Elburton Primary School

Computing Policy

	July 2022	Policy Review Date
1	July 2020	Policy Agreed
Version	**Date**	**Description**

Contents:

1. Curriculum Statement - Computing

Intent

In line with the 2014 National Curriculum for Computing, our aim is to provide a high-quality computing education which equips children to use computational thinking and creativity to understand and change the world. The curriculum will teach children key knowledge about how computers and computer systems work and how they are designed and programmed. Learners will have the opportunity to gain an understanding of computational systems of all kinds, whether or not they include computers.

By the time they leave Elburton, children will have gained key knowledge and skills in the three main areas of the computing curriculum: computer science (programming and understanding how digital systems work), information technology (using computer systems to store, retrieve and send information) and digital literacy (evaluating digital content and using technology safely and respectfully). The objectives within each strand support the development of learning across the key stages, ensuring a solid grounding for future learning and beyond.

Implementation

At Elburton, computing is taught using a blocked curriculum approach. This ensures children are able to develop depth in their knowledge and skills over the duration of each of their computing units. Teachers use the Purple Mash platform, which is based on the structure of the 'Switched On: Computing' scheme, published by Rising Stars, for the planning of their computing lessons, which are linked to engaging contexts in other subject areas where possible. We have a whole-school computing suite, LearnPad tablets in years 1 and 2 and a class set of Chrome Books within years 3-6 to ensure that all year groups have the opportunity to use a range of devices and programs for many purposes across the wider curriculum, as well as in discrete computing lessons. Embedding technology across other curriculum areas supports children to make connections and remember the key skills they have been taught.

The implementation of the curriculum also ensures a balanced coverage of computer science, information technology and digital literacy. The children will have experiences of all three strands in each year group, however the subject knowledge imparted becomes increasingly specific and in depth, with more complex skills being taught, thus ensuring appropriate progression throughout the school. For example, children in Key Stage 1 begin by learning what algorithms are, which leads them to the design stage of programming in Key Stage 2, where they design, write and debug programs, explaining the thinking behind their algorithms. This computational thinking is a key skill within this curriculum area and one which can be applied across a range of other subjects. Solving problems, refining ideas, drawing on prior learning and thinking logically, systematically and creatively are all skills that we teach the children at Elburton in order to be successful in computing.

Impact

Our approach to the curriculum results in a fun, engaging and high-quality computing education. The children are taught how computers and computer systems work; they design and build programs, develop their ideas using technology and create a range of content. Allowing children regular, meaningful access to a range of computer-based technology throughout the curriculum helps to embed these skills and develop their understanding. Through following a progressive, challenging programme of studies, the pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – to think computationally and become active participants in the digital world.

Evidence gathered from children's saved work, in their Computing exercise books and through observations carried out during lesson time is used to feed into teachers' future planning. As we continue to develop our foundation subject curriculum, we will seek opportunities to embed the skills taught during computing lessons, revisit misconceptions and knowledge gaps in computing and support children's learning to ensure that all pupils make good progress.

The subject-specific knowledge developed in our computing lessons equip pupils with experiences which will benefit them in secondary school, further education and future workplaces. From research methods, use of presentation and creative tools and critical thinking, computing at Elburton gives children the building blocks that enable them to pursue a wide range of interests and vocations in the next stage of their lives.

2. Teaching and Learning

Even though whole school co-ordination and support is essential to the development of Computing capability, it remains the responsibility of each teacher to deliver appropriate Computing activities and assist the co-ordinator in the monitoring and recording of pupil progress in Computing.
Teachers' own use of Computing in lessons is also an essential part of preparing engaging, fast moving, motivating lessons for pupils. The Computing co-ordinator will keep teachers up to date on the latest uses of Computing as a teaching tool; individual teachers then need to implement these tools into their lessons wherever possible.
Teachers are expected to follow the suggested units as outlined by the Purple Mash Computing Scheme of Work; however, they may be further adapted to topics as well as to the needs of the class.

3. Assessment

- **Formative Assessment**

- **Self-assessment**
  In line with the National Curriculum, children are taught to debug their own programs, use logical reasoning to explain simple algorithms (including their own) and detect and correct errors in both algorithms and programs.

- **Peer-assessment**
  The ideas of self-assessment suggested above translate naturally into peer assessment, with pupils working with a partner to review, and help correct, algorithms and programs, or provide critical, constructive feedback on digital content.

- **Open questioning**
  Pupils' knowledge of the concepts covered by the programme of study may not be immediately apparent in the work they produce. The use of open questioning during lesson time is one way in which their understanding of concepts can be gauged and developed at the point of teaching.

- **Discussion with Peers**
  Encouraging pupils to use similar open questions can be effective in allowing them to focus on what they've learned, rather than only on what they've done. The use of email has been used effectively as a tool for communication and collaboration when working on inter-class projects.

- **Target Setting**
  Project management skills such as planning, organising, motivating others and allocating resources, are of great importance in real-world projects, and they can be widely applied in education.

- **Storage of Work**
  Children's computing work is stored in a cloud-based system managed by Purple Mash. This provides privacy for the children as their accounts are password protected however these areas can be easily accessed by members of the teaching team for assessment purposes.

- **Summative Assessment**
  Using this form as a check list (taken from Computing at School), teachers are able to check the progress of their pupils as they progress through the different units across the school. This could become an interactive activity, where children become aware of their targets to work on.

NB: the numbers down the left hand side are not 'levels' as such; they are merely guides as to how the child is progressing. Purple Mash also provide a Progression of Skills Map which is available to view on the Elburton school website.

	CS	IT	DL
KS1 - 1	Understand what algorithms are Create simple programs	Use technology purposefully to create digital content Use technology purposefully to store digital content Use technology purposefully to retrieve digital content	Use technology safely Keep personal information private Recognise common uses of information technology beyond school
KS1 - 2	Understand that algorithms are implemented as programs on digital devices Understand that programs execute by following precise and unambiguous instructions Debug simple programs Use logical reasoning to predict the behaviour of simple programs	Use technology purposefully to organise digital content Use technology purposefully to manipulate digital content	Use technology respectfully Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies
KS2 -3	Write programs that accomplish specific goals Use sequence in programs Work with various forms of input Work with various forms of output	Use search technologies effectively Use a variety of software to accomplish given goals Collect information Design and create content Present information	Use technology responsibly Identify a range of ways to report concerns about contact
KS2 - 4	Design programs that accomplish specific goals Design and create program Debug programs that accomplish specific goals Use repetition in programs Control or simulate physical systems Use logical reasoning to detect and correct errors in programs Understand how computer networks can provide multiple services, such as the world wide web Appreciate how search results are selected	Select a variety of software to accomplish given goals Select, use and combine internet services Analyse information Evaluate information Collect data Present data	Understand the opportunities computer networks offer for communication Identify a range of ways to report concerns about content Recognize acceptable / unacceptable behaviour
KS2 -5	Solve problems by decomposing them into smaller parts Use selection in programs Work with variables Use logical reasoning to explain how some simple algorithms work Use logical reasoning to detect and correct errors in algorithms Understand computer networks including the internet Appreciate how search results are ranked	Combine a variety of software to accomplish given goals Select use and combine software on a range of digital devices Analyse data Evaluate data Design and create systems	Understand the opportunities computer networks offer for collaboration Be discerning in evaluating digital content

4. Planning and Resources

Planning: Purple Mash Units based on Rising Stars - Switched On Computing

The school uses the Purple Mash platform, which is linked to the *Rising Stars: Switched On Computing* scheme, as a starting point to deliver the programme of study. It covers the programme of study for computing, including programming and computational thinking. This scheme supports clear progression of skills from Years 1 to 6, with early years using the EYFS Profile targets to prepare the children for the work that will be covered in the following years. The Purple Mash computing scheme supports teachers of all levels of experience as it provides software demos and detailed step-by-step planning. Throughout the scheme, E-Safety is embedded to ensure the safe and responsible use of technology. All of the medium term plans and lesson plans can be accessed via the Purple Mash platform and each year group teacher has a login to access this as part of the admin tool.

Resources

- **Computing Suite**
  There are 31 computers, each having access to a range of programmes that can meet the needs of the Computing programme of study. These machines are all networked on the school's intranet to enable all users to login to their own, secure work area.

- **LearnPads**
  We have approximately 100 LearnPads, used mainly in KS1, to support independent learning in any area around the school grounds; mostly they allow computing work to take place in the classroom environment however they may be used outside where they remain connected to the school's Wi-Fi.

- **Chrome Books:**
  We have a class set (31) Chrome Books within each year group from years 3-6. These can be accessed by the children at any time to support their learning in all curriculum areas, not just Computing. Each year group set is stored and charged within a trolley for ease of access.

- **iPads**
  Each teacher has an iPad for assessment purposes. These are also regularly used as a tool to celebrate learning across all curriculum areas; for example, photos of children undertaking activities and completing work in the Foundation stage and in Year 1 have their evidence recorded on Tapestry; in other year groups, similar photos are regularly uploaded onto the school's Facebook page. As a school, we have also adopted the use of Class Dojo; here, work can also be celebrated through year group pages.

- **Classroom Computers**
  There is at least one desktop computer in each classroom. These machines are networked and have access to the shared drive for planning and preparation.

- **Printers and Photocopiers**
  At Elburton, we have one colour photocopier in each key stage which is networked to each computer. Separate copying facilities are utilised by our admin team. Photocopiers can be accessed by teachers from home using the secure VPN link.

- **Interactive Touch Screens**
  Each of our 14 classrooms has an interactive Promethean screen linked to the desktop computer. We also have 2 similar screens in our intervention spaces, and an Interactive Whiteboard in our Computing suite and in our after school club facility.

- **Other Resources to support the curriculum**
  We also have resources such as Beebots, Probots, digital cameras and headphones to support the children's learning.

5. Organisation

Computing will be arranged, planned and taught in specific units by the class teacher therefore following a project-based approach. There are a minimum of 6 topics that can be covered at any point throughout the year.

6. EYFS

Children working at EYFS are introduced to computers and technology in order to give them a range of experiences to prepare them for their subsequent work in this subject area. Children have access to the computing suite where they can access a range of learning-based games and activities via the Purple Mash (Mini Mash) platform. They also have access to other types of technology to develop their interest and understanding; examples include remotely controlled vehicles, BeeBots and hand-held metal detectors.

7. KS1 and KS2

At Elburton, children in both key stages are taught about the benefits of the knowledge and skills they are learning as well as their application in real life contexts and professions. These skills are vital to prepare children for further education and eventually the workplace where they will need to participate effectively in the digital world.

Key Stage 1 - Subject Knowledge

Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.

An algorithm is a precisely defined procedure – a sequence of instructions, or a set of rules, for performing a specific task (e.g. instructions for changing a wheel or making a sandwich). While all correct algorithms should produce the right answer, some algorithms are more efficient than others. Computer scientists are interested in finding better algorithms, partly out of intellectual curiosity, and partly because improvements in algorithms can result in massive savings in terms of both cost and time.

Use logical reasoning to predict the behaviour of simple programs.

Computers are deterministic machines. We can predict exactly how they'll behave through repeated experience or by developing an internal model of how a piece of software works. Stepping through the program can give a clear sense of what it does, and how it does it, giving a feel for the algorithm that's been implemented.

In the classroom, getting one pupil to role-play a floor turtle or screen sprite while another steps through the program can give a far more immediate sense of what's going on. When working with a computer, pupils are encouraged to make a prediction about what the program will do before they press return or click the button, and to explain their prediction logically; this is part of computer science. **Logical reasoning** also implies that pupils are following a set of rules when making predictions. Pupils who step outside the boundaries of these rules are not using logical reasoning. A pupil who expects a roamer to jump doesn't understand the constraints of its programming language or hardware.

Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Creating digital content has many practical possibilities. These include commonplace tasks such as word-processing, creating pictures using paint packages, working with digital photographs and video (including animations), writing computer programs, and creating online content such as blog posts, forum contributions, wiki entries and social network updates. This creative work is digitised (i.e. converted to numbers) once it's on the computer. The sheer quantity of digital information makes the skill of organising digital content more important than ever. In more practical terms, we might think of how to bring together different digital media, how to order a series of paragraphs, how to organise the files in our documents directory, or how to tag photos and posts online.

Storing digital content is perhaps something we take for granted. Knowing where a file is saved in the directory structure is important. It's vital to be able to distinguish between the hard disk (or solid state storage) inside the computer itself, the school's network server, USB disks or memory cards, and online storage via the internet. Manipulating digital content is likely to involve using one or more application programs, such as word-processors, presentation software, or image-, audio- or video-editing packages. The pupil makes changes to the digital content, which might include combining content from multiple sources. The skill here is not just using the software tools, but also knowing how best to change the content for the audience and purpose, and to take into account principles of good design. Retrieving digital content could be seen as the reverse of storing: the skills of opening and saving documents are similar. Retrieving content requires you to know what you called the file, what file type it is, and where you stored it.

Recognise common uses of information technology beyond school.
There are many opportunities for pupils to consider the applications of algorithms, programs and systems.

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.
This statement covers the key principles of pupils' e-safety. Pupils should be aware of the main risks associated with the internet and recognise that they should not share certain types of personal information online. Pupils must have a clear understanding of what to do if they have concerns about inappropriate online behaviour (such as unwelcome contact or cyberbullying). Telling a teacher or parent should normally be the first response, however pupils should also know that they can talk directly and confidentially to Childline about such matters. As well as the emphasis on this aspect in lessons, the school also celebrates the annual national 'Safer Internet Day'. This includes a KS1 assembly about e-safety, led by the coordinator and communications to parents in line with national guidance on safer internet use at home. The children also focus on cyber-bullying as part of their Anti-Bullying Week which culminates in the design of an e-Safety charter which is displayed in every classroom.

Key Stage 2 - Subject Knowledge
Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them in to smaller parts.
The focus on algorithms at key stage 1 leads pupils into the design stage of programming at key stage 2. Algorithms are the necessary start of the process of creating working code; identifying the steps needed to solve any problem is essential. Splitting problems into smaller parts is part of computational thinking. For example, designing a game in Scratch will involve thinking about algorithms, programming, drawing sprites and backgrounds, making animations, and even composing music or recording sound effects.

Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.
Sequence in this context is the step-by-step nature of computer programs, mirroring the sequence of steps the algorithm would list. **Selection** refers to instructions such as if ... then ... otherwise decisions in which the operation (what the program does) depends on whether or not certain conditions are met. For example, a quiz provides different feedback if the player answers the question correctly or incorrectly. It is helpful to refer pupils to selections (choices) they make in everyday life; for example, if it rains in the morning, then I will wear my anorak to school, otherwise I won't. **Repetition** is a programming structure such as a repeat ... until loop in which the computer runs part of the program a certain number of times or until a particular condition is met. **Variables** are used to keep track of the things that can change while a program is running. They are a bit like x or y in algebra, in that the values may not initially be known.

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
Key stage 2 pupils should be able to explain the thinking behind their algorithms, talking through the steps and explaining why they've solved a problem the way they have. They also need to be able to look at a simple programming project and explain what's going on. This is made easier with languages like Scratch or Logo, which feature an on-screen sprite or turtle. The immediate feedback helps pupils to understand and debug their programs. Pupils might also be expected to look at someone else's algorithm and explain how it does what it does.

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.
Computer networks, including the internet, are made up of computers connected together. The computers include fast, dedicated machines that pass on data that's not intended for them (called 'routers', 'gateways', 'hubs' or 'switches', depending on particular roles), and 'servers' (always-on machines looking after emails, web pages and files that other computers might ask for from time to time). The connections between the computers in a network may consist of radio or satellite signals, copper wires or fibre-optic cables.

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.
Using search technologies involves aspects of computer science, information technology and digital literacy. Effective use of search engines gets the results you want. It relies on specifying the right keyword, skimming and scanning the results to see which seems most relevant and distinguishing between the main results and adverts presented as sponsored results. It may also involve using other features of the search engine, including searching for phrases rather than keywords, or limiting searches to a particular time frame, language, reading level or website.

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.
This statement brings together various aspects of the computing curriculum. Pupils might typically be expected to demonstrate progression by:

- using software under the control of the teacher
- then, using software with increasing independence
- then, combining software (e.g. importing an edited image or video into a presentation or web page)
- then, selecting software themselves (perhaps from the full range of applications installed on computers, smartphones and tablets at home or at school, or available to them via the web).

Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and contact.
Safe and responsible use of technology at key stage 2 builds on skills learned in key stage 1. As well as requiring pupils to keep themselves safe and to treat others with respect, the programme of study at key stage 2 introduces an emphasis on responsible use of technology. Pupils need to consider how their online actions impact other people. They need to be aware of their legal and ethical responsibilities, such as showing respect for intellectual property rights (e.g. musical, literary and artistic works), keeping passwords and personal data secure, and observing the terms and conditions for web services they use (such as the 13+ age restriction on most websites, including Facebook, resulting from COPPA10 legislation).

Pupils should also develop some awareness of their digital footprint: the data automatically generated when they use the internet and other communication services, and how this is, or could be, used. Pupils should be aware of, and abide by, the school's acceptable use policy, as well as the requirements of any other services they use. Encourage pupils to think twice, and to check terms and conditions, before signing up for internet-based services.

As well as the emphasis on this aspect in lessons, the school also celebrates the annual national 'Safer Internet Day'. This includes a KS2 assembly about e-safety, led by the coordinator and communications to parents in line with national guidance on safer internet use at home. As in KS1, the children also focus on cyber-bullying as part of their Anti-Bullying Week which culminates in the design of an e-Safety charter which is displayed in every classroom.

8. Equal Opportunities

Elburton Primary School will ensure that all children are provided with the same learning opportunities regardless of social class, gender, culture, race, disability or learning difficulties. As a result, we hope to enable all children to develop positive attitudes towards others. All pupils have equal access to computing and all staff members follow the equal opportunities policy. Resources for SEN children and children who are working at greater depth are made available to support and challenge appropriately.

9. Inclusion

Work in Computing is frequently group or paired work using the computers in the Computing Suite or a more practical activity using the Beebots, ProBots, LearnPads or Chrome Books. Independent activities take place at available points for assessment purposes. At Elburton, all children have the right to access the computing curriculum; in order to ensure that children with special educational needs achieve to the best of their ability, it may be necessary to adapt the delivery of the computing curriculum for some pupils.

We teach computing to all children, whatever their ability. Computing forms part of the national curriculum to provide a broad and balanced education for all children. Through the teaching of computing, we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs. Where appropriate, computing can be used to support SEN children on a one-to-one basis where children receive additional support. Additionally, as part of our approach to teaching and learning, we will use adapted resources wherever possible such as visual timetables, different coloured backgrounds and screen printouts.

10. Role of the Subject Leader

The Computing Lead will assess and address staff training needs as part of the annual development plan process or in response to individual needs and requests throughout the year.

Individual teachers should attempt to continually develop their own skills and knowledge, identify their own needs and notify the coordinator. Teachers will be encouraged to use ICT and computing to produce plans, reports, communications and teaching resources. The Computing Lead will provide on-going staff training to ensure teachers are confident in delivering the curriculum in a range of contexts; additional support may be required if a new resource, item of software or hardware is adopted.

The Computing Lead will support staff to overcome technical issues with computing technology at the school. They will also liaise and access support from TME, alongside the IT Manager, as and when required.

11. Parents

Parental involvement is highly encouraged, mainly through home learning tasks. Children's safety is of paramount importance to us; we not only provide a safe environment in which children can learn, but we also teach our pupils how to use information technology safely and respectfully themselves and how any misuse or inappropriate content can be reported and dealt with affectively.

We understand that the systems in place for children at home may differ greatly to school and we also understand how many parents feel daunted by their children's use and understanding of technology; for this reason, we also provide parents with guidance as to how issues involving eSafety can be raised, debated and monitored at home. Useful guides to eSafety are made available through our school website; in addition to this, each year group holds a 'Getting to Know Year. .' meeting at the beginning

of each year where eSafety is discussed. Any Computing activities completed for school from home are done so via a secure login on the Purple Mash platform.