



Computing Curriculum Rationale and Purpose

Introduction

At Coton-in-the-Elms Primary School, we aim for every child to have PEACE and the decisions we take are driven by 5 simple words, which we hold dear.

Perseverance. Enjoyment. Awe & Wonder. Compassion. Excellence.

- We Persevere to offer our very best and work closely with every family
- We foster a sense of Enjoyment for all who is involved with our school
- We provide plenty of Awe & Wonder moments to make school memorable and learning exciting
- We encourage and promote acts of kindness and Compassion
- We strive to deliver Excellence in all that we do by making continual improvements and never 'standing still' for the good of all children

We believe that through the accumulation and application of knowledge, children are equipped to experience 'life in all its fullness' (John 10:10).

'If any of you lacks wisdom, let him ask God, who gives generously to all without reproach, and it will be given him.' James 1:5.

Thanks to God's wisdom, humans have used this to create a technological age, through which we can communicate, learn and problem solve. Computers have over the past twenty years, revolutionised the world. With this comes an abundance of advantages, however also disadvantages. We ensure our computing curriculum teaches children: how to be safe online; moderate their time on computers to ensure physical activity and handwriting skills are not impeded and to be aware of some of the effects social media can have on our well-being when not used appropriately.



"A high quality computing education equips pupils to use computational thinking and creativity to understand and change the world"

Department for Education, 2013
National curriculum in England: computing programmes of study

Curriculum Purpose: Why study Computing?

Why do learners at Coton-in-the-Elms Primary need to study Computing?

Many aspects of the modern world are run by technology. We see it in every aspect of our lives: from supermarket self-scanners to QR codes and social media. The internet is constantly at our fingertips. Many of the pupils from our school family are digital masters as they have constant access to technology and the Internet. It is likely that many of our children's future careers are going to be heavily influenced and involved in technology. With the many risks posed from the ever-changing developments within online communication, we need to ensure that our pupils keep themselves safe as they use social media and collaborative gaming. By studying computational thinking through programming, pupils learn how to recognise problems and approach them in a controlled and systematic way

What are the aims for the Computing curriculum?

(i.e. what do we want learners to be able to know and do by the time they leave school?)

As our children leave Coton-in-the-Elms Primary School, we want to be confident that they are computer and technologically literate. We want them to understand the risks and know how to stay safe online. We want our children to be able to at the very least meet the requirements of the national curriculum:

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
- problem solve and write their own programs through writing and debugging algorithms
- use the internet safely and securely both as a tool for communication and research.
- use a variety of computer programs to publish their ideas to illustrate their understanding
- to create, edit and publish music and film using a variety of computing multimedia.
- know that data can be presented in different ways and manipulated within an evaluation.
- know the many risks involved in use of the internet,
- be digital ambassadors – not only knowing how to keep themselves safe online, but also others within their community.
- 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

Our Curriculum

How is our curriculum designed?

We ensure that our subject knowledge is up to date. We engage in a range of professional development through the local authority, from the DfE and read and reflect on OFSTED's research materials - [Research review series: computing - GOV.UK \(www.gov.uk\)](https://www.gov.uk/research-review-series-computing)

All staff received training about the DfE approved Computing scheme in July 2022. It was agreed that this curriculum program would meet the needs of our pupils and implemented in September 2022.

Our lessons are sequenced to ensure progression of skills and knowledge. Staff have received training about the Science of Learn. Based on this educational research, each lesson begins with a 'Can you still...?' activity, drawing on prior learning from the previous lesson, previous unit of work and from previous units. This is to ensure that the knowledge gained over time is revisited and embedded into their memory. The problems that novices face in programming arise in part from a lack of organised knowledge, ultimately undeveloped schema. Opportunities to revisit prior learning and to have new and repeated encounters with contexts will build a breadth and depth of knowledge.

Where there are gaps in knowledge, teachers adapt the lessons to address these. These adjustments are noted on the planning document and kept in class files.

Any content not completed due to time restrictions or having to revise previous content, is noted on the long-term plan and picked up later. This might be through merging lessons or could be to have additional lessons to meet lesson objectives.

Which values underpin the curriculum content?

Our values of P.E.A.C.E are all evident in the computing curriculum. Within the computing curriculum, there are aspects of problem solving and the challenge this brings, requires children to persevere. The essence of each unit is chosen based on what children enjoy. *For example, when learning about Spreadsheets, pupils choose to create a table of facts related to their favourite sport/game, drawing on the knowledge they have of this from their personal experiences.* Understanding the impact that misuse of the internet can have on people's lives and well-being draws on the value of compassion. High expectations and an ambitious computing curriculum expects pupils to attain well and achieve excellence.

How are British Values taught from Computing?

Within Computing, we promote tolerance through pupils' behaviour online and how mutual respect and tolerance is applicable to the online world as well as in society. Pupils have the opportunity to work independently and as a team to build resilience and self-esteem through tasks. In particular the idea of working in teams is vital in coding and debugging tasks. When working in groups pupils are expected to share ideas and resources and encourage and support each other. By promoting high expectations through the setting of ground rules, pupils are rewarded for positive behaviour. Pupils will learn about significant advances in technology and people who are responsible for these. In upper KS2 links to LGBTQ+ are made when learning about Alan Turing and the challenges he faced. Children will learn about how Gordon Brown made an unequivocal public apology on behalf of the government. [PM's apology to codebreaker Alan Turing: we were inhumane | LGBT rights | The Guardian](#)

Inclusion: Our curriculum is ambitious for all and is adapted through differentiation, scaffolds and support to address inclusion and disadvantage in its implementation.

Which links to careers can be made within the Computing curriculum?

E-learning developer, Forensic computer analyst, Hardware designer, ICT consultant, Systems analyst, Software developer, Computer service and repair, technician, Helpdesk professional, IT project manager, Network engineer, Systems architect, Animator, Computer games designer, Web designer, Web developer

Curriculum Rationale: Why study Computing in this way?

Why has the specific knowledge been selected?

Our computing curriculum is divided into the following threads, each of which play a vital part within gaining a good knowledge and understanding of Computing : algorithms, data, communicating, using the internet, databases, presentation and ESafety. Each of these components contribute the children's computational thinking and gives them an understanding of not just the influence computing has on us, but also the influence we can have on computing. Programming is a large part of the computing curriculum but should not just be viewed as a skill but learning to program successfully involves learning a body of knowledge.

Substantive Concept	Definition.
Computer Science	The technical design. The design of new software, the solution to computing problems and the development of different ways to use technology.
Information Technology	The technical knowledge. The design, use and understanding of hardware and software; computers and electronic systems for storing and using information.
Digital Literacy	The technical skills. The ability to use information and communication technologies to find, create, evaluate, and communicate information.

Disciplinary Concept	Definition.
Code	Using and writing codes to produce instructions and algorithms; to solve problems; to test and use logic and sequences against inputs and outputs.
Connect	Being able to safely, efficiently and confidently digitally connect with others.
Communicate	Being able to safely, efficiently and confidently use apps and information technology to communicate ideas.
Collect	Being able to safely, efficiently and confidently find, evaluate, store, sort and use appropriate data.

Why is it taught in the order that it is?

The knowledge and understanding of the complexity and capabilities of computing spirals incrementally as the child progresses through our school. The expectation in the production of data and information becomes more complex through KS1 and KS2. E-Safety is age appropriate and represents the levels of exposure to online communication at each key stage. The threads which run vertically through our curriculum include algorithms, data, communicating, using the internet, databases, presentation and E-Safety.

How are Computing lessons delivered?

Computing is taught in weekly sessions and links to other curriculum areas where appropriate. Sessions are taught within three strands: computer science, information technology and digital literacy. Pupils are given the opportunity to use their computational skills in other areas of the curriculum where this enhances and supports the lesson.

What is the impact?

After the implementation of this computing curriculum, children at our school will be digitally literate and able to join the rest of the world on its digital platform. They will be equipped, not only with the skills and knowledge to use technology effectively and for their own benefit, but more importantly – safely. The biggest impact we want on our children is that they understand the consequences of using the Internet and that they are also aware of how to keep themselves safe online. As children become more confident in their abilities in Computing, they will become more independent and key life skills such as problem solving, logical thinking and self-evaluation become second nature.

Computing Curriculum Aims (end-points/expectations)

What do pupils learn?

OFSTED's research series in 2022 into Computing states that high quality computing education should ensure:

- The curriculum is rich in computer science knowledge, enabling pupils to make sense of the entire computing curriculum.
- Pupils learn important programming knowledge to enable them to become skilful programmers.
- The curriculum sets out the knowledge pupils need to build a mental model of program execution.
- Programming languages are chosen to meet curriculum goals.
- Development of Computational Thinking and problem-solving is underpinned by domain-specific knowledge that is identified and sequenced in the curriculum.

What are the aims, end-points, of specific stages of the curriculum?

EYFS

Early Learning Goal:

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

Key Stage 1

Pupils should be taught 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

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

Safeguarding

We take the safeguarding of our pupils and families extremely seriously. We provide parents with e-safety ideas and reflections through the school newsletters. Curriculum workshops all include an aspect of e-safety to support parents' awareness and support them in ensuring pups are safe at home when online.

Useful Internet safety links include:

<https://www.childnet.com/resources/looking-for-kidsmart>

<https://kidshealth.org/en/parents/net-safety.html>

<https://www.childnet.com/parents-and-carers>

<https://www.bbc.co.uk/cbbc/findoutmore/help-me-out-staying-safe-online>

<https://www.childnet.com/blog/staying-safe-online-in-the-summer-holidays-advice-for-parents-and-carers>