



Computing at LHS

Topic 1 - Using computers safely

We begin studying in Year 7 by giving pupils access to the Office 365 suite and introducing a range of computing skills such as how to search for accurate information, importance of communicating safely and respectfully online, the need to keep personal information private and how to report concerns online.

Topic 2 - Spreadsheet Modelling

How computers can be used to model data and answer "what-if?" questions. Understand the difference between data and information and use a range of spreadsheet functions such as AVERAGE, COUNTIF and IF statements to analyse data.

Topic 3 - Programing Essentials in Scratch

What are algorithms? Develop programs, detect and correct simple semantic errors i.e. debugging, in programs. Solve problems through decomposition. Build programs that implement algorithms to achieve given goals and use logical reasoning to predict the behaviour of programs.

Topic 1 - Understanding Computers

How do computers work? How do they use binary to store information? What is ASCII? How do computers represent sound waves, images and text?

Topic 2 - Computer Networks & Protocols

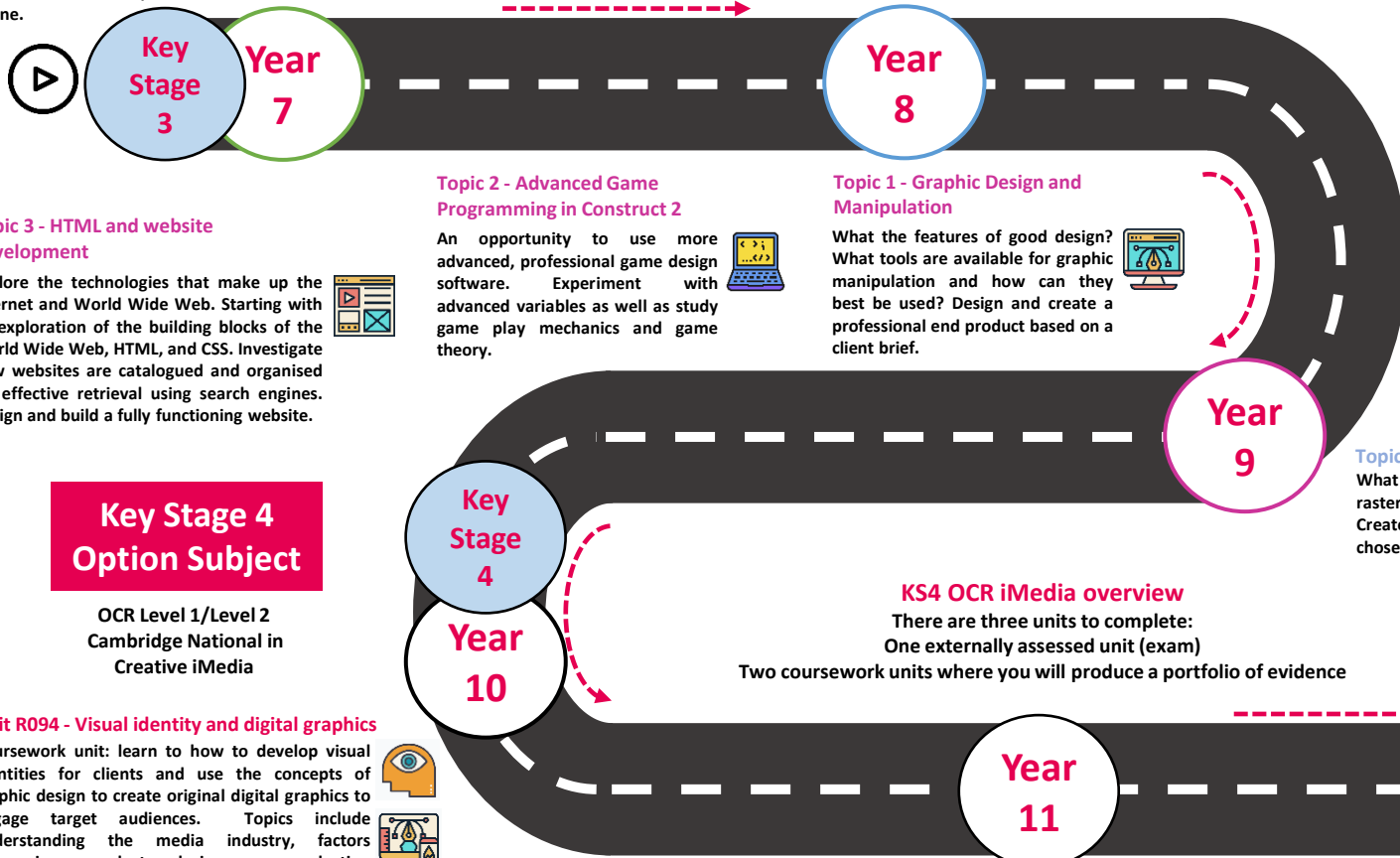
What is a computer network and how data is transmitted between computers across networks? What protocols are and how do they control systems? What is bandwidth and how does that influence data transfer speeds across a network such as the internet? What are components on the internet (servers, browsers, pages, HTTP and HTTPS protocols, etc.) and how do they work together?

Topic 3 - Data Security and Cybersecurity

What is the difference between data and information? What data do companies collect on you? How that data might be valuable to cybercriminals? How can human errors pose security risks to data? What is hacking and how is it done, what prevention methods are there? What are the most effective methods to prevent cyberattacks?

Topic 4 - Vector Graphics

What is the difference between bitmap and raster graphics? Where should each be used? Create a set of vector graphic icons for a chosen real world scenario.



Key Stage 4 Option Subject

OCR Level 1/Level 2
Cambridge National in
Creative iMedia

Unit R094 - Visual identity and digital graphics

Coursework unit: learn to how to develop visual identities for clients and use the concepts of graphic design to create original digital graphics to engage target audiences. Topics include understanding the media industry, factors influencing product design, pre-production planning and distribution considerations.



Topic 2 - Advanced Game Programming in Construct 2

An opportunity to use more advanced, professional game design software. Experiment with advanced variables as well as study game play mechanics and game theory.

Topic 1 - Graphic Design and Manipulation

What the features of good design? What tools are available for graphic manipulation and how can they best be used? Design and create a professional end product based on a client brief.

KS4 OCR iMedia overview

There are three units to complete:
One externally assessed unit (exam)
Two coursework units where you will produce a portfolio of evidence

Unit R099 - Digital games

Coursework unit: learn how to plan, create and review digital games. The UK has one of the largest games markets in the world, and the UK's games industry is among the largest in Europe. Its workforce has one of the youngest profiles in the media industries with earnings above the media industry average. It is a sector with a huge variety of technical and creative job roles. This unit will open the door to a variety of roles within the media industry by enabling you to identify core features of digital games and understand the basics of planning, designing, creating and testing digital games.

Unit R093 - Creative iMedia in the media

Exam Unit: Learn about the sectors, products and job roles that form the media industry. You will learn the legal and ethical issues considered and the processes used to plan and create digital media products. You will learn how media codes are used within the creation of media products to convey meaning, create impact and engage audiences. You will learn to choose the most appropriate format and properties for different media products.

Next Steps ?

T Level

BTEC Level 3

Apprenticeship

A Level



Topic 1 - using computers safely

We begin studying in Year 7 by giving pupils access to the Office 365 suite of software. Pupils will also be given their username and password for the school systems.

1. Binary – What do you know? What do you not know? This initial base line test will assess how much you already know about IT and computing so we can tailor lessons to individual student ability.

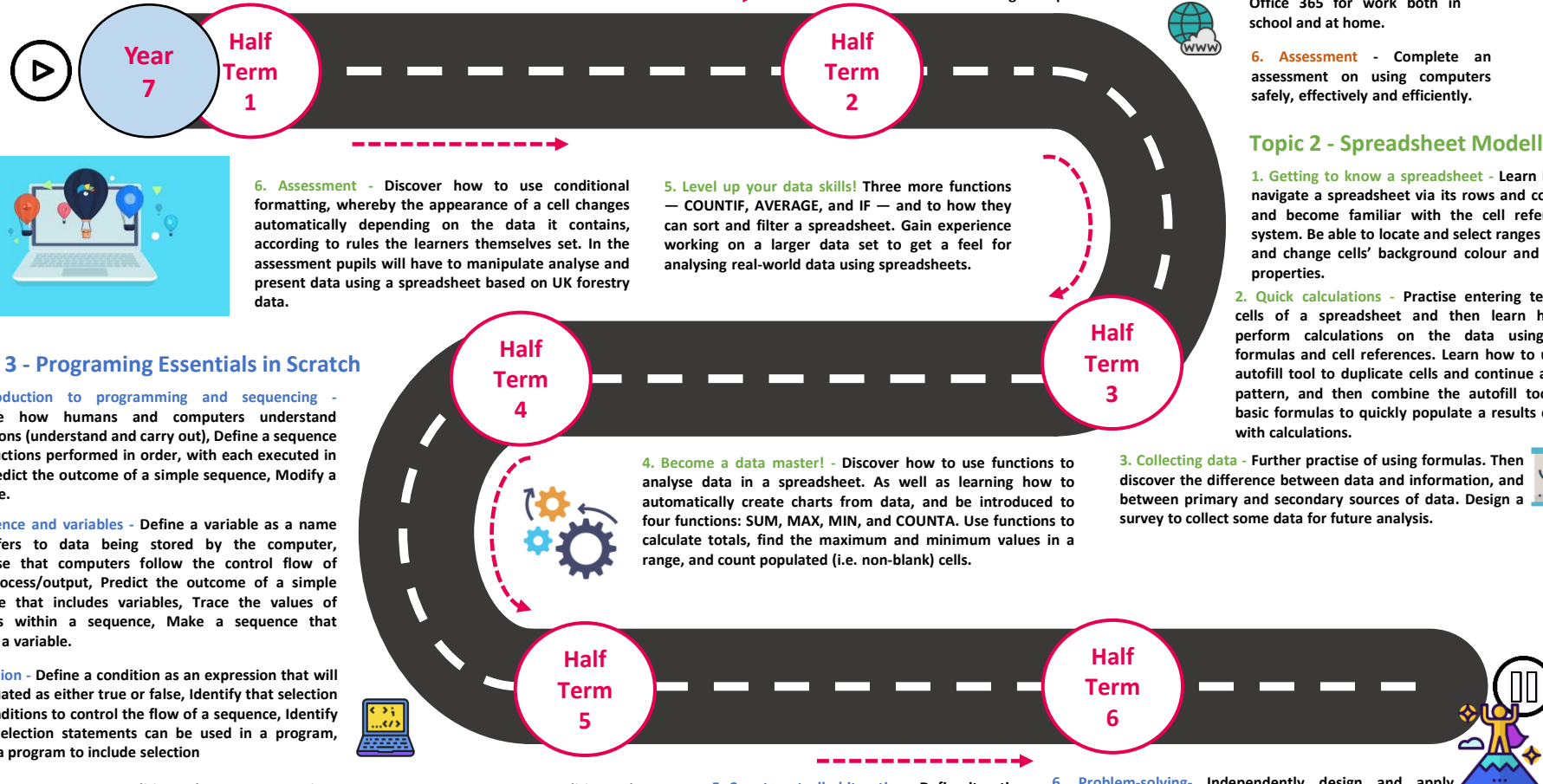
2. E-Safety – Learn how to log and use the school's IT system efficiently. Understand how to search for accurate and reliable information and know what to do to report concerns and stay safe online.

3. The Internet - What is the difference between the World Wide Web and the Internet? How does the internet work? How can you be sure information online is reliable? How can you search efficiently.

4. Searching the web - How you locate accurate information on the Internet? Learn advanced search techniques and how to spot "fake news". Understand how search engines operate.

5. Microsoft Office - Which Office application is right for the job? Learn how to use Office 365 for work both in school and at home.

6. Assessment - Complete an assessment on using computers safely, effectively and efficiently.



6. Assessment - Discover how to use conditional formatting, whereby the appearance of a cell changes automatically depending on the data it contains, according to rules the learners themselves set. In the assessment pupils will have to manipulate analyse and present data using a spreadsheet based on UK forestry data.

5. Level up your data skills! Three more functions – COUNTIF, AVERAGE, and IF – and to how they can sort and filter a spreadsheet. Gain experience working on a larger data set to get a feel for analysing real-world data using spreadsheets.

Topic 3 - Programming Essentials in Scratch

1. Introduction to programming and sequencing - Compare how humans and computers understand instructions (understand and carry out), Define a sequence as instructions performed in order, with each executed in turn, Predict the outcome of a simple sequence, Modify a sequence.

2. Sequence and variables - Define a variable as a name that refers to data being stored by the computer, Recognise that computers follow the control flow of input/process/output, Predict the outcome of a simple sequence that includes variables, Trace the values of variables within a sequence, Make a sequence that includes a variable.

3. Selection - Define a condition as an expression that will be evaluated as either true or false, Identify that selection uses conditions to control the flow of a sequence, Identify where selection statements can be used in a program, Modify a program to include selection

4. Operators - Create conditions that use comparison operators (>,<,<=), Create conditions that use logic operators (and/or/not), Identify where selection statements can be used in a program that include comparison and logical operators



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Half Term 4



4. Become a data master! - Discover how to use functions to analyse data in a spreadsheet. As well as learning how to automatically create charts from data, and be introduced to four functions: SUM, MAX, MIN, and COUNTA. Use functions to calculate totals, find the maximum and minimum values in a range, and count populated (i.e. non-blank) cells.

Half Term 5

5. Count-controlled iteration - Define iteration as a group of instructions that are repeatedly executed, Describe the need for iteration, Identify where count-controlled iteration can be used in a program, Implement count-controlled iteration in a program, Detect and correct errors in a program (debugging)

Half Term 3

3. Collecting data - Further practise of using formulas. Then discover the difference between data and information, and between primary and secondary sources of data. Design a survey to collect some data for future analysis.



Half Term 6

6. Problem-solving - Independently design and apply programming constructs to solve a problem (subroutine, selection, count-controlled iteration, operators, and variables)
Assessment - Summative assessment task where pupils are required to independently work through tasks to complete a dance move game.



Topic 2 - Spreadsheet Modelling

1. Getting to know a spreadsheet - Learn how to navigate a spreadsheet via its rows and columns, and become familiar with the cell referencing system. Be able to locate and select ranges of cells and change cells' background colour and border properties.

2. Quick calculations - Practise entering text into cells of a spreadsheet and then learn how to perform calculations on the data using basic formulas and cell references. Learn how to use the autofill tool to duplicate cells and continue a linear pattern, and then combine the autofill tool with basic formulas to quickly populate a results column with calculations.



Topic 1 – Understanding Computers

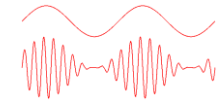
Year 8 introduces more Computer Science concepts with pupils learning how computers work, how they represent text, images and sounds then moving to look at how data is transferred across networking devices and the importance of cyber security. Pupils finish the year the study of vector graphics, their properties, design and use.

1. Understanding binary – What is binary and how do computers use it to store information? Learn how to count in binary and mathematical operations. Understand the concept of bits in relation to computer memory.

2. ASCII – How do computers use ASCII to represent text? Understand the need protocols when developing computer codes and systems. Attempt to convert ASCII to plain text and the reverse.

3. Digital Images – How do computers represent images? Learn about pixels, RGB colours, bitmaps, meta data and resolution. Learn how to write computer code to display an image on screen.

4. Digital sound – How do computers represent sound? Learn how computers sample analogue sound waves and recreate them digitally. Understand about sound sample rates and sample your own sound wave.



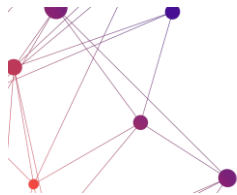
5. Machine code – How do computers carry out instructions? Learn about Opcode, machine codes and instructions. Demonstrate then ability to write machine code by recreating your name in machine code. Complete an summative **assessment** of the unit.



Year 8

Half Term 1

Half Term 2



5. Internet Services – Learners will understand the difference between the World Wide Web and the internet. Explore the emergence of the Internet of things (IoT) and make predictions on future web developments that may take place with a particular focus on privacy and security. **Assessment** – Undertake an summative assessment on network protocols an hardware.

4. The internet – Learn about the history of the internet from it's small beginnings as a military assets to the globe spanning network that it is today. Understand how data is transmitted over the internet in "packets" and the importance of networking protocols such as TCP/IP and HTML

3. Wired and wireless networks – Explore the different wireless technologies of 3G, 4G, and 5G. Develop an understanding of the term 'bandwidth'. Explore the advantages and disadvantages of wired and wireless networks. And identify whether a wired or wireless network should be used in a number of given scenarios.

Half Term 3

Half Term 4

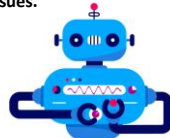
Topic 3 – Data and Cyber security

1. You and your data – learn what data companies collect from their users and how they you may already be giving data to. Explore the laws regarding data protection and will reflect on why cybercriminals might want to gain access to data and how to protect yourself from potential cyber crime.

2. Social engineering– learn what data companies collect from their users and how they you may already be giving data to. Explore the laws regarding data protection and will reflect on why cybercriminals might want to gain access to data and how to protect yourself from potential cyber crime.

3. Social engineering– Be aware of how humans can be a weak point in the system, as well as looking at the social engineering tactics deployed by cybercriminals to dupe users into giving away data that could lead to further crime. Explore the common social engineering techniques, and start to consider the consequences of the scams and how to avoid becoming a victim.

5. Rise of the bots– Become aware of malware and the different categories of malware, as well as understanding how they work and the potential damage they can do. Explore scenarios that demonstrate the hidden role of bots and what potential influence they could have on societal issues.



6. There's no place like 127.0.0.1 - Develop your understanding of the risks that cyber threats pose to a network, and explore methods of defending a network against attacks, such as firewalls and anti-malware. Study real-world examples of cyber attacks and investigate the impact on businesses and individuals. **Assessment** - use unit knowledge and skills to plan and design a cyber defence strategy on a tight budget.

2. Paths united – Using path operations such as union, difference, and intersection, students are able to combine simple shapes into more complex ones. Learn how to Manipulate groups of objects (select, group/ungroup, align, distribute) and combine paths by applying operations (union, difference, intersection)

5. Under the hood – Time to investigate what vector images are really made of. Study the working of and modify an .svg file to grasp how it is essentially a structured description of an image and how that image is rendered when viewed. Explore cases where vector graphics are (or aren't) useful.

6. Showcase and assessment – A chance to conclude, showcase, and peer assess projects. Improve your own project work based on feedback. Complete a summative assessment on the properties, uses and characteristics of vector graphics.



Topic 4 – Vector Graphics

1. Get into shapes – Gain an understanding of vector graphics and where they are used such as logos, icons, and illustrations. Use graphic editing software to draw and manipulate objects and experiment with their properties (fill and stroke, flip, z-order etc.)

3-4. Icon challenges – Using the skills learnt so far and some creative thinking to create a set of monochrome icons. Using elementary shapes and operations, creating any shape imaginable is possible. Learn how to Convert objects to paths, Draw paths and Edit path nodes to create complex and professional looking final products.

Half Term 5

Half Term 6



Topic 1 – Graphic Design and Manipulation

Year 9 builds on knowledge and skills from Year 7 & 8 and introduced more advanced coding, graphics and design skills. Work in Year 9 is based around working to a client brief and undertaking creative projects as well as creating, re-using, revise and re-purposing digitally artefacts .

1. What makes good design? – What makes an image visually appealing? You will look at examples of both good and bad design to come up with a set of “key design rules” that you will follow through this unit.

2. Introduction to Draw Plus – Learn how to use Serif DrawPlus – a professional graphics design package. Learn how to use advanced tools to both create and manipulate graphics to produce professional looking final products.

3. The importance of planning – Learn why the planning stage is often the most time consuming and import part of a project. If you fail to prepare, you prepare to fail! Learn about mind maps, mood boards and visualisation diagrams.

4. Get creative – Using the skills and knowledge learnt so far, along with a suitable plan and following the golden design rules, complete a short project based on a real world client brief. This will give you valuable experience of working to a deadline and working alongside a client to make their ideas a reality.

5. Review and evaluate – How happy is the client with what has been produced? How do you know? Being able to critically evaluate both your own and other’s work is a key skill to producing the most professionally looking final pieces. Learn how to both take and receive creative feedback in order to produce the best possible final outcomes. Your work will go through several iterations before being “perfect”



Year 9

Half Term 1

Half Term 2

7-14. Design, Develop and Test a fully functioning game in Construct 2 – This is the start of their extended creative project and assessment for this unit. Working to a client brief, design, plan and create a fully working product. Combine all of the skills and knowledge learned so far in this and the previous units to create a professional final product that will satisfy the requirements of the client brief. The final product will be full tested by both the author and gameplay tested by users to inform areas for improvement.

6. Experimentation time – Time to experiment! Game design involves a lot of experimentation time and that there is more often than not more than one way of doing things. Time is allocated to make mistakes, identify what went wrong and find creative and inventive solutions.

4. Variables – Explore the use of variables in coding and more specifically in game design. Learn how to create variable to control different element of games such as health, time, ammo. Arithmetic operations are introduced at this point to build more complex code into projects.

Half Term 3

Half Term 4

5. Gameplay mechanics – What is it that makes games fun to play? What keeps players coming back for more? Explore game mechanics by looking at some classic examples and than design, plan and implement game play mechanics to add to individual projects.

3. Pseudocode – Introduction to the concept of pseudocode – talking about code in plain English. Use this skill to debug example code and then fix problems in provided coding in examples. Linked to this is the idea of decomposition- breaking down coding problems in to small chunks as well as debugging code.

2. Events and actions – Understand how coding in Construct 2 uses a hierarchical structure and a “top down” approach. Explore the concept of “events” and “actions” and the “if this, then that” element of coding. Write code to collect an item when the player collects it and add to a scoring system by learning about both global and instance variables.



Topic 3 – Python programming

1. Python warmup – In this lesson, you'll learn to write programs that display messages, receive keyboard input, and use arithmetic expressions in assignment statements. You'll explore using if-elif-else statements to control program flow. Additionally, you'll practice locating and correcting syntax errors and creating and accessing list items. These skills will build your programming foundation for future lessons.

2. Playlist – Here you will cover common list operations: adding, removing, or modifying items, and locating or counting occurrences. Learners tackle short challenges, identifying and applying relevant list operations to complete tasks to further improve your coding skills.



Half Term 5

3. In a while, crocodile – This lesson teaches you how to use iteration (while statements) to control program flow. You'll also learn to perform common operations on lists and individual items, as well as operations on strings and individual characters. These skills are essential for effective programming.

4-5. The famous for – In this lesson, you will use a for-loop to iterate over list items. You will study various examples to understand its syntax, use, and mechanics before applying this knowledge to similar tasks. Activities include iterating over lists of real-world textual and numerical data, requiring you to recall and apply knowledge from previous lessons.

Half Term 6

6-10. Make a thing – In this lesson, you will choose from several meaningful mini-projects to apply your acquired knowledge and skills. Each project includes an introduction for context, a detailed description of the task, and clues to help create a solution. You will select one mini-project to complete for your final assessment.

