ACE Computing Curriculum

Intent

At Altrincham CE Primary School, we want our children to be **masters of technology** and not slaves to it, recognising the significance of digital technology in their everyday lives. We offer a high-quality, broad computing education encompassing **computer science, information technology and digital literacy** that will inspire pupils' to be **creators** and not just consumers of technology. We explicitly teach pupils the skills and knowledge they need to become **creative, digitally literate, computational thinkers**.

Purpose (the reason it is taught)

Technology is everywhere and will play a pivotal part in our children's lives. Therefore, we want to **model and educate** our pupils on how to use technology positively. We want our pupils to understand that there is always a choice when using technology and as a school **we utilise technology, especially social media to model positive use**. We recognise that the best prevention for a lot of issues we currently see with technology/social media is through education.

We recognise that technology can allow pupils to **share their learning in creative ways**. We also understand the accessibility opportunities technology can provide for our pupils. Our knowledge rich computing curriculum which is embedded across the curriculum allows our children to **apply their knowledge creatively**, which will in turn help our pupils become skilful computer scientists.

We strive for our pupils to be **fluent with a wide range of tools** to best express their understanding so that by Upper Key Stage 2, our pupils have the **independence and confidence** to choose the best tool to fulfil the task and challenge set by teachers.

We set this learning in the context of our Christian, church school heritage. We encourage children to question and interpret the moral merit of computing and technology in the light of our values framework.

Aims *(desired outcomes)*

- **Understand** and **apply** the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- **Analyse** problems in computational terms and have repeated practical experience of writing computer programs in order to solve such problems.

- **Evaluate** and **apply** information technology, including new or unfamiliar technologies, analytically to solve problems.
- **Be responsible, competent** and **creative** users of information and communication technology**.**
- Utilise opportunities outside the classroom including home learning and **real life experiences to enrich experiences** and to **learn about computing in an active and creative way.**
- Ensure learning without limits, **making cross-curricular links to secure application and mastery**
- **Ensure continuity and progression across key stages,** recognising computing as an enquiry with a focus on skills and deepening knowledge and understanding, supported by robust assessment.
- **Understand** key Computing and ICT **threshold concepts** and use them to encourage curiosity about digital technology by asking valid questions about the digital systems around them, make connections in order to explore how technology is used in the real world including the effective use of tools, analyse and evaluate the impact of technology and how to use it creatively in a safe and responsible way.

These are:

- **Computing systems and networks:** systems, networks and how they are used, the internet, hardware and software.
- **Computational thinking including programming:** interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors.
- **Data and Information:** collecting, analysing, evaluating, presenting data and information
- **Creating media:** design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content.

The computing curriculum at ACE is carefully planned and structured to ensure that current learning is linked to previous learning and the school's approaches are informed by current pedagogy. Each unit of learning includes **knowledge** and **skills statements** which build year on year to deepen and challenge our learners. Our curriculum is led by **key concepts, terms** and **vocabulary** providing opportunities to build a shared and consistent understanding. Units are organised into a spiral curriculum to ensure themes are revisited regularly as pupils move through the school. This ensures each unit builds effectively on prior learning and ensures connections are made between different units to help children know more and remember more. Our pupils are able to **apply** and **consolidate understanding** as they progress through the school to enable them to become computer scientists of the future.

We deliver a broad and balanced computing curriculum which stimulates and maintains children's digital curiosity. Key concepts are enhanced through real-world contextual examples on to give the children a real-life understanding of the terms taught. Where possible, a focus on interdependencies with other curriculum subjects is used in lessons to give our children a deeper understanding of these concepts.

Computing Units of work

Here is an overview of the Computing Curriculum:

Information Technology	Computer Science	Digital Literacy
Word Processing/Typing	**Computational Thinking**	**Self-Image and Identity**
Data Handling	**Coding/Programming**	**Online Relationships**
Animation	**Computing Systems and Networks**	**Online Reputation**
Photography and Digital Art		**Online Bullying**
Audio/Sound		**Health, Wellbeing and Lifestyle**
Video Creation/Editing		**Privacy and Security**
Webpage Creation/Desk Top Publishing		**Copyright and Ownership**

Knowledge Categories

Knowledge Category	Content
Networks (NW)	How networks can be used to retrieve and share information
Creating Media (CM)	Selecting and creating a range of media including text, images, sounds and video
Data and Information (DI)	How data is stored, organised and used to represent real world artefacts and scenarios
Design and Development (DD)	The activities involved in planning, creating and evaluating computing artefacts
Computing Systems (CS)	What a computer is and how its constituent parts function as a whole)
Impact of Technology (IT)	How individuals, systems and society as a whole interact with computer systems
Algorithms (AL)	Comprehending, designing, creating and evaluating algorithms
Programming (PG)	Creating software to allow computers to solve problems
Effective Use of Tools (ET)	Using software tools to support computing work

Safety and Security (SS)	Understanding risks when using technology and how to protect individuals and systems

Milestones are the goals the children are aiming for and this is how they equate to the different year groups across school:

Milestone 1	**Years 1 and 2**
Milestone 2	**Years 3 and 4**
Milestone 3	**Years 5 and 6**

In the first year of a milestone, children will experience basic tasks which will progress to advancing and deeper tasks into the second year of the milestone as the learning schema gets stronger.

In Computing, we use 'I Can Statements' for every element of the computing curriculum from EYFS to Year 6 to inform our assessment.

The assessment of Technology is not included in the revised Early Learning Goals and Development Matters framework. Altrincham CE Primary School is mindful that Development Matters is an assessment framework. It is **not** a curriculum. By only teaching towards Development Matters, children miss out on the bigger picture of learning. Therefore, we plan a Computing curriculum which includes our youngest learners and offers meaningful ways for our children to create with video, photographs, digital images, sound recordings and control devices like floor robots. They also learn social skills, rules and responsible use of devices and the internet. This is all done with 'The Characteristics of Learning' in mind, making purposeful links to all areas of learning.

Children have the right to enjoy childhood online, to access safe online spaces, and to benefit from all the opportunities that a connected world can bring to them, appropriate to their age and stage. As they grow older, it is crucial that they learn to balance the benefits offered by technology with a critical awareness of their own and other's online behaviour and develop effective strategies for staying safe and making a positive contribution online. We use the DFE approved 'Education for a Connected World' Framework which describes the knowledge, understanding and skills that children and young people should have the opportunity to develop at different ages and stages. It highlights what a child should know in terms of current online technology, its influence on behaviour and development, how to get support, and what skills they need to be able to navigate it safely.

The Framework focuses on eight specific aspects of online education:

1. Self-image and identity	This strand explores the differences between online and offline identity beginning with self-awareness, shaping online identities and media influence in propagating stereotypes. It identifies effective routes for reporting and support and explores the impact of online technologies on self-image and behaviour.
2. Online relationships	This strand explores how technology shapes communication styles and identifies strategies for positive relationships in online communities. It offers opportunities to discuss relationships, respecting, giving and denying consent and behaviours that may lead to harm and how positive online interaction can empower and amplify voice.
3. Online reputation	This strand explores the concept of reputation and how others may use online information to make judgements. It offers opportunities to develop strategies to manage personal digital content effectively and capitalise on technology's capacity to create effective positive profiles.
4. Online bullying	This strand explores bullying and other online aggression and how technology impacts those issues. It offers strategies for effective reporting and intervention and considers how bullying and other aggressive behaviour relates to legislation.
5. Managing online information	This strand explores how online information is found, viewed and interpreted. It offers strategies for effective searching, critical evaluation of data, the recognition of risks and the management of online threats and challenges. It explores how online threats can pose risks to our physical safety as well as online safety. It also covers learning relevant to ethical publishing.
6. Health, well-being and lifestyle	This strand explores the impact that technology has on health, well-being and lifestyle e.g. mood, sleep, body health and relationships. It also includes understanding negative behaviours and issues amplified and sustained by online technologies and the strategies for dealing with them.
7. Privacy and security	This strand explores how personal online information can be used, stored, processed and shared. It offers both behavioural and technical strategies to limit impact on privacy and protect data and systems against compromise.
8. Copyright and ownership	This strand explores the concept of ownership of online content. It explores strategies for protecting personal content and crediting the rights of others as well as addressing potential consequences of illegal access, download and distribution.

Our PSHE Scheme of Work (Jigsaw) supports our staff to teach personal development relevant to pupils' real world; this enables strong skills-based foundations to be laid, so that when online, children and young people manage themselves and situations better – with more discernment, assertiveness and clarity. We note that Jigsaw, throughout its programme enables safe online behaviour and relationships as well as focussing on healthy, positive offline relationships.

Key Computing Knowledge and Skills Progression

Education for a Connected World

Jigsaw PSHE Scheme and Online Safety

KS1 Curriculum Map

KS2 Curriculum Map

Implementation

It is our belief that pupils should be taught in the best way possible according to up to date pedagogical thinking. High quality, inclusive teaching (IQFT) is an essential component of our curriculum framework model so that our 'irresistible' curriculum intent translates into outstanding teaching at the point of implementation.

At Altrincham CE Primary School, we use the Teach Computing Curriculum. This has been developed by a team of leading computing experts from The National Centre for Computing Education and has been funded by the Department for Education. The programme ensures the full coverage of the National Curriculum following the identified programmes of study.

Our curriculum is centred upon the core of computer science and how information technology and digital literacy are built on this knowledge and understanding; this requires deep thinking, exploration, discussion, investigating and researching. The clear progression ensures that children are continually building on their prior learning as they systematically develop their understanding of key ideas and their computing skills. Our pupils draw conclusions and use computational vocabulary to discuss and present their findings in a range of different ways.

The knowledge the children need to acquire has been organised around a set of key concepts which are revisited as pupils progress through the school. (See progression document)

All learning outcomes can be described through the following ten strands:

- Algorithms
- Computer Networks
- Computer Systems
- Creating Media
- Data and Information
- Design and development

- Effective Use of Tools
- Impact of Technology
- Programming
- Safety and Security

All children have access to the Computing curriculum with work being tailored appropriately for children with SEND. Children will learn through similar activities, with final outcomes modified to suit all needs.

We believe that computing should be embedded across the curriculum. Our children will have a timetabled Computing session each week. The timetabled Computing session will focus on one of two elements: an explicit Computer Science lesson or a Tinkering Session. The Computer Science part of the curriculum will often but not always need a more explicit approach. Where it can be, this should be embedded across the curriculum. A tinkering session looks at introducing a new app or tool and gives children the opportunity to experiment and familiarise themselves with different elements and tools before it can be used and applied in a more focused approach across the curriculum.
Our implementation allows for flexibility; therefore, some weeks computing can be covered by using technology to demonstrate learning in other subjects. For example, in History, Year 6 children learning about World War 2 could be asked to create a video about how the Second World War started. In doing so, they would be covering some of the Information Technology objectives from *Video Creation*. This would also require children researching information and therefore covering aspects of Digital Literacy: *Managing Online Information*. As the pupils upload their work on Seesaw, they are also covering objectives from Information Technology: *Word Processing.*

The following constructs may be used to teach Computing at ACE, these are suggestions but are not exhaustive.

IQFT	Subject Specific
Planning Learning Opportunities • Carefully planned, **well-structured** and paced lessons. • Making **strong cross-curricular links** when appropriate. • Clearly **defined Learning Objectives and Tasks**, shared with pupils at the beginning of each lesson. These are known as 'Ls' and 'Ts' at ACE.	• Use of 'hooks', wow moments, first hand experiences

- Each Learning Objective is **differentiated** on a number of levels so that children gradually develop skills, knowledge and application of knowledge. These are known as **'Chilli- Challenges'** at ACE.

High Expectations

- Children at ACE are expected to be **RISK-TAKERS** and **choose their own level of challenge.** Thereby taking control of their own learning.
- Children understand that they need to challenge themselves in order to learn and that this will require them to work outside of their comfort zone and show **RESILIENCE**. At ACE, we talk about being in the **'Learning Pit' and 'Wobbling'**.
- Resource boxes and Table packs develop **INDEPENDENCE, support and deepen leaning.**
- **Positive relationships** between adults and pupils, using praise and positive reinforcement so that children feel valued and inspired to achieve their best.
- Setting **high standards and expectations** for behaviour.

Engagement and Enhancement

- Pupils **demonstrating their learning** in a variety of forms, with a focus on enjoying the journey that comes from **DEEP THINKING, LEARNING** and **PROBLEM SOLVING**.
- **Imaginative and creative approaches** to ensure lessons are interesting and stimulating.
- Varied **teaching styles**.
- Use of **ICT** to enhance learning experiences

Learning Environment

- Classrooms are bright, vibrant and **alive with learning**, following our 'communication friendly' guidelines.
- Displaying **self-help working walls** to promote independence and perseverance
- Examples of **WAGOLs (What a good one looks like)** and high quality pupils' work.

Feedback

- Outdoor learning opportunities E.g. photography
- Mathematics – data handling, quiz
- Art and Design Technology – programming, video creation, animation, digital art
- Science and Music – recordings, sound tracks,
- Presentations – Pic Collage/Seesaw, voice overs, digital posters, special effects
- Creative writing – eBook, cartoon creation, animated characters, character interview, news report
- Research of information including: artefacts, photographs, maps, film, quiz

• Use continuous **Assessment for Learning** to make ongoing judgements of pupils • **Teach at the Point of Learning (TaPoL)** to be responsive to children's needs. • Give **timely feedback** during the lesson. • Enabling pupils to **respond to feedback** (self, peer, adult) in an age appropriate way. Pupils at ACE in Year 1 (Summer Term onwards) and Years 2-6, will have opportunities to edit, improve and correct their learning outcomes. For example, pupils will make changes to their work. At ACE, this is known as **'Purple Polishing'.**	

Impact

We encourage our children to enjoy and value the curriculum we deliver. We will constantly ask the WHY behind their learning and not just the HOW. The successful, collaborative approach to the teaching of computing across school results in an engaging, high quality education that allows pupils to understand the world around them and encourages them to explore digital technology further as they leave primary school.
Computing is monitored by the subject leader throughout all year groups using a variety of strategies such as work scrutiny, lesson observations, staff discussions and pupil interviews. Feedback is given to teachers so that they can continually review and improve their practice. School leaders use the information to see if the children have developed the correct skills and knowledge for their age group, making good progress from their starting points.

The way pupils showcase, share, celebrate and publish their work will best show the impact of our curriculum. We also look for evidence through reviewing pupil's knowledge and skills digitally through tools like Google Drive and Seesaw and observing learning regularly. Progress of our computing curriculum is demonstrated through outcomes and the record of coverage in the process of achieving these outcomes.

Assessment

Computing is assessed through teacher judgement and monitored by the Subject Leader and Senior Leadership Team. Regular monitoring of work, observing learning and pupil voice is used to support teachers when making accurate judgements of what children know and where learning is not secure, additional learning takes place to address this.