

Computing Phase One Curriculum

“Everyone should learn to code; it teaches you how to think!” Steve Jobs.

Intent statement: Computing at Trinity Academy St Edward’s equips students to become digital citizens who can communicate effectively, be cyber aware, can creatively use computer devices and systems that enables them to engage fully in a digital society. It supports students to become computational thinkers who can approach problems in a logical way.

Golden Threads: Computing during Phase One (KS3) incorporates the three distinct strands found in the National Curriculum, alongside e-safety. These topics are repeated throughout the curriculum, to secure prior knowledge, whilst introducing more complex ideas with each iteration. E-safety is interleaved into all topics covered during the course of the curriculum, alongside a bespoke week of work during the annual Safer Internet Day campaign in February.

- **Computer Science** is the study of the principles and use of computers.
- **Information Technology** is the use of computer systems to manage, process, protect, and exchange information.
- **Digital Literacy** is about being able to find, sort, evaluate, manage and create information in digital forms.
- **E-Safety** is to ensure the safe and responsible use of technology. This is taught where appropriate in all areas of the Computing curriculum but also has a dedicated week in February every year in line with National Internet Safety Day.

Computing core values

- Communication
- Cyber security
- Computational thinking
- Creativity

Overview:

The computing curriculum develops students into digital citizens by delivering a wide variety of projects where students take on the role of various positions in the IT industry. Students are aware of the skills required to be able to complete the tasks for each role to a high standard. Through delivery of projects including cyber security, coding and data modelling the curriculum is commensurate with the national curriculum and students are at the heart of its design to ensure engagement and progress.

Throughout the year students will also take part in additional external events and challenges.

- The Bebras Challenge introduces computational thinking to students worldwide. This exciting challenge takes place in school, under the supervision of teachers in November each year.

- E-Safety is a Computing golden thread therefore it is constantly visited throughout the curriculum with an enhanced focus inline with Safer Internet Day which is celebrated globally in **February** each year to promote the safe and positive use of digital technology for children and young people, and to inspire a national conversation about using technology responsibly, respectfully, critically, and creatively.

Year 7

Content:

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Cyber Security and Me	Maze Game (Scratch)	Graphics (Vector)	Data Representation (Binary)	Artificial Intelligence	Data Modelling (Spreadsheets)
Vehicle: Lightbox competition	Vehicle: TASE Game tournament	Vehicle: Character for a children's game	Vehicle: Crack the code	Vehicle: Create and code a chatbot	Vehicle: Dino park in Barnsley
<p>In this project students will develop knowledge and skills about how to protect themselves, their data, and their devices online.</p> <p>Students will take on the role as a 'Cyber security officer', they will design their own workstation looking at hardware and software requirements.</p> <p>Once they understand their role and protection methods students will present this in a Sway presentation aimed at users of the local library.</p> <p>Final products will be judged by staff at the Lightbox library. The</p>	<p>In this project students will be complete a project using the software Scratch. This is a programming project whereby students will take on the role as a 'Game designer'. In this role they will create their own version of the popular maze game 'Pac-Man'.</p> <p>This project will see students learn block coding to programme all sections of the game, from creating the maze, to programming the enemies to chase their character.</p>	<p>In this project students will learn the difference between raster and vector graphics.</p> <p>They will understand what creates a vector graphic looking at advantages and disadvantages of using such tools.</p> <p>Once students have some knowledge of this field, they will take on the role of a 'Graphics designer'. In their role they will create a new character for a children's computer game.</p> <p>The key piece of work in this project will be a character for a new</p>	<p>In this project students will take on various roles in the IT industry as having knowledge of binary would enable them to do so in the real world.</p> <p>Students will begin by understanding units of storage and will then crack codes using binary to denary conversion and vice versa.</p> <p>Students will then deepen their knowledge and skills by looking at the ASCII table and coding messages for secret agents to translate.</p> <p>The key piece of work in this project will be the creation and decryption of</p>	<p>In this project students will use their vector graphics skills learnt in Term 3 to create a chatbot for a given scenario.</p> <p>Once the chatbot is complete it will be time to code it to enable it to interact with humans.</p> <p>In this project students will activate prior learning of coding and graphics. Followed by deepening the graphics skills in a different package and enhancing their coding skills to include human responses. Further developing their knowledge and</p>	<p>In this project students will take on the role as 'Data analyst'. They will be given raw data about dinosaurs to enter using a variety of input methods.</p> <p>Once the data is input students will create formulas and functions that will allow them to model the data. While modelling the data students will be able to make recommendations for the Dino Park based on their findings.</p> <p>The key piece of work in this project will be the use of formulas and functions assessed throughout the project.</p>

best presentations will be awarded prizes, and their work will be on display in the library.	<p>Programming terms sequencing, iteration and selection will be vital to students beginning their coding journey.</p> <p>Final product of the maze game will be the key piece of work in this project.</p>	children's computer game that students have designed themselves. This will be assessed in the last 2 lessons of the project.	messages written in binary. They will be assessed in the last 2 lessons of the project.	<p>experience of the building blocks of code.</p> <p>The key piece of work in this project will be the coded chatbot. Students will be assessed in the last 2 lessons of the project.</p>	
--	---	--	---	---	--

Year 8

Content:

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Real Computer Crimes/ Businesses and Cyber Crime	BBC Micro: Bit	Graphics (Photoshop)	Data Representation and Sound	Computer Bots	Back to the future (Computer Systems)
Vehicle: Cybercrime around the world.	Vehicle: Retro style games.	Vehicle: Game environment design.	Vehicle: Bit images and digital sounds.	Vehicle: Chat bot for given scenario.	Vehicle: devices specifications and communication.
<p>In this project students will look at real cybercrimes from around the world.</p> <p>They will learn reasons why people carry out cyber attacks and the effects these attacks can have on the victims of the attacks.</p> <p>The key piece of work in this project will be a podcast where students have interviewed the author of a piece of</p>	<p>In this project students will code BBC Micro: bits.</p> <p>BBC Micro: bits are coded with blocks in 'make code' and students will produce a series of retro style games. Magic 8 ball, coin toss, hot potato and many more.</p> <p>Problem solving and computational thinking skills all play a key role in this project.</p>	<p>In this project students will use raster graphics to produce promotional material.</p> <p>They will edit images, apply filters, modify, and rotate.</p> <p>Creativity plays a key role in this project.</p> <p>The key piece of work in this project will be the final game environment created though out the project.</p>	<p>In this project students will further develop their binary knowledge by carrying out binary arithmetic and shift. While also looking at bitmap images colour depth and sound sampling.</p> <p>Students will create bit images a sound file and understand how a computer views these file types.</p>	<p>In this project students will learn about Computer bots.</p> <p>Students will create a chat bot for a given scenario.</p> <p>This will involve students writing an algorithm for FAQs and providing responses.</p> <p>The key piece of work in this project will be the algorithm for a given chat bot scenario assessed in</p>	<p>In this project students will research computers/gaming devices specifications and networking.</p> <p>They will investigate the hardware and software development, plot their findings on a timeline.</p> <p>Research techniques play an important role in this project.</p> <p>The key piece of work in this project will be a</p>

malware that caused significant disruption to the digital world.	The key piece of work in this project will be a crystal ball code and debugging given codes assessed in the penultimate lesson of the project.		The key piece of work in this project will include a variety of binary tasks to ensure a thorough understanding of how computers input, process, and output binary code. This will take place in the penultimate lesson of the project.	the penultimate lesson of the project.	design of their own computer specification and communication hardware/software.
--	--	--	---	--	---

Year 9

Content:

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Python coding	Artificial Intelligence (AI)	Escape room	Logic Gates	Networks 2	Python Art
Vehicle: codes in movies.	Vehicle: Amazon fresh	Vehicle: escape room quiz	Vehicle: logical thinking	Vehicle: dream network	Vehicle: fractal art
<p>In this project students will use text-based programming language Python.</p> <p>They will use all the building blocks of code sequence, selection and iteration repeatedly. Students will learn using the PRIMM method of coding.</p> <p>The key piece of work in this project will involve</p>	<p>In this project students will learn about Artificial Intelligence with a focus on machine learning.</p> <p>Students will train an AI system to be able to identify fruit and vegetables.</p> <p>Problem solving and computational thinking skills all play a key role in this project.</p>	<p>In this project students will use a combination of skills and knowledge learnt in the KS3 curriculum to produce an escape room style quiz.</p> <p>They will create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.</p>	<p>In this project students will understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming.</p> <p>Students will design circuits quickly and easily.</p> <p>The key piece of work in this project will be a logical circuit for a given audience and purpose.</p>	<p>In this project students will learn about Computer bots.</p> <p>Students will create a chat bot for a given scenario.</p> <p>This will involve students writing an algorithm for FAQs and providing responses.</p> <p>The key piece of work in this project will be the</p>	<p>In this project students will further develop their text-based programming skills.</p> <p>They will create fractal art, some of which will be displayed in the local art gallery.</p> <p>The art will be created using the 3 building blocks of code included nested codes and arrays.</p>

students completing a project to create a program that will generate random usernames and passwords. Students will write pseudocode, draw flow charts, write code, peer assess other students code and then evaluate their project. This will take place in the penultimate lesson of the project.	The key piece of work in this project is a complete AI system that can successfully identify fruit and vegetables. Students will be assessed in the penultimate lesson of the project.	Creativity plays a key role in this project. The key piece of work in this project will be the final escape room quiz created though out the project.	This will take place in the penultimate lesson of the project.	algorithm for a given chat bot scenario assessed in the penultimate lesson of the project.	The key piece of work in this final piece of fractal art created. This will be developed and assessed throughout the project.
--	--	--	--	--	---

Who to contact about Phase One Computing:

Mrs Elizabeth Bestall, Subject Co-ordinator: Computing – ebestall@stedwards.trinitymat.org