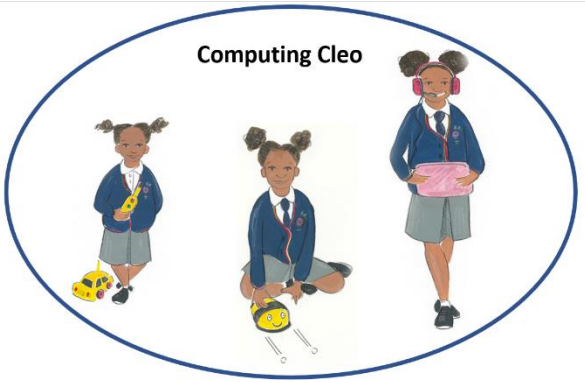
Computing

Long Term Curriculum Map

Whole School Scheme of Learning



Intent - This is what we want for our children.

At Barley Fields, it is our mission to prepare our children for a future in technology. We know that in this rapidly evolving digital landscape, our children need more than just basic skills- they need to be masters of the digital world. That is why we are committed to nurturing their confidence and competence in computing.

At our school, we don't just teach technology; we inspire a love for it. We encourage our children to dive headfirst into the digital world, exploring and creating with enthusiasm whilst also prioritising the importance of responsibility. Our children become respectful and mindful users of technology, always aware of its power and pitfalls.

We strive to challenge our students: we want them to embrace failure as a stepping stone to success. In our classes, we aim for children to think critically, solve problems with increasing independence and to never back down from a challenge. We aspire for our children to become the future pioneers of the digital age.

We hope to empower our children to be thoughtful decision-makers when it comes to using technology. We want them to understand that technology isn't always the answer and that sometimes the best solution to a problem is a more traditional approach. We aim for children to consider the pros and cons of using technology in different scenarios. Whether its deciding if they tackle a problem with the help of an algorithm or rely instead on a pen and paper, we want our students feel confident in the choices that they make. Our goal is to teach children to recognise when technology can enhance their lives or when it may be better to go without. Children at Barley Fields will also have an understanding of how their digital lives can have an impact on their health and well-being. After all, being a digital native is about more than just knowing how to use a computer: it is about living a balanced and fulfilling life in the digital world.

We are proud to offer a curriculum informed by the latest research that undergoes constant reviews and updates to ensure its relevance and effectiveness. We are committed to offering our children a computing curriculum that prepares them for their future.

Implementation – This is what it will look like in the classroom

Our children follow a carefully structured computing curriculum which has been designed to ensure children know more, can do more and remember more as they progress through our school. Our curriculum is built around five strands of learning that are revisited every year:

- Computer systems and networks
- Programming
- Data and Information
- Creating Media
- Digital Literacy and Online Safety

The curriculum has been designed using content from the National Curriculum and the Teach Computing scheme devised by The NCCE (The National Centre for Computing Education). This has been selected because it has been created by subject experts and is based on the latest pedagogical research however we have adapted it to suit the needs of our children.

The computing curriculum is a spiral curriculum and each of the strands is revisited every year with a new unit where the children are given the opportunity to consolidate and build on prior learning within that theme. The curriculum has been designed to support all pupils: lessons are sequences to build on the learning from the previous lesson, activities are scaffolded so that all pupils can succeed and project-based tasks foster a deeper understanding of a concept, encouraging children to apply their leaning in different contexts and make connections to other learning experiences. Embedded within the medium-term planning are a range of pedagogical strategies which also support staff in making computing accessible to all learners. Lessons are taught in blocks to ensure children have opportunities for a sustained period of study and have time to embed and enhance their learning. In addition to this, many of the resources, software and activities can be accessed for free from home meaning learning isn't just confined to school. In our teaching of computing, we endeavour to expose children to a variety of software, programs and equipment. As a school, we have invested heavily into resourcing this: children have access to their own iPads and are given responsibility for them. They have to ensure it is charged, use it responsibly and be aware of their digital footprint.

Our children understand the core skills needed to learn in Computing with the use of the school curriculum character – Computing Cleo. This character is regularly used to encourage children to reflect on the key skills needed when working within Computing.

Impact: This is what it will mean for our children.

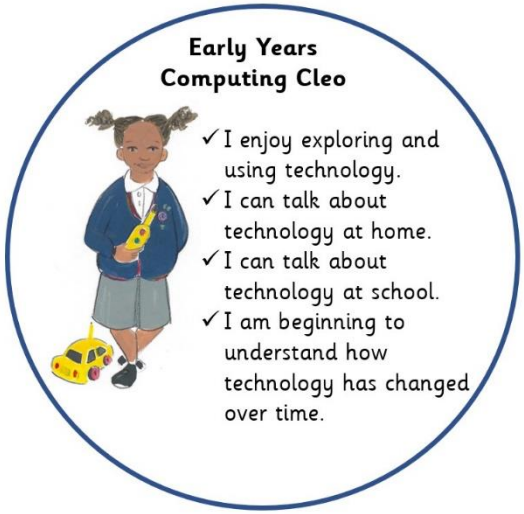
The impact of our curriculum is that children are confident and responsible users of technology who understand when it will benefit their lives without over relying on it. We want the children to understand that finding the right balance with technology is key to an effective education and a healthy life-style. They will be prepared for the next stage in their lives, knowing how to be a responsible user of technology in the wider world and most importantly, know where to seek support. Confidence in this subject will also mean that pupils are able to be more independent and competent in life skills such as problem solving and logical thinking.

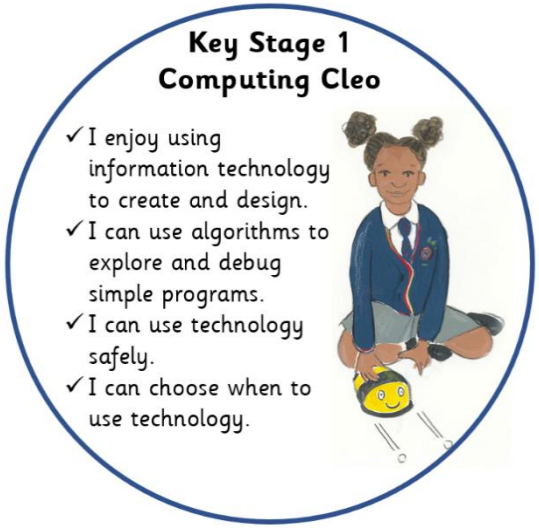
Our computing curriculum and our teaching and learning pedagogy leads to children who:

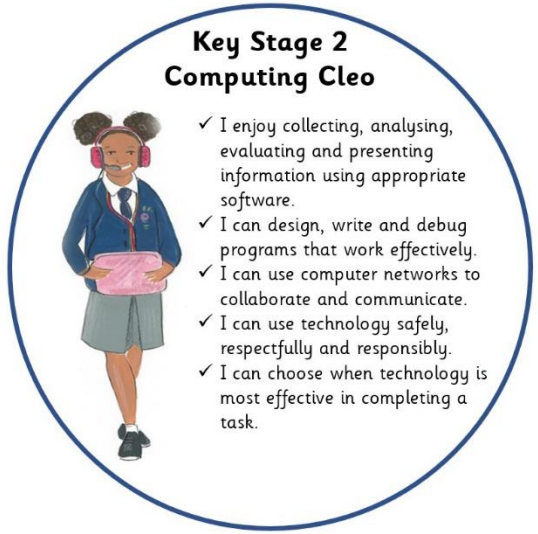
- Are inspired, motivated and enthusiastic when using technology
- Are safe and responsible navigating the technological landscape
- Use and create algorithms and debug programs
- Use technology to collect, analyse and present information and data

- Understand and use computer networks to collaborate and communicate.

We are proud of our children's development of skills and knowledge in computing. They have the opportunity to show what they know by completing quizzes and projects. We continually observe and formatively assess children against both procedural and declarative knowledge and use this information to plan the next steps in their learning and to challenge and consolidate their skills. By the end of each key stage, pupils are expected to know, apply and understand the skills and techniques specified in the relevant curriculum plans.

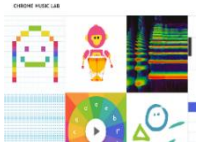
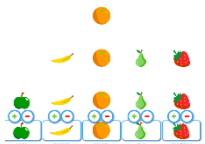




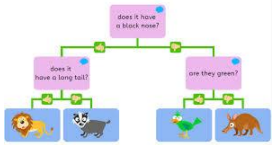


School Overview of Computing - Teaching and Learning Sequences

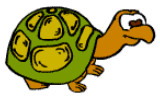
Year 1					
Autumn		**Spring**		**Summer**	
Computer Science- Computing Systems and Networks Technology Around Us 	**Information Technology Creating Media 1 Digital Painting** 	**Information Technology Creating Media 2 Digital Writing** 	**Information Technology Data and Information Grouping Data** 	**Computer Science Programming A Moving A Robot** 	**Computer Science Programming B Introduction to Animation** 
1. Technology In Our Classroom. 2. Using Technology 3. How do I use a Computer Keyboard- 4. How do I further develop Key Board Skills? 5. Using a computer responsibly	1. How Can We Paint Using Computers? 2. Using Shapes and Lines to paint digitally 3. Making Careful Choices when painting digitally 4. Painting using a computer Independently 5. Comparing Computer Art and Paintings- In class	1. Exploring the Keyboard 2. Exploring the Toolbar 3. Making Changes to Text 4. Explaining My Choices 5. Pencil or Keyboard?	1. Label and Match 2. Group and Count 3. Count and describe an Object 4. Making Different Groups 5. Comparing Groups 6. Answering Questions- Computers	1. What are buttons for?- In class 2. Using and giving Directions - In class 3. Using Forwards and Backwards Commands- In class 4. Using direction Commands - Four Directions - In class 5. Getting There – planning a simple programme - In class 6. Creating Routes - In class	1. Comparing Tools to give commands – iPads 2. Joining Blocks to create a series of programming commands- iPads 3. Changing values and recognising effects – iPads 4. Adding Sprites – iPads 5. Project Design – animation and algorithm- In class 6. Following My Design to write an animation program – iPads

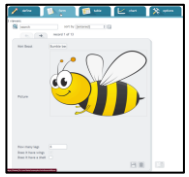
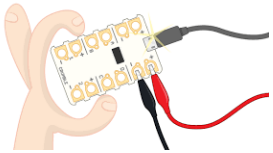
Year 2					
Autumn		**Spring**		**Summer**	
Computer Science- Computing Systems and Networks IT Around Us 	**Information Technology Creating Media 1 Digital Photography** 	**Information Technology Creating Media 2 Making Music** 	**Information Technology Data and Information Pictograms** 	**Computer Science Programming A Robot Algorithms** 	**Computer Science Programming B An Introduction to Quizzes** 

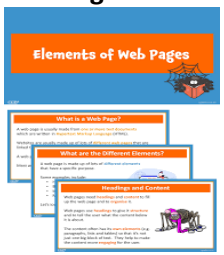
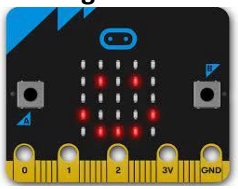
1. What Is IT?- In class lesson 2. What IT do we have in school? 3. How do we use IT in the World? In class 4. What are the Benefits of using IT? 5. How can we use information technology safely? 6. What choices can we make when using IT In different ways- *In class lesson*	1. How Can We Take a Photograph? iPad lesson 2. Making choices about orientation when taking photographs? 3. Making Careful Choices when taking a good photograph digitally 4. Can I improve my photographs with light? 5. How can use editing tools to change a photograph? 6. How can Photographs be changed? Is it real? *iPad lesson*	1. Can the computer make Music? – Complete on computers 2. How can music be created? Complete on computers 3. How can I make changes to notes and tempo in digital music composition- computer suite 4. Can I compose music digitally for a purpose? computer suite 5. Can I make music? - *computer suite*	1. How can we collect data in a Tally? In class 2. Entering data into a database 3. Can I create a pictogram using the computer – iPads 4. What is an Attribute? iPad or computer suite 5. Comparing People – iPads or Computer Suite 6. Presenting data digitally- Computers	1. How to give instructions?- In class 2. What happens when we change the order of instructions? - In class 3. Can I make predictions by reading a set of instructions?- In class 4. Creating and Using mats and routes - In class 5. Can I write an algorithm - In class 6. What is debugging? - In class	1. Scratch Recap and Revisit– iPads 2. Joining Blocks to create a series an algorithm with an outcome - iPads 3. Joining Blocks to create a series an algorithm with an outcome - iPads 4. Can I create a programme using a given design? – iPads 5. Project Design – animation and algorithm- In class 6. Evaluating my Design Program- iPads

Year 3					
Autumn		**Spring**		**Summer**	
Computer Science - Computing Systems and Networks **Connecting Computers** 	**Information Technology Creating Media** **Stop Frame Animation** 	**Information Technology Creating Media** **Desktop Publishing**	**Information Technology Data and Information** **Branching Databases** 	**Computer Science Programming A** **Sequence In Music** 	**Computer Science Programming B** **Events and Actions in Programs** 
1. How does a digital device work 2. What parts make up a digital device? 3. What do Digital Devices do? In class/iPad 4. How am I connected? 5. How are computers connected? 6. What does our school network look like? - *In class lesson*	1. What is animation? iPad lesson 2. Can I make a stop Frame animation? 3. Can I create a storyboard and plan for an animation? 4. Can I complete a simple stop frame animation? 5. How can I review and edit my animation? 6. How can I evaluate my animation?	1. How can we use a publishing programme to add text and images? 2. How can we alter text, font size, colour and layout when publishing? Complete on computers 3. How can we use templates to make a magazine cover? computer suite	1. How can we use yes/no questions to organise data? In class 2. Using questions to create a branching database - classroom 3. Can I create a branching database using software – iPads or computers 4. What is an Attribute and how can it be used in a branching	1. What do I know about using the animation program ScatchJr?- In class 2. What happens when we try to create movement for a number of sprites? - In class 3. What happens when we try to create movement for a number of sprites? - In class	1. Can I describe the relationship between an event an and action in animation?- In class 2. Can I choose a character and manipulate movement with programming? - In class 3. Can I adapt my program?- In class 4. Can I develop my program adding additional features -

		4. Can I add content to my magazine ? computer suite 5. Can I look at how information can be laid out for different purposes? - *computer suite* 6. Why is desktop publishing important? - *computer suite*	database? iPad or computer suite 5. Can I combine my skills to create a branching database about dinosaurs - planning? – classroom 6. Can I combine my skills to create a branching database about dinosaurs - Computers	4. Can I create sequences of movements through programming?- In class 5. Can I create sequences of movements through programming?- In class 6. Can I create a program linked to a task description? - In class	Computers 5. Can I debug my program – Computers 6. Can I design and create a maze-based challenge using my programming skills? - Computers

Year 4					
Autumn		**Spring**		**Summer**	
Computer Science **- Computing Systems and Networks** **The Internet** 	**Computer Science** **Craeting Media 1** **Audio Production** 	**Computer Science** **Creating Media 2** **Photo Editing** 	**Information Technology** **Data and Information** **Data and Information** **Data Logging** 	**Computer Science** **Programming A** **Repetition in Shape** 	**Computer Science** **Programming B** **Repetition in Games** 
1. How do networks physically link together?- In class 2. What is the internet made of? 3. What can be shared on the World Wide Web?- computers/iPad 4. What is a Website? – Computers/iPad 5. Who owns the World Wide Web? Computers/iPad 6. Can I believe what I read?	1. How can sound be recorded?- In class 2. How can we edit an audio recording? – Computer/iPad 3. What is a Podcast and how can I plan to record one?- Computer/iPad 4. Can I record and edit sounds to create a Podcast? – Computers/iPad 5. Can I enhance and develop my Podcast with sound effects and music? Computers/iPad 6. Can I evaluate my Podcast?	1. How can I change a digital image?- iPad 2. What happens when we change the colours and colour effects of images?- iPad 3. How does the cloning technique help to improve images? iPad 4. Can I use a range of tools to edit and combine images? iPad 5. Can I combine images for a purpose? iPad 6. Can I evaluate my work and make editing changes? I Pads	1. How can data gathered over time be used to answer questions? 2. How can I collect data over time with a digital device? 3. What is a data logger? 4. How can I analyse data in a data file? 5. Can I think of questions that can be answered from my logged data? 6. Can I use my data collected to answer questions?	1. What is Logo? 2. Can I write ordered instructions (code) to created my initials in logo? 3. How do I use the 'repeat' command in Logo? 4. How do loops in code create effects? 5. What is decomposition as how can it be used in code? 6. Can I create a program with count-controlled loops?	1. How can I create loops of code in the Scratch program?- 2. What types of loop can be created in programming? 3. Can I develop a design using loops to create a short animation? 4. Can I modify code for a game design to change how things happen? 5. Can I design a game that includes the use of repetitive code in the algorithm? 6. To create a game using my coding skills?

Year 5					
Autumn		**Spring**		**Summer**	
Computer Science **- Computing Systems and Networks** **Computer Networks** 	**Information Technology** **Creating Media 1** **What is Vector Drawing?** 	**Information Technology** **Creating Media 2** **Video Editing** 	**Information Technology** **Data and Information** **Flat-File Databases** 	**Computer Science** **Programming A** **Selection In Physical Computing** 	**Computer Science** **Programming B** **Selection in Quizzes** 
1. What is a system? 2. How can systems help us? 3. How does a search engine work? 4. How do search engines select results? 5. How are results ranked? 6. How are searches influenced?	1. How do different drawing tools produce different outcomes? In class 2. Can I create a vector drawing by combining shapes? – iPad/Computer 3. Can I use a range of drawing tools to create an effective drawing?- In class 4. Do I understand that vector drawings consist of layers? iPad/Computer 5. How can I group objects when drawing to make it easier to draw? iPad/Computers 6. Create a Vector Drawing – IT Project	• What is a Video?- In class • What happens when we change the order of instructions? - In class • Can I use different techniques to capture images?- In class • Creating a video storyboard - In class • Can improve my video with reshooting and editing? - In class • Can I evaluate my video? - In class	1. How can I use a form to record information?- 2. What is the difference between a computer and a paper-based database? 3. Why and how do we use a database to answer questions?- 4. How do we use tools to search for data? 5. Can I write an algorithm? 6. Can I use a database in real life?	1. How can I control a simple circuit connected to a computer?- 2. Can I write a program that includes count-controlled loops? 3. Can I understand that a loop in a program stops when a condition is met?- 4. How are loops used? 5. Can I design a physical project that includes selection? 6. Can I create a program to control a physical computing project?	1. What are conditions? 2. Can I select outcomes in a program? 3. Can I ask questions in a program? 4. Can I plan a quiz program? 5. Can I test my program? 6. Can I evaluate my program?

Year 6					
Autumn		**Spring**		**Summer**	
Computer Science **- Computing Systems and Networks** **Communication and Collaboration** 	**Information Technology** **Creating Media 1** **3D Modelling** 	**Information Technology** **Creating Media 2** **Web Page Creation** 	**Information Technology** **Data and Information** **Introduction to Spreadsheets** 	**Computer Science** **Programming A** **Variables In Games** 	**Computer Science** **Programming B** **Sensing Movement** 
1. What is an internet address? 2. What is a data packet? 3. How do computer systems work together? 4. How do computer systems share information? 5. How do we comminute using a computer? 6. How can we communicate responsibly?	7. What is 3D Modelling? 8. How can I manipulate a 3D model? 9. Can I duplicate, resize and reorient 3D shapes? 10. Can I create a 3D model for a given purpose? 11. Can I plan a 3D model? 12. Can I create a 3D model?	1. What makes a good website? 2. How would you lay out your web page? 3. Copyright or copywrong? 4. Can I review how my website looks? 5. What is a navigation path? 6. What is linked content? Why do I need to be careful with this?	1. What is a Spreadsheet? 2. How can I create a spreadsheet? 3. What's the formula? 4. How can I calculate and duplicate? 5. Can I plan an event using Excel? 6. How can I present data using Excel?	1. What is a variable? 2. What are variables in programming? 3. How can I improve a game? 4. Can I design a game? 5. Can I code my design into a game? 6. How can I improve and share my work?	1. What is a micro:bit? 2. Go with the flow. 3. How do I sense inputs 4. How do I plan a program? 5. Can I design a step counter program? **6.** Can I make a step counter program?

National Curriculum Subject Content

Key stage 1 – National Curriculum

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 – National Curriculum

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

Curriculum Coverage and Skill Progression

Computing Curriculum Coverage Year 1	Technology Around Us	Digital Painting	Digital Writing	Grouping Data	Moving a Robot	Introduction to Animation
• 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.						

Computing Curriculum Coverage Year 2	It Around Us	Digital Photography	Making Music	Data Pictograms	Robot Algorithms	Introduction to Quizzes
• 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.						

Computing Curriculum Coverage Year 3	Connecting Computers	Animation	Desktop Publishing	Branching Databases	Sequence in Music	Events and Actions
• 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						

Computing Curriculum Coverage Year 4	The Internet	Audio Editing	Photo Editing	Data Logging	Repetition in Shape	Repetition in Computing
• 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						

Computing Curriculum Coverage Year 5	Computer Networks	Vector Drawing	Video Editing	Fact File Databases	selection in physical computing	selection in games
• 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						

Computing Curriculum Coverage Year 6	computer communication	3D modelling	webpage creation	spreadsheets	variables in games	sensing
• 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						