

Computing Year 9

Computing effects our daily lives, stimulates curiosity and broadens student's horizons, both in the understanding of the wider surrounding platforms and providing access to a range of job opportunities. The computing curriculum provides students with the opportunity to develop a love and appreciation of computing and realise their full creative potential through the breadth and depth of knowledge and skills.

The curriculum broadens the students' knowledge behind the science within the subject.

Curriculum overview:

	Autumn term:	Spring:	Summer:
Half term 1	Animation Identify how to add, delete, and move objects, scale and rotate objects Understand how to use a material to add colour to objects. Effectively add, move, and delete keyframes to make basic animations Learn how to play, pause, and move through the animation using the timeline. Join multiple objects together using parenting. Competently use edit mode and extrude. Understand how to use loop cut and face editing. Apply different colour to different parts of the same model. Effectively use the proportional editing and knife tool, including subdivision.	Cybersecurity Explain the difference between data and information. Critique online services in relation to data privacy. Identify what happens to data that is entered online. Understand the need for the Data Protection Act. Recognise how human errors pose security risks to data. Implement strategies to minimise the risk of data being compromised through human error. Define hacking in the context of cybersecurity. Explain how a DDoS attack can impact the users of online services. Identify strategies to reduce the chance of a brute force attack being successful? Understand the need for the Computer Misuse Act (1990). List the common malware threats. Examine how different types of malware cause problems for computer systems. Question how malicious bots can have an impact on societal issues.	Units of data (Images) How is an image represented as a series of pixels? How is an image represented in binary? What is metadata? What can the effect of colour depth and resolution have on the image? How can sound can be sampled and stored in digital form? What effect does the sample rate, duration and bit depth have on sound? Why do we need compression? What are the different types of compression?

	Understand how to set up the camera, add and edit lighting. Compare different render modes.		Compare security threats against their probability and their potential impact to organisations. Explain how networks can be protected from common security threats. Identify the most effective methods to prevent cyber-attacks.			
	Important vocabulary:		Important vocabulary:		Important vocabulary:	
	Object Sphere, cone Scale, add Move, rotate Keyframe, parenting Edit mode, extude	Proportional editing Loop cut, face Knife tool, lights Camera, vertex Focus, ray tracing	Data, information, cybersecurity, cybercriminals, profiling, user behaviour, privacy policies, data protection, data subject, data portability, malware Social engineering, phishing, blagging, shouldering, name generator attack, scam Cyberthreats, ethical hacking, penetration testing, brute force attacks,	Anti-malware, firewall, end-user authentication, folder permissions/privileges, botnet, trojans, biometrics, two-factor authentication (2FA), CAPTCHA Blagging, , DDoS, brute force, hacking, spyware, adware, firewall, two-factor authentication (2FA), backups, CAPTCHA, Internet Service Provider (ISP), auto- updates script kiddies, DoS (denial of service), DDoS (distributed denial of service), Computer Misuse Act (1990) malware, viruses, trojans, worms, adware, spyware, bots, botnet	Units of Data Binary codes, character set Character set, ASCII, UNICODE Pixels, binary	Metadata, colour depth, resolution, size Sample, storage, digital Sample rate, duration, bit depth, playback quality
Half term 2	System Architecture What actions occur at each stage of the fetch-execute cycle? What is the role/purpose of each component and what does it manage, store, or control during the fetch-execute cycle? What is the purpose of each register? What does it store? (data or address)		Python Describe what algorithms and programs are and how they differ. Recall that a program written in a programming language needs to be translated in order to be executed by a machine Write simple Python programs that display messages, assign values to variables. Locate and correct common syntax errors. Describe the semantics of assignment statements.		Networks and Topologies What are the different modes of connection to a network? What are the different protocols we use on a network? Can you explain the concept of layers?	






<p>What is the difference between storing data and an address?</p> <p>How do common characteristics of a CPUs affect the performance?</p> <p>What are the purposes and characteristics of embedded systems?</p> <p>Can you identify and explain examples of embedded systems?</p>		<p>Use simple arithmetic expressions in assignment statements to calculate values.</p> <p>Receive input from the keyboard and convert it to a numerical value.</p> <p>Use binary selection (if, else statements) to control the flow of program execution.</p> <p>Use multi-branch selection (if, elif, else statements) to control the flow of the program execution.</p> <p>Use iteration (while loops) to control the flow of program execution.</p> <p>Combine iteration and selection.</p> <p>Use Boolean variables as flags</p>			
Important vocabulary:		Important vocabulary:			
CPU, process, input, output Fetch, Decode, Execute ALU, CU, Cache, Registers	Memory, address bus, control bus, data bus MDR, MAR, PC, Accumulator Clock speed, cache, number of cores	: Algorithm, program, programming language, program translation and execution, interpreter, programming environment, input, output, variables, assignment variables,	conditions, randomness, Iteration, counting, Iteration, Boolean (or logical) operators and expressions, counting, flags operators, expressions, integer and string type, execution, walk-through Selection, relational (or comparison) logical (or Boolean)	Compression, lossy, lossless LAN, WAN Factors, Performance Client-server, peer-to-peer Hardware, LAN, router, switch, WAP, NIC, transmission media	Internet, DNS, hosting, IP address, MAC address Cloud, web-server, clients Star, mesh bus, topologies

Key staff contacts:





Faculty M. Hutchings

m.hutchings@fi.[coastandvale](mailto:m.hutchings@fi.coastandvale.academy).academy

What are our curriculum aims for your child in year 9?

-  Our curriculum aims for all students in year 9 to experience a broad selection of topics, some which will be subject transferable across different subjects.
-  To enable students to realize the creativity within computing and iMedia, understanding the importance of Cyber security, how to use and understand coding.
-  Gain experience in Developing the Web and using software to create new Apps.
-  In our curriculum we aspire to stretch our students' knowledge within computing, to understand how to successfully use coding, identify the needs for suitable storage and the rationale behind this, advantages and disadvantages.
-  To enable students to realise the science within computing.

How can I help my child be successful in Computing?

-  Review key vocabulary with your child to help them transfer it to their long-term memory.
-  Ask students to explain what they have learnt that week, this also helps build long-term memory.
-  Help them explore computing safely, encouraging good practice regarding cybersecurity.
-  Encourage creativity using various available software.

Continuous monitoring of the students' progress via Google classrooms, with work submitted weekly, marked and returned.

To monitor the progress in students' knowledge and skills they will sit a short assessment for each topic, with time to mark their work and correct mistakes.