Computing period 1

<table>
<tr><td>Year group: 3
Forces Frenzy</td><td>Concept/Aspect: Online Safety</td></tr>
<tr><td>Target Memories
Communicating online can have risks including hacking, viruses and cyberbullying (specific apps to mention: Roblox/online games).
We should speak to a trusted adult if we receive communications we are not sure about online.
We should use block and report features to prevent unwanted communications.
Some information is private and should not be shared online.
Spam messages can contain dangerous links which we should not click on.
Websites that contain a padlock in their address bar are encoded which makes them secure.
Not everything online is true as anyone can put information on the internet.</td><td>Bonus Memories
We can use security features on devices and apps to prevent unwanted communications.
The more people you share your email address with, the more likely you are to receive spam emails.
A URL with random numbers and letters in is less likely to be a secure site.
Information online can also be biased and try to affect my opinions.
We should fact check information against multiple sources to make sure they are true.</td></tr>
<tr><td>Target Vocab
Communication: exchanging of information.
Cyberbullying: bullying that takes place over digital devices.
Hacking: gaining access to a computer system without permission.
Virus: a piece of code that negatively affects a computer system.
Encoded: a secure way of protecting information on a website.</td><td>Bonus Vocab
Spam: unwanted messages sent online, often in large numbers.
URL: the address of a website.
Biased: favouring a particular side.
Source: a book or document that provides evidence.</td></tr>
<tr><td>Year group: 4
Changing Matters</td><td>Concept/ Aspect: Databases /Excel</td></tr>
<tr><td>Target Memories
Excel uses spreadsheets to record data.
Spreadsheets are made up of cells which have a reference.
Cell references are made up of a letter for their column and then a number for their row.
By clicking on a cell, we can enter data into it.
Formula can be placed into cells using =
Formula allow for a spreadsheet to complete calculations for us.
If we include a cell reference in a formula, it will use the value in that cell for the calculation.
Online Safety Focus
We should check with a trusted adult before accessing online activities that require personal information.
Some websites indicate they are secure using a padlock symbol or http://</td><td>Bonus Memories
Simple formulas can be used to add up a range of cells using a colon between the cell reference numbers. e.g. =SUM(B10:B15)
Copy and Paste can be used to move the data or formula in a cell.
Clicking and dragging the mouse allows us to highlight data to change the font or colour.</td></tr>
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- It is important to understand that not everything online is real.

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Target Vocab

- Spreadsheet: a document that records data for collection, analysing and presenting
- Data: facts or statistics recorded for reference or analysis
- Cell: an individual square in a spreadsheet
- Secure: safe to access
- Row: a horizontal line of cells
- Column: a vertical line of cells
- Formula: a method to produce a result

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Bonus Vocab

- Highlight: the selected area of a document or spreadsheet.
- Copy: a command that remembers a copy of the selected object.
- Paste: a command that places the remembered object into the document.

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Year group: 5
Space Travellers

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Concept/Aspect: Computing Systems and Networks/PowerPoint

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Target Memories

- Microsoft PowerPoint can be used to create presentations for a range of purposes.
- Text boxes and images can be inserted into a presentation, resized and rotated.
- Presentations are made up of multiple slides, which can be added or deleted.
- The background of a presentation can be customised using a variety of colours, textures or even images.
- Animations can be applied to text or images to change how they appear on the slide.

Online Safety Focus

- We should show respectful behaviour when interacting with others online.
- If someone is consistently being disrespectful online, this could be cyberbullying.
- What we put on the internet may be there forever even if we delete it.

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Bonus Memories

- A theme can be applied to a presentation from a selection on the program.
- A background colour can have a gradient applied.
- Transitions can be added between slides to affect how the next slide appears.
- Graphs can be inserted into presentations to present data.

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Target Vocab

- Presentation: a document made of several slides that provides information to the reader or listener.
- Slide: a single page of a presentation.
- Insert: place into a document.
- Text box: an area of a slide into which text can be entered.
- Background: the very back of a slide.
- Animation: the movement of an element across a slide.

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Bonus Vocab

- Theme: an overall style or feel of something.
- Gradient: a slight change in colour.
- Transition: the movement effects applied to a slide as a whole.

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Year group: 6
In a Heartbeat

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Concept/ Aspect: Databases / excel

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Target Memories

- In Excel, the AutoSUM button can be used to make quick calculations using a spreadsheet.
- A formula can be copied into multiple cells on Excel by dragging the bottom right corner.
- Excel spreadsheets can be ordered ascending or descending by different columns or rows in order to compare and analyse data.

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Bonus Memories

- Spreadsheet cells can be formatted using various fonts, colours, highlights and alignments to better display information.
- Excel can automatically convert data into a range of graphs and charts using options on the Insert tab.
- Conditional formatting can be used to change the way a cell looks based on data value within it.

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• Excel can calculate the mean average of a set of numbers using the Averages option of the formula menu. • Any changes to the data will automatically update the calculations performed by any formula. **Online Safety Focus** • It is important to keep our personal information private online. • A range of safety tools and privacy settings can be used to keep our information safe. • We can ask for help from trusted sources if we feel safe online.	• A series of formula can be used to display cumulative totals as well as perform individual calculations.
Target Vocab • Ascending: increasing in size or value • Descending: decreasing in size or value • Average: the most typical or central value in a set of data	**Bonus Vocab** • Alignment: the position of something compared of other objects. • Conditional: changing depending on different requirements • Format: the way in which something is arranged or set out • Cumulative: increasing or decreasing with each addition

Computing period 2

Year group: 3 **What's Beneath My Feet?**	**Concept/Aspect:** Computing systems and networks
Target Memories • The Internet can be used to find information. • We use web browsers such as Edge or Chrome to browse the internet. • Search engines can help us to browse the internet quickly. • The internet is made up of webpages that each have a URL. • When we open up a web browser, we are taken to our home page. • The backwards and forwards arrows can be used to navigate websites.	**Bonus Memories** • We can go directly to a website by typing the URL into the address bar. • Frequently visited websites can be added to our Favourites. • Recently visited websites can be found in our History. • Many webpages linked closely together are called a website.
Target Vocab • Internet: a global system of connected computers built to share information and communicate with each other. • Browse: looking at information on the internet • Search Engine: a system of searching for items on the internet. • URL: a unique address for a webpage. • Hyperlink: usually underlined and sends you to another online location. **Online Safety Focus** • Not all websites are reliable and it is important to think critically about websites we use to ensure they are safe.	**Bonus Vocab** • Address bar: The space at the top of a web browser for entering a URL.

Year group: 4 **Teeth and Tummies**	**Concept/ Aspect:** Computing systems and networks
Target Memories • A network is a group of connected devices that communicate with each other. • The internet is an example of a very large network which most devices will connect to whilst the school has a much smaller network of devices. • Search engines rank websites on their lists by traffic. • Sometimes search engines will put a suggested website higher if the website owner has paid them for advertising. • A hyperlink can be clicked to take you to a different location on the internet. **Online Safety Focus** • Not all websites are reliable and it is important to think critically about websites we use to ensure they are safe.	**Bonus Memories** • Email is the sending and receiving of data using the internet. • Writing or images online can sometimes be subject to copyright and should not be copied.
Target Vocab • Network: a group of interconnected computers or digital devices. • Hyperlink: a link placed on a webpage of document that sends you to a different location of the internet. • Traffic: the amount of people accessing a particular website over time	**Bonus Vocab** • Copyright: a right to print and publish certain material.
Year group: 5 **Divorced, Beheaded and Died**	**Concept/Aspect:** Creating Media (TinkerCAD)
Target Memories • CAD stands for Computer-Aided Design. • TinkerCAD is a 3D modelling program that can help designers create new ideas. • In TinkerCAD, we can place objects, change how we view them and move them. • We can duplicate objects in TinkerCAD. • Shapes can be merged in TinkerCAD to create new models. • TinkerCAD can create patterns using duplicate and repeat commands. **Online Safety Focus** • We leave a digital footprint when we use the internet. • It is important to ensure we have a positive digital footprint.	**Bonus Memories** • Objects in TinkerCAD are displayed on separate axis. • Objects in TinkerCAD can be grouped so they can be edited together.
Target Vocab • **Duplicate:** to make an identical copy of something • **Merge:** to combine two objects to make one new object	**Bonus Vocab** • **Axis:** a reference line using coordinates • **Group:** select objects together for editing
Year group: 6 **From Trenches to Triumph**	**Concept/ Aspect:** Computing systems and networks
Target Memories • Devices that are set up to connect to a network are known as 'clients'.	**Bonus Memories** • Clients can be connected to a network either by wired connection or wirelessly.

• In a network, a central computer called a server stores data. • Data is sent in packets which split information into manageable bits and recombine them on arrival. • Protocols tell a network how and where to send data. **Online Safety Focus** • It is important to build positive and healthy online relationships. • We should know who to use for support if a friend or peer is experiencing hurtful online behaviour.	• A 'switch' connected to a server ensures that data is sent to the correct client. • Routing is the path a data packet is sent on its way to its destination via various routers. • A packet is made up of a header and a data payload.
Target Vocab • Client: a digital device that can contact a server. • Server: a computer that manages access to the central information of a network. • Protocol: a set of rules on the exchange of data between devices.	**Bonus Vocab** • Router: a device that sends data packets to the correct part of a network. • Header: data containing the address of the devices involved in sending and receiving a data packet and any protocols about the exchange. • Data Payload: the data actually being sent as part of a data packet.

Computing period 3

Year group: 3 **Fang and Claw**	**Concept/ Aspect:** Programming (Animation)
Target Memories • A program is a sequence of instructions that achieve a specific goal. • Programs are written in programming languages. • Programs can be used in animations to move a sprite. • Computer programs with graphics have x and y axis. • Programs can be made to repeat. **Online Safety Focus:** • Some online activities have age restrictions because of content that may not be appropriate. • Some websites have secure markers that let us know whether they are trustworthy such as a padlock and https:// • Safer Internet Day	**Bonus Memories** • Music can be added to an animation's program. • Images can be imported and then animated.
Target Vocab • Program: a set of instructions put into a computer to make it perform a task. • Axis: a fixed reference line • Animation: a moving image created using a computer • Sprite: a computer graphic • Restriction: a limitation on who can use something	**Bonus Vocab** • Import: bring information into a document.
Year group: 4 **Marvellous Mountains and Raging Rivers**	**Concept/ Aspect:** Online Safety/Creating Media

Target Memories • We can reduce the risks online by using safe behaviours. • There are risks involved with using communications technologies as anyone can access them. (specific apps to mention: WhatsApp/messaging apps) • We can use security and privacy settings to reduce the risks online. • A range of information should be kept private including, but not limited to, names, addresses, dates of birth, school names and location data. • We need to think carefully when asked to share personal information and make sure to ask appropriate questions to decide when it is safe to do so. • Not all information online is safe and reliable and we need to know the basic steps to know whether a website is safe or not. • Signing up for some apps or games may mean my personal data is shared with companies who can then use it to advertise to me or contact me.	**Bonus Memories** • Search engines rank search results by views to make sure we see particular results, but this can include those that have paid to appear further up a search. • We can identify which search results have been paid for as they must be labelled as adverts. • Being added to a group on a messaging app can mean that my phone number is available to people I do not know.
Target Vocab • Location data: information about where someone is or where they have been • Advertise: trying to convince someone to buy a product or service	**Bonus Vocab** • Rank: ordering information by a single quality
Year group: 5 **Island Explorers**	**Concept/ Aspect:** Programming (Scratch)
Target Memories • A simulation replicates a real-life experience whilst the aim of a game is to entertain. • Games have inputs and outputs. • Variables are used to make things change in a game. • Game designers carry out debugging to ensure a game works as intended. • Games are designed by teams of people with varied jobs: programmer, designer, play tester. • Coding blocks must be sequenced correctly for a game to run as intended. **Online Safety Focus** • Safer Internet Day • Some behaviour is not acceptable online – we should treat people online as we would expect to be treated in person. • It is important to think carefully about what we see online and understand that not everything online is true or helpful.	**Bonus Memories** • A Boolean variable has two possible states: true or false. • Coding variables creates algorithms.
Target Vocab • Variable: a feature of a computer program that is likely to change • Input: put into a computer • Output: result put out by a computer	**Bonus Vocab** • Boolean variable: a feature of a computer program that has two possible options.

• Sequence: the order that a computer follows rules	
Year group: 6 **Frozen Frontiers**	**Concept/ Aspect:** Programming (Make Code)
Target Memories • Problems with a program can be solved using decomposing. • A computer program can be coded to follow logic to make decisions. • Sensors can be used on physical systems to inform variables. • Programs can be designed to control physical systems. **Online Safety Focus** • Safer Internet Day • We each have a digital footprint and it is important to ensure this is positive. • We need to think critically about what we see in social media as things may be presented to us in misleading ways. • Phishing is a risk online, so it is important to think carefully when receiving messages or links.	**Bonus Memories** • Coding blocks are made up of coding languages such as Java and Python and can be programmed in more detail using this code. • We can switch between Blocks and Java/Python on Micro Bit.
Target Vocab • Decomposing: breaking down a program into smaller steps • Physical system: an output for a program that exists outside the computer itself • Logic: A series of variables that determine how a program makes decisions. • Sensors: a device that detects a particular type of input such as light or sound	**Bonus Vocab** • Coding language: a system used for writing computer programs.

Project period 4

Year group: 3 **All the Ages**	**Concept/ Aspect:** Data and Information
Target Memories • Information is easier to find when in a sorted order. • Splitting a problem up and solving parts at the same time can help to find solutions. • An algorithm is a set of instructions that solve a task. • Computers follow algorithms to finish tasks and these are called programs. **Online Safety Focus** • We must build healthy and positive online relationships and friends. • We have people and organisations who we can go to for support if we or our friends experience hurtful behaviour online.	**Bonus Memories** • Computers can be used to solve problems quicker than humans would be able to. • If the instructions in an algorithm do not make sense, this will create an error and the computer will not be able to compete the task.

• We understand what situations online require the help of an adult and why it is important to be brave in doing this.	
Target Vocab • Order: Sorting information by a certain factor • Compare: Looking at the similarities and differences between sets of information. • Program: a computer algorithm for a specific task.	**Bonus Vocab** • Error: where the instructions provided to a computer cannot be completed due to a mistake.
Year group: 4 **Sensational Sounds**	**Concept/ Aspect:** Programming (Turtle Art/Robomind)
Target Memories • Coding blocks are pre-written instructions we can combine to make a program. • I can debug problems with code I have written. • Coding blocks need to be in correct sequence to ensure a task is completed successfully. • Programs can be used to change the size or orientation of a shape or image. **Online Safety Focus:** • It is important to develop healthy, respectful and empathetic online relationships. • It is important to speak up if I see something online that makes me uncomfortable or if I see cyberbullying.	**Bonus Memories** • I can analyse the outcome of a program and make changes as necessary. • If statements can be used to change the way a program runs based on conditions.
Target Vocab • Coding: A set of instructions that make up a program. • Debug: solve problems or errors in a computer program • Sequence: the order that a computer follows rules • Orientation: the rotation of an image or shape.	**Bonus Vocab** • Outcome: the end result of a program. • Statement: a piece of a program that may change based on other parts of the program. • Conditions: rules that must be met before a statement takes effect.
Year group: 5 **From Plant to Plate**	**Concept/ Aspect:** Online Safety
Target Memories • Many apps may share my information with advertisers or companies who could be able to contact me. • It is not always clear that you are only speaking to people you know online (specific apps to mention: WhatsApp/TikTok/Snapchat) • I may receive spam emails which could come from malicious sources. • People can create fake profiles or bots to share false information to deliberately deceive or manipulate people. • Fake profiles are often used to persuade us to give our personal information, images, money and other data. This can also happen because of phishing.	**Bonus Memories** • It is important to be discerning when looking at digital content and ensure that we are certain who we are speaking to.

• Content has age restrictions and some content may be damaging to under-age consumers.	
Target Vocab • Phishing: sending communications in order to try and access someone's personal information • Consumers: a person who buys goods or services • Spam: unwanted messages online	**Bonus Vocab** • Discerning: showing good judgment
Year group: 6 **Mysteries of the Maya**	**Concept/ Aspect:** iApp (Micro Bits)
Target Memories • Mobile technology has changed the way in which the world works. • We can use code to program basic apps using Microbit that include light, sound and buttons. • We can create an app to fulfil a given purpose. • Apps are computer programs that are developed to achieve a certain goal or complete a certain job. • Apps are built using procedures and variables. • We can plan an app for a given purpose. **Online Safety Focus** • We know where to get support for ourselves or others when they are worried about anything online. • AI can be used to identify the location of a photo, so it is important to think about where and with who you share a photo.	**Bonus Memories** • Once we have created a plan, we can develop our app using appropriate programs. • Whilst debugging, we can amend our code to ensure the program executes correctly.
Target Vocab • Mobile technology: technology that can move with the user. • App: a program downloaded for a mobile device that carries out a particular job • Procedures: a sequence of statements that can be repeated with only a single command.	**Bonus Vocab** • Execute: carry out a program. • Amend: make a change to a program based on an error.

Project period 5

Year group: 3 **City Lights**	**Concept/ Aspect:** Creating Media (Microsoft Word)
Target Memories • Word processing can be used to create a range of documents. • We can save, load and print documents using word processors. • We can use the shift button on a keyboard to type capital letters or use alternative functions for keys.	**Bonus Memories** • Caps lock and Num lock can be used to 'lock' the function of a key without having to press shift first.

• We can copy, paste and cut information within a word processing document. • Print screen can be used to take a record of what is on our computer monitor. **Online Safety Focus** • Online search results may be paid for or adverts and may take me away from what I am looking for. • Pop up adverts may try to convince me to buy something and I can get rid of them by clicking the cross in the corner. • I recognise good and bad online behaviours. • There must be a balance between being online and spending time offline.	
Target Vocab • Word processor: a program for writing documents • Monitor: the computer's screen • Copy: save an identical version of something without removing the original. • Paste: make a version of a copied or cut object appear in a document. • Cut: save a copy of an object whilst removing it from a document. • Function: the purpose of a particular object	**Bonus Vocab** • Caps lock: a keyboard key that forces all letter keys to function as capital letters. • Num lock: a keyboard key that forces all number keys to only function as numbers
Year group: 4 **The Deep**	**Concept/ Aspect:** Data and Information (Binary)
Target Memories • Computers record data as a series of 'on' and 'off' switches called binary. • These on and off switches are recorded as '1's and '0's. • Data can be kept in records on a computer. • Records can be sorted by data fields. • Databases can be searched using data fields for quick access. • Database information can be reported in a chart or table. **Online Safety Focus:** • Some people online may try to deliberately deceive me or manipulate me.	**Bonus Memories** • Information can be recorded as numbers, letters or choices (such as yes/no). • Binary switches turn on or off electrical components of a computer, allowing the computer to process data using electrical currents.
Target Vocab • Binary: a series of on or off switches on a computer recorded as 1s and 0s. • Switches: electrical states on a computer that direct how it processes data. • Records: a collection of fields that can be used to sort or order data • Fields: individual pieces of information within a data record.	**Bonus Vocab** • Component: individual parts of a computer system.
Year group: 5 **The Circle of Life**	**Concept/ Aspect:** Programming (Crumble Kits)

Target Memories • A microcontroller can be programmed to control components connected to it. • A microcontroller can control a circuit. • Count-controlled loops can make sure that a program repeats a set number of times. • We can design and program our own circuit. • We can troubleshoot problems with our circuit. **Online Safety Focus** • We understand when it is important to talk to an adult about what we see online and why this is important. • We recognise cyberbullying when we see it and know how to report it.	**Bonus Memories** • Programs can written as flow charts.
Target Vocab • Microcontroller: a small computer with a single chip. • Troubleshoot: using trial and error to debug a program. • Count-controlled: a loop that repeats only a set amount of times.	**Bonus Vocab** • Flow chart: a chart used to show the order of instructions
Year group: 6 **Survival of the Fittest**	**Concept/ Aspect:** Online Safety
Target Memories • It is not always simple to delete something we put onto the internet. • We need to be careful online to ensure we are not dragged into Cybercrime. • We must think before we share images and videos of ourselves online, and it is illegal to share or store inappropriate images. • We have many resources and individuals available to us if we experience hurtful behaviour online or see anything that makes us uncomfortable. • It is important to use safety tools and privacy settings to protect ourselves online. • People we speak to online may not have our best interests in mind, and it is important to stay alert for those who may wish to harm or groom us.	**Bonus Memories** •
Target Vocab • Cybercrime: a range of crimes that happen online. • Grooming: manipulating someone online for personal gain	**Bonus Vocab** •

Key stage 2

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- 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
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- 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
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact