

<b>Year 6</b> <b>Computing</b> <b>Autumn 1</b> <b>Computing systems and networks: Bletchley Park</b>	
<b>Previous learning</b>	
<p>Before starting this unit, you might want to check that children can recall:</p> <p>What copyright is and why we should seek permission to use other people's photos, artwork and writing.          You can use images, text, transitions and animation in presentation slides.          World War 2 was a battle between two groups of countries called the Allies (Britain, France, Russia, China and the United States) and the Axis (Germany, Italy and Japan). It started in 1937 and ended in 1945.</p>	
<b>Substantive Knowledge in Computing</b>	<b>Disciplinary knowledge in Computing</b>
<p>By the end of KS2, children will know how different technology is used in our lives; they will have developed knowledge of Digital Literacy; they will understand the basic principles of programming and coding and they will know how to stay safe using the internet.</p>	<p>Our Computing curriculum will equip children not only with the skills and knowledge to learn and grow in the digital world we live in, but more importantly in a safe and secure manner. They will be able to apply the British Values of democracy, tolerance, mutual respect, rule of law and liberty when using digital systems.</p>
<b>Lesson 1</b>	<b>Secret codes</b>
	<p>To understand there are many different types of secret codes.</p> <p>I can explain why codes might be valuable.          I can identify some common secret codes.          I can decipher some secret codes.          I can write a message using a secret code.</p>
<b>Lesson 2</b>	<b>Brute force hacking</b>
	<p>To understand the importance of having a secure password.</p> <p>I can describe what is meant by brute force hacking          I can understand why it is important to have a secure password.          I can explain why a longer password is more secure than a short one.</p>
<b>Lesson 3</b>	<b>Bletchley Park</b>
	<p>To understand the importance of Bletchley Park to the World War II war effort.</p> <p>I can understand that Bletchley Park was important during WWII.          I can explain what the first computer was built for.          I can create an information poster about Bletchley Park.</p>
<b>Lesson 4</b>	<b>Computing heroes</b>
	<p>To research historical figures that contributed to technological advances in computing.</p> <p>I can identify some of the people who contributed to computing history          I can explain what some historical figures achieved.          I can research one historical figure in detail.</p>
<b>Lesson 5</b>	<b>Computing heroes part 2</b>
	<p>To research and present information about historical figures in computing.</p> <p>I can identify why historical figures were influential in creating modern computers.</p>

	I can present information using presentation software. I can explain why a historical figure is important.
<b>Vocabulary</b>	
Acrostic Code, Brute force hacking, Caesar cipher, Chip and pin system, Cipher, Code, Combination, Contribute, Convince, Date shift cipher, Nth Letter Cipher, Password, Pig Latin, Pigpen cipher, Scrambled, Technological advancement, Trial and error	

<b>Year 6</b> <b>Computing</b> <b>Autumn 2</b> <b>Programming: Intro to Python</b>	
<b>Previous learning</b>	
<p>Before starting this unit, you might want to check that children can recall:</p> <p>An algorithm is when instructions are put in an exact order.  Decomposition means breaking a problem into manageable chunks and can be used to create a program for a specific purpose.  Using loops to repeat something in a program can make coding simpler and more effective.</p>	
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<b>Lesson 1</b>	<b>Tinkering with Logo</b>
	<p>To tinker with a new piece of software.</p> <p>I can predict what I think something new will do.  I can explore something independently.  I can explain what I found.</p>
<b>Lesson 2</b>	<b>Nested loops</b>
	<p>To understand nested loops.</p> <p>I can explain what a loop is.  I can understand why we use loops.  I can explain how a nested loop works.</p>
<b>Lesson 3</b>	<b>Using Python</b>
	<p>To understand basic Python commands.</p> <p>I can decompose a picture.  I can 'remix' a project by tinkering.  I can choose Python commands for a purpose.</p>
<b>Lesson 4</b>	<b>Using loops in Python</b>
	<p>To use loops when programming.</p> <p>I can explain what a loop is.  I can suggest an appropriate place to use a loop.  I can use the syntax for a loop.</p>
<b>Lesson 5</b>	<b>Coding Mondrian</b>

	<p>To understand the use of random numbers.</p> <p>I can identify the need for random numbers.</p> <p>I can decompose a program.</p> <p>I can write an algorithm.</p>
<b>Vocabulary</b>	
Algorithm, Code, Command, Design, Import, Indentation, Input, Instructions, Loop, Output, Patterns, Random, Remix, Repeat, Shape	

<b>Year 6</b> <b>Computing</b> <b>Spring 1</b> <b>Data handling 1: Big Data 1</b>	
<b>Previous learning</b>	
<p>Before starting the unit, you might want to check that the children can recall:</p> <p>Some ways in which data can be transmitted or collected. (Input, process, output.)</p> <p>Types of software they have previously used to store or collect data on. (Google sheets, Microsoft Excel.)</p> <p>Reasons why data collection and analysis is important. (To allow us to track data to answer questions that have not yet been answered.)</p> <p>What type of data the Mars Rover was collecting. (Binary code.)</p>	
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<b>Lesson 1</b>	<b>Barcodes</b>
	<p>To identify how barcodes and QR codes work.</p> <p>I can identify and collect data from QR codes.</p> <p>I can recall how the data contained within barcodes and QR codes can be used by computers.</p>
<b>Lesson 2</b>	<b>Transmitting data</b>
	<p>To know how infrared waves transmit data.</p> <p>I can explain how infrared light can be used to transmit data.</p> <p>I can recall that infrared light can be used for a variety of purposes.</p>
<b>Lesson 3</b>	<b>RFID</b>
	<p>To recognise how RFID is used.</p> <p>I can identify how RFID can be used to transmit data.</p> <p>I can recall that encoding keeps data safe.</p> <p>I can type formulas into cells using a spreadsheet.</p>
<b>Lesson 4</b>	<b>Using RFID</b>
	<p>To input and analyse real-world data.</p> <p>I can recognise further uses of RFID.</p> <p>I can input and present data in a spreadsheet.</p> <p>I can make conclusions from a data source.</p>

<b>Lesson 5</b>	<b>Transport data</b>
	<p>To analyse and evaluate data.</p> <p>I can recall how RFID is used in data transfer. I can identify how RFID helps to solve real-world data challenges. I can sort and compare data within a spreadsheet.</p>
<b>Vocabulary</b>	
Algorithms, Barcode, Binary, Boolean, Brand, Chips, Commuter, Contactless, Data, Encrypted, Infrared, MagicBand, Privacy, Proximity, QR code, QR scanner, Radio waves, RFID, Signal, Systems/data analyst, Transmission, Wireless	

<b>Year 6</b> <b>Computing</b> <b>Spring 2</b> <b>Creating media: History of computers</b>	
<b>Previous learning</b>	
<p>Before starting the unit, you might want to check that the children can recall:</p> <p>What was the name of the computer constructed by codebreakers at Bletchley Park? (Collosus.)  What is another word for information written in a secret way? (Cipher.)  What does encrypt mean? (Converting data into a secret code or message.)</p>	
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<b>Lesson 1</b>	<b>Playing with sound</b>
	<p>To tinker with sound.</p> <p>I can identify the key features of a radio play. I can record sounds to sound recording software. I can add tracks in order to include sound effects into my recording.</p>
<b>Lesson 2</b>	<b>Radio plays</b>
	<p>To record, edit and add sound effects to a radio play.</p> <p>I can plan and record a radio play. I can edit my radio play to remove any mistakes. I can add sound effects to my radio play to make it more interesting.</p>
<b>Lesson 3</b>	<b>First computers</b>
	<p>To understand how computers have changed and the impact this has had on the modern world.</p> <p>I can identify how computers have evolved over time. I understand that computers are everywhere in modern life. I can recognise some of the earliest computers and how they impacted the modern world.</p>
<b>Lesson 4</b>	<b>Computers that changed the world</b>
	To research one of the computers that changed the world and present information about it to the class.

	<p>I can present information about one device that changed the world.</p> <p>I can research information carefully.</p> <p>I can recognise whether information is reliable.</p> <p>I can cite and record sources found on the internet.</p>
<b>Lesson 5</b>	<b>Future computer</b>
	<p>To design a computer of the future.</p> <p>I can recognise the components of a computer and why they are important.</p> <p>I can identify how computers have evolved over time.</p> <p>I can use my understanding of historic computers to design a computer of the future.</p>
<b>Vocabulary</b>	
<p>Background noise, Byte, Computer, Devices, File, FX, Gigabyte, Graphics, Hard drive, Hardware, Kilobytes, Megabyte, Memory storage, Mouse, Operating system, Overlay, Play, Processor, Radio play, RAM, Raspberry Pi, Record, Reverb, ROM, Script, Smartphone, Sound, Sound effects, Terabytes, Touch screen, Track, Trackpad, Trailer</p>	

<p><b>Year 6</b>  <b>Computing</b>  <b>Summer 1</b>  <b>Data handling 2: Big Data 2</b></p>	
<b>Previous learning</b>	
<p>Before starting the unit, you might want to check that the children can recall:</p> <p>What is the name for 'a machine readable code of lines and numbers?' (A barcode.)          What does 'QR code' stand for? (Quick Response code.)          What is the right to keep information private called? (Data privacy.)          What does RFID stand for? (Radio Frequency Identification.)</p>	
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<b>Lesson 1</b>	<b>Transferring data</b>
	<p>To explain how data can be safely transferred.</p> <p>I can recognise that data can become corrupted within a network.</p> <p>I can explain how data sent in 'packets' is more robust.</p> <p>I can identify the need to update devices and software.</p>
<b>Lesson 2</b>	<b>Data usage</b>
	<p>To investigate the data usage of online activities.</p> <p>I can compare methods of wireless data transfer.</p> <p>I can recognise differences between WiFi and mobile data.</p> <p>I can use a spreadsheet to compare the data-usage of various online activities.</p>
<b>Lesson 3</b>	<b>The Internet of Things</b>
	<p>To identify how data analysis can improve city life.</p> <p>I can identify the meaning of the term 'Internet of Things'.</p>

	<p>I can recall how devices can be connected to the 'Internet of Things' - via WiFi or mobile data.  I can recognise how the IoT has led to Big Data.  I can link data analytics to improvement in town planning.</p>
<b>Lesson 4</b>	<b>Designing a smart school</b>
	<p>To design a system for turning a school into a smart school.</p> <p>I can recall methods of data transfer.  I can evaluate the methods of data transfer.  I can apply Big Data/IoT principles to solve a problem.  I can research the technology associated with solving the problem.  I can prepare a presentation.</p>
<b>Lesson 5</b>	<b>Smart school presentation</b>
	<p>To present ideas for turning a school into a smart school.</p> <p>I can present my ideas for improving a school through the application of Big Data and the Internet of Things.  I can listen to the ideas of my peers and provide effective feedback on their presentations.  I can ask and answer effective questions that deepen my understanding.</p>
<b>Vocabulary</b>	
Big Data, Bluetooth, Corrupted, Data, Energy, GPS, Improve, Infrared, Internet of Things, Personal, Privacy, QR codes, Revolution, RFID, SIM, Simulation, Smart city, Smart school, Stop motion, Threat, WiFi, Wireless	

<b>Year 6</b> <b>Computing</b> <b>Summer 2</b> <b>Skills showcase: Inventing a product</b>	
<b>Previous learning</b>	
<p>Before starting this unit, you might want to check that the children can recall:</p> <p>A program is a set of instructions that a computer can run.  A micro:bit is a programmable device that uses a block coding language similar to Scratch.  A loop is a repeated sequence of instructions.  Variables are used to store and name pieces of information that are likely to change when the program runs.  There are text-based programming languages such as Logo and Python.</p>	
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<b>Lesson 1</b>	<b>Invention design</b>
	<p>To design an electronic product.</p> <p>I can evaluate code and understand what it does.  I know that programs are designed for a specific purpose.  I can use and adapt existing code to design a product.</p>
<b>Lesson 2</b>	<b>Coding and debugging</b>
	To code and debug a program.

	<p>I can debug programs and make them more efficient. I can use sequence, selection, repetition, variables or inputs and outputs within my program.</p>
<b>Lesson 3</b>	<b>Computer Aided Design (CAD)</b>
	<p>To use CAD to design a product.</p> <p>I understand the inputs and outputs needed for my product. I can design appropriate housing for this. I can use CAD software to create shapes.</p>
<b>Lesson 4</b>	<b>My product's website</b>
	<p>To create a website.</p> <p>I can create an appealing website for my product. I can describe clearly what my product is and what it does. I can use persuasive language.</p>
<b>Lesson 5</b>	<b>Video advert</b>
	<p>To create and edit a video.</p> <p>I can undertake independent online tutorial-based learning. I can name my object. I can share my object to an online community. I can discuss how to use an online community responsibly.</p>
<b>Lesson 6</b>	<b>Persuasive advertisements</b>
	<p>To understand the techniques used in advertising a product.</p> <p>I can record a video or take photos of my product. I can identify and articulate the key benefits of my product. I can edit a video.</p>
<b>Vocabulary</b>	
3D, Algorithm, Binary image, CAD, Compression, CPU, Data, Drag and drop, Fetch, decode, execute, ID card, Input, JPEG, Memory, Online community, Operating system, Output, Pixels, RAM, Responsible, RGB, ROM	