

Computer Science Home Work Plan

YR 7/Cs	DUE	Yr8/Cs	DUE	YR 9/Cs	DUE	YR 10Cs	DUE	YR 11Cs	DUE
W/B: 4/11 Using example, explain what an algorithm is.	W/E : 11/11	W/B: 4/11 Research on: 1. Alan Turning 2. Sir Tim-Berners-Lee	W/E : 11/11	W/B: 4/11 Homework booklet(Topic: Memory) Q 1 & 2	W/E : 11/11	W/B: 4/11 Homework 1 from knowledge organiser and homework booklet.	W/E : 11/11	W/B: 4/11 End of topic questions on operating systems.	W/E : 11/11
W/B: 11/11 .Create a poster that explains the use of shapes in maths, art and computing.	W/E 18/11	W/B: 11/11 ,Look up the following: 1. HTML 2. WWW 3. Internet	W/E 18/11	W/B: 11/11 Booklet Q3 - 5	W/E 18/11	W/B: 11/11 Homework 2 from knowledge organiser and homework booklet.	W/E 18/11	W/B: 11/11 End of topic questions on Von Newmann Architecture/functions of CPU	W/E 18/11
W/B: 18/11 Research on the artist: -	W/E 25/11	W/B: 18/11 Prepare a webpage	W/E 25/11	W/B: 18/11 Booklet Q6	W/E 25/11	W/B: 18/11 Homework 3 from knowledge	W/E 25/11	W/B: 18/11	W/E 25/11

Mondrain & Theo Van Doesburg.		template on Sir Tim Berners-Lee.				organiser and homework booklet.		Questions on computer memory	
W/B:25/11 Take away homework.	W/E 2/12	W/B:25/11 At least two paragraphs of who George Boole is and why he is important.	W/E 2/12	W/B:25/11 Topic: Storage Q 1- 3	W/E 2/12	W/B:25/11 Homework 4 from knowledge organiser and homework booklet.	W/E 2/12	W/B:25/11 End of topic questions on Data storage.	W/E 2/12
W/B:2/12 Explain how to solve Mondrain problem by breaking up into parts.	W/E 09/12	W/B:2/12 Worksheet on Charles Babbage task 1,	W/E 09/12	W/B:2/12 Booklet (System Architecture) Q 1 & 2	W/E 09/12	W/B:2/12 Homework 5 from knowledge organiser and homework booklet.	W/E 09/12	W/B:2/12 End of topic questions on Introduction to computer Networks.	W/E 18/10
W/B:09/12 Takeaway homework extra mild and mild medium task.	W/E 6/01/20	W/B:09/12 Worksheet on Charles Babbage task 2 and 3,	W/E 6/01/20	W/B:09/12 Booklet Q 3 & 4	W/E 6/01/20	W/B:09/12 Quiz on functions and characteristics of CPU.	W/E 6/01/20	W/B:09/12 Questions of Network Protocols & Layers/Network Topologies	W/E 6/01/20

W/B: Week beginning

W/E: Week ending.

Memory

1. Ann wants to purchase a new computer and is looking at two models. The specification of the CPU in each computer is shown in **Fig. 1**.

Fig. 1

Computer 1	Computer 2
Clock Speed: 1 GHz	Clock Speed: 1.4 GHz
Cache size: 2 MB	Cache size: 2 MB
Number of Cores: 4	Number of Cores: 2

Identify **two** internal components that are not in **Fig. 1**, which could improve the performance of the computers.

[2]

2. Gareth has a satellite navigation system (Sat Nav) in his car that uses RAM and ROM.

Fig. 2 lists some characteristics of computer memory. Tick (✓) **one** box in each row to show whether each of the statements is **true** for the RAM or ROM in Gareth's Sat Nav.

Fig. 2

	RAM	ROM
Stores the boot up sequence of the Sat Nav.		
The contents are lost when the Sat Nav is turned off.		
Holds copies of open maps and routes.		

[3]

3(a). Bob's computer has 512 kilobytes of ROM and 8 gigabytes of RAM.

i. Describe the purpose of the ROM in Bob's computer.

ii. Describe the purpose of the RAM in Bob's computer.

[4]

- (b). State **one** difference between ROM and RAM, other than the size and the purpose.

[1]

- 4(a). A computer has 1024 megabytes of RAM.

State **two** items that will be stored in the RAM.

1

2

[2]

- (b). The A computer sometimes uses virtual memory.

Describe what is meant by virtual memory **and** state why it is needed.

[3]

- 5(a). Dipesh is thinking of buying a tablet computer to replace his old desktop computer.
Describe how the CPU and RAM work together to enable the tablet computer to operate.

[3]

- (b). The tablet computer also uses cache memory. Describe the purpose of cache memory.

[2]

6. The computer will only have 2GB of RAM, but Alicia says that virtual memory can be used instead of adding more RAM. A computer only has 2GB of RAM. Alicia says that virtual memory can be used instead of adding more RAM. etc.

- i. Explain how virtual memory can compensate for the lack of RAM in Alicia's computer.

[3]

- ii. Explain why it would be beneficial for Alicia to get more RAM instead of relying on virtual memory.

[2]

Storage

- 1(a). Vicky has been on holiday and has taken lots of photos. The memory in her camera is now full and she needs to transfer her photos to an external secondary storage device.

Define what is meant by 'secondary storage'.

[1]

- (b). Identify the **three** common storage technologies Vicky can choose from.

[3]

- (c). State **four** characteristics of secondary storage devices that Vicky should consider when choosing a device.

[4]

2(a). Apu has a handheld e-book reader that allows him to store and read electronic books.

Types of secondary storage devices are magnetic, optical or solid state.

i. State which type of storage is most suitable for storing the electronic books inside the e-book reader.

[1]

ii. Explain **one** reason why this type of storage is the most suitable.

[2]

(b). Apu gets a free e-book on a CD-ROM from a magazine.

i. Give **two** reasons why a CD-ROM is suitable in this case.

1

2

[2]

ii. State whether a CD-ROM is magnetic, optical or solid state storage.

[1]

3. A computer has 1024 megabytes of RAM.

How many gigabytes of RAM does the computer have?

[1]

4(a). Most computer systems use at least one storage device.

Explain **one** reason why a secondary storage device is needed in most computer systems.

[2]

(b). * Some secondary storage devices are magnetic and others are solid state.

Describe the characteristics of magnetic and solid state secondary storage.

The quality of written communication will be assessed in your answer to this question.

Systems Architecture

- 1(a). Ann wants to purchase a new computer and is looking at two models. The specification of the CPU in each computer is shown in **Fig. 1**.

Fig. 1

Computer 1	Computer 2
Clock Speed: 1 GHz	Clock Speed: 1.4 GHz
Cache size: 2 MB	Cache size: 2 MB
Number of Cores: 4	Number of Cores: 2

When running a 3D flight simulator, Computer 1 is likely to run faster than Computer 2.

Using the information in **Fig. 1**, identify **one** reason for this.

[1]

- (b). Explain **one** reason why the cache size affects the performance of the CPU.

[2]

- (c). Identify **four** events that take place during the fetch-execute cycle.

[4]

- 2(a). Gareth has a satellite navigation system (Sat Nav) Gareth's Sat Nav which contains an embedded system. Define what is meant by an 'embedded system'.

[1]

- (b). Identify **three** devices, other than a Satellite Navigation system, that contain embedded systems.

[3]

3. Here are some statements about the CPU of a computer.
Tick **one** box in each row to show whether each of the following statements is true or false.

Statement	True	False
CPU stands for Central Processing Unit.		
The CPU fetches and decodes instructions.		
The speed of a CPU is usually measured in GigaHertz (GHz).		
If a CPU has many cores, this slows down the computer.		
The hard disk drive is part of the CPU.		

[5]

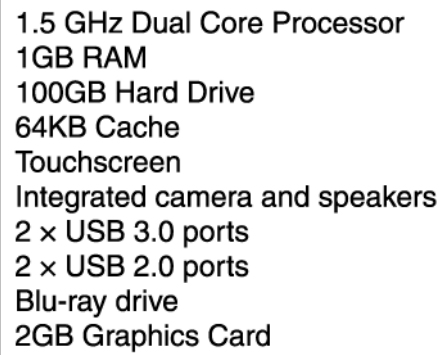
- 4(a). Dipesh is thinking of buying a tablet computer to replace his old desktop computer.
Describe how the CPU and RAM work together to enable the tablet computer to operate.

[3]

- (b). The tablet computer also uses cache memory. Describe the purpose of cache memory.

[2]

5(a). Quinn's current computer specification is shown in Fig. 4.



1.5 GHz Dual Core Processor
1GB RAM
100GB Hard Drive
64KB Cache
Touchscreen
Integrated camera and speakers
2 × USB 3.0 ports
2 × USB 2.0 ports
Blu-ray drive
2GB Graphics Card

Fig. 4

Describe the benefits of a dual core processor over a single core processor.

[2]

(b). Quinn is considering upgrading the RAM.

i. Describe **two** differences between RAM and ROM.

Difference

1

Difference

2

[4]

ii. Quinn has decided to upgrade the RAM on his computer. Explain why this would improve the computer's performance.

[2]

iii. *After upgrading the RAM, Quinn could make further changes to improve his computer's performance.

Identify the changes and explain how these changes would improve performance.

The quality of your written communication will be assessed in your answer.

[6]

6(a). Alicia has designed a computer using Von Neumann architecture.

Describe the purpose of **two** registers that are used by Von Neumann architecture.

1

2

[4]

- (b). The CPU has a clock speed of 3.8 GHz.
A CPU has a clock speed of 3.8 GHz. etc.
Describe what is meant by a clock speed of 3.8 GHz.

[2]

- (c). Alicia says:
“My computer has a quad-core processor, so it will run twice as fast as a computer with a dual-core processor”.

Explain why this statement is not always true.

[3]

Data Representation

1(a). Order the following units from smallest to largest:

GB bit PB byte nibble MB

[1]

(b). Convert the decimal number 191 into an 8 bit binary number.

[1]

(c). Convert the hexadecimal number 3E into a decimal number. You must show your working.

[2]

(d). i. Add together the following two 8 bit binary numbers. Express your response in an 8 bit binary form.

01101010

10010110

- ii. Identify the problem this addition has created.

2(a). Numbers can be represented in denary, binary or hexadecimal.

- i. Convert the binary number 01101001 to denary, showing your working.

[2]

- ii. Convert the denary number 154 to binary.

[2]

- (b). The security code for an alarm system is a long binary number which begins
10001111100101111011 ...

The technicians prefer to use hexadecimal to enter the security code.

- i. When the number is converted into hexadecimal, the first two digits are 8F as shown below.

Complete the gaps to show the next three digits.

Binary:	1000	1111	1001	0111	1011
Hexadecimal:	8	F

[3]

- ii. Explain why the technicians prefer to use hexadecimal.

[2]

3. The number 62 could be a denary number or a hex number.

- i. If 62 is a hex number, calculate its value as a denary number.

You **must** show your working.

[2]

- ii. If 62 is a denary number, calculate its value as a hex number.

You **must** show your working.

[2]

4. Convert the decimal number 191 into 8-bit binary.

[1]

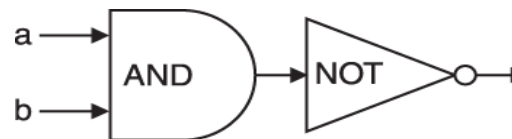
Computational Logic

1. Complete the truth table below for the Boolean statement $p = \text{NOT } (A \text{ AND } B)$.

A	B	P
FALSE	FALSE	TRUE
FALSE	TRUE	
TRUE	FALSE	
TRUE	TRUE	FALSE

[2]

2. The following logic diagram shows the expression $\text{NOT } (a \text{ AND } b)$.



Complete the missing boxes in the truth table below to show the value of $\text{NOT } (a \text{ AND } b)$ that will be output for each possible set of values of a and b .

a	b	NOT (a AND b)
0	0	1
0		1
1	0	

[4]

3. The logic diagram below (Fig. 2) shows a system made up of two connected logic gates.

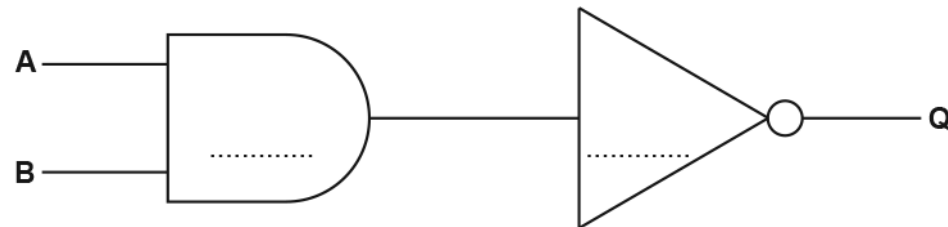


Fig.2

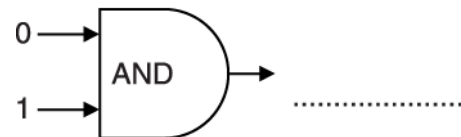
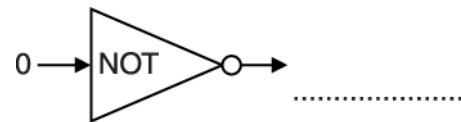
[2]

- (i) Label the names of the two gates on the diagram above.
- (ii) Complete the truth table below to show the output from this logic system.

A	B	Q
0	0	
0	1	
1	0	
1	1	

[4]

4(a). State the output of each of the following logic circuits for the inputs given.



[2]

(b). Fig. 1 is a circuit diagram.

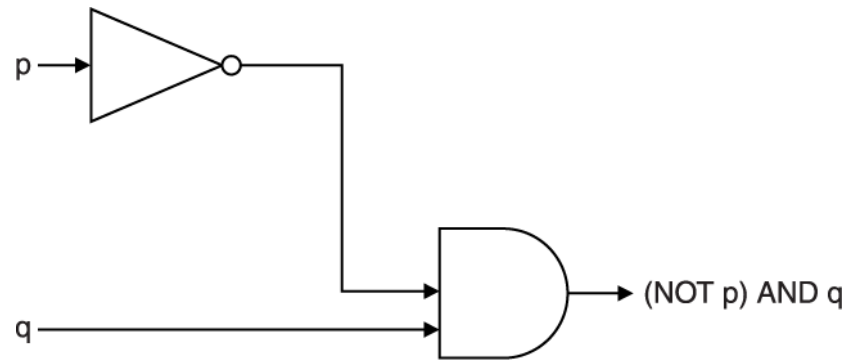


Fig. 1

Complete the truth table for Fig. 1.

p	q	(NOT p) AND q
0	0	0
1	0	0



[DOCUMENT TITLE]

[Document subtitle]



Set week A.

Due week B

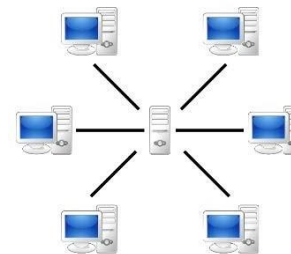
GCSE Computer Science

Knowledge Organiser --Networks

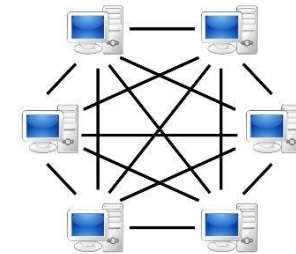
Key vocabulary	
Network	A collection of computer systems that are linked together and can share data.
Node	A device connected to a network via a link.
Links	The interface on which multiple devices can communicate. Such as a cable or wireless.
Client	A client is a piece of computer hardware or software that accesses a service made available by a server.
Server	A server is an instance of a computer program that accepts and responds to requests made by another program, known as a client.

Network Scale	
LAN	A Local Area Network. All devices are connected on one site. The network may be in a single building or campus or group of buildings in a small area. Management and maintenance is usually completed by a group of network engineers.
WAN	A Wide Area Network. Typically covers a large geographical area, talking in many cities or worldwide. The connections are typically provided by a telecoms company such as BT. The largest example of a WAN is the internet. A WAN connects multiple LAN networks.
PAN	Personal Area Network. Personal devices are often connected to each other in a home or a car.
WLAN	Wireless LAN
MAN	Metropolitan Area Network. Devices are connected in a city. Not commonly used as many devices now use the internet.
SAN	Storage Area Network where multiple servers provide a large-scale storage facility.

Network Organisation	
Client – Server	One or more computers are designated as servers, providing a service to clients on a network.
Peer-to-peer	A distributed system where functionality can be divided among the nodes on the network. All computers have an equal status and may partially act as a server to other devices. Peers are both suppliers and users of network data and services.



Server-based



P2P-network



Homework 1: learn all 5 terms in the Key Vocabulary box, and answer the first 2 questions below. You will be expected to remember the terms for a test in week B.

1. Zoe is organising a LAN-party. Her friends will each bring a computer to the party so that they can play games against each other.

Describe what is meant by a Local Area Network (LAN).

2.

A company, OCR Supermarkets, has supermarket stores throughout the country. The computers for each store connect to the central office using a Wide Area Network (WAN).

Identify **two** differences between a WAN and a LAN (Local Area Network).

Difference 1:

Difference 2:

Homework 2: learn the first 4 terms in the Network Scale Box, and answer the questions 3 and 4 below. You will be expected to remember the terms for a test in week B.

3. A school has all of its computers in a local area network (LAN).

State **two** benefits of a LAN.

1

2

4. A company, OCR Supermarkets, has supermarket stores throughout the country. The computers for each store connect to the central office using a Wide Area Network (WAN).

OCR Supermarkets use a client-server network to connect the checkout computers to the store's server.

Describe **two** benefits to OCR Supermarkets of using a client-server network instead of a peer-to-peer network.

Benefit 1:

Benefit 2:

Homework 3: learn the last 3 terms in the Network Scale Box, and answer the questions 5 and 6 below. You will be expected to remember the terms for a test in week B.

5. A law firm currently use a Local Area Network (LAN) linked to a Wide Area Network (WAN). They want to upgrade their system to utilise cloud storage.

Define what is meant by a Wide Area Network.

[1]

6. A bank uses a local area network to connect all the computers in its head office.

Computers in the network can be identified using both IP addresses and MAC addresses.

Describe **two** differences between IP addresses and MAC addresses.

Homework 4: learn the all the terms in the Knowledge Organiser Box, and answer the questions 7 and 8 below. You will be expected to remember the terms for a test in week B.

7. Zoe plans to use the star topology in the LAN.

Describe the star topology.

You may use a diagram.

[2]

8. A bank uses a local area network to connect all the computers in its head office.

State **two** ways the local area network can be used to monitor the work of employees.

1

2

[2]

Homework 5: learn the two diagrams and answer the questions 9 and 10 below. You will be expected to remember the diagrams for a test in week B.

9. A school has all of its computers in a local area network (LAN).

Explain **two** measures which the school will need to take to ensure the security of the network.

1

2

[4]

10. A law firm currently use a Local Area Network (LAN) linked to a Wide Area Network (WAN). They want to upgrade their system to utilise cloud storage.

Explain **two** advantages to the law firm of storing their data in the cloud.

[4]