



Year 9 ICT Medium Term Plan

Autumn Term 1A

Learning Overview (Contents)	This unit introduces learners to how data can be represented and processed in sequences, such as lists and strings. The lessons cover a spectrum of operations on sequences of data, that range from accessing an individual element to manipulating the entire sequence. Great care has been taken so that the selection of problems used in the programming tasks are realistic and engaging: learners will process solar system planets, book texts, capital cities, leaked passwords, word dictionaries, ECG data, and more. • use two or more programming languages, at least one of which is textual, to solve a variety of computational problems • understand how instructions are stored and executed within a computer system • understand several key algorithms that reflect computational thinking; use logical reasoning to compare the utility of alternative algorithms for the same problem • design, use, and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
Assessment Opportunities	Practical Project
Textbooks Published Lesson Resources	https://teachcomputing.org/
Home Learning Resources	Computing, secondary, Year 9 - Lesson listing Oak National Academy
Knowledge organisers	Knowledge Organizer Python Sequences Y9.pdf

Week Number	Learning Overview / objective	What should pupils know, understand and be able to do by the end of the week?
1	Welcome Back and Introduction	• Gain understanding about the ICT subject expectations and prospects • Learn about the ICT lab rules and regulations

2	Warm up	• Write programs that display messages, receive keyboard input, and use simple arithmetic expressions in assignment statements • Use selection (if-elif-else statements) to control the flow of program execution • Locate and correct common syntax errors • Create lists and access individual list items
3	playlist	Perform common operations on lists or individual items
4	in a while, crocodile	• Use iteration (while statements) to control the flow of program execution • Perform common operations on lists or individual items Perform common operations on strings or individual characters
5	4 the famous for	• Use iteration (for statements) to iterate over list items Perform common operations on lists or strings
6	Making a thing	• Use iteration (for loops) to iterate over lists and strings • Use variables to keep track of counts and sums Combine key programming language features to develop solutions to meaningful problems
7	Wrap it up	Complete the project



Year 9 ICT Medium Term Plan

Autumn Term 1B

Learning Overview (Contents)	Films, television, computer games, advertising, and architecture have been revolutionised by computer-based 3D modelling and animation. In this unit learners will discover how professionals create 3D animations using the industry-standard software package, Blender. By completing this unit learners will gain a greater understanding of how this important creative field is used to make the media products that we consume. Sessions will take learners through the basics of modelling, texturing, and animating; outputs will include 3D models, short videos, and VR. • Create, reuse, revise, and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability
Assessment Opportunities	End of term assessment
Textbooks Published Lesson Resources	https://teachcomputing.org/
Home Learning Resources	Computing, secondary, Year 9 - Lesson listing Oak National Academy
Knowledge organisers	Knowledge Organizer Data Science TeachComputing Y9.pdf

Week Number	Learning Overview / objective	What should pupils know, understand and be able to do by the end of the week?
1	Move, rotate, scale, colour	• Add, delete, and move objects • Scale and rotate objects • Use a material to add colour to objects
2	Animation, names, parenting	• Add, move, and delete keyframes to make basic animations • Play, pause, and move through the animation using the timeline • Create useful names for objects • Join multiple objects together using parenting
3	Complex model and colours	• Use edit mode and extrude

		• Use loop cut and face editing • Apply different colours to different parts of the same model
4	Organic modeling	• Use proportional editing • Use the knife tool • Use subdivision
5	Lights, camera, render	• Add and edit set lighting • Set up the camera • Compare different render modes
6	Project	• Create a 3–10 second animation • Render out the animation
7	End of term assessment	• Take an assessment about what have been covered



Year 9 ICT Medium Term Plan

Spring Term 2A

Learning Overview (Contents)	learners will be introduced to data science, and by the end of the unit they will be empowered by knowing how to use data to investigate problems and make changes to the world around them. Learners will be exposed to both global and local data sets and gain an understanding of how visualising data can help with the process of identifying patterns and trends. Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
Assessment Opportunities	End of half term project
Textbooks Published Lesson Resources	https://teachcomputing.org/
Home Learning Resources	Computing, secondary, Year 9 - Lesson listing Oak National Academy
Knowledge organisers	Knowledge Organizer Data Science Y9.pdf

Week Number	Learning Overview / objective	What should pupils know, understand and be able to do by the end of the week?
1	Delving into data science	- Define data science - Explain how visualising data can help identify patterns and trends in order to help us gain insights - Use an appropriate software tool to visualise data sets and look for patterns or trends
2	Global Data	- Recognise examples of where large data sets are used in daily life - Select criteria and use data set to investigate predictions

		● Evaluate findings to support arguments for or against a prediction ●
3	Statistical state of mind	● Define the terms 'correlation' and 'outliers' in relation to data trends ● Identify the steps of the investigative cycle ● Solve a problem by implementing steps of the investigative cycle on a data set ● Use findings to support a recommendation
4	Data for action	● Identify the steps of the investigative cycle ● Identify the data needed to answer a question defined by the learner ● Create a data capture form
5	Make a change	● Visualise a data set ● Analyse visualisations to identify patterns, trends, and outliers ● Draw conclusions and report findings
6	End of half term project	● Apply what have been covered to a project
7	End of half term project	● Present the project



Year 9 ICT Medium Term Plan

Spring Term 2B

Learning Overview (Contents)	learners will focus on digital media such as images and sounds, and discover the binary digits that lie beneath these types of media. Just like in the previous unit, where learners examined characters and numbers, the ideas that learners need to understand are not really new to them. You will draw on familiar examples of composing images out of individual elements, mixing elementary colours to produce new ones, and taking samples of analogue signals, to illustrate these ideas and bring them together in a coherent narrative. • Understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
Assessment Opportunities	End of term assessment
Textbooks Published Lesson Resources	https://teachcomputing.org/
Home Learning Resources	Computing, secondary, Year 9 - Lesson listing Oak National Academy
Knowledge organisers	Knowledge Organizer Representations_Y9.pdf

Week Number	Learning Overview / objective	What should pupils know, understand and be able to do by the end of the week?
1	Binary Mosaic	• Describe how digital images are composed of individual elements • Recall that the colour of each picture element is represented using a sequence of binary digits • Define key terms such as 'pixels', 'resolution', and 'colour depth' • Describe how an image can be represented as a sequence of bits

2	A splash of colours	- Describe how colour can be represented as a mixture of red, green, and blue, with a sequence of bits representing each colour's intensity - Compute the representation size of a digital image, by multiplying resolution (number of pixels) with colour depth (number of bits used to represent the colour of individual pixels) - Describe the trade-off between representation size and perceived quality for digital images
3	Collage	- Perform basic image editing tasks using appropriate software and combine them in order to solve more complex problems requiring image manipulation - Explain how the manipulation of digital images amounts to arithmetic operations on their digital representation Describe and assess the creative benefits and ethical drawbacks of digital manipulation
4	Good vibrations	- Recall that sound is a wave - Explain the function of microphones and speakers as components that capture and generate sound - Define key terms such as 'sample', 'sampling frequency/rate', 'sample size' - Describe how sounds are represented as sequences of bits
5	Sonic playground	- Calculate representation size for a given digital sound, given its attributes - Explain how attributes such as sampling frequency and sample size affect characteristics such as representation size and perceived quality, and the trade-offs involved - Perform basic sound editing tasks using appropriate software and combine them in order to solve more complex problems requiring sound manipulation
6	Always another way	- Recall that bitmap images and pulse code sound are not the only binary representations of images and sound available - Define 'compression', and describe why it is necessary
7	End of term assessment	Take the end of semester assessment

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Year 9 ICT Medium Term Plan

Summer Term

Learning Overview (Contents)	Introduction of cybersecurity This unit takes the learners on an eye-opening journey of discovery about techniques used by cybercriminals to steal data, disrupt systems, and infiltrate networks. The learners will start by considering the value of their data to organisations and what they might use it for. They will then look at social engineering techniques used by cybercriminals to try to trick users into giving away their personal data. • Understand a range of ways to use technology safely, respectfully, responsibly, and securely, including protecting their online identity and privacy; recognise inappropriate content, contact, and conduct, and know how to report concerns Applying programming skills with physical computing This unit applies and enhances the learners' programming skills in a new engaging context: physical computing, using the BBC micro:bit. In the first half of the unit, learners will get acquainted with the host of components built into the micro:bit, and write simple programs that use these components to interact with the physical world. In the process, they will refresh their Python programming skills and encounter a range of programming patterns that arise frequently in physical computing applications. In the second half, learners will work in pairs to build a physical computing project. • Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems • Understand several key algorithms that reflect computational thinking; use logical reasoning to compare the utility of alternative algorithms for the same problem • Understand how instructions are stored and executed within a computer system • Design, use, and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
Assessment Opportunities	End of term assessment Half term project

Textbooks Published Lesson Resources	https://teachcomputing.org/
Home Learning Resources	Computing, secondary, Year 9 - Lesson listing Oak National Academy Computing, secondary, Year 9 - Lesson listing Oak National Academy
Knowledge organisers	Revision Booklet Physical Computing Y9 (1).pdf Knowledge Organizer Cybersecurity Y9.pdf

Week Number	Learning Overview / objective	What should pupils know, understand and be able to do by the end of the week?
1	You and your data	• Explain the difference between data and information • Critique online services in relation to data privacy • Identify what happens to data entered online • Explain the need for the Data Protection Act
2	Social engineering	• Recognise how human errors pose security risks to data • Implement strategies to minimise the risk of data being compromised through human error
3	Under Attack	• Identify the most effective methods to prevent cyberattacks • Do the half term project
4	Python: hello physical world	• Describe what the micro: bit is • List the micro: bit's input and output devices • Use a development environment to write, execute, and debug a Python program for the micro: bit
5	Bare bones	• Write programs that use the micro: bit's built-in input and output devices
6	Connections	• Write programs that use GPIO pins to generate output and receive input • Write programs that communicate with other devices by sending and receiving messages wirelessly

7	Build it up	Implement a physical computing project, while following, revising, and refining the project plan
8	Wrap it up	• Implement a physical computing project, while following, revising, and refining the project plan • Take the end of term assessment