



Northowram Primary School

Computing guidance

2019- 2020

Curriculum Pledge



“Children benefit from an inspiring curriculum. Leaders ensure that children receive excellent opportunities to develop their knowledge of subjects beyond English and Mathematics.” (Ofsted 2016) “The wider curriculum in Years 4, 5 and 6 is taught by subject specialists who dedicate their afternoons to teaching their subject across all six classes. This arrangement is leading to in-depth teaching, often at higher levels than typically seen and much appreciated by pupils and parents. In their own words, pupils feel ‘they have the best teachers for the job’. “ (Ofsted 2016)

Intent

To achieve the aims of our school vision, we are committed to:

- Ensuring all our children receive their full legal entitlement to learning programmes in all curriculum areas in all year groups.
- Providing a full curriculum (enhanced by out of school visits and visitors to school) in all subjects throughout each year including year 6. Our curriculum is not narrowed for exam or test preparation.
- Ensuring that, in addition to the skills and knowledge, which is required learning in each subject as detailed in the National Curriculum, our curriculum is also planned to include explicit teaching and learning related to human values (e.g. respect, diversity, equality, tolerance, kindness) and responsible citizenship.
- Ensuring that high quality teaching in every curriculum area leads to excellence in pupil outcomes, in all curriculum subjects.
- Ensuring that our children extend their learning in a wide range of curriculum areas beyond the hours of the school days through our provision of extra-curricular clubs. Our target is that upwards of 50% of our children will take part in clubs in any given year. We offer a wide range of clubs including those linked to PE (many types of dance, PE and sports clubs), the creative arts and music (e.g. choirs, recorders, samba, drumming, violins). Children are provided with an annual opportunity to showcase their talent and progress in these areas in our annual ‘Soiree’ performances.



Implementation

- At the upper end of school (years 4,5 and 6), our research, monitoring and evaluation have shown that curriculum subjects (Music, French, Geography, Computing, Art, Design and Technology, Science, PE, History, RE) are most effectively taught by subject specialist teachers who have a high level of subject knowledge in their curriculum area. In years 4, 5 and 6, our teachers specialise in one or two curriculum areas and our children receive instruction from different teachers for each subject. Our children have the best teachers for each subject.
- In years 1-6, all curriculum subjects are taught discreetly rather than being taught in a topic-based way. In this way, we ensure that specific skills and knowledge linked to subject are taught, learned and built upon year on year. Children have workbooks for all subjects including practical subjects (e.g Art, Design and Technology, PE) where they record their work, ideas, reflection and progress. Work in all subjects is assessed and marked with regular individual feedback given.
- Our school provides a healthy budget for the provision of high-quality resources for every curriculum area. Lead teachers for each subject place resource orders on an annual basis to replenish resources and source new resources to ensure that high quality resources are available for the children to maximise learning in all curriculum areas.
- Children receive weekly PSHCE lessons. Our PSHCE curriculum is delivered through high quality circle time sessions every Friday afternoon. All our teachers are trained in delivering high quality circle time sessions based on recommendations from national experts in this area.

Impact

- Lead teachers for each curriculum subject undertake regular monitoring of outcomes (through pupil interviews and workbook scrutinies) and the quality of instruction in each curriculum area through lesson observations. Lesson observations linked to English, Maths and all other curriculum subjects take place each year.
- Lead teachers for each subject in year 1,2,3 team and key stage 2 team work together to ensure that progression and coverage in each curriculum subject is robust.
- Each subject has well defined assessment processes which are used to track children's progress in each area, report progress to parents and to provide valuable feedback in each subject to individual children.

Long Term Plan



Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Digital literacy Typing/ Logging on/saving		Control/programming Algorithms Bee bots		E safety	
Year 2	E-safety		Algorithms and coding		Word Processing and Presentation Skills	
Year 3	Digital Artist -creating digital art pieces Digital Filmmaker -creating a short film		Digital Researcher and Publisher -Creating documents containing both		Digital Programmer -Sequencing and debugging programs	
Year 4		E-safety Risks PEGI ratings Cyber bullying		Coding Identify, write and debug algorithms		Digital Literacy Microsoft Publisher
Year 5		E-safety Risks Fraud Respecting the internet		Coding Identify, write and debug algorithms - including variables		Digital Literacy Microsoft Word
Year 6		E-safety Case-studies Fraud Responsible use of internet safety		Coding Identify, write and debug algorithms – including variables and repetition		Digital Literacy Microsoft PowerPoint

Progression skills document

Computing Progression	Algorithms	Programming and Development	Data and Data Representation	Hardware and Processing	Communication and Networks	Information Technology
Year 1	<p>Begin to understand what an algorithm is.</p> <p>Begin to write a simple set of instructions for a purpose using symbols.</p>	<p>Knows that users can develop their own programs.</p> <p>Demonstrates this by creating simple programs e.g. on programmable robots.</p> <p>Executes, checks and changes programs.</p> <p>Understands that programs execute by following precise instructions.</p>	<p>Recognises that digital content can be represented in many forms.</p> <p>Begins to distinguish between some of these forms and can explain the different ways that they communicate information.</p> <p>Organises, stores, edits and manipulates data in different digital formats.</p>	<p>Understands that computers have no intelligence and can do nothing unless a program is used.</p> <p>Recognises that all software executed (used) on digital devices is programmed (look at examples)</p>	<p>Obtains content from the world wide web using a web browser.</p> <p>Understand the importance of communicating safely and respectfully on line and the need for keeping personal information private.</p> <p>Knows what to do when concerned about content or being contacted.</p>	<p>Uses software under supervision to create, store and edit digital content using appropriate files and folder names.</p> <p>Understands that people interact with computers.</p> <p>Shares their use of technology in school.</p> <p>Knows common use of information technology outside school.</p> <p>Talks about their work and makes changes to improve it.</p>
Year 2	<p>Understands what an algorithm is and is able to express simple linear (non-branching) algorithms as symbols.</p> <p>Understands that computers need precise instructions.</p> <p>Demonstrates care and precision to avoid errors.</p> <p>Understand that algorithms are used on digital devices as programs.</p> <p>Simple algorithms using loops and selection (as statements).</p> <p>Uses logical reasoning to predict outcomes.</p> <p>Detects and corrects errors (debugging) in algorithms.</p>	<p>Develops their own programs e.g. robots.</p> <p>Uses arithmetic operators and what if statements and loops within programs.</p> <p>Uses logical reasoning to predict the behaviour of programs and detects and corrects simple semantic errors i.e. debugging.</p>	<p>Recognises the different types of data e.g. text and number.</p> <p>Appreciates that programs can work with different types of data.</p> <p>Recognises that data can be structured in tables to make it useful.</p> <p>Confidently organises, stores, edits and manipulates data in a range of digital formats.</p> <p>Begins to recognise the difference between data and information .</p>	<p>Recognises that a range of digital devices can be considered a computer (look at examples).</p> <p>Recognises and uses a range of input and output devices (e.g. robotics)</p> <p>Understands how programs specify the function of a general purpose computer.</p>	<p>Navigates the web and can carry out simple web searches to collect digital content.</p> <p>Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online.</p>	<p>Uses technology with increasing independence to purposely organise digital content.</p> <p>Shows awareness of the quality of digital content collected.</p> <p>Uses software to manipulate and present digital content: data and information.</p> <p>Shares their experiences of technology in school and outside school.</p> <p>Talks about their work and makes some improvements to solutions based on feedback received.</p>

<p>Year 3</p>	<p>Designs solutions (algorithms) that use repetition and two way selection (i.e if, then, else.) Uses diagrams to express solutions. Uses logical reasoning to predict outputs, showing some awareness of inputs.</p>	<p>Create programs that implement algorithms to achieve given goals. Identifies and assigns variables in programs. Uses loop commands “until” and sequences of selection statements in programs, including if, then, else statements.</p>	<p>Understands and can explain the difference between data and information. Knows why sorting data in a ‘flat file’ can improve searching for information. Uses filters or can perform single criteria searches for information.</p>	<p>Recognise that computers collect data from various input devices e.g. sensors and application software. Understand the difference between hardware and application software and their roles within a computer system.</p>	<p>Understands the difference between the internet and internet services e.g. world wide web. Shows awareness of, and can use some internet services such as VOIP. Recognises what is acceptable and unacceptable behaviour when using technologies and online services.</p>	<p>Confidently collects, organises and presents data and information in digital content. Creates digital content to achieve a given goal through combining software, packages and internet services to communicate with a wider audience e.g blogging. Makes effective improvements to solutions based on feedback received and can comment on the success of the solution.</p>
<p>Year 4</p>	<p>Knows which tasks best completed by human or computers. Designs solutions by decomposing a problem and creates a sub-solution for each part of the problem (decomposition) Recognises that there is more than one solution to a problem.</p>	<p>Understands differences between and appropriately uses ‘if’ and ‘if’, then and else statements. Uses variable and relational operators within a loop to control ‘endings’ in programs. Designs, writes and debugs (modular) programs using procedures (algorithms). Knows that a procedure can be used to hide details in programs.</p>	<p>Understands and can clearly explain the difference between data and information. Knows why sorting data in a ‘flat file’ can improve searching for information. Performs more complex searches for information e.g. using Booleam and relational operators. Analyses and evaluates data and information and recognises that poor quality data leads to unreliable results and inaccurate conclusions.</p>	<p>Understands why and when computers are used. Understands the main functions of the operating systems. Knows the difference between physical, wireless and mobile networks. Look at examples e.g. internet: how they provide multiple services such as the world wide web.</p>	<p>Understands how to effectively use search engines and knows how search results are selecting including that search engines are ‘web crawler programs’ Selects, combines and uses internet services. Demonstrates responsible use of technologies and online services and knows a range of ways to report concerns.</p>	<p>Makes judgements about digital content when evaluating and assigning it for a given audience. Recognises the audience when designing and creating digital content. Understands the potential of information technology for collaboration when computers are networked. Uses criteria to evaluate the quality of solutions. Can identify improvements, making some refinements to the solution and future solutions.</p>
<p>Year 5</p>	<p>Knows and can explain which tasks are best completed by human or computers. Designs solutions by decomposing a problem and creates a sub-solution for each part of the problem (decomposition). Recognises that there are several solutions to the same problem. Understands that various algorithms exist for different functions. Begins to identify patterns in algorithms that help to solve specific problems.</p>	<p>Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience of high level textual languages e.g. standard libraries when programming. Uses some operators and expressions e.g. Booleam. Starts to apply these in the context of program control (e.g. input/process/output.)</p>	<p>Knows why sorting data in a ‘flat file’ can improve searching for information. Performs more complex searches for information e.g. using Booleam and relational operators. Analyses and evaluates data and information and recognises that poor quality data leads to unreliable results and inaccurate conclusions. Begins to understand that digital computers are binary to represent all data. Begins to understand how bit patterns represent numbers and images.</p>	<p>Recognise the function of the main internal parts of basic computer designs (architecture.) Begins to understand the concept behind the fetch-execute cycle. Starts to appreciate that there is a range of operating systems and application software for the same hardware.</p>	<p>Understands how search engines rank search results and test some of these systems. Understands how to construct static web pages using HTML and CSS. Understands data transmission between digital computers over networks including the internet i.e. IP addresses and packet switching.</p>	<p>Evaluates the appropriateness of digital services, internet services and application software to achieve given goals. Recognises ethical issues surrounding the application of information technology beyond school. Designs criteria to critically evaluate the quality of solutions. Uses the criteria to identify improvements, and can make appropriate some refinements to the solution.</p>

<p>Year 6</p>	<p>Understand that iteration is the repetition of a process such as a loop. Recognises that different algorithms exist for the same problem. Detects errors in algorithms. Rewrites and tests own tests and sequences. Is able to identify similarities and differences in situations and can use these to solve problems (pattern recognition.)</p>	<p>Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience of high level textual languages e.g. standard libraries when programming. Uses a range of operators and expressions e.g. Boolean and applies them in the context of program control (e.g. input/process/output.) Starts to select the appropriate data types.</p>	<p>Knows that digital computers use binary to represent all data. Understands how bit patterns represent numbers and images. Knows that computers transfer data in binary (code). Recognises the relationship between binary and file size (uncompressed) Defines data types: real numbers and Boolean. Queries data on one table using typical query language.</p>	<p>Recognises and understands the function of the main internal parts of basic computer designs (architecture.) Understands the concepts behind the fetch-execute cycle. Knows that there is a range of operating systems and application software for the same hardware. Tests, contrasts and evaluates the effectiveness of operating systems (eg. Windows android)</p>	<p>Understands how search engines rank search results. Clearly evaluates these systems. Understands how to construct static web pages using HTML and CSS. Designs and creates own web pages for a purpose. Understands data transmission between digital computers over networks including the internet i.e. IP addresses and packet switching.</p>	<p>Justifies the choice of, combines and uses multiple digital devices, internet services and application software to achieve given goals. Evaluates the trustworthiness of digital content. Knows how the use of technology can impact on society. Begins to design criteria for users to evaluate the quality of solutions and uses the feedback to identify some improvements.</p>
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Teaching Computing ‘The Northowram Way’



- Sequencing of teaching in computing will always begin with an E-Safety unit. E-Safety is a priority across all year groups at Northowram and every step is taken to educate our child in the safe usage of the internet and devices. These units often take up a whole half term and cover topics such as: App safety, safe ways to use our devices, password protection, sharing of images, talking to others across various platforms. In addition to the e-safety units, children will also be taught to skills in digital literacy (working with various Microsoft applications) and Computer Science (programming and computer systems)
- Teaching Computing as a subject specialism means children learn specific skills and knowledge that are applicable to the wider world. Children leave our school with a vast knowledge of different computer systems, programming and essential skills and knowledge to keep themselves safe on while being ‘connected’. Children also learn valuable touch-typing skills that will aid them in the future.
- Children learn various progressive skills throughout their time at our school that are transferable across all subjects and in life outside of school.

Assessment in Computing



- Computing is assessed, at first, through input at the beginning of each lessons. Children's prior knowledge will be assessed and misconceptions planned for in later lessons. Skills within lessons will then be assessed formatively and a skills/knowledge assessment grid will be used. Evidence of children learning will be taken using screen shots and worksheets, printed and stuck into computing books.
- An assessment grid is used for each topic of Computing which are written in line with the National Curriculum 2014 and ticked off with a purple swipe (greater depth), green swipe (achieved objective) or an orange swipe (has mostly achieved).
- An entry quiz will be used to assess children's knowledge at the start of a topic. General questions will be asked about the subject and children will be asked to complete this independently and guess at every question. An exit quiz will be used at the end of the topic to assess what key concepts children have understood and to show progress between the start (entry quiz) and end of the unit.
- Monitoring will take place throughout the year. Monitoring will include book scrutinies and lesson observations.

SEN and vulnerable groups



- SEN and vulnerable groups will be supported throughout classroom based lessons and lessons in the ICT suite. During lessons children will be given models, enlarged copies of work, use magnifications software/speech recognition software and will have 1:1 support or work with the teacher. During ICT lessons, allowances will be made for fine and gross motor-skill difficulties – using enlarged or coloured keyboards and specially designed input equipment.
- Children will be assessed using methods outlined in the ‘Assessment’ section. If children cannot access classroom based lessons or ICT suite lessons, assessment will be adapted to reflect progress that individual has made.
- Monitoring will take place across books. If children are absent from lessons, due to interventions being run, the teacher will be responsible for addressing missed learning with the individual.

Marking and feedback



- Marking should take place before children receive books back the next lesson. Positive praise (comments, stickers, stamps, merits) should be used. Teachers should address misconceptions with a comment bringing this to the child's attention next lesson.
- Children will be given time in the next lesson to respond to any comments if they have been made. Generally this time will be spent sticking in photos or evaluations from the previous lessons practical work.