Planning for Computing Science S1 – Senior Phase

Background

Kyle Academy is a secondary school in South Ayrshire Council with a school roll of approx. 830 pupils.

Pupils are timetabled for one 50 minute period a week of Computing Science in first and second year. The Computing Science department has created a course that allows them to cover all the required content across S1 and S2, a total of 80 periods.

At the end of second year pupils are able to select subjects to study in third year. If they select Computing Science they will receive two 50 minute periods of a week.

Pathways

In the senior phase the Computing Science department offer the following subjects

- National 5 Computing Science
- Higher Computing Science
- National progression award in Cyber Security at levels 4,5 & 6

The Senior Phase subject choice within Computing Science at Kyle Academy is constructed around what they know about their learners. The department looked at current uptake, the number of learners leaving to attend FE, HE or going straight into employment, the qualifications that could be offered at a school level and the labour market intelligence for the local areas as well as Scotland wide.

This information showed that there is currently a National skill shortage in computing industry and the amount of cyber-attacks on business was increasing and that more companies are willing to take on school leaver's as graduate apprentices at the end of fifth year.

Through conversation with partners it was clear that every pupil should have basic Cyber hygiene skills no matter what profession they decide to pursue a career in and that every pupil in first and second year should learn about basic Cyber hygiene.

Progression

Using the moderation cycle we bundled the experiences and outcomes for the first, second and third year course into the following units:

- Software development
- Computer Systems
- Cyber Reliance and Internet safety
- Web development

The following pages show the result of this work.

A key part of this was to ensure that learners developed the knowledge, understanding and skills in a context that was relevant and engaging.

Overall planning of outcomes from S1 to Nat 5 Computing Science				
S1	**S2**	**S3**	**S4**	
Cyber Security S1 police Scotland Cyber Security badge *I can explore and use the features of a range of digital technologies, integrated software and online resources to determine the most appropriate to solve problems.* *TCH 3-01a* *I can keep myself safe and secure in online environments and I am aware of the importance and consequences of doing this for myself and others. TCH 3-03a* **Personal security** *Having used digital technologies to search, access and retrieve information I can justify my selection in terms of validity, reliability and have an awareness of plagiarism.* *TCH 3-02a* *I can use digital technologies to process and manage information responsibly and can reference sources accordingly.* *TCH 4-02a*		**Cyber Security (SQA level 4 cyber security fundamental)** *I can select and use digital technologies to access, select relevant information and solve real world problems.* *TCH 4-01a* *I can explore the impact of cyber-crime for business and industry and the consequences this can have on me.* *TCH 4-03a*	**Cyber Centurions** **(NPA Cyber Security Level 4/5)**	
Web Development I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements TCH 3-15a		**Web Development (javascript)** I can informally compare algorithms for correctness and efficiency TCH 3-13b I understand constructs and data structures in a textual programming language TCH 4-14a I can select appropriate development tools to design, build, evaluate and refine computing solutions to process and present information whilst making reasoned arguments to justify my decisions. TCH 4-15a	**National 5 Computing Science** **Web Development**	
Software development/Computer systems I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements TCH 3-15a I can describe different fundamental information processes and how they communicate and can identify their use in solving different problems TCH 3-13a I understand language constructs for representing structured information TCH 3-14a		**Software Development** I can informally compare algorithms for correctness and efficiency TCH 3-13b understand the relationship between high level language and the operation of computer TCH 4-14c I can explain the overall operation and architecture of a digitally created solution TCH 4-14b	**Computer systems** **(SQA level 4 Setting up a computer unit)** I can explain the overall operation and architecture of a digitally created solution TCH 4-14b I understand the relationship between high level language and the operation of computer TCH 4-14c	**National 5 Computing Science** **Software Design and Development**	**National 5 Computing Science** **Computer Systems**

Overall planning of content from S1 to Nat 5 Computing Science			
S1	**S2**	**S3**	**S4**
Cyber Security Internet versus WWW Home network & router Hacking & viruses Security Precautions 1 & Anti-Virus Software Anti-Virus Evaluation Security Precautions 2 Firewalls, Security Suites and Firewall Evaluation Passwords Phishing Social Networking Chat-rooms, Cyberbullying & Grooming	**Personal Security** Digital Footprint Social media profile Spear Phishing Grooming	**Cyber Security (cyber security fundamental)** Malware Social engineering Denial of service attack Computer law Security percussions	**Cyber Centurions project (NPA Cyber Security level 4/5)** Data Security Ethical Hacking Digital Forensics **National 5 Computing Science** Describe the role of firewalls. Describe the use made of encryption in electronic communications.
Web Development(HTML) HTML Elements HTML Attributes What is a browser Basic HTML structure Image tag Hyperlinks tag Tables tag Video tag DIV tag Testing	**Web Development (CSS)** Web site structure External Style sheet Internal Style Sheet Inline Style sheet CSS Syntax Color Align Background Boarders Fonts Testing	**Web Development (javascript)** Wire frame design Prototyping Mouse over Mouse out On click Animation Scrolling banners Testing	**National 5 Computing Science: Web Development** Describe and exemplify the website structure with a home page, a maximum of four linked multimedia pages, and any necessary external links. Describe, exemplify and implement, taking into account end-user requirements, effective user-interface design (visual layout and readability) using wire-framing - navigational links; consistency across multiple pages; relative vertical positioning of the media displayed; file formats of the media (text, graphics, video, and audio) web content (text, graphics, video, and audio)
Software development & computer systems using Microbits Processor Input devices Output devices Sequence Inputs Data types Variables Selection Iteration	**Software development & computer systems using Lego Mindstorms** Ram Backing storage Input including Sensors Reading code Sequences Design and build a solution Testing	**Software development using Python** Design and build a solution Sequence Selection Variable Iteration Data types Testing **Computer systems** Hard drive RAM CD drive Mother board Power supply Heat sync OS, Application and Utility Software	**National 5 Computing Science: Software design and Development** Identify the purpose and functional requirements of a problem that relates to the design and implementation at this level, in terms of: inputs, processes and outputs Identify the data types and structures required for a problem that relates to the implementation at this level Describe, identify, and be able to read and understand structure diagram, flowcharts and pseudocode Exemplify and implement one of the above design techniques to design efficient solutions to a problem. Describe, exemplify, and implement appropriately the following data types and structures: Character; string; numeric (integer and real) and Boolean **National 5 Computing Science Computer Systems** Describe the purpose of the basic computer architecture components and how they are linked together: processor (registers, ALU, control unit); memory locations with unique addresses; buses (data and address)

S1 Computing Science Cyber Security	Block: **(1 period a week)**	
Context for learning	**Learning Intentions**	**Learning Experience**
Pupils will complete the Police Scotland cyber security badge to raise awareness of the danger they and their family face while using the WWW & the Internet**.**

In this unit we the pupils will go home and investigate the devices and people who use the devices and give recommendations on how to reduce the risk of the people or device being attacked by cybercriminal. | Explore the devices and resources connected to my home network and determine the most appropriate risk to these devices.

Determine the best strategies to keep myself safe in online environments

Demonstrate an understanding   of the consequences of not staying safe online | This unit will last between 12-14 week to completed at 1 x 50 minute period a week. This is the first unit of work pupils will undertake in S1.
Activities
• Identify all devices in their home that connect to the internet
• Pupils will create a home network diagram.
• Question member of their family about their online habits
• Identify characteristic of phishing e-mails
• Create strong passwords
• Evaluate their use of social media
• Identify dangers of social media
• Understand percussion that they can take to reduce their chance of becoming a victim of cyber crime |
| **Experiences and Outcomes** | **Success Criteria** | **Assessment** |
| I can explore and use the features of a range of digital technologies, integrated software and online resources to determine the most appropriate to solve problems.
TCH 3-01a

I can keep myself safe and secure in online environments and I am aware of the importance and consequences of doing this for myself and others.
TCH 3-03a | I know the difference between the WWW. and the Internet
I can identify a website.
I know how to change the password on my home router.
I can identify all the devices in my house connected to the internet.
I can identify a router from a network diagram.
I know how to find out if my router has a firewall.
I know the difference between hacking and spreading of viruses.
I can identify a computer virus.
I know all 4 ways a hacker can damage my computer.
I know the most common way a virus can attack my computer.
I know the most effective way to protect my computer form viruses.
I know the most effective way of stopping hackers from attacking my computer.
I can Identify my firewall on my computer.
I can create a secure password.
I can Identify a phishing e-mail.
I know the three most common dangers I will face on social networking sites.
I know how to identify a catfishing attempt.
I know the five tips for safer social networking.
I know the common dangers I face when using a chat-room.
I can identify devices used for cyberbullying.
I know the most common places grooming takes place.
I know the 6 tips to prevent grooming.
I know how to report a grooming attempt. | Pupils must produce a home network diagram and interview 2 members of their family using questionnaire before they can undertake the assessment which is to complete a review of the people and device that use their home network.

Using the information they have gathered they must identify risks and give strategies to reduce the risk. |

S1 Computing Science Software development /Computer systems	Block: **(1 period a week)**	
Context for learning	**Learning Intentions**	**Learning Experience**
Using BBC Microbit pupils will be introduced to the basic concepts of software development and Computer systems. We decided to use microbits for software development as pupil are more engaged when they are programming experience is more physical and interactive We have combined both topics as we feel as pupils become inquisitive about the Microbit they will start to ask questions relating to how the MIcrobit works which leads into basics of computer systems. This unit will start to introduce pupils to the skill of reading code. We relate the Microbit to the desktop computer they use every day in school.	Design, build and evaluate BBC Microbit programs to produce different devices Gain an understanding of different programming constructs used when writing programs to solve problem	This unit will last between 12-14 week to completed at 1x 50 minute period a week. The pupils will be introduced to software development process as they design and build interactive programs using the Microbits. They will be also introduced to computer systems by comparing then mircobit with the desktop computer they use every day. Computer systems will focus on the basic of Input devices, processor and output device main memory and backing storage will be introduced in S2 Lego mindstorm unit. At the end of each section of the pupil booklet pupil will have to complete a progress check. In each progress check pupil will have to read and explain what different sections of code do and identify an error that exist within code
Experiences and Outcomes	**Success Criteria**	**Assessment**
I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements TCH 3-15a I can describe different fundamental information processes and how they communicate and can identify their use in solving different problems TCH 3-13a I understand language constructs for representing structured information TCH 3-14a	I understand the importance of sequence while creating code for the microbit I can select the correct blocks to display my lucky number I can select the correct blocks to display my first name I can select the correct blocks to display my first name followed by my age I can use on shake and on button press input code I can create a microbit program that uses a minimum of 2 input commands I understand the importance of different data types I can use more than 1 data type when coding I understand the importance of Variables I can use at least 1 variable when creating code I understand the importance of selection I can use at least selection when creating code	Pupils will be assed using the portfolio approach as the department does not have time to incorporate unit assessment that could take 2 -3 period to complete. The evidence will be generated over a number of weeks as pupil complete the practical task and progress checks for each topic in the unit . The combination of progress checks and practical task complete will determine the level for each pupil

S1 Computing Science Web Development	Block: (1 period a week)	
Context for learning	**Learning Intentions**	**Learning Experience**
Pupils will use the WWW on a daily basis and this unit has been introduced to allow pupils to gain an understanding of how all web page are created and viewed by users. This is the department introducing the knowledge and skill needed for the N5 web development unit. As we only have limited time we decided to start with HTML and then Move onto CSS in S2 and JavaScript in S3 which will reduce time taken to teach these topics in the N5.	Develop the skill need to build and evaluate web sites Gain an understanding of how to use HTML to create web pages	This unit will last between 10-12 week to completed at 1x 50 minute period a week. Over the course of this block pupil will learn and the different languages that are need to create a web page . The pupils will learn how to use the basic structure of a web page to produce a web page. They will learn a number of different tags to add content to web pages.
Experiences and Outcomes	**Success Criteria**	**Assessment**
I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements TCH 3-15a	I can Use the basic structure of HTML tags I can use the P tag I can view my webpages in a web browser I can Identify any errors in the HTML tags I can identify the different file extension s used for images I can insert image into a web page I can change the height and width of images using HTML I can use internal and external hyperlinks I can add a table to a web page I can add multimedia to a web page I can use the div tag in a web page	Pupils will be assed using the portfolio approach as the department does not have time to incorporate unit assessment that could take 2 -3 period to complete. The evidence will be generated over a number of weeks as pupil start using tags to build web pages. The combination of tags used by pupils will determine whether the level has been achieved

S2 Computing Science Cyber Security	Block: **(August- October 1 period a week)**

Context for learning	Learning Intentions	Learning Experience
This unit with focus on the digital footprint and how it could be used against you. The unit will starts with looking at social media profiles and what they tell people about you. The class will the move onto learning how to use " " & : in goggle to reduce their search results. Pupils will then use these skill gather as much information as possible on two targets (Michelle Keegan & Ash White) . We will then look at how this information can be used against you in a spear phish attack. The class will then move onto look at a case study (Breck Bednar), We then try to get the pupils to understand how the skill they have learned when gathering information on Michelle Keegan & Ash White might have saved Brecks life if he had used them.	Develop the skill needed to search and retrieve information relating to specific targets. Gain an understanding of the importance of managing my digital information responsibly.	This unit will last between 10 week to completed at 1x 50 minute period a week. Pupils will look at how to use Google search engine to gather as much information as possible on selected target (Michelle Keegan). The must then put together a spear phishing attack for the target (Michelle Keegan). Pupils will evaluate their social media profile and establish any changes they need to make. They will then look at how groomers can use social media to select their victims. They will then look at a case study of victim go grooming attack and look at strategies to deal with groomer

Experiences and Outcomes	Success Criteria	Assessment
Having used digital technologies to search, access and retrieve information I can justify my selection in terms of validity, reliability and have an awareness of plagiarism. TCH 3-02a I can keep myself safe and secure in online environments and I am aware of the importance and consequences of doing this for myself and others. TCH 3-03a I can use digital technologies to process and manage information responsibly and can reference sources accordingly. TCH 4-02a	I can identify how to make my social media profile more secure I understand how the information I post on social media can be used against me I can find out the name of the person who owns the orange lambergine I can find the occupation of the person who owns the car I can find the person home address I can find who else lives at the address with the person I can find the person company accounts I can identify a spear phishing e-mail I can research a famous person I can use this information to gathered to create a spear phishing e-mail I can produce a timeline of the Breck Bednar story I can identify points in the timeline where Breck should have stopped communicating I can identify points in the timeline where Breck should have looked for help I can create a set of rules for communication online I can check the personal details of people I meet online to make sure they are correct	Pupils will be assed using the portfolio approach as the department does not have time to incorporate unit assessment that could take 2 -3 period to complete. The evidence that is gathered is e-mail created for spear phishing attack and the evaluation of the case study. This unit will form part of the holistic assessment at the end of S2. Pupil will have to create for the personal safety web page**.**

S2 Computing Science Software development / computer systems	Block: **(October - December 1 period a week)**

Context for learning	Learning Intentions	Learning Experience
In this unit we use Lego mindstorm Ev3 robots to add an element t of challenge into the software development unit. We are trying to build on what pupils have learned in the BBC microbit unit in S1 by making the unit as interactive as possible. I this unit pupil must solve a series of challenge and we have a leader board of the pupils who get the robot to complete the challenges in the quickest time. Pupils will work at their own pace through these challenges and should be pupil lead	Develop an understanding of how the sequence of programming construct are important when solving a problem Gain an I understand how testing and evaluating is important when refining mindstorms programs Explore the Lego Mindstorms ev3 block to understand how my programs are stored and updated.	This unit will last between 10 week to completed at 1x 50 minute period a week. Pupils will have to write programs that will allow a Lego minstorms robot complete a series of tasks. Each task will get steadily more challenging and pupils will have to refine their code after each test run. Pupils must understand the different hardware used by the robot before they start using the software to solve problems. They will have to understand the different types of input devices that can be used by a computer not just the traditional keyboard and mouse.

Experiences and Outcomes	Success Criteria	Assessment
I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements TCH 3-15a I can describe different fundamental information processes and how they communicate and can identify their use in solving different problems TCH 3-13a I understand language constructs for representing structured information TCH 3-14a	I can identify input device used be the robot I can identify output device used be the robot I can identify storage device used be the robot I can name all the different sensors on the robot I can name the different interfaces used by the robot I can identify the robots motors. I can download a program from my computer to the robot I can run a program stored on the robot I can identify the blocks needed to move my robot in a straight line I can program my robot to move 1 meter in a straight line I can identify the block that will make my robot move backwards I can program my robot to move forward and then move back I can identify the blocks needed to make my robot turn left I can identify the blocks required to make my robot turn right I can program my robot to move forward 1 meter and then turn right and move 50 cm I can program my robot to move around obstacles I have completed the parking challenge I have completed the raised parking challenge I have managed to complete the collection challenge	Assessment will be an on-going process and will be related to the level of challenge they can complete during the unit of work.. The computer systems unit will be assessed using a Holistic assessment at the end of S2. Pupils will have to create the content for the computer systems web page.

S2 Computing Science Web Development	Block: **(January – April period a week)**	
Context for learning	**Learning Intentions**	**Learning Experience**
This unit of work will build on the skill pupils learned in S1. They will now learn how to change the style of the web pages using CSS As we only have limited time we decided to start with HTML and then move onto CSS in S2 and JavaScript in S3 which will reduce time taken to teach these topics in the N5.	Demonstrate the use of HTML & CSS to create a web site. Gain and understanding how CSS can change the content on a web site	This unit will last between 10-12 week to completed at 1x 50 minute period a week. Pupil will learn how to add CSS to web pages to change how the page looks. They will have to build a web site that use a number of different HTML & CSS tags.
Experiences and Outcomes	**Success Criteria**	**Assessment**
I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements TCH 3-15a	I can understand CSS syntax I understand the different types of style sheet used in web pages I can use CSS to change the colour of font I can use CSS to change the font size I can use CSS to place a border around text I can use CSS to change the background colour of the page I can use CSS to change the background colour of a block of text I can use an external style sheet across two different pages	Pupils will be assed using the portfolio approach as the department does not have time to incorporate unit assessment that could take 2 -3 period to complete. The evidence will be generated over a number of weeks as pupil start using tags to build web pages. The combination of tags used by pupils will determine whether the level has been achieved. This unit will form part of the holistic assessment that is completed at the end of S2.

S3 Computing Science Cyber Security	Block: (2 periods a week)

Context for learning	Learning Intentions	Learning Experience
The SQA level 4 cyber Security Fundamentals unit and an Introduction to ethical hacking. This unit is in the S3 course to give pupils the skills and understanding to undertake the Cyber Centurions project. This unit should be used to make pupils inquisitive about a career in cyber security. The school will also raise awareness about the opportunities that exist in school if they decide to follow the cyber security pathway**.** This is a 40 hour unit but because of the prior learning in S1 &S2 we can complete 20 hours.	Demonstrate the use of ethical Hacking software Gain and understanding how cybercrime can impact on Businesses Explore Ethical hacking software to understand how the software can be used to select information to solve a problem.	This unit will last between 12-14 week to complete at 2x 50 minute period a week. During the SQA cyber Security Fundamentals pupils will carry out the following task Pupils will gain a understanding of some of the tools that are used by hackers to exploit the most common vulnerabilities and the laws that are broken by these attacks. They will also gain an understanding of the importance of making sure that all their software is updated regularly Pupils will install Ubuntu operating system and then configure the firewall settings The pupils will also gain an understanding of how their action can by exploited by a hacker(social engineering)

Experiences and Outcomes	Success Criteria	Assessment
I can explore the impact of cyber-crime for business and industry and the consequences this can have on me. TCH 4-03a I can select and use digital technologies to access, select relevant information and solve real world problems. TCH 4-01a	I can use terminology correctly I can state the reasons for the growth of cyber crime I understand what are the main factors that motivate hackers I can state the common vulnerabilities in digital devices I understand how these vulnerabilities can be used in an attack I have a understanding of basic social engineering techniques I can state the risks to personal privacy I can describe the correct security measure to reduce the risk to devices I know what steps I can take to reduce the risk of an attack I know the current computer related laws I can state the correct response to specific cyber attacks I can install anti-virus software and ensure it is up to date I can use encryption to protect a file. I can use a pop up blocker on a web browser I can make back-ups of important data to removable storage I can identify way to physically secure devices I can use anti-virus software to run a scan on my device and on external storage devices I can configure the firewall on a computer.	The pupils will complete SQA Cyber Security fundamental assessments.

S3 Computing Science Web development	Block: (2 periods a week)	
Context for learning	**Learning Intentions**	**Learning Experience**
In this unit pupils will learn how to add interactive to their web site using JavaScript. This unit will equip pupils with the skill and knowledge to undertake N5 Computing Science course assignment.	I understand the relationship between the high level language and the operation of the web browser Demonstrate the use of JavaScript to add interactivity to a web page Gain an understanding HTML, CSS & JavaScript construct I can select the appropriate development tools to build, refine & evaluate web pages	This unit will last between 12-14 week to completed at 2 x 50 minute period a week. Pupil will be given completed wireframe designs and they will have to produce a web site that matches the design. As well as completing the practical tasks pupil will have to complete a web development booklet that requires the pupils to read and understand the code that is used to create web pages. In this booklet pupils will have to draw the output produced by HTML, CSS & JavaScript.
Experiences and Outcomes	**Success Criteria**	**Assessment**
I understand the relationship between high level language and the operation of computer TCH 4-14c I can select appropriate development tools to design, build, evaluate and refine computing solutions to process and present information whilst making reasoned arguments to justify my decisions. TCH 4-15a I understand constructs and data structures in a textual programming language TCH 4-14a	I can read and understand HTML, CSS & JavaScript I can demonstrate understanding of HTML,CSS & JavaScript by drawing the output of the code I can insert JavaScript into an existing webpage I can understand a wireframe design I can create web page that match the wireframe design I can identify and rectify errors in HTML, CSS & JavaScript I can test the web page I have created I can evaluate the web pages I have create against user requirements	The assessment will resemble the current N5 web development section of the course assignment. They will also have to complete a small class test where they have to answers question of a similar to the exam that will be in the N5 exam.

S3 Computing Science software development	Block: **August – October (2 periods a week)**

Context for learning	Learning Intentions	Learning Experience
In this unit we will introduce pupils to Python programming language which we use in N5 & Higher. During the course of learning and teaching pupil will be given the design of a program and they have to create a program that matches the design this will allow the pupils st gain the skill they need to complete the software development section of the N5 course assignment.	I understand the appropriate tools to build, evaluate and refine Python solutions Demonstrate the use of Python to produce correct & efficient programs to solve problems Gain an understanding Python construct I can select the appropriate development tools to design, build, refine & evaluate Python programs	This unit will last between 12-14 week to completed at 2 x 50 minute period a week. In this unit pupils will be given the design of a programing using flow chats and pupils will have to implement the design in Python. The pupils will work their way through a Python programming booklet. In the booklet pupils will be given flow charts or partially completed flow chart which increasing introduce different programming constructs.

Experiences and Outcomes	Success Criteria	Assessment
I can select appropriate development tools to design, build, evaluate and refine computing solutions to process and present information whilst making reasoned arguments to justify my decisions. TCH 4-15a I can informally compare algorithms for correctness and efficiency TCH 3-13b I understand constructs and data structures in a textual programming language TCH 4-14a	I can understand a Flow chart I can produce a program that matches a flow chart design I can draw a flow chart that meet the requirements of the user I can read code and explain what the output will be I can trace through code and identify any errors I can create a program that use variables I can use If statements in my program I can use a fixed loop in my program I can use conditional statements in my program I can test my program to ensure it work I can use 2 techniques to make my code readable I can evaluate my solution to make sure it is fit for purpose	The pupils will undertake ongoing assessment using the portfolio approach. The pupils will work through a series of task which will increase in difficult and depending on the task they complete will depend on their level. I will also sit a small write test on reading and explain code.

S3 Computing Science Computer systems	Block: **(2 periods a week)**	
Context for learning	**Learning Intentions**	**Learning Experience**
Pupil will build on their basic knowledge of computer system by allowing pupils to remove component such as the hard drive and ram for old computer. This should bring the dry subject of computer system to life and make it more engaging with pupils as the physical get to remove components from the computer. They will then use virtual machine to install operating systems

In this unit pupils will undertake a unit from the SQA NPA in computer refurbishment. | I understand the overall architecture of the a desktop computer

Demonstrate the how remove components from a computer systems

I understand the relationship between the hardware components and the Operating system

Demonstrate the how to install an operating system onto a Virtual machine | This unit will last between 12-14 week to completed at 2 x 50 minute period a week.
Pupil will get the opportunity to remove the following from old computers RAM, Hard drive, mother board, heat sync, power supply and CD drive. While doing this they will have to follow health and safety producers.

Set up install operating systems on virtual machines and change the firewall setting of the operating system. |
| **Experiences and Outcomes** | **Success Criteria** | **Assessment** |
| I can explain the overall operation and architecture of a digitally created solution
TCH 4-14b

I understand the relationship between high level language and the operation of computer
TCH 4-14c | I can demonstrate an understand on health hand safety

I can remove and replace all internal connection
I can remove RAM from the Computer

I can remove and replace CD drive

I can remove and replace power supply unit

I can I can remove and replace Hard drive

I can I can remove and replace heat sync

I can I can remove and replace mother board

 I can clean the components safely

I can successfully power up the computer system after I have replace components

I can boot the computer using a pen drive

I can install a new operating system

I can change one security setting on the newly installed operating system | Pupils will complete the SQA assessment for Computer refurbishment at level 4 |