Computing In Action at Woodlands Academy

Intent:

Technology is changing the lives of everyone. Through teaching Computing, we equip children to participate in a rapidly changing world where work and leisure activities are increasingly transformed by technology.
It is our intention to enable children to find, explore, analyse, exchange and present information. We also focus on developing the skills necessary for children to be able to use information in a discriminating and effective way. We want children to know more, remember more and understand more in computing so that they leave our school computer literate. Computing, in general, is a significant part of everyone's daily life and children should be at the forefront of new technology, with a thirst for learning what is out there. Computing within schools can therefore provide a wealth of learning opportunities and transferrable skills explicitly within the Computing lesson and across other curriculum subjects.
By the time, the children leave Woodlands; children will have gained key knowledge and skills in the three main areas of the computing curriculum: computer science (programming and understanding how digital systems work), information technology (using computer systems to store, retrieve and send information) and digital literacy (evaluating digital content and using technology safely and respectfully). The objectives within each strand support the development of learning across the key stages, ensuring a solid grounding for future learning and beyond.
At the core of our computing curriculum 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, we intend for our children to use information technology to create programs, systems and a range of content. Children must be taught in the art form of 'Computational Thinking' in order to provide them essential knowledge that will enable them to participate effectively and safely in the digital world beyond our gates. We aim to ensure 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. In July 2018, the Online Safety Mark inspection team found that 'The school provides excellent provision around digital literacy with children have regular curriculum engagement looking at areas such as online well-being, bullying, copyright and ownership.'
Computing skills are a major factor in enabling children to be confident, creative and independent learners and it is our intention that children have every opportunity available to allow them to achieve this.
The national curriculum for computing aims to ensure that all pupils:

- ✓ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- ✓ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems

- ✓ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- ✓ are responsible, competent, confident and creative users of information and communication technology

Department for Education research outlines that education providers must focus on the underpinning knowledge and behaviours that can help pupils navigate the online world safely and confidently regardless of device, platform or application: factors which are constantly changing.
Education Endowment Fund research indicates that digital technology, where learners use programmes or applications designed for problem solving or open-ended learning, is associated with moderate learning gains (4 months progress on average).

Implementation:

Key Concepts

- ✓ Computer science (programming and understanding how digital systems work),
- ✓ Information technology (using computer systems to store, retrieve and send information)
- ✓ Digital literacy (evaluating digital content and using technology safely and respectfully)

Curriculum Map Overview

	Autumn	Spring	Summer
	Six weeks (taught alternate weeks)	Six weeks (taught alternate weeks)	Six weeks (taught alternate weeks)
Nursery	Information Technology	Computer Science	Digital Literacy/ Information Technology
Reception	Information Technology	Computer Science	Digital Literacy/ Information Technology
Y1	Information Technology	Computer Science	Digital Literacy/ Information Technology
Y2	Information Technology	Computer Science	Digital Literacy/ Information Technology
Y3	Information Technology	Computer Science	Digital Literacy/ Information Technology
Y4	Computer Science	Information Technology	Information Technology
Y5	Information Technology	Computer Science	Digital Literacy/ Information Technology
Y6	Digital Literacy/ Information Technology	Information Technology	Computer Science

Online Safety taught at the start of every half term and throughout. Curriculum adjusted to suit the needs of the class (any issues that arise)

Key Subject Specific Vocabulary

Nursery	Computer, Screen, Keyboard, Tinker, Move, Turn,
Reception	Instructions, Algorithm, Move, Turn, Forward, Right, Left, Keyboard, Computer, Screen, Click, Screen, Tinker,
Y1	Username, Password, Mouse, Keyboard, Computer, Click, Move, Print, Save, Open, Paint, Picture, desktop, laptop, screen, trackpad, base unit, technology, technology in school, technology in the outside world. Instructions, Algorithm, Sequence, Program, Turn, Forward, Right, Left, 90 degrees, Animation,
Y2	Username, Password, Mouse, Keyboard, Computer, Click, Move, Print, Save, Open, Paint, Picture, desktop, laptop, screen, trackpad, base unit, technology, technology in school, technology in the outside world, Information technology, benefits. Animation, Email, Communicate, Send, Reply, Forward PowerPoint, Google Slides, slides, text, font, size, space bar, insert, copy, paste, images, evaluate, feedback, bold, italics, underline. Algorithm, sprite, blocks, instructions, sequence, debug, movement, forwards, backwards, joining blocks, adding blocks, outcomes

Y3	Username, Password, Mouse, Keyboard, Computer, Click, Move, Print, Save, Open, Paint, Picture, desktop, laptop, screen, trackpad, base unit, technology, technology in school, technology in the outside world, Information technology, benefits. Animation, Email, Communicate, Send, Reply, Forward PowerPoint, Google Slides, slides, text, font, size, space bar, insert, copy, paste, images, evaluate, feedback, bold, italics, underline. Algorithm, sprite, blocks, instructions, sequence, debug, movement, forwards, backwards, joining blocks, adding blocks, outcomes, commands, drawing lines. Branching database, Database, Collect, Data, Research, networks, switched, server and Wi-Fi, devices, connecting,
Y4	Username, Password, Mouse, Keyboard, Computer, Click, Move, Print, Save, Open, Paint, Picture, desktop, laptop, screen, trackpad, base unit, technology, technology in school, technology in the outside world, Information technology, benefits. Animation, Email, Communicate, Send, Reply, Forward PowerPoint, Google Slides, slides, text, font, size, space bar, insert, copy, paste, images, evaluate, feedback, bold, italics, underline. Algorithm, sprite, blocks, instructions, sequence, debug, movement, forwards, backwards, joining blocks, adding blocks, outcomes, commands, drawing lines, loops, adding values, infinite loops and count-controlled loops, event block. Branching database, Database, Collect, Data, Research, networks, switched, server and Wi-Fi, devices, connecting, WWW, World Wide Web, media, websites, internet services, content, reshare Data logger, data, program, collect, analyse, spreadsheet, cell, row, column, feedback, present.
Y5	Username, Password, Mouse, Keyboard, Computer, Click, Move, Print, Save, Open, Paint, Picture, desktop, laptop, screen, trackpad, base unit, technology, technology in school, technology in the outside world, Information technology, benefits. Animation, Email, Communicate, Send, Reply, Forward PowerPoint, Google Slides, slides, text, font, size, space bar, insert, copy, paste, images, evaluate, feedback, bold, italics, underline. Algorithm, sprite, blocks, instructions, sequence, debug, movement, forwards, backwards, joining blocks, adding blocks, outcomes, commands, drawing lines, loops, adding values, infinite loops and count-controlled loops, event block, selection, conditions, if… then… else…, repeat, branching structure, Branching database, Database, Collect, Data, Research, networks, switched, server and Wi-Fi, devices, connecting, WWW, World Wide Web, media, websites, internet services, content, reshare Data logger, data, program, collect, analyse, spreadsheet, cell, row, column, feedback, present. field, order, sort, group, data cards, flat-file database, grouping, sorting, AND, OR, multiple criteria, Green Screen,
Y6	Username, Password, Mouse, Keyboard, Computer, Click, Move, Print, Save, Open, Paint, Picture, desktop, laptop, screen, trackpad, base unit, technology, technology in school, technology in the outside world, Information technology, benefits. Animation, Email, Communicate, Send, Reply, Forward PowerPoint, Google Slides, slides, text, font, size, space bar, insert, copy, paste, images, evaluate, feedback, bold, italics, underline. Algorithm, sprite, blocks, instructions, sequence, debug, movement, forwards, backwards, joining blocks, adding blocks, outcomes, commands, drawing lines, loops, adding values,

	infinite loops and count-controlled loops, event block, selection, conditions, if… then… else…, repeat, branching structure, variable, placeholder, event Branching database, Database, Collect, Data, Research, networks, switched, server and Wi-Fi, devices, connecting, WWW, World Wide Web, media, websites, internet services, content, reshare, refine, search, search engines, web crawlers, search engine's index, limitations Data logger, data, program, collect, analyse, spreadsheet, cell, row, column, feedback, present. field, order, sort, group, data cards, flat-file database, grouping, sorting, AND, OR, multiple criteria, Green Screen, calculations, formula

Special Educational Needs and Disabilities adaptations:

Universal strategies and approaches (Band 0)

Non-negotiables

- Quality First Teaching
- Progression of skills in planning
- Knowledge organisers
- Learning walls linked to each unit with key vocabulary displayed
- Teaching key vocabulary
- SMART rules – Online Safety Rules
- Handling hardware
- CEOP – reporting button
- Prior learning mind map – assessment for learning
- BAD approach
- Questioning
- Discussion/observations
- Self-assessment
- Maths in action
- Targeted interventions
- Continuous provision

Cognition and Learning	Communication and interaction	Social, emotional mental health	Sensory and Physical
Scaffolding the learning Labs challenge	Circle time Partner talk MTYT Whiteboard work Key vocabulary Makaton Learning walls Opportunities to talk Feedback Makaton	Circle time Daily check in Partner talk Meet and greet Rules, routines and expectations Rules for Online Safety Resilience Self-belief and confidence	Time to explore Equipment – the devices that are being used

Reasonable Adjustments (LA and Environmental SEND) (Band 1)

- Partner support
- Visual clues/prompts
- Step by step instructions
- Preteach
- Teach specific vocabulary
- Peer to peer support and feedback
- Repeat instructions
- Using key vocabulary through prompts or visual aids
- Talk about their learning to their peers and Teacher
- Reflect on their own progress at the end of each lesson
- Challenges clear with specific vocab (adapted if necessary)

Cognition and Learning	Communication and interaction	Social, emotional mental health	Sensory and Physical
Visual timeline of lesson Visual prompts Peer support Memory games WAGOLL Word vocabulary mats Pre-teaching Vocabulary Targeted support for small groups Task slicing Time prompts	Talking tins Teach to learning styles Positive feedback Makaton Social Stories (Online Safety related)	Positive feedback Small group work Peer to peer support	Equipment – range of tools

SEND School Based Support (Band 2-3)

- Remind children how to use equipment before use
- Set out a visual rule poster to keep themselves safe.
- Know what they are learning about through prompts and visual aids.
- Have peer or adult support – Task slicing
- Short instructions
- Visual timetable– for lesson
- Visual timers to be used for tasks
- Complete a task linked to the learning
- Recap learning throughout the week to keep learning and skills simmering.

Cognition and Learning	Communication and interaction	Social, emotional mental health	Sensory and Physical
Change instructions Task slicing Adult support for guidance Partner talk Scaffold / help sheets	Pre/post teaching – vocab specific Makaton	De-brief Emotion check ins Use of time out to self-regulate	Equipment – range of tools Slower pace of learning Attention to seating, lighting and acoustics 1:1 opportunities and small group work

Visual cues			Mixed ability partners/groupings Pre-teach Support for low vision aids Demonstration prior to children undertaking independently

SEND EHCP (Band 4)

- Clear/concise instructions
- Clear routines
- Pre-post teaching
- Children practise the skill prior to next lesson – opportunity to overlearn

Cognition and Learning	Communication and interaction	Social, emotional mental health	Sensory and Physical
Visual prompts Visual time prompts Small targets to achieve within the lesson Photos of them at each point so children can see what they are to do 1:1 support from an adult Curriculum adapted to suit needs	Makaton Visual prompts	Working in a small group Turn taking Interact Positive praise for growth mind set/resilience	Equipment – range of tools

Talk in Every Lesson

Exploratory talk will be used in every lesson to engage with the learning objective. It will be used to strengthen and deepen children's understanding of their learning, enabling them to explore the knowledge before they present to the class or complete a written task.

Presentational talk tasks are used as an opportunity to assess children's understanding of the learning objective.

- Children will be given the opportunity to think for themselves for at least one minute (wait time) and then discuss with a talk partner before sharing their response with the class for any question that is posed.
- Children will be asked to feed ideas back to the class in a variety of ways in every lesson e.g. hands-up, whiteboard, thumbs-up. When sharing responses through a written form, a selection of pupils will be asked to also provide it verbally ("5, 4, 3, 2, 1, boards up." Teacher scans the responses provided. "Can someone tell me…?")
- Teachers will use partner or group talk as an opportunity to circulate the room and make a note of any misunderstandings revealed. They will then use the responses as anonymous examples later, asking the class to tell them why it is not accurate ("I noticed a few people saying… Can anyone explain why this cannot be true?").

- Teachers will plan for some 'open' questions in every lesson.
- Teachers will plan for some 'why' questions in every lesson and ask the children to explain their ideas to the class.
- Teachers will provide sentence/talk stems for every question posed to support children in structuring their response. Sentence/talk stems will be adapted based on the subject (drawing upon subject-specific language and sentence structures).
- Teachers will introduce children to the vocabulary they will require for the objective at the beginning of every lesson.
- Teachers will always hold back on providing any of the correct answers to a question until a number of children have given their idea:
  - Student provides idea.
  - Teacher repeats their idea to them ("So you are saying/you think…") and then praises them for contributing and asks if any other students have an idea.
- Knowledge organisers will be provided to support vocabulary acquisition.

Impact:

Our approach to the curriculum results in a fun, engaging, and high-quality computing education. The quality of children's learning is evident through a variety of media and digital platforms. Much of the subject-specific knowledge developed in our computing lessons equip pupils with experiences, which will benefit them in secondary school, further education and future workplaces. From research methods, use of presentation and creative tools and critical thinking, computing at Woodlands Academy gives children the building blocks that enable them to pursue a wide range of interests and vocations in the next stage of their lives.

Our Computing curriculum is high quality, well thought out and is planned to demonstrate progression. If children are keeping up with the curriculum, they are deemed to be making good or better progress. In addition, we measure the impact of our curriculum through the following methods:

- ✓ A reflection on standards achieved against the planned outcomes
- ✓ 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.

Assessment of Learning (Summative assessment) will be calculated from the learning aspects outlined above. Once staff have identified which children are working towards the expected standard (WTS) or greater depth GD on the table below this will then classify those children who have achieved the expected standard for the year. From this, percentages can be created for the children who are working at age related expectations (ARE) and at greater depth (GD) in each aspect across the academy. This will then highlight any areas that need more development as well as those that the children have flourished in.

Learning Focus	End of Teaching Unit		Mid-point assessment		End of Year Assessment	
Aspect: Information technology (Data Handling) (Multimedia)	Working Towards	Working at GD	Working Towards	Working at GD	Working Towards	Working at GD
Aspect: Computer Science (Programming)	Working Towards	Working at GD	Working Towards	Working at GD	Working Towards	Working at GD
Aspect: Digital Literacy (Online Safety)	Working Towards	Working at GD	Working Towards	Working at GD	Working Towards	Working at GD

Progress in Computing will then be reported to parents at the end of the academic year in each child's School Report against the key aspects.

Nursery	
Aspect: Information technology	To be able to say the different kinds of information such as pictures, video, text and sound. To use technology to show learning.
Aspect: Computer Science	To show skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.
Aspect: Digital Literacy	To ask an adult when they want to use the internet.

Reception	
Aspect: Information technology	To use technology to take a picture. To explain how they have used technology to create their work.
Aspect: Computer Science	To explain what buttons have been used on a device and the effect it had.
Aspect: Digital Literacy	To tell an adult when something worrying or unexpected happens while they are using the Internet.

Year 1	
Aspect: Information technology	To be able to present ideas using a given program and to be able to save and retrieve their work. To understand a device and its components.
Aspect: Computer Science	To explain that an algorithm is a set of instructions to make a device work.
Aspect: Digital Literacy	To know the rules I need to follow in order to keep myself safe online.

Year 2	
Aspect: Information technology	To use technology to organise and present ideas using a chosen program. To be able to identify what IT is and how it is used.
Aspect: Computer Science	To create a simple program using Scratch Jr to move a sprite.
Aspect: Digital Literacy	To understand how to be a good digital citizen and recognise that not everyone is who he or she say they are.

Year 3	
Aspect: Information technology	To design and create a branching database. To say what digital device is and the parts it is made up of.
Aspect: Computer Science	To create a simple program using Scratch which includes movement and sound.
Aspect: Digital Literacy	To understand and can give reasons why passwords are important can give examples of the risks posed by online communications.

Year 4	
Aspect: Information technology	To use data collected by a data logger to create a spreadsheet, graph and presentation to present their findings. To say what the World Wide Web is and how it is used.
Aspect: Computer Science	To create a sequence of code using Scratch which includes movement, sound and loops.
Aspect: Digital Literacy	To choose and use a secure password and to be able to use the safety features of a website.

Year 5	
Aspect: Information technology	To know what a flat-file database is and how it is used to store data. To know what a computer system is and how information is transferred between systems and devices.
Aspect: Computer Science	To be able to create a sequence of code using Scratch which includes movement, sound, loops and if… then… else… variables.
Aspect: Digital Literacy	To use technology safely, respectfully and responsibly, recognising acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact.

Year 6	
Aspect: Information technology	To know how the WWW is used as a form of communication and how search engines are used and ranked. To use formulae within a spreadsheet.
Aspect: Computer Science	To create their own game using all variables learned (movement, sound, loops and if… then… else… variables)
Aspect: Digital Literacy	To be able to use different passwords for a range of online services and describe effective strategies for managing those passwords (e.g. password managers, acronyms, stories) and know what to do if their password is lost or stolen.

Appendix

Published: September 2013

Computing programmes of study: key stages 1 and 2

National curriculum in England

Purpose of study

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.

Aims

The national curriculum for computing aims to ensure that all pupils:

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

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Schools are not required by law to teach the example content in [square brackets]. Computing – key stages 1 and 2 2

Subject content

Key stage 1

Pupils should be taught to:

- 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.

Reference: DFE-00171-2013