

Yearly Overview

Subject: Computing

Year Group: 6

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Unit of work	<b>Bletchley Park</b>	<b>History of computers</b>	<b>Intro to Python</b>	<b>Big Data 1</b>	<b>Big Data 2</b>	<b>Inventing a product</b>
Link to programme of study	<b>Computing systems and networks</b>	<b>Creating media</b>	<b>Programming</b>	<b>Data handling</b>	<b>Data handling</b>	<b>Skills showcase</b>
Composite Knowledge	<p>To understand the importance of having a secure password and what "brute force hacking" is.</p> <p>To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2.</p> <p>To know about some of the historical figures that contributed to technological advances in computing.</p> <p>To understand what techniques are required to create a presentation using appropriate software.</p>	<p>To understand the main features that have changed in computers over the years.</p> <p>To know the main differences between the first computers and those we use today.</p> <p>To use the understanding of historic computers to design a computer of the future.</p>	<p>To know that there are text-based programming languages such as Logo and Python.</p> <p>To know that nested loops are loops inside of loops.</p> <p>To understand the use of random numbers and remix Python code.</p>	<p>To know that data contained within barcodes and QR codes can be used by computers.</p> <p>To know that infrared waves are a way of transmitting data.</p> <p>To know that Radio Frequency Identification (RFID) is a more private way of transmitting data.</p> <p>To know that data is often encrypted so that even if it is stolen it is not useful to the thief.</p>	<p>To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'.</p> <p>I know that devices that are not updated are most vulnerable to hackers.</p> <p>To know the difference between mobile data and WiFi.</p>	<p>To know what designing an electronic product involves.</p> <p>To know which programming software/ language is best to achieve a purpose.</p> <p>To know the building blocks of computational thinking e.g. sequence, selection, repetition, variables and inputs and outputs.</p>
Key Concepts and Key skills (Component / intentional knowledge - what they need to understand)	<p><b>Computer Science - Hardware</b> Learning about the history of computers and how they have evolved over time</p> <p><b>Computer Science - Programming</b> Remixing existing code to explore a problem Changing a program to personalise it Evaluating code to understand its purpose</p> <p><b>Information Technology - Using Software</b> Using logical thinking to explore software independently, iterating ideas and testing continuously</p> <p><b>Digital Literacy and Online Safety</b> Understanding the importance of secure passwords and how to create them Recognising that updated software can help to prevent data corruption and hacking</p>	<p><b>Computer Science - Hardware</b> Learning about the history of computers and how they have evolved over time Using the understanding of historic computers to design a computer of the future</p> <p><b>Information Technology - Using Software</b> Using search and word processing skills to create a presentation</p> <p><b>Digital Literacy and Online Safety</b> Using search engines safely and effectively</p>	<p><b>Computer Science - Computational Thinking</b> Decomposing a program into an algorithm Writing increasingly complex algorithms for a purpose</p> <p><b>Computer Science - Programming</b> Debugging quickly and effectively to make a program more efficient Remixing existing code to explore a problem Using and adapting nested loops Programming using the language Python Changing a program to personalise it Evaluating code to understand its purpose Using logical thinking to explore software independently, iterating ideas and testing continuously.</p>	<p><b>Information Technology - Using Data</b> Understanding how barcodes, QR codes and RFID work Gathering and analysing data in real time Creating formulas and sorting data within spreadsheets</p> <p><b>Information Technology - Wider Use of Technology</b> Learning about the Internet of Things and how it has led to 'big data'. Learning how 'big data' can be used to solve a problem or improve efficiency</p> <p><b>Computer Science - Hardware</b> Learning how barcodes, QR codes and RFID work.</p>	<p><b>Digital Literacy and Online Safety</b> Using search and word processing skills to create a presentation. Recognising that updated software can help to prevent data corruption and hacking.</p> <p><b>Computer Science - Hardware</b> Learning about some of the methods which cause data corruption.</p> <p><b>Computer Science - Networks and Data Representation</b> Understanding that computer networks provide multiple services</p>	<p><b>Computer Science</b> Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose. Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Changing a program to personalise it. Evaluating code to understand its purpose Predicting code and adapting it to a chosen purpose.</p> <p><b>Information Technology</b> Using logical thinking to explore software independently, iterating ideas and testing continuously. Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions. Using design software TinkerCAD to design a product. Creating a website with embedded links and multiple pages. Understanding how search engines work.</p> <p><b>Digital Literacy and Online Safety</b> Using search engines safely and effectively.</p>
Learning objectives	<p><b>Lesson 1:</b> To understand that there are lots of different types of secret codes.</p> <p><b>Lesson 2:</b> To understand the importance of having a secure password.</p> <p><b>Lesson 3:</b> To understand the importance of Bletchley Park to the World War II war effort.</p> <p><b>Lesson 4:</b> To understand about some of the historical figures that contributed to technological advances in computing.</p> <p><b>Lesson 5:</b> To research and present information about historical figures in computing.</p>	<p><b>Lesson 1:</b> To understand how computers have changed and the impact this has had on the modern world.</p> <p><b>Lesson 2:</b> To research one of the computers that changed the world and present information about it to the class.</p> <p><b>Lesson 3:</b> To design a computer of the future.</p>	<p><b>Lesson 1:</b> To tinker with a new piece of software.</p> <p><b>Lesson 2:</b> To understand nested loops.</p> <p><b>Lesson 3:</b> To understand basic Python commands.</p> <p><b>Lesson 4:</b> To use loops when programming.</p> <p><b>Lesson 5:</b> To understand the use of random numbers.</p>	<p><b>Lesson 1:</b> To identify how barcodes and QR codes work.</p> <p><b>Lesson 2:</b> To explore how infrared waves transmit data.</p> <p><b>Lesson 3:</b> To recognise the uses of RFID.</p> <p><b>Lesson 4:</b> To input and analyse real-world data.</p> <p><b>Lesson 5:</b> To analyse and evaluate data.</p>	<p><b>Lesson 1:</b> To explain how data can be safely transferred.</p> <p><b>Lesson 2:</b> To investigate the data usage of online activities.</p> <p><b>Lesson 3:</b> To identify how data analysis can improve city life.</p> <p><b>Lesson 4:</b> To design a system for turning a school into a smart school.</p> <p><b>Lesson 5:</b> To present ideas for turning a school into a smart school.</p>	<p><b>Lesson 1:</b> To design an electronic product.</p> <p><b>Lesson 2:</b> To code and debug a program.</p> <p><b>Lesson 3:</b> To use CAD to design a product.</p> <p><b>Lesson 4:</b> To create a website.</p> <p><b>Lesson 5:</b> To create and edit a video.</p> <p><b>Lesson 6:</b> To understand the techniques used in advertising a product.</p>
Vocabulary	Code, brute force hacking, Caesar cipher, encrypt, date shift cipher, Nth letter cipher, pigpen cipher, trial and error	Hard drive, processor, memory storage, operating system	algorithm, code, command, import (software), indentation (programming), loop, nested loop, random numbers, remix	barcode, boolean, infrared waves, NFC, QR code, RFID encrypt	Internet of Things (IoT), simulation, data, WiFi, smart city, corrupt data	Recap on the year's vocabulary: Algorithm, code, input, loop, output, program, sequence, variable.

Links to Prior Knowledge	Year 5: Google: Computing systems and networks: Search engines  Programming music: Scratch  Micro:bit	Year 5: Mars Rover 1  Mars Rover 2	Year 5: Programming music: Scratch  Micro:bit	Year 5: Mars Rover 1 (data transmission over long distances)	Year 6: Big Data 1	All units taught during the academic year.
Key knowledge for assessment	What is the importance of having a secure password and what is "brute force hacking"? Where were the first computers created and what were they used for? Who were the historical figures that contributed to technological advances in Computing? What techniques are required to create a presentation using appropriate software?	What are the main features that have changed in computers over the years? What are some of the main differences between the first computers and those we use today?	What are nested loops? What does a specific part of code do in a program?	How does a barcode/QR work? How can RFID be used to transmit data? How are infrared waves used in technology? Why is it important that data is encrypted?	What are the differences between WiFi and mobile data? How can we reduce the chance of data becoming corrupted within a network? Why is it important to update devices?	What does the code do? What is 'Computer Aided Design (CAD)?' What makes a website appealing? What are the key features of an advert? What is a search engine?
Cultural Capital & Significant person Fieldwork and practicals wherever possible.	Alan Turing and his team making the Bombe to crack codes  Tommy Flowers built the Colossus		Python was created in the late 1980s, and first released in 1991, by Guido van Rossum as a successor to the ABC programming language.			
Cross curricular links				Maths: data handling (Google Sheets and graphs)		
Online safety unit:	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	
National Curriculum KS2 (skills)	<p><b>Key stage 2</b> <b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</li> <li>understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.</li> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</li> <li>use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>					