St James' CE Primary School

Computing Policy

SAINT JAMES'
Church of England School

LDST
Liverpool Diocesan Schools Trust

Luke 1:37 'For with GOD nothing should be impossible'

'For with God nothing shall be impossible' (Luke 1:37)

Our school vision is linked to the Christian Values of the school to support and challenge our children to learn.

Our curriculum exposes our children to enriching experiences, immersing them in progressive knowledge and skills; equipping them with personal characteristics and aspirations required to succeed in life. The key principles behind the design of our curriculum are for our children to;

L E A R N

The St James' LEARN curriculum.

L	Love Jesus	
E	Equality for Everyone	
A	Attend every day	
R	Reach for the stars	
N	Never give up	

We are walking hand in hand with Jesus fulfilling the potential God has given us.

'For with God nothing is impossible'

Luke 1:37

Our **LEARN** curriculum ensures that our children are successful in learning and in life, no matter what their starting points and barriers to learning may be by:

- Promoting positive partnerships to support the families of our school who speak 15 different languages and who come from many varied faiths and none. So that ALL our pupils are settled in school and ready to **LEARN.**
- Providing nurture, emotional, financial, and spiritual support to our pupils and All stakeholders. So that families and children are fully supported and are in the best place they can be and ready to **LEARN.**
- By understanding our community and thus providing learning opportunities in environments which promote reading, oracy, and the constant development of vocabulary. So that our pupils are equipped with the skills they need to flourish in life and **LEARN.**
- By providing dedicated nurture spaces to offer emotional and practical support to meet the needs of ALL of our pupils thus allowing them to **LEARN**.
- A curriculum which will be inclusive, aspirational, and relevant and respectful to the culture and customs of our children and families. So that our children want to come to school, are engaged with their individual needs met, and experience a full and varied range of opportunities to enrich their lives and **LEARN**ing experience.

We understand that if all children acquire the above, they will be ready for the challenges of the secondary school curriculum. Ultimately, we want all of our children, to be the best they can be, making a positive contribution to the world they live in.

The aims of Computing

Ultimately, we aim for our pupils to be digital citizens equipped to use computational thinking and creativity to understand and change the world. To give them the tools, knowledge and experiences they need to understand computer science and put this knowledge to use through programming.

Computing 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.

The aims of the national curriculum are:

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

How the National Curriculum links to our ASPIRE Key Principles

Appendix (a)

Intent / Implementation / Impact

INTENT

Our computing curriculum enables children to experience technology happily, safely and confidently and is underpinned by the principles of online safety. The computing curriculum builds knowledge and skills across three main strands; computer science, digital literacy and information technology. We aim to put children in control of the devices that they use and to empower them to build resilience and positive behaviours for the future. Children are encouraged to be active users of technology and to understand how it is implemented in the wider world; learning and practicing how they can create, change and control the programs and devices they encounter.

All pupils at St James' have the right to have rich, deep learning experiences that balance all the aspects of computing. With technology playing such a significant role in society today, we believe 'Computational thinking' is a skill children must be taught if they are to be able to participate effectively and safely in a digital world. At St James', pupils are introduced to a wide range of technology, including laptops, iPads and interactive whiteboards, allowing them to continually practice and improve the skills they learn.

Our curriculum has been designed to develop the creative, practical and computational expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly digital and technological world.

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.
The National Curriculum

Best practise in Computing, including quality examples of expectations are shared with teaching staff, prior to their teaching of Computing. The documents 'What does best practise in Computing look like?' can be found on the school's central system, always available for teaching and support staff to access.

IMPLEMENTATION

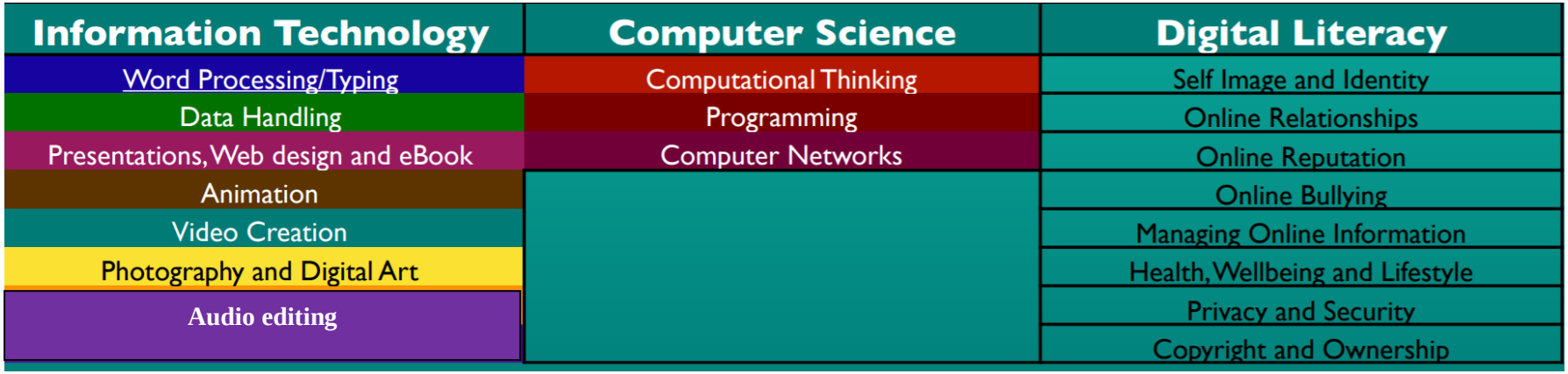
Timetable

The timetable has been structured to allow for the teaching of Computing to be taught for 1 hour each week.

The time dedicated to Computing ensures that each topic can be delivered to a high standard and children can practice new skills, explore their creativity and develop computational thinking.

Strategies for the Teaching and Learning of Computing

Children will develop knowledge, vocabulary and skills across the three main strands of computing; computer science, digital literacy and information technology.



The mode of working in Computing is both individual and co-operative group work. Within this structure, the groups are usually of mixed ability and children are encouraged to develop inter-personal skills through discussion, enquiry and negotiation and to be able to work as part of a team.

Computing is taught by the class teachers and supported by teaching assistants. The emphasis in our teaching of Computing is on providing opportunities for pupils to combine their skills with knowledge and understanding in order to create projects (for example in Y4, children gain knowledge in audio editing and can practice this skill by creating their own podcast.)

We recognise the importance of Computing and online safety within the curriculum and we aim to celebrate this on display and presentation boards in classrooms and throughout the school. Work can also be presented in celebration assemblies.

In order to enhance our children's learning and raise aspirations in Computing, we invite STEM ambassadors into school to provide workshops for children and staff. For example, children have the opportunity to become robotic engineers during a lego STEM workshop.

Planning

We plan Computing lessons so that they build upon the prior learning of the children; each lesson begins with a retrieval activity so that children revisit learning from previous lessons, topics and years. We give children of all abilities the opportunity to develop their skills, knowledge and understanding through differentiation and scaffolding so that all learners can access each lesson objective. Children use KBO's to enhance vocabulary and knowledge each lesson.

Long-term plans:

In Years 1-6, the National Curriculum is being used as a basis for the delivery of Computing and the 'Teach Computing' scheme is followed to ensure full curriculum coverage. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the programme of study below:

Key stage 1

- 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

- 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.

Medium-term plans:

Medium term plans are provided for teachers by the Computing lead. Teachers annotate their plans and refer to them from lesson to lesson. Specific annotation will include personalised adaptations for all SEN and Disadvantaged children, a plan for the TA and their role, an evaluation and next steps by the teacher and TA from their observations of the lesson- for every lesson. The Teach Computing scheme of work is followed throughout school and we use their MTPs. We designed knowledge organisers to meet our needs and requirements and these are used in each lessons, particularly in retrieval practice at the start of each lesson.

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Progression

EYFS

In the Early Years Foundation Stage, children are provided with a range of experiences that encourage exploration, observation, problem solving, critical thinking and discussion. These activities, which happen indoors and outdoors, encourage the development of skills and their knowledge and understanding of the world. This learning forms the foundations for later work in Computing. Good quality early experiences include asking questions about how things work, investigating and using a variety of technological toys and resources. Reception have 'technology hours' in which they practice key skills on a range of devices such as iPads and computers. Children have the opportunities to understand how technology works within a wide range of resources such as cause and effect toys.

In KS1, children build upon experiences gained in early years and develop their knowledge and understanding of technology, digital literacy and computer science. Topics are progressive from KS1 through to KS2. For example in Y6, the final KS2 programming unit brings together elements of all the four programming constructs: sequence from year 3, repetition from year 4, selection from year 5 and variables, introduced in year 6, programming A.

British Values

In this subject, the children learn to respect and value other people, differences and opinions online. Children are taught about following the law and the legal implications of unacceptable usage of technology and behaviours online (e.g. copyright, cyber bullying, illegal downloading, age restricted platforms).

Inclusivity in Computing

Positive attitudes towards Computing are encouraged, so that all children, regardless of race, gender, ability or special needs, including those for whom English is a second language, develop an enjoyment of computing, whether this be word processing, coding or learning about online safety.

The aim is to ensure that everyone makes progress and gains positively from lessons and to plan inclusive lessons where all children are exposed to the different levels within the lesson. This will help develop the expected standard as well as greater depth learning. Teachers use a practical approach to teaching which support all children and will benefit children including those for whom English is an additional language (EAL). Throughout each topic, children learn about different aspects relating to Computing. Children of all abilities gain a better understanding that computing technicians come from many different backgrounds, have different beliefs and have different computing abilities in order to promote equal opportunities for everyone.

Weekly Computing lessons are inclusive to pupils with special educational needs and disabilities. Within the weekly Computing lesson, teachers have a responsibility to not only provide support for children with SEND but also activities that provide sufficient challenge for children who are high achievers (GD). It is the teachers' responsibility to ensure that all children are challenged at a level appropriate to their ability.

Examples of how pupils with SEN are supported:

- Vocabulary mats are used on tables
- Knowledge organisers are sent home prior to the topic starting
- Support with reading and writing but not necessarily with computing skills or area of knowledge involved.
- Extra teacher/ TA support for pupils who have difficulty using language to express their knowledge of computing.

Examples of how Greater Depth pupils are challenged:

- Specific GD targets set linking directly to the National Curriculum objectives
- Differentiated, challenging work is created
- Extension activities prepared and given to children as a challenge

<u>Supporting the Areas of Need in Computing</u>

Cognition and Learning	Communication and Interaction
• Pupils will be pre-taught key vocabulary with the teaching assistant and knowledge organisers sent home before the topic. • Every lesson begins with retrieval which supports links to prior learning. Vocabulary and knowledge from previous topics and year groups is revisited each lesson. • The teacher will explicitly model key tasks to children and understanding will be demonstrated in ways suitable to the child e.g. mind maps, diagrams, pictures. • Children will be given additional time to complete tasks where necessary.	• Rules of 'correct listening' are regularly displayed, taught and modelled. Pupils are aware of pre-arranged cues for active listening e.g. a 5 second hand signal/ countdown to stop what they are doing on laptops, iPads etc and to start listening. • For some children, delivery of information may be slowed down and repeated. Instructions on how to work programmes on the computer may be broken down into smaller steps and supported by a teaching assistant. • TA's are used to effectively to explain and support pupils to ask and answer questions; this may be 1:1, in a small group or with the whole class. • Talk partners are used each lesson, to practise speaking and listening with peers. • We adopt many oracy activities in this lesson and they are evidenced with 'speak it' strips in our books.
Social, Emotional and Mental Health (SEMH)	**Physical and Sensory**
• Take time to find pupil's strengths and praise them. Ensure that the pupil has opportunities to succeed and maintain self-confidence. • Expectations of behaviour should be clear and consistent; clear targets are modelled and explained. Expectations on the safe and responsible use of technology is regularly revisited. • Lots of opportunities are provided for kinaesthetic learning e.g. practical activities, experimental learning. • Children are placed in mixed ability groups to provide positive role models • Where necessary, brain breaks are built into lessons	• There is a clear organisation of the classroom and computing areas to allow for free movement and access for all. • Consideration for lighting and seating arrangements. • Chairs and tables are of an appropriate height. • Oral presentations are used as an alternative to some written work. • Additional time is given when required to complete tasks. • Access is given to technology to practise typing skills e.g. 'BBC dance mat typing'.

Resources

Our school has a wide range of resources to support the teaching of computing across school. School have a new computing suite with 30 computers, headphones, speakers and keyboards. We have iPads, laptops and cameras across school. Each classroom is equipped with computers and iPads, alongside an online safety board.

Health and Safety

The general teaching requirement for health and safety applies in this subject and staff should refer to the health and safety policy. We teach children how to follow proper procedures. It is the responsibility of teachers to teach the safe use of equipment and insist on good practice. The teacher will be responsible for the health and safety of themselves, classroom assistants and pupils within their class.

Pupils will be taught to:

1. Collect and return ICT equipment safely;
2. Follow clear instructions when using ICT equipment;
3. Only move around the room when necessary;

To ensure the safe use of equipment, it is important that teachers are confident when using them, so that they can correctly demonstrate their use. All pupils should be clear on the intended use of the equipment. An annual inspection of resources/equipment will be made by the coordinator to ensure the safety of the equipment.

Classroom Support

Teaching Assistants and helpers in Computing assist:

· In the classroom throughout the school by working with groups and individuals on task.

· In providing targeted and positive support to those pupils identified with difficulties.

· In providing other help, such as preparation of resources and display work.

Teaching Assistants and adult helpers need to be made aware of the risk assessment and teachers should ensure they have been briefed on health and safety before the start of each lesson.

Display

Work produced in Computing can be displayed on boards in the computing suite, on social media for parents/carers to view and in class floor books. The computing suite and every classroom has an internet safety board outlining the rules of acceptable usage of technology.

Rewards

Rewards will be given to children in the form of praise for both individual and group work. House points will be rewarded as well as stickers and postcards home. Outstanding achievements will be celebrated in assemblies.

IMPACT

Assessment

Assessment for learning is continuous throughout the planning, teaching and learning cycle. Assessment is supported by use of the following strategies:

- Observing children at work, individually, in pairs, in a group and in class during whole class teaching
- Using differentiated, open-ended questions that require children to explain and unpick their understanding
- Teacher/pupil conversations about their ideas and understanding. Facilitating and listening to discussions
- Providing effective feedback to engage children with their learning and to provide opportunities for self-assessment

Assessment is an integral part of teaching and learning and is a continuous process analysing errors and picking up on misconceptions. These ongoing assessments inform future planning and teaching. Lessons are adapted readily and short-term planning evaluated in light of these assessments. At the end of each unit, teachers plan an assessment task to give children the opportunity to share their knowledge from that topic. Teachers are to design impact tasks that are creative and do not rely solely on written recorded evidence. Any photographic and video evidence should be saved in the shared area as evidence for assessment.

A robust assessment criteria has been developed to allow teachers to assess against the National Curriculum objectives in line with age related expectations. Assessment grids (shown in Appendix 6) are filled out by each class teacher at the end of a Computing topic with a judgement to the children who have achieved the expected standard(EXS), those who are working towards standard (WTS) and those who are working at a greater depth standard (GDS) in relation to age

related expectations (ARE). This, along with formative and summative assessment, then allows the teachers to make a judgement at the end the year, which is then reported to parents/carers.

Assessment data is analysed by the subject leader who identifies the percentage of children who are working at ARE and at a greater depth. This information is fed back to the Head Teacher and class teachers to inform future planning.

The Role of the Computing Lead;

It is the role of the Computing Lead to:

- To lead in the development of Computing throughout the school.
- To support colleagues in their development of planning and assessment.
- To monitor the planning, teaching and learning of Computing throughout the school.
- To provide teachers with support in the teaching of Computing.
- To provide staff with CPD opportunities in relation to Computing within the confines of the budget and the School Improvement Plan.
- To monitor and maintain high quality resources.
- To keep up to date with new developments in the area of Computing.

Expectations and high level of aspiration

Children will apply the knowledge and skills they have learned to design and make projects such as podcasts, animations and photography books. Children have the opportunity to be technicians, designers, radio show hosts, artists and other creative roles. This gives children the opportunity to learn how the skills taught in computing can be applied to a wide variety of roles in the wider world. The work produced will be celebrated with the wider community on the school newsletters, website and Twitter.

Subject association

The computing lead is part of the National Computing association to keep subject knowledge and practices up to date for the curriculum. For example,

The current issue arising in computing for children and young people is the time spent on devices. Educators are advised to focus on encouraging children to have a healthy balance of using technology and engaging in other activities, to promote a healthy lifestyle.

Sequencing of subjects

Subjects are sequenced so that each year group are focusing on the same concept at a time (e.g. computer science). This is for monitoring purposes as it shows the progression in knowledge and skills KS1 through to KS2. For example in Spring 2 – Y1 are grouping data, Y2 are creating pictograms, Y3 branching databases, Y4 databases, Y5 flat file databases, Y6 Excel spreadsheets.

Enrichment opportunities

There is a weekly afterschool club in which KS2 children have the opportunity to use technology to practice a variety of skills, such as times tables.

Visitors are invited in to school, such as 'STEM Ambassadors' to raise aspirations of children in computing and give opportunities for children to experience technology in different ways.

STEM Ambassadors provide future careers talks to Y6 pupils to discuss opportunities available to them in the wider world.

School celebrate National days such as 'Online Safety Day' and have assemblies, competitions and quizzes.

Appendix 1 -National Curriculum links with Long term plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Year 1	Technology around us	Digital painting	Digital writing	Grouping data	Moving a robot	Programming animations
	• 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	• use technology purposefully to create, organise, store, manipulate and retrieve digital content	• use technology purposefully to create, organise, store, manipulate and retrieve digital content	• use technology purposefully to create, organise, store, manipulate and retrieve digital content	• 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	• 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

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Year 2	**Information technology around us** • 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	Digital photography use technology purposefully to create, organise, store, manipulate and retrieve digital content	Making music • use technology purposefully to create, organise, store, manipulate and retrieve digital content	Pictograms • use technology purposefully to create, organise, store, manipulate and retrieve digital content	Robot algorithms • 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	Programming quizzes • 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

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	Connecting computers	Stop frame animation	Desktop publishing	Branching databases	Sequencing sounds	Events and actions in programs

	• 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	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	• 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	• 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	• 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

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	The internet	Audio editing	Photo editing	Databases	Repetition in shapes	Repetition in games

	• 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	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	• 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	• 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	• 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

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	Sharing information • use technology safely, respectfully and	Vector drawing select, use and combine a variety of software	Video editing select, use and combine a variety of software	Flat-file databases • select, use and combine a variety of	Selection in physical computing (Swift Playgrounds)	Selection in quizzes • design, write and debug programs that

	responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	(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 internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals	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	• 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	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

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 6	Internet communication • understand computer networks, including the internet; how they can	3D modelling select, use and combine a variety of software (including internet services)	Webpage creation select, use and combine a variety of software (including internet services)	Introduction to spreadsheets • select, use and combine a variety of	Variables in games • design, write and debug programs that accomplish specific	Sensing • design, write and debug programs that accomplish specific

	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	on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals	on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals	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	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	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

Appendix 2 – Best practise in Computing

Our curriculum uses the 'teach computing' curriculum from the NCCE.

"Effective pedagogy is at the heart of good teaching and learning; successful computing teachers combine their knowledge of the subject with evidence-based teaching practices. As computing is a relatively new discipline, evidence of effective teaching approaches continues to emerge and evolve.

The work of the NCCE is underpinned by their 12 principles of Computing Pedagogy, below" (NCCE https://teachcomputing.org/pedagogy)

Lead with concepts

Support pupils in the acquisition of knowledge, through the use of key concepts, terms, and vocabulary, providing opportunities to build a shared and consistent understanding. Glossaries, concept maps, and displays, along with regular recall and revision, can support this approach.

Unplug, unpack, repack

Teach new concepts by first unpacking complex terms and ideas, exploring these ideas in unplugged and familiar contexts, then repacking this new understanding into the original concept. This approach (semantic waves) can help pupils develop a secure understanding of complex concepts.

Create projects

Use project-based learning activities to provide pupils with the opportunity to apply and consolidate their knowledge and understanding. Design is an important, often overlooked aspect of computing. Pupils can consider how to develop an artefact for a particular user or function, and evaluate it against a set of criteria.

Challenge misconceptions

Use formative questioning to uncover misconceptions and adapt teaching to address them as they occur. Awareness of common misconceptions alongside discussion, concept mapping, peer instruction, or simple quizzes can help identify areas of confusion.

Structure lessons

Use supportive frameworks when planning lessons, such as PRIMM (Predict, Run, Investigate, Modify, Make) and Use-Modify-Create. These frameworks are based on research and ensure

Work together

Encourage collaboration, specifically using pair programming and peer instruction, and also structured group tasks. Working together stimulates classroom dialogue, articulation of concepts, and development of shared understanding.

Model everything

Model processes or practices — everything from debugging code to binary number conversions — using techniques such as worked examples and live coding. Modelling is particularly beneficial to novices, providing scaffolding that can be gradually taken away.

Add variety

Provide activities with different levels of direction, scaffolding, and support that promote active learning, ranging from highly structured to more exploratory tasks. Adapting your instruction to suit different objectives will help keep all pupils engaged and encourage greater independence.

Make concrete

Bring abstract concepts to life with real-world, contextual examples and a focus on interdependencies with other curriculum subjects. This can be achieved through the use of unplugged activities, proposing analogies, storytelling around concepts, and finding examples of the concepts in pupils' lives.

Read and explore code first

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When teaching programming, focus first on code 'reading' activities, before code writing. With both block-based and text-based programming, encourage pupils to review and interpret blocks of code. Research has shown

Get hands-on

Use physical computing and making activities that offer tactile and sensory experiences to enhance learning. Combining electronics and programming with arts and crafts (especially through exploratory projects) provides pupils with a creative, engaging context to explore and apply computing concepts.

Foster program comprehension

Use a variety of activities to consolidate knowledge and understanding of the function and structure of programs, including debugging, tracing, and Parson's Problems. Regular comprehension activities will help secure understanding and build connections with new knowledge.

Find out more about our principles and add some or all to your personal pedagogy toolkit.

ncce.io/pedagogy

Appendix 3 – EYFS and Computing

It is important in the EYFS to give children a broad, play-based experience of ICT in a range of contexts, including outdoor play. Early years learning environments should feature ICT scenarios based on experience in the real world, such as in role play. Children gain confidence, control and language skills through opportunities to 'paint' on the whiteboard or drive a remote-controlled toy. Recording devices can support children to develop their communication skills. This is particular useful with children who have English as an additional language. It is our aim within the EYFS for the children to gain skills within computing and technology ensuring the children leave the EYFS with the necessary skills to flourish in Key Stage One. Children within the EYFS work through the supporting 'Birth to 5 Matters' supporting guidance to maintain consistency across the Key Stage as well as ensuring the curriculum for technology and computing is progressive. The objectives we want the children to achieve across the EYFS are listed below.

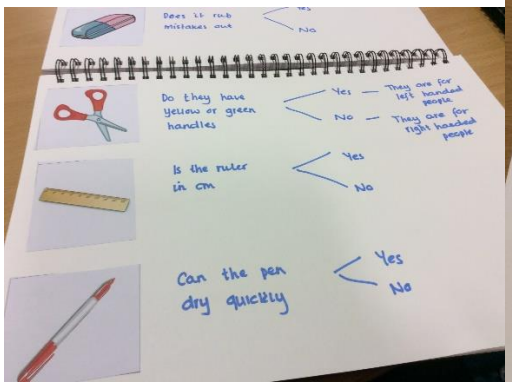
- Seeks to acquire basic skills in turning on and operating some digital equipment
- Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car
- Plays with water to investigate "low technology" such as washing and cleaning
- Uses pipes, funnels and other tools to carry/ transport water from one place to another
- Knows how to operate simple equipment, e.g. turns on CD player, uses a remote control, can navigate touch-capable technology with support
- Shows an interest in technological toys with knobs or pulleys, real objects such as cameras, and touchscreen devices such as mobile phones and tablets

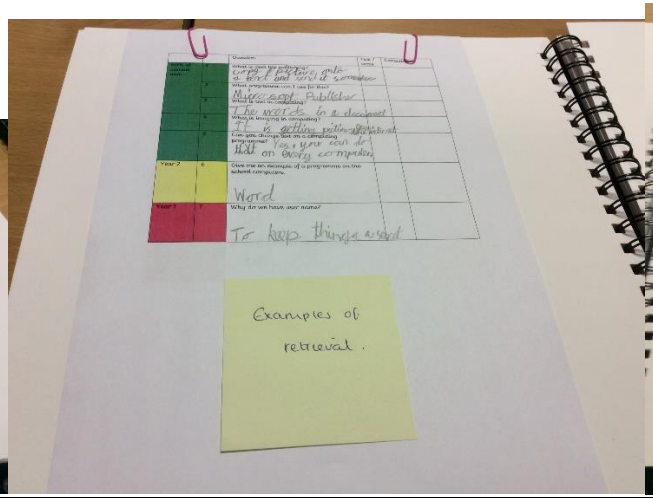
- Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images
- Knows that information can be retrieved from digital devices and the internet
- Plays with a range of materials to learn cause and effect, for example, makes a string puppet using dowels and string to suspend the puppet
- Completes a simple program on electronic devices
- Uses ICT hardware to interact with age appropriate computer software
- Can create content such as a video recording, stories, and/or draw a picture on screen
- Develops digital literacy skills by being able to access, understand and interact with a range of technologies
- Can use the internet with adult supervision to find and retrieve information of interest to them

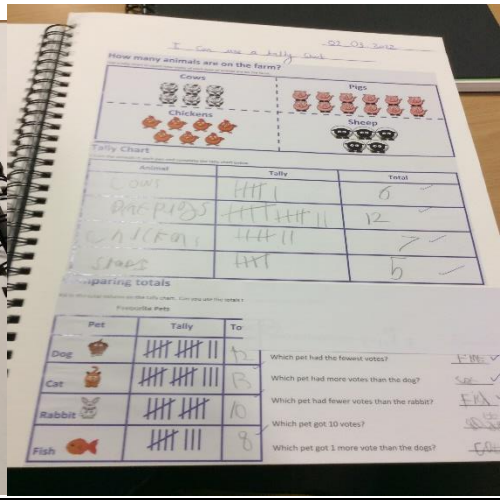
Alongside the skills taught we embed knowledge related to online safety, this is delivered by the Pre-School Manager and the Reception Class Teacher through the use of 'Hector's World' as well as within PSHE and our restorative practice. Children within the EYFS develop lifelong ICT skills to ensure they are ICT literate.

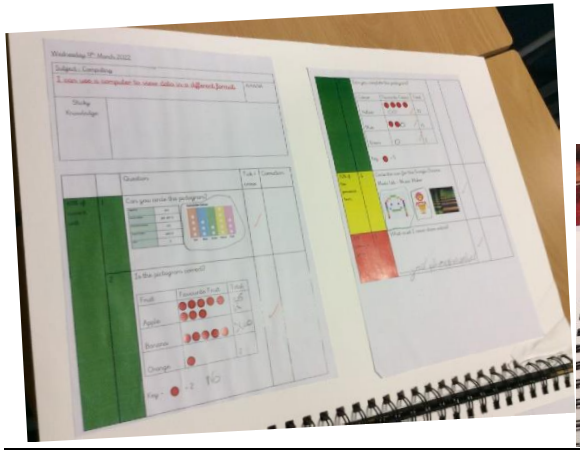
Appendix 4 – Floor book examples

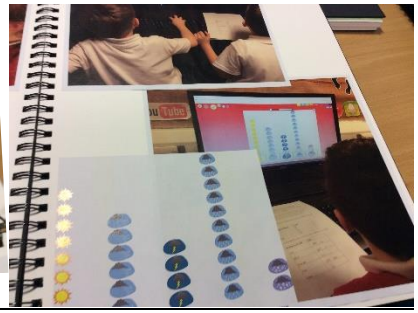
Every lesson, the learning objective, sticky knowledge and evidence of work are recorded in class floor books. See below for examples.


Does it rub mistakes out
Yes
No
Do they have yellow or green handles
Yes
They are for left handed people.
No
They are for right handed people
Is the ruler in cm
Yes
No
Can the pen dry quickly
Yes
No


Examples of retrieval.


How many animals are on the farm?
Cows
Chickens
Pigs
Sheep
Tally Chart
Animal
Tally
Total
Comparing totals
Pet
Tally
Dog
Cat
Rabbit
Fish
Which pet had the fewest votes?
Which pet had more votes than the dog?
Which pet had fewer votes than the rabbit?
Which pet got 10 votes?
Which pet got 1 more vote than the dogs?





Appendix 5 – LTP

Computing Long Term Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Digital literacy On Line Safety	Digital literacy On Line Safety	Digital literacy On Line Safety	Digital literacy On Line Safety	Digital literacy On Line Safety	Digital literacy On Line Safety
Year 1	Technology around us	Digital painting	Digital writing	Grouping data	Moving a robot	Programming animations
Year 2	Information technology around us	Digital photography	Making music	Pictograms	Robot algorithms	Programming quizzes
Year 3	Connecting computers	Stop frame animation	Desktop publishing	Branching databases	Sequencing sounds	Events and actions in programs
Year 4	The internet	Audio editing	Photo editing	Databases	Repetition in shapes	Repetition in games
Year 5	Sharing information	Vector drawing	Video editing	Flat-file databases	Selection in physical computing (Swift Playgrounds)	Selection in quizzes
Year 6	Internet communication	3D modelling	Webpage creation	Introduction to spreadsheets	Variables in games	Sensing

Appendix 6 – MTP *example*

Year 3 – Connecting computers

Unit introduction

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.

You will need digital devices for learners to interact with during this unit. Lesson 3 requires digital devices with a painting application. Lesson 6 includes a 'network tour', which involves learners identifying key parts of your school network. You will therefore need access to your school's server, switch, and wireless access points.

Overview of lessons

Lesson	Brief overview	Learning objectives
1 How does a digital device work?	This lesson introduces the concepts of input, process, and output. These concepts are fundamental to all digital devices.	To explain how digital devices function • I can explain that digital devices accept inputs • I can explain that digital devices produce outputs • I can follow a process
2 What parts make up a digital device?	Learners will develop their knowledge of the relationship between inputs, processes, and outputs and apply it to devices and parts of devices that they will be familiar with from their everyday surroundings.	To identify input and output devices • I can classify input and output devices • I can describe a simple process • I can design a digital device
3 How do digital devices help us?	Learners will apply their learning from Lessons 1 and 2 by using programs in conjunction with inputs and outputs on a digital device. They will create two pieces of work with the same focus, using digital devices to create one piece of work, and non-digital tools to create the other. Learners will then compare and contrast the two approaches.	To recognise how digital devices can change the way that we work • I can explain how I use digital devices for different activities • I can recognise similarities between using digital devices and using non-digital tools

		• I can suggest differences between using digital devices and using non-digital tools
4 How am I connected?	Many digital devices are now connected to other digital devices, eg computers through wires, tablets through Wi-Fi, and smartphones through mobile phone networks. The benefit of connecting digital devices is that it allows information to be shared between users and systems. This lesson introduces the concept of connections and moving information between connected devices. Learners will learn to explain how and why computers are joined together to form networks.	To explain how a computer network can be used to share information • I can recognise different connections • I can explain how messages are passed through multiple connections • I can discuss why we need a network switch
5 How are computers connected?	This lesson introduces key network components, including a server and wireless access points. Learners will examine each device's functionality and look at the benefits of networking computers.	To explore how digital devices can be connected • I can recognise that a computer network is made up of a number of devices • I can demonstrate how information can be passed between devices • I can explain the role of a switch, server, and wireless access point in a network

6 What does our school network look like?	Learners will further develop their understanding of computer networks. They will see examples of network infrastructure in a real-world setting and relate them to the activities in Lesson 5.	To recognise the physical components of a network • I can identify how devices in a network are connected together • I can identify networked devices around me • I can identify the benefits of computer networks