Subject curriculum; Computer Science

Serviam; Developing our gifts and talents for the good of others.

Academic Year Year; 7	Content. Unit title and brief outline of content.	Skills taught in each unit.	Assessment – what knowledge and skills will be assessed and how?
Rationale	The modules taught below support students learning from KS2 of IT/CS or non to help built pupils skills in the subject. It also provides a taster of Computer Science GCSE. The Computer Science Pathway map is used to identify levels.		
Autumn A	Internet Safety and MS Teams	Key feature use in Teams Being able to make alerts of incidents	Knowledge on how to stay safe online will be assessed as well as how MS Teams can be used as a tool to support pupils though their education at the Ursuline.
Autumn B	Using IT to effectively Learn (Bit pattern)(History of CS)(Webquest using search engines)	Use of MS Office How to email/structure Converting binary to denary and vice verse	Pupils are assessed on Hardware/software and well as the binary numbering system. Advanced Searching skills using a browser are assessed especially to see if pupils can use keywords or element items from a search.
Spring A	Algorithms using Flowol	Decomposing Problem solving Algometric thinking	Pupils are assessed on algometric thinking skills to see how they create flowcharts based on scenarios as well how they can decompose a situation.
Spring B	Programming with Scratch	Sequencing of instructions Problem solving Decomposing Evaluating Genralisation	Pupils are assessed on a practice basis and observed to see how and what they create using the Scratch software. Pupils are assessed on the skills listed in the skills section for this module.
Summer A	Programming with Scratch and ethics	Arguing a point Evaluate	Pupils are assessed on the use of advance skills in scratch and how

		Explain and justify Debate	they can decompose a situation. Pupils are assessed on how they can argue an ethical and moral situation that technology brings through exam style questions from a GCSE paper.
Summer B	Internet of Things and Microbits	Compare Discuss Justify Suggest Problem solving Algometric thinking Decomposing Evaluating Genralisation	Pupils are assessed on key words from the module and there understanding of what 'The Internet of Things' is. Pupils are practically assessed on how they use a BBC Microbit to tackle a given scenario and observation notes are made of their creation allowing assessment to be based on what they produce and steps taken to produce the given scenario.

| Academic Year

Year; 8 | Content.
Unit title and brief outline of content. | Skills taught in each unit. | Assessment – what knowledge and skills will be assessed and how? |
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| Rationale | The modules taught below help built pupils skills in the subject as a development from year 7. It also provides a taster of Computer Science GCSE allowing them to engage and take interest within the subject and explore technology used in the real world. The Computer Science Pathway map is used to identify levels. Pupils in year 8 are provided with key skills required to move into IT courses at KS4/KS5 providing a choice of course at a higher level and a taster of CS/IT. | | |
| Autumn A | Online Safety and MS Teams | Key feature use in Teams
Being able to make alerts of incidents | Knowledge on how to stay safe online will be assessed as well as how MS Teams can be used as a tool to support pupils though their education at the Ursuline. |
| Autumn B | Introduction to Databases and Plagiarism
(Using search engines webquest) | Creating a database
Creating a query
SQL writing
Creating a form/report | Pupils are tested on keywords relating to Database as well as how they use sources to reference work they produce. |
| Spring A | Programming in Python with Logic Gates | Sequencing of instructions
Problem solving
Decomposing
Evaluating
Genralisation | Pupils are assessed on materials they produce using python code as well as there understanding of logic gates. |
| Spring B | Programming in Python with Sorting | Sequencing of instructions
Problem solving
Decomposing
Evaluating
Genralisation | Pupils are assessed on materials they produce using python code and assessed on if they can remember the types of sorts a program can produce and the algorithm for them. |
| Summer A | Ethic and Cryptography and Data Representation | Arguing a point
Evaluate
Explain and justify | Pupils are assessed on how they encrypt and decrypt data as well as how data in an image form is |

		Debate Problem solving Generalisation	created using machine code. Pupils are assessed on how they can argue an ethical and moral situation that technology brings through exam style questions from a GCSE paper.
Summer B	Networks and Internet, Website Design & Development (HTML/CSS) and Compression	Problem solving Decomposing Genralisation	Pupils are assessed on the theory aspect of the different types of network you can produce as well as how the internet works. Pupils make a website using HTML/CSS code and are assessed on the website functionality and user interface.

Academic Year Year; 9	Content. Unit title and brief outline of content.	Skills taught in each unit.	Assessment – what knowledge and skills will be assessed and how?
Rationale	The modules taught below help build pupils skills in the subject as a development from year 8. It is also a chance to start exploring Computer Science modules allowing pupils to be ready to move forward with GCSE and start the course if they pick the subject as a choice. The Computer Science Pathway map and GCSE levels is used to identify levels. (OCR J277)		
Autumn A	**Algorithms** – Abstraction/Decomposition/Algorithmic thinking	Abstraction Decomposition Algorithmic thinking	Assessment on the understanding of key words and its use
Autumn B	**Algorithms** – **Designing, creating and refining algorithms.** Identifying inputs/processes/ and output for a problem Structure diagram	Algorithmic Thinking Generalisation Problem Solving	Assessment on a structure diagram created and identification of input/process/output
Spring A	**Algorithms** – **Designing, creating and refining algorithms.** Create, interpret, correct, complete, and refine algorithms using: o Pseudocode o Flowcharts o Reference language/high-level programming language	Abstraction Decomposition Algorithmic thinking Evaluate Coding	Creating and or working with pseudocode and flowchart on a given scenario and implementing this into code form
Spring B	**Algorithms** – **Designing, creating and refining algorithms.** Identify common errors Trace tables	Problem solving Evaluate	Being able to find common errors and solve problems. Create a trace table
Summer A	**Algorithms** – Searching and sorting algorithms	Algorithmic thinking Decomposition	Knowing which search and sort should be used

	Standard searching algorithms: ○ Binary search ○ Linear search ☐ Standard sorting algorithms: ○ Bubble sort ○ Merge sort ○ Insertion sort (May involve parts of 2.2. programming techniques – cover programming fundamentals)	Problem Solving	Knowing the algorithm of the sort and search. Use a search to find an item.
Summer B	Practice programming through project work with Python (GCSE 2.2 covered) covering: Data types Additional programming techniques: The use of basic string manipulation ☐ The use of basic file handling operations: ○ Open ○ Read ○ Write ○ Close ☐ The use of records to store data ☐ The use of SQL to search for data ☐ The use of arrays (or equivalent) when solving problems, including both one-dimensional and two-dimensional arrays ☐ How to use sub programs (functions and procedures) to produce structured code ☐ Random number generation	Coding Decomposing Algorithmic thinking Evaluate Abstraction Generalisation SQL	Producing a program from a given scenario. Simple file handling code Error handling Use of SQL for a query