# YEAR 3

## COMPUTING Progression Overview

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| **Big Idea** | Fragile Earth (8 weeks) | Game Changers (7 weeks) | Portal to the Past (12 weeks) | | Where in the world? (5 weeks) | Through the ages (7 weeks) |
| **Kapow Unit** | Computing systems and networks 1 + 1 online safety | Programming Scratch + 1 online safety | Data handling | Computing systems and networks 2 + 1 online safety | Creating media | Computing systems and networks 3 + 1 online safety |
| **Big Idea Link** | Discrete | Discrete | Discrete | Discrete | Discrete | Discrete |
| **National Curriculum** | 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. | Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

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 technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | 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.

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content | 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 technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | 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 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. | 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.

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 […] content that accomplish given goals

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. |
| **Lessons** | Lesson 1 – Learning to understand what a network is and understand our school network.

Lesson 2 – Learning to understand how information moves around a network and begin to recognise real world networks.

Lesson 3 – Learning to understand how the Internet works and explain a website's journey.

Lesson 4 – Learning to explore the role of routers.

Lesson 5 – Learning to understand the role of packets. | Lesson 1 – Learning to explore a programming application.

Lesson 2 – Learning to use repetition (a loop) in a program.

Lesson 3 – Learning to program an animation.

Lesson 4 – Learning To program a story

Lesson 5 – To program a game

Lesson 3 (online safety) – Understanding why personal information should/ should not be shared with. | Lesson 1: Records, fields and data – To understand the terminology around databases

Lesson 2: Race against the computer – To compare paper and computerised databases

Lesson 3: Sorting and filtering – To sort, filter and interpret data

Lesson 4: Representing data – To represent data in different ways

Lesson 5: Planning a holiday – To sort data for a purpose | Lesson 1: Sending an email – To understand what email is used for and to send an email

Lesson 2: Adding attachments – To edit email content and add an attachment

Lesson 3: Be kind online – To understand the importance of being kind online and what this looks like.

Lesson 4: Cyberbullying – To understand that cyberbullying involves being unkind online

Lesson 5: Fake emails – To understand that not all emails are genuine | Lesson 1: Planning a book trailer – To plan a book trailer

Lesson 2: Filming – To take photos or videos to tell a story

Lesson 3: Editing the trailer – To edit a video

Lesson 4: Transitions and text – To add text and transitions to a video

Lesson 5: Video reviews – To evaluate video editing | Lesson 1: Inputs and outputs – To recognise basic inputs and outputs

Lesson 2: Building a paper laptop – To decompose a laptop

Lesson 3: Following instructions – To understand the purpose of computer parts

Lesson 4: Computer memory – To understand the purpose of computer parts

Lesson 5: Dismantling a tablet – To decompose a tablet computer |
| **Skills** | Learning what a network is and its purpose

Identifying the key components within a network, including whether they are wired or wireless | Using logical thinking to explore more complex software; predicting, testing and explaining what it does

Incorporating loops to make code more efficient | 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 to log in and out of an email account.

Writing an email including a subject, 'to' and 'from'.

Sending an email with an attachment. | Using logical thinking to explore more complex software; predicting, testing and explaining what it does.

Taking photographs and recording video to tell a story. | Understanding what the different components of a computer do and how they work together.

Drawing comparisons across different types of computers. |

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| | Recognising links between networks and the internet<br><br>Learning how data is transferred | Remixing existing code<br><br>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected<br><br>Using decomposition to explore the code behind an animation.<br><br>Using repetition in programs.<br><br>Understanding that computers follow instructions.<br><br>Using an algorithm to explain the roles of different parts of a computer.<br><br>Using logical reasoning to explain how simple algorithms work.<br><br>Explaining the purpose of an algorithm.<br><br>Forming algorithms independently | Learning about the pros and cons of digital versus paper databases.<br><br>Sorting and filtering databases to easily retrieve information.<br><br>Creating and interpreting charts and graphs to understand data. | Replying to an email.<br><br>Understanding the purpose of emails.<br>Learning about cyberbullying.<br><br>Learning that not all emails are genuine, recognising when an email might be fake and what to do about it. | Using software to edit and enhance their video adding music, sounds and text on screen with transitions. | Using decomposition to explain the parts of a laptop computer.<br><br>Explaining the purpose of an algorithm |
| **Software used** | Chrome<br>Canva | Chrome<br>Scratch<br>Incredibox | Chrome<br>Google sheets | Chrome<br>Gmail | Chrome<br>Wevo | Chrome |
| **Vocabulary** | Digital, Devices, Inputs, Outputs, Network, Switch, Server, Wireless, access point, Network, Connections, Information | Scratch, Attributes, Projects, Sprites, Backdrop, Commands, Blocks, Program, Sequence, Algorithm, Debug | Categorise, Category, Chart, Data, Database, Fields, Filter, Graph, Information, Interpret, PDF, Questionnaire, Record, Representation, Sort, Spreadsheet | Attachment, Bcc (Blind carbon copy), Cc (Carbon copy), Compose, Content, Cyberbullying, Document, Domain, Download, Email, Email account, Email address, Emoji, Emotions, Fake, Font, Genuine, Hacker, Icons, Inbox, Information, Link, Log in, Log out, Negative language, Password, Personal information, Positive language, Reply, Responsible digital citizen, Scammer, Settings, Send, Sign in, Spam email, Subject bar, Theme, Tone, Username, Virus, WiFi | Application, Camera angle, Clip, Cross blur, Crossfade, Cross zoom, Desktop, Digital device, Dip to black, Directional wipe, Edit, Film, Film editing software ,Graphics, Import, Key events, Laptop, Music, Photo, Plan, Recording, Sound effects, Storyboard, Time code, Trailer, Transition, Video, Voiceover | Algorithm, Assemble, CPU (central processing unit), Data, Decompose, Desktop, Disassemble, GPU (graphics processing unit), Hard drive, HDD (hard disk drive), Infinite loop, Input, Keyboard, Laptop, Memory, Microphone, Monitor, Mouse, Output, Photocopier, Program, QR Code, RAM (random access memory), ROM (read only memory), Storage, Tablet device, Technology, Touchscreen, Touchpad |
| **Online safety session** | Lesson 1: Beliefs, opinions and facts on the internet<br>To understand how the internet can be used to share beliefs, opinions and facts | Lesson 2: When being online makes me upset<br>To understand the effects that some internet use can have on our feelings and emotional wellbeing | Lesson 3: Sharing of information<br>To understand the ways personal information can be shared on the internet | Lesson 4: Rules of social media platforms<br>To understand the rules for social media platforms | | |
| **Education for a connected world** | Managing online information<br><br>I can demonstrate how to use key phrases in search engines to gather accurate information online.<br><br>I can explain how the internet can be used to sell and/or buy things.<br><br>I can explain the difference between a 'belief', an 'opinion' and a 'fact. and can give examples of how and where they might be shared online, e.g. in videos, memes, posts, news stories etc.<br><br>I can explain that not all opinions shared may be accepted as true or fair by others (e.g. monsters under the bed). | Managing online information<br><br>I can describe and demonstrate how we can get help from a trusted adult if we see content that makes us feel sad, uncomfortable, worried or frightened.<br>I can explain who someone can ask if they are unsure about putting something online.<br><br>Privacy and security<br><br>I can give reasons why someone should only share information with people they choose to and can trust.<br>I can explain that if they are not sure or feel pressured then they should tell a trusted adult.<br><br>Health, well-being and lifestyle<br><br>I can explain why spending too much time using technology can sometimes have a negative impact on me.<br>I can give some examples of activities where it is easy to spend a lot of time engaged (e.g. games, films, videos). | Managing online information<br><br>I can explain what autocomplete is and how to choose the best suggestion.<br><br>Privacy and security<br><br>I can describe how connected devices can collect and share my information with others.<br>I can give reasons why someone should only share information with people they choose to and can trust. | Health, wellbeing and lifestyle<br><br>I can explain why some online activities have age restrictions, why it is important to follow them and know who I can talk to if others pressure me to watch or do something online that makes me feel uncomfortable (e.g. age restricted gaming or websites).<br><br>Online reputation<br><br>I can explain how to search for information about others online | | |

# YEAR 4

## COMPUTING Progression Overview

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
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| **Big Idea** | Agents For Change | Heroes from History | Ancient Ancestors | Ancient Ancestors | Where in the World | Through the Ages |
| **Kapow Unit** | Computing systems and networks + 1 online safety | Programming 1 Scratch + 1 online safety | Data handling weather + 1 online safety | Programming 2 Comp Thinking + 1 online safety | Creating media web design + 1 online safety | Skills Showcase HTML |
| **Big Idea Link** | Discrete | Discrete | Discrete | Discrete | Discrete | Discrete |
| **National Curriculum** | 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.<br><br>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.<br><br>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.<br><br>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts<br><br>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs<br><br>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.<br><br>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.<br><br>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.<br><br>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output<br><br>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.<br><br>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.<br><br>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.<br><br>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | 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<br><br>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems.<br><br>Solve problems by decomposing them into smaller parts. |
| **Lessons** | Lesson 1: Teamwork - To understand that software can be used collaboratively online to work as a team<br><br>Lesson 2: Sharing a document - To understand how to contribute to someone else's work effectively<br><br>Lesson 3: Slide presentations - To understand how to create effective presentations<br><br>Lesson 4: Google Forms - To understand how to create and share Google Forms<br><br>Lesson 5: Shared spreadsheets - To understand how to use a shared spreadsheet to explore data | Lesson 1 - Learning To recall the key features of Scratch.<br><br>Lesson 2 - Learning To understand how a Scratch game works by using decomposition to identify key features.<br><br>Lesson 3 - Learning To understand what a variable is and how to make one<br><br>Lesson 4 - Learning to understand how to make a variable in Scratch<br><br>Lesson 5 - Learning to use knowledge of how variables work to create a quiz. | Lesson 1 - Learning to log data taken from online sources within a spreadsheet.<br><br>Lesson 2 - Learning to design a weather station.<br><br>Lesson 3 - Learning to design an automated machine to respond to sensor data.<br><br>Lesson 4 - Learning to understand how weather forecasts are made.<br><br>Lesson 5 - Learning to use green screen technology in a video to present a weather forecast. | Lesson 1: What is computational thinking? - To understand that computational thinking is made up of four key strands<br><br>Lesson 2: Decomposition - To understand what decomposition is and how to apply it to solve problems<br><br>Lesson 3: Abstraction and pattern recognition To understand what pattern recognition and abstraction mean<br><br>Lesson 4: Algorithm design - To understand how to create an algorithm and what it can be used for<br><br>Lesson 5: Applying computational thinking - To combine computational thinking skills to solve a problem | Lesson 1: Google Sites skills - To explore the features of Google Sites to learn how to create content for a web page<br><br>Lesson 2: Book review web page - To plan content for a web page as a collaborative online piece of work<br><br>Lesson 3: Creating a web page - To create a web page as part of a collaborative class website<br><br>Lesson 4: Planning my website - To plan and create a website<br><br>Lesson 5: Creating my website - To create a website and evaluate its success. | Lesson 1: Introduction to HTML - To understand and identify examples of HTML tags<br><br>Lesson 2: Remixing HTML - To change HTML code for a specific purpose<br><br>Lesson 3: Changing HTML and CSS - To change the HTML and CSS to alter the appearance of an object on the web<br><br>Lesson 4: Website hacking - To understand and explore more complex components of a web page<br><br>Lesson 5: Replacing images - To alter key elements on a webpage including text and images |
| **Skills** | Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration. | Understanding that websites can be altered by exploring the code beneath the site<br><br>Coding a simple game | Designing a weather station which gathers and records sensor data<br><br>Use Google online software for documents, | Using decomposition to solve a problem by finding out what code was used.<br><br>Using decomposition to understand the purpose | Building a web page and creating content for it.<br><br>Designing and creating a webpage for a given purpose. | Remixing existing code.<br><br>Building a web page and creating content for it. |

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| | Use online software for documents, presentations, forms and spreadsheets. Using software to work collaboratively with others.<br><br>Understanding that software can be used collaboratively online to work as a team.<br><br>Recognising what appropriate behaviour is when collaborating with others online. | Using abstraction and pattern recognition to modify code<br><br>Incorporating variables to make code more efficient<br><br>Remixing existing code<br><br>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected | presentations, forms and spreadsheets | of a script of code.<br><br>Identifying patterns through unplugged activities.<br><br>Using past experiences to help solve new problems.<br><br>Using abstraction to identify the important parts when completing both plugged and unplugged activities.<br><br>Creating algorithms for a specific purpose.<br><br>Using abstraction and pattern recognition to modify code. | Using software to work collaboratively with others. | Understanding that information found by searching the internet is not all grounded in fact.<br><br>Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others. |
| **Software used** | Chrome<br>Google Sheets<br>Google Forms | Chrome<br>Scratch | Chrome<br>Google Sheets<br>Sketchup | Chrome<br>Scratch | Chrome<br>Google Slides | Chrome<br>HTML<br>CSS |
| **Vocabulary** | Animations, Average, Bar chart, Collaboration, Comment, Contribution, Data, Edited, Email, account, Format, Freeze, Icon, Images, Insert Link, Multiple choice, Numerical data, Pie chart, Presentations, Resolved, Reviewing comments, Share, Slides, Software, Spreadsheets, Suggestions, Survey, Teamwork, Themes, Transitions | Instructions, Repetition, Count controlled, loops, Programming, Infinite, loops, Project, Code, Algorithm, Debug | Weather, Degrees, Measurement, Accurate, Evaporation, Condensation, Extreme weather, Sensor data, Sensitive, Climate zone, Accurate, Tornado, Lightning | Abstraction, Algorithm, Code, Computational, thinking, Decomposition, Input, Logical reasoning, Output, Pattern recognition, Script, Sequence, Variable | Assessment, Audience, Checklist, Collaboration, Content, Contribution, Create, Design, Embed, Evaluate, Features, Google Sites, Hobby, Homepage, Hyperlinks, Images, Insert, Online, Plan, Progress, Published, Record, Review, Style, Subpage, Tab, Theme, Web page, Website, World Wide Web | Code, Component, Content, Copyright, CSS, End tag, Fake news, Hacking, Heading, Headline, Hex code, HTML, Input, Internet browser, Output, Paragraph, Permission, Remixing, Script, Start, tag, Tags, Text, URL, Webpage |
| **Online safety session** | Lesson 1: What happens when I search online?<br>To describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy. | Lesson 2: How do companies encourage us to buy online?<br>To describe some of the methods used to encourage people to buy things online. | Lesson 3: Fact, opinion or belief?<br>To explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true. | Lesson 4: What is a bot?<br>To explain that technology can be designed to act like or impersonate living things. | Lesson 5: What is my #TechTimetable like?<br>To explain how technology can be a distraction and identify when I might need to limit the amount of time spent using technology. | |
| **Education for a connected world** | Managing online information<br><br>I can describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy (e.g. social media, image sites, video sites) | Managing Online Information<br><br>I can describe some of the methods used to encourage people to buy things online (e.g. advertising offers; in-app purchases, pop-ups) and can recognise some of these when they appear online | Managing Online Information<br><br>I can explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true | Managing Online Information<br><br>I can explain that technology can be designed to act like or impersonate living things (e.g. bots) and describe what the benefits and the risks might be | Health, well-being and lifestyle<br><br>I can explain how using technology can be a distraction from other things, in both a positive and negative way.<br><br>I can identify times or situations when I might need to limit the amount of time I use technology. e.g. I can suggest strategies to help with limiting this time | |

# YEAR 5

## COMPUTING Progression Overview

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
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| **Big Idea** | Agents For Change | Heroes from History | Ancient Ancestors | Ancient Ancestors | Where in the World | Through the Ages |
| **Kapow Unit** | Computing systems and networks + 1 online safety | Programming 1 Music + 1 online safety | Data handling Mars Rover 1 + 1 online safety | Programming 2 Micro bit + 1 online safety | Creating media Stop motion + 1 online safety | Skills Showcase Mars Rover 2 |
| **Big Idea Link** | Discrete Australian Bush Fires | Discrete | Discrete | Discrete | Discrete | Discrete |
| **National Curriculum** | 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) to create content that accomplish given goals, including collecting 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. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | Design, write and debug programs that accomplish specific goals. Use sequence, selection, and repetition in 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. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | 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. | Design, write and debug programs that accomplish specific goals. Solve problems by decomposing them into smaller parts. Use sequence and repetition in programs; work with various forms of input and output. Use logical reasoning to explain how some simple algorithms work. Work with variables and various forms of input. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller part Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | 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 search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. |
| **Lessons** | Lesson 1: Searching basics – To understand what a search engine is and how to use it. Lesson 2: Inaccurate information – To be aware that not everything online is true Lesson 3: Web quest – To search effectively Lesson 4: Information poster – To create an informative poster. Lesson 5: Web crawlers – To understand how search engines work | Lesson 1 – Introduction to Scratch music elements. Lesson 2 – Learning to create a program that plays themed music. Lesson 3 – Learning to plan a soundtrack program. Lesson 4 – Learning to program a soundtrack Lesson 5 – Learning to program music. | Lesson 1: Mars Rover – To identify how and why data is collected from space Lesson 2: Binary code – To read and calculate numbers using binary code Lesson 3: Computer architecture – To identify the computer architecture of the Mars Rovers Lesson 4: Using binary – numbers – To use simple operations to calculate bit patterns Lesson 5: Using binary - text – To represent binary as text | Lesson 1 – Introduction to BBC Micro:bit. Lesson 2 – Learning to program an animation. Lesson 3 – Learning to recognise coding structures. Lesson 4 – Learning to create a program (pedometer). Lesson 5 – Learning to create a program (score board). | Lesson 1: Animation explored – To understand what animation is Lesson 2: Exploring stop motion – To understand what stop motion animation is Lesson 3: Planning my stop motion project – To plan my stop motion video, thinking about the characters I want to use Lesson 4: Stop motion creation – To create a stop motion animation Lesson 5: Editing my stop motion project To edit and assess my stop motion animation. | Lesson 1 – Learning to understand how bit patterns represent images as pixels. Lesson 2 – Learning to explain how the data for digital images can be compressed. Lesson 3 – Learning to identify and explain the 'fetch, decode, execute' cycle. Lesson 4 – Learning to create a safe online profile and tinker with 3D design software. Lesson 5 – Learning to modify the design of a 3D object using CAD software. |
| **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 | 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 | Learning that external devices can be programmed by a separate computer. 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. | 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. | 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. | Learning the difference between ROM and RAM. 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. |

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| | of checking validity. | corrected.<br><br>Writing code to create a desired effect.<br>Using a range of programming commands.<br>Using repetition within a program.<br><br>Amending code within a live scenario.<br><br>Using logical thinking to explore software more independently, making predictions based on their previous experience.<br><br>Using a software programme (Scratch) to create music.<br><br>Identify ways to improve and edit programs, videos, images etc. | Relating binary signals (Boolean) to the simple character-based language, ASCII.<br>Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations.<br><br>Understanding how data is collected in remote or dangerous places.<br><br>Understanding how data might be used to tell us about a location.<br><br>Learn about different forms of communication that have developed with the use of technology. | Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.<br><br>Writing code to create a desired effect.<br>Using a range of programming commands.<br>Using repetition within a program.<br><br>Using logical thinking to explore software more independently, making predictions based on their previous experience.<br><br>Identify ways to improve and edit programs, videos, images etc. | | Understanding how bit patterns represent images as pixels.<br><br>Using logical thinking to explore software more independently, making predictions based on their previous experience.<br><br>Independently learning how to use 3D design software package TinkerCAD.<br><br>Learn about different forms of communication that have developed with the use of technology. |
| **Software used** | Chrome<br>Google | Chrome<br>Scratch | Chrome | Chrome<br>Micrbit.org | Chrome<br>Stop Motion Animator | Chrome<br>Tinkercad |
| **Vocabulary** | Algorithm, Appropriate, Copyright, Correct, Credit, Data leak, Deceive, Fair, Fake, Inappropriate, Incorrect, Index, Information, Keywords, Network, Privacy, Rank, Real, Search engine, TASK, Web crawler, Website | Scratch, Predict, Programming, Music, Typing, Spacing, Performance, Coding, Error, Command, Instructions, Debugging | 8-bit binary, Addition, ASCII, Binary code, Boolean Byte, Communicate, Construction, CPU, Data transmission, Decimal numbers, Design, Discovery, Distance, Hexadecimal, Input, Instructions, Internet, Mars Rover, Moon, Numerical data, Output, Planet, Radio signal, RAM, Research, Scientist, Sequence, Signal, Simulation, Space, Subtraction, Technology, Transmit | Device, Micro:bit, Webpage, Pairing, App, Menu, Instructions, Screen, Wireless, Wifi, Wires, Laptop, Desktop, Connection, USB, Download, Program, Coding, Internet, Animation, Input | Animation, Animator, Background, Character, Decomposition, Design, Digital device, Edit, Evaluate, Flip book, Fluid movement, Frames Model, Moving images, Onion skinning, Still images, Stop motion, Storyboard, Thaumatrope, Zoetrope | Input, Output, Memory, Pixel, Binary image, ROM CPU, RAM, Fetch, decode, execute cycle, Algorithm, Operating system |
| **Online safety session** | Lesson 1: Online protection<br>To understand how apps can access our personal information and how to alter the permissions | Lesson 2: Online communication<br>To be aware of the positive and negative aspects of online communication | Lesson 3: Online reputation<br>To understand how online information can be used to form judgements | Lesson 4: Online bullying<br>To discover ways to overcome bullying | Lesson 5: Online health<br>To understand how technology can affect health and wellbeing | |
| **Education for a connected world** | <u>Privacy and security</u><br><br>I can explain what a strong password is and demonstrate how to create one.<br><br>I can explain how many free apps or services may read and share private information (e.g. friends, contacts, likes, images, videos, voice, messages, geolocation) with others.<br><br>I can explain what app permissions are and can give some examples.<br><br><u>Health, well-being and lifestyle</u><br><br>I can explain how and why some apps and games may request or take payment for additional content (e.g. in-app purchases, loot boxes) and explain the importance of seeking permission from a trusted adult before purchasing. | <u>Online relationships</u><br><br>I can give examples of technology specific forms of communication (e.g. emojis, memes and GIFs).<br>I can explain that there are some people I communicate with online who may want to do me or my friends harm. I can recognise that this is not my / our fault.<br><br>I can describe some of the ways people may be involved in online communities and describe how they might collaborate constructively with others and make positive contributions. (e.g. gaming communities or social media groups).<br><br>I can explain how someone can get help if they are having problems and identify when to tell a trusted adult.<br><br>I can demonstrate how to support others (including those who are having difficulties) online.<br><br><u>Online bullying</u><br><br>I can describe how what one person perceives as playful joking and teasing (including 'banter') might be experienced by others as bullying.<br><br>I can explain how to block abusive users. | <u>Online reputation</u><br><br>I can search for information about an individual online and summarise the information found.<br><br>I can describe ways that information about anyone online can be used by others to make judgments about an individual and why these may be incorrect. | <u>Online bullying</u><br><br>I can recognise online bullying can be different to bullying in the physical world and can describe some of those differences.<br><br>I can explain how anyone can get help if they are being bullied online and identify when to tell a trusted adult.<br><br>I can identify a range of ways to report concerns and access support both in school and at home about online bullying.<br><br>I can describe the helpline services which can help people experiencing bullying, and how to access them (e.g. Childline or The Mix). | <u>Health, wellbeing and lifestyle</u><br><br>I can describe ways technology can affect health and well-being both positively (e.g. mindfulness apps) and negatively.<br><br>I can describe some strategies, tips or advice to promote health and wellbeing with regards to technology.<br><br>I recognise the benefits and risks of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals. | |

# YEAR 6

COMPUTING Progression Overview

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| **Big Idea** | Agents For Change | Heroes from History | Ancient Ancestors | Ancient Ancestors | Where in the World | Through the Ages |
| **Kapow Unit** | Computing systems and networks + 1 online safety | Programming Python + 1 online safety | Data handling 1 + 1 online safety | Data handling 2 + 1 online safety | Creating media History of computers + 1 online safety | Skills Showcase inventing + 1 online safety |
| **Big Idea Link** | Discrete | Discrete | Discrete | Discrete | Discrete | Discrete |
| **National Curriculum** | 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 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 | Design, write and debug programs that accomplish specific goals.

Use sequence, selection, and repetition in programs.

Solve problems by decomposing them into smaller parts.

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact | 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. | 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.

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. | 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.

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. | 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. |
| **Lessons** | Lesson 1: Secret codes – To understand that there are lots of different types of secret codes

Lesson 2: Brute force hacking – To understand the importance of having a secure password

Lesson 3: Bletchley Park –To understand the importance of Bletchley Park to the World War II war effort

Lesson 4: Computing heroes – To understand about some of the historical figures that contributed to technological advances in computing

Lesson 5: Computing heroes part 2 – To research and present information about historical figures in computing | Lesson 1 – Introduction to MSWLogo.

Lesson 2 – Learning to understand nested loops

Lesson 3 – Learning to understand basic Python commands

Lesson 4 – Learning To use loops when programming

Lesson 5 – Learning to understand the use of random numbers | Lesson 1: Barcodes – To identify how barcodes and QR codes work

Lesson 2: Transmitting data – To explore how infrared waves transmit data

Lesson 3: RFID – To recognise the uses of RFID

Lesson 4: Using RFID – To input and analyse real-world data

Lesson 5: Transport data – To analyse and evaluate data | Lesson 1: Transferring data – To explain how data can be safely transferred

Lesson 2: Data usage – To investigate the data usage of online activities

Lesson 3: The Internet of Things – To identify how data analysis can improve city life

Lesson 4: Designing a smart school – To design a system for turning a school into a smart school

Lesson 5: Smart school presentation – To present ideas for turning a school into a smart school | Lesson 1: Playing with sound – To tinker with sound

Lesson 2: Radio plays – To record, edit and add sound effects to a radio play

Lesson 3: First computers – To understand how computers have changed and the impact this has had on the modern world

Lesson 4: Computers that changed the world – To research one of the computers that changed the world and present information about it to the class

Lesson 5: Future computer – To design a computer of the future | Lesson 1: Invention design – To design an electronic product

Lesson 2: Coding and debugging – To code and debug a program

Lesson 3: Computer Aided Design (CAD)

Lesson 4: My product's website – To create a website

Lesson 5: Video advert – To create and edit a video

Lesson 6: Persuasive advertisements – To understand the techniques used in advertising a product |
| **Skills** | Learning about the history of computers and how they have evolved over time.

Using past experiences to help solve new | Debugging quickly and effectively to make a program more efficient

Remixing existing code to explore a problem | Understanding and identifying barcodes, QR codes and RFID.

Identifying devices and applications that can scan | Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files). | Learning about the history of computers and how they have evolved over time.

Using the understanding of historic computers to | Using past experiences to help solve new problems.

Writing increasingly complex algorithms for a |

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|---|---|---|---|---|---|---|
| | problems.<br><br>Writing increasingly complex algorithms for a purpose.<br><br>Debugging quickly and effectively to make a program more efficient.<br><br>Remixing existing code to explore a problem.<br><br>Changing a program to personalise it.<br><br>Evaluating code to understand its purpose.<br><br>Predicting code and adapting it to a chosen purpose.<br><br>Using search and word processing skills to create a presentation.<br><br>Understanding how search engines work.<br><br>Understanding the importance of secure passwords and how to create them.<br><br>Using search engines safely and effectively. | Using and adapting nested loops<br><br>Programming using the language Python<br><br>Changing a program to personalise it<br><br>Evaluating code to understand its purpose<br><br>Predicting code and adapting it to a chosen purpose<br><br>Altering a website's code to create changes | or read barcodes, QR codes and RFID.<br><br>Understanding how barcodes, QR codes and RFID work.<br><br>Gathering and analysing data in real time. Creating formulas and sorting data within spreadsheets.<br><br>Learning how 'big data' can be used to solve a problem or improve efficiency. | Understanding that computer networks provide multiple services.<br><br>Using search and word processing skills to create a presentation.<br><br>Creating formulas and sorting data within spreadsheets.<br><br>Learning about the Internet of Things and how it has led to 'big data'.<br><br>Learning how 'big data' can be used to solve a problem or improve efficiency. | design a computer of the future.<br><br>Using search and word processing skills to create a presentation.<br><br>Planning, recording and editing a radio play. Creating and editing sound recordings for a specific purpose. | purpose.<br><br>Debugging quickly and effectively to make a program more efficient.<br><br>Remixing existing code to explore a problem.<br><br>Changing a program to personalise it. Evaluating code to understand its purpose. Predicting code and adapting it to a chosen purpose.<br><br>Using logical thinking to explore software independently, iterating ideas and testing continuously.<br><br>Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.<br><br>Using design software TinkerCAD to design a product.<br><br>Creating a website with embedded links and multiple pages.<br><br>Understanding how search engines work. Using search engines safely and effectively. |
| **Software used** | Chrome<br>Scratch<br>Google sites | Chrome<br>Logo<br>Trinket | Chrome | Chrome<br>Google sheets | Chrome<br>Soundtrap<br>TinkerCad<br>Google Slides | Chrome<br>TinkerCad<br>Scratch<br>Google Slides |
| **Vocabulary** | Acrostic Code, Brute force hacking, Caesar cipher, Chip and pin system, Cipher, Code, Combination, Contribute, Convince, Date shift cipher, Discovery, Hero, Invention, Nth Letter Cipher, Password, Pig Latin, Pigpen cipher, Present, Scrambled, Secret, Secure, Technological advancement, Trial and error | Loop, Code, Command, Patterns, Instructions, Shape, Repeat | Algorithms, Barcode, Binary, Boolean, Brand, Chips Commuter, Contactless, Data, Encrypted, Infrared, MagicBand, Privacy, Proximity, QR code, QR scanner, Radio waves, RFID (radio frequency identification), Signal, Systems/data analyst, Transmission, Wireless | Big Data, Bluetooth, Corrupted, Data, Energy, GPS, Improve, Infrared, Internet of Things, Personal Privacy, QR codes, Revolution, RFID, SIM, Simulation, Smart city, Smart school, Stop motion, Threat, WiFi, Wireless | Background noise, Byte, Computer, Devices, File, FX, Gigabyte, Graphics, Hard drive, Hardware, Kilobytes, Megabyte, Memory storage, Mouse, Operating system, Overlay, Play, Processor, audio play, RAM, Raspberry Pi, Record, Reverb, ROM, Script, Smartphone, Sound, Sound effects, Terabytes, Touch screen, Track, Trackpad, Trailer | Adapt, Advert, Algorithm, Bugs, Coding, Debugging, Design, Edit, Electronic, Evaluate, Facts, Image rights, Images, Influence, Information, Inputs, Loops, Manipulation, Opinions, Output, Photos, Product, Program, Repetition, Screenshot, Search engine Selection, Sequence, Snippets, Software, Structures, Variables, Video, Website |
| **Online safety session** | Lesson 1 – Life online<br>To describe issues online that give us negative feelings and know ways to get help | Lesson 2 – sharing online<br>To think about the impact and consequences of sharing online | Lesson 3 – Creating a positive online reputation<br>To know how to create a positive online reputation | Lesson 4 – Capturing evidence<br>To be able to describe how to capture bullying content as evidence | Lesson 5 – Password security<br>To manage personal passwords effectively | Lesson 6 – Think before you click<br>To be aware of strategies to help be protected online |
| **Education for a connected world** | Self-image and identity<br><br>I can describe issues online that could make anyone feel sad, worried, uncomfortable or frightened. I know and can give examples of how to get help, both on and offline<br><br>I can explain the importance of asking until I get the help needed | Online Relationships<br><br>I can explain how sharing something online may have an impact either positively or negatively.<br><br>I can describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and how to support them if others do not.<br><br>I can describe how things shared privately online can have unintended consequences for others. e.g. screen-grabs.<br><br>I can explain that taking or sharing inappropriate images of someone (e.g. embarrassing images), even if they say it is okay, may have an impact for the sharer and others; and who can help if someone is worried about this. | Online Reputation<br><br>I can explain the ways in which anyone can develop a positive online reputation.<br><br>I can explain strategies anyone can use to protect their 'digital personality' and online reputation, including degrees of anonymity | Online Bullying<br><br>I can describe how to capture bullying content as evidence (e.g screen grab, URL, profile) to share with others who can help me | Privacy and Security<br><br>I can describe effective ways people can manage passwords (e.g. storing them securely or saving them in the browser)<br><br>I can explain what to do if a password is shared, lost or stolen | Privacy and Security<br><br>I can describe how and why people should keep their software and apps up to date, e.g. auto updates.<br><br>I can describe simple ways to increase privacy on apps and services that provide privacy settings.<br><br>I can describe ways in which some online content targets people to gain money or information illegally; I can describe strategies to help me identify such content (e.g. scams, phishing)<br><br>I know that online services have terms and conditions that govern their use |