CURRICULUM IMPLEMENTATION
- To ensure that we make Computing an engaging and challenging learning experience.
- Keep up to date with the technological changes that go on in the world.
- Our topic led curriculum allows pupils to engage with the National Curriculum objectives in a range of ways using a variety of tools including desktop computers.
- We recognise that all classes have pupils with widely differing ICT abilities. This is especially true when some pupils have access to ICT equipment at home, while others do not. We provide suitable learning opportunities for all pupils by matching the challenge of the task to the ability and experience of the pupil. We achieve this in a variety of ways, by:
  - Setting common tasks which are open-ended and can have a variety of responses.
  - Setting tasks of increasing difficulty (not all pupils complete all tasks).
  - Grouping pupils by ability in the room and setting different tasks to each ability group.
  - Providing resources of different complexity depending on the ability of the pupil.
- It is important to give pupils the opportunity to use a variety of hardware and programmes/apps.
- Clear overview of curriculum within each key stage and each year, showing the sequence of learning.

KS3 COMPUTING

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world.

Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems.

The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content.

Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

GCSE COMPUTER SCIENCE

Students are introduced to core principles of computer science and develop skills in problem solving and computational thinking. This builds on skills learned in Key Stages 1 to 3 in Computer Science/IT while also ensuring that students new to the subject are supported appropriately.

Following on from more visual programming environments, programming skills are further developed using high-level textual programming languages.

Students develop knowledge and understanding of how technology can be used to help proactively with current issues that impact on modern society, preparing them for their next steps in today's global world.

CREATIVE IMEDIA

The Cambridge Nationals in Creative iMedia will equip learners with a range of creative media skills and provide opportunities to develop, in context, desirable, transferable skills such as research, planning, and review, working with others and communicating creative concepts effectively.

Through the use of these skills, learners will ultimately be creating fit-for-purpose creative media products.

The Cambridge Nationals in Creative iMedia will also challenge all learners, including high attaining learners, by introducing them to demanding material and techniques; encouraging independence and creativity and providing tasks that engage with the most taxing aspects of the National Curriculum.

ICT & COMPUTER SCIENCE DEPARTMENT
5 YEAR CURRICULUM MAP

	Autumn Term		Spring Term		Summer Term	
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
YEAR 7 COMPUTING	ICT Skills	E-Safety	Data Representation	Scratch Programming	Hardware & Software	
YEAR 8 COMPUTING	The Internet		Python Programming		Media Production Skills	BBC Micro:Bit
YEAR 9 COMPUTING	Databases		Binary		Web Design	Data Storage, Compression & Encryption
YEAR 10 GCSE COMPUTER SCIENCE	Logic & Programming Languages	Data Representation	Networks & Network Security Internet & the World Wide Web	Algorithms & Decomposition	Programming & Programming Project	
YEAR 11 GCSE COMPUTER SCIENCE	Hardware	Software	Emerging Trends, Issues & Impact	Revision	Exam Paper 1 – Principles of Computer Science Paper 2 – Application of Computational Thinking	
YEAR 10 CREATIVE IMEDIA	R085 – Creating A Multipage Website		R081 – Media Production Skills		Exam Paper – Pre-Production Skills R082 – Creating Digital Graphics	
YEAR 11 CREATIVE IMEDIA	R082 – Creating Digital Graphics		Exam Paper – Pre-Production Skills R082 – Creating Digital Graphics	R087 – Creating Interactive Multimedia Products		

YEAR 7 COMPUTING

Autumn Term		Spring Term		Summer Term	
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Key Themes

ICT Skills:
BIG QUESTION
DO I KNOW HOW TO USE A COMPUTER?
 	
Introduction to CT/Computing lessons at Penwortham Priory Academy.
  – School Rules
  – Logins/Passwords
  – Files and Folders
 	
  • Introduction to Computing
  • Knowing how to use a computer correctly and saving work
	E-Safety:
	BIG QUESTION
	IS THE INTERNET THE MOST DANGEROUS INVENTION SINCE THE ATOMIC BOMB?
	
	Introduction to E-Safety. Knowing how to stay safe when online and being careful of the dangers that can occur when online.
	  • What is E-Safety
	  • Digital Footprint
	  • Communicating Online
		Data Representation:
		BIG QUESTION
		HOW DO YOU TURN ELECTRICITY INTO WORDS, IMAGES AND SOUND?
		
		To know the difference between data and information and how data is represented within a computer system.
		  • Units of Data
		  • Characters of Data
		  • Binary representation of Images
		  • Instructions
			Scratch:
			BIG QUESTION
			WHAT IS INVOLVED IN DESIGNING A COMPUTER GAME?
			
			Introduction to Programming and the language constructs using 'Scratch Blocks' (non-textual approach).
			  • Move a sprite Control a sprite (repeat function)
			  • Costumes
			  • Variables
			  • Selection (IF-ELSE statements)
				Hardware & Software
				
				BIG QUESTION
				HOW DO YOU BUILD A ROBOT?
				
				To know why and when computers are used and know the function of the main internal parts of basic computer architecture.
				
				Lessons
				  • Computer peripherals
				  • Internal parts of basic computer architecture
				  • How computers transfer data
				  • Operating Systems

Assessment

Assessment	Assessment	Assessment	Assessment

A written assessment made up of exam style questions covering the theoretical aspects of the unit.
This will be carried out at the end of the unit (approx. at the end of the half-term).

Why do I need to know this

Students need to be aware of how to use a school computer correctly and efficiently as many students have previously used iPads or Tablets for learning but have not used a computer.	Students need to be aware about how to stay safe when online and be careful of the dangers that can occur when online.	Computers are able to store and manipulate large quantities of data. They use binary to represent different types of data. Students are expected to learn how different types of data are represented in a computer.	Learning to program is a core component of a computer science course. Students should be competent at designing, reading, writing and debugging programs. They must be able to apply their skills to solve real problems and produce robust programs.	Students are using Computing devices on a daily basis and need to be aware of the jobs for each part of hardware in their device. Students are using many different software programs on different devices and need to be aware of how different software works.

How will I learn this

- Shared and consistent lesson structures with accompanying resources.
- Coherent step-by-step sequences that build on existing knowledge and allow incremental development of knowledge.
- The use of low stakes testing and interleaving.
- Explicitly teaching new tier two and tier three vocabulary
- Unrelenting focus on key concepts.
- Embedded regular retrieval practice and spaced practice
- Embedded and consistently applied homework focused on knowledge retrieval.

YEAR 8 COMPUTING

Autumn Term		Spring Term		Summer Term	
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Key Themes

The Internet:
BIG QUESTION
IS THE INTERNET THE MOST DANGEROUS INVENTION SINCE THE ATOMIC BOMB?

Introduction to how the internet works and staying safe when online
- Introduction to Computing
- Understanding browsers
- Spot the Scam
- Safety Savvy
- Safe social networking
- Connecting to the internet
- Communicating online

Programming with Python:
BIG QUESTION
WHY IS PROGRAMMING IMPORTANT?

Introduction to programming and the language constructs (textual approach).
- Introduction to Python Variables and User inputs
- Selection Statements
- Until Loop
- Arithmetic Operators
- Procedures

Media Production Skills
BIG QUESTION
HOW DOES DIGITAL MEDIA INFLUENCE OUR LIVES?

Introduction to various types of software such as graphics editing, video editing and web design software to complete various tasks.
- Logo Design.
- Poster Design using Graphics Editing Software
- TV advert (Video) creation using video editing software
- Website Design using Web design software
- Evaluation

BBC Micro:bit:
BIG QUESTION
HOW CAN I TELL A COMPUTER WHAT TO DO?

Understanding the various components of the embedded device. Remembering the basics of programming.
- Outputs
- Variables
- Inputs
- Selection (IF-ELSE Statements)
- Conditionals
- Understand the concept of compiling and flashing.

Assessment

A written assessment made up of exam style questions covering the theoretical aspects of the unit.
This will be carried out at the end of the unit

Why do I need to know this

You need to be aware about how the internet works and how to stay safe when online.
To know about the risks involved and also the impact social media can have on you.

Learning to program is a core component of a computer science course. Students should be competent at designing, reading, writing and debugging programs. They must be able to apply their skills to solve real problems and produce robust programs.

Digital graphics feature in many areas of our lives and play a very important part in today's world. The digital media sector relies heavily on these visual stimulants within the products it produces, to communicate messages effectively.

Learning to program is a core component of a computer science course. Students should be competent at designing, reading, writing and debugging programs. They must be able to apply their skills to solve real problems and produce robust programs.

How will I learn this

- Shared and consistent lesson structures with accompanying resources.
- Coherent step-by-step sequences that build on existing knowledge and allow incremental development of knowledge.
- The use of low stakes testing and interleaving.
- Explicitly teaching new tier two and tier three vocabulary
- Unrelenting focus on key concepts.
- Embedded regular retrieval practice and spaced practice
- Embedded and consistently applied homework focused on knowledge retrieval.

YEAR 9 COMPUTING

Autumn Term		Spring Term		Summer Term	
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Key Themes	Key Themes	Key Themes	Key Themes	Key Themes	Key Themes

Databases:

BIG QUESTION
HOW ARE DATABSES USED IN EVERYDAY LIFE?

Introduction to databases and how they are used to store data in a structured way.
- Introduction to databases
- Collecting Data
- Designing a database
- Creating database tables
- Creating database queries
- Forms & Reports
- Evaluating the database

Binary:
BIG QUESTION
HOW DOES MY COMPUTER UNDERSTAND WHAT I TYPE?

Understand that computers use binary to represent number data
- Converting between binary and denary whole numbers (0- 255)
- Performing binary arithmetic
- Concept of overflow
- Why hexadecimal notation is used
- Converting between hexadecimal and binary
- Negative numbers in binary

Web Design:

BIG QUESTION
WHAT MAKES A GOOD WEBSITE?

Introduction to web design and the languages used in the creation of websites (HTML and CSS)
- Introduction to websites
- Researching for websites
- Website designs
- Creating a website
- Improving websites
- HTML and CSS for websites

Data Storage & Compression and Encryption:
BIG QUESTION
HOW IS INFORMATION STORED AND SENT FROM ONE PLACE TO ANOTHER?

Understand the need for data compression and methods of compressing data
- Convert between the terms
  - Bit
  - Nibble
  - Byte
  - Kilobyte (KB)
  - Megabyte (MB)
  - Gigabyte (GB)
  - Terabyte (TB)
- Lossless/Lossy data compression
- Data encryption
- Caesar cipher algorithm

Assessment

A written assessment made up of exam style questions covering the theoretical aspects of the unit.
This will be carried out at the end of the unit

Why do I need to know this

You need to be aware of how information is stored in a computer and how it can be organised. Many businesses (large or small) use databases to store information (Eg Schools have a students database, whereas shops may have a products database). You need to be aware of how the database is created and how it can be used.	Computers are able to store and manipulate large quantities of data. They use binary to represent different types of data. Students are expected to learn how different types of data are represented in a computer.	Multipage websites are the basis of internet content and are therefore used extensively in the creative digital media sector, whether for mobile phones or computers in all their forms.	Computers are able to store and manipulate large quantities of data. Students need to understand how data can be manipulated by a computer system and compressed or encrypted for different uses.

How will I learn this

- Shared and consistent lesson structures with accompanying resources.
- Coherent step-by-step sequences that build on existing knowledge and allow incremental development of knowledge.
- The use of low stakes testing and interleaving.
- Explicitly teaching new tier two and tier three vocabulary
- Unrelenting focus on key concepts.
- Embedded regular retrieval practice and spaced practice
- Embedded and consistently applied homework focused on knowledge retrieval.

GCSE COMPUTER SCIENCE (YEAR 10)

Autumn Term		Spring Term		Summer Term	
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Key Themes	Key Themes	Key Themes	Key Themes	Key Themes	Key Themes
Logic & Programming Languages Understand how to produce logic statements for a given problem. Also learning the advantages/ disadvantages of high/low level programming languages. • Truth tables • Logic Statements • High-level and low level programming languages • Assembler • Compiler • Interpreter	**Data Representation** Understanding how images are represented on a computer system and also how Sound can be represented by a computer system Lessons • ASCII • Bitmap Images • Sound Representation	**Networks & Network Security** **The Internet & World Wide Web:** Understanding what a network is and the different types of networks and topologies. Also looking at the different methods of network security. • Wired and wireless connectivity • Network Protocols • Network Topologies • Physical Security • Firewalls • Different forms of Cyberattack • Components of the World Wide Web	**Algorithms & Decomposition** Understand what Algorithms are and how a Computer must follow algorithms in order to process data. • Sorting/Searching Algorithms • Flowcharts • Pseudocode	**Programming + Programming Project** Understanding the theory behind programming and the rules for programming. Completing a 20 hour programming project set by the exam board. Work will be assessed by the exam board. • Programming Theory • Programming Techniques • Errors (Syntax, Logic, Runtime) • Programming Constructs • Data Types • Data Structures • Test Plans / Test Data • Trace Tables • Programming Operators • Subprograms	

Assessment		Assessment		Assessment	Assessment
A written assessment made up of exam style questions covering the theoretical aspects of the unit. This will be carried out at the end of the unit					

Why do I need to know this					
Students are expected to develop an understanding about how Computers process data and provide you with the desired outcome.	Computers are able to store and manipulate large quantities of data. They use binary to represent different types of data. Students are expected to learn how different types of data are represented in a computer.	Computer networks and the internet are now ubiquitous. Many computer applications in use today would not be possible without networks. Students should understand the key principles behind the organisation and of computer networks.	Students are expected to develop a set of computational thinking skills that enable them to understand how computer systems work, and to design, implement and analyse algorithms for solving problems.	Learning to program is a core component of a computer science course. Students should be competent at designing, reading, writing and debugging programs. They must be able to apply their skills to solve real problems and produce robust programs.	

How will I learn this					
• Shared and consistent lesson structures with accompanying resources. • Coherent step-by-step sequences that build on existing knowledge and allow incremental development of knowledge. • The use of low stakes testing and interleaving. • Explicitly teaching new tier two and tier three vocabulary • Unrelenting focus on key concepts. • Embedded regular retrieval practice and spaced practice • Embedded and consistently applied homework focused on knowledge retrieval.				Timed: 20 hour programming project in class lesson time •	

GCSE COMPUTER SCIENCE (YEAR 11)

Autumn Term		Spring Term		Summer Term	
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Key Themes	Key Themes	Key Themes	Key Themes	Key Themes	Key Themes
Hardware Students must be familiar with the hardware components that make up a computer system and recognise that computers take many forms from embedded microprocessors to distributed clouds. • Types of Main Memory • Concept of a stored program • Physical storage devices • Fetch Execute Cycles (Von Neumann Model)	**Software:** Students must be familiar with the hardware and software components that make up a computer system and recognise that computers take many forms from embedded microprocessors to distributed clouds. • Operating System • Utility Software • Simulation	**Emerging Trends Issues, and Impact:** Understanding the Environmental, ethical and legal impacts of using technology • Environmental Impact • Ethical Impact • Legal Impact •	**Revision:** Recap all GCSE Topics • Algorithms & Decomposition • Programming • Binary • Data Representation • Data Storage, Compression & Encryption • Databases • Hardware • Software • Networks & Network Security • The Internet and the World Wide Web • Emerging Trends, Issues & Impact	**Exam:** **PAPER 1** Monday 11th May 2020 AM 1Hr 40Mins **PAPER 2** Thursday 14th May 2020 PM 2Hrs	
Assessment		Assessment	Assessment	Assessment	
A written assessment made up of exam style questions covering the theoretical aspects of the unit. This will be carried out at the end of the unit					
Why do I need to know this					
Students are using Computing devices on a daily basis and need to be aware of the jobs for each part of hardware in their device.	Students are using many different software programs on different devices and need to be aware of how different software works.	Students should be aware of the influence of computing technology and recognise that computing has an impact on nearly every aspect of the world in which they live			
How will I learn this					
• Shared and consistent lesson structures with accompanying resources. • Coherent step-by-step sequences that build on existing knowledge and allow incremental development of knowledge. • The use of low stakes testing and interleaving. • Explicitly teaching new tier two and tier three vocabulary • Unrelenting focus on key concepts. • Embedded regular retrieval practice and spaced practice • Embedded and consistently applied homework focused on knowledge retrieval.				Timed: 20 hour programming project in class lesson time •	

CREATIVE IMEDIA (YEAR 10)

Autumn Term				Spring Term	Summer Term	
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**		**Summer 1**	**Summer 2**
Key Themes	Key Themes	Key Themes	Key Themes		Key Themes	Key Themes

R085 - Creating a Multipage Website This unit will enable learners to understand the basics of creating multipage websites. It will enable learners to demonstrate their creativity by combining components to create a functional, intuitive and aesthetically pleasing website. • Purpose and Components of Multipage Websites • Internet Connection Methods • Client Requirements & Target Audience • Work Plan • Visualisation Diagram • Assets & Resources • Legislation • Creating a Multipage Website using Web Design Software • Reviewing Multipage Websites	**R081 - Pre-Production Skills** This unit will enable learners to understand pre-production skills used in the creative and digital media sector. It will develop their understanding of the client brief, time frames, deadlines and preparation techniques that form part of the planning and creation process. • Mood boards • Mind Maps • Visualisation Diagrams • Storyboards • Scripts • Work Plans / Production Schedule • Target Audience • Hardware/Software • Health & Safety • Legislation • Reviewing Documents	**Exam** Friday 5th June 2020 PM 1hr 15Mins **R082 - Creating Digital Graphics** The aim of this unit is for learners to understand the basics of digital graphics editing for the creative and digital media sector.

Assessment	Assessment	
Each assignment will be assessed under the exam board marking criteria		

Why do I need to know this		
Multipage websites are the basis of internet content and are therefore used extensively in the creative digital media sector, whether for mobile phones or computers in all their forms.	Planning is an essential part of working in the creative and digital media sector. This unit will enable learners to acquire the underpinning knowledge and skills needed to create digital media products and gain an understanding of their application.	

How will I learn this		
On completion of this unit, learners will be able to explore and understand the different properties, purposes and features of multipage websites, plan and create a multipage website and review the final website against a specific brief.	On completion of this unit, learners will understand the purpose and uses of a range of pre-production techniques. They will be able to plan pre-production of a creative digital media product to a client brief, and will understand how to review pre-production documents.	

CREATIVE IMEDIA (YEAR 11)

Autumn Term		Spring Term		Summer Term	
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Key Themes	Key Themes	Key Themes	Key Themes	Key Themes	Key Themes

R082 - Creating Digital Graphics The aim of this unit is for learners to understand the basics of digital graphics editing for the creative and digital media sector. •Why and How digital Graphics are used •Types of Digital Graphics •File Formats •Client Brief & Target Audience •Work Plan •Visualisation Diagram •Assets & Resources •Legislation •Creating Digital Graphics using Graphics Editing Software •Reviewing Digital Graphics	**R087 - Creating Interactive Multimedia Products** This unit will enable learners to understand the basics of interactive multimedia products for the creative and digital media sector. •Purpose and Components of Interactive Products •Hardware/Software/Peripherals •File Formats •Client Requirements & Target Audience •Work Plan •Visualisation Diagram •Assets & Resources •Legislation •Creating an Interactive Multimedia Product •Reviewing Interactive Multimedia Products	

Assessment	Assessment
Each assignment will be assessed under the exam board marking criteria	

Why do I need to know this

Digital graphics feature in many areas of our lives and play a very important part in today's world. The digital media sector relies heavily on these visual stimulants within the products it produces, to communicate messages effectively.	Interactive multimedia products are used widely in everyday life and the creative and digital media sector. They are used in computer games, mobile phone applications, presentations and many other areas.	

How will I learn this

On completion of this unit, learners will understand the purpose and properties of digital graphics, and know where and how they are used. They will be able to plan the creation of digital graphics, create new digital graphics using a range of editing techniques and review a completed graphic against a specific brief.	On completion of this unit, learners will understand the purpose and properties of interactive multimedia products, be able to plan and create an interactive multimedia product to a client's requirements and review it, identifying areas for improvement.	