 3: How to identify and prevent vulnerabilities.

Difficulty level:



Using the network threats provided, suggest a suitable strategy that will identify and/or prevent this form of attack.

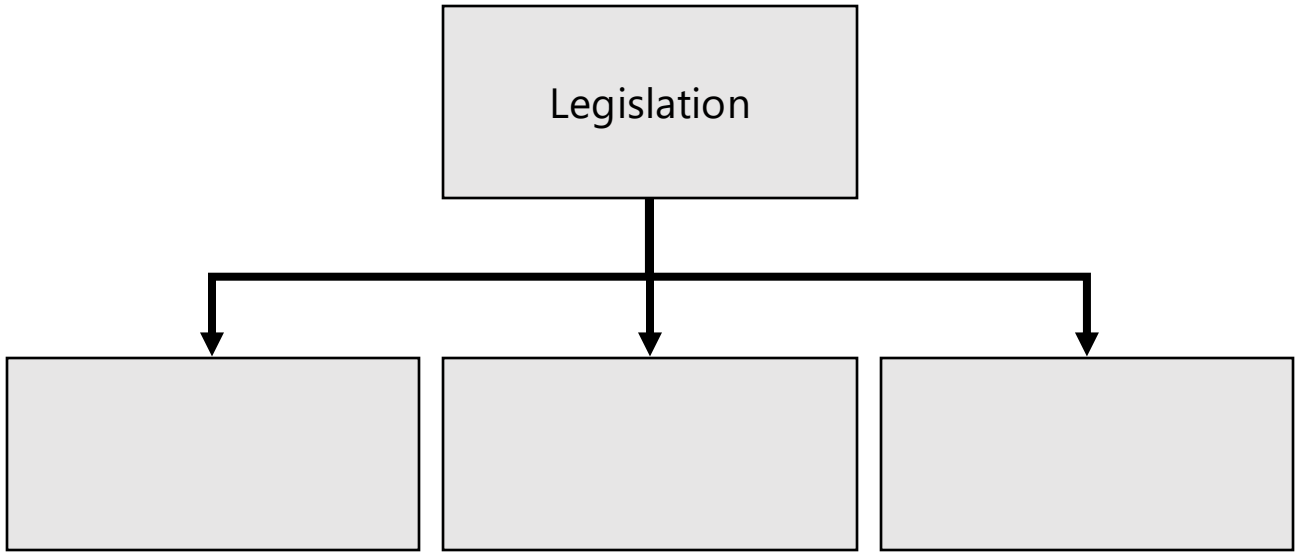
Threat	**How to identify/prevent vulnerability.**	**Justification**
Malware	Anti-malware software	An anti malware immediately separates malicious software from legitimate applications to prevent damage on the computer.
Social engineering	Don't click on suspicious links.	This form of threat requires no coding knowledge so may extract personal information using phishing techniques.
Brute force attack	Strong password	The software is unlikely to guess a password combination that has a combination of letters, numbers and symbols.
Data interception	Encryption	Packet sniffers will find it difficult to intercept data packets that are encrypted because
SQL injection	Penetration testing	Employing an ethical hacker with knowledge of databases will be able to check for vulnerabilities.
Denial of service attack	Firewall	This can be used to monitor data coming in and out of the network and can scan for a sudden increase in traffic.

Topic 1.6.1 – Legislation relevant to Computer Science

Activity 1: Concept map

Difficulty level:

Complete the concept below to the three types of legislation you need to know for this course.

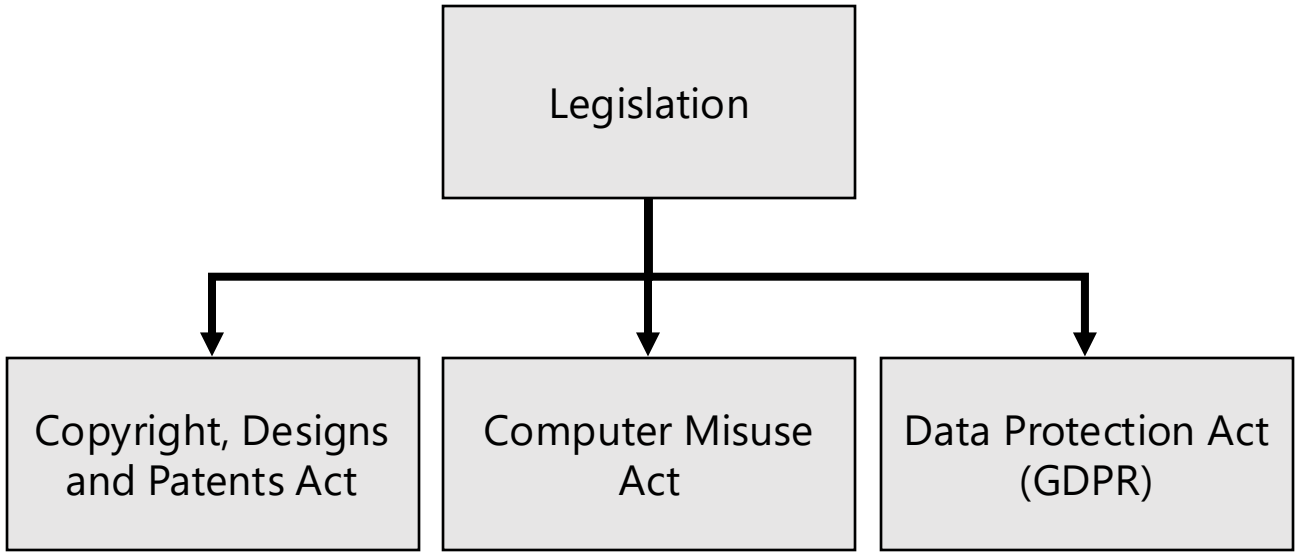


Topic 1.6.1 – Legislation relevant to Computer Science (Answers)

Activity 1: Concept map

Difficulty level:

Complete the concept below to identify two types of software licences and the three types of legislation you need to know for this course.

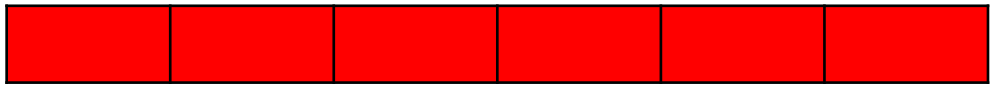


Topic 1.6.1 – Legislation relevant to Computer Science

Activity 3: Legislation

Answer the following questions below on legislation.

Difficulty level:



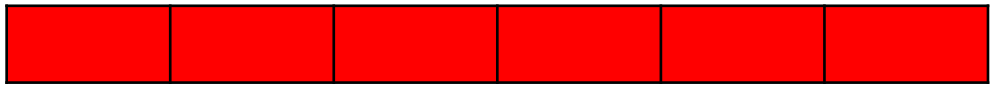
	Copyright, Designs and Patents Act	Computer Misuse Act	Data Protection Act
Purpose			
What is prohibited?			

Topic 1.6.1 – Legislation relevant to Computer Science (Answers)

Activity 3: Legislation

Answer the following questions below on legislation.

Difficulty level:



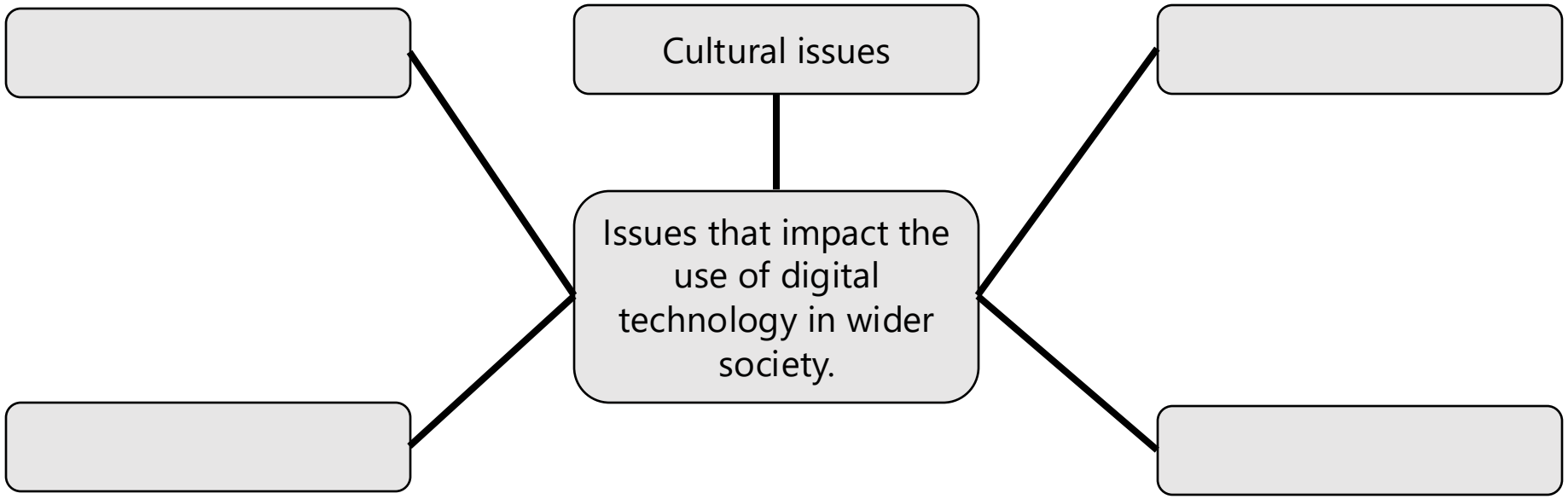
	Copyright, Designs and Patents Act	Computer Misuse Act	Data Protection Act
Purpose	The legal right to protect the original work of the people whom it may belong to.	An act to make provision for securing computer material against unauthorised access.	It controls how your personal information is used by organisations, businesses or the government.
What is prohibited?	The use of protected material such as books, films, software etc without owner's permission. This is known as copyright infringement.	Unauthorised access to computer material, with intent to commit an offence, cause risk/damage, obtaining information and impair operations.	Data only used for it's intended purpose. Only collecting data that is needed. Data collected is accurate and up to date. Data must be stored securely. Data should only be kept as long as it's needed.

Topic 1.6.1 – Impact of digital technology

Activity 1: Introduction

Difficulty level:

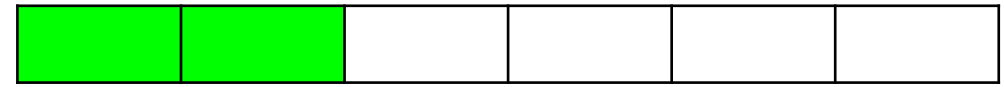
In the mind map below identify the issues that you may be asked to discuss in the examination. The first one has been done for you.



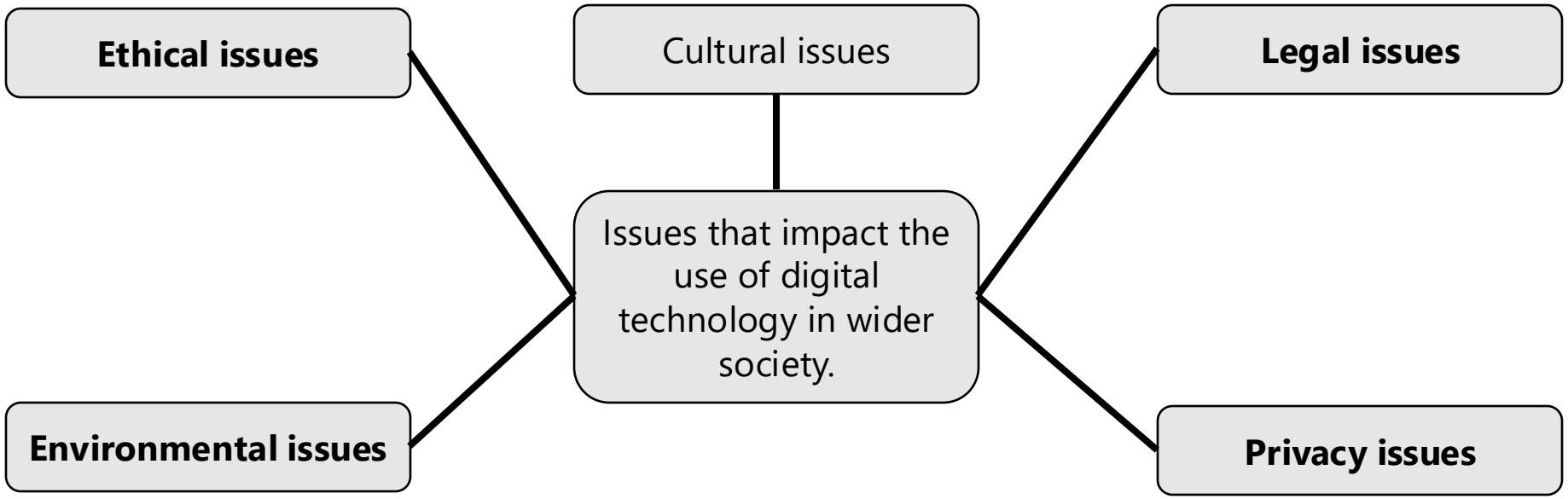
Topic 1.6.1 – Impact of digital technology (Answers)

Activity 1: Introduction

Difficulty level:



In the mind map below identify the issues that you may be asked to discuss in the examination. The first one has been done for you.



Topic 1.6.1 – Impact of digital technology

Activity 2: Understanding the issues

Difficulty level:

In each box below, list some examples that are directly impacted by technology.

Cultural issues	Legal issues	Environmental issues	Ethical issues	Privacy issues
Examples:	Examples:	Examples:	Examples:	Examples:

Topic 1.6.1 – Impact of digital technology (Answers)

Activity 2: Understanding the issues

Difficulty level:

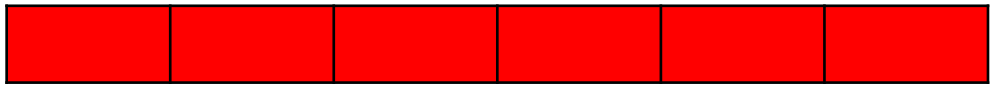
In each box below, list some examples that are directly impacted by technology.

Cultural issues	Legal issues	Environmental issues	Ethical issues	Privacy issues
Examples: **Digital divide** **Online services** **Censorship** **Software not developed to cater for other cultures**	Examples: **Copyright, Designs and Patents Act** **Computer Misuse Act** **Data Protection Act**	Examples: **E-waste** **Energy consumption** **Recycling**	Examples: **Impact technology has on mental health** **Regulation of media products** **Recording DNA at birth.**	Examples: **Tracking (GPS, phone masts)** **Facial recognition technology** **Internet browsing history** **Smart devices**

Topic 1.6.1 – Impact of digital technology

Activity: 8 mark question

Difficulty level:



Gerry is a Computer Science teacher and has developed a website for GCSE Computer Science where they can access content linked to the specification. The students will have an individual account that they can log into so they can download course material, use the student forum and participate in revision quizzes in which their progress is tracked. **(8 marks)**

When approach an extended writing question of this nature, you need to focus on the bullet points. In this case there are 4 bullet points. As this is an 8-mark question you should treat these are 4 2-mark questions.

Discuss a wide range factors Gerry must consider when setting up the website. In your answer you might consider the following:

- Students
- Technology
- Ethical issues
- Legal issues

2 FOR STUDENTS

2 FOR TECHNOLOGY

2 FOR ETHICAL ISSUES

2 FOR LEGAL ISSUES

Topic 1.6.1 – Impact of digital technology

Activity: 8 mark question

Difficulty level:

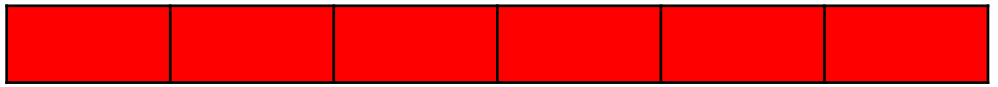
2 FOR STUDENTS **2 FOR TECHNOLOGY** **2 FOR ETHICAL ISSUES** **2 FOR LEGAL ISSUES**

Students How will the development of the website have a positive impact on their education? How will the development of the website have a negative impact on their education?	
Technology What do students have access to in terms of devices? How might these devices impact how they have access to this information?	

Topic 1.6.1 – Impact of digital technology (Exemplar)

Activity: 8 mark question

Difficulty level:



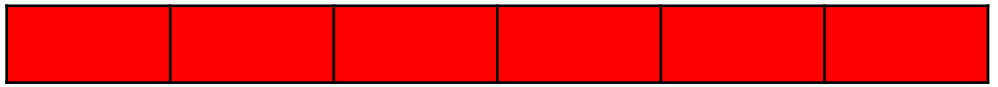
2 FOR STUDENTS **2 FOR TECHNOLOGY** **2 FOR ETHICAL ISSUES** **2 FOR LEGAL ISSUES**

Students How will the development of the website have a positive impact on their education? How will the development of the website have a negative impact on their education?	This is good for students because they're able to access material on the go and no need to purchase text books as they can download the all the material as long as they have access to it via an internet connection. One disadvantage is that students might become too reliant on this to complete classwork and plagiarise, claiming the work is their own.
Technology What do students have access to in terms of devices? How might these devices impact how they have access to this information?	Gerry would need to make sure that the website is accessible on all devices. Not all students own desktop computers or laptops and maybe more inclined to use portable technology, such as smartphones and tablets to access this information. It's important that all the content is compatible and can be viewed across multiple devices.

Topic 1.6.1 – Impact of digital technology

Activity: 8 mark question

Difficulty level:



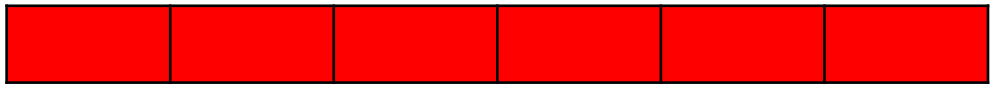
2 FOR STUDENTS **2 FOR TECHNOLOGY** **2 FOR ETHICAL ISSUES** **2 FOR LEGAL ISSUES**

Legal issues Copyright? Data Protection Act? Students need to login – is this a problem?	
Structure of the network Cyberbullying How would parents feel? Digital divide Risk of students misusing it.	

Topic 1.6.1 – Impact of digital technology (Exemplar)

Activity: 8 mark question

Difficulty level:



2 FOR STUDENTS **2 FOR TECHNOLOGY** **2 FOR ETHICAL ISSUES** **2 FOR LEGAL ISSUES**

Legal issues Copyright? Data Protection Act? Students need to login – is this a problem?	Gerry must make sure that he requests use of copyrighted material. He may have to request permission to use it and ensure that the original creators' conditions are met. For example, the original creator might want to be credited on the website or cite a source that re-directs users back to the original. He also has to be aware of potential attacks on the website as this could lead to unauthorised access to student's personal data that will be hidden behind their login credentials.
Structure of the network Cyberbullying How would parents feel? Digital divide Risk of students misusing it.	There is plenty opportunity for the technology to be misused and in particular forums might become the hotspot for cyberbullying and the communication of inappropriate material. Students would need to sign a code of conduct which would act as an acceptable use policy on how to use the website appropriately.