

At Burton Primary School, we have implemented the Kapow (from January, 2023 onwards) Computing scheme into our Computing teaching. The Computing scheme offers a progressive and sequenced teaching of the National Curriculum, where each unit taught works towards the end of Key Stage attainment targets.

The Kapow scheme of work fulfils the statutory requirements in the National Curriculum (2014). The National Curriculum for Computing aims to ensure that all pupils are exposed to a 'high-quality computing education which equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.' (National Curriculum, 2014)

'The National Curriculum for computing aims to ensure that all pupils:

- Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- Can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- Can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- Are responsible, competent, confident and creative users of information and communication technology.'

The National Curriculum identifies three strands (**Digital Literacy**, **Information Technology** and **Computer Science**), which the KAPOW Scheme covers through five units: **Computing systems and networks**; **Programming**, **Creating media**, **Data handling** and **Online Safety** (we cover this through a separate scheme- NOS). Using KAPOW's condensed curriculum, each unit is covered through every year group to ensure the coverage of both skills and knowledge

| 1. Digital literacy                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <ul style="list-style-type: none"> <li>• use technology purposefully to create, organise, store, manipulate and retrieve digital content (KS1)</li> <li>• 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. (KS1)</li> </ul> | <ul style="list-style-type: none"> <li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. (KS2)</li> <li>• Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration (KS2)</li> <li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (KS2)</li> </ul>                                                                                                             |
| 2. Information Technology                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>• Recognise common uses of information technology beyond school (KS1)</li> </ul>                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>• Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration (KS2)</li> <li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (KS2)</li> <li>• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information (KS2)</li> </ul> |
| 3. Computer Science                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions (KS1)</li> <li>• Create and debug simple programs (KS1)</li> <li>• Use logical reasoning to predict the behaviour of simple programs (KS1)</li> </ul>                               | <ul style="list-style-type: none"> <li>• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (KS2)</li> <li>• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (KS2)</li> <li>• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (KS2)</li> <li>• Select, use and combine a variety of software (including internet services) on</li> </ul>                                                                                                      |

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|  | 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 (KS2) |
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Each unit enables children to build skills and knowledge towards exciting outcomes while offering opportunities for teachers to develop the learning for the needs of their children and their specific curriculum. Children use their technological devices to apply skills and knowledge throughout each unit.

### Progression of skills in each Kapow unit

| Computing Science:                                                                                                |                  |                                                                                                               |                                                                                                                               |                                                                          |                                                                                                                               |
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| Year group/phase:<br>Strands:  | EYFS (Reception) | End of Key Stage 1<br>Year 1<br>Year 2                                                                        | End of Lower Key Stage 2<br>Year 3<br>Year 4                                                                                  | Year 5                                                                   | Year 6                                                                                                                        |
| Hardware                                                                                                          |                  | Learning how to operate a camera or tablet to take photos and videos. Learning how to explore and tinker with | Understanding what the different components of a computer do and how they work together. Drawing comparisons across different | Learning that external devices can be programmed by a separate computer. | Learning about the history of computers and how they have evolved over time. Using the understanding of historic computers to |

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|                                  |  | <p>hardware to find out how it works. Learning where keys are located on the keyboard.</p> <p>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. Developing confidence with the keyboard and the basics of touch typing.</p> | <p>types of computers. Learning about the purpose of routers.</p> <p>Using tablets or digital cameras to film a weather forecast. Understanding that weather stations use sensors to gather and record data which predicts the weather.</p>                                                                           |                                                                                                                                                                                                                                                                            | <p>design a computer of the future. Understanding and identifying barcodes, QR codes and RFID. Identifying devices and applications that can scan or read barcodes, QR codes and RFID.</p> |
| Networks and data representation |  | N/A                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Understanding the role of the key components of a network. Identifying the key components within a network, including whether they are wired or wireless. Understanding that websites and videos are files that are shared from one computer to another. Learning about the role of packets. Understanding how</p> | <p>Learning the vocabulary associated with data: data and transmit. Recognising that computers transfer data in binary and understanding simple binary addition. Learning that messages can be sent by binary code, reading binary up to eight characters and carrying</p> | N/A                                                                                                                                                                                        |

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|                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>networks work and their purpose. Recognising links between networks and the internet. Learning how data is transferred.</p> <p>Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</p>                                                                                                                                                                                                             | out binary calculations.                                                                                                                                                                                                         |                                                                                                                                                    |
| Computational thinking |  | <p>Learning that decomposition means breaking a problem down into smaller parts. 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.</p> <p>Articulating what decomposition is.</p> | <p>Using decomposition to explain the parts of a laptop computer. 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.</p> <p>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</p> | Decomposing animations into a series of images. Decomposing a story to be able to plan a program to tell a story. Predicting how software will work based on previous experience. Writing more complex algorithms for a purpose. | Decomposing a program into an algorithm. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose. |

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|             |  | 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.                                                                                                           | activities. Using abstraction to identify the important parts when completing both plugged and unplugged activities.                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                |
| Programming |  | <p>Programming a Floor robot to follow a planned route. Learning to debug instructions when things go wrong. Learning to debug an algorithm in an unplugged scenario.</p> <p>Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program.</p> | <p>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.</p> <p>Creating algorithms for a specific purpose. Coding a simple game. Using abstraction and pattern recognition to modify code. Incorporating variables to make code more efficient.</p> | 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. | Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Using and adapting nested loops. Programming using the language Python. Changing a program to personalise it. Evaluating code to understand its purpose. Predicting code and adapting it to a chosen purpose. |

| Year group/phase:<br>Strands: ↓   | EYFS (Reception) | End of Key Stage 1<br>Year 1:<br>Year 2:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | End of Lower Key Stage 2<br>Year 3:<br>Year 4:                                                                                                                                                                                                                                                               | Year 5                                                                                                                                                                                                                                                                                                                                                                       | Year 6                                                                                                                                                                            |
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| Using software                    |                  | <p>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.</p> <p>Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using word processing software to type and reformat text. Using software (and unplugged means) to create story animations. Creating and labelling images.</p> | <p>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.</p> <p>Use online software for documents, presentations, forms and spreadsheets. Using software to work collaboratively with others.</p> | <p>Using logical thinking to explore software more independently, making predictions based on their previous experience. Using software programme Sonic Pi/Scratch to create music. Using the video editing software to animate. Identify ways to improve and edit programs, videos, images etc. Independently learning how to use 3D design software package TinkerCAD.</p> | <p>Using logical thinking to explore software more independently, iterating ideas and testing continuously. Using search and word processing skills to create a presentation.</p> |
| Using email and internet searches |                  | Recognising devices that are connected to the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Understanding why some results come before others                                                                                                                                                                                                                                                            | Developing searching skills to help find relevant                                                                                                                                                                                                                                                                                                                            | Understanding how search engines work.                                                                                                                                            |

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|                         |  | <p>internet. Understanding that we are connected to others when using the internet.</p> <p>Searching for appropriate images to use in a document.</p>                                          | <p>when searching. Understanding that information found by searching the internet is not all grounded in fact. Searching the internet for data.</p>                                                                                          | <p>information on the internet.</p>                                                                                                         |                                                                                                                                                               |
| Using data              |  | <p>Collecting and inputting data into a spreadsheet. Interpreting data from a spreadsheet.</p>                                                                                                 | <p>Understanding that data is used to forecast weather. Recording data in a spreadsheet independently. Sorting data in a spreadsheet to compare using the 'sort by...' option. Designing a device which gathers and records sensor data.</p> | <p>Understanding how data is collected in remote or dangerous places. Understanding how data might be used to tell us about a location.</p> | <p>Understanding how barcodes, QR codes and RFID work. Gathering and analysing data in real time. Creating formulas and sorting data within spreadsheets.</p> |
| Wider use of technology |  | <p>Recognising common uses of information technology, including beyond school. Understanding some of the ways we can use the internet. Learning how computers are used in the wider world.</p> | <p>Recognising how social media platforms are used to interact. Understanding that software can be used collaboratively online to work as a team.</p>                                                                                        | <p>Learn about different forms of communication that have developed with the use of technology</p>                                          | <p>Learning how 'big data' can be used to solve a problem or improve efficiency.</p>                                                                          |

| Year group/phase:<br>Strands:  | EYFS (Reception) | End of Key Stage 1<br>Year 1<br>Year 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | End of Lower Key Stage 2<br>Year 3<br>Year 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Year 5                                                                                                                                                                                                                                                                                                                                               | Year 6                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| Online Safety                                                                                                   |                  | <p>Logging in and out and saving work on their own account. 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 what we post.</p> <p>Learning how to create a strong password. Understanding how to stay safe when talking to people online and what to do if they see or hear something online</p> | <p>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. Learning about cyberbullying. Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.</p> <p>Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others. Learning to make judgements about the accuracy of online searches. Identifying forms of advertising online. Recognising what appropriate behaviour is when collaborating with</p> | <p>Identifying possible dangers online and learning how to stay safe. Evaluating the pros and cons of online communication. Recognising that information on the internet might not be true or correct and learning ways of checking validity. Learning what to do if they experience bullying online. Learning to use an online community safely</p> | <p>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 create them. Learning strategies to capture evidence of online bullying in order to seek help. Using search engines safely and effectively. Recognising that updated software can help to prevent data corruption and hacking</p> |

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|  |  | that makes them feel upset or uncomfortable<br>Identifying whether information is safe or unsafe to be shared online. 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. | others online. Reflecting on the positives and negatives of time spent online. Identifying respectful and disrespectful online behaviour. |  |  |
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