

Singleton Church of England Primary School

Computing Overview

"Passion for LearningPassion for life"

Governors and school leaders facilitate a reflective and ambitious culture. Constructive challenge and creative ideas are encouraged, valued and used to inform whole school planning. The views of learners, parents, staff, governors, therapists, social workers and other stakeholders inform the evaluation of the quality of our work and provision, which in turn is used to identify areas for improvement.



Singleton C of E Primary School is an exciting and innovative Church of England School committed to providing the highest standard of education for every pupil. We share, with parents, the responsibility for teaching our children and preparing them for the future. It is a place where children really matter and every individual's ability is recognised, developed and rewarded. We embrace every child's learning journey and encourage them to be the best they can be.

'Computing is not about computers anymore. It's about living'

Nicholas Negroponte

'We're changing the World with Technology'

Bill Gates

We believe that all children who become pupils at our school deserve the best and our aim is to help them succeed by reaching their full potential in every area of school life – academic, social, personal, physical and spiritual. We do this by ensuring that each child has a clearly defined personal creative curriculum where they understand their educational journey – where it is beginning, where it will take them and how they will get there! Our mission statement is at the very heart of this.

'Passion for learning, Passion for life'

Curriculum Intent

At Singleton School, we believe Computing is a vital part of the education for all children and that computing capability is an essential skill for life- and enables learners to participate more readily in a rapidly changing world. Our children's understanding of the key computing skills need to be developed by effective teaching and by a considered sequence of experiences.

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

(DFE 2013)

The school's aim is to provide a Computing Curriculum, which will enable each child to reach their full potential in learning in Computing. Through investigation; logical reasoning and making predictions; to using technology purposefully and evaluating their own programs and designs and that made by others. In addition, throughout this- children are supported, and taught, in how to use technology safely and respectfully.

All of the children in Singleton School, including those with special educational needs and or disabilities, are given access to a broad, rich and deep curriculum. Singleton school recognises the important of substance of the education.

The National Curriculum 2014 states:

EYFS

Pupils should be taught:

- Children recognise that a range of technology is used in places such as homes and schools.
- They select and use technology for particular purposes.

Key stage 1

Pupils should be taught:

- 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.

Key stage 2

Pupils should be taught to:

- 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.

Curriculum Implementation

Singleton Primary School views computing as an area where skills building is key. Children will practise and consolidate skills and techniques each year, therefore emphasising the process involved, in turn leading to a better standard of computing in our school. Right from the beginning of school, children will be given opportunities, to develop independent thinking in relation to Computer Science and Information Technology and computing experiences will be presented to children through first-hand practical experience. We have used best 'endeavours approach' to organising the curriculum for mixed year classes. In doing this we ensure topics are fully in line with the National Curriculum and that children will build and revisit, through a spiral approach, key skills within computing. This is planned for and addressed on the 2-year cycle and the progression in skills grids. By the end of Key Stage 2 pupils, in conjunction with the 2014 national curriculum, we endeavour to ensure that through an exciting and rigorous curriculum that we address the challenges and opportunities offered by the technologically rich world in which we live- and children will therefore be able to see how computer science and programming works from a practical perspective, and be able to work independently and in groups, to solve problems and recognise the core principles (without relying on the use of a specific technology) and therefore be able to understand it's application in varying contexts. In relation to Information technology children are able to apply computer systems to solve real-world problems; research;

exchange and share information; and review, modify and evaluate work- as part of a broad and balanced technological education- but have the additional focus that children can see and have a critical understanding of how computers, software, the internet, the web and search engines work- and how the impact of these technologies have on their lives and on society.

'It [The Computing National Curriculum 2014] allows pupils to solve problems, design systems, and understand the power and limits of human and machine intelligence. It is a skill that empowers, and one that all pupils should be aware of and develop competence in. Pupils who can think computationally are better able to conceptualise, understand and use computer-based technology, and so are better prepared for today's world and the future. Computing is a practical subject, in which invention and resourcefulness are encouraged. The ideas of computing are applied to understanding real-world systems and creating purposeful products. This combination of principles, practice and invention makes computing an extraordinarily useful and intensely creative subject, suffused with excitement, both visceral ('it works!') and intellectual ('that is so beautiful').1

(CAS Primary Computing 'Computing at School')



LKS2 children using the LEGO® WEDO 2.0 equipment to create 'machines' that are programmable to have different variables (e.g. moving part/light up/sound effects etc.) as part of Fantastic Friday

Digital Literacy:

At Singleton CE Primary School, we take digital literacy very seriously and through vigorous reviewal of our Internet Safety/Acceptable Use Policies, we feel we are able to have a broad and balanced curriculum that offers children access to a wide selection of technologies through, rather than simply restricting access, having an approach to using technology safely, respectfully and responsibly; recognising acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and at key stage 2 building on skills learned in key stage 1, to as well as requiring pupils to keep themselves safe and to treating others with respect, the programme of study at key stage 2 introduces an emphasis on responsible use of technology (NC 2014)

As a school we have a pupil-centred approach and children play an integral part in promoting and developing digital literacy in the school- from supporting planning and executing our 'Internet Safety Week' each year; support in delivering assemblies to parents across the school; having an enquiry based approach within the classroom itself (where children are encouraged to be active participants in discussions and activities surrounding digital literacy and internet safety) and having an Internet Safety JLT to be the 'voice' of our pupils.

We're proud to say that our pupils throughout school develop their sensitivity to others online, treating them with respect, and showing respect for their privacy. Our pupils have an age-appropriate understanding of their responsibilities under the school's acceptable use policy and they know how to report a worry, and are encouraged (in the first instance) to talk to teachers or parents about their concerns about inappropriate online behaviour (such as unwelcome contact or cyberbullying) and inappropriate content. We follow our

school's child protection policy and our pupils are aware that they can also talk directly to the police, report their concern to CEOP, or talk in confidence to counsellors at Childline. Our designated child protection lead (Mrs Clayton (HT), Mrs Millward (SENCO) and Mrs James) might, depending on the nature of the concern, raise the matter with local social services, the police or CEOP as appropriate.

Our pupils have an opportunity to develop a more critical media literacy as they work with tools that, until relatively recently, were the domain of professionals. Tools for recording audio and video, and for creating animation, web pages, digital photos, digital music and 3D models are included in our broad and exciting curriculum and as such using technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact are interwoven into our computing curriculum as well as forming the first lesson to every half term's computing lesson.

Our pupils are 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 US websites, including Facebook, resulting from COPPA10 legislation). Our pupils also develop 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.



UKS2 pupils creating mind maps of their thoughts and ideas in regards to technology and well-being

JLT Internet Safety Team



JLT Internet Safety Team



Part of our JLT presentation to parents from a class assembly with parents present.

Topics

All topics are fully in line with National Curriculum.

- See the deep dive coverage of skills/knowledge and assessment grids for clarity as to how and when topics are taught and NC is covered.
- All statutory requirements are covered
- Due to mixed classes, the topics are taught on a 2-year rolling programme.
- Topics are listed on the long-term planners. Computing is taught directly in each class once a week (with a focus on the Purple Mash Programme of Study (Scheme of Work) from September 2020) as well as discreetly throughout the curriculum, where appropriate. In addition to this, computing is also

taught with our whole school approach in Fantastic Friday's within a STEM/coding context to KS1 & 2 (via Lego® WeDo 2.0; MINDSTORM® and Boost and from a general perspective to EYFS).

[Purple Mash](#)



[Education Lego WeDo 2.0](#)



[LEGO® MINDSTORMS® Education](#)



[Lego Boost](#)



- Mixed classes do present challenges when it comes to delivery but due to our bespoke spiral approach to revisiting all skill areas- are intention is to enhance pupil's skills and knowledge and allow for these skills to become embedded.
- Digital Literacy is a key focus, re visited at the beginning of each half-term, as we build on those skills.
- Where possible cross –curricular links are made when delivering computing to link with other subjects e.g. in year 5/6 the children look at, The Vikings in History and use this focus to create a Viking Information Web-Site, which enhances the children's learning experience and give a real life context in terms of application.



Pupils using music software to compose songs as part of our MAD week.



All KS2 pupils complete their own 'Home Projects' with use of power-point/videos and music.

Theme Key:

Key stage one:

Cycle A

***Online Safety Lesson 1 each half Term**

- Online Safety and Exploring Purple Mash (Unit 1.1) 4 weeks
- Effect Searching (Unit 2.5) 3 weeks
- Lego Builders (Unit 1.4) 3 weeks
- Technology Outside School (Unit 1.9) 2 weeks
- Grouping and Sorting (unit 1.2) 2 weeks
- Creating Pictures (unit 2.6) 5 weeks
- Spreadsheets (Unit 1.8) 3 weeks
- Coding (Unit 1.7) 6 weeks
- Coding (Unit 2.1) 5 weeks (teach both coding units consecutively)
- Year One Summer Term 2 Computing – Lego Education WeDo 2.0 Core Set- Maker for Primary School ('Sort to Recycle') [Lesson plans](#)
- Year Two Summer Term 1 Computing – Lego Education WeDo 2.0 Core Set- Maker for Primary School ('Sort to Recycle') [Lesson plans](#)

Cycle B

***Online Safety Lesson 1 each half Term**

- Online Safety (Unit 2.2) 2 weeks
- Online Safety and Exploring Purple Mash (Unit 1.1) 4 weeks
- Maze Explorers (Unit 1.5) 3 weeks
- Questioning (Unit 2.4) 5 weeks
- Animated Story Books (Unit 1.6) 5 weeks
- Making Music (Unit 2.7) 3 weeks
- Spreadsheets (Unit 2.3) 4 weeks
- Pictograms (Unit 1.3) 3 weeks
- Presenting Ideas (Unit 2.8) 4 weeks
- Year 4- Spring 1 Computing – Lego Education WeDo 2.0 Core Set- Maker for Primary School ('Sort to Recycle') [Lesson plans](#)
- Year 3- Spring 2 Computing – Lego Education WeDo 2.0 Core Set- Maker for Primary School ('Sort to Recycle') [Lesson plans](#)

Key stage 2: Year 3/4

Cycle A

***Online Safety Lesson 1 each half Term**

- Online Safety (Unit 3.2) 2 weeks
- Coding 'Accomplishing a goal in a program' 2 weeks
 - 'Stimulating a physical system and making and controlling simulations' 2 weeks
 - 'Debugging' 2 weeks
- Spreadsheets (Unit 3.3) 3 weeks
- Touch Typing (Unit 3.4) 4 weeks
- Email (Unit 3.5) including email safety- 6 weeks
- Branching Databases (Unit 3.6) 4 weeks
- Simulations (Unit 3.7) 3 weeks
- Graphing (Unit 3.8)

- Year 4 Autumn Term 1 Computing (Computer Science) – Lego Education WeDo 2.0 Core Set- Maker for Primary School ('Make a Dancing Robot' lessons 1-5) [Lesson plans](#)
- Year 3 Autumn Term 2 Computing (Computer Science) – Lego Education WeDo 2.0 Core Set- Maker for Primary School ('Make a Dancing Robot' lessons 1-5) [Lesson plans](#)

Cycle B

*Online Safety Lesson 1 each half Term

- Online Safety (Unit 4.2) 2 weeks
- Coding 'Introducing 'if'/'else' statements- 2 weeks
 - 'Repetition using a timer and repeat commands' 1 week
 - 'Repetition and user input' 1 week
 - 'Variables' 2 weeks
- Spreadsheets (Unit 4.3) 6 weeks
- Writing for different Audiences (Unit 4.4) 5 weeks
- Logo (Unit 4.5) week 4
- Animation (Unit 4.6) 3 weeks
- Effective Search (Unit 4.7) 3 weeks
- Hardware Investigators (Unit 4.8) 2 weeks
- Year 4- Summer Term 1- Computing – Lego Education WeDo 2.0 Core Set- ('Getting Started Project - Part A: Milo the Science Rover' (lessons 1-8) [Lesson plans](#)
- Year 3- Summer Term 1- Computing – Lego Education WeDo 2.0 Core Set- ('Getting Started Project - Part A: Milo the Science Rover' (lessons 1-8) [Lesson plans](#)

Upper Key stage 2: Year 5/6

Cycle A

*Online Safety Lesson 1 each half Term

- Online Safety 2 weeks
- Coding (Unit 5.1) 'Internet Safety' 1 week
 - 'Accomplishing a goal in a program' 1 week
 - 'Simulating a physical system' 1 week
 - 'Creating a game with a score and timer' 2 weeks
 - 'Using buttons to showcase work' 1 week
- Spreadsheets (Unit 3.3) 6 weeks
- Databases (Unit 5.4)
- Game Creator (Unit 5.5) 5 weeks
- 3D Modelling (Unit 5.6) 4 weeks
- Concept Maps (Unit 5.7) 4 weeks
- Year 5- Spring Term 1 Computing – Mindstorms Education EV3- 'Robot Trainer' [Lesson plans](#)
- Year 6- Spring Term 2 Computing – Mindstorms Education EV3- 'Robot Trainer' [Lesson plans](#)

Cycle B

*Online Safety Lesson 1 each half Term

- Online Safety (Unit 6.2)
- Coding 'Designing and writing a more complex program' 2 weeks
 - 'Introducing text variables' 1 week
 - 'Introducing Functions' 1 week
 - 'Text Adventures' 1 week

'Vocabulary review and quizzes' 1 week

- Spreadsheets Unit 6.3) 5 weeks
- Blogging (Unit 6.4) 5 weeks
- Text Adventures (Unit 6.5) 5 weeks
- Networks (Unit 6.6) 3 weeks
- Quizzing (Unit 6.7) 6 weeks
- Azure Website Design 6 weeks
- Year Six- Autumn Term 1- Computing – Mindstorms Education EV3- 'Engineering Lab' [Lesson plans Computer Science](#)
- Year Five- Autumn Term 2- Computing – Mindstorms Education EV3- 'Engineering Lab' [Lesson plans Computer Science](#)

Progression in skills

- This is bespoke for our school, to support with planning
- This is particularly important with the mixed age classes, as it provides a quick reference point for staff and leaders
- The progression in skills charts uses the Purple Mash Programme of Study as our key scheme of work (from September 2020)- which we use within teaching and learning and assessment. We also use Lancashire Klips to break learning down into manageable, recognised steps.
- Alongside the Progressions grid this help with SEN and inclusion as it supports with differentiation for children who are working below or above age-related expectations.
- These also support the notion that the work given over time across the school in Computing, match the aims of the NC. This is planned and sequences to build on prior knowledge and skills and provide a pathway for future learning in Computing.

Planning

Singleton school uses a mixture of Purple Mash and Educated for a Connected World to support planning.

- These plans have been written to be fully in line with the National Curriculum
- Topics have been selected and ensure full coverage of progression of skills
- Cross curricular links are encouraged
- Each Topic comes with plans and resources and assessment tools
- Teachers are encouraged to stretch beyond the plans and be creative. Taking ownership of their plans and reflect on which activities were the most engaging and successful for their class.
- Online Safety taught the first lesson of each half term via: [Project Evolve](#)



Teaching

- Teachers at Singleton are continuously encouraged to be high practitioners.
- Quality first teach model implemented across school.
- Lessons are observed, evaluated and discussed in the appropriate manner
- Lesson delivery in monitored
- Staff use Purple Mash and our bespoke long-term planners to plan and execute lessons. They supplement and personalise these plans with a wider range of resources off the internet.

Educational Visits and Cultural Capital

In order to develop a broad, rich and deep computing education we believe children learn through experience. It is therefore considered essential to provide the children with hands on experiences, through educational visits. We aim to address this with suggestions on the two-year cycle with Educational visits, trips and real experience.



Our UKS2 pupils were visited by one of our parents, Mr Lee, a website designer, who supported our children in developing their own Viking webpages using Axure software.



Resources:

As a school we have ensured our curriculum developments are supported by resources that enhance our pupils learning, understanding and independent problem-solving skills. In EYFS (but also for use by KS1/2) we have invested in x15 new iPads (September 2020) which we hope will enhance learning across the curriculum through investment in education apps as well as supporting in taking learning outdoor as a means to take photographs/videos and as a recording device for data/notes etc. In 2022, we invested in 30 new laptops to be used by pupils in KS2.

At key stage 1 and 2, we wanted to make 'controlling physical systems' (sensors, lights and motors) a key focus of our Fantast Friday activities. We use LEGO®'s WeDo and MindStorm® equipment and utilise iPad's as our programming function. We also use Scratch 1.4, in co-ordination with Purple Mash.

Impact

At Singleton, we believe assessment is on-going and a vital tool to aid future planning. Children are assessed on their ability to develop ideas, master techniques and personalise inspiration. In KS1 and KS2, teachers will assess the children using the progression of skills document, which is in line with the Lancashire KLIPS. Foundation Stage children will be assessed using the development matters and early learning goals document.

Assessment:

As a school we endeavour to use our own bespoke assessment system to which we are in the process of developing. We recognise the challenges to assessing computing:

- *It's hard for teachers to judge pupils' knowledge and understanding based on the outcomes of practical tasks alone.*
- *If pupils work collaboratively, it can be hard to identify each individual's contribution.*
- *If the teaching of computing is embedded in other subjects, it's often difficult to separate attainment in computing from that in the host subject (CAS Primary Computing)*

Despite these challenges, as a school we use the assessment for learning (AFL) techniques:

Formative Assessment:

- **Self-assessment:** The curriculum expects pupils 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. We therefore encourage our pupils to reflect and assess their own learning and adapt their work accordingly throughout. This is currently recorded in the Computing/Fantastic Friday Floor books.
- **Peer-assessment:** Due to the nature of computing science being a collaborative approach- for the most part pupils are working with a partner/in small groups and are therefore able to review, and help correct, algorithms and programs, or providing critical, constructive feedback on digital content for one another.
- **Open questioning:** As part of the Quality First Teach approach, we use open questioning as a means to both assess and develop pupils grasp of concepts. For example, 'Why' and 'how' questions work well: Why did Google place that result at the top? How does your program work? Why might that not be a safe website? etc.
- **Discussion with peers:** We encourage pupils to use similar open questions to consider what they've learned, rather than only on what they've done.
- **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. The 'decomposition' aspect of computational thinking, in which large problems are broken down into small tasks, is a necessary part of managing all but the smallest of projects' (CAS Primary Computing)

• **KWL:** KWL grids are used across the curriculum at our school and therefore pupils are very familiar with this approach and we feel it supports independent learning in computing. In particular, this can be applied to the logical reasoning needed to explain algorithms and to detect and correct errors, with pupils first establishing a firm foundation, before exploring alternatives and subsequently reviewing what they have learned, rather than only what they have done.

Summative Assessment:

We use assessment grids for our Fantastic Friday assessments. From September 2023, we are using our bespoke Key Assessment grids to assess computing, these will check what pupils have learned and whether they are on track to meet expectations at the end of the key stage, and so that we can report regularly to parents. Our teachers will therefore form a judgement as to whether each child has learned all the content of the programme of study by the end of the key stage and is 'ticked off', with evidence of this achievement forming part of the child's computing portfolio (see 'evidence'). Moreover, as a pupil's profile of achievement is built up, the statements yet to be achieved will provide a clear guide for planning, showing exactly where the 'gaps' are in each pupil's knowledge, skills and understanding, and thus where subsequent teaching should be targeted.

Evidence

- All children have their own log in for Purple Mash and a Class Folder to be able to save their work.
- Children also have their own 'Pupil' share drive on the computers with their own folders to save their work and this will move with them through school.
- Floor books are also used to support the children's journey in fantastic Friday and celebrate their work for that unit/topic.
- We also celebrate children's work via Facebook.

Reporting

- Children's progress and attainment will be reported to parents in their annual report. As a school, we report end of KS1 and end of KS2 attainment on pupil data sheets based upon the end of Key Stage outcomes.
- In EYFS parents are informed where the children's abilities lie in 'Technology' strand.