



Bolton Primary School

Computing

2024-2026

Bolton Primary School

Computing Policy



Introduction

The use of computers and computer systems is an integral part of the National Curriculum and knowing how they work is a key life skill. In an increasingly digital world there now exists a wealth of software, tools and technologies that can be used to communicate, collaborate, express ideas and create digital content. At Bolton Primary, we recognise that pupils are entitled to a broad and balanced computing education with a structured, progressive, approach to the learning how computer systems work, the use of IT and the skills necessary to become digitally literate and participate fully in the modern world. The purpose of this policy is to state how the school intends to make this provision.

Aims

The aim is for the school to develop a whole school approach to Computing with the proper integration of Computers across the curriculum in line with National Curriculum guidelines. Computers are part of the school's core provision with influence on all aspects of a pupil's learning. In particular, the computer is a tool for the teacher, which can be used to enhance the learning experience and to support traditional classroom activities.

The school's aims are to:

- Provide a broad, balanced, challenging and enjoyable curriculum for all pupils
- Develop pupil's computational thinking skills that will benefit them throughout their lives
- Meet the requirements of the National Curriculum programmes of study for computing at Key Stage 1 and 2
- To respond to new developments in technology
- To equip pupils with the confidence and skills to use digital tools and technologies throughout their lives
- To enhance and enrich learning in other areas of the curriculum using IT and computing
- To develop the understanding of how to use computers and digital tools safely and responsibly

The National Curriculum for Computing aims to ensure that all pupils:

- 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

Rationale

The school believes that IT, computer science and digital literacy:

- Are essential life skills necessary to fully participate in the modern digital world
- Allows children to become creators of digital content rather than simply consumers of it
- Provides access to a rich and varied source of information and content

- Communicates and presents information in new ways, which helps pupils understand, access and use it more readily.
- Can motivate and enthuse pupils.
- Offers opportunities for communication and collaboration through group working both inside and outside of school.
- Has the flexibility to meet the individual needs and abilities of each pupil.

Digital Literacy: To equip students with the knowledge and skills required to become digitally literate, enabling them to confidently and safely use various digital tools and technologies.

Computational Thinking: To develop students' computational thinking abilities, such as problem-solving, logical reasoning, and algorithmic thinking, which are essential in solving real-world problems.

Creativity and Innovation: To foster creativity and innovation in students by encouraging them to create digital content and use technology as a tool for self-expression and problem-solving.

Safe and Ethical Use of Technology: To promote responsible and ethical behaviour when using technology, including understanding online safety, privacy, and respecting digital citizenship.

Preparation for Future Technologies: To prepare students for an ever-evolving technological landscape by introducing them to emerging technologies and digital trends.

Objectives

Early years (see also early year's policy)

It is important in the foundation stage to give children a broad, play-based experience of IT and computing in a range of contexts, including off-computer activities and outdoor play. Computing is not just about computers. Early years learning environments should feature IT scenarios based on experience in the real world, such as in role play. Children gain confidence, control and language skills through opportunities such as 'programming' each other using directional language to find toys/objects, creating artwork using digital drawing tools and controlling programmable toys.

Outdoor exploration is an important aspect and using digital recording devices such as video recorders, cameras and microphones can support children in developing communication skills. This is particularly beneficial for children who have English as an additional language.

By the end of 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 a sequence of instructions
- Write and test simple programs
- Use logical reasoning to predict and computing the behaviour of simple programs
- Organise, store, manipulate and retrieve data in a range of digital formats
- Communicate safely and respectfully online, keeping personal information private, and recognise common uses of information technology beyond school

By the end of key stage 2 pupils should be taught to:

- Design and write 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; generate appropriate inputs and predicted outputs to test programs
- Use logical reasoning to explain how a simple algorithm works 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
- Describe how internet search engines find and store data; use search engines effectively; be discerning in evaluating digital content; respect individuals and intellectual property; use technology responsibly, securely and safely
- Select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Resources and access

Bolton School acknowledges the need to continually maintain, update and develop its resources and to make progress towards consistent, compatible computer systems by investing in resources that will effectively deliver the objectives of the National Curriculum and support the use of IT, computer science and digital literacy across the school. Teachers are required to inform the computing subject leader of any faults as soon as they are noticed. Resources if not classroom based are located in KS2 classrooms. A service level agreement with System IT and JAMF are currently in place to help support the subject leader to fulfil this role both in hardware & software. Computing network infrastructure and equipment has been sited so that:

- Every classroom from Reception to Y6 has a computer connected to the school network and an interactive whiteboard with sound, DVD and video facilities
- There are over 30 working pupil laptops within the school
- There are 3 laptop charge cabinets in school containing 36 charge points. Laptops are stored in here overnight to charge
- There are 28 owned iPads and 20 leased iPads in school. We invested in leased iPads to enhance our quality of teaching and learning in Computing
- Internet access is available in all classrooms
- There is a projector and screen in the hall
- Each class from Reception – Y6 has an allocated slot one afternoon per week for teaching computing as a discrete subject
- The laptops and iPads are available for use throughout the school day as part of computing lessons and for cross-curricular use
- Pupils may use IT and computing independently, in pairs, alongside a TA or in a group with a teacher
- System IT visit the school for approximately one day per term
- A governor will monitor computing within the school

We also have a range of software that covers both the requirements of the National Curriculum for Computing and which also supports other subject areas. We know the vital role that computers will have in children's lives and we aim to ensure that they become confident and able users of technology and its various applications, including email, coding and the internet. We are also very aware that we need to help our children stay safe online and this is prioritised at Bolton – for more information see our Internet Safety Advice on our school's website.

Planning

At Bolton Primary School, we follow the D.A.R.E.S. scheme. D.A.R.E.S is an innovative approach to teaching computing which encourages pupils to be critical thinkers, problems solvers and computational thinkers while creating purposeful content to demonstrate how learning can be applied across the wider curriculum. The aim of this approach is to provide a scheme that deepen children's knowledge of computing so they can creatively apply their learning across the curriculum in a personalised and accessible way. The stages which can be adapted into lessons are as follows:

D - Design: Pupils start to discuss the desired outcome for their project and are given time to tinker with the software before planning what they will do to achieve their outcome.

A - Apply: Pupils are given the opportunity to create, make and produce content using the app or software explored in the Design lesson(s)

R - Refine: Pupils spend time considering ways to modify and improve their projects to get the best results possible.

E - Evaluate: Upon completing their desired outcome, pupils are given the opportunity to reflect and consider how effectively they have achieved their goal.

S - Share: Learners are given the opportunity to publish and exhibit their work to the world embedding skills from the Digital Literacy curriculum.

The D.A.R.E.S. scheme fully meets the objectives of the National Curriculum for Computing and allows for clear progression in computing. Pupil progress towards these objectives will be recorded by teachers as part of the school recording system. Staff will follow D.A.R.E.S. planning guidance and pupil progress trackers. A minority of children will have particular teaching and learning requirements which go beyond the provision for that age range and if not addressed, could create barriers to learning. This could include G&T children, those with SEN or those who have EAL. Teachers must take account of these requirements and plan, where necessary, to support individuals or groups of pupils to enable them to participate effectively in the curriculum and assessment activities. During any teaching activities, teachers should bear in mind that special arrangements could be made available to support individual pupils. This is in accordance with the school inclusion policy. These children should be identified and discussed at pupil progress meetings to ensure that appropriate provisions and/or interventions are effective.

Teaching and Learning

All children will study Computing one session per week. The knowledge, skills and understanding will be taught within Computing topics to ensure continuity and progression through the two key stages and to provide a sound structure on which to build as they continue to KS3. The children will generally work in small groups and the lesson content will be pitched to the children's individual needs, interests and abilities. Where possible cross curricular links will be made to enhance the meeting of objectives. All units will be planned and monitored by teaching staff.

1. The children will learn to use a wide range of computing tools for communicating information and analysis including word processors, desk top publishing programmes, data handling packages, draw and painting software, picture collections, spreadsheets, logo, adventure and simulation games and Scratch
2. They will have frequent use of the computers so they can practise and develop their skills

3. Computing is integrated into the planned topic work and emphasis is placed on progression and continuity following the National Curriculum
4. Children will have the opportunity to complete Computing Foundation homework linked to the key objectives taught in computing in the current term.
There will also be many chances for children to use Computing in many cross-curricular activities both in planned curriculum sessions and in homework activities
5. Computing lessons take priority over other lessons in terms of laptops and iPads e.g. when Computing is timetabled there is an expectation that the class can access the laptops and iPads

Assessment and record keeping (also see Assessment Policy)

Teachers regularly assess progress through observations and evidence. Key objectives to be assessed are taken from the National Curriculum to assess computing each term. The school also uses D.A.R.E.S. assessment criteria and pupil progress trackers as a guide. Assessing computing is an integral part of teaching & learning and key to good practice. Assessment should be process orientated - reviewing the way that techniques and skills are applied purposefully by pupils to demonstrate their understanding of computing concepts. As assessment is part of the learning process, it is essential that pupils are closely involved. Assessment can be broken down into:

- Formative assessments are carried out during and following short, focused tasks and activities. They provide pupils and teaching staff the opportunity to reflect on their learning in the context of the agreed success criteria. This feeds into planning for the next lesson or activity.
- Summative assessment should review pupils' ability and provide a best fit 'level'. Independent tasks provide a number of opportunities and scope for pupils to demonstrate their capability throughout the term. There should be an opportunity for pupil review and identification of next steps. Summative assessment should be recorded for all pupils – showing whether the pupils have met, exceeded or not achieved the learning objectives.

We assess the children's work in computing by making informal judgments as we observe the children during lessons. Once the children complete a unit of work, we make a summary judgment of the work for each pupil as to whether they are working towards, expected or have exceeded the expectations of the unit. We record the results in our computing assessment files and we use these to plan future work, provide the basis for progress. The children's work is saved into their Seesaw Online Learning Journey and also on the school network. There is also an evidence folder in each classroom to keep samples of the children's work in a portfolio.

Pupils with special educational needs (see also SEN policy)

We believe that all children have the right to access IT and computing. In order to ensure that children with special educational needs achieve to the best of their ability, it may be necessary to adapt the delivery of the computing curriculum for some pupils. We teach IT and computing to all children, whatever their ability. Computing forms part of the National Curriculum to provide a broad and balanced education for all children. Through the teaching of Computing, we provide opportunities that enable all pupils to make progress. We do this by setting suitable challenges and responding to each child's individual needs. Where appropriate IT can be used to support SEN children on a one-to-one basis where children receive additional support.

Disadvantaged: The school is committed to raising achievement for disadvantaged young people. Teachers and teaching assistants will ensure an equitable approach and give more support, guidance and challenge to our disadvantaged in all our lessons.

Equal opportunities (see also equal opportunities policy)

We will ensure that all children are provided with the same learning opportunities regardless of social class, gender, culture, race, disability or learning difficulties. As a result, we hope to enable all children to develop positive attitudes towards others. All pupils have equal access to computing and all staff members follow the equal opportunities policy. Resources for SEN children and gifted & talented will be made available to support and challenge appropriately.

The role of the Subject Leader

There is a Computing Subject Leader who is responsible for the implementation of Computing Policy across the school.

Their role is to:

- Offer help and support to all members of staff (including teaching assistants) in their teaching, planning and assessment of computing
- Provide colleagues opportunities to observe good practice in the teaching of computing
- Maintain resources and advise staff on the use of digital tools, technologies and resources
- Monitor classroom teaching or planning following the schools monitoring programme
- Monitor the children's progression in computing, looking at examples of work of different abilities
- Manage the computing budget
- Keep up-to-date with new technological developments and communicate information and developments with colleagues
- Lead staff training on new initiatives
- Attend appropriate in-service training
- Have enthusiasm for computing and encourage staff to share this enthusiasm
- Keep parents and governors informed on the implementation of computing in the school
- Liaise with all members of staff on how to reach and improve on agreed targets
- Help staff to use assessment to inform future planning

The role of the class teacher

Individual teachers will be responsible for ensuring that pupils in their classes have opportunities for learning computing and using their knowledge, skills and understanding of computing across the curriculum. They will plan and deliver the requirements of the National Curriculum for Computing to the best of their ability. We set high expectations for our pupils and provide opportunities for all to achieve, including girls and boys, pupils with educational special needs, pupils with disabilities pupils from all social and cultural backgrounds, and those from diverse linguistic backgrounds.

The class teacher's role is a vital role in the development of computing throughout the school and will ensure continued progression in learning and understanding and create effective learning environments.

The class teacher will also:

- Secure pupil motivation and engagement
- Provide equality of opportunity using a range of teaching approaches and techniques
- Use appropriate assessment techniques and approaches
- Set suitable targets for learning as outlined in the inclusion policy.

- Maintain up to date assessment records (see policy document).

Staff training

The computing subject leader will assess and address staff training needs as part of the annual development plan process or in response to individual needs and requests throughout the year. Individual teachers should attempt to continually develop their own skills and knowledge, identify their own needs and notify the subject leader. Teachers will be encouraged to use IT and computing to produce plans, reports, communications and teaching resources.

Health and safety (see also Health and Safety policy)

The school is aware of the health and safety issues involved in children's use of IT and computing. All fixed electrical appliances in school are tested by a Local Authority contractor every five years and all portable electrical equipment in school is tested by an external contractor every twelve months. It is advised that staff should not bring their own electrical equipment in to school but, if this is necessary, equipment must be PAT tested before being used in school. This also applies to any equipment brought in to school by, for example, visitors running workshops, activities, etc. and it is the responsibility of the member of staff organising the workshop, etc. to advise those people.

All staff should visually check electrical equipment before they use it and take any damaged equipment out of use. Damaged equipment should then be reported to a computer technician, bursar or head teacher who will arrange for repair or disposal.

In addition:

- Children should not put plugs into sockets or switch the sockets on.
- Trailing leads should be made safe behind the equipment
- Liquids must not be taken near the computers
- Magnets must be kept away from all equipment
- Safety guidelines in relation to IWBs will be displayed in the classrooms
- E-safety guidelines will be set out in the e-safety policy & Acceptable Use Policy

Security

We take security very seriously. As such:

- System IT will be responsible for regularly updating anti-virus software.
- Use of IT and computing will be in line with the school's 'acceptable use policy'. All staff, volunteers and children must sign a copy of the schools AUP.
- Parents will be made aware of the 'acceptable use policy' at school entry and ks2.
- All pupils and parents will be aware of the school rules for responsible use of IT and computing and the internet and will understand the consequence of any misuse.
- The agreed rules for safe and responsible use of IT and computing and the internet will be displayed in all computing areas.

Cross curricular links

As a staff we are all aware that IT and computing skills should be developed through core and foundation subjects. Where appropriate, IT and computing should be incorporated into schemes of work for all subjects. IT and computing should be used to support learning in other subjects as well as developing computing knowledge, skills and understanding. Our school provides pupils with opportunities to enrich and deepen learning using cross-curricular approaches and uses Teach Computing Across the Curriculum, which embeds computing in English, Mathematics, Science, Geography and History from Year 1 to Year 6.

Parental involvement

Parents are encouraged to support the implementation of IT and computing where possible by encouraging use of IT and computing skills at home for pleasure, through home-learning tasks and use of the school website. Parents will be made aware of issues surrounding e-safety and encouraged to promote this at home.

Monitoring, Evaluation and Review

The subject leader is responsible for monitoring the standard of the children's work and the quality of teaching in line with the schools monitoring cycle. This may be through lesson observations, pupil discussion and evaluating pupil work. We allocate time for the vital task of reviewing samples of children's work and for visiting classes to observe teaching in the subject.

This policy is a working document and should be updated every two years.

The subject lead is Debbie Tinkler (w.e.f. September 2020) and the current governor with responsibility for Computing is Jane Morris.

This policy was reviewed Summer 2024 and will be reviewed again Summer 2026.



Computing at Bolton Primary School by Debbie Tinkler (Subject Lead since September 2020)



As the Computing lead and also the main teacher of discreet computing sessions across the school from Reception to Year 6, it has allowed me to develop a curriculum that moves children on through the knowledge and skills needed and ensures that there is a clear progression in all areas of Computing. In September 2020, I worked with Sarah Zaman (Stem Computing Specialist) to develop our Computing Curriculum and to ensure that we had coverage of all the key areas of learning, including Computer Science, Digital Literacy and Information Technology. We used this curriculum from 2020 until March 2023. In March 2023, I completed some training called 'Raising Standards in The Classroom Through Technology', which inspired me to make our Computing Curriculum more memorable and magical. I made the decision to buy into the scheme called D.A.R.E.S. My aim would be that by the time children leave in Y6, pupils to be fluent with a range of tools to best express their understanding and hope children have the independence and confidence to choose the best tool to fulfil the task and challenge set by teachers and in the real world.

D.A.R.E.S. Scheme:

D.A.R.E.S is an innovative approach to teaching computing which encourages pupils to be critical thinkers, problems solvers and computational thinkers while creating purposeful content to demonstrate how learning can be applied across the wider curriculum.

Through these projects, pupils are able to deepen their knowledge of computing by applying it to solve problems and create content. These may take place in computing lessons over a half term to then allow pupils to apply these creative ideas more regularly across the curriculum. D.A.R.E.S. scheme does not want to make these projects too prescriptive as we know some classes may need some more time to complete different elements.

As the teacher, I know the ability of the class and have been able to change or adapt some of the projects to fit the ability of the class.

The stages which can be adapted into lessons are as follows:

D - Design: Pupils start to discuss the desired outcome for their project and are given time to tinker with the software before planning what they will do to achieve their outcome.

A - Apply: Pupils are given the opportunity to create, make and produce content using the app or software explored in the Design lesson(s)

R - Refine: Pupils spend time considering ways to modify and improve their projects to get the best results possible.

E - Evaluate: Upon completing their desired outcome, pupils are given the opportunity to reflect and consider how effectively they have achieved their goal.

S - Share: Learners are given the opportunity to publish and exhibit their work to the world embedding skills from the Digital Literacy curriculum.

Bolton Primary School has now used the D.A.R.E.S. scheme over a year and we are really happy with the resources and support given. We love that it incorporates advances in Technology such as AI and VR. It also provides children with the opportunity to explore a range of apps on iPads which can then be used in other areas of the curriculum. Further to this new scheme, an area of the curriculum that we have worked hard to develop is physical computing with each class. We have been able to share resources with other school within our cluster meaning that the children have been able to access resources, such as Ozobots, crumbles and Microbits. We also have been able to offer opportunities for our children to join in with Computing cluster events such as drone workshops. As Computing is taught each week, we have built into our curriculum that one lesson each half term is focussed on basic IT skills, such as using word/PowerPoint/Excel etc as well as these programs being used within the other areas of the curriculum. Following the changes with Mary Myatt within other areas of the curriculum, I have introduced the unit Hidden Figures by Margot Lee Shetterly & Winfred Conkling. This is a KS2 unit looking at Equity and Racism. Black women have been vital in the roles they have played in Space Exploration, but they had to fight for this to be the case. (This also introduces intersectionality. Being black and a woman increased discrimination).

Here's a brief summary of each aspect of the computing curriculum:

1. Computer Science: This aspect focuses on understanding the principles of computation and how computers work. It covers topics such as algorithms, data structures, programming languages, and computer architecture. Students learn how to write code, solve problems, and develop software applications. Key skills include computational thinking, coding proficiency, and understanding the theoretical foundations of computing.
2. Information Technology (IT): Information Technology deals with the practical application of computing in various domains. It involves using hardware, software,

networks, and other IT resources to solve real-world problems and meet business needs. Students learn about databases, network systems, cybersecurity, software development methodologies, and project management. IT skills are essential for managing technology infrastructure, supporting users, and ensuring the efficient operation of IT systems.

3. Digital Literacy: Digital literacy focuses on developing the skills and knowledge necessary to navigate and utilize digital technologies effectively. This includes understanding how to use software applications, browse the internet safely, evaluate online information critically, communicate digitally, and protect personal information and privacy online. Digital literacy empowers individuals to participate fully in the digital age and make informed decisions about technology use.

Key Points:

At Bolton Primary School, a computer specialist teaches computing across the school while other specialists teach their expertise to the other classes.

- In Y1 – Pupils need to learn the basic skills e.g., mouse skills, keyboard and typing skills, how to log on and off devices properly. They need to create instructions through algorithms using programs such as Beebots. They develop coding skills through robotics. They use programs such as Scratch to develop their computing. KS1 use simple programs like Paint. Need to embed their skills – just like embedding their handwriting.
- Lower KS2 – Pupils begin using programs independently. Focus continues to be on coding and robotics. Also introduce elements of Minecraft. Important to give the children some freedom to play with programs.
- By Y6, expect pupils to take the skills they've learned through the computing curriculum and apply them to other contexts, for example through problem and project-based work.
- E-safety element is emphasised throughout primary to ensure that children use technology safely, including looking at fake news. 10 minutes taught at the beginning of each discrete computing lesson and then teachers build this in throughout the week to give consistent messages.

Other areas of the curriculum

- Computing knowledge and skills are weaved into other areas of the curriculum – as long as it adds value to learning in that subject
- Aim to do a blended approach well and work hard to get CPD right for teachers
- In maths sessions, we use TT RockStars as a starter in Maths then back to normal traditional lessons. This is thinking about what is fit for purpose and making sure that it adds value to learning. When we are planning, we ask ourselves – ‘What will make this lesson purposeful? What piece of tech might help the children here?’ It's about blending the tech with a well-planned lesson
- Every child has a device (whole class rotation model)

“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 practice experience of writing computer programs in order to solve such problems; can evaluate and apply information technology, including new and unfamiliar technologies, analytically to solve problems; are responsible, competent, confident and creative users of information and communication technology.”

We offer a structured sequence of lessons on a unit, helping teachers to ensure that they have covered the skills required to meet the aims of the National Curriculum. The content allows for a broad, deep understanding of computing and how it links to children's lives. It offers a range of opportunities for consolidation, challenge and variety. This allows children to apply the fundamental principles and concepts of computer science. They develop analytical problem-solving skills and learn to evaluate and apply information technology. It also enables them to become responsible, competent, confident and creative users of information technology. This progression of skills helps teachers to monitor learning and the successful acquisition of skills; the two-year plan indicates areas of IT/computing that are not covered in discrete Computing lessons and these will be planned into other areas of the curriculum. At our school we want pupils to be masters of technology and not slaves to it. Technology is everywhere and will play a pivotal part in students' lives. Therefore, we want to model and educate our pupils on how to use technology positively, responsibly and safely. We want our pupils to be creators not consumers and our broad curriculum encompassing computer science, information technology and digital literacy reflects this. We want our pupils

to understand that there is always a choice with 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. Building our knowledge in this subject will allow pupils to effectively demonstrate their learning through creative use of technology.

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 curriculum has to be balanced with the opportunity for pupils to apply their knowledge creatively which will in turn help our pupils become skilful computer scientists. We encourage staff to try and embed computing across the whole curriculum to make learning creative and accessible. We want our pupils to be fluent with a range of tools to best express their understanding and hope by Upper Key Stage 2, children have the independence and confidence to choose the best tool to fulfil the task and challenge set by teachers.

Through the D.A.R.E.S. scheme, each lesson contains revision, analysis and problem solving. Through the sequence of lessons and medium-term plans, we intend to inspire pupils to develop a love of the digital world, see its place in their future and give teachers confidence. These are taught on a two-year program (Y1/2, Y3/4 and Y5/6). Cross curricular links are also important in supporting other areas of learning. Our lesson plans and resources help children to build on prior knowledge at the same time as introducing new skills and challenges. In KS1, the focus is on developing the use of algorithms, programming and how technology can be used safely and purposefully. In KS2, lessons still focus on developing the use of algorithms, programming and coding but in a more complex way and for different purposes. Children also develop their knowledge of computer networks, internet services and the safe and purposeful use of the internet and technology. Data handling is featured more heavily in UKS2. Skills learnt through KS1 and LKS2 are used to support data presentation. Assessments are carried out throughout the unit, so staff can feel confident in the progression of skills and knowledge and that outcomes have been met. We encourage that key words are displayed and the use of Knowledge organisers, where appropriate, showing the progression of specific language involved in children's learning so that teachers can also assess understanding and progress through vocabulary.

We have created a comprehensive progression document for staff to follow to best embed and cover every element of the computing curriculum. The knowledge/skills statements build year on year to deepen and challenge our learners.

Computer Science	Information Technology	Digital Literacy
Computational Thinking	Word Processing/Typing	Self Image and Identity
Programming	Data Handling	Online Relationships
Computer Networks	Presentations, Web design and eBook	Online Reputation
Artificial Intelligence	Animation	Online Bullying
	Video Creation	Managing Online Information
	Photography and Digital Art	Health, Wellbeing and Lifestyle
	Augmented Reality and Virtual Reality	Privacy and Security
	Sound	Copyright and Ownership

Learning in computing will be enjoyed across the school. Teachers will have high expectations and quality evidence will be presented through the use of Seesaw Online learning journeys, which will include samples of work from sessions and pupil and teacher comments. Children will use digital and technological vocabulary accurately, alongside a progression in their technical skills. They will be confident using a range of hardware and software and will produce high-quality purposeful products. Children will see the digital world as part of their world, extending beyond school, and understanding that they have choices to make. They will be confident and respectful digital citizens going on to lead happy and healthy digital lives.

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. We want learners to discuss, reflect and appreciate the impact computing has on their learning, development and well-being. Finding the right balance with technology is key to an effective education and a healthy life-style. We feel the way we implement computing helps children realise the need for the right balance and one they can continue to build on in their next stage of education and beyond. We encourage regular discussions between staff and pupils to best embed and understand this. 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/Google Classroom 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.

Unit Overviews:

Autumn A

KS1

Basic Technology around us: Children will develop their understanding of what information technology (IT) is and will begin to identify examples. They will discuss where they have seen IT in school and beyond, in settings such as shops, hospitals, and libraries. Learners will then investigate how IT improves our world, and they will learn about the importance of using IT responsibly.

Programming Animations (Scratch Jr): Children will develop an understanding of what an algorithm is and be able to write simple algorithms. They will be able to debug simple codes and create their own.

Video Creation - Masking Storytime: Children will know how to use tools to add effects to a video and they will begin to know how to use a green screen.

LKS2

Programming Animations (Scratch 3.0): Children will learn how to create algorithms for their own projects. They will learn how to decompose projects. They will learn how to identify patterns in an algorithm and they will create a program using a design. They will create a sequence of codes. They will learn how to evaluate a program.

Video Creation – Visual Storytelling: Children will learn how to sequence clips of mixed media in a timeline and record a voiceover. They will learn to evaluate and improve their work using video tools.

UKS2

Programming Platform Game (Scratch 3.0): Children will use logical reasoning to explain how a variety of algorithms work and will learn how to evaluate the effectiveness of coding. They will create programs by decomposing them into smaller parts. They will use a variety of commands in programs. The children will know how to use conditions and work with variables. They will create programs that control or simulate physical systems. Children will be able to identify errors in their work.

Video Creation – Greenscreen special effect: Children will learn how to choose and create different types of animations to best explain their learning. They will create videos using a range of media including a green screen, animations, film and image. They will know how to critically evaluate their own work.

Spring A

KS1

Computer Network – Effective searching online: This unit introduces children to using the Internet safely and with a purpose. Children are shown how to search the Internet using one word; how to make sense of the returned results; how to use “for kids” to return more suitable results; how to follow links and return to the search results. Children are encouraged to use a range of search engines, including Google, Bing and Yahoo, and some more child-friendly engines like Kidrex. (Note: many of the child-friendly searches use Google.) The children then learn to blog safely and responsibly. Teachers will need to ensure they follow their own school guidelines on blogging, particularly on the use of names and photographs. Suggested guidelines are included in the lessons, but may differ from those agreed by the school. The focus of the lessons is less on the technical aspects, which will vary according to which blogging site is used, and more on how to blog in a safe and responsible way, looking at how to blog well, and how to post and respond to comments effectively.

Photo/Digital Art – Avatars: Children will develop an understanding of AR around them, including the use of photography and Digital Art. They will know how to select and use shapes and will develop skills of being able to resize, rotate and change the colour of shapes.

LKS2

Computer Network – Exploring and Understanding the internet: During this unit children will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and be given opportunities to explore the World Wide Web for themselves to learn about who owns content and what they can access, add, and create. They will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.

Photo/Digital Art – Digital Self Portraits: Children will know how to create a digital image using a range of tools, pens, brushes and effects. They will develop an understanding of how people can represent themselves in different ways online. They will be able to explain ways in which someone might change their identity and why.

UKS2

Computer Networks – Search Engines and HTML: In this unit, the class will learn about the World Wide Web as a communication tool. First, they will learn how we find information on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through

comparing different search engines. They will then investigate different methods of communication, before focusing on internet-based communication. Finally, they will evaluate which methods of internet communication to use for particular purposes.

AR/VR – Interactive Displays: Children will be able to evaluate and improve their videos using a range of tools. They will know how to enhance digital photos and images using crop, brightness and resize tools. They will develop an understanding of how to create an interactive poster using AR.

Summer A

KS1

Presentations – Storyboard: Children will be able to order images to create simple storyboards. They will sequence series of pictures. Children will be able to evaluate their work and suggest improvements. They will also develop an online reputation and will be able to explain ways that help to build a positive online reputation.

AR/VR – Storytelling: Children will choose and create different types of animations. They will create videos using a range of media, such as green screen, animations, film and image. They will be able to bring objects into their surroundings using Augmented Reality.

LKS2

Presentations – Interactive Comics: Children will know how to edit the style and effect of their text and images to make their documents more engaging and eye-catching. They will create interactive comics with sounds, formatted text and video.

AR/VR – Invent a toy: Children will be able to create their own digital 360 designs. They will use AR/CR to add multiple objects into their designs.

UKS2

Presentations – Webpage Design: Children will create a webpage and embed videos. They will know how to evaluate and improve their webpages.

AR/VR: Interactive VR: Children will be able to create an interactive guide to an image by embedding digital content and publishing it online. They will know how to create a website which includes a variety of media, such as green screen, animation and film. Children will know how to make a digital photo using both AR and VR.

Autumn B

KS1

AI – AI around Us: Children will know how to use some simple AI technology and can talk about what it does. They will create an animation to tell a story with more than one scene.

Programming – Algorithms: Children will use logical reasoning to predict the outcome of algorithms. They will debug algorithms and will be able to follow precise instructions. Children will create programs using digital devices such as Beebot or ScratchJr.

LKS2

AI – Exploring Data: Children will develop an understanding of how data is used to train AI technology. They will be able to independently create a green screen clip.

Programming – Games controller: Children will know how to use abstraction to focus on what's important in their design. They will learn how to write more precise algorithms for use when programming. They will know how to use repetition in program and how to use simple selection in programs.

UKS2

AI – My AI Invention: Children will create and train an AI invention using image recognition. They will know how to solve problems by decomposing them into smaller parts and how to use selection in algorithms. Children will learn how to use logical reasoning to explain how a variety of algorithms work.

Programming – Coding Patterns: Children will know how to use a range of sequence. Selection and repetition commands to implement my design. They will know how to decompose a design or code to focus on specific parts and know how to recognise and make use of patterns in my design and code.

Spring B

KS1

Animation – Bringing a character to life: Children will know how to animate a simple image to speak in role and know how to add filters and stickers to enhance an animation of a character.

Sound – Podcasting: Children will be able to write and record a script using a teleprompter tool. They learn how to record their voice and add different effects.

LKS2

Animation – Line Drawing Animation: Children will know how to create a presentation demonstrating my understanding with a range of media. They will know how to use line draw tool to create animations and know how to add animated titles and transitions.

Sound – Movie Soundtrack: Children will know how to edit sound effects for a purpose. They will know how to compose a soundtrack that can be added to a film project and know how to add music and sound effects to my films

UKS2

Animation – Animated Cartoon Character: Children will know how to choose and create different types of animations to best explain my learning. They will make an animated talking Gif of a cartoon character. They will create videos using a range of media - green screen, animations, film and image.

Sound: Podcasting: Children will combine digital images from different sources, objects, and text to make a final piece of a variety of tasks: posters, documents, eBooks, scripts, leaflets. They will write and record a script using a teleprompter tool. Children will experiment with live loops to create a song.

Summer B

KS1

Data Handling – Pictograms: Children will know how to sort images or text into two or more categories on a digital device. They will learn how to collect data on a topic and know how to create a tally chart and pictogram.

Programming – Knock Knock: Children will understand decomposition is breaking objects/processes down. They will know how to debug algorithms and they will understand programs follow precise instructions. Children will know how to create programs using different digital devices E.g. Bee Bot or ScratchJr on a tablet. They will know how to debug programs of increasing complexity and know how to use logical reasoning to predict the outcome of simple programs

LKS2

Data Handling – Story Graphs: Children will know how to create my own sorting diagram and complete a data handling activity with it using images and text. They will know how to create a feelings chart exploring a story or character's feelings.

Programming – Crumbles: Children will use block-based coding to create simple programs. They will learn fundamentals of circuits (input/output) through connecting crumbles to various components like LEDs, motors and switches. Children will use logical thinking and problem-solving skills to design and debug simple projects.

UKS2

Data Handling – GoogleSheets: Children will use simple formulae to solve calculations including =sum. They will edit and format difference cells in a spreadsheet. Children will write spreadsheet formula to solve more challenging maths problems.

Programming – Microbit: Children will use block-based coding using the Microbit. They will interact with built-in sensors and external components. Children will use logical thinking and problem-solving skills to design and debug simple projects.

Online Safety

As a school, we are an accredited Online Safety school – all staff, parents and children use our Online Safety courses, webinars or lessons to enhance their understanding of keeping safe online. We use the resource 'connected in an educated world' to teach discreet online safety lessons each half term. There is a clear focus for each half term in each class, such as 'online bullying' and this is referred to throughout the term by myself and other members of staff. We also have included some online safety focus sessions in our assembly programme. The key areas that are covered are:


- Self-image and identify
- Online Relationships
- Online Reputation
- Online Bullying
- Managing Online Information
- Health, wellbeing and lifestyle
- Privacy and security
- Copyright and ownership

Strengths and Next Steps

Strengths	Next Steps
<p>1.Focus: Quality of Education Physical computing enhanced during 23/24 with the introduction of hardware, such as crumble sets, ozobots and megabits Clear plan of how Computing will be used across the curriculum AI and VR being taught in KS2 Seesaw App used as a digital online learning journey to collect children's computing work (when necessary) D.A.R.E.S. scheme used throughout school since Summer 2023</p> <p>2.Focus: Behaviour and Attitudes Computers being used more by other members of staff Children show a great attitude to learning in Computing</p> <p>3.Focus: Personal Development of Children New laptops have made a massive improvement to Computing in school and made it more accessible for all iPads in Class 1 have been a great addition School accredited the National Online Safety award for 2023/2024 A range of ways of working in Computing e.g. group work, discussions planned into each unit where appropriate</p> <p>4.Focus: Leadership and Management Parents, staff and governors all completed some online safety CPD 23/24 Computing is taught by the subject specialist</p>	<p>1.Focus: Quality of Education</p> <ul style="list-style-type: none">• Develop a magical and memorable curriculum• Ensure computing is embedded across the curriculum• Develop Computing in EY <p>2.Focus: Behaviour and Attitudes</p> <ul style="list-style-type: none">• Develop respecting computing equipment• Develop Computing Leaders - Role Models for good use of being Online• Create a culture of what is acceptable online and developing their online reputation <p>3.Focus: Personal Development of Children</p> <ul style="list-style-type: none">• Opportunities for specialists to come in to work with the children e.g., website designed or animation expert etc.• Computing Club <p>4.Focus: Leadership and Management</p> <ul style="list-style-type: none">• Ensure school has a plan for replacing and keeping up to date with IT equipment / resources• Computing CPD to be offered and expected for all staff• National Online Safety to be used to promote keeping safe online for staff, children and parents

Progression of Skills in Computing at Bolton

See MrPICT Computing Progression Document for specific progression throughout each areas of the Computing National Curriculum including the progression of vocabulary in each area.



MrPICT.com

Updated Jan 2023

Computing Progression Document

In this document, we have put together a comprehensive list of statements/objectives for every element of the computing curriculum from EYFS - Year 6. We feel this will demonstrate a clear progression of knowledge/skills that will help staff best implement computing in their school.
We have broken the computing curriculum into these areas:

Computer Science	Information Technology	Digital Literacy
<u>Computational Thinking</u>	<u>Word Processing/Typing</u>	<u>Self Image and Identity</u>
<u>Coding/Programming</u>	<u>Data Handling</u>	<u>Online Relationships</u>
<u>Computer Networks</u>	<u>Presentations, Web Design and eBook Creation</u>	<u>Online Reputation</u>
<u>Artificial Intelligence</u>	<u>Animation</u>	<u>Online Bullying</u>
	<u>Video Creation</u>	<u>Managing Online Information</u>
	<u>Photography and Digital Art</u>	<u>Health, Wellbeing and Lifestyle</u>
	<u>Augmented Reality and Virtual Reality</u>	<u>Privacy and Security</u>
	<u>Sound</u>	<u>Copyright and Ownership</u>

	KS1	LKS2	UKS2
Multimedia Text and Images	<p>Children begin to understand the particular purposes technology can be used for and that by adding text and images you can communicate with technology. Children develop their skills in typing, selecting tools and organising information.</p> <p>KS1 Computing National Curriculum</p> <p>Children use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p> <p>Children can:</p> <ul style="list-style-type: none"> a add text strings, text boxes and show and hide objects and images, manipulating the features; b use various tools, such as brushes, pens, eraser, stamps and shapes, and set the size, colour and shape; c use applications and devices in order to communicate ideas, work, messages and demonstrate control; d save, retrieve and organise work; e use key vocabulary to demonstrate knowledge and understanding in this strand: paint, colour, brush, tools, settings, undo, redo, text, image, size, poster, launch, application, software, window, minimise, restore, size, move, screen, close, click, drag, log on, log off, keyboards, keys, mouse, click, button, double click, drag, present. 	<p>Children develop their skills of formatting using keyboard commands, organising their work to demonstrate effect. In LKS2, they will have the opportunity to express themselves more through digital technology, art, PowerPoint and posters. Children should continue to demonstrate control when operating tools as in KS1.</p> <p>Lower KS2 Computing National Curriculum</p> <p>Children 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. They 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.</p> <p>Children can:</p> <ul style="list-style-type: none"> a create different effects with different technological tools, demonstrating control; b use appropriate keyboard commands to amend text on a device; c use applications and devices in order to communicate ideas, work, and messages; d save, retrieve and evaluate work, making amendments; e insert a picture/text/graph/hyperlink from the internet or a personal file; f use key vocabulary to demonstrate knowledge and understanding in this strand: draw, object, shape, line, line colour, fill colour, group, ungroup, font, size, text box, format, image, wrap text, plan, link, image, object, link, hyperlink, minimise, restore, size, move, screen, split, create, organise, file, folder, close, exit, search, print, password, screenshot, snipping tool, shift, undo, redo, menu, dictionary, highlight, cursor, toolbar, spellcheck. 	<p>Children begin to look at new software, creating 3D models and learning how to orbit, zoom and develop their editing skills further. They become more confident in inserting links, images and formatting text to create effect.</p> <p>Upper KS2 Computing National Curriculum</p> <p>Children 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.</p> <p>Children can:</p> <ul style="list-style-type: none"> a use the skills already developed to create content using unfamiliar technology; b select, use and combine the appropriate technology tools to create effect; c review and improve their own work and support others to improve their work; d save, retrieve and evaluate their work, making amendments; e insert a picture/text/graph/hyperlink from the internet or personal file; f use key vocabulary to demonstrate knowledge and understanding in this strand: window, layout, text, font, colour, format, heading, hyperlink, 2D shape, 3D shape, orbit, pan, zoom, eraser, dimension, measurement, guide.

Children begin to develop their creativity using technology through recording sound. Children will also begin to develop their editing skills and control of the tools.

KS1 Computing National Curriculum

Children use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Children can:

- a use software to record sounds;
- b change sounds recorded;
- c save, retrieve and organise work;
- d use key vocabulary to demonstrate knowledge and understanding in this strand: commands, add sound.

Children develop their editing skills further by cropping, organising and arranging film clips. They are able to share work and offer feedback and ideas for improvement with animation and film, giving their opinion on which software to use. In LKS2, children also look at the history of animation and reflect upon the changes over time.

Lower KS2 Computing National Curriculum

Children 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.

Children can:

- a use software to record, create and edit sounds and capture still images;
- b change recorded sounds, volume, duration and pauses;
- c use software to capture video for a purpose;
- d crop and arrange clips to create a short film;
- e plan an animation and move items within each animation for playback;
- f use key vocabulary to demonstrate knowledge and understanding in this strand: audio, sound, video, movie, embed, link, file format, animate, animation, still image, thaumatrope, zoetrope, zoopraxiscope, stereoscope, flip book, frame, onion skinning, loop, frame rate, record, stop, play, stop motion, stop frame.

Children begin to look more into multimedia broadcasting, learning new skills including recording jingles, podcasts and narration. They become more confident in post-production with editing, trimming and refining their work based on plans they have made.

Upper KS2 Computing National Curriculum

Children 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.

Children can:

- a collect audio from a variety of resources including own recordings and internet clips;
- b use a digital device to record sounds and present audio;
- c trim, arrange and edit audio levels to improve quality;
- d publish their animation and use a movie editing package to edit/refine and add titles;
- e use key vocabulary to demonstrate knowledge and understanding in this strand: audio, record, edit, play stop, skip, waveform, input, output, record, edit, play podcast, digital content, downloadable, backing track, voiceover, mute, gain, production, post-production, documentary, project, evaluation, screening, ceremony, upload.

Children begin to explore expressing information in tables, sorting and organising information for others to be able to understand.

Lower KS2 Computing National Curriculum

Children 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.

Children can:

- a talk about the different ways data can be organised;
- b sort and organise information to use in other ways;
- c search a ready-made database to answer questions;
- d use key vocabulary to demonstrate knowledge and understanding in this strand: Google Docs, insert, table.

Data Handling in UKS2 focuses on selecting the correct method to display data and using software such as spreadsheets. Children also learn how to check the accuracy of data and compare data for a specific purpose.

Upper KS2 Computing National Curriculum

Children 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.

Children can:

- a construct data on the most appropriate application;
- b know how to interpret data, including spotting inaccurate data and comparing data;
- c use keyboard shortcuts and functions to input data on spreadsheets and create formulas for spreadsheets;
- d add data to an existing database;
- e use key vocabulary to demonstrate knowledge and understanding in this strand: Google Docs, insert, table, spreadsheet, cell, row, column, formula/formulas, calculate, format, edit, insert, ascending, descending.

Children begin to make links to how they use technology outside of the classroom. They begin to think about the benefits of using technology in their lives, making links to learning about online safety.

KS1 Computing National Curriculum

Children recognise common uses of technology beyond school. They use technology safely and respectfully, keeping personal information private; they identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Children can:

- a recognise ways that technology is used in the home and community, e.g. taking photos, blogs, shopping;
- b use links to websites to find information;
- c recognise age-appropriate websites;
- d use safe search filters;
- e use key vocabulary to demonstrate knowledge and understanding in this strand: filter, Google, search engine, image, keyboard, email, internet, subject, address, communicate, sender, safe, secure.

Children refer to online safety rules when discussing technology in their lives. They are able to navigate between websites and use safe search terms on trusted search engines. They become more confident in using email for communication, including attaching and saving files from emails.

Lower KS2 Computing National Curriculum

Children 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. They use search technologies effectively, appreciate how results are selected and ranked, and are discerning in evaluating digital content.

Children can:

- a explain ways to communicate with others online;
- b describe the world wide web as the part of the internet that contains websites;
- c add websites to a favourites list;
- d use search tools to find and use an appropriate website and content;
- e use strategies to improve results when searching online;
- f use key vocabulary to demonstrate knowledge and understanding in this strand: filter, Google, search engine, image, keyboard, email, subject, address, communicate, sender, safe, secure, internet, world wide web, social media.

Children can use safe search terms on trusted search engines, and evaluate websites based on layout and information. They become more confident in understanding Google rankings, adverts and the reliability of websites.

Upper KS2 Computing National Curriculum

Children 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. They use search technologies effectively, appreciate how results are selected and ranked, and are discerning in evaluating digital content.

Children can:

- a search for information using appropriate websites and advanced search functions within Google;
- b use strategies to check the reliability of information (cross-check with another source such as books);
- c talk about the way search results are selected and ranked;
- d check the reliability of a website, including the photos on site;
- e tell you about copyright and acknowledge the sources of information;
- f use key vocabulary to demonstrate knowledge and understanding in this strand: world wide web, search, search engine, advanced search, results, Google, browser, terms of use, bias, authority, citation, plagiarism, source, website, secure, https, site, domain, website, browser, address bar.

Children begin to understand their influence on technology by developing their programming skills to determine output. They begin to understand that an algorithm is a series of steps for solving problems and a code is a series of steps that machines can execute. They begin to explore debugging, predicting when codes may not work and changing them.

KS1 Computing National Curriculum

Children understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. They create, debug and use logical reasoning to predict the behaviour of simple programs.

Children can:

- a give commands one at a time to control direction and movement, including straight, forwards, backwards, turn;
- b control the nature of events: repeat, loops, single events and add and delete features;
- c give a set of instructions to follow and predict what will happen;
- d improve/change their sequence of commands by debugging;
- e use key vocabulary to demonstrate knowledge and understanding in this strand: algorithm, instruction, order, debug, program, turn, left, right, clockwise, anticlockwise, blocks, sequence, project, repeat, repeat forever, invisible, grow, shrink.

Children build on their programming skills by solving problems and programming commands to achieve a specific outcome. They begin to write programs, explain algorithms and identify errors in their work.

KS2 Computing National Curriculum

Children design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; they solve problems by decomposing them into smaller parts. They use sequence, selection, and repetition in programs and work with variables and various forms of input and output. They use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

Children can:

- a use logical thinking to solve an open-ended problem by breaking it up into smaller parts;
- b write a program, putting commands into a sequence to achieve a specific outcome;
- c give a set of instructions to follow and predict what will happen;
- d keep testing a program and recognise when it needs to be debugged;
- e use variables to create an effect, e.g. repetition, if, when, loop;
- f use key vocabulary to demonstrate knowledge and understanding in this strand: decompose, decomposing, logical sequence, flowchart, sprite, block, command, algorithm, answer, correct, errors, program, algorithm, instructions, commands, forward (fd), left (lt), right (rt), move, turn, clear screen (cs), variable.

Children build on their programming skills by using new systems such as a flowchart. They continue to break down problems and create algorithms to solve them. They are able to explain the outcome of an algorithm with confidence and accuracy.

KS2 Computing National Curriculum

Children design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; they solve problems by decomposing them into smaller parts. They use sequence, selection, and repetition in programs and work with variables and various forms of input and output. They use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

Children can:

- a use external triggers and infinite loops to demonstrate control;
- b follow a sequence of instructions, e.g. in a flowchart and modify a flowchart using symbols;
- c use conditional statements and edit variables;
- d decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program;
- e keep testing a program and recognise when it needs to be debugged;
- f use key vocabulary to demonstrate knowledge and understanding in this strand: flowchart, algorithm, control, output, symbol, start, stop, delay, process, decision, loop, backdrop, script, block, repeat, commentary, sequence, consequence, debug, program, Kodu, world, object, tool palette, program environment, smooth, flatten, raise.

Children begin to consider their activity on the internet and learn about ways to keep themselves safe and why it is important to do so. They also compare appropriate and inappropriate activity on the internet and decide what to do next.

KS1 Computing National Curriculum
 Children can use technology safely and respectfully, keeping personal information private; they identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Children can:

- a identify what things count as personal information;
- b identify what is appropriate and inappropriate behaviour on the internet;
- c agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;
- d seek help from an adult when they see something that is unexpected or worrying;
- e demonstrate how to safely open and close applications and log on and log off from websites;
- f use key vocabulary to demonstrate knowledge and understanding in this strand: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, key, question, tell, safe, share, stranger, danger, internet.

Children become more aware of their digital footprint by reflecting on their experience on the internet. They are able to understand more about age-appropriate websites and adverts and how adverts are used by companies. Children are also introduced to the concept of plagiarism and citation.

KS2 Computing National Curriculum
 Children use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact.

Children can:

- a reflect on their own digital footprint and behaviour online;
- b identify what is appropriate and inappropriate behaviour on the internet, recognising the term cyberbullying;
- c agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;
- d seek help from an adult when they see something that is unexpected or worrying;
- e demonstrate understanding of age-appropriate websites and adverts;
- f use key vocabulary to demonstrate knowledge and understanding in this strand: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, internet, world wide web, communicate, message, social media, email, password, cyberbullying/bullying, plagiarism, profiles, account, private, public.

Children are encouraged to identify online risks and share their knowledge of the risks and consequences for people online. They begin to think more critically about what they see online and look at the concept of fake news and false photographs.

KS2 Computing National Curriculum
 Children use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact.

Children can:

- a protect their password and other personal information;
- b be a good online citizen and friend;
- c judge what sort of privacy settings might be relevant to reducing different risks;
- d seek help from an adult when they see something that is unexpected or worrying;
- e discuss scenarios involving online risk;
- f use key vocabulary to demonstrate knowledge and understanding in this strand: spam, link, privacy, virus, scam, phishing, inbox, junk, sender, subject, secure, safe, account, online, private, social media, adverts, cyberbullying, reporting, anonymous, victim, fraud/fraudulent, policy, private/personal.

Bolton Long Term Planning – Computing

Year	Autumn			Spring			Summer		
A	Year 1/2	Year 3/4	Year 5/6	Year 1/2	Year 3/4	Year 5/6	Year 1/2	Year 3/4	Year 5/6
1st half term	<p>E-safety – Self-image and Identify</p> <p>Basic skills & Technology around us</p> <p>Programming: Animations Y1 (Scratch Jr)</p>	<p>E-safety – Self-image and Identify</p> <p>Programming: Animations Y3 (Scratch 3.0)</p>	<p>E-safety – Self-image and Identify</p> <p>Programming: Platform Game Y5 (Scratch 3.0)</p>	<p>E-safety – Online Reputation</p> <p>Computer Networks: Effective Searching Online</p>	<p>E-safety – Online Reputation</p> <p>Computer Networks: Network Exploring Y3 and Understanding the internet Y4</p>	<p>E-safety – Online Reputation</p> <p>Computer Networks: Search Engine Y5 and HTML Y6</p>	<p>E-safety – Online Bullying</p> <p>Presentations: Storyboard Y1 (Pic Collage)</p>	<p>E-safety – Online Bullying</p> <p>Presentations: Digital Comic Y3 (Book Creator)</p>	<p>E-safety – Online Bullying</p> <p>Presentations: Webpage Design Y5 (Adobe Spark Page)</p>
2nd half term	<p>E-safety – Online Relationships</p> <p>Video Creation: Making Storytime Y2 (Doink Greenscreen)</p>	<p>E-safety – Online Relationships</p> <p>Video Creation: Visual Storytelling Y4 (Adobe Spark Video)</p>	<p>E-safety – Online Relationships</p> <p>Video Creation: Greenscreen Special Effect Y6 (Doink Greenscreen)</p>	<p>Photo/Digital Art: Emoji Avatars Y1 (Keynote)</p>	<p>Photo/Digital Art: Digital Self-Portraits Y3 (Keynote App)</p>	<p>AR/VR: Interactive Display Y5 (EyeJack)</p>	<p>E-safety - Revisit</p> <p>AR/VR: Storytelling Y2 with AR (AR Makr)</p>	<p>E-safety - Revisit</p> <p>AR/VR: Invent a Toy Y4 (Tinkercad)</p>	<p>E-safety - Revisit</p> <p>AR/VR: Interactive VR Y6 (Thinglink)</p>
B	Year 1/2	Year 3/4	Year 5/6	Year 1/2	Year 3/4	Year 5/6	Year 1/2	Year 3/4	Year 5/6
1st half term	<p>E-safety – Health, well-being and lifestyles</p> <p>AI: AI Around Us Y1 (Puppetpals)</p>	<p>E-safety – Health, well-being and lifestyles</p> <p>AI: Exploring Data Y3 (Doink Greenscreen)</p>	<p>E-safety – Health, well-being and lifestyles</p> <p>AI: My AI Invention Y5 (Teachable Machine)</p>	<p>E-safety – Privacy and Security</p> <p>Animation: Animated Character Y1 (Chatterpix Kids)</p>	<p>E-safety – Privacy and Security</p> <p>Animation: Line Draw Animation Y4 (Keynote)</p>	<p>E-safety – Privacy and Security</p> <p>Animation: Animated Cartoon Character Y6 (Keynote)</p>	<p>E-safety – Copyright and Ownership</p> <p>Data Handling: Pictograms Y1 (Pic Collage)</p>	<p>E-safety – Copyright and Ownership</p> <p>Data Handling: Story Graphs Y3 (Seesaw)</p>	<p>E-safety – Copyright and Ownership</p> <p>Data Handling: GoogleSheets Y5 (Google)</p>
2nd half term	<p>E-safety – Managing Online Information</p> <p>Programming: Algorithms Y2 (BeeBot App)</p>	<p>E-safety – Managing Online Information</p> <p>Programming: Games Controller Y4 (Make Makey)</p>	<p>E-safety – Managing Online Information</p> <p>Programming: Coding Patterns with Tinkercad Y6 (Tinkercad)</p>	<p>Sound: Podcasting Y1 (Keezy)</p>	<p>Sound: Movie Soundtrack Y4 (Garageband)</p>	<p>Sound: Podcasting Y6 (Garageband)</p>	<p>E-safety - Revisit</p> <p>Programming: Knock Knock Joke Y2 (Scratch Jr)</p>	<p>E-safety - Revisit</p> <p>Programming: Historical Scenes Y3 (Crumbles)</p>	<p>E-safety - Revisit</p> <p>Programming: MicroBit Score Counter Y5 (MakeCode)</p>
E-safety Curriculum - Following Project Evolve / Education for a connected world - National Online Safety Lesson Plans									

Computing Links across the curriculum	Multi-media	Technology in Our Lives	Processing Skills in other Curriculum areas
	Windows Movie Maker PowerPoint Stop Motion Animation Photostory iMovies Publisher	iPads: camera, video, calculator, thermal camera, throughout curriculum Digital thermometer Digital magnifier Dataloggers Interactive whiteboards throughout the curriculum Photocopier Microwave, kettle, oven (DT) GoogleEarth	Word PowerPoint Excel Publisher Email Internet use



Computer Science – Blue

Information Technology – Green

Digital Literacy – Red

Coding and programming – code.org, A.L.E.X, Light Bot, Kodable, Scratch 2.0, Scratch Junior, Beebot App, Beebot robots, Logo.

Handling data –Branch/Flexitree, Excel, Word (tables), Musescore, dataloggers.

Multimedia text and images – Word, Paint, Publisher, BBC Dance Mat typing, ipad camera, dictionary app, online dictionaries, Excel, photo editing apps, Stop-motion animation, Photostory, email, PowerPoint.

Multimedia sound and motion – sound recording/playback recording, ipad (sound editing apps), Musescore, Podcasts, Stop-Motion animation, Internet, Windows Movie-maker/apps, Garageband, PowerPoint.

Technology in our lives – digital thermometer, digital microscopes, photocopier, interactive whiteboard, microwave, kettle, oven, microphones, Google Earth, calculator, thermal camera, search engines, email, WWW, social media.

Online safety – CEOP, Thinkuknow-Hector's World, Kara, Winston and the SMART crew – Childnet, NSPCC, Kidsmart, BBC Bitesize, Safety Net kids, Internet Matters.

Computing

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].

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.