Burbage Primary School Computing Curriculum

Intent

At Burbage, we aim for our pupils to be masters of technology and not slaves to it. Technology is everywhere and will play a pivotal part in students' lives,. Therefore, we want to model and educate our pupils on how to use technology positively, responsibly and safely. We want our pupils to be creators not consumers and our broad curriculum encompassing computer science, information technology and digital literacy reflects this. We want our pupils to understand that there is always a choice with using technology and as a school we utilise technology positively. We recognise that the best prevention for a lot of issues we currently see with technology/social media is through education. Building our knowledge in this subject will allow pupils to effectively demonstrate their learning through creative use of technology and recognise that technology can allow pupils to share their learning in creative ways. We also understand the accessibility opportunities technology can provide for our pupils. Our knowledge rich curriculum has to be balanced with the opportunity for pupils to apply their knowledge creatively which will in turn help our pupils become skilful computer scientists. We encourage staff to try and embed computing across the whole curriculum to make learning creative and accessible. We want our pupils to be fluent with a range of tools to best express their understanding and hope by Upper Key Stage 2, children have the independence and confidence to choose the best tool to fulfil the task and challenge set by teachers.

Implementation

We encourage children to embrace technology and to have a life-long love of learning. Through a progressive skills-based curriculum, we aim to develop confident, independent learners who are able to use technology safely and responsibly. At Burbage Primary School, Computing is taught in discreet computing lessons. Our scheme of work for Computing is adapted from the 'Teach Computing' Curriculum and covers all aspects of the National Curriculum. This scheme was chosen as it has been created by subject experts and based on the latest pedagogical research.

Every lesson in our computing curriculum can be effectively taught using the infrastructure we have in place at school and so that it can meet the needs of all our pupils. Our chosen scheme has been closely referenced against the 2014 National Curriculum attainment targets in order to ensure progression and

coverage as well and enabling children to enter the next stage of their education feeling empowered by technology. Knowledge and skills are mapped across each topic and year group to ensure systematic progression.

A key part of implementing our computing curriculum is to ensure that safety of our pupils is paramount. We take online safety very seriously and we aim to give children the necessary skills to keep themselves safe online. Children have a right to enjoy childhood online, to access safe online spaces and to benefit from all the opportunities that a connected world can bring them, appropriate to their age and stage.

Impact

Computing skills are a major factor in enabling children to be confident, creative and independent learners and it is our intention that children have every opportunity available to allow them to achieve this. At the end of each year, pupils have developed their computing skills, and have gained a new understanding of online safety issues and how to keep themselves safe online.

We encourage our children to enjoy and value the computing curriculum we deliver. We will constantly ask the *why* behind their learning and not just the *how*. We want learners to discuss, reflect and appreciate the impact computing has on their learning, development and well-being. Finding the right balance with technology is key to an effective education and a healthy life-style. We feel the way we implement computing helps children realise the need for the right balance and one they can continue to build on in their next stage of education and beyond.

We encourage regular discussions between staff and pupils to best embed and understand this. The way pupils showcase, share, celebrate and publish their work will best show the impact of our curriculum. We also look for evidence through reviewing pupil's knowledge and skills digitally through a range of ways such as digital enf of unit projects, written work and discussion of experiences.

Through discussion and feedback, children talk enthusiastically about their computing lessons and speak about how they love learning on the computer. Children across the school articulate well about the potential risks of being online, and can talk about ways to keep safe.

Ultimately, the school vision is achieved - to *inspire and nurture together*. Children are inspired by technology and nurtured through the curriculum and understand how to be safe.

Curriculum Coverage

At Burbage, we deliver lessons in discreet *blocks*.

		Autumn Term	Spring Term	Summer Term
Key Stage 1	Year 1	**Computing Systems and Networks** (Technology All Around Us)	**Creating Media** (Digital Painting)	**Programming** (Moving a Robot)
	Year 2	**Computing Systems and Networks** (IT All Around Us)	**Digital Media** (Making Music)	**Programming** (Quizzes)
Lower Key Stage 2	Year 3	**Computing Systems and Networks** (Connecting Computers)	**Creating Media** (Stop-Frame Animation)	**Programming** (Sequencing Sounds)
	Year 4	**Computing Systems and Networks** (The Internet)	**Creating Media** (Photo Editing)	**Programming** (Repetition in Shapes)
Upper Key Stage 2	Year 5	**Computing Systems and Networks** (Systems and Searching)	**Data and Information** (Flat-file Databases)	**Programming** (Selection in Quizzes)
	Year 6	**Computing Systems and Networks** (Communication and Collaboration)	**Data and Information** (Introduction to Spreadsheets)	**Programming** (Variables in Games)

Year 1

Computing Systems and Networks: Technology All Around Us
Unit Overview: Develop an understanding of technology and how it can help them. They will become more familiar with the different components of a computer by developing their keyboard and mouse skills, and also start to consider how to use technology responsibly.

Unit Outcomes:	**National Curriculum Links:**
• Identify examples of technology and explain how they can help us • Recognise that a computer is an example of technology • Describe what a keyboard is for • Know a computer stores work in files • Give examples of rules to keep them safe and healthy when they are using technology in and beyond the home	• Recognise common uses of information technology beyond school • 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.
Applications / Software / Hardware Needed: • Paintz.app https://paintz.app/ • Mouse (not essential) • Microsoft Word	

Digital Media: Digital Painting	
Unit Overview: Explore the world of digital art and its exciting range of creative tools. Empower children to create their own paintings, while getting inspiration from a range of other artists. Conclude by asking them to consider their preferences when painting with, and without, the use of digital devices.	
Unit Outcomes: • Explain what different freehand tools do • Recognise that computers can be used to create a range of art • Recognise a tool can be adjusted	**National Curriculum Links:** • Use technology purposefully to create, organise, store, manipulate, and retrieve digital content
Applications / Software / Hardware Needed: • Paintz.app / Microsoft Paint https://paintz.app/	

Programming: Moving a Robot

Unit Overview:
An introduction to early programming concepts. Children will explore using individual commands, both with other learners and as part of a computer program. They will identify what each floor robot command does and use that knowledge to start predicting the outcome of programs. Learners are also introduced to the early stages of program design through the introduction of algorithms.

Unit Outcomes:	**National Curriculum Links:**
• Explain what a given command does • Predict the outcome of a sequence involving up to four commands • Match a command to an outcome • Understand that a program is a set of commands that a computer can run • Know that a series of instructions can be issued before they are enacted	• 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 • Recognise common uses of information technology beyond school

Applications / Software / Hardware Needed:
- Beebots

Year 2

Computing Systems and Networks: IT All Around Us

Unit Overview:
Understand how is information technology (IT) is being used for good in our lives. An initial focus on IT in the home, learners explore how IT benefits society in places such as shops, libraries, and hospitals. Whilst discussing the responsible use of technology, and how to make smart choices when using it.

Unit Outcomes:	**National Curriculum Links:**
• Know what information technology is • Understand how IT is used in school and in the wider world • Use IT safely • Use IT in different ways.	• 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.

Applications / Software / Hardware Needed:

- Microsoft PowerPoint

Digital Media: Making Music

Unit Overview:

Create patterns and use those patterns to make music with both percussion instruments and digital tools. They will also create different rhythms and tunes, using the movement of animals for inspiration. Finally, learners will share their creations and compare creating music digitally and non-digitally.

Unit Outcomes:

- Reflect on a piece of music
- Follow a rhythm pattern
- Understand that a computer can generate different sounds
- Understand that a computer can be used to make a sequence of notes

National Curriculum Links:

- 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

Applications / Software / Hardware Needed:

- Chrome Music Lab
  https://musiclab.chromeexperiments.com/

Programming: Quizzes

Unit Overview:

An introduction to early programming concepts. Children will explore using individual commands, both with other learners and as part of a computer program. They will identify what each floor robot command does and use that knowledge to start predicting the outcome of programs. Learners are also introduced to the early stages of program design through the introduction of algorithms.

Unit Outcomes:

- Know that a sequence can be started using a variety of event blocks
- Know that a sequence has an outcome, and identify different programs that have the same outcome

National Curriculum Links:

- 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

• Know the backgrounds can be changed through the programming blocks • Understand the role of the numbers on ScratchJr blocks	• Use logical reasoning to predict the behaviour of simple programs • Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Use logical reasoning to predict the behaviour of simple programs
Applications / Software / Hardware Needed: • iPads • Scratch Jr	

Year 3

Computing Systems and Networks: Connecting Computers	
Unit Overview: Learners will develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They will also compare digital and non-digital devices. Next, learners will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, learners will discover the benefits of connecting devices in a network.	
Unit Outcomes: • Explain that digital devices accept inputs and produce outputs • Explain what makes a secure password • Classify input and output devices • Describe a simple process • Design a digital device	**National Curriculum Links:** • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • 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

Applications / Software / Hardware Needed:

- Know the location of the school's:
- Server
- Switch
- Wireless access points

Digital Media: Stop Frame Animation	
Unit Overview: Learners will use a range of techniques to create a stop-frame animation. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text. This unit uses the context of Romans, but this can be adapted to suit your curriculum topics.	
Unit Outcomes: • Create an animation where movement is smooth • The animation follows the storyboard • Evaluate and improve animation. • Add some additional media	**National Curriculum Links:** • 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

Applications / Software / Hardware Needed:

- iPads
- iMotion (application)

Programming: Sequencing Sounds
Unit Overview:

This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.

Unit Outcomes:

- Choose a name that describes the action of the sprite
- Choose relevant backdrops and costumes
- Create an algorithm for each sprite
- Explain what sequence means and demonstrate it in an algorithm
- Adapt their code for additional named sprites
- Explain why the code is in thar particular sequence
- Run their code and identify if it meets the requirements of the task

National Curriculum Links:

- 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

Applications / Software / Hardware Needed:

- iPads (optional)
- Scratch Jr

Year 4

Computing Systems and Networks: The Internet

Unit Overview:

Learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet and will be given opportunities to explore the World Wide Web for

themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.

Unit Outcomes:	**National Curriculum Links:**
• To describe how networks physically connect to other networks • To recognise how networked devices make up the internet • To outline how websites can be shared via the World Wide Web (WWW) • To describe how content can be added and accessed on the World Wide Web (WWW) • To recognise how the content of the WWW is created by people • To evaluate the consequences of unreliable content	• Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Applications / Software / Hardware Needed:
- Devices with internet access
- Chrome Music Lab

Digital Media: Photo Editing

Unit Overview:
Learners will use a range of techniques to create a stop-frame animation. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text. This unit uses the context of Romans, but this can be adapted to suit your curriculum topics.

Unit Outcomes:	**National Curriculum Links:**
• To explain that the composition of digital images can be changed • To explain that colours can be changed in digital images • To explain how cloning can be used in photo editing • To explain that images can be combined	• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of

• To combine images for a purpose • To evaluate how changes can improve an image	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
Applications / Software / Hardware Needed: • Getpaint (download required) https://www.getpaint.net/download.html	

Programming: Repetition in Shapes	
Unit Overview: Learners will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language. This unit is the first of the two programming units in Year 4 and looks at repetition and loops within programming.	
Unit Outcomes: • To identify that accuracy in programming is important • To create a program in a text-based language • To explain what 'repeat' means • To modify a count-controlled loop to produce a given outcome • To decompose a task into small steps • To create a program that uses count-controlled loops to produce a given outcome	**National Curriculum Links:** • 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
Applications / Software / Hardware Needed: • Turtle Academy https://turtleacademy.com/lessons	

Year 5

Computing Systems and Networks: Systems and Searching

Unit Overview:

Learners develop their understanding of computer systems and how information is transferred between systems and devices. Learners consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Learners discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines.

Unit Outcomes:	**National Curriculum Links:**
• To explain that computers can be connected together to form systems • To recognise the role of computer systems in our lives • To identify how to use a search engine • To describe how search engines select results • To explain how search results are ranked • To recognise why the order of results is important, and to whom	• 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

Applications / Software / Hardware Needed:

- Internet
- Search engine

Data and Information: Flat-file Databases

Unit Overview:

This unit looks at how a flat-file database can be used to organise data in records. Learners will use tools within a database to order and answer questions about data. They will create graphs and charts from their data to help solve problems. They will also use a real-life database to answer a question, and present their work to others.

Unit Outcomes:	**National Curriculum Links:**

• To use a form to record information • To compare paper and computer-based databases • To outline how you can answer questions by grouping and then sorting data • To explain that tools can be used to select specific data • To explain that computer programs can be used to compare data visually • To use a real-world database to answer questions	• 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
Applications / Software / Hardware Needed: • Data Platform – J2e https://www.j2e.com/database/ • Microsoft Word • Microsoft Excel	

Programming: Selection in Quizzes	
Unit Overview: Learners will develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming and then learning how the 'if… then… else…' structure can be used to select different outcomes depending on whether a condition is 'true' or 'false'. They represent this understanding in algorithms, and then by constructing programs in the Scratch programming environment. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to design a quiz in response to a given task and implement it as a program. To conclude the unit, learners evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved.	
Unit Outcomes: • To explain how selection is used in computer programs • To relate that a conditional statement connects a condition to an outcome • To explain how selection directs the flow of a program • To design a program that uses selection • To create a program that uses selection • To evaluate my program	**National Curriculum Links:** • 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
Applications / Software / Hardware Needed: • Turtle Academy https://turtleacademy.com/lessons	

Year 6

Computing Systems and Networks: Communication and Collaboration	
Unit Overview: In this unit learners explore how data is transferred over the internet. Learners initially focus on addressing, before they move on to the makeup and structure of data packets. Learners then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate different methods of communication. Finally, they learn how to communicate responsibly by considering what should and should not be shared on the internet.	
Unit Outcomes: • To explain the importance of internet addresses • To recognise how data is transferred across the internet • To explain how sharing information online can help people to work together • To evaluate different ways of working together online • To recognise how we communicate using technology • To evaluate different methods of online communication •	**National Curriculum Links:** • 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
Applications / Software / Hardware Needed: • Microsoft PowerPoint	

Data and Information: Introduction to Spreadsheets	
Unit Overview: This unit introduces the learners to spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Learners will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. Learners will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Learners will use spreadsheets to plan an event and answer questions. Finally, learners will create charts, and evaluate their results in comparison to questions asked.	
Unit Outcomes: • To create a data set in a spreadsheet • To build a data set in a spreadsheet • To explain that formulas can be used to produce calculated data • To apply formulas to data • To create a spreadsheet to plan an event • To choose suitable ways to present data	**National Curriculum Links:** • 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
Applications / Software / Hardware Needed: • Microsoft Excel	

Programming: Selection in Quizzes
Unit Overview: This unit explores the concept of variables in programming through games in Scratch. First, learners find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, learners experiment with variables in an existing project, then modify them, before they create

<table>
<tr><td colspan="2">their own project. In Lesson 4, learners focus on design. Finally, in Lesson 6, learners apply their knowledge of variables and design to improve their games in Scratch.</td></tr>
<tr><td>Unit Outcomes:
To define a ‘variable’ as something that is changeable
To explain why a variable is used in a program
To choose how to improve a game by using variables
To design a project that builds on a given example
To use my design to create a project
To evaluate my project</td><td>National Curriculum Links:
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</td></tr>
<tr><td colspan="2">Applications / Software / Hardware Needed:
Scratch</td></tr>
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