St Peter's CE Middle School Curriculum Overview

Subject: Computing

<table>
<tr><td rowspan="2">Year 5</td><td>Topic:
Creating an Identity
1.1 Building a Brand
Exploring online identity, e-safety, and personal branding through logo design, email communication, and digital organisation.

1.2 Going Global
Understanding the Internet as a network, data transfer, and web structure through HTML/CSS homepage design, responsive layout, and accessibility principles.</td><td>Topic:
Creating a World
2.1 Building Blocks
Students begin by uncovering how computers represent all forms of information—numbers, text, images, colours, and sounds—using binary (ones and zeros).

2.2 Building Worlds
In the second half, students apply these concepts by programming their own digital worlds. Through projects, students learn core programming constructs (sequencing, loops, conditionals) and Mathematical concepts (coordinates, angles) in creative contexts.</td><td>Topic:
Creating a Creator
3.1 Building a Brain
Students begin by exploring artificial intelligence and machine learning through practical and reflective activities.

3.2 Brain Training
In the second half, students focus on computational thinking: decomposition, pattern recognition, abstraction, and algorithmic thinking. They apply these concepts to solve logic-based puzzles.</td></tr>
<tr><td>Concepts:

E-Safety
• Online identity
• Digital footprint
• E-safety principles
• Responsible digital navigation

Software and Design
• Mobile-first design
• Pixel pressure
• Personal branding
• Logo creation (PowerPoint)
• Professional communication (email)

File Management
• Folder hierarchies
• File naming conventions
• OneDrive management

Networks
• Internet as a network of networks
• Client-server model
• Data transfer in packets</td><td>Concept:

Data Representation
• Binary system (ones and zeros)
• Encoding numbers and text
• Pixel colour representation
• Sound sampling and digitisation

Computational Thinking
• Abstraction and decomposition
• Pattern recognition
• Algorithmic thinking
• Debugging strategies

Programming Fundamentals
• Sequencing instructions
• Loops and iteration
• Conditional statements
• Coordinates and angles in code

Digital Literacy
• Understanding how computers interpret commands
• Linking theory to practical outcomes
• Building resilience through problem-solving</td><td>Concept:

Artificial Intelligence & Machine Learning
• AI in everyday life
• Machine learning fundamentals
• Training models with data
• Pattern recognition in AI
• Teachable Machine (image, sound, pose classification)
• Natural language AI (ChatGPT)
• Limitations of AI systems

Ethics & Society
• Bias in AI
• Privacy and data protection
• Fairness and accountability
• Decision-making implications
• Responsible use of AI

Computational Thinking
• Decomposition
• Pattern recognition
• Abstraction
• Algorithmic thinking</td></tr>
</table>

	Web development and Design • HTML and CSS basics • Personal homepage creation • Hexadecimal colour codes • Responsive design principles • Accessibility and usability in web design	• Connecting data representation to creative outputs	**Problem-Solving & Logic** • Logic-based puzzles (Minesweeper, Tent Game, Nonograms) • Strategy building • Collaboration and timed challenges • Bebras Challenge preparation • Reflecting on reasoning and comparing strategies
	Skills\Learning Objectives: • Practise file management and saving work to OneDrive • Create a basic logo using PowerPoint utilising shapes, text and colour • Apply branding across documents including Word document headers and as an email signature • Send a professionally formatted email with an attachment • Describe that the internet is a global network connecting computers and people • Use PowerPoint to plan the layout of a webpage before coding • Save and organise files using OneDrive folders • Use a web browser to explore websites and identify basic elements (text, images, headings) • Open and edit a pre-made HTML file to change text and replace images • Modify colours in a CSS file using hexadecimal codes	**Skills\Learning Objectives:** • Recognise that computers use binary (0s and 1s) to represent data • Identify simple binary patterns (e.g. 0–15) • Understand that pictures are made of pixels with numeric colour values • Explore RGB colour codes via simple tools • Create a Scratch project with a single background and sprite. • Place a sprite using x and y coordinates. • Use sequence to control sprite movements or animations. • Add a repeat loop to perform repeated actions (e.g. move steps). • Apply basic selection using 'if touching' or 'if key pressed'. • Assign specific behaviours to different sprites (e.g. speech, sound).	**Skills\Learning Objectives:** • Understand that some computers can 'learn' from examples (machine learning). • Recognise that AI uses data to make decisions (e.g. images, words, sounds). • Use Teachable Machine to train a basic model to distinguish between two objects or sounds. • Explore how ChatGPT responds to simple questions and prompts. • Begin to talk about fairness and mistakes in AI systems (e.g. 'why did it get it wrong?'). • • Understand what an algorithm is and follow step-by-step instructions. • Use decomposition to break puzzles into smaller parts. • Recognise patterns and use them to make predictions in games. • Begin to identify important vs. unimportant information (abstraction). • Solve beginner logic puzzles using trial and error with increasing accuracy.
	Outcome\Assessment: • Organised folder structure and clear file names used correctly. • Logo - Creative, balanced, and polished logo with clear branding intent.	**Outcome\Assessment:** • Students will use Scratch to create an interactive or animated digital world that responds to user input, reflects structured design, and demonstrates key programming constructs.	**Outcome\Assessment:** • The unit will be assessed through a 45-minute online test that evaluates students' understanding of artificial intelligence, machine learning concepts, and natural language systems.

	• Online Safety Contract- Creative, balanced, and polished logo with clear branding intent. • Email to Teacher - Creative, balanced, and polished logo with clear branding intent. • HTML Adaptation with edits made to headings, text, and basic structure (e.g. paragraphs, lists). • CSS Adaptation with classes edited with consistent colour scheme and text styling. • Bebras Challenge result. **Detailed assessment rubrics for each year group will be available on Teams and can also be requested in advance.** **KS2 National Curriculum:** 4.1, 4.2, 4.3, 4.4, 4.5	• Each area of the project is assessed on a 0–5+ scale, based on the clarity, functionality, and design of the work submitted. **Detailed assessment rubrics for each year group will be available on Teams and can also be requested in advance.** **KS2 National Curriculum:** 4.1, 4.2, 4.3, 4.4, 4.5	• Students will also participate in the Bebras Coding Challenge, with their performance used as an additional measure of progress in computational thinking and problem-solving skills. **KS2 National Curriculum:** 4.1, 4.2, 4.3, 4.4, 4.5

Year 6	**Topic:** **Creating an Identity** **1.1 Building a Brand** Exploring online identity, e-safety, and personal branding through logo design, email communication, and digital organisation. **1.2 Going Global** Understanding the Internet as a network, data transfer, and web structure through HTML/CSS homepage design, responsive layout, and accessibility principles.	**Topic:** **Creating a World** **2.1 Building Blocks** Students begin by uncovering how computers represent all forms of information—numbers, text, images, colours, and sounds—using binary (ones and zeros). **2.2 Building Worlds** In the second half, students apply these concepts by programming their own digital worlds. Through projects, students learn core programming constructs (sequencing, loops, conditionals) and Mathematical concepts (coordinates, angles) in creative contexts.	**Topic:** **Creating a Creator** **3.1 Building a Brain** Students begin by exploring artificial intelligence and machine learning through practical and reflective activities. **3.2 Brain Training** In the second half, students focus on computational thinking: decomposition, pattern recognition, abstraction, and algorithmic thinking. They apply these concepts to solve logic-based puzzles.
	Concepts: **E-Safety** • Online identity • Digital footprint • E-safety principles • Responsible digital navigation **Software and Design** • Mobile-first design • Pixel pressure • Personal branding • Logo creation (PowerPoint) • Professional communication (email) **File Management** • Folder hierarchies • File naming conventions • OneDrive management **Networks** • Internet as a network of networks • Client-server model • Data transfer in packets	**Concepts:** **Data Representation** • Binary system (ones and zeros) • Encoding numbers and text • Pixel colour representation • Sound sampling and digitisation **Computational Thinking** • Abstraction and decomposition • Pattern recognition • Algorithmic thinking • Debugging strategies **Programming Fundamentals** • Sequencing instructions • Loops and iteration • Conditional statements • Coordinates and angles in code **Digital Literacy** • Understanding how computers interpret commands • Linking theory to practical outcomes • Building resilience through problem-solving	**Concept:** **Artificial Intelligence & Machine Learning** • AI in everyday life • Machine learning fundamentals • Training models with data • Pattern recognition in AI • Teachable Machine (image, sound, pose classification) • Natural language AI (ChatGPT) • Limitations of AI systems **Ethics & Society** • Bias in AI • Privacy and data protection • Fairness and accountability • Decision-making implications • Responsible use of AI **Computational Thinking** • Decomposition • Pattern recognition • Abstraction • Algorithmic thinking

	Web development and Design • HTML and CSS basics • Personal homepage creation • Hexadecimal colour codes • Responsive design principles • Accessibility and usability in web design	• Connecting data representation to creative outputs	**Problem-Solving & Logic** • Logic-based puzzles (Minesweeper, Tent Game, Nonograms) • Strategy building • Collaboration and timed challenges • Bebras Challenge preparation • Reflecting on reasoning and comparing strategies
	Skills\Learning Objectives: • Create a logo using PowerPoint utilising shapes, text, colour, layers and transparency. • Apply branding across documents (e.g. slides, headers, signatures) • Format professional emails with greetings, polite tone and sign-offs • Learn to identify suspicious messages or websites • Develop better organisation using folders and naming conventions • Explain the difference between a website, a browser, and a server • Edit HTML structure by modifying headings, lists, and links • Use CSS to change fonts, spacing, and background styles • Replace and appropriately size images while considering alignment • Apply consistent design choices (logo, colour scheme) across multiple pages • Use nested folders and logical file naming to manage digital work	**Skills\Learning Objectives :** • Convert numbers between binary and decimal (up to 255) • Explain how text characters can be stored as numeric codes (e.g. ASCII) • Create simple binary image grids (pixel art) • Describe how sound can be sampled as numbers • Design a multi-sprite Scratch project with changing backdrops. • Trigger actions using events such as broadcasts or key presses. • Use sequence blocks to build structured animations or interactions. • Use if/else blocks to allow sprites to react to conditions. • Implement loops for repeated movement, animation, or sound. • Organise code for each sprite to represent its unique role or behaviour. • Combine programming elements to create a multi-step interaction or story.	**Skills\Learning Objectives :** • Explain that machine learning systems are trained using many examples. • Use Teachable Machine to create and test a model using image or sound inputs. • Explore ChatGPT as a text-based AI and reflect on how it forms its responses. • Identify limitations or unexpected behaviours in AI tools. • Discuss the idea of bias or incorrect training data in age-appropriate terms. • Apply decomposition and pattern recognition to solve multi-stage puzzles. • Write or follow simple algorithms to complete logic-based tasks. • Use abstraction to simplify a complex puzzle before solving it. • Begin to justify puzzle strategies verbally or in writing. • Prepare for the Bebras Challenge by practising similar task formats.
	Outcome\Assessment: • Organised folder structure and clear file names used correctly.	**Outcome\Assessment:** • Students will use Scratch to create an interactive or animated digital world that responds to user input, reflects structured	**Outcome\Assessment:** • The unit will be assessed through a 45-minute online test that evaluates students' understanding of artificial intelligence, machine

	• Logo - Creative, balanced, and polished logo with clear branding intent. • Online Safety Contract- Creative, balanced, and polished logo with clear branding intent. • Email to Teacher - Creative, balanced, and polished logo with clear branding intent. • HTML Adaptation with edits made to headings, text, and basic structure (e.g. paragraphs, lists). • CSS Adaptation with classes edited with consistent colour scheme and text styling. • Bebras Challenge result. **Detailed assessment rubrics for each year group will be available on Teams and can also be requested in advance.** **KS2 National Curriculum:** 4.1, 4.2, 4.3, 4.4	design, and demonstrates key programming constructs. • Each area of the project is assessed on a 0–5+ scale, based on the clarity, functionality, and design of the work submitted. **Detailed assessment rubrics for each year group will be available on Teams and can also be requested in advance.** **KS2 National Curriculum:** 4.1, 4.2, 4.3, 4.4, 4.5	learning concepts, and natural language systems. • Students will also participate in the Bebras Coding Challenge, with their performance used as an additional measure of progress in computational thinking and problem-solving skills. **KS2 National Curriculum:** 4.1, 4.2, 4.3, 4.4, 4.5

Year 7	**Topic:** **1 Creating an Identity** **1.1 Building a Brand** Exploring online identity, e-safety, and personal branding through logo design, email communication, and digital organisation. **1.2 Going Global** Understanding the Internet as a network, data transfer, and web structure through HTML/CSS homepage design, responsive layout, and accessibility principles.	**Topic:** **Creating a World** **2.1 Building Blocks** Students begin by uncovering how computers represent all forms of information—numbers, text, images, colours, and sounds—using binary (ones and zeros). **2.2 Building Worlds** In the second half, students apply these concepts by programming their own digital worlds. Through projects, students learn core programming constructs (sequencing, loops, conditionals) and Mathematical concepts (coordinates, angles) in creative contexts.	**Topic:** **Creating a Creator** **3.1 Building a Brain** Students begin by exploring artificial intelligence and machine learning through practical and reflective activities. **3.2 Brain Training** In the second half, students focus on computational thinking: decomposition, pattern recognition, abstraction, and algorithmic thinking. They apply these concepts to solve logic-based puzzles.
	Concepts: **E-Safety** • Online identity • Digital footprint • E-safety principles • Responsible digital navigation **Software and Design** • Mobile-first design • Pixel pressure • Personal branding • Logo creation (PowerPoint) • Professional communication (email) **File Management** • Folder hierarchies • File naming conventions • OneDrive management **Networks** • Internet as a network of networks • Client-server model • Data transfer in packets	**Concepts:** **Data Representation** • Binary system (ones and zeros) • Encoding numbers and text • Pixel colour representation • Sound sampling and digitisation **Computational Thinking** • Abstraction and decomposition • Pattern recognition • Algorithmic thinking • Debugging strategies **Programming Fundamentals** • Sequencing instructions • Loops and iteration • Conditional statements • Coordinates and angles in code **Digital Literacy** • Understanding how computers interpret commands • Linking theory to practical outcomes • Building resilience through problem-solving	**Concept:** **Artificial Intelligence & Machine Learning** • AI in everyday life • Machine learning fundamentals • Training models with data • Pattern recognition in AI • Teachable Machine (image, sound, pose classification) • Natural language AI (ChatGPT) • Limitations of AI systems **Ethics & Society** • Bias in AI • Privacy and data protection • Fairness and accountability • Decision-making implications • Responsible use of AI **Computational Thinking** • Decomposition • Pattern recognition • Abstraction • Algorithmic thinking

	Web development and Design • HTML and CSS basics • Personal homepage creation • Hexadecimal colour codes • Responsive design principles • Accessibility and usability in web design	• Connecting data representation to creative outputs	**Problem-Solving & Logic** • Logic-based puzzles (Minesweeper, Tent Game, Nonograms) • Strategy building • Collaboration and timed challenges • Bebras Challenge preparation • Reflecting on reasoning and comparing strategies
	Skills\Learning Objectives: • Apply branding across multiple applications (e.g. slides, flyers, posters) • Use formatting tools with intention (e.g. layout, white space, typography) • Understand how online actions (comments, sharing) impact their long-term brand • Review and discuss appropriate design for different audiences • Describe how web browsers request and load pages via IP and DNS • Use semantic HTML tags (e.g. <section>, <article>, <nav>) to structure page content • Style different elements using CSS classes and IDs for layout and readability • Adjust media queries to adjust website design for mobile, tablet, and desktop views • Evaluate accessibility features (e.g. alt text, colour contrast) • Create and link multiple pages within a personal site	**Skills\Learning Objectives:** • Convert numbers between binary, decimal, and hex • Perform simple binary arithmetic • Understand how colour codes (hex) relate to binary and RGB • Describe image resolution, colour depth, and sound sampling • Write Python Turtle code to draw at least two different shapes. • Use functions (subroutines) to define drawing behaviours. • Use 'for' or 'while' loops to repeat drawing instructions. • Apply if/else conditions to change drawing based on rules. • Position shapes using coordinates to form a structured scene. • Assign distinct properties to drawing elements (e.g. colour, size, angle). • Reuse functions with different inputs to generate patterns or layouts.	**Skills\Learning Objectives:** • Describe the difference between rule-based systems and machine learning. • Train a custom Teachable Machine model with labelled data and evaluate accuracy. • Explore how ChatGPT uses large datasets and language patterns to generate text. • Reflect on the implications of AI decisions (e.g. errors, data privacy, bias). • Understand that AI is not 'thinking' but using learned patterns to respond. • Confidently apply the four elements of computational thinking. • Create algorithms and flowcharts to solve structured logic problems. • Analyse and debug logical reasoning errors in puzzle-based activities. • Collaborate with peers to compare problem-solving
	Outcome\Assessment: • Organised folder structure and clear file names used correctly. • Logo - Creative, balanced, and polished logo with clear branding intent. • Online Safety Contract- Creative, balanced, and polished logo with clear branding intent.	**Outcome\Assessment:** • Students will use Python Turtle to create an interactive or animated digital world that responds to user input, reflects structured design, and demonstrates key programming constructs.	**Outcome\Assessment:** • The unit will be assessed through a 45-minute online test that evaluates students' understanding of artificial intelligence, machine learning concepts, and natural language systems.

	• Email to Teacher - Creative, balanced, and polished logo with clear branding intent. • HTML Adaptation with edits made to headings, text, and basic structure (e.g. paragraphs, lists). • CSS Adaptation with classes edited with consistent colour scheme and text styling. • Bebras Challenge result. **Detailed assessment rubrics for each year group will be available on Teams and can also be requested in advance.** **KS3 National Curriculum:** 5.3, 5.4, 5.5	• Each area of the project is assessed on a 0–5+ scale, based on the clarity, functionality, and design of the work submitted. **Detailed assessment rubrics for each year group will be available on Teams and can also be requested in advance.** **KS3 National Curriculum:** 5.1, 5.2, 5.3, 5.4, 5.6, 5.7	• Students will also participate in the Bebras Coding Challenge, with their performance used as an additional measure of progress in computational thinking and problem-solving skills. **KS3 National Curriculum:** 5.1, 5.2, 5.3, 5.4, 5.6, 5.7

Year 8	**Topic:** **Creating an Identity** **1.1 Building a Brand** Exploring online identity, e-safety, and personal branding through logo design, email communication, and digital organisation. **1.2 Going Global** Understanding the Internet as a network, data transfer, and web structure through HTML/CSS homepage design, responsive layout, and accessibility principles.	**Topic:** **Creating a World** **2.1 Building Blocks** Students begin by uncovering how computers represent all forms of information—numbers, text, images, colours, and sounds—using binary (ones and zeros). **2.2 Building Worlds** In the second half, students apply these concepts by programming their own digital worlds. Through projects, students learn core programming constructs (sequencing, loops, conditionals) and Mathematical concepts (coordinates, angles) in creative contexts.	**Topic:** **Creating a Creator** **3.1 Building a Brain** Students begin by exploring artificial intelligence and machine learning through practical and reflective activities. **3.2 Brain Training** In the second half, students focus on computational thinking: decomposition, pattern recognition, abstraction, and algorithmic thinking. They apply these concepts to solve logic-based puzzles.
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	Web development and Design • HTML and CSS basics • Personal homepage creation • Hexadecimal colour codes • Responsive design principles • Accessibility and usability in web design	• Connecting data representation to creative outputs	**Problem-Solving & Logic** • Logic-based puzzles (Minesweeper, Tent Game, Nonograms) • Strategy building • Collaboration and timed challenges • Bebras Challenge preparation • Reflecting on reasoning and comparing strategies
	Skills\Learning Objectives: • Launch a personal brand through a digital portfolio or presentation • Incorporate a polished logo, bio, and communication template • Self-audit online presence and make informed decisions about privacy • Explore copyright, fair use, and how to give credit	**Skills\Learning Objectives:** • Fluently convert between number bases and explain bit-length • Understand ASCII and Unicode encoding standards • Explain how higher-level languages are translated into binary • Build a scene in Python Turtle with multiple graphical elements. • Use functions with parameters to model different object types. • Apply nested loops to create complex patterns or repeated layouts. • Use selection to control behaviour based on object state or position. • Track object state using variables (e.g. score, speed, direction). • Simulate simple interactions between elements (e.g. collision detection). • Test and debug the program to ensure objects respond correctly and independently.	**Skills\Learning Objectives:** • Explain how supervised machine learning works using labelled data. • Explore the role of ChatGPT as a generative AI and critically evaluate its responses. • Discuss ethical implications of AI (e.g. misinformation, automation, and data use). • Compare human and machine approaches to learning and reasoning. • Transfer computational thinking strategies across unfamiliar problem types. • Develop and refine algorithms for complex puzzles with multiple constraints. • Explain and compare multiple approaches to solving the same problem. • Lead group problem-solving discussions, highlighting reasoning and choices. • Participate in the Bebras Challenge and reflect on performance with insight.
	Outcome\Assessment: • Organised folder structure and clear file names used correctly. • Logo - Creative, balanced, and polished logo with clear branding intent. • Online Safety Contract- Creative, balanced, and polished logo with clear branding intent. • Email to Teacher - Creative, balanced, and polished logo with clear branding intent.	**Outcome\Assessment:** • Students will use Python Turtle to create an interactive or animated digital world that responds to user input, reflects structured design, and demonstrates key programming constructs.	**Outcome\Assessment:** • The unit will be assessed through a 45-minute online test that evaluates students' understanding of artificial intelligence, machine learning concepts, and natural language systems. • Students will also participate in the Bebras Coding Challenge, with their performance

	• HTML Adaptation with edits made to headings, text, and basic structure (e.g. paragraphs, lists). • CSS Adaptation with classes edited with consistent colour scheme and text styling. • Bebras Challenge result. **Detailed assessment rubrics for each year group will be available on Teams and can also be requested in advance.** **KS3 National Curriculum:** 5.3, 5.4, 5.5	• Each area of the project is assessed on a 0–5+ scale, based on the clarity, functionality, and design of the work submitted. **Detailed assessment rubrics for each year group will be available on Teams and can also be requested in advance.** **KS3 National Curriculum:** 5.1, 5.2, 5.3, 5.4, 5.6, 5.7	used as an additional measure of progress in computational thinking and problem-solving skills. **KS3 National Curriculum:** 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7