

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.

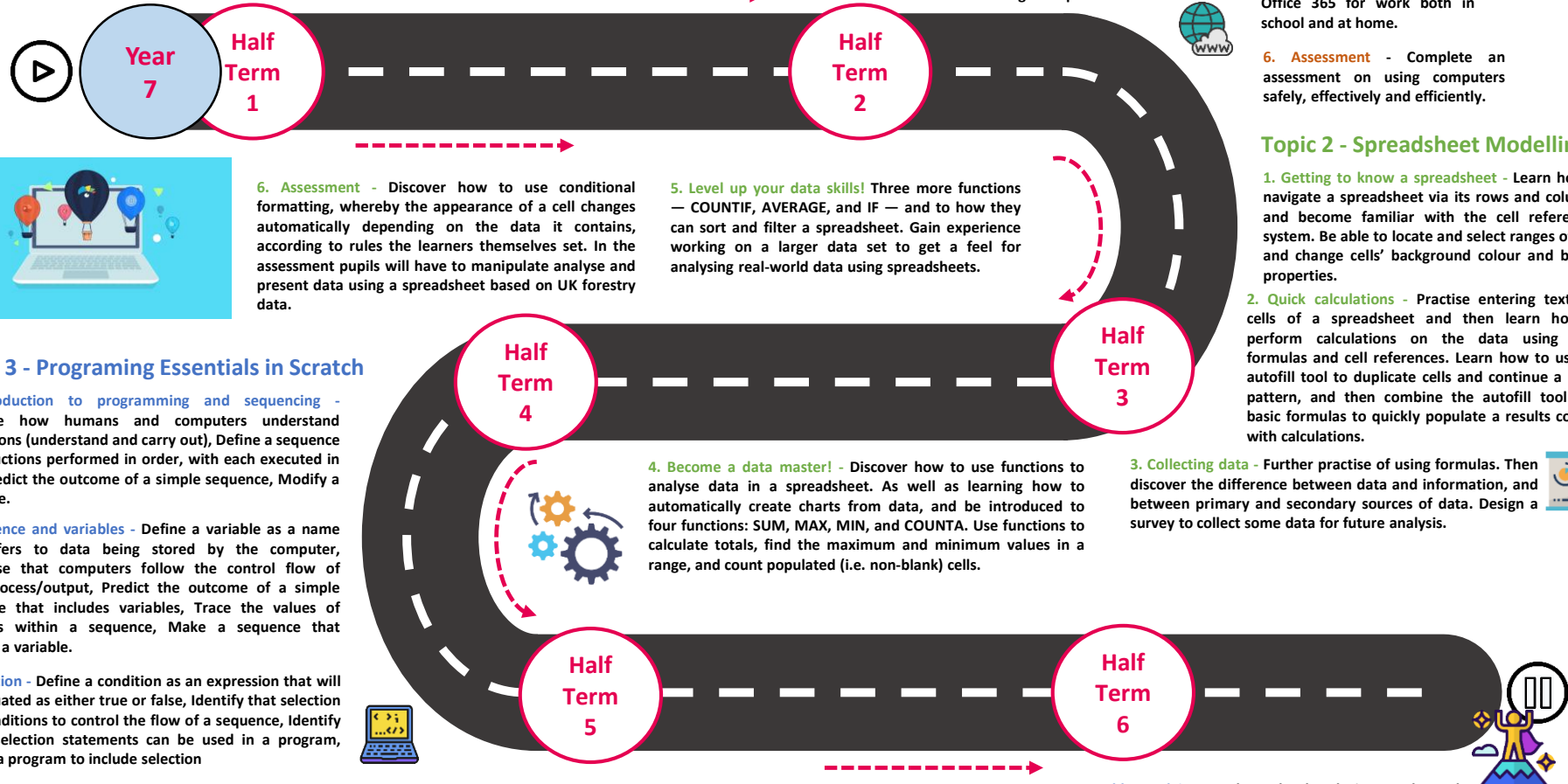
2. E-Safety – Learn how to log and use the school's IT system efficiently. Understand how to search for accurate and reliable information and know what to do to report concerns and stay safe online.

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

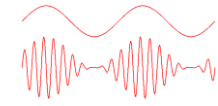
Year 8 introduces more Computer Science concepts with pupils learning how computers work, how they represent text, images and sounds then moving to look at how data is transferred across networking devices and the importance of cyber security. Pupils finish the year the study of vector graphics, their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



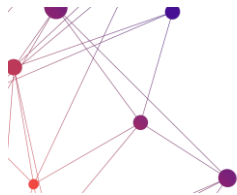
5. Machine code – How do computers carry out instructions? Learn about Opcode, machine codes and instructions. Demonstrate then ability to write machine code by recreating your name in machine code. Complete an summative **assessment** of the unit.



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

Topic 2 – Networks and Protocols

1. Computer networks and protocols – learn what a computer network is, along with the meaning of the word 'protocol'. Gain an appreciation of the growth of networked devices. Identify different greeting protocols and use a series of protocol commands in a 'climber/belayer' scenario. Finally, explore the connection between non-networking and networking protocols.

2. Networking hardware – Explore the functionality of key hardware components found in a network - network cables, hubs, servers and routers. Use this knowledge of to build a series of increasingly complicated network diagrams and produce inventive and creative solutions to networking problems.



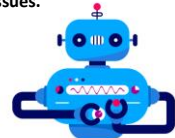
Topic 3 – Data and Cyber security

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.



Half Term 4

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

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)

Half Term 6

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 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

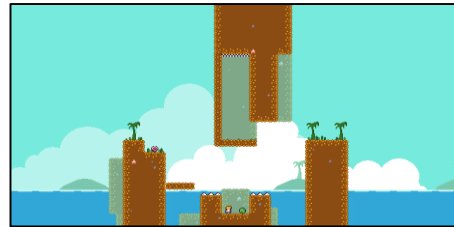
Half Term 1

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 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.

Half Term 3

Half Term 6

Topic 3 – HTML coding and website development

1. Website building blocks – The first lesson looks behind the curtain to help start to understand how web pages are constructed using HTML tags, and how they can be modified to start to resemble the websites. Practise formatting sections of text to improve readability, modify tags to change their appearance in a document. Consider and explore the power of automation for repetitive tasks, before delving into some practical web page formatting activities using HTML tags.

2. Words are not enough – Web pages that only use text are not going to be read for long on a screen. The use of images on web pages is important as it can bring them to life and help improve the reader’s experience. Explore the structure and operation of the “img” tag and understand how it can be used to ‘add’ images to web pages. Then try to replicate a given web page design to see if you can use what they have learnt in the most effective way.



3. Taking shortcuts – The benefit of using a computer is that it is a device that allows the easy editing of content. Computer scientists like to find efficient ways to automate what they do and in this lesson you will see that CSS is a more efficient way of styling HTML documents. As you become more experienced in the structure of CSS you will look to extend your knowledge and skills by experimenting with the numerous attributes that can be controlled by CSS.

4-5. Searching the web – Like artists, web developers create works of art that they want people to see. There is so much content on the World Wide Web, that making sure your web page stands out can be difficult. By considering how search engines find and rank web pages, you will learn how you can make your designs appear towards the top of search engine lists, so that more people will view the content that you have created.

6-10. Navigating the web – Investigate advanced search techniques. Understand how search operators can be used to combine or exclude search terms to either expand or narrow search results. Learn how to hyperlink web pages into a complete website allowing navigation between the pages that you have created. **Assessment** – Create a website using HTML based on the requirements of a real world, specific client brief in which you will have to research, plan, create and finally evaluate a fully functional HTML website.

