

KS3: YEAR 7



SUMMER 3:2

SUMMER 3:1

SPRING 2:2

SPRING 2:1

AUTUMN 1:2

AUTUMN 1:1



7.5 Computing Pioneers
The technology we have today is a result of many remarkable people and their creations. This topic focusses on four pioneers who each played their part in the growth of computing. Students will learn about Alan Turing; how to use different encryption methods, Charles Babbage; how to solve problems using logic, George Boole; the use of the AND, OR, NOT logic gates, and Sir Tim Berners-Lee who created the world's first webpage.



7.6 Mobile Applications
In this topic students will learn event-driven programming while creating a mobile application. Following on from topic 7.4 these lessons will introduce students to more key terms and programming skills such as; properties, events, debugging, if statements and user input.





7.4 Introduction to Programming: Kodu Lab
The ability to write programming code is essential in computer science, therefore in year 7 we introduce students to programming using an engaging program called Kodu Lab. Students will learn about the key terms; algorithm, variables, objects and environment through lessons covering; character paths & enemies, scoring & timers and collectable items. Students have the opportunity to demonstrate prior knowledge when they produce pre-production documents when designing their final program.

7.3 Pre-Production Techniques
Throughout our key stage 3, 4 & 5 journey students are required to 'plan' stages of a project, whether this be digital graphics in year 8, interactive products in year 10 iMedia or the A-Level computing project in years 12 and 13. This topic teaches students the skills required to successfully produce a robust/professional plan that meets a given scenario. Lessons include; research methods, mood boards, sketches & wireframes, the use of layout & colour, Gantt charts and contingency plans.

7.2 Hardware & Software
We all use computing devices daily, but what classifies as a computer? This topic teaches students all about computer systems, including; what is the difference between hardware & software, what are the key hardware components required in a computer system, what is meant by system & application software, the need for memory & storage and the categorisation and need for peripheral devices.

7.0 Introduction to the Newman system
In the first week students will be given an induction on the school's computer system. This will include how to login, access emails and navigate their online classroom.

7.1 E-Safety
In this topic students will learn how to use computers safely and conduct themselves appropriately when online. Lessons will include; online privacy, the uses of social media, cyberbullying, artificial intelligence, how to stay safe online, and how to identify fake news.

St John Henry Newman Catholic School



KS3: YEAR 8



SUMMER 3:2

8.5 Data Representation

How is data represented inside a computer system? In this topic students will build on their knowledge from topic 8.3 where they learnt that the CPU processes data in a binary format (0s and 1s). Lessons will include; what a 'base 2' number system is, how to convert between binary & denary, how text, images & sound are represented in binary and how files are compressed to aid transmission and storage.

8.6 Multimedia – Digital Graphics

This topic has direct links to our KS4 Creative iMedia course and gives students the skills required to repurpose assets using image editing software. Lessons include; basic Photoshop skills, what are layers and masks? Colour correction, special effects and how to correctly export images while choosing appropriate image file types.

SUMMER 3:1

8.4 Python Programming

The ability to use a text-based programming language is an essential skill for computer science students. Python is a professionally used programming language, widely used in industry. Lessons in this topic include; how to effectively use algorithms, how to use an IDE and the features included that help programmers i.e. commenting/debugging, how to produce code to allow users to enter inputs and see outputs, what different data types we use, and how to use selection (IF, ELIF, ELSE).

SPRING 2:2

8.3 Computational Thinking

Building our understanding from topic 7.2 in year 7, it is in this topic where students will really begin to grasp how exactly a computer works, and that the term 'computer' relates to any modern device such as a mobile phone, tablet or games console. Lessons in this topic will cover; systems architecture (what is the function of a CPU?), the function and difference between memory & storage (including virtual and cloud storage) and embedded systems.

SPRING 2:1

8.2 Creating websites using HTML & CSS

Web technology is a key feature in the exam content for those students who choose computer science or iMedia at key stage 4. In this topic students will demonstrate the skills required create a website. They will learn to code the structure and content of a webpage using HTML before adding design and colour elements using CSS.

AUTUMN 1:2

8.1 Computer Networks

We live in an online world where are devices are connected not only to each other, but globally. What is a Network? In this topic students will understand the different types of networks and how they are created' Lessons in this topic include; What makes a Network? What is a LAN/WAN?, network hardware, common network threats, security methods and 'The Internet of Everything'.

AUTUMN 1:1

PITSTOP Assessment

SUMMER Assessment

SPRING Assessment

AUTUMN Assessment

St John Henry Newman Catholic School



KS3: YEAR 9

OUR LEARNING JOURNEY

SUMMER 3:2

SUMMER 3:1

SPRING 2:2

SPRING 2:1

AUTUMN 1:2

AUTUMN 1:1

9.6 Summer Project

Students will be given a scenario (based on pas iMedia exam content), they will have to demonstrate a variety of skills learnt across KS3 to create a portfolio of evidence. Evidence will include; pre-production documents to show substantial planning, a variety of digital content (image, video, animation) and a review/evaluation of their final product.

SUMMER Assessment

9.5 Ethical & Legal issues with technology

This topic has a direct link to the GCSE computer science specification and gives students knowledge in the current issues we face when using technology. Students will learn about what ethics and ethical reasoning are, the legal issues surrounding technology, and the implications of the emergence of AI impacts us at school, work and in society.

PITSTOP Assessment

9.4 Multimedia – Animation

Our final multimedia topic is creating computer animation, following on from creating digital graphics in topic 8.6 in year 8 and creating video earlier this year in topic 9.2. This topic covers a variety of skills that students will learn to create an animation, including; how to move, rotate & scale objects, adjust frames and movement paths, create complex models and how to adjust the light and camera options.

SPRING Assessment

PITSTOP Assessment

9.3 Python Programming

Students will recap their knowledge from topic 8.4 in year 8 where they learnt the basics of using Python. In this series of lessons students will learn to use all 3 programming constructs required at GCSE level; sequence, selection and iteration. Students will demonstrate these skills by being issued a range of 'programming problems' in which they have to plan, code and test their solutions

9.2 Multimedia - Video Creation

Building on from topic 8.6 in year 8, students will continue preparing for KS4 if they choose Creative iMedia by studying this topic in video editing. Lessons will include the skills required to; use composition & colour, adjust pacing, use transitions, understand the use of sound and how to 'sync', and use colour grading.

AUTUMN Assessment

9.1 Cybersecurity

It is essential for students of this age group to understand what is meant by 'data' and where they input their personal data online. What are the threats involved? Who has access to your data? This topic will equip students with the knowledge to make the correct choices when using online platforms and be aware of the risks involved. Lessons include; What data is and what laws protect it, social engineering techniques, the different forms of computer attacks, computer malware, and how to prevent attacks using appropriate security methods.

St John Henry Newman Catholic School

KS4: YEAR 10



OUR LEARNING JOURNEY

MOCK EXAM

SUMMER 3:2

PITSTOP Assessment

1.5 System Software

Students will have a grasp on the different systems software from topics studied in KS3. At GCSE level we will cover this topic in greater depth. Students are required to be able to describe the purpose & functionality of operating systems including their main roles; provide a user interface, memory management & multitasking, peripheral management & drivers, user management and file management. Students will also learn the purpose and need for a computer system to run utility software that includes; encryption, defragmentation and compression software.

SUMMER 3:1

1.6 Ethical, legal, cultural and environmental impacts of digital technology

Technology introduces ethical, legal, cultural, environmental and privacy issues in today's society, students learnt about ethical and legal issues in year 9, this topic will cover the content in greater depth. Students will be able to discuss in relation to a given scenario; ethical, legal, cultural, environmental and privacy issues. They are also required to have an understanding of the current legislation that is relevant to computer science; The Data Protection Act (GDPR 2018), Computer Misuse Act (1990), Copyright, Designs and Patents Act 1988 and Software licences (i.e. open-source and proprietary).

SPRING 2:2

PITSTOP Assessment

1.3 Computer Networks

In this topic students will build on the knowledge they required in KS3. They will learn in more detail the types of network (LAN & WAN) we use and be able to discuss the factors that affect the performance of networks including their topologies. Students will be able to explain the different roles of computers in a client-server and peer-to-peer network including the different hardware components required to set up the networks. Other lessons include; the Internet as a worldwide collection of networks, the DNS, cloud services, web servers & clients, modes of connection (wired/wireless), encryption, IP & MAC addressing, standards, protocols and the concept of network layers.

SPRING Assessment

1.4 Network Security

This topic also build on lots of knowledge students would have gained in KS3, students will learn in detail the different forms of attack, and how to identify and prevent vulnerabilities. Lessons in this topic will include the following content; forms of attack – malware, social engineering (phishing, peaople as the 'weak' point), brute-force attacks, DoS, data interception & theft, the concepts of SQL injection, penetration testing, anti-malware software, firewalls, user access levels, passwords, encryption and physical security.

SPRING 2:1

1.2 Memory and storage

Primary storage (memory) - in the first part of this topic students will learn the key terminology and differences between memory and storage. Students will be able to explain the need for primary memory and the purpose of ROM, RAM & virtual memory in a computer system. *Secondary storage* – students will be able to explain the need for secondary storage in a computer system and discuss the different options users have when choosing an appropriate type of storage medium (magnetic, solid-state, optical). Students will also be able to discuss the advantages and disadvantages of storage mediums while evaluating different characteristics such as capacity, speed and cost. *Units* – Students are required to understand that all data is processed as binary and the different units of measurement we use. *Data storage* – Students will learn how to convert between the denary, binary and hexadecimal number systems, add two 8-bit binary numbers together, and perform binary shifts. Students will also be able to explain how text, images and sound are represented in binary, and how compression is used to transmit and store data.

AUTUMN 1:2

PITSTOP Assessment

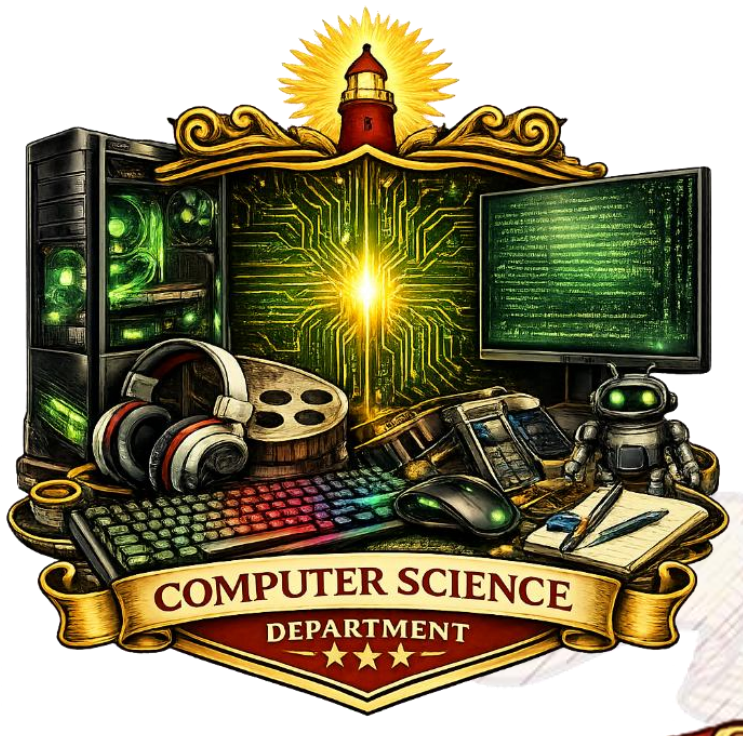
AUTUMN 1:1

1.1 Systems Architecture

In this topic students will learn abo architecture of the CPU. Lessons will include; the purpose of the CPU (fetch-decode-execute cycle), the common CPU components and their function (ALU, CU, cache, registers), the Von Neumann architecture (MAR, ADR, program counter, accumulator), the common characteristics which affect performance and embedded systems.

AUTUMN Assessment

St John Henry Newman Catholic School



KS4: YEAR 11



Examinations



EXAM!



EXAM PREPARATION



MOCK EXAM

2.5 Programming Languages & IDEs

In this topic students will learn about programming language characteristics and the different levels of language. This includes; the purpose of translators, the characteristics of compilers and interpreters, and the common tools and facilities available in an integrated development environment (IDE).

2.3 Producing Robust programs

In this topic students will learn how to use defensive design techniques to help produce robust programs. This includes; anticipating misuse, input validation and using maintainability techniques. The students also need to learn the importance and need for testing. This includes the different types of testing, identifying syntax & logic errors, and selecting and using suitable test data.

Term 2 Component 1 Recap



MOCK EXAM

2.2 Programming fundamentals

Programming fundamentals – In this topic students will be able to produce/refine programs using variables, constants, operators, inputs, outputs and assignments. They will use the three basic programming constructs used to control the flow of a program; sequence, selection and iteration. *Data types* – Students will be able to define and give examples of the common data tyoes; integer, real, boolean, character, string and understand the process of casting. Students will also be required to perform a number of additional programming techniques, such as; file handling (open, read, write, close), string manipulation, arrays (1D and 2D), how to use sub-programs and random number generation.

Term 1 Coimponent 1 Recap

2.1 Algorithms

Computation thinking – Students will be able to explain the principles of computational thinking, including; abstraction, decomposition and algorithmic thinking. *Designing, creating and refining algorithms* – In this topic students will learn how to either plan, create and adapt programming code. They will be able to produce pseudocode and flowcharts to plan code whilst identifying comment errors. *Searching and sorting algorithms* – Students will learn how the standard algorithms work for searching data (binary and linear search) and sorting data (bubble, merge and insertion sort).

SUMMER 3:2

SUMMER 3:1

SPRING 2:2

SPRING 2:1

AUTUMN 1:2

AUTUMN 1:1

St John Henry Newman Catholic School



KS5: YEAR 12



SUMMER 3:2

Component 1 content

1.5.2 *Moral and ethical issues,* ***1.2.1*** *Systems software,* ***1.4.3*** *Boolean Algebra*

Component 3 content

3.3 *Developing the solution*



SUMMER 3:1

Component 1 content

1.3.1 *Compression, encryption and hashing,* ***1.3.3*** *Networks,* ***1.3.4*** *Web technologies*

Component 3 content

3.2 *Design*



Component 1 content

1.3.2 *Databases,* ***1.2.3*** *Software development*

Component 3 content

3.1 *Analysis*



SPRING 2:2



Component 1 content

1.4.2 *Data structures*

Component 2 content

2.1.5 *Thinking concurrently,* ***2.3.1*** *Algorithms*

SPRING 2:1

Component 1 content

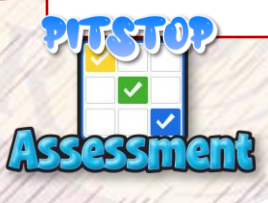
1.4.1 *Data types* ***1.4.3*** *Boolean algebra*

Component 2 content

2.2.1 *Programming techniques* ***2.1.3*** *Thinking procedurally* ***2.1.1*** *Thinking abstractly* ***2.2.2*** *Computational methods*



AUTUMN 1:2





AUTUMN 1:1

Component 1 content

1.1.3 *Input, output and storage,* ***1.1.1*** *Structure and function of the processor,* ***1.2.4*** *Types of programming language,* ***1.2.2*** *Types of processor,* ***1.2.2*** *Applications generation,* ***1.2.1*** *Systems software.*

Component 2 content

2.1.2 Thinking ahead, 2.1.4 *Thinking logically,* ***2.2.1*** *Programming techniques*

St John Henry Newman Catholic School

KS5: YEAR 13

COMPUTER SCIENCE DEPARTMENT

OUR LEARNING JOURNEY

AUTUMN 1:1

Component 3 content

At the start of year 13 students will be well under way with their projects. The majority of the first term will be given to the continued development of their programming code.

3.3 Developing the solution (continued)

3.3.1 – Iterative development process

3.3.2 – Testing to inform development

AUTUMN 1:2

Component 3 content

3.4 Evaluation

3.4.1 – Testing to inform evaluation

3.4.2 – Success of the solution

3.4.3 – Describe the final product

3.4.4 – Maintenance and development

Year 12 recap

Lessons in this term will also revist the following topics.

- 1.1 The characteristics of contemporary processors, input, output & storage
- 1.4 Data types, data structures and algorithms

These lessons will have an exam focus, we will recap the knowledge from year 12 and use past paper and revision questions to prepare for the summer exams.

SPRING 2:1

MOCK EXAM

Component 3 content

Completion and assessment of project NEA

Students will have a deadline for the submission of their project. This will be marked and standardised, students will be given their grade which is worth 20% of the overall A-Level.

SPRING 2:2

Year 12 recap

Lessons in this term will also revist the following topics.

- 1.3 Exchanging data
- 2.2 Problem solving and programming
- 2.3 Algorithms

These lessons will have an exam focus, we will recap the knowledge from year 12 and use past paper and revision questions to prepare for the summer exams.

MOCK EXAM

SUMMER 3:1

Year 12 recap

Lessons in this term will also revist the following topics.

- 1.2 Software and software development
- 1.5 Legal, moral and ethical issues
- 2.1 Elements of computational thinking

These lessons will have an exam focus, we will recap the knowledge from year 12 and use past paper and revision questions to prepare for the summer exams.

SUMMER 3:2

Examinations

EXAM!

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