Curriculum Overview – Year 9 Computing

Sequencing of topics	What knowledge will students develop? (Including key terminology)	What skills will students develop? (Including literacy & numeracy)	Assessment opportunities	Homework opportunities	Personal development (Ursuline Values, Catholic Social Teaching, Cultural Capital, Cross-curricular, Careers)	Curriculum links
Autumn Term 1						
Programming with sequenced instructions in Python	Students will read and create simple programs that use selection, and introduce the concept of LISTS/ARRAYS. identify the operations that are commonly performed on lists investigate iteration using WHILE How to use FOR to iterate over list items. Make a game using lists : planetary quiz mini-project in Python Finish the planetary quiz project.	Learners recap on the introduction to Python units from last year. Students learn to add, remove and modifying items in a list. Practice using lists with iteration. Study a range of examples before moving on to apply what they have learnt to similar tasks. increase their independence in Python programming Further develop their independence in Python	• Mid-topic assessment • End of topic assessment Use of questioning in class	Questions set on Satchel One once a week	Listening and attentive to the technical information shared in class Courageous and resilient when overcoming problems during coding. Links to Science Career path: Computer Programmer	use two or more programming languages one of which is text based. make appropriate use of data structures
Autumn Term 2						
Cybersecurity	You and your data : students explore why our data is valuable to others and why it is important to keep it safe.	• Students learn what data companies collect about them and what they use it for.	• Mid-topic assessment		Listening and attentive to the technical information shared in class	understand a range of ways to use technology safely, respectfully,

	Data Protection: How the law tries to keep our data safe. Social Engineering: humans as the weak point in the system. Exploring the concept of hacking and the techniques used by hackers to exploit computer systems. Malware: Trojans viruses and worms. and the different categories of malware, as well as understanding how they work and the damage they can do.	• The main provisions of Data Protection Legislation. • Students learn how to identify social engineering attacks such as phishing emails. • Students learn the difference between ethical and unethical hacking as well consequences of hacking . • Students learn the different categories of malware, as well as how they work and the damage they can do.	• End of topic assessment Use of questioning in class		Acting with truth and integrity. students research the available career choices in cyber defence **Leading others in pursuit of justice** when discussing he negative effects of the spread of the internet and how it can be dealt with Links to PHSE	responsibly and securely, including protecting their online identity and privacy
Spring Term 1						
Representation of data in computer systems	Creating digital mosaics pixel by pixel. representation of colour as a mixture of red, green, and blue (RGB) Creating digital images using INKSCAPE Sampling sounds using analogue to digital conversion. how the sample rate and the sample size affect the size and quality of the representation. Compression: what compression is and why it is necessary.	• how an image composed of individual coloured elements can correspond to a sequence of binary digits. • How to represent colour using an 8-bit sequence • Learners use appropriate software to perform a range of image manipulation functions and complete specific tasks and challenges. • understanding samples, sampling rate, and sample size	• Mid-topic assessment • End of topic assessment • Use of questioning in class	Questions set on Satchel One once a week	Listening and attentive to the technical information shared in class **Courageous and resilient** when overcoming problems. Links to Science and Design and Technology	understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits.

		• using Audacity to sample sounds as AUF files Using Audacity to compress sound files to MP3 standard				

Data Science	Introduction to data science Exploring Global data sets • Learning the stages of the investigative cycle: • Problem • Plan • Data • analysis, • conclusion	How visualising data can provide insights when looking at raw data. exploring how advances in technology have made it possible to collect, store, and analyse large datasets learn about the investigative cycle :problem, plan, data, analyse, conclusion apply the cycle to a data set before uploading to the CODAP platform	• Mid-topic assessment • End of topic assessment Use of questioning in class	Questions set on Satchel One once a week	Listening and attentive to the technical information shared in class Courageous and resilient when overcoming problems such as converting denary to binary numbers Links to Maths Career path: System Development, Data Mining	collecting and analysing data and meeting the needs of known users Links to Maths and Science

Physical Computing	Students are introduced to the topic of physical computing Students exploring the micro: bit hardware components: input Output, CPU Write and execute Python programs on the micro: bit.	Students will learn about the micro: bit. They will also write and execute Python programs on the micro: bit using simple coding patterns.	• Mid-topic assessment • End of topic assessment	Questions set on Satchel One once a week	Listening and attentive to the technical information shared in class Courageous and resilient when overcoming problems such as finding logic and syntax errors in Python code. Discerning and Joyful	use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate

	Making connections (Part 1) students learn to use the outputs of the Micro bit , such as LEDs and speakers. Making connections (Part 2) students experiment with examples of using the micro: bit's General-Purpose Input Output (GPIO) pins Students create a guess the number game with the micro bit to consolidate their learning.	Students experiment with examples of using the micro bit's General-Purpose Input Output (GPIO) pins to connect it to external hardware component Students create a game will utilise gestures for input, and it will utilise sound and light for output.	Use of questioning in class		When using the hardware for creative projects Opportunity to discuss the history of early computers and their use in code breaking during WW2	understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
Summer Term 2						
Animation	Move, rotate, scale, colour Pupils learn how to move rotate scale and colour objects using Blender software Students learn basic animation techniques Students develop complex models and learn how to use the colour palette Organic modelling Final animation project	how to move, rotate, scale and colour objects in Blender learn how to create animations in Blender and make more complex models students make models realistic by using different rendering techniques more about rendering and how to add different lighting effects to animations. Use all of the skills developed in this unit to make a short animation.	• Mid-topic assessment • End of topic assessment End of Year assessment	Questions set on Satchel One once a week	Discerning and Joyful Students share their enjoyment by undertaking a final summer project of their own design in Blender Links to Design and Technology Opportunity to explore the origins of screen animation from early films such as "Steamboat Willie" to modern computer generated films.	undertake creative projects that involve selecting, using, and combining multiple applications, collecting and analysing data and meeting the needs of known users Links to Design and Technology and Art.