Teaching Computing at Dove Bank

Subject Statement

Digital technology is driving extraordinary global changes that some are calling the Fourth Industrial Revolution. Navigating these changes effectively and safely requires a significant understanding of digital literacy, information technology and computer science. This knowledge is also crucial if business, industry and individuals are to exploit the opportunities offered by this revolution. The National Curriculum makes it clear that computing is mandatory at key stages 1 to 4 and that 'a high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world'. – Ofsted Research Review: Computing May 2022

At Dove Bank, we believe that every child should have the right to a curriculum that champions excellence; supporting pupils in achieving to the very best of their abilities. We understand the immense value technology plays not only in supporting the computing and whole school curriculum but overall in the day-to-day life of our school. We believe that technology can provide: enhanced collaborative learning opportunities; better engagement of pupils; easier access to rich content; support conceptual understanding of new concepts and can support the needs of all our pupils.

Subject Leader & Expert Teachers

Within school we have a wealth of experience in the teaching of computing. Details of staff are detailed below:

- Katie Halliwell is our computing lead.
- Novus maintain our computing network.
- Alicia McLaren is an experienced teacher who is confident in using technology.
- All staff use a range of technology daily and have access to updated technology.

Curriculum Organisation

At Dove Bank, we believe that computing gives children the opportunity to explore and experience the wider world around them, widening and deepening their essential knowledge and skills. Ensuring that children become computer literate ensures that they can access the curriculum as fully and safely as possible and also provides a foundation for life-long learning. We teach computing using National Centre for Computing Education's Teach Computing which provides a progressive scheme ensuring that knowledge and skills are built progressively term on term and year on year. Online Safety is a key part of our curriculum to ensure that all children are aware of how to keep themselves and others safe online and how they can report anything that they are concerned about. This is taught through both the Teach Computing units and the ProjectEVOLVE resources.

As a school, we have chosen the Teach Computing programme from Year 1 to Year 6. The programme supports our teachers in delivering fun and engaging lessons which help to raise standards and allow all pupils to achieve to their full potential. The Teach Computing programme is a comprehensive set of resources aligned to the National Curriculum for Computing, Technology and Digital Competence.

The programme is intended to facilitate teachers in achieving the very best outcomes for children and exposes children to a wide variety of digital tools, technological skills, and innovations.

Every year group covers key units on online safety. These units focus on looking at different issues children may face online. These units underpin the children's learning all the way through until the end of Key Stage 2, allowing them to discuss and explore these areas in depth therefore building up secure knowledge and skills in these areas.

The Teach Computing Curriculum uses the National Centre for Computing Education's computing taxonomy to ensure comprehensive coverage. All learning outcomes can be described through ten strands:

1. Algorithms
2. Computer networks
3. Computer systems
4. Creating media
5. Data and information
6. Design and development
7. Effective use of tools
8. Impact of technology
9. Programming
10. Safety and security

The units for key stages 1 and 2 are based on a spiral curriculum. This means that each of the themes is revisited at least once in each year group, and pupils revisit each theme through a new unit that consolidates and builds on prior learning within that theme.

Computing in the Early Years
In Early Years, pupils are given the opportunities to develop their computing skills and knowledge through a wide range of activities. This may include:

- taking a photograph with a camera or tablet
- searching for information on the internet
- playing games on the interactive whiteboard
- exploring an old typewriter or other mechanical toys
- using a Beebot
- watching a video clip
- listening to music

These opportunities prepare our pupils well with a strong foundation of knowledge for using technology in their computing lessons as they move into Key Stage One. Pupils have access to a range of technology and equipment including electronic toys, talking boards, iPads and programmable toys.

<u>Skills, knowledge and vocabulary progression</u>

The computing curriculum is broken down into four themes – Computing systems and networks, Programming, Data and information, and Creating media. Within the Teach Computing Curriculum, every year group learns through units within these four themes, which combine the ten strands of the National Centre for Computing Education's taxonomy (see table, right). All learning objectives have

been mapped to the strands, which ensures that units build on each other from one key stage to the next.

Primary themes	Computing systems and networks	Programming	Data and information	Creating media
Taxonomy strands	Computer systems Computer networks	Programming Algorithms Design and development	Data and information	Creating media Design and development
	Effective use of tools			
	Impact of technology			
	Safety and security			

Progression through the four themes:

<u>Computing systems and networks</u>

The Computer Systems and Networks strand is taught once a year, building progressively from one year group to the next, with subject specific knowledge introduced at age-appropriate points.

Computer Systems and Networks	
1	Technology around us
2	IT around us
3	Connecting Computers
4	The Internet
5	Systems and Searching
6	Communication and Collaboration

<u>Programming</u>

The Programming stand is taught twice a year, with the same concept revisited and covered in more depth. The following year incorporates the previous skills, whilst progressing onto a new concept.

Programming		
1	Moving a Robot	Programming animations
2	Robot algorithms	Programming quizzes
3	Sequencing sounds	Events and actions in programs
4	Repetition in shapes	Repetition in games
5	Selection in physical computing	Selection in quizzes
6	Variables in games	Sensing movement

<u>Data and information</u>

The Data and Information strand is again taught once a year, progressing in both skills and software. Key Stage 1 uses simplified age-appropriate software platforms, progressing to more industry focused software in upper Key Stage 2.

Data and Information	
1	Grouping data
2	Pictograms
3	Branching databases
4	Data logging
5	Flat file databases
6	Introduction to spreadsheets

Creating media

The Creating Media strand hosts a wide range of different media types, and therefore different skills. To support progression, this can be best categorised into four different key areas: text, graphics (the use of pictures and text), photo and video, and audio. The spiral curriculum covers each of these four areas over a phase (KS1, LKS2 and UKS2), rather than in every year group, with links across these areas made where possible.

Creating Media				
	Text	Graphics	Photo and Video	Audio
1	Digital writing	Digital painting		
2			Digital photography	Digital music
3	Desktop publishing	Stop frame animation		
4		Photo editing		Audio production
5		Introduction to vector graphics	Video production	
6	Web page creation	3D modelling		

Subject specific vocabulary has been identified, and a list of vocabulary to be covered during each area of learning has been specified, although this list is by no means exhaustive and teachers should use their professional judgement to ensure that children are fully equipped with the vocabulary that they need to access their learning. Prior knowledge has been identified on our Computing long term plans, to ensure that teachers know their class's starting points and blocks to build upon.

Subject Specific information

Computing is taught in units throughout each year group. When a class focus is computing, this is usually delivered for one hour per week, however some units are best suited to block teaching and this unit might be taught as a block over a week or through double sessions.

The school has 3 sets of iPads (10 per set), which are located throughout the school. These are timetabled to coincide with computing lessons but are also available for cross curricular use. We also have a laptop trolley, which provides opportunities for children to use a Windows operating system. There is an interactive whiteboard in each classroom throughout the school for staff to use to support teaching and learning. We also have a selection of ICT resources available in school; most are stored in a central location (in the stationary cupboard), while others are located in accessible places.

The Teach Computing website is free to access for all staff members. Teach Computing provides teacher unit plans and accompanying resources for each unit. Teach Computing contains everything that is needed to deliver engaging lessons whilst allowing for the flexibility to meet individual school needs. Our computing long term plans are available to staff on our school Teams.

We also have access to the Computing at School website and 'Barefoot Computing', where there are lots of resources, activities and suggested lesson plans that can be accessed by staff – staff should contact the Computing Subject Leader if they require further assistance or support to login.

If staff need any further support or resources to allow them to teach their computing curriculum, they should contact the Computing Subject Leader in the first instance.

As well as support from the Computing Lead, staff receive training and support from the North Midlands Computing Hub, who are also able to provide additional teaching resources including Crumble Controllers and Bee Bots. Staff have attended online Teach Computing training in June 2024. Most computing work is completed online and will be saved in the child's individual online folder. Computing is used throughout all areas of the curriculum for a variety of purposes including

researching and recording and therefore work maybe found in other relevant subject books e.g. Maths, Geography etc. This also increases the hours allocated to our computing curriculum.

Assessment

Teachers will formatively assess children's work in computing by making informal judgements during lessons. Class teachers assess the pupils in their class, using the work completed in class, on a half termly basis (or at the end of a taught unit). Each unit includes a summative assessment for the children to complete. Teachers use this assessment to plan for future learning. Written or verbal feedback is given to the child to help guide his/her progress. Older children are encouraged to make judgements about how they can improve their own work.

The Computing Lead has access to all work and is able to look at individual and class folders and work completed. A selection of children from every class are chosen for scrutiny. There are opportunities for pupil voice meetings, where we discuss computing to check their understanding from their learning from specific units.

Computing across the Curriculum

The unit overviews for each unit show the links between the content of the lessons and the national curriculum and Education for a Connected World framework (ncce.io/ efacw). These references have been provided to show where aspects relating to online safety, or digital citizenship, are covered within the Teach Computing curriculum. The coverage required for the computing national curriculum is provided. The school also takes part in Safer Internet Day and relevant information about online safety is shared with parents through newsletters.

Vocabulary and oracy are being embedded across the curriculum. Pupils are taught key vocabulary throughout units of work, and are given the opportunity to orally rehearse new vocabulary in context.

The teaching of computing and computational thinking contributes to teaching and learning in all curriculum areas. It also offers ways of impacting on learning which are not possible with conventional methods. Teachers use software to present information visually, dynamically and interactively, so that children understand concepts more clearly. For example, graphics work links in closely with work in art, and work using databases supports work in mathematics, while role-play simulations and the Internet prove very useful for research in humanities subjects. Computing enables children to present their information and conclusions in the most appropriate way. Most of our software is generic, and can therefore be used in several curriculum areas. Teachers use Interactive Whiteboards, iPads and desktops to support teaching & learning.

Extra-Curricular Activities

We realise that not all children have access to computers outside of school hours and so we offer after a coding school club. We also have Digital Ambassadors who have a love for technology and help to make the most of learning through technology.
Reading and multiplication facts learning is supported through the use of Oxford Owl and Times Tables Rock Stars.