



Uplands Computing Curriculum

Our computing curriculum follows a two-year rolling programme. It fully covers the National Curriculum and enhances our topics wherever possible.

We follow the scheme of work from National Centre for Computing Education (<https://teachcomputing.org>). We have one class set of ipads and one class set of Chrome Books that are used across the school to deliver our curriculum. We also have a set of Beebots and remote control cars that are used in reception and KS1.

Wherever possible, we also ensure that our computing skills are used across other subjects: researching, presentation, data handling and communicating.

All our units are mapped out across the curriculum and either link to previous learning in that year group or previous years. They will also link to future learning in other classes.

Wherever possible, our learning links to our five big ideas: diversity, similarities and differences, changes, relationships and the environment.

We recognise the important part we play in educating our pupils in how to use digital devices and the internet safely. Therefore, as well as having at least one unit of esafety across the two year rolling programme, many of the individual units have extra lessons on how to keep ourselves safe when using technology.



Merlins Year A and B Computing Key Learning Points and End of Unit Outcomes

	Autumn	Spring	Summer
Links	<p>Previous learning: Development matters: Make independent choices.</p> <p>Future learning: Owls Animation unit</p> <p>Big ideas: Changes</p>	<p>Previous learning: Development matters: Explore how things work.</p> <p>Future learning: Owls Beebot unit</p> <p>Big ideas: Changes</p>	<p>Previous learning: Development matters: Explore how things work.</p> <p>Future learning: Owls Creating media</p> <p>Big ideas: n/a</p>
Key Learning	<p>Using digital painting <i>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</i></p> <ul style="list-style-type: none"> • Different drawing tools can be used. • The background colour can be changed <p>Outcome: To create a picture using Microsoft Paint.</p>	<p>Remote control cars <i>Explore how things work.</i></p> <ul style="list-style-type: none"> • We can control things with a remote control. • Different buttons/movements will make the car do different things. <p>Outcome: To program the remote control cars to move.</p>	<p>Taking photographs <i>Explore how things work.</i></p> <ul style="list-style-type: none"> • You can take a photograph using a camera, a mobile phone or an ipad. • You can open the camera app on an ipad and press the capture button to take a photo. <p>Outcome: To take a photograph using an ipad.</p>
Vocab	Keyboard, mouse, type, picture.	Remote control, program.	Ipad, photograph, capture.



Owls Year A Computing Key Learning Points and End of Unit Outcomes

	Autumn	Spring	Summer
Links	<p>Past learning: N/A</p> <p>Future learning: Esafety lessons in Kestrels and Eagles.</p> <p>Big ideas: Relationships</p>	<p>Past learning: Merlins Remote Control Cars</p> <p>Future learning: Owls Programming Animation</p> <p>Big ideas: Changes</p>	<p>Past learning: Owls – Programming A Moving Robots/Merlins Remote Control Cars.</p> <p>Future learning: Kestrels – programming units.</p> <p>Big ideas: Changes</p>
Key Learning	<p>Online Safety 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</p> <ul style="list-style-type: none"> • A digital footprint contains information about a person. • Whenever we go online we leave a digital footprint. • Not all websites are appropriate for children; you should tell an adult if you see something that makes you feel uncomfortable. <p>Outcome: To know how to judge the suitability of a website.</p>	<p>Programming A – Moving Robots (Y1) 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</p> <ul style="list-style-type: none"> • Beebots have command buttons: forwards, backwards, turn left, turn right, stop and go. • You need to clear memory before inputting new instructions. • You can use the command buttons to program a sequence that the robot will perform. <p>Outcome: Plan and program a set of instructions using a Beebot.</p>	<p>Programming Animations 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</p> <ul style="list-style-type: none"> • You can use a command block to make a sprite move. • You can combine command blocks to create a sequence of movements. • You can change the value of some instruction blocks to repeat that action a set number of times. • Each sprite needs a separate set of commands. <p>Outcome: Design and program a ‘Spare Race’ animation using Scratch Jnr.</p>
Voca	<p>Digital, content, digital footprint, keywords, website.</p>	<p>Beebot, buttons, program, command, algorithm, turn left, turn right, forwards, backwards, clear memory.</p>	<p>Scratch Jnr, commands, programming, algorithm, blocks, sprites, start block, values.</p>



Owls Year B Computing Key Learning Points and End of Unit Outcomes

	Autumn	Spring	Summer
Links	<p>Past learning: Owls E-Safety unit</p> <p>Future learning: Kestrels Computing Systems and Networks unit.</p> <p>Big ideas: Relationships</p>	<p>Past learning: N/A</p> <p>Future learning: Kestrels Data and Information unit.</p> <p>Big ideas: Similarities and differences</p>	<p>Past learning: Merlins Digital Paint.</p> <p>Future learning: Kestrels Creating Media unit/Kestrels Microbit unit</p> <p>Big ideas: Changes</p>
Key Learning	<p><i>Computing Systems and Networks – IT around us</i> recognise common uses of information technology beyond school</p> <ul style="list-style-type: none"> • Information technology is a computer or something that works with a computer. • Information technology can help you communicate with people; help you do a job or enable you to play or watch things. • When using IT you must never share personal information. <p>Outcome: To know that information technology is all around us and that it needs to be used safely.</p>	<p><i>Data and Information – Pictograms</i> Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</p> <ul style="list-style-type: none"> • Data means information that can be collected and analysed. • A pictogram uses pictures to display data. • You can input data into a computer program and it can present the data in different ways. • An attribute is a way to describe an object and can be used to group data. <p>Outcome: To collect data and use a computer program to present it as a pictogram.</p>	<p><i>Creating Media – Making Music</i> Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</p> <ul style="list-style-type: none"> • Music can be created using instruments or a computer program. • Chrome Music Lab uses patterns and pictures to make music. • You can create musical patterns by changing the tempo, pitch, duration of the notes. <p>Outcome: To create music using Chrome Music Labs.</p>
Vocab	Information technology, devices, IT, barcode, passwords.	Data, attribute, pictograms, block diagrams, tally, compare.	Rhythm, pulse, pitch, duration, tempo, digital music, musical pattern, melody.



Kestrels Year A Computing Key Learning Points and End of Unit Outcomes

	Autumn	Spring	Summer
Links	<p>Past learning: Owls ESafety Future learning: Eagles ESafety. Big ideas: Relationships</p>	<p>Past learning: Owls Making Music Future learning: Kestrels Programming Events and Actions/Eagles Programming a Quiz and Programming a game using variables. Big ideas: Changes.</p>	<p>Past learning: Owls Animation unit. Future learning: Eagles Vector Drawing unit. Big ideas: Changes.</p>
Key Learning	<p>Esafety <i>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</i></p> <ul style="list-style-type: none"> • Cyberbullying is any form of bullying that happens on an electronic device. • Personal information should never be shared online and passwords should be kept private. • You should always tell a trusted adult if you are worried about something you see or do online. <p>Outcome: To know how to stay safe online.</p>	<p>Microbit – first lessons <i>Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</i> <i>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</i></p> <ul style="list-style-type: none"> • An algorithm is a set of instructions to be followed by a computer. • A command block gives instructions to the sprite and controls its actions. • A sequence is a pattern or process in which one thing follows another; on Microbit this is created by putting command blocks together. <p>Outcome: To create a series of commands to create 6 different projects</p>	<p>Creating Media – Animation <i>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.</i></p> <ul style="list-style-type: none"> • Animation is a sequence of pictures or photographs. • A frame is one still picture or photograph from an animation. Onion-skinning shows the previous frame faintly so that you know where to draw next. • It is important to keep the background and ipad in a consistent position when creating an animation. <p>Outcome: To create a short animation using the Stop-Motion App.</p>
Vocab	<p>Cyberbullying, passwords.</p>	<p>Algorithm, sprite, command, sequence, debug, costumes, backdrops, events.</p>	<p>Stop-frame animation, frame, storyboard, onion skinning, sequence, editing.</p>



Kestrels Year B Computing Key Learning Points and End of Unit Outcomes

	Autumn	Spring	Summer
Links	<p>Past learning: Owls Pictograms. Future learning: Eagles Data Handling Big ideas: Changes.</p>	<p>Past learning: Owls Computer Systems and Networks units. Future learning: Eagles Computer Networks units Big ideas: Relationships</p>	<p>Past learning: Owls Programming Animations Future learning: Eagles programming units (games and quizzes) Big ideas: Similarities and differences</p>
Key Learning	<p>Data and Information – Data Logging Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. 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> <ul style="list-style-type: none"> Computers can use special input devices called sensors to monitor the environment. Digital devices can be used to collect data automatically. A data logger collects ‘data points’ from sensors over time. <p>Outcome: Use a data logger to collect data to answer a specific question.</p>	<p>Computer Systems and Networks - Internet 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.</p> <ul style="list-style-type: none"> The World Wide Web is part of the internet. The internet is a global network of networks which needs to be kept secure. Routers enable messages to be passed between networks via switches; they enable us to connect to the internet and to connect networks together. Anyone can share information on the Internet and not all of it will be factual and trustworthy. <p>Outcome: To evaluate online content to decide how honest, reliable and accurate it is.</p>	<p>Programming B – Repetition 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</p> <ul style="list-style-type: none"> In programming, an infinite loop is when commands are repeated over and over again, without an end point. In Scratch, this is called the repeat forever block. A count-controlled loop repeats the commands for a set number of times. <p>Outcome: Plan and create a game using infinite and count-controlled loops using Scratch.</p>
Vocab	<p>Data, sensors, data sets, data points, logging intervals,</p>	<p>Network, World Wide Web, Internet, routers, website, webpage, data centres, browser.</p>	<p>Programming, sprite, blocks, code, loop, repeat, value, infinite loop, repeat forever, count-controlled loop.</p>



Eagles Year A Computing Key Learning Points and End of Unit Outcomes

	Autumn	Spring	Summer 1	Summer 2
Links	<p>Previous learning: Kestrels Data and Information unit</p> <p>Future learning: KS3 Data handling – spreadsheet modelling.</p> <p>Big Ideas: Changes.</p>	<p>Previous learning: Kestrels Computing Networks</p> <p>Future learning: KS3 Hardware and software.</p> <p>Big Ideas: Relationships – collaborative working online</p>	<p>Previous learning: Kestrels programming units</p> <p>Future learning: KS3 Scratch programming.</p> <p>Big Ideas: Changes.</p>	<p>Previous learning: Kestrels Animation unit</p> <p>Future learning: KS3 design computational abstractions</p> <p>Big Ideas: Changes</p>
Key Learning	<p>Data handling <i>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.</i></p> <ul style="list-style-type: none"> • A spreadsheet is a type of computer software that allows its user to store and analyse data. • Each of the boxes that make up a spreadsheet is called a cell. • A formula can tell a computer which mathematical operation to use for a calculation: add, multiply, divide, or subtract. • A formula in Excel will start with an = sign and have a mathematical operation. <p>Outcome: To create a spreadsheet using Microsoft Excel to plan an event.</p>	<p>Computing networks – Communication <i>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.</i></p> <ul style="list-style-type: none"> • An IP address is a unique address made up of numbers that identifies a device on the internet. • A data packet is a small parcel of digital information that is sent from one computer to another. • People can work collaboratively online when they are not in the same location. <p>Outcome: To work collaboratively in different locations to create a PowerPoint presentation.</p>	<p>Programming – Quizzes <i>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</i></p> <ul style="list-style-type: none"> • Selection is a programming construct that uses conditions to decide which actions to follow • Conditions are statements that need to be met for actions to be carried out (if...then blocks). • A conditional statement allows for a set of actions to be carried out when the condition is false, as well as when the condition is true (if...then...else blocks). <p>Outcome: To create an interactive quiz using Scratch.</p>	<p>Vector Drawings <i>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.</i></p> <ul style="list-style-type: none"> • A vector drawing is created on a computer and is made up of lines and shapes. • You can copy and paste shapes, resize and rotate shapes to create different images. • Images can be layered by using the ordering tool and moving objects to the front or back. <p>Outcome: To create a vector drawing for a specific purpose using Google Drawings.</p>
Vocab	Analyse, data item, cell, sum, average, data, data set, calculate, operation, formula, range, duplicate, sigma.	Protocol, internet protocol, domain, DNS domain name server, data packets.	Selection, conditions, conditional statement, algorithm, debug, infinite loop, binary question,	Vector, object, resize, rotate, align, pixels, pixelated,



Eagles Year B Computing Key Learning Points and End of Unit Outcomes

	Autumn	Autumn	Spring	Summer
Links	<p>Previous learning: Kestrels ESafety Future learning: KS3 online safety Big Ideas: Relationships.</p>	<p>Previous learning: Kestrels Programming units. Future learning: KS3 creative projects across multiple devices Big Ideas: Changes.</p>	<p>Previous learning: Kestrels Network unit Future learning: KS3 Hardware and Software Big Ideas: Relationships</p>	<p>Previous learning: Kestrels Programming units. Future learning: KS3 Scratch programming Big Ideas: Changes</p>
Key Learning	<p>Esafety <i>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</i></p> <ul style="list-style-type: none"> There are a number of different ways to communication online using words or pictures including different social media and gaming sites. Having strong passwords that cannot be worked out is an important part of keeping safe online. Cyberbullying is any form of bullying that is carried out using electronic devices. It can include posting or sending harmful, negative or false content about someone else. <p>Outcome: To know how to stay safe online.</p>	<p>Programming unit linked to DT <i>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems.</i></p> <ul style="list-style-type: none"> The Crumble Controller is a small circuit board which is capable of driving two motors. The Crumble will 'run' a single line (i.e. a block) of a program, one at a time, starting from the top. An infinite loop block means the instructions will repeat forever. <p>Outcome: To program a moon buggy created in DT to move using The Crumble.</p>	<p>Year 5 – Systems and Searching Understand computer networks, <i>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</i></p> <ul style="list-style-type: none"> Searches on the Internet can be done by either using the address bar or a search engine. Search engines use programs called web crawlers to create an index of the web Search engines rank their results using an algorithm to show you the most relevant results first. <p>Outcome: To know how to refine a search on the internet to get the most relevant results.</p>	<p>Programming – Variables in Games <i>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</i></p> <ul style="list-style-type: none"> A variable is a storage container that holds a value that can be modified or retrieved by your program. Variables are used in programming and can hold a single value at a time. There are four levels of abstraction in programming: task, design, code, running the code. <p>Outcome: To create a game using Scratch.</p>
Vocab	<p>Online world, copyright, plagiarism, cyberbullying.</p>	<p>Crumble, single line, block, infinite loop.</p>	<p>Search engine, web crawlers, data centre,</p>	<p>Algorithm, variables, instruction blocks, sprites, debug, input, output, programs.</p>