STOKE DAMEREL
Community College

Cycle 2

Computer Science

Year 10

Name: _____

Tutor: _____

Year 10 Homework Timetable

Monday	Bedrock Learning	Ebacc Option D	Option C	Modern Britain
Tuesday	English	Tassomai	Option B	Art Option A
Wednesday	Hegarty	Science	Modern Britain	Option C
Thursday	Ebacc Option D	Tassomai	Bedrock Learning	Option B
Friday	Hegarty	Science	English	

Tassomai - 50 questions per week
Hegarty - 4 tasks of Hegarty per week

Block A	Block B	Block C	Block D
Art	Business Studies	Art	French
Dance	Child Development	Business Studies	Geography
Drama	Catering	Geography	History
Media Studies	Computer Science	Health & Social Care	
Music	Drama	History	
Photography	Health & Social Care	Catering	
	IT	Photography	
	Media Studies	Sport	
	Sociology	Travel & Tourism	
	Sport		

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GREENSHAW LEARNING TRUST

Year 10 Computer Science
Cycle 2

Week Number	Homework Task	Exam Question
1 **15th November**	**Cornell Notes** ● Client-Server Networks ● Types of Servers	Client-Server and Peer-to-Peer networks.
2 **22nd November**	**Cornell Notes** ● Web Hosting ● The Cloud ● Transmission Media	Advantages of using Cloud Storage
3 **29th November**	**Cornell Notes** ● Network Performance: ○ Latency ○ Bandwidth ○ Error rate / collisions	Performance of wireless networks
4 **6th December**	**Cornell Notes** ● Web and Mail Protocols: HTTP, HTTPS, FTP, SMTP, POP, IMAP	Identifying correct protocols.
5 **13th December**	**Cornell Notes** ● TCP / IP Protocol	Explaining the function of protocols.
6 **3rd January**	**Cornell Notes** ● TCP / IP Protocol Stack ● The importance of protocol layers	Explaining what a protocol layer is and the advantages of using layered protocols.
7 and 8 **10th January** **17th January**	**Cornell Notes / Mind Map / Revision Flash Cards** ● All Topics	
9 **24th January**	**Plug the gaps** ● All gaps in knowledge from Assessment.	

Week 1: Client-Server Networks

Client-Server Networks A computer network (such as in a school) could include hundreds of **clients** and dozens of **servers**. Larger networks, such as those seen in banks, hospitals and large Internet business (such as Amazon, Facebook and Google) will have much larger networks.	
Server	A powerful computer that carries out requests from clients on a network. The server waits for requests from a client, processes the request and then sends the requested data back to the client. Examples of servers include file, email and print servers.
Client	A device on a network that makes a request of a server. It will need to wait for a reply from the server, then reply to it. Examples of clients include desktop PCs, laptop PCs, tablets or smartphones.

Types of server	
File Server	holds all the data files (such as documents for all users) and databases and manages backups
Printer Server	may organise printing on different printers. It also manages the queue of 'print jobs' that are waiting to be printed.
Email Server	may receive emails, detect and block spam, distribute emails to users
Web Server	may host the school's external website
Database Server	may hold records of information about customers, students, suppliers, etc.

Week 2: Hosting and The Cloud / Media Types

The Cloud
The 'Cloud' is a term used to refer to services that are delivered over the Internet. Cloud Computing applications include Google Docs / Slides / Sheets or Office 365. It also includes smart-heating apps and Cloud Gaming like Google Stadia

Web Hosting
Web hosting is a service offered by companies that will host web pages and files for websites. The web hosts will often provide database servers so that a company can store data for it's webpage. For example, for an online business that sells products, the web hosting company might allow them to contain a database of products for sale. When a web page is accessed (for example, www.sdcc.net), the client's browser can access the page from the web hosting company.

Advantages of Web Hosting

- Hosts have far more bandwidth, can serve more users
- Web hosts are able to monitor their equipment 24 / 7
- Web hosts will backup web sites remotely
- Setting up a web server can be costly for a small company as they may need to buy equipment and employ a website developer.

Comparison of Media Types

Media Type	Advantages	Disadvantages
Copper Cable (uses electricity)	- tried and trusted technology - relatively inexpensive	- signal affected by electric and magnetic fields - low bandwidth - heavy cables
Fibre Optic (uses light)	- very fast data transmission - low loss of signal over distance - not affected by magnetic or electric fields - require very little power - more difficult to 'tap into' than copper cables	- high investment cost due a need for expensive optical transmitters and receivers
Wireless Transmission (uses radio waves)	- no need for trailing wires (safer) - allows devices to be used anywhere provided there is a signal - easier to add devices to a network	- data transmission rate less than wired systems - signal can be blocked by objects or walls - increased security issues

Week 3: Network Performance

There are several factors that affect performance of a network:	
Bandwidth	The amount of data that can be carried through a connection at a time. Measured in bits per second (b/s, kb/s, mb/s, gb/s)
Latency	The length of time a packet of information takes to travel through the network. Measured in milliseconds (ms). For example, the latency of a satellite phone will be greater than a landline, because the signal has further to travel.
Error rate / collisions	Every time a transmission error occurs, packets have to be resent, which slows down the number of packets sent per second. Transmission errors may occur because of interference, a break in the cable or because two packets have 'collided' because they have been sent by two different nodes on a network at the same time.

Week 4: Web and Mail Protocols (You should also recap Week 1 this week)

Protocol - A set of rules for carrying out a specific task / set of instructions.	
HTTP	**Hypertext Transfer Protocol**. Used for accessing and receiving web pages via the Internet. Web pages are 'scripted' in HTML (Hypertext Markup Language). The protocol requests a web page from the web server. The server then sends its response which contains the web page.
HTTPS	A secure version of the HTTP protocol. Encrypts the information so that it cannot be understood by an eavesdropper. HTTPs is used by many services where you are sending private information such as when you have 'signed in' to a Google account, logged in to Social Media accounts or using online banking.
FTP	**File Transfer Protocol**. Used for sending or retrieving files to or from a FTP server.
SMTP	**Simple Mail Transfer Protocol**. When an email is sent from a computer it will first be sent to a mail server using the SMTP protocol. It is then forwarded on by other SMTP servers. When it reaches the destination mail server it is stored. The user's computer uses POP or IMAP to access the email.
POP	**Post Office Protocol**. Will download every new message to your local device and with them no longer being available on the server – This is similar to the protocol of sending a letter through a post office (the post office doesn't keep your letter once it's passed it on)
IMAP	**Internet Message Access Protocol**.will leave the messages on a server. They can be accessed by multiple devices and they only are removed if the user deletes them.

Week 5: TCP / IP Protocols (You should also recap Week 2 this week)

Transmission over networks uses the TCP / IP protocol stack	
TCP	**Transmission Control Protocol** ● Breaks up messages sent over the Internet into small chunks called packets ● Reassembles the packets at the other end ● Detects errors ● Resends lost messages
IP	**Internet Protocol** ● Routes the individual packets from one IP address to another until it reaches the destination IP.

Week 6: TCP / IP Protocol Stack (You should also recap Week 2 this week)

TCP / IP Protocol Stack The TCP / IP protocol stack is a **group of protocols**. Each protocol is grouped into a layer. Each layer carries out a specific job.	
Application Layer	Applications such as email clients and web browsers create data to send in this layer. SMTP, FTP and HTTP operate in this layer. A browser might use HTTP, a banking app might use HTTPS, an email program might use SMTP and file transfer software might use FTP.
Transport Layer	The Transport layer creates the connection between two computers, or 'hosts'. ● Data is then divided up into packets and given a packet number ● Packets are reassembled by the recipient's Transport layer ● Lost packets are resent ● This layer uses TCP (Transmission Control Protocol)
Internet Layer	Responsible for routing packets. Routers operate at this layer. ● Source and destination addresses are written on to the packets ready for transmission
Link Layer	Controls the type of connection used. Examples of Protocols used at this layer are; Ethernet, WiFi and MAC (Media Access Control).

The Importance of Protocol Layers

Layers are self-contained- The functionality of one layer can be changed without affecting the functionality of other layers.

Different hardware or software operates on a particular layer providing interoperability between providers and systems

- This means that manufacturer's routers operating on the Internet layer, will operate with another manufacturer's Network Interface Cards (NICs) operating on the Link layer
- Senders and receivers using different software and hardware can communicate using the same layer protocols

Week 7 and 8: Preparing for Assessment

Self-quiz the knowledge covered in Weeks 1 - 6

WEEK 1

Date…….

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.

[4 marks]

Answer:-

WEEK 2

Date…….

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 marks]

Answer:-

WEEK 3

Date…….

An office has a LAN (Local Area Network). The office has four employees who each have a laptop. The office also has one server and one networked printer.

The office introduces a WAP (Wireless Access Point) to allow network access to wireless devices.

The office manager has noticed that the performance of the network has recently decreased.

(i) Describe how introducing wireless access could have slowed down the network.

[2 marks]

Answer:-

(ii) Identify two factors that can affect the performance of a network.

[2 marks]

Answer:-

WEEK 4

Date…….

TCP/IP is one example of a protocol.

Give the name of one appropriate protocol for each:

- Sending an email from one mail server to another
- Transmitting a file from a client to a server
- Viewing a website using a web browser
- Downloading an email to your computer

[4 marks]

Answer:-

WEEK 5

Date…….

When connecting computers into a network, the use of appropriate protocols are important.
For each of the scenarios below, identify the most appropriate protocol to be used and explain the function of the protocol.

(i) A user wants to transfer a file directly from his computer to his friend's computer.
[2 marks]

Answer:-

(ii)A customer wants to securely log into her bank's website to check her account balance.
[2 marks]

Answer:-

WEEK 6

Date…….

The owners of a large bakery have a Local Area Network (LAN) with a star topology. They order their supplies over the Internet. When data is transmitted from the bakery to the supplier, network protocols are used.

TCP/IP is a set of protocols based on layers.

(i) With regards to network protocols, define what is meant by a 'layer'.

[1 mark]

Answer:-

(ii)
Describe one advantage of using layers to construct network protocols.

[2 marks]

Answer:-

STEP 2: CREATE CUES

What: Reduce your notes to just the essentials.

What: Immediately after class, discussion, or reading session.

How:
- Jot down key ideas, important words and phrases
- Create questions that might appear on an exam
- Reducing your notes to the most important ideas and concepts improves recall. Creating questions that may appear on an exam gets you thinking about how the information might be applied and improves your performance on the exam.

Why: Spend at least ten minutes every week reviewing all of your previous notes. Reflect on the material and ask yourself questions based on what you've recorded in the Cue area. Cover the note-taking area with a piece of paper. Can you answer them?

STEP 1: RECORD YOUR NOTES

What: Record all keywords, ideas, important dates, people, places, diagrams
and formulas from the lesson. Create a new page for each topic discussed.

When: During class lecture, discussion, or reading session.

How:
- Use bullet points, abbreviated phrases, and pictures
- Avoid full sentences and paragraphs
- Leave space between points to add more information later

Why: Important ideas must be recorded in a way that is meaningful to you.

STEP 3: SUMMARISE & REVIEW

What: Summarise the main ideas from the lesson.
What: At the end of the class lecture, discussion, or reading session.
How: In complete sentences, write down the conclusions that can be made from the information in your notes.
Why: Summarising the information after it's learned improves long-term retention.

Date / / **Topic**

WEEK 1

Questions	Notes

Summary

Date / / **Topic**

Questions	Notes

Summary

Date / / **Topic**

WEEK 2

Questions	Notes

Summary

Date / / **Topic**

Questions	Notes

Summary

Date / / **Topic**

WEEK 3

Questions	Notes

Summary

Date / / **Topic**

Questions	Notes

Summary

Date / / Topic

WEEK 4

Questions	Notes

Summary

Date / / **Topic**

Questions	Notes

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Date / / Topic

WEEK 5

Questions	Notes

Summary

Date / / Topic

Questions	Notes

Summary

Date / / Topic

WEEK 6

Questions	Notes

Summary

Date / / **Topic**

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Summary

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