St. Peter and St. Paul's RC Primary School

Computing - Unit and Progression Overview

Holding God's hand,
we grow in faith together,
we dream, believe, achieve.
Following the footsteps of Jesus,
we act with love,
we care for one another
and our world.

Computing Long Term Plan

Nursery		
Personal, Social and Emotional Development	**Physical Development**	**Understanding the World**
• Remember rules without an adult to remind them.	• Match their developing physical skills to tasks and activities in the setting.	• Explore how things work.

Reception		
Personal, Social and Emotional Development	**Physical Development**	**Expressive Arts and Design**
• Show resilience and perseverance in the face of a challenge. • Know and talk about the different factors that support their overall health and wellbeing: Sensible amounts of 'screen time'.	• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.	• Explore, use and refine a variety of artistic effects to express their ideas and feelings.

ELG: Managing Self	**ELG: Creating with Materials**
• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Explain the reasons for rules, know right from wrong and try to behave accordingly.	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Year 1		
Computing Systems and Networks- Improving Mouse Skills The children learn to log in to a computer and learn how to access a website. They develop their mouse skills and use these to draw and edit shapes. The children draw a scene from a story using digital tools, before creating a self-portrait, using digital techniques. **Programming 1- Algorithms Unplugged** During this unit, the children develop their understanding of what an algorithm is. They learn to follow instructions precisely to carry out an action. They learn to understand that computers and devices around us use inputs and outputs. They develop their understanding of how to debug a range of algorithms.	**1Skills Showcase- Rocket to the Moon** The children are exposed to digital content represented in many different forms. They learn to design a rocket, using a graphics editing programme. They sequence a set of instructions to build a rocket and test a design and record data. **Programming 2- Programming Bee-Bots** The children explore a new device and create a demonstration video. They plan and follow a precise set of instructions and learn to program a device. They create a program that tells a story. **Creating Media- Digital Imagery** The children learn to create a sequence of pictures. They develop their skills by taking clear photos and learning to edit photos. They practise searching for an importing images to create a photo collage.	**Data Handling- Introduction to Data** The children continue to develop their learning on how data can be represented in different ways. They use technology to represent data and collect and record data. The children sort data and design an invention to gather data. **Online Safety** The children learn to recognise what the internet is and how to use it safely. They identify how people's feelings and emotions can be affected by online content. They recognise how to treat others, both online and in person and recognise the importance of being careful when posting and sharing online. They discuss the ways to balance time spent online and offline.
Concepts **Computing Systems and Networks** **Programming**	**Concepts** **Programming** **Creating Media**	**Concepts** **Online Safety** **Data Handling**
National Curriculum Coverage Key Stage one **Computing Systems and Networks- Improving Mouse Skills** Pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school	**National Curriculum Coverage Key Stage one** **Skills Showcase- Rocket to the Moon** Pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content	**National Curriculum Coverage Key Stage one** **Data Handling- Introduction to Data** Pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school

• use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies **Programming 1- Algorithms Unplugged** Pupils should be taught to: • understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • create and debug simple programs	**Programming 2- Programming Bee-Bots** Pupils should be taught to: • understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs **Creating Media- Digital Imagery** Pupils should be taught to: • use logical reasoning to predict the behaviour of simple programs • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	**Online Safety** Pupils should be taught to: • recognise common uses of information technology beyond school • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies
<u>Computing Systems and Networks- Improving Mouse Skills</u> **Skills** • Learning how to explore and tinker with hardware to find out how it works. • Learning where keys are located on the keyboard. • Using a basic range of tools within graphic editing software. • Developing control of the mouse through dragging, clicking and resizing of images to create different effects. • Developing understanding of different software tools. • Recognising devices that are connected to the internet. • Logging in and out and saving work on their own account. **Knowledge** To know: • Log in and log out means to begin and end a connection with a computer • A computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art. • Passwords are important for security and to keep us safe. **<u>Programming 1- Algorithms Unplugged</u>** **Skills** • Recognising that some devices are input devices and others are output devices. • Learning that decomposition means breaking a problem down into smaller parts. • Using decomposition to solve unplugged challenges. • Developing the skills associated with sequencing in unplugged activities. • Following a basic set of instructions. • Assembling instructions into a simple algorithm.	**<u>Skills Showcase- Rocket to the Moon</u>** **Skills** • Learning where keys are located on the keyboard. • Learning how to operate a camera to take photos and videos. • Using logical reasoning to predict the behaviour of simple programs. • Developing the skills associated with sequencing in unplugged activities. • Following a basic set of instructions. • Assembling instructions into a simple algorithm. • Learning to debug instructions when things go wrong. • Learning to debug an algorithm in an unplugged scenario. • Using a basic range of tools within graphic editing software. • Taking and editing photographs. • Developing control of the mouse through dragging, clicking and resizing of images to create different effects. • Developing understanding of different software tools. • Recognising devices that are connected to the internet. • Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. • Logging in and out and saving work on their own account. **Knowledge**	**<u>Data Handling- Introduction to Data</u>** **Skills** • Learning how to explore and tinker with hardware to determine how it works. • Recognising that some devices are input devices and others are output devices. • Learning where keys are located on the keyboard. • Developing control of the mouse through dragging, clicking and resizing images to create different effects. • Developing an understanding of different software tools. • Recognising devices that are connected to the internet. • Understanding that technology can be used to represent data in different ways, such as pictograms, tables, pie charts, bar charts and block graphs. • Using data representations to answer questions about data. • Using software to explore and create pictograms and branching databases. **Knowledge** To know: • Charts and pictograms can be created using a computer. • A branching database is a way of classifying a group of objects. • Computers understand different types of input. **<u>Online Safety</u>** **Skills**

• Learning to debug instructions when things go wrong. • Learning to debug an algorithm in an unplugged scenario. **Knowledge** To know: • An algorithm is when instructions are put in an exact order. • Decomposition means breaking a problem into manageable chunks and that is important in computing. • We call errors in an algorithm are called bugs and fixing these is called debugging.	• To know that when we create something on a computer it can be more easily saved and shared than a paper version. • To know some of the simple graphic design features of a piece of online software. • To know that a spreadsheet is an electronic 'table' for sorting data**.** **<u>Programming 2- Programming Bee-Bots</u>** **Skills** • Learning how to explore and tinker with hardware to find out how it works. • Learning how to operate a camera to take photos and videos. • Using decomposition to solve unplugged challenges. • Using logical reasoning to predict the behaviour of simple programs. • Developing the skills associated with sequencing in unplugged activities. • Following a basic set of instructions. • Assembling instructions into a simple algorithm. • Programing a floor robot to follow a planned route. • Learning to debug instructions when things go wrong. • Using programming language to explain how a floor robot works. • Learning to debug an algorithm in an unplugged scenario. • Taking and editing photographs. **Knowledge** To know: • The basic functions of a Bee-Bot. • You can use a camera/tablet to make simple videos. • Algorithms move a Bee-Bot accurately to a chosen destination. **<u>Creating Media- Digital Imagery</u>** **Skills** • Learning how to explore and tinker with hardware to find out how it works. • Learning where keys are located on the keyboard. • Learning how to operate a camera to take photos and videos. • Developing the skills associated with sequencing in unplugged activities. • Using a basic range of tools within graphic editing software. • Taking and editing photographs. • Developing control of the mouse through dragging, clicking and resizing images to create different effects. • Developing an understanding of different software tools. • Searching and downloading images from the internet safely.	• Recognising devices that are connected to the internet. • Understanding that we are connected to others when using the internet. • Understanding some of the ways we can use the internet. • When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. • Understanding how to interact safely with others online. • Recognising how actions on the internet can affect others. • Recognising what a digital footprint is and how to be careful about posting online. • Discussing ways to balance time spent online and offline. **Knowledge** • To know that the internet is many devices connected to one another. • To know what to do if you feel unsafe or worried online – tell a trusted adult. • To know that people you do not know on the internet (online) are strangers and are not always who they say they are. • To know that to stay safe online it is important to keep personal information safe. • To know that 'sharing' online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.

	• When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. **Knowledge** To know: • Holding a camera or device still and considering angles and light are important to taking good pictures. • Photographs can be edited, cropped and filtered. • How to search safely for images online.	

Year 2		
Computing Systems and Networks- What is a Computer? The children learn to recognise and name the different parts of a computer. They recognise how technology is controlled. The children learn to create a design for an invention and understand the role of computers. **Programming- Algorithms and Debugging** During this unit, the children decompose a game to predict the algorithms that are used. They understand that computers can use algorithms to make predictions. They plan their own algorithms, to solve problems. They understand what abstraction is and use debugging to solve problems.	**Computing Systems and Networks- Word Processing** The children learn to touch type and understand how to use a word processor. They understand how to add images to a text document and create a poetry book using sources from the internet. The children then create a digital piece of writing. **Programming- Programming Scratch Jr** The children use scratch junior to create a basic animation. They use characters as buttons and plan and use code to create an algorithm.	**Creating Media- Stop Motion** Children learn how to create simple animations from storyboarding creative ideas. **Data Handling- International Space Station** The children learn to identify how computers can help humans to survive in space. They learn to create a digital drawing of essential items for life in space. They understand the role of sensors on the ISS. The children create an algorithm for growing a plant in space and interpret given data. **Online Safety** During this unit, they develop their understanding on which information is safe to share online. They learn to recognise when to deny permission online and recognise that not everything which is said/ shared online is true.
Concepts **Programming** **Computing Systems and Networks**	**Concepts** **Computing Systems and Networks** **Programming**	**Concepts** **Online Safety** **Data Handling** **Creating Media**
National Curriculum Coverage Key Stage one **Computing Systems and Networks- What is a Computer?** Pupils should be taught to: • understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • recognise common uses of information technology beyond school **Programming- Algorithms and Debugging** Pupils should be taught to: • understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • create and debug simple programs	**National Curriculum Coverage Key Stage one** **Computing Systems and Networks- Word Processing** Pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies **Programming- Programming Scratch Jr** Pupils should be taught to:	**National Curriculum Coverage Key Stage one** **Creating Media- Stop Motion** Pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school **Data Handling- International Space Station** Pupils should be taught to: • understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • use technology purposefully to create, organise, store, manipulate and retrieve digital content

• use logical reasoning to predict the behaviour of simple programs	• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs • use technology purposefully to create, organise, store, manipulate and retrieve digital content	**Online Safety** Pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies
Computing Systems and Networks- What is a Computer? **Skills** • Understanding what a computer is and that it's made up of different components. • Recognising that buttons cause effects and that technology follows instructions. • Learning how we know that technology is doing what we want it to do via its output. • Using greater control when taking photos with cameras, tablets or computers. • Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. • Using word processing software to type and reformat text. • Creating and labelling images. • Learning how computers are used in the wider world **Knowledge** To know: • The difference between a desktop and a laptop computer. • People control technology. • Some input devices that give a computer an instruction about what to do (output). • Computers often work together. **Programming- Algorithms and Debugging** **Skills** • Developing confidence with the keyboard and the basics of touch typing. • Articulating what decomposition is. • Decomposing a game to predict the algorithms used to create it. • Learning that there are different levels of abstraction. • Explaining what an algorithm is. • Following an algorithm. • Creating a clear and precise algorithm. • Learning that programs execute by following precise instructions. • Incorporating loops within algorithms. • Using logical thinking to explore software, predicting, testing and explaining what it does.	**Computing Systems and Networks- Word Processing** **Skills** • Developing confidence with the keyboard and the basics of touch typing. • Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. • Using word processing software to type and reformat text. • Searching for appropriate images to use in a document. • Understanding what online information is. • Identifying whether information is safe or unsafe to be shared online. **Knowledge** • To know that touch typing is the fastest way to type. • To know that I can make text a different style, size and colour. • To know that "copy and paste" is a quick way of duplicating text. **Programming- Programming Scratch Jr** **Skills** • Recognising that buttons cause effects and that technology follows instruction • Explaining what an algorithm is. • Following an algorithm. • Creating a clear and precise algorithm. • Learning that programs execute by following precise instructions. • Incorporating loops within algorithms. • Using logical thinking to explore software, predicting, testing and explaining what it does.	**Creating Media- Stop Motion** **Skills** • Using greater control when taking photos with cameras, tablets or computers. • Using logical thinking to explore software, predicting, testing and explaining what it does. **Knowledge** • To understand that an animation is made up of a sequence of photographs. • To know that small changes in my frames will create a smoother looking animation. • To understand what software creates simple animations and some of its features e.g. onion skinning. **Data Handling- International Space Station** **Skills** • Developing confidence with the keyboard and the basics of touch typing. • Creating and labelling images. • Collecting and inputting data into a spreadsheet. • Interpreting data from a spreadsheet. • Learning how computers are used in the wider world. **Knowledge** **To know:** • Simple data can be entered into a spreadsheet. • What steps are needed to take to create an algorithm. • What data to use to answer certain questions. • Computers can be used to monitor supplies. **Online Safety** **Skills** • Identifying whether information is safe or unsafe to be shared online.

• Using an algorithm to write a basic computer program. • Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. **Knowledge** • To understand what machine learning is and how it enables computers to make predictions. • To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. • To know that abstraction is the removing of unnecessary detail to help solve a problem.	• Using an algorithm to write a basic computer program. • Using loop blocks when programming to repeat an instruction more than once. • Using software (and unplugged means) to create story animations. **Knowledge** • To know that coding is writing in a special language so that the computer understands what to do. • To understand that the character in ScratchJr is controlled by the programming blocks. • To know that you can write a program to create a musical instrument or tell a joke.	• Learning how to create a strong password. • Learning to be respectful of others when sharing online and ask for their permission before sharing content. • Learning strategies for checking if something they read online is true. • Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable. **Knowledge** • To understand the difference between online and offline. • To understand what information I should not post online. • To know how to create a strong password. • To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.' • To understand that not everything I see or read online is true.
Year 3		
Computing Systems and Networks- Networks The children learn to recognise what a network is and demonstrate how information moves around a network. They learn how a website works and explore the role of a router, before identifying the role of packet data. **Programming- Programming Scratch** During this unit, they explore the programming application, with Scratch. They learn to use repetition (a loop) in a program and learn to program an animation, to program a story. The children learn to program a game, before sharing this with others.	**Computing Systems and Networks- Emailing** During this unit, the children understand how we communicate with technology and understand what emails are and how to send one. The learn how to create an email with an attachment and understand the importance of being kind online. They recognise when an email is not genuine. **Computing Systems and Networks- Journey Inside a Computer** The children learn to recognise basic inputs and outputs. They learn to identify the components inside a laptop and understand the purpose of computer parts. They then learn to decompose a tablet computer and identify the main parts.	**Creating Media- Video Trailers** The children plan a book trailer by taking photos or videos that tell a story. They learn to edit the video and add text and transitions. The complete the unit by evaluating video editing. **Data Handling- Comparison Cards Databases** In this unit, the children learn the terminology around databases and compare paper and computerised databases. They sort, filter and interpret data and learn to represent data in different ways. The children sort data for a purpose and use their data to plan a holiday. **Online Safety- Online Safety** The children develop their understanding of how the internet can be used to share beliefs, opinions and facts. They explain what should be done before sharing information online and identify the effects that the internet can have on people's feelings. They understand the ways personal information can be shared on the internet and understand the rules for social media platforms.
Concepts **Computing Systems and Networks** **Programming**	**Concepts** **Computing Systems and Networks**	**Concepts** **Online Safety** **Data Handling** **Creating Media**
National Curriculum Coverage Key Stage Two **Computing Systems and Networks- Networks** **Pupils should be taught to:** • 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	**National Curriculum Coverage Key Stage Two** **Computing Systems and Networks- Emailing** **Pupils should be taught to:** • 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 • select, use and combine a variety of software (including internet services) on a range of digital	**National Curriculum Coverage Key Stage Two** **Creating Media- Video Trailers** **Pupils should be taught to:** • 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,

• 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 **Programming- Programming Scratch** **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 • 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	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. **Computing Systems and Networks- Journey Inside a Computer** **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 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	including collecting, analysing, evaluating and presenting data and information **Data Handling- Comparison Cards Databases** **Pupils should be taught to:** • 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 **Online Safety- Online Safety** **Pupils should be taught to:** • 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
<u>Computing Systems and Networks- Networks</u> **Skills** • Learning about the purpose of routers. • Understanding the role of the key components of a network. • Understanding that websites and videos are files that are shared from one computer to another. • Learning about the role of packets. • Understanding how networks work and their purpose. • Identifying the key components within a network, including whether they are wired or wireless. • Recognising links between networks and the internet. • Learning how data is transferred. **Knowledge** • To understand that a network is a group of interconnected devices. • To know the components that make up a network (Wireless access point/WAP, Network switch, Router, Server and devices). • To know that a server is central to a network and responds to requests made. • To know that the internet connects all the networks around the world. • To know that a router connects us to the internet. • To know what a packet is and why it is important for website data transfer. **<u>Programming- Programming Scratch</u>** **Skills**	**<u>Computing Systems and Networks- Emailing</u>** **Skills** • Learning to log in and out of an email account. • Writing an email including a subject, 'to' and 'from'. • Sending an email with an attachment. • Replying to an email. • Understanding the purpose of emails. • Learning about cyberbullying. • Learning that not all emails are genuine, recognising when an email might be fake and what to do about it **Knowledge** • To understand that email stands for 'electronic mail.' • To know that an attachment is an extra file added to an email. • To understand that emails should contain appropriate and respectful content. • To know that cyberbullying is bullying using electronics such as a computer or phone. **<u>Computing Systems and Networks- Journey Inside a Computer</u>** **Skills** • Understanding what the different components of a computer do and how they work together. • Drawing comparisons across different types of computers.	**<u>Creating Media- Video Trailers</u>** **Skills** • Using logical thinking to explore more complex software; predicting, testing and explaining what it does. • Taking photographs and recording video to tell a story. • Using software to edit and enhance their video adding music, sounds and text on screen with transitions. **Knowledge** • To know that different types of camera shots can make my photos or videos look more effective. • To know that I can edit photos and videos using film editing software. • To understand that I can add transitions and text to my video. **<u>Data Handling- Comparison Cards Databases</u>** **Skills** • Using logical thinking to explore more complex software; predicting, testing and explaining what it does. • Understanding the vocabulary associated with databases: field, record, data. • Learning about the pros and cons of digital versus paper databases.

- Using decomposition to explore the code behind an animation.
- Using repetition in programs.
- Using logical reasoning to explain how simple algorithms work.
- Explaining the purpose of an algorithm.
- Forming algorithms independently.
- Using logical thinking to explore more complex software; predicting, testing and explaining what it does.
- Incorporating loops to make code more efficient.
- Continuing existing code.
- Making reasonable suggestions for how to debug their own and others' code.

Knowledge
To know:
- Scratch is a programming language and some of its basic functions.
- How to use loops to improve programming.
- How decomposition is used in programming.
- That you can remix and adapt existing code.

- Using decomposition to explain the parts of a laptop computer.
- Explaining the purpose of an algorithm

Knowledge
- To know the roles that inputs and outputs play on computers.
- To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.
- To know what a tablet is and how it is different from a laptop/desktop computer.

- Sorting and filtering databases to easily retrieve information.
- Creating and interpreting charts and graphs to understand data.

Knowledge
- To know that a database is a collection of data stored in a logical, structured and orderly manner.
- To know that computer databases can be useful for sorting and filtering data.
- To know that different visual representations of data can be made on a computer.

Online Safety- Online Safety
Skills
- Recognising how social media platforms are used to interact.
- Recognising that different information is shared online, including facts, beliefs and opinions.
- Learning how to identify reliable information when searching online.
- Learning how to stay safe on social media.
- Considering the impact technology can have on mood.

Knowledge
To know:
- That not everything on the internet is true: people share facts, beliefs and opinions online.
- The internet can affect people's moods and feelings.
- Privacy settings limit who can access important personal information, such as names, ages, gender etc.
- What social media is and that age restrictions apply

Year 4

Computing Systems and Networks- Collaborative Learning
The children learn how software can be used to work online collaboratively. They understand how to contribute to someone else's work effectively and understand how to create effective presentations. The children learn how to use a shared spreadsheet to explore data.

Programming- Further Coding and Scratch
The children build on their prior learning, recalling the key features of Scratch. They learn how a Scratch game works by using decomposition to identify key features. The children learn to recognise what a variable is and understand how to make a variable in the program. They then learn to create a quiz using variables.

Creating Media- Website Design
During this using, the children explore the features of Google sites. They plan content for a collaborative webpage, before creating a webpage as part of a collaborative class website. The children evaluate the website to identify if it meets the design criteria.

Skills Showcase- HTML
The children learn to recognise the role of HTML in a web page. They begin to change HITML code for a specific purpose and recognise the basics of HTML. They alter the HTML on a live web page and alter an image on a web page.

Programming- Computational Thinking
The children learn that computational thinking is made up of four key strands. They begin to understand what decomposition is and how to apply it to solve problems. They develop their understanding of what pattern recognition and abstraction mean. The children build on their prior learning of algorithms and create them for specific purposes. They then combine computational thinking skills to solve a problem.

Data Handling- Investigating Weather
The children take data from online sources to create a spreadsheet. They use this information to design a weather station and design an automated machine to respond to sensor data. The children learn how weather forecasts are made and use tablets to present a weather forecast.

Online Safety

		The children learn to describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy. They learn to describe some of the methods used to encourage people to buy things online. They explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true. The children begin to explain how technology can be designed to act like or impersonate living things. They explain how technology can be a distraction and identify when they might need to limit the amount of time spent using technology.
Concepts **Computing Systems and Networks** **Programming**	**Concepts** **Creating Media**	**Concepts** **Online Safety** **Data Handling** **Programming**
National Curriculum Coverage Key Stage Two **Computing Systems and Networks- Collaborative Learning** • 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 technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. **Programming- Further Coding and Scratch** • 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 • 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	**National Curriculum Coverage Key Stage Two** **Creating Media- Website Design** • 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. **Skills Showcase- HTML** • 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 • 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.	**National Curriculum Coverage Key Stage Two** **Programming- Computational Thinking** • 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 • 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 **Data Handling- Investigating Weather** • use sequence, selection, and repetition in programs; work with variables and various forms of input and output • 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. **Online Safety** • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Computing Systems and Networks- Collaborative Learning

Skills

- Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.
- Use online software for documents, presentations, forms and spreadsheets.
- Using software to work collaboratively with others.
- Understanding that software can be used collaboratively online to work as a team.
- Recognising what appropriate behaviour is when collaborating with others online.

Knowledge

- To understand that software can be used collaboratively online to work as a team.
- To know what type of comments and suggestions on a collaborative document can be helpful.
- To know that you can use images, text, transitions and animation in presentation slides.

Programming- Further Coding and Scratch

Skills

- Using decomposition to solve a problem by finding out what code was used.
- Using decomposition to understand the purpose of a script of code.
- Creating algorithms for a specific purpose.
- Coding a simple game.
- Incorporating variables to make code more efficient.
- Remixing existing code.

Knowledge

To know:

- That a variable is a value that can change (depending on conditions) and know that you can create them in Scratch.
- What a conditional statement is in programming.
- That using variables can help you to create a quiz on Scratch.

Creating Media- Website Design

Skills

- Building a web page and creating content for it.
- Designing and creating a webpage for a given purpose.
- Using software to work collaboratively with others.

Knowledge

- To know that a website is a collection of pages that are all connected.
- To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks.
- To know that websites should be informative and interactive.

Skills Showcase- HTML

Skills

- Exploring the HTML on a web page.
- Remixing existing code.
- Translating HTML into text and images.
- Identifying HTML tags.
- Altering HTML on a live web page.
- Replacing images on a web page.
- Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others.

Knowledge

To know:

- And identify examples of HTML tags.
- What changing the HTML does to alter the appearance of an object on the web.
- Copyright means that those images are protected and to understand that people should use a 'Creative Commons' image search if they wish to use images from the internet.
- What fake news is and ways to spot websites that carry this type of misinformation.
- What the inspect tool is and ways of using it to explore and alter text and images.

Programming- Computational Thinking

Skills

- Using decomposition to solve a problem by finding out what code was used.
- Using decomposition to understand the purpose of a script of code.
- Identifying patterns through unplugged activities.
- Using past experiences to help solve new problems.
- Using abstraction to identify the important parts when completing both plugged and unplugged activities.
- Creating algorithms for a specific purpose.
- Using abstraction and pattern recognition to modify code.

Knowledge

To know:

- Combining computational thinking skills can help solve a problem.
- Pattern recognition means identifying patterns to help them work out how the code works.
- Algorithms can be used for several purposes, e.g. animation, game design, etc.

Data Handling- Investigating Weather

Skills

- Using tablets or digital cameras to film a weather forecast.
- Understanding that weather stations use sensors to gather and record data that predicts the weather.
- Using keywords to effectively search for information on the internet.
- Searching the internet for data.
- Designing a device that gathers and records sensor data.
- Recording data in a spreadsheet independently.
- Sorting data in a spreadsheet to compare using the 'sort by…' option.
- Understanding that data is used to forecast weather.

Knowledge

- To know that computers can use different forms of input to sense the world around them so that they can record and respond to data ('sensor data').
- To know that a weather machine is an automated machine that respond to sensor data.
- To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.

Online Safety

Skills

- Understanding why some results come before others when searching.

		• Understanding that information found by searching the internet is not all grounded in fact. • Learning to make judgements about the accuracy of online searches. • Identifying forms of advertising online. • Reflecting on the positives and negatives of time online. • Identifying respectful and disrespectful online behaviour. • Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others. **Knowledge** To know: • Some of the methods used to encourage people to buy things online. • Technology can be designed to act like or impersonate living things. • Technology can be a distraction and identify when someone might need to limit the amount of time spent using technology. • What behaviours are appropriate to stay safe and be respectful online.

Year 5		
Computing Systems and Networks- Search Engines The children develop their understanding of what a search engine is and how to use it and are aware that not everything online is true. The children learn to search effectively and create an informative poster. They understand how search engines work. **Programming- Programming Music** The children learn to explore with new software and create a program that plays themed music. They plan soundtracks with programs and program music for a specific purpose.	**Data Handling- Mars Rover 1** The children identify how and why data is collected from space. They learn to read and calculate numbers using binary code and identify the computer architecture of the Mars Rovers. They use simple operations to calculate bit paters and represent binary as text. **Programming- Microbit** During this unit, the children explore new software to program an animation. The develop their understanding of coding structures and create a program for a specific task.	**Creating Media- Stop Motion Animation** The children develop their understanding of animation and learn what stop motion animation is. They plan their own stop motion video, thinking about the characters they want to use and create their own animation, before editing and assessing their work. **Skills Showcase: Mars Rover 2** The children learn to recognise how bit patterns represent images as pixels and explain how the data for digital images can be compressed. They learn how to identify and explain the fetch, decode and execute cycle. The children create a safe online profile and explore 3D design software. **Online Safety** During this unit, the children learn how apps can access personal information and how to alter the permissions. They are aware of the positive and negative aspects of online communication and how online information can be used to form judgements. They discover ways to overcome bullying online and learn the ways technology can affect health and wellbeing.
Concepts **Programming** **Computing Systems and Networks**	**Concepts** **Data Handling** **Programming**	**Concepts** **Online Safety** **Creating Media**
National Curriculum Coverage Key Stage Two **Computing Systems and Networks- Search Engines**	**National Curriculum Coverage Key Stage Two** **Data Handling- Mars Rover 1**	**National Curriculum Coverage Key Stage Two** **Creating Media- Stop Motion Animation**

• 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. **Programming- Programming Music** • 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 • 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	• 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 • 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 **Programming- Microbit** • 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 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	• 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 **Skills Showcase: Mars Rover 2** • 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 **Online Safety** • 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.
<u>Computing Systems and Networks- Search Engines</u> **Skills** • Developing searching skills to help find relevant information on the internet. • Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns. • Learn about different forms of communication that have developed with the use of technology. • Recognising that information on the Internet might not be true or correct and learning ways of checking validity. **Knowledge** • To know how search engines work. • To understand that anyone can create a website and therefore we should take steps to check the validity of websites. • To know that web crawlers are computer programs that crawl through the internet. • To understand what copyright is.	**<u>Data Handling- Mars Rover 1</u>** **Skills** • Learning that a separate computer can program external devices. • Recognising how the size of RAM affects the processing of data. • Learning the vocabulary associated with data: data and transmit. • Recognising that computers transfer data in binary and understanding simple binary addition. • Relating binary signals (Boolean) to the simple character-based language, ASCII. • Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations. • Understanding how data is collected in remote or dangerous places. • Understanding how data might be used to tell us about a location.	**<u>Creating Media- Stop Motion Animation</u>** **Skills** • Decomposing animations into a series of images. • Decomposing a story to be able to plan a program to tell a story. • Using video editing software to animate. **Knowledge** To know: • Decomposition of an idea is important when creating stop-motion animations. • Stop-motion animation is filmed one frame at a time using models and with tiny changes between each photograph. • Editing is an important feature of making and improving a stop-motion animation. **<u>Skills Showcase: Mars Rover 2</u>** **Skills** • Learning the difference between ROM and RAM.

Programming- Programming Music

Skills

- Predicting how software will work based on previous experience.
- Writing more complex algorithms for a purpose.
- Iterating and developing their programming as they work.
- Confidently using loops in their programming.
- Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.
- Writing code to create a desired effect.
- Using a range of programming commands.
- Using repetition within a program.
- Amending code within a live scenario.
- Using logical thinking to explore software more independently, making predictions based on their previous experience.
- Using a software programme (Sonic Pi) to create music.
- Identify ways to improve and edit programs, videos, images etc.

Knowledge

- To know that a soundtrack is music for a film/video and that one way of composing these is on programming software.
- To understand that using loops can make the process of writing music simpler and more effective.
- To know how to adapt their music while performing.

- Learn about different forms of communication that have developed with the use of technology.

Knowledge

To know:

- Mars Rover is a motor vehicle that collects data from space by taking photos and examining rock samples.
- What numbers using binary code look like and be able to identify how messages can be sent in this format.
- RAM is Random Access Memory and acts as the computer's working memory.
- What simple operations can be used to calculate bit patterns.

Programming- Microbit

Skills

- Decomposing a program without support.
- Predicting how software will work based on previous experience.
- Writing more complex algorithms for a purpose.
- Programming an animation.
- Iterating and developing their programming as they work.
- Confidently using loops in their programming.
- Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.
- Writing code to create a desired effect.
- Using arrange of programming commands.
- Using repetition within a program.
- Using logical thinking to explore software more independently, making predictions based on their previous experience.
- Identify ways to improve and edit programs, videos, images etc

Knowledge

- To know that a Micro:bit is a programmable device.
- To know that Micro:bit uses a block coding language similar to Scratch.
- To understand and recognise coding structures including variables.
- To know what techniques to use to create a program for a specific purpose (including decomposition).

- Recognising how the size of RAM affects the processing of data.
- Understanding the fetch, decode, execute cycle.
- Learning how the data for digital images can be compressed.
- Recognising that computers transfer data in binary and understanding simple binary addition.
- Understanding how bit patterns represent images as pixels.
- Using logical thinking to explore software more independently, making predictions based on their previous experience.
- Independently learning how to use 3D design software package TinkerCAD.
- Learn about different forms of communication that have developed with the use of technology.

Knowledge

- To understand that bit patterns represent images as pixels.
- To understand that the data for digital images can be compressed.
- To know the difference between ROM and RAM.
- To understand various techniques that will improve the design of a 3D object (using CAD software).

Online Safety

Skills

- Understand that passwords need to be strong and that apps require some form of password.
- Recognise some types of online communication and know who to go to if they need help with any communication matters online.
- Search for simple information about a person, such as their birthday or key life moments.
- Know what bullying is and that it can occur both online and in the real world.
- Recognise when health and well-being are being affected in either a positive or negative way through online use.
- Offer some advice and tips to combat the negative effects of online use.

Knowledge

To know:

- Possible dangers online and how to stay safe.
- The pros and cons of online communication.
- That information on the internet might not be true or correct and ways of checking validity.
- What to do if they experience bullying online.
- How to use an online community safely.

Year 6

Computing systems and networks: Bletchley Park and the history of computers Discovering the history of Bletchley Park, historical figures and computer science. Children learn about code-breaking and password hacking as well as decoding messages. Children present information about historical figures and look back in time at how computers have evolved, finally designing a computer of the future and creating an audio advert for their designs. **Computing Systems and Networks- AI** Exploring what AI is and how it generates text, images and code. Learning about creating and refining prompts to improve AI responses while also considering the ethical implications of AI and its potential to replace human roles.	**Data Handling- Big Data 1** Understanding about the use of big data including barcodes, QR codes, infrared, and RFID technologies. Children will create and scan their own QR codes, manipulate real-time data in spreadsheets, and present their findings. They also analyse transport data to understand its usefulness to commuters. **Programming- Intro to Python** Learning the fundamentals of the programming language of Python, they will test, change and explain what their program does. Children use loops and explain what repeats do and what the parts of the loop do while recognising that computers choose random numbers and decompose the program into an algorithm.	**Data Handling- Big Data 2** Understanding data usage through the use of mobile data vs WiFi, the Internet of Things, and big data. Identifying high/low data activities and preparing presentations on using Big Data/IoT to improve school efficiency while respecting privacy. **Skills Showcase- Inventing a Product** Designing a new electronic product and using CAD software to design appropriate housing for it. Developing skills in website design, video editing, and persuasive language to promote their product. Evaluating and adapting existing code, debugging programs, and searching for accurate information online. **Online Safety** The children learn to describe online issues, which give us negative feelings and know how to get help. They explore the impact and consequences of sharing online and learn how to create a positive online reputation. The children describe how to capture bullying content as evidence and develop their awareness of strategies that help to protect people online.
Concepts **Computing Systems and Networks**	**Concepts** **Data Handling** **Programming**	**Concepts** **Online Safety** **Data Handling**
National Curriculum Coverage Key Stage Two **Computing Systems and Networks- Bletchley Park and the history of computers** • 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. • 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. **Computing Systems and Networks- AI** • 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.	**National Curriculum Coverage Key Stage Two** **Data Handling- Big Data 1** • 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 • 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. **Programming- Intro to Python** • 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	**National Curriculum Coverage Key Stage Two** **Data Handling- Big Data 2** • 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 • 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. **Skills Showcase- Inventing a Product** • 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 logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • 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	• 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. **Online Safety** • • 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
<u>Computing Systems and Networks- Bletchley Park and the history of computers</u> **Skills** • Learning about the history of computers and how they have evolved over time. • 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. • Using search and word processing skills to create a presentation. • Understanding how search engines work. • Using search engines safely and effectively. • Understanding the importance of secure passwords and how to create them. • Using the understanding of historic computers to design a computer of the future. • Planning, recording and editing an audio recording. • Creating and editing sound recordings for a specific purpose. **Knowledge** To know: • The importance of having a secure password and what brute force hacking is. • The first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2. • About some of the historical figures that contributed to technological advances in computing.	**<u>Data Handling- Big Data 1</u>** **Skills** • Understanding and identifying barcodes, QR codes and RFID. • Identifying devices and applications that can scan or read barcodes, QR codes and RFID. • Understanding how barcodes, QR codes and RFID work. • Gathering and analysing data in real time. • Creating formulas and sorting data within spreadsheets. • Learning how 'big data' can be used to solve a problem or improve efficiency. **Knowledge** • Data contained within barcodes and QR codes can be used by computers. • Infrared waves are a way of transmitting data. • Radio Frequency Identification (RFID) is a more private way of transmitting data. • Data is often encrypted so that even if it is stolen it is not useful to the thief. **<u>Programming- Intro to Python</u>** **Skills** • Decomposing a program into an algorithm. • Writing increasingly complex algorithms for a purpose. • Debugging quickly and effectively to make a program more efficient.	**<u>Data Handling- Big Data 2</u>** **Skills** • Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files). • Understanding that computer networks provide multiple services. • Using search and word processing skills to create a presentation. • Creating formulas and sorting data within spreadsheets. • 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. **Knowledge** • To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'. • To know that devices or that are not updated are most vulnerable to hackers. • To know the difference between mobile data and WiFi. **<u>Skills Showcase- Inventing a Product</u>** **Skills** • 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.

• What techniques are required to create a presentation using appropriate software. • Sound clips can be recorded using sound recording software. • Sound clips can be edited and trimmed. **<u>Computing Systems and Networks- AI</u>** **Skills** • Identify different types of AI and their applications in everyday life. • Exploring text-based and image-based AI tools to understand how they generate content. • Applying coding skills like decomposition and pattern recognition to interact with AI applications. • Analysing the effectiveness of prompts and refining them for improved AI outputs. • Exploring ethical considerations around AI use and its impact on society. **Knowledge** **To know:** • AI is artificial intelligence and is used in everyday life. • AI is trained on data to recognise patterns and generate outputs. • AI can be used to generate written content. • AI can be used to create visual content like pictures. • AI can help generate basic HTML code to create the structure and layout of a website. • There are ethical issues surrounding AI, including data privacy, bias and responsible use.	• 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. **Knowledge** • To know that there are text-based programming languages such as Logo and Python. • To know that nested loops are loops inside of loops. • To understand the use of random numbers and remix Python code.	• Evaluating code to understand its purpose. • Predicting code and adapting it to a chosen purpose. • 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. • Using search engines safely and effectively. **Knowledge** • What designing an electronic product involves. • Which programming software/language is best to achieve a purpose. • The building blocks of computational thinking, for example, sequence, selection, repetition, variables and inputs and outputs. **<u>Online Safety</u>** **Skills** • Learning about the positive and negative impacts of sharing online. • Learning strategies to create a positive online reputation. • Understanding the importance of secure passwords and how to make them. • Learning strategies to capture evidence of online bullying to seek help. • Recognising that updated software can help to prevent data corruption and hacking. **Knowledge** • A digital footprint means the information that exists on the internet as a result of a person's online activity. • What steps are required to capture bullying content as evidence. • It is important to manage personal passwords effectively. • What it means to have a positive online reputation. • Some common online scams.