



Harvington C.E. First and Nursery School

Computing

Intent and Implementation

Progression of Knowledge and Skills for Computing

Computing Curriculum Intent Statement:

Our aims in teaching Computing at Harvington First and Nursery School is to produce learners who are confident and effective users of computing. We want to equip all learners with the experience and skills for computing that they will use in a fast-changing technological world. We encourage computing learning through different computing devices, this may involve laptops, iPads, interactive whiteboards, electronic toys and Beebots. We use Purple Mash for our Computing lessons but also encourage use computing cross- curricula to engage and support the children with other areas of learning.

Our curriculum intent includes planned opportunities to:

- Develop confidence in using different forms of computing
- Develop computing knowledge, skills and vocabulary
- Gain an increasing awareness of online safety
- Promote enjoyment and enthusiasm for learning through practical learning
- Provide children with computing tasks which they can also access from home
- Provide children with activities that enable them to make connections between concepts and explore at a greater depth;
- Make links with computing learning at home
- Focuses on the three key elements of computer- digital literacy, computer science and information technology
- Ensure children have access to a high-quality computing curriculum that is both enjoyable and challenging;
- Use computing as cross curricula to engage children in other areas of learning
- Promote confidence and competence with coding
- Opportunities
- Discuss online safety implications
- Make links with previous and future learning
- Reinforce our Christian values including perseverance;
- Provide a sequence of lessons which build on from one another and offer a chance to revisit learning and move learning forward
- Promote team work and collaborative learning

Computing curriculum implementation-

The computing curriculum follows the National Curriculum objectives. To improve staff confidence in teaching computing we bought into the 'purple mash' scheme of work in 2018 and rolled this out the year 2018/2019 in all year groups (nursery- year 5). The purple mash schemes of work focuses on the three key elements of computer, computer science, digital literacy and information technology. Each year group follows a progressive scheme which ensures all objectives are covered over the course of the year.

- Computing lessons are taught weekly as well as extra cross curricular use of computing devices.
- Stories used to support online safety
- Computing theme day planned by computing lead annually
- PTFA funded computing/ online safety theme day every other year
- Half termly Online Safety focus
- Online safety drip feeding every time children use computing devices
- Online safety workshops for parents
- Online safety articles in monthly newsletters

Planning

We use the planning from our purple mash scheme of work. This is shared in a long term plan showing which units are taught when, we have moved some elements of learning around to fit in with year group themes. Teachers access the long term plan and will then plan further within their medium term and weekly planning. Our planning follows the National Curriculum.

KS1

- understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- 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

KS2

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Moderation

In school during staff meetings and monitoring week. Computing lead will also moderate work against assessments during monitoring week.

Assessment

At Harvington First and Nursery School, we recognise that Assessment for learning lies at the heart of promoting learning and in raising standards of attainment. We further recognise that effective AFL depends on using the information gained.

Assessment procedures:

- Make ongoing assessments during computing sessions. These 'immediate' responses are mainly verbal and they inform next steps for learning.
- Assessment through purple mash. Pupils will 'hand in' work every session, allowing teachers to give feedback on specific computing tasks which children re-visit at the beginning of a new lesson.
- Evidence is usually through technology and there we do not recommend sticking photos in books (doubling teacher workload), however if this is appropriate feedback will then be given in books.
- Teachers will also use 'excel' to record judgements. The judgements are: working below the year group, working towards, expected and greater depth. Results are tracked during monitoring by the Computing lead.
- Children in Nursery and Reception evidence computing learning on Teams.
- Reception children will have a judgement at the end of the year to decide if children are working below, towards or expected.
- Children's progress is recorded on their end of year report.
- During subject monitoring cycles, the subject lead will request and collate examples of work for moderation.

Resources-

Computing resources are organised centrally. We have a learning zone (ICT suite) of 12 laptops. We also have a laptop trolley which contains a further 20 laptops. They are reviewed, maintained and updated regularly by the subject lead. Every class has a set of at least 6 iPads. These are located in secure and locked charging units. We have a set of Beebots which are located centrally. We have Lego we do software and lego packs. These are used mainly in KS2 to support coding and also used by the computing after school club. EYFS has a range of ICT resources such as (digital cameras, Beebots, tuff cams etc)

Monitoring- Computing is monitored by the Computing lead following the Monitoring policy. This includes observations of lessons, discussions with children and analysing assessments. The Computing Lead is responsible for writing, updating and evaluating the Computing action plan.

Subject vocabulary

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5
Beebots mouse app laptop internet	icon password username direction sequence record save online Google	character eBook edit algorithm debug instructions predict programming permission personal private keyboard save edit film instructions recipe audio book microphone recording	algorithms instructions predict problem program address attachment database evidence email safety Google mind map presentation research search engine data tick chart camera image	algorithm animation input output program audio editing footage zooming attachment e-safety spam virus questions research survey network wi-fi debug	composition digital sample sequencing software edit information reliable algorithm debug input interactive output program variable hyperlink web page chart data-logging graph spreadsheet	algorithm debugging code programming blog copyright hyperlinks animation navigation virtual bias decrypt encrypt security

Skills Progression:
EYFS

<u>Nursery</u> <u>Personal, Social and Emotional Development</u> - Increasingly follow rules, understanding why they are important. <u>Physical Development</u> - Match their developing physical skills to tasks and activities in the setting. <u>Understanding the World</u> - Explore how things work. <u>Reception</u> <u>Personal, Social and Emotional Development</u> - Show resilience and perseverance in the face of a challenge. <u>Physical Development</u> - Develop their small motor skills so that they can use a range of tools competently, safely and confidently. - Know and talk about the different factors that support their overall health and wellbeing: sensible amounts of 'screen time'. <u>Expressive Arts and Design</u> - Explore, use and refine a variety of artistic effects to express their ideas and feelings.	<u>Focussed Learning Opportunities</u> -Weekly forest school sessions -Weekly RE lessons -Topic learning -Collective worship -Weekly computing opportunities		Where would you see this subject specific learning? -Circle times -Forest school sessions -‘Marvellous me’ box -In the learning zone -Learning zone (ICT suite) - Inside and outside	
	<u>Specific Assessments</u> -Observations -Half termly judgements to show where chn are working within the EYFS -End of year ELG assessments			
	<u>Continuous Provision/ resources</u> Ipads IWB Laptops electronic toys beebots Investigations station/ sensory tray Opportunities where chn can explore how things work Adult led modelling of how to use a mouse/ keyboard		<u>Skills</u> Observation Investigative Online safety Classify Evaluate Question Predict	<u>Knowledge</u> Seasons Growth and change Past/ present Materials Recognising and accepting differences and similarities Healthy living Occupations Senses

Early Learning Goal			Online safety discussions/ displays/ books Age appropriate apps on iPads Tinker trays Loose parts	Making links Care and empathy Curiosity Exploring Taking risks Mindfulness Experiment	Experiences Early technology skills Festivals Cultures/ beliefs/ traditions Online safety Promoting British values Global events
Personal, Social and Emotional Development	Managing Self	• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Explain the reasons for rules, know right from wrong and try to behave accordingly.			
Expressive Arts and Design	Creating with Materials	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.			

Year 1-

	Computer Science			Information Technology	Digital Literacy	
Statement	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	Create and debug simple programs.	Use logical reasoning to predict the behaviour of simple programs.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	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.
Outcome	Children understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. They know that an algorithm written for a computer is called a program.	Children can work out what is wrong with a simple algorithm when the steps are out of order, e.g. The Wrong Sandwich in Purple Mash and can write their own simple algorithm, e.g. Colouring in a Bird activity . Children know that an unexpected outcome is due to the code they have created and can make logical attempts to fix the code, e.g. Bubbles activity in 2Code .	When looking at a program, children can read code one line at a time and make good attempts to envision the bigger picture of the overall effect of the program. Children can, for example, interpret where the turtle in 2Go challenges will end up at the end of the program.	Children are able to sort, collate, edit and store simple digital content e.g. children can name, save and retrieve their work and follow simple instructions to access online resources, use Purple Mash 2Quiz example (sorting shapes), 2Code design mode (manipulating backgrounds) or using pictogram software such as 2Count .	Children understand what is meant by technology and can identify a variety of examples both in and out of school. They can make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair.	Children understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons. Children take ownership of their work and save this in their own private space such as their My Work folder on Purple Mash.

Year 2

	Computer Science			Information Technology	Digital Literacy	
Statement	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	Create and debug simple programs.	Use logical reasoning to predict the behaviour of simple programs.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	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.
Outcome	Children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs , children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code.	Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors, e.g. Debug Challenges: Chimp . Children's program designs display a growing awareness of the need for logical, programmable steps.	Children can identify the parts of a program that respond to specific events and initiate specific actions. For example, they can write a cause and effect sentence of what will happen in a program.	Children demonstrate an ability to organise data using, for example, a database such as 2Investigate and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital data such as music compositions within 2Sequence . Children are confident when creating, naming, saving and retrieving content. Children use a range of media in their digital content including photos, text and sound.	Children can effectively retrieve relevant, purposeful digital content using a search engine. They can apply their learning of effective searching beyond the classroom. They can share this knowledge, e.g. 2Publish example template . Children make links between technology they see around them, coding and multimedia work they do in school e.g. animations, interactive code and programs .	Children know the implications of inappropriate online searches. Children begin to understand how things are shared electronically such as posting work to the Purple Mash display board. They develop an understanding of using email safely by using 2Respond activities on Purple Mash and know ways of reporting inappropriate behaviours and content to a trusted adult.

Year 3-

	Computer Science				Information Technology		Digital Literacy
Statement	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	Use sequence, selection and repetition in programs; work with variables and various forms of input and output.	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.
Outcome	Children can turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts. Their design shows that they are thinking of the desired task and how this translates into code. Children can identify an error within their program that prevents it following the desired algorithm and then fix it.	Children demonstrate the ability to design and code a program that follows a simple sequence. They experiment with timers to achieve repetition effects in their programs. Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects. Children understand how variables can be used to store information while a program is executing.	Children's designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, 'if' statements, repetition and variables. They make good attempts to 'step through' more complex code in order to identify errors in algorithms and can correct this. e.g. traffic light algorithm in 2Code . In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately.	Children can list a range of ways that the internet can be used to provide different methods of communication. They can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails using 2Email . They can describe appropriate email conventions when communicating in this way.	Children can carry out simple searches to retrieve digital content. They understand that to do this, they are connecting to the internet and using a search engine such as Purple Mash search or internet-wide search engines.	Children can collect, analyse, evaluate and present data and information using a selection of software, e.g. using a branching database (2Question), using software such as 2Graph . Children can consider what software is most appropriate for a given task. They can create purposeful content to attach to emails, e.g. 2Respond .	Children demonstrate the importance of having a secure password and not sharing this with anyone else. Furthermore, children can explain the negative implications of failure to keep passwords safe and secure. They understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as 2Email in Purple Mash. They know more than one way to report unacceptable content and contact.

Year 4

	Computer Science				Information Technology		Digital Literacy
Statement	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	Use sequence, selection and repetition in programs; work with variables and various forms of input and output.	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.
Outcome	When turning a real-life situation into an algorithm, the children's design shows that they are thinking of the required task and how to accomplish this in code using coding structures for selection and repetition. Children make more intuitive attempts to debug their own programs.	Children's use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs. They understand 'if statements' for selection and attempt to combine these with other coding structures including variables to achieve the effects that they design in their programs. As well as understanding how variables can be used to store information while a program is executing, they are able to use and manipulate the value of variables. Children can make use of user inputs and outputs such as 'print to screen'. e.g. 2Code .	Children's designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, 'if' statements, repetition and variables. They can trace code and use step-through methods to identify errors in code and make logical attempts to correct this. e.g. traffic light algorithm in 2Code . In programs such as Logo, they can 'read' programs with several steps and predict the outcome accurately.	Children recognise the main component parts of hardware which allow computers to join and form a network. Their ability to understand the online safety implications associated with the ways the internet can be used to provide different methods of communication is improving.	Children understand the function, features and layout of a search engine. They can appraise selected webpages for credibility and information at a basic level. .	Children are able to make improvements to digital solutions based on feedback. Children make informed software choices when presenting information and data. They create linked content using a range of software such as 2Connect and 2Publish+ . Children share digital content within their community, i.e. using Virtual Display Boards .	Children can explore key concepts relating to online safety using concept mapping such as 2Connect . They can help others to understand the importance of online safety. Children know a range of ways of reporting inappropriate content and contact.

	Computer Science				Information Technology		Digital Literacy
Statement	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	Use sequence, selection and repetition in programs; work with variables and various forms of input and output.	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.
Outcome	Children may attempt to turn more complex real-life situations into algorithms for a program by deconstructing it into manageable parts. Children are able to test and debug their programs as they go and can use logical methods to identify the approximate cause of any bug but may need some support identifying the specific line of code .	Children can translate algorithms that include sequence, selection and repetition into code with increasing ease and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures. They are combining sequence, selection and repetition with other coding structures to achieve their algorithm design .	When children code, they are beginning to think about their code structure in terms of the ability to debug and interpret the code later, e.g. the use of tabs to organise code and the naming of variables .	Children understand the value of computer networks but are also aware of the main dangers. They recognise what personal information is and can explain how this can be kept safe. Children can select the most appropriate form of online communications contingent on audience and digital content, e.g. 2Blog , 2Email , Display Boards .	Children search with greater complexity for digital content when using a search engine. They are able to explain in some detail how credible a webpage is and the information it contains.	Children are able to make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution. e.g. creating their own program to meet a design brief using 2Code . They objectively review solutions from others. Children are able to collaboratively create content and solutions using digital features within software such as collaborative mode. They are able to use several ways of sharing digital content, i.e., 2Blog , Display Boards and 2Email .	Children have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services . Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.

Computing Units -Purple Mash

	<u>A1</u>	<u>A2</u>	<u>SP1</u>	<u>SP2</u>	<u>SU1</u>	<u>SU2</u>
EYFS Throughout the year become familiar with::	Using technology safely Use different equipment: BeeBots, iPads, Laptops, Interactive Whiteboard, Online safety Mini-Mash					
Year 1	1.2 Grouping and sorting Online safety	1.3 Pictograms Online safety	1.4 Lego builders Online Safety	1.5 Maze Explorers Online Safety	1.6 Animated Story books Online SAFETY	1.7 Coding Online Safety
Year 2	2.1 Coding Online Safety	2.4 Questioning Online Safety	2.5 Effective Searching Online Safety	2.6 Creating Pictures Online Safety	2.7 Making music Online Safety	2.8 Presenting ideas Online Safety
Year 3	3.1 Coding Online safety	3.3 Spreadsheets Online safety	3.4 Touch typing Online safety	3.5 Email Online safety	3.6 Branch databases Online safety	3.7 Simulations Online safety
Year 4	4.1 Coding Online Safety	4.3 Spreadsheets Online Safety	4.4 Writing for different audiences Online Safety	4.5 Logo Online Safety	4.6 Animation Online Safety	4.7 Effective searches Online Safety
Year 5	5.1 Coding Online Safety	5.4 Databases Online Safety	5.5 Game creator Online Safety	5.6 3D modelling Online Safety	5.7 Concept maps Online Safety	5.3 Spreadsheets Online Safety

Greater Depth

What does "Mastery in Computing" look like?

What is Mastery?

A child's ability to skilfully **apply** their learning in more in-depth ways is called **Mastery**. Mastery is not just knowing a fact, but it is using that fact in increasingly more complex situations to extend their learning. Mastery also enables children to work in ways which show a deeper understanding of a given task.

What is Mastery in Computing?

Mastery in computing means acquiring a deep, long-term, secure and adaptable understanding of the subject. It is demonstrated by how skilfully a child can apply their learning in computing to new situations in unfamiliar contexts. It is when a child is able to display a higher level of technical skill with a broad range of equipment and think of innovative ways to use this knowledge to enhance their work. The children are more analytical and work independently showing a greater breadth of knowledge. Their skills are embedded and used fluently.

Examples of Cultural Capital in Computing

- Developing an understanding and confidence with technology which is used as part of everyday life
- Develop a love for learning through the use of exciting equipment: lego wedo, beebots, ipads...
- Develop skills such as curiosity when trying to solve problems and get things to work
- Having the skills to be able to communicate differently: through video calls, emails...
- Knowing how to protect themselves online through half termly online safety lessons and activities
- Computing after school clubs to develop skills further
- Use of subscription sites to further support learning at home and learn in a different way
- Using computer technology such as video clips and virtual tours to learn about and experience different places and cultures
- Investing in technology such as laptops and ipads to support children's learning

- Using technology to learn and present work in different ways
- Using technology to increase knowledge in a variety of different subjects
- Develop problem solving skills by adapting and making changes when something doesn't work
- Preparing children for the world of work by learning how to use a range of different technology
- Learning how to work as part of a team in computing projects/lessons
- Use of technology to expand experiences
- Developing the knowledge of the impact of technology on the wider world
- Use of technology to continue learning through school closures such as COVID closure
- Use of technology to ensure all pupils all can learn-supporting children with SEND needs

Examples of how Computing skills are relevant for future jobs:

Please use this list to suggest to children how these skills can be used. Suggest that this format is used to display with the learning objective:

Learning Objective:
How you can use this learning for a job when you are older:

- Software designer
- Programmer
- Computer sales support
- Database administrator
- Office work
- IT Technical support
- Designing computer security
- Monitoring computer security systems

- Computing teacher
- Lecturer at university
- Web designer
- Game developer
- Finance
- Computer security