

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

Lesson.	<u>Lesson Objective/topic</u>	<u>Lesson Content/outcomes</u>	<u>Cross curricular</u> <u>Prior learning</u>	Assessment + Resources Oak academy/Home Learning (for all home learning tasks. Go through videos, lessons and make notes on topics)
Lesson 1	<u>Use craig and videos for each topic :</u> https://student.craigndave.org/gcse-videos https://www.youtube.com/playlist?list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37- Unit-1.1-Systems Architecture – Topic 1 Go through PowerPoint on introduction to course and answer questions on input – process and output.			

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

<p>2 lessons</p>	<ul style="list-style-type: none">• To be able to describe the purpose of the CPU• To be able to state the function of the CPU (fetch and execute instructions stored in memory)• To be able to describe how common characteristics of CPUs affect their performance: Clock Speed Cache Size Number of Cores	<p>Why is this relevant for the learners? Question given to the learners to spark interest in the topic – “1969 was a year famous for what...?”</p> <ul style="list-style-type: none">• Collect responses/guesses from learners• Lead into answer with suggestions such as: Travel, Mission, Space, Lunar• 1969 – Man on the Moon – Apollo 11 Spaceship <p>Follow up questions:</p> <ul style="list-style-type: none">• What typical computing hardware may be inside Apollo Guidance Computer? <p>What would be the brains of the Computer? Lead into Processor.</p> <p>Go through powerpoint presentation</p> <p><u>Activity 1</u></p> <p>(I can I will Risk Taking)</p>	<p>Questions and answer session?</p> <p>PL: pupils will have some understanding of the CPU from Yr 7 under the hood. Greater depth and understanding needed for GCSE</p>	<p>Presentation and task sheets in folder</p> <p>Introduction to CPU</p> <p>https://classroom.thenational.academy/lessons/introduction-to-the-cpu-6hhkj</p> <p>computer specifications – CPU performance</p> <p>https://classroom.thenational.academy/lessons/computer-specifications-74r32c</p>
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Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>What tasks will I ask the pupils to complete to develop their understanding during the lesson?</p> <ul style="list-style-type: none">• Students to produce a guide explaining the development of the CPU over the last 20 years. Include descriptions of:<ul style="list-style-type: none">• Processor Speed• Processor Number of Cores• Processor Cache Size• Within the guide explain the concept of Moore's Law <p>Find diagrams of different CPUs</p> <p>(I can I will Curiosity)</p> <p><u>Activity 2 – will find out what improves the performance of CPU</u></p> <ul style="list-style-type: none">• Students will be given a number of scenarios on improving the performance of a processor and be asked specifically to state the actual affect<ul style="list-style-type: none">• E.g. 1GHz clock upgraded to 2GHz – the number of instructions executed per second will double		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">Match activity – a variety of processors given with number of cores and clock speed. Students to match which are executing at the same speed based on cores/speed.		
1 lesson	<ul style="list-style-type: none">To understand embedded systems Their Purpose Give examples	<p>Starter</p> <p>Go through questions on CPU</p> <p>Main 1</p> <p>Explain embedded systems</p> <ul style="list-style-type: none">Produce a list of embedded systems found around the home include imagesDiscuss the purpose of these with your partner<ul style="list-style-type: none">Would you ever need to write a proper program for these?	<p>PL: once the term embedded systems is explained. Pupils will be able to identify the different embedded systems.</p> <p>CC: pupils use embedded systems in different subjects and at home.</p>	<p>Presentation and task sheets in folder</p> <p>1.3 Systems Architecture</p> <p>Go through video and make notes:</p> <p>https://www.youtube.com/watch?v=Bsyag_1Pfm0&list=PLCiOXwirr_aUAvkTPDWeeSqAKty3LAG37-&index=3</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Why do you think that we have embedded systems?• What are the benefits and drawbacks of embedded systems? Make a list of these for revision. <p>Task 2</p> <p>Complete task sheet 2 on embedded systems</p> <p>Homework</p> <p>Find out the different registers in the CPU</p>		
2 lessons	<ul style="list-style-type: none">• To be able to label an internal diagram of the CPU• To be able to describe the roles of the MAR and the MDR in the fetch part of the	<p>Starter</p> <p>Ask pupils what an embedded system and give examples.</p> <p>Activity 1</p> <ul style="list-style-type: none">• Diagram given to learners of the Internal Components of a computer system. Initially	<p>Question and answer session</p> <p>PL: starter for 10 key terms will help pupils understanding of the</p>	<p>Presentation and task sheets in folder</p> <p>1.3 Systems Architecture</p> <p>Go through video and make notes:</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	<p>fetch-execute cycle</p> <ul style="list-style-type: none">• To be able to describe the purpose of the accumulator• To be able to explain the purposes of the ALU, CU and the cache	<p>label what they believe to be the Processor, the Main Memory and the System Clock.</p> <ul style="list-style-type: none">• Discuss the term Busses with the students, and label the Data Bus and the Address Bus.• Activity 1 sheet given to pupils <p>Activity 2 – pupils to explain the role of the different registers</p> <p>Produce a labelled diagram of the CPU including: <i>(use resource sheet)</i></p> <ul style="list-style-type: none">• Processor• Main Memory• Busses (Data and Address)• MAR• MDR• Program Counter• CIR• ALU• Accumulator	<p>different registers in the CPU</p>	<p>https://www.youtube.com/watch?v=t8H6-anK0t4&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-</p>
1 lesson	<ul style="list-style-type: none">• The describe the importance of the Program Counter in the	<p>Starter</p>		<p>Aim to complete end of unit test after 9 lessons.</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	Fetch-Execute cycle	<p>Ask the pupils the internal components of the CPU</p> <p>Main</p> <p>Activity 3 – pupils to explain the role of the CPU using fetch-decode and execute</p> <ul style="list-style-type: none">• Class divided up into groups of students. Each group to have a person to act as Main Memory (holds all of the data, instructions), Processor (completes/executes instructions), Address Bus (this person carries addresses from processor), Data Bus (this person carries data along the data bus), Program Counter (this person keeps track of which instruction is currently being worked on).• The task is to simulate a basic representation of what happens with the internal components as part of the Fetch Execute Cycle.<ul style="list-style-type: none">• Program Counter passes the Address Bus the instruction to collect, Address Bus goes to main memory and looks into the memory location, the data stored is	<p>PL: pupils to re-cap the different registers of the CPU from last lesson</p>	<p>Presentation and task sheets in folder</p> <p>T 1.3 Systems Architecture</p> <p>FDE cycle:</p> <p>https://classroom.thenationalacademy/lessons/the-fde-cycle-68w3ct</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		returned along the Data bus to the processor, the program counter adds one and the processor executes the instruction		
1 lesson	Revision on 1.1 system architecture	Go through the revision workbook on system architecture 1.1. Tell pupils to revise next lesson as they have a test.		<p>1.1 Systems Architecture</p> <p>Pupils to go to the following websites read through them and watch videos and make notes :</p> <p>https://www.bbc.co.uk/bitesize/guides/zbfn4j/revision/1</p> <p>https://www.bbc.co.uk/bitesize/guides/zbfn4j/video</p> <p>Complete the following quiz:</p> <p>https://www.bbc.co.uk/bitesize/guides/zbfn4j/test</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		System architecture test – 40 minutes		
		DIRT lesson Go through answers – misconceptions		
	Start topic 1.2.1 Primary storage (Memory)			
2 lessons	<ol style="list-style-type: none">1. List the two main forms of memory.2. Discuss the need for ROM and RAM3. Explain the difference between ROM and RAM4. Discuss the impact of the amount of RAM on performance	<p>Starter</p> <p>Ask pupils the form of memory in the computer?</p> <p>Show pupils the following video:</p> <ul style="list-style-type: none">• https://www.youtube.com/watch?time_continue=22&v=URYPErhTkMY <p>Ask pupils what is RAM and ROM?</p>	<p>PL: pupils will have some knowledge of memory from Yr 7 – under the hood</p>	<p>Presentation and task sheets in folder</p> <p>Memory</p> <p>https://classroom.thenational.academy/lessons/ram-and-rom</p> <p>https://www.youtube.com/watch?v=tsH7IGcWSLg&list=PLCiOXwirr</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Pupils to explain the differences and purpose of RAM and ROM</p> <p>Go through RAM and ROM powerpoint</p> <p>Task</p> <p>Complete fill in the gaps</p> <p>Complete the table on RAM and ROM</p> <p>Plenary quiz on RAM and ROM</p>		aUAvkTPDWeeSqAKty3LAG37-&index=4
2 lesson	<ol style="list-style-type: none">1. Recap on RAM and ROM (embedding)2. Explain what virtual memory is3. Explain the advantages and disadvantages of virtual memory4. Understand what flash memory is	<p>Starter</p> <p>Why would RAM be faster than the hard disk?</p> <p>Main</p> <p>Show pupils following video:</p> <p>https://www.youtube.com/watch?time_continue=99&v=dEvG8IRuz9w</p>	<p>New keywords and topics pupils not covered before</p>	<p>Presentation and task sheets in folder</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Ask pupils what is virtual memory?</p> <p>Go through powerpoint</p> <p>Task</p> <p>Pupils to fill in blanks</p> <p>Task</p> <p>Complete task sheet on virtual memory</p> <p>Go through answers with pupils</p> <p>Show pupils video on flash memory. Then ask pupils what is flash memory?</p> <p>Go through powerpoint</p> <p>Tasks</p> <p>Pupils to complete task sheet</p> <p>Go through answers.</p> <p>Plenary</p>		<p>Memory</p> <p>https://classroom.thenational.academy/lessons/virtual-memory</p> <p>https://www.youtube.com/watch?v=qr6IPzYW1eY&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=5</p> <p>https://www.youtube.com/watch?v=djPYjHK3JH0&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=6</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		Quiz on virtual and flash memory. Homework Tell pupils test next lesson on memory		
		Revision and Memory test Record marks on tracker		Pupils to go to the following websites read through them and watch videos and make notes : https://www.bbc.co.uk/bitesize/guides/zd4r97h/revision/1 https://www.bbc.co.uk/bitesize/guides/zd4r97h/video Complete the following quiz: https://www.bbc.co.uk/bitesize/guides/zd4r97h/test
		DIRT lesson Go through answers – misconceptions		

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	Start topic 1.2.2 Secondary storage			
1 lesson	1. Understand the need for secondary storage	<p>Starter What do you store on your phones? On your computers? Tablets? Why do we need storage devices? What could computers do without storage devices?</p> <p>Activity 1 Ask students to identify what they store on their computers, tablets, phones etc. Write these on a whiteboard.</p> <p>Discuss the need for storage devices – what would they do without them? What use would computers be without storage?</p> <p>Activity 2 Ask pupils what is secondary storage? Then go through the answers.</p>	<p>Question and answer session</p> <p>Question and answer session</p> <p>CC: pupils use secondary storage all the time. However, new to the concepts.</p> <p>PL: pupils have covered the different storage</p>	<p>Presentation and task sheets in folder</p> <p>Secondary storage</p> <p>https://classroom.thenational.academy/lessons/secondary-storage-6cv3jt</p> <p>https://www.youtube.com/watch?v=0vEv8B8HUq0&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=9</p>

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Ask pupils what the different types secondary storage are? And write down how each one works. Optical Solid state Magnetic</p> <p>Go through powerpoint and go through the different types of secondary storage.</p> <p>Activity 3 Pupils to complete table on secondary storage.</p> <p>Extension</p> <ol style="list-style-type: none">1. Which of these devices can store the most data?2. Which of these devices can store the least data?3. Which of these devices is the cheapest per MB?4. Which of these devices is the most expensive per MB?5. Which of these devices is easiest to put in your bag and take with you?	<p>types in Yr 7 – under the hood</p> <p>Question and answer session</p>	
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>6. Which of these devices is most likely to get damaged?</p> <p>Plenary Go ask pupils secondary storage questions</p>		
2 lessons	<ul style="list-style-type: none">Identify the need for and purpose of secondary storageExplain the characteristics of common types of storage	<p>Starter</p> <p>Ask pupils what the different storage types</p> <p>Optical Solid state Magnetic</p> <p>Ask pupils the characteristics of storage types. Make a list on the board.</p> <ul style="list-style-type: none">Capacity<ul style="list-style-type: none">how much data can it store?Speed<ul style="list-style-type: none">how fast can it access the data?Portability<ul style="list-style-type: none">how easy is it to move it from one place to another	<p>New topic of characteristics of secondary storage. PL: starter for 10</p>	<p>Presentation and task sheets in folder</p> <p>Storage</p> <p>optical and magnetic storage</p> <p>https://classroom.thenational.academy/lessons/optical-and-magnetic-storage-6ww66d</p> <p>https://www.youtube.com/watch?v=VwBtjraysnE&list=PLCiO</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Durability<ul style="list-style-type: none">- how well does it last e.g. if it is dropped• Reliability<ul style="list-style-type: none">- how consistently does it perform• Cost<ul style="list-style-type: none">- how much does it cost per KB, MB or GB? <p>Activity 1 Go through the table on the powerpoint and the pupils to complete: L2 - Storage devices activity sheet</p> <p>Activity 2 Pupils to be given Storage_L2_Activity_2. This can be printed in A4 and A3. Ask students to complete the boxes, the grey ones are the three types of storage. For each type, give a definitions, list example devices and identify the characteristics</p> <p>Plenary</p> <ul style="list-style-type: none">• What is secondary storage?• Why do we need secondary storage?		XwirraUAvkTPDWeeSqAKty3LAG37-&index=10
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• What are the 3 types of storage?• What type of storage is a USB memory stick?• What type of storage is a CDROM?• What type of storage is a HDD?• What type of storage is the fastest to read data from?• What type of storage is the most expensive per GB?• What type of storage is the most reliable?• What type of storage is the least durable? <p>Homework Complete Activity 2</p>		
1 lesson	1. Be able to recommend a storage device for a situation	<p>Starter</p> <ol style="list-style-type: none">1. How do you decide which storage device to buy? Do you own one? Why did you choose that one?2. Ask students to discuss these questions, ask for their answers and get them to justify		<p>Presentation and task sheets in folder</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>their choices with reference to the characteristics from last lesson</p> <p>Engagement Activity</p> <ol style="list-style-type: none">1. Give students the statement: A CD ROM is better than a USB memory stick.2. Ask students what they think of this statement. Defend the statement and get students to argue against it. The aim is to get them to consider the scenario and purpose and realise how important that is to the statement. <ul style="list-style-type: none">• What characteristics can you remember from last lesson?<ul style="list-style-type: none">- Capacity- Speed- Portability- Durability- Reliability- Cost <p>Activity 1</p> <ul style="list-style-type: none">• For each of the scenarios on the worksheet:		<p>Storage</p> <p>selecting a storage device</p> <p>https://classroom.thenational.academy/lessons/selecting-a-storage-device-74v64c</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ol style="list-style-type: none">1. Identify the most appropriate type of storage2. Justify (explain) your choice		
		Plenary Go through types of storage and recommendations made		
		Revision and Test		1.3 Storage Pupils to go to the following websites read through them and watch videos and make notes : https://www.bbc.co.uk/bitesize/guides/z67j2nb/revision/1 Complete the following quiz: https://www.bbc.co.uk/bitesize/guides/z67j2nb/test
	1.2.3 Units			

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

1 lesson	2. Estimate data capacity requirements for different file types	<p>Starter</p> <p>Research the size of each of these units of storage and put them in order from lowest to highest:</p> <ul style="list-style-type: none">• GB• KB• Byte• MB• Nibble• Bit <p>Go through powerpoint and how to calculate the size of units.</p> <p>Pupils to complete to 11. Storage_L4_Activity_2.</p> <p>Go through answers for activity.</p> <p>Plenary</p> <ul style="list-style-type: none">• Working in mixed pairs, put these files into order from smallest to largest:	PL: pupils have covered the size of different units in Yr 8 – Binary	Presentation and task sheets in folder Data Storage https://classroom.thenational.academy/lessons/units-of-measurement-6rv36d/activities/1
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• A text file with 220 words• An image that is 1000 x 200 pixels, with 1 byte per pixel• A sound file that has 1 byte per sample, it takes 2 samples per second, over 1 channel and is 600 seconds long• An image that is 100 x 200 pixels, with 2 bytes per pixel• A text file with 3000 words <p>Plenary – review objectives</p> <p>Revise Storage Test next lesson</p>		
		Start of lesson 10 minutes re-cap Secondary Storage test – 40 minutes		
		DIRT lesson Go through answers – misconceptions Record marks on tracker		
	Start topic:			

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	1.2.4 Data storage			
2 lessons	<ul style="list-style-type: none">Define the units bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, petabyte.Know how data needs to be converted into a binary format to be processed by a computer.Know how to convert positive denary whole numbers (0-255) into 8 bit binary numbers and vice versaKnow how to convert from binary and denary into positive hexadecimal	<p>Starter</p> <p>Ask pupils what is binary?</p> <p>Put these units in the correct order of size (smallest->largest):</p> <ul style="list-style-type: none">BitGigabyteKilobyteBytePetabyteTerabyteMegabyte	<p>PL: pupils have covered the size of different units in Yr 8 – Binary</p> <p>Binary to decimal and decimal to binary conversions done in Yr 8</p>	<p>Presentation and task sheets in folder</p> <p>Data Storage</p> <p>number Bases</p> <p>https://classroom.thenational.academy/lessons/number-bases-c4rkac</p> <p>binary Maths</p> <p>https://classroom.thenational.academy/lessons/binary-maths-68rkae</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	numbers (0-255) and back again	<ul style="list-style-type: none">• Nibble <p>Go through powerpoint and units of measure. Pupils to make notes.</p> <p><u>Activity 1</u></p> <p>Create a Poster that defines all of the different units of storage.</p> <ul style="list-style-type: none">• Your poster must include:• An order to the units in how they are displayed• Definition of each unit• Examples of what could fit into that unit• Colour that makes the poster engaging <p>Stretch & Challenge</p> <p>Research and Include a section on what comes after Petabyte and what could possibly be stored with that capacity.</p>		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Go through powerpoint on binary and converting binary to decimal.</p> <p>Complete Activity 2 – converting binary to decimal</p> <p>Then go through answers.</p> <p>Then go through converting binary to decimal.</p> <p>Complete Activity 3 – converting decimal to binary</p> <p>Then go through answers.</p> <p>Go through powerpoint and go through hexadecimal conversions and the use of hexadecimal.</p> <p>Activity 4 give pupils hexadecimal numbers to convert.</p>		
1 lessons	<ul style="list-style-type: none">• Convert binary to hexadecimal	Starter		

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	<ul style="list-style-type: none">• Explain the use of binary codes to represent characters• Know the term character set• Describe with examples (for example ASCII and Unicode) the relationship between the number of bits	<p><i>If you type your name into the keyboard, how does the computer know how to show the correct characters?</i></p> <p><i>Watch this video which may help!</i></p> <p>https://www.youtube.com/watch?v=JwWoVQXQ24k</p> <p>Show pupils ASCII code and ask. Using these decimal codes, what would the word Computing look like?</p> <p>Go through ASCII table.</p> <p>Activity 1</p> <p>Using the character codes in the table, write a message in binary for the person sat next to you. Swap messages and ask them to decode it!</p> <p>Stretch & Challenge</p>	<p>New topic – assessed via starter for 10</p>	<p>Presentation and task sheets in folder</p> <p>Data Storage</p> <p>hexadecimal</p> <p>https://classroom.thenational.academy/lessons/hexadecimal-75qkcr</p> <p>https://classroom.thenational.academy/lessons/what-can-you-remember-cmv3at</p> <p>representing Text</p> <p>https://classroom.thenational.academy/lessons/representing-text-chk66t/activities/1</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Write your message in Hexadecimal for the other person to work out</p> <p>Go through Unicode and character set.</p> <p>Activity 2</p> <p>Discuss with the person sat next you, the answers to these questions:</p> <ol style="list-style-type: none">1. What is meant by the character set of a computer?2. Explain how ASCII represents the character set of a computer.3. Explain the difference between using an ASCII character set and a Unicode character set. <p>Complete Activity 3 sheet</p> <p>Plenary</p> <p>Complete quiz</p>		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

1 lesson	<ul style="list-style-type: none">Understand how a digital image is made up and be able to recognise the affect changing the resolution has on an image.Understand how a computer displays coloured images using binary and rgb values.	<p>Starter</p> <p>Go through powerpoint and how digital images are made up. Then go through how a computer displays coloured images using binary and rgb values.</p> <p>Activity 1</p> <ol style="list-style-type: none">In your own words, explain how a bitmap image can be represented in Binary and how the resolution of an image can change.What does pixelated mean?What is Metadata and why does it need to be included in the file?Discuss the effect of colour depth and resolution on the size of an imageWhich three colours are used to make all three colours on a computer		<p>Presentation and task sheets in folder</p> <p>Data Storage</p> <p>representing bitmap images</p> <p>https://classroom.thenational.academy/lessons/representing-bitmap-images-6rr36e</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>6. Discuss direct colour and explain how colour is stored this way</p> <p>Activity 2 – worksheets</p> <ol style="list-style-type: none">1. Work your way through the challenges on the worksheet you will be given2. Have a go at each exercise (Easy, Medium, Hard) <p>Plenary</p> <p>Complete the binary representation for the image on the presentation</p>		
1 lesson	<ul style="list-style-type: none">• To understand how sound can be stored in digital form• To understand what factors can affect the size of a sound file and quality of feedback	<p>Starter</p> <p>Do you know anything about digital audio? Or sound?</p> <p>Go through powerpoint on sound</p> <p>Activity 1</p>		<p>Presentation and task sheets in folder</p> <p>Data Storage</p> <p>representing sound</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ol style="list-style-type: none">1. What are the three factors that affect the size of a sound file2. Explain how the three factors affect the size of a sound file and the quality of the playback3. Research file compression4. Write a definition for file compression with an example5. Explain how file compression could be used so that high quality audio files stay of a high quality <p>Plenary</p> <p>What factors affect the quality of an audio file and how?</p> <p>Why would a higher sample rate mean more storage is needed?</p>		https://classroom.thenational.academy/lessons/representing-sound-6mt3ed
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		What is file compression and how does it work?		
1 lesson	<ul style="list-style-type: none">• Understand the need for compression• Know the difference between lossy and lossless.• Analyse when lossy and lossless would be used	<p>Starter</p> <p>Ask pupils what happens when file size is exceeded?</p> <p>Go through compression and lossless compression.</p> <p>Activity 1</p> <ol style="list-style-type: none">1. In your own words, write up the benefits of compressing data.2. Describe using examples the difference between lossy compression and lossless.3. Consider an email with a large attachment why does the file need to be compressed?	<p>New topic covered in GCSE. Assessed via starter for 10</p>	<p>Presentation and task sheets in folder</p> <p>Data Storage</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Plenary</p> <ul style="list-style-type: none">• Use the multiple choice questions to check your knowledge• Add/Correct any errors, writing out the answers• Summarise the process of Lossy and Lossless compression in 10 words each. <p>Homework</p> <p>Pupils to revise for test next lesson.</p>		
		<p>Start of lesson 10 minutes re-cap Units test – 40 minutes</p>		<p>Pupils to go to the following websites read through them and watch videos and make notes :</p> <p>https://www.bbc.co.uk/bitesize/guides/zfspfcw/revision/1</p> <p>https://www.bbc.co.uk/bitesize/guides/zfspfcw/video</p> <p>Complete the following quiz:</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

				https://www.bbc.co.uk/bitesize/guides/zfspfcw/test
		DIRT lesson Go through answers – misconceptions Record marks on tracker		
	Start topic Unit 1.3.1 Networks and topologies			
1 lesson	<ul style="list-style-type: none">• Understand why we network computers together• Understand what is meant by a LAN• Understand what is meant by a WAN• Understand what is meant by a client-server network	Starter Ask pupils what is a network? Show pupils following video: https://www.youtube.com/watch?v=oaNfeCIDMu0 Pupils to answer following questions:	PL: concept of networking covered in yr 8	Presentation and task sheets in folder Networks and topologies 1.4 Wired and Wireless Networks Go through video and make notes

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	<ul style="list-style-type: none">• Understand what is meant by a peer-to-peer network	<ul style="list-style-type: none">• Why do we think it is a good idea to network computers together?• What did we hope to gain from networking computers together? <p>Engagement task:</p> <ul style="list-style-type: none">• What is the biggest network that we use?• How many networks do you think you use in a day? <p>Task 1</p> <p>How are the following types of network structured?</p> <ul style="list-style-type: none">• LAN• WAN• Client-server• Peer-to-peer		https://www.youtube.com/watch?v=ZAMbMcYqK_0&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=12&t=0s
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Go through powerpoint of above network networks.</p> <p>Complete Activity 1a:</p> <ul style="list-style-type: none">• Identify 5 daily activities that you use a network for• Could you carry out these activities without the use of a network. How would you try and do that?• Are there any activities that you cannot do, or would need to change considerably without the use of a network? <p>Then go through answers for Activity 1a.</p> <p>Complete Activity 1b</p>		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Complete the worksheet by filling in the characteristics and functions of a LAN and a WAN• You may need to do some further research to complete the sheet <p>Go through answers for activity 1b.</p> <p>Plenary</p> <p>Ask pupils:</p> <p>What is a LAN?</p> <p>What is WAN?</p> <p>Who would use a LAN?</p> <p>Who would use a WAN?</p>		
1 lesson	<ul style="list-style-type: none">• Understand what is meant by a			

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	<p>client-server network</p> <ul style="list-style-type: none">Understand what is meant by a peer-to-peer network	<p>Starter</p> <ul style="list-style-type: none">What is a client and peer to peer server? <p>Then go through lesson 2 powerpoint.</p> <p>Complete: Wired and Wireless Networks_L1_Activity 2_v1.</p> <p>Complete Extension on activity 2 sheet.</p> <p>Extension 2</p> <p>Create a poster on client and peer to peer server</p>		<p>Presentation and task sheets in folder</p> <p>Wired and Wireless Networks</p> <p>Go through video, make notes and create a poster</p> <p>https://www.youtube.com/watch?v=3qRCxu9C_AI&list=PLCiOXwirr_aUAvkTPDWeeSqAKty3LAG37-&index=13</p>
1 lesson	<ul style="list-style-type: none">Identify the components required to create a LANDescribe the role of each component in a LANUnderstand what is meant by the	<p><u>Starter</u></p> <ul style="list-style-type: none">Show Video: https://www.youtube.com/watch?v=EWTKcg7Pj8What hardware do we need to create a LAN. How will the computers be		<p>Presentation and task sheets in folder</p> <p>Wired and Wireless Networks</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	<p>performance of a network and why this is important</p> <ul style="list-style-type: none">• Explain the factors that can affect the performance of a network	<p>connected together and what might be required to do this?</p> <ul style="list-style-type: none">• What do we mean by the performance of a network and why this might be important? <p>Then go through answers with pupils</p> <p><u>Engagement Activity</u></p> <ul style="list-style-type: none">• How do packets travel around a network? (Practical class engagement task)• Complete a classroom activity of asking one student to be a sending computer and one student to be a receiving computer. The sending computer will use a pile of mini-whiteboards to write a message across at least 10 mini whiteboards – labelling each with a sequence number. (These are like packets) All other students will be routers around the world that accept the packet and route it towards the destination. Packets can		<p>Go through video, make notes and create a poster</p> <p>https://www.youtube.com/watch?v=KDnHXq-trOk&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=12</p>
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Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>take different routes around the network and the receiving computer pieces these back together again.</p> <ul style="list-style-type: none">○ Depending upon the group of learners you could intercept a packet and make it get "lost" from the network. This can create discussion of what happens if a full message is not received by the receiving device.● Ask learners if they have ever been frustrated by their computer or mobile device working very slowly. Explain to them what might be causing that to happen and what might be affecting the performance of the network they are trying to use. <p><u>Activity 1</u></p> <p>Pupils to answer the following questions in their books:</p> <ul style="list-style-type: none">• What do we mean by a packets of data?• Why do we need to create packets of data?• What might happen if we did not have the correct hardware to guide the passage of the packets of data?		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		Then go through powerpoint and answer questions above.		
		<p>Task – hardware components</p> <p>What is the role of the following hardware components in a network? (answer in your book)</p> <ul style="list-style-type: none">• Wireless access point (WAP)• Router• Switch• Network interface card (NIC)• Transmission media <p>Go through the hardware components through powerpoint.</p> <p>Activity 2</p> <ul style="list-style-type: none">• Complete the worksheet by drawing lines between the correct hardware term and definition. <p>Activity 3</p>		<p>Presentation and task sheets in folder</p> <p>Wired and Wireless Networks</p> <p>Go through video, make notes and create a poster</p> <p>https://www.youtube.com/watch?v=SrZd6uqr8rs&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=14</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Create a leaflet for a business to explain how they can get the best out of their network.• In it the leaflet you should explain the factors that can affect the performance of a network and how these can possibly be overcome. <p>Plenary</p> <ul style="list-style-type: none">• Pair testing• Use revision cards to test your partner to find out what they know about network components		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

2 lessons	<ul style="list-style-type: none">• Understand the internet is a worldwide collection of computers• Understand the role of DNS as part of the internet• Understand what is meant by hosting• Understand what is meant by the cloud• Understand what is meant by a virtual network• Understand why virtual networks are used	<p>Starter</p> <ul style="list-style-type: none">• We use the internet on a daily basis, but do we realise what is involved in this?• What is operating the background for us to do this? <p>Engagement Activity</p> <ul style="list-style-type: none">• Do you use a virtual network? Do they know what one is?• Why are virtual networks important and how can they add a new level of security to keeping your personal data safe? <p>Go through questions above with pupils</p> <p>Task</p> <p>Tell pupils to find out what the following do:</p> <ul style="list-style-type: none">• Internet		<p>Presentation and task sheets in folder</p> <p>Wired and Wireless Networks</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• DNS• Hosting• The cloud• Virtual network• VPN <p>Then go through answers.</p> <p>Activity 1</p> <ul style="list-style-type: none">• Let's watch two videos that explain what a virtual private network is.• https://www.youtube.com/watch?v=rFg7TSwVcL4• https://www.youtube.com/watch?v=plvWpky92eU• What is virtual network in general? What can they be used for?• Let's construct a mind map on the board to represent the abilities of a virtual network.		
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Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Then go through powerpoint and explain a virtual network</p> <p>Activity 2</p> <ul style="list-style-type: none">• Peer teach• Your groups will be assigned a topic• You need to research your topic and create a 5 minute lesson to teach your peers about what you have learnt <p>Use Lesson 3_Activity_1 – as template for task above</p> <p>Separate learners into groups of three, assign them either DNS, hosting or the cloud as their topic. In their groups learners need to research their topic, using the guiding questions on their work sheet. They need to put together a 5-minute peer teach that they will present to the rest of the class. Each learner in the group should be involved in presenting the peer teach in some way.</p> <p>Presentations could be carried out next lesson to allow time for further planning.</p>		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Next lessons pupils will present their presentation to the rest of class.</p> <p>Tell pupils they will have test next lesson and must revise.</p>		
		<p>Revise and complete Wired and Wireless Networks test</p>		<p>Pupils to go to the following websites read through them and watch videos and make notes :</p> <p>https://www.bbc.co.uk/bitesize/guides/zvspfcw/revision/1</p> <p>Complete the following quiz:</p> <p>https://www.bbc.co.uk/bitesize/guides/zvspfcw/test</p>
		<p>DIRT lesson</p> <p>Go through answers – misconceptions</p> <p>Record marks on tracker</p>		
	Start topic:			

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	Unit- 1.3.2 Wired and wireless networks, protocols and layers		
Lesson 1	<ul style="list-style-type: none">Students will be able to identify a Star and Mesh TopologyStudents will be able to compare Advantages and Disadvantages of Wi-Fi and Ethernet	<p>Starter discussion</p> <p>Most computers and devices are connected together via networks. This opens up new opportunities and advantages.</p> <p>What are the advantages?</p> <p>Go through answers with pupils</p> <p>What is a network?</p> <p><u>Engagement Activity</u></p> <p>Networks are all around you, in school, at home in businesses and hospitals.</p> <p>Think about what these networks look like</p> <p>Draw a diagram to represent one of these networks. Include the parts, devices and wires</p> <p>Be ready to explain your diagram</p>	<p>Presentation and task sheets in folder</p> <p>Wired and wireless networks, protocols and layers</p> <p>Go through video, make notes and create a poster</p> <p>https://www.youtube.com/watch?v=vW3PeQ0XYc&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=17</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Teacher to go round and check the different networks</p> <p><u>Task 1</u></p> <p>You will be given some string and cups.</p> <p>Create a Mesh Network</p> <p>Create a Star Network</p> <p>Think about and discuss the features of each.</p> <p>Teacher to go through answers.</p> <ul style="list-style-type: none">• Teacher break a wire (remove a string) students discuss what impact this has on the Network• Simulate adding another computer or device (add another student) what impact does it have on the Network <p>Task 2</p> <p>Use Activity 1 to sort cards</p> <ul style="list-style-type: none">• You will be given a selection of cards that show the advantages and		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>disadvantages of Wired and Wireless networks (Ethernet and WiFi)</p> <ul style="list-style-type: none">• Sort them into groups• Compare you answers with other students. <p>Go through answers</p> <p>Go through Wifi frequency and channels</p> <p>Plenary</p> <p>Go through the different network topologies</p>		
1 lesson	<p>Understand and explain what encryption is and why it is required</p>	<p>Starter</p> <p>Ask pupils what is network? And what are the different network topologies?</p> <p>Explain to the pupils we are looking at encryption today. Ask pupils what encryption is?</p>		

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Go through powerpoint and examples of encryption. E.g. https</p> <p>Then show pupils video</p> <p>Encryption task</p> <p>https://cryptoclub.org/games/rogue_computer.php</p>		<p>Presentation and task sheets in folder</p> <p>Wired and wireless networks, protocols and layers</p> <p>Encryption task</p> <p>https://cryptoclub.org/games/rogue_computer.php</p>
1 lesson	<p>Understand what the main IP Addressing, MAC Addressing and protocols are</p> <p>Be able to recall a range of protocol acronyms</p> <p>Explain what some of the protocols do</p>	<p>In the previous lesson students were introduced to types of Networks.</p> <p>This lesson students will learn how IP addressing, MAC addressing and Protocols support the access and to Network.</p> <p>Engagement activity</p> <p>(1 mins) Think of all of the words that are related to networks</p>		<p>Presentation and task sheets in folder</p> <p>Wired and wireless networks, protocols and layers</p> <p>Go through video, make notes and create a poster</p> <p>https://www.youtube.com/watch?v=dJSaY-</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>(1 mins) Share and copy down other words from other students in the class</p> <p>(3 mins) select 5 words and write a simple definition down</p> <p>(3 mins) use the internet to find definitions of 3 of the words you do not know.</p> <p>Activity 1 - IP addresses</p> <p>Go through powerpoint on IP and MAC addresses</p> <p>Protocols</p> <p>Ask pupils what a protocol is?</p> <p><u>Key protocols</u></p> <p>TCP/IP (Transmission Control Protocol/Internet Protocol)</p> <p>HTTP (Hyper Text Transfer Protocol)</p> <p>HTTPS (Hyper Text Transfer Protocol Secure)</p> <p>FTP (File Transfer Protocol)</p> <p>POP (Post Office Protocol)</p>		<p>B9GiY&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=20</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>IMAP (Internet Message Access Protocol) SMTP (Simple Mail Transfer Protocol)</p> <p>Activity</p> <p>Briefly research the purpose of each Protocol Choose one of the protocols and create a poster which explains to the reader what the protocol is, its features. Include a diagram and examples Share these posters with other students</p> <p>Plenary Go over protocols with pupils</p>		
	<p>Be able to recall a range of protocol acronyms Explain what some of the protocols do</p>	<p>Starter Ask pupils what the different protocols are</p> <p>Explanation videos of protocols An Overview: https://www.youtube.com/watch?v=WmymBI-X7Tc IP https://www.youtube.com/watch?v=zyL1Fud1Z1c</p>		

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>IMAP vs POP3: https://www.youtube.com/watch?v=BK4ng6Gcits</p> <ol style="list-style-type: none">1. Complete the table you are given<ol style="list-style-type: none">i. You have 10 minutes to complete itii. You may use notes to help you2. Ask for help from others if you are totally stuck3. Compare your answers with others around you and add post-it notes for corrections <p>Plenary</p> <p>BBC Online test: http://www.bbc.co.uk/education/guides/zp9jpv4/test</p>		<p>Presentation and task sheets in folder</p> <p>Wired and wireless networks, protocols and layers</p> <p>Explanation videos of protocols An Overview: https://www.youtube.com/watch?v=WmymBI-X7Tc</p> <p>IP https://www.youtube.com/watch?v=zyL1Fud1Z1c</p> <p>IMAP vs POP3: https://www.youtube.com/watch?v=BK4ng6Gcits</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

1 lesson	<ul style="list-style-type: none">• Know what layers are and their role• Be able to explain the role of each layer• Understand the concept of Packet Switching	<p>Starter</p> <ul style="list-style-type: none">• What is Internet anyway?• https://www.youtube.com/watch?v=95-yZ-31j9A <p>Go through packet switching and layers using the powerpoint</p> <ul style="list-style-type: none">• https://www.youtube.com/watch?v=WwyJGzZmBe8• Play packet switching game<ul style="list-style-type: none">• Resources from http://code-it.co.uk/netintsearch <p>Layers</p> <ul style="list-style-type: none">• As a packet is prepared the data travels through layers where protocols manage it, adding or removing extra information as required.		<p>Presentation and task sheets in folder</p> <p>Wired and wireless networks, protocols and layers</p> <p>Go through following videos:</p> <ul style="list-style-type: none">• https://www.youtube.com/watch?v=95-yZ-31j9A <p>Go through packet switching and layers using the powerpoint</p> <ul style="list-style-type: none">• https://www.youtube.com/watch?v=WwyJGzZmBe8• http://code-it.co.uk/netintsearch <p>Go through video, make notes and create a poster</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">https://www.youtube.com/watch?v=zyL1Fud1Z1c plenary Ask pupils what is packet switching and layers Go through TCP/IP routing lesson Homework Revise for test next lesson		https://www.youtube.com/watch?v=Wj3nYkxPTT0&list=PLCiOXwirmaUAvkTPDWeeSqAKty3LAG37-&index=22
		Test on Unit- 1.3.2 Wired and wireless networks, protocols and layers		Pupils to go to the following websites read through them and watch videos and make notes : https://www.bbc.co.uk/bitesize/guides/zr3yb82/revision/1 https://www.bbc.co.uk/bitesize/guides/zr3yb82/video Complete the following quiz:

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

				https://www.bbc.co.uk/bitesize/guides/zr3yb82/test
		DIRT lesson Go through answers – misconceptions Record marks on tracker		
	Start Unit - 1.4.1 Threats to computer systems and networks Unit - 1.4.2 Identifying and preventing vulnerabilities			
	<ul style="list-style-type: none">Explain the different types of malwareDiscuss a real life malware-related eventUnderstand how phishing operatesDiscuss how data can be intercepted	<ul style="list-style-type: none">What computing threats are out there in the world? https://www.youtube.com/watch?v=dVW1FNW5aTg Engagement activity <ul style="list-style-type: none">What technological threats do modern companies face? Go through the threats with pupils		Presentation and task sheets in folder System Threats and Vulnerabilities Go through video, make notes and create a poster https://www.youtube.com/watch?v=v6Qgr1wT4uE&list=PLCiOXwirr

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Activity 1</p> <ul style="list-style-type: none">• Complete Activity 1 – Table• Explain the different types of malware and use resources in order to expand on your answers. <p>Activity 2</p> <ul style="list-style-type: none">• Look at the Activity 2 email• Identify how you could tell this email may be a phishing email• What are the 'tell-tale' signs? <p>Activity 3</p> <ul style="list-style-type: none">• Short research, discussion and present findings <p>What different ways are there to intercept data?</p> <p>What risks are there to the following stakeholders:</p> <ul style="list-style-type: none">- Individuals- Companies- Governments- Military		<p>aUAvkTPDWeeSqAKty3LAG37-&index=23</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		Plenary <ul style="list-style-type: none">• What is Phishing?• Are there different types of phishing? If so, what are they?		
	<ul style="list-style-type: none">• Understand the meaning of DDOS and brute force attacks• Explain the effects of a DDOS attack• Explain how to be protected against DDOS attacks• Understand the concept of SQL injection• Explain how a vulnerability can be exploited	Starter <ul style="list-style-type: none">• What is a brute force attack? <p>https://www.youtube.com/watch?v=4d7sBxAdAes</p> Engagement activity <ul style="list-style-type: none">• What DDOS attacks have you heard about in recent years?<ul style="list-style-type: none">• Who was involved?• Who was affected by the attack (business, clients, customers)?• Was there a motive around the attack? Go through powerpoint		Presentation and task sheets in folder https://classroom.thenational.academy/lessons/explaining-how-social-engineering-data-interception-and-brute-force-atta System Threats and Prevenabilities
		Activity 1 <ul style="list-style-type: none">• Answer the following questions:		

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Explain a recent DDOS attack and discuss the effects on customers and businesses.• Research and describe a 'botnet' and explain how they originate• Extension: <p>How can companies protect themselves from DDOS attacks?</p> <p>Go through SQL injection</p> <p>Activity 2</p> <ul style="list-style-type: none">• Create an informative leaflet for SQL administrators explaining the importance of protecting against SQL injection and how attackers can exploit vulnerabilities in SQL databases. <p>Plenary</p> <ul style="list-style-type: none">• Paired quiz – best answer sharing• What is a DDOS attack?• What are botnets?• How does SQL injection work?		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	<ul style="list-style-type: none">• Explain what is meant by 'network forensics'• Understand the legalities and consequences of unlawfully intercepting data• Understand the concept of penetration testing• Explore network policies and how they can help protect networks	<p>Starter</p> <ul style="list-style-type: none">• Threats to networks are far more prevalent in recent years. How can organisations protect themselves from attack? <p>http://www.youtube.com/watch?v=rrbv26ukhPg&t=0m53s</p> <p>Engagement activity</p> <ul style="list-style-type: none">• What is the 'official title' of the person who is responsible for exploring vulnerabilities of computer systems and reporting of this in an organisation?• What vulnerabilities may they discover? <p>Go through lesson 3 presentation on Network Forensics.</p> <p>Activity 1</p>		<p>Presentation and task sheets in folder</p> <p>https://classroom.thenational.academy/lessons/describe-the-different-types-of-malware</p> <p>System Threats and Prevenabilities</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ol style="list-style-type: none">1. What law is being broken if a user were to gain access to a system or intercept user data without permission?2. Law enforcement agencies can intercept information under what law and for which reason? <p>Go through presentation on how to prevent vulnerabilities.</p> <p>Activity 2</p> <ul style="list-style-type: none">• Look at your school's security policy (exemplar policy available in resources)• What is the point of a security policy?• Why key things does it cover?• What would you make your 'Top 3' of important things to have in a policy and why?• Extension:		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Create a resource to inform other people how security policies help prevent attacks <p>Activity 3</p> <ul style="list-style-type: none">• Write your own security policy for an organisation using a template to help you: <p>Low Challenge</p> <ul style="list-style-type: none">• Small accountancy firm <p>Medium Challenge</p> <ul style="list-style-type: none">• University <p>High Challenge</p> <ul style="list-style-type: none">• Supermarket chain <p>Plenary</p> <ul style="list-style-type: none">• Develop revision cards• Check questions and answers by shuffling cards and sharing around to test each other		
	<ul style="list-style-type: none">• To understand the effects of user access	Starter		

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	<p>levels on a system</p> <ul style="list-style-type: none">To understand how and why passwords must be kept secure and the levels of complexity	<ul style="list-style-type: none">What are the benefits of encryption?Why should passwords be kept secure? <p>Discuss with a neighbour: What things can we do to make sure our passwords are secure? List as many things as you can think of.</p> <p>Engagement Activity</p> <ul style="list-style-type: none">What makes a secure password?Build a list of suitable requirements for secure passwordsCreate a list of rules for keeping a password secureExplain why passwords should be kept secure in such a way. <p>Go through PowerPoint 4 on user access levels.</p> <ul style="list-style-type: none">Complete Worksheet 1		<p>Presentation and task sheets in folder</p> <p>System Threats and Prevenabilities</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">Define a set of user access levels for various groups. Go through activity 1 answers		
	<ul style="list-style-type: none">	Go through PowerPoint 4 on passwords. Activity 2 <ul style="list-style-type: none">Create an infographic to illustrate the importance of secure passwordsExplain the elements of a secure passwordPiktochart.com Plenary Question pupils on user access levels and passwords		
	<ul style="list-style-type: none">To learn how encryption can have a negative effect on law	Starter Ask pupils what encryption is?		

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	<p>enforcement and investigations</p> <ul style="list-style-type: none">• To understand how encryption works• To demonstrate a knowledge of a cypher and its' key.	<p>Go through answers</p> <ul style="list-style-type: none">• Reading: https://www.wired.com/2016/04/forget-apple-vs-fbi-whatsapp-just-switched-encryption-billion-people/• What effect would Whatsapp's encryption policy have on British police and other security investigations? <p>Activity</p> <ul style="list-style-type: none">• Caesar Cipher• Use template in order to write a message• Swap with a partner to decrypt the message <p>Extension</p> <p>Create revision material on Unit-1.6-system-security.</p>		<p>Presentation and task sheets in folder</p> <p>System Threats and Prevenabilities</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		Homework Revise for: Unit - 1.4.1 Threats to computer systems and networks Unit - 1.4.2 Identifying and preventing vulnerabilities		
		Test on: Unit - 1.4.1 Threats to computer systems and networks Unit - 1.4.2 Identifying and preventing vulnerabilities		Pupils to go to the following websites read through them and watch videos and make notes : https://www.bbc.co.uk/bitesize/guides/zj89dxs/revision/1 Complete the following quiz: https://www.bbc.co.uk/bitesize/guides/zj89dxs/test

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		DIRT lesson Go through answers – misconceptions Record marks on tracker		
	Start System-software 1.5.1 Operating systems 1.5.2 Utility software			
1 lesson	<ul style="list-style-type: none">• To understand what is meant by Systems Software• To be able to describe the role and purpose of an Operating System including:<ul style="list-style-type: none">○ User Interface○ Memory Management / Multitasking○ Peripheral Management and Drivers○ User Management○ File Management	<p>Starter</p> <p>What is an operating system?</p> <p>What Operating Systems have you used? Why are there so many different Operating Systems?</p> <p>Pupils to answer questions in their books. Then question further questions on examples of different operating systems and how they work.</p> <p>Ask pupils: What does an Operating System do for the user? Go through answers with pupils</p> <ul style="list-style-type: none">○ Provides a user interface○ Can be graphical		<p>Presentation and task sheets in folder</p> <p>Operating Systems and Utilities</p> <p>Go through video, make notes and create a poster</p> <p>https://www.youtube.com/watch?v=dJH_ev7DR5I&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=26</p> <p>https://www.youtube.com/watch?v=IOAMkJSjy2k&list=PLCiOXwirra</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">○ Includes device drivers to be able to use hardware○ Can copy, create, delete, edit files○ Manages the computers memory○ Allows input/output (peripheral devices) to work e.g. keyboard, mouse (e.g. plug and play)○ Allows us to have user accounts○ Can do lots of tasks at once (e.g. browse internet and type in Word)○ Controls the memory○ Manages processor time. <p>Go through powerpoint on systems software and operating systems.</p> <p>Activity 1 – use from folder</p> <ul style="list-style-type: none">• In teams of four you will be given a limited set of resources to share• Each team member will be given a set of cards– Complete tasks in order for each set, but you can decide how to order each set		<p>UAvkTPDWeeSqAKty3LAG37-&index=27</p> <p>https://www.youtube.com/watch?v= F1AuCLLW2o&list=PLCiOXwrraUAvkTPDWeeSqAKty3LAG37-&index=28</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• E.g. one task from Set A, followed by one task from Set B, followed by one task from Set C OR all Set A's tasks, followed by all Set B's tasks <p>Activity 1 – feedback</p> <ul style="list-style-type: none">• What problems did you encounter?• How did you overcome these? <p>Go through powerpoint on the functions of an operating system</p> <p>Activity 2</p> <p>Comparing interfaces for GUI and CL. Go through task sheet with pupils and then get them to do the practical task.</p> <p>Then pupils need to state the differences between the 2 interfaces.</p> <p>Plenary</p> <ul style="list-style-type: none">• Questioning• Produce One Question + Mark Scheme		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Exit Pass – Describe one role of an Operating System• Exit Pass – Draw a diagram to represent System Software Hierarchy• Homework: Investigate the differences between mobile phone Operating Systems and the differences in features of both.		
1 lesson	<ul style="list-style-type: none">• To understand the need for Utility Software• To be able to describe the purpose of<ul style="list-style-type: none">– Encryption Software– Defragmentation– Data Compression• To understand the role and methods of backup<ul style="list-style-type: none">– Full– Incremental	<p>Starter</p> <p>What is a utility program? Provide examples</p> <p>Go through powerpoint and utility programs</p> <p>Activity 1</p> <p>Encryption task – lesson 2 – activity 1</p> <p>Then go through answers</p> <p>Ask pupils what is the purpose of backups?</p> <p><u>Task</u></p>		<p>Presentation and task sheets in folder Operating Systems and Utilities</p> <p>Go through video, make notes and create a poster</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Find out how the following back-ups work:</p> <ul style="list-style-type: none">• Full backup• Incremental back up <p>Go through the different back ups.</p> <p>Plenary</p> <ul style="list-style-type: none">• Questioning• Produce One Question + Mark Scheme• Exit Pass – Describe one Utility Program in detail• Exit Pass – Explain how Encryption can be applied to data• Exit Pass – Explain how compression techniques are used• Homework: Explore further utility programs that exist on your computer /		<p>https://www.youtube.com/watch?v=8oMmtm4zJ2E&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=29</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>mobile phone and list the features and functions of these.</p> <p>Revise for test next lesson</p> <p>Test on:</p> <p>Start System-software</p> <p>1.5.1 Operating systems</p> <p>Utility software</p>		
		<p>DIRT lesson</p> <p>Go through answers – misconceptions</p> <p>Record marks on tracker</p>		<p>Pupils to go to the following websites read through them and watch videos and make notes :</p> <p>https://www.bbc.co.uk/bitesize/guides/zmqw7p3/revision/1</p> <p>Complete the following quiz:</p> <p>https://www.bbc.co.uk/bitesize/guides/zmqw7p3/test</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

	Start Unit- 1.6.1 Ethical, legal, cultural and environmental impact			
2 lessons	<ul style="list-style-type: none">• Understand what is meant by a key stakeholder• Identify stakeholders in a range of scenarios• Recognise and discuss issues related to Environmental, Cultural, Morals & Ethics	<p>Starter</p> <ul style="list-style-type: none">• Have you ever done anything illegal that might break a law relating to Computer Science?• Have you ever done anything that made you feel may have been morally or socially unacceptable linked to Computer Science?• Do you use technology in an environmentally responsible way? <p>Get pupils to write down the answers in their books.</p> <p>Task</p>		<p>Presentation and task sheets in folder</p> <p>Ethical, legal, cultural and environmental impact</p> <p>Go through video, make notes and create a poster</p> <p>https://www.youtube.com/watch?v=d4OJ7FUHD8Q&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=35</p> <p><u>Oak Academy</u></p> <p><u>How does Technology impact us?</u></p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Find 5 examples of Computer Science in the news – what issues are they discussing? <p>10 minutes activity. Ask pupils what they found out?</p> <p>Ask pupils what a stakeholder is? Then go through what a stakeholder is.</p> <p>Activity 1 – worksheet</p> <ul style="list-style-type: none">• Create a list of stakeholders and effects using the activity sheets• Discuss your results with a peer• Can you identify one extra stakeholder that your peer may not have?• Can you both come up with one that neither of you have? <p>Go through answers with pupils.</p> <p>Ask pupils the difference between ethics and morals? Then go through answers.</p>		https://classroom.thenational.academy/lessons/how-does-technology-impact-us-crrp4d
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>Activity 2</p> <p>Discuss whether each of these questions would be Ethical or Moral issues, or neither!</p> <ul style="list-style-type: none">• A company decides to install a range of computer software and hardware that would make most of its workforce unemployed• Digging for shale gas (Fracking) to release more energy supplies• The advancement of Artificial Intelligence• The use of live animals for testing <p>Go through answers with pupils</p> <p>Legal</p> <ul style="list-style-type: none">• Computer Science may be used to break a range of legislation• You must learn about 5 different legislations in Computer Science<ul style="list-style-type: none">• The Data Protection Act 1998• Computer Misuse Act 1990		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Copyright Designs and Patents Act 1988• Creative Commons Licensing• Freedom of Information Act 2000 <p>Pupils to find out what each of the legislations are about</p> <p>Activity 3 – cultural issues</p> <ul style="list-style-type: none">• You will be asked to discover anything you can on either:<ul style="list-style-type: none">• Languages/Character Sets<ul style="list-style-type: none">– What are character sets and how do they affect communication?• Colours/Dates/Numbers<ul style="list-style-type: none">– Are certain colours used differently across different countries?• Use of social media		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">– Does every country allow access to social media in the same way?• Globalisation of Computers<ul style="list-style-type: none">– Do privacy and computer legislations apply in every country?• Discuss your findings in a 2 minute presentation <p>Go through presentations</p> <p>Activity 4 – environmental issues Complete worksheet</p> <p>Plenary</p> <ul style="list-style-type: none">• Pass Out Quiz!• - You have 5 minutes to come up with the answers to the following:<ul style="list-style-type: none">• Give a definition of a stakeholder• Think of a new situation/issue and identify<ul style="list-style-type: none">• An Environmental issue		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• A stakeholder involved with this issue• How these are linked• Give 2 things to talk about when discussing Cultural issues• State the key difference between Ethics and Morals		
1 lesson	<ul style="list-style-type: none">• Understand what is meant by open source software.• Understand what is meant by proprietary software.• Understand what they are legally allowed to do with open source and proprietary software.	<p>Starter question</p> <ul style="list-style-type: none">• Why do you think that some people would bother to create software for free?• Do you think there could be any ethical issues that may arise from this? <p>Task</p>		<p>Presentation and task sheets in folder</p> <p>Ethical, legal, cultural and environmental impact</p> <p>Go through video, make notes and create a poster</p> <p>https://www.youtube.com/watch?v=f2NkKTn-mw8&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=36</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Research as many Open Source and Proprietary Operating Systems as you can.• Can you find at least 10 of each? <p>Go through answers</p> <p>Activity 1 – worksheet</p> <ul style="list-style-type: none">• Complete the table about open source and proprietary software.• Tick which statement applies to which software. <p>Go through answers</p> <p>Go through powerpoint on open source and proprietary software</p> <p>Activity 2</p> <ul style="list-style-type: none">• Work in small groups.		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Think of as many different applications and programs as you can.• Identify a proprietary version, and an open source version which do the 'same thing'.• E.g. Operating System:<ul style="list-style-type: none">– Microsoft Office v Linux/Gnu. <p>Plenary</p> <ul style="list-style-type: none">• Pair and Share.• Pair up with a buddy:<ul style="list-style-type: none">– Talk for 1 minute on Proprietary Software.– Swap around.– Discuss if, between you, you think that you have missed anything.		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>– Then do the same thing for Open Source.</p>		
	<ul style="list-style-type: none">• Understand what environmental issues could arise through the use of technology• Understand what privacy issue could arise through the use of technology	<p>Starter</p> <ul style="list-style-type: none">• Why so much development is occurring?• Does this development have any impact on our environment and does it pose any issues to our privacy? <p>Engagement activity</p> <ul style="list-style-type: none">• How often does the average person get a new mobile device?• What do you think an issue of changing your mobile phone every 2 years may have on 'privacy'?• https://www.youtube.com/watch?v=sIfYxgDpRo		<p>Presentation and task sheets in folder</p> <p>Ethical, legal, cultural and environmental impact</p> <p><u>Oak Academy</u></p> <p>The Law Data Protection and copyright</p> <p>https://classroom.thenationalacademy/lessons/the-law-data-protection-and-copyright-61hked</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<p>activity 1</p> <ul style="list-style-type: none">• In groups of two• Research what each of these legislations cover:<ul style="list-style-type: none">– The Data Protection Act 1998– Computer Misuse Act 1990– Copyright Designs and Patents Act 1988– Creative Commons Licensing– Freedom of Information Act 2000• Create a 4 minute podcast on what you have discovered <p>Go through the different acts</p> <p>Activity 2 Copyright Designs and Patents Act –</p> <ul style="list-style-type: none">• 4-types of licences• https://creativecommons.org/• Find out what licences you can get – and what you may use them for		<p><u>Oak Academy</u></p> <p>cultural impacts</p> <p>https://classroom.thenational.academy/lessons/cultural-impacts-cmtk2c</p> <p><u>Oak Academy</u></p> <p>privacy and surveillance</p> <p>https://classroom.thenational.academy/lessons/privacy-and-surveillance-cguk6c</p> <p><u>Oak Academy</u></p> <p>Environmental Impact</p>
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• Create an A4 poster on one of the licences <p>Freedom of Information Act 2000</p> <ul style="list-style-type: none">• Investigate the types of things you could request, and where from using the following link: https://www.gov.uk/make-a-freedom-of-information-request/the-freedom-of-information-act <ul style="list-style-type: none">• What information could you/would you ask for?• Is it already published?• What would you use that information for?• Discuss what you find with the person next to you <p>Privacy of Data</p> <ul style="list-style-type: none">• The internet means that millions of people could potentially access our data		<p>https://classroom.thenational.academy/lessons/environmental-impact-71h3ac</p> <p><u>Oak Academy</u></p> <p>Ethical impact</p> <p>https://classroom.thenational.academy/lessons/ethical-impact-c8w64t</p>
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Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ul style="list-style-type: none">• The Data Protection Act helps to stop our data being misused... but are we always safe?• We often give away key data without realising it:<ul style="list-style-type: none">• E.g. Ellie98 as a username...<ul style="list-style-type: none">• May identify you as female• May suggest you were born in 1998• Activity 3:<ul style="list-style-type: none">• Discussion: What bits of data do you put online? Could they leave you open to attack? <p>Privacy of Data – Activity 4</p> <p>Privacy of Data – Activity 5</p> <p>Search for yourself using Google, Bing and one other search engine:</p>		
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Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

		<ol style="list-style-type: none">1. List all of the things you find... Include<ol style="list-style-type: none">1. Videos2. Pictures3. Weblinks4. Usernames2. Read the descriptions of the first 20 searches to really see what comes up3. Could you build a profile about yourself, simply through searching your name? <p>Plenary</p> <ul style="list-style-type: none">• Create a Poster on one of the pieces of legislation you have covered<ul style="list-style-type: none">– Include as much detail as you can– Add some pictures! <p>https://www.youtube.com/watch?v=eUxUUarTRW4</p> <p>revise for test next lesson</p>		
		<p>Test on Unit- 1.6.1 Ethical, legal, cultural and environmental impact</p> <p>Record marks on tracker</p>		<p>Pupils to go to the following websites read through them and watch videos and make notes :</p>

Scheme of Learning

Curriculum area: GCSE Computer Science Unit 1

Key Stage: 4

Unit/Topic Title: Curriculum area: GCSE Computer Science Unit 1

				<p>https://www.bbc.co.uk/bitesize/guides/zhx26yc/revision/1</p> <p>Complete the following quiz:</p> <p>https://www.bbc.co.uk/bitesize/guides/zhx26yc/test</p>
		<p>DIRT lesson Go through answers – misconceptions Record marks on tracker</p>		