



### The Computing Curriculum at Crowthorne – Key Stage 2

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.

<p>NC Objective</p> <p>Pupils should be taught to:</p>	<p><b>Year 3</b></p> <p><b>Computing Systems and Networks – Connecting Computers 1</b>  <b>Creating Media – Stop Frame Animation – 2</b>  <b>Programming A – Sequencing Sounds – 3</b>  <b>Data and Information – Branching Databases – 4</b>  <b>Creating Media – Desktop Publishing – 5</b>  <b>Programming B – Events and Actions in Programs - 6</b></p>	<p><b>Year 4</b></p> <p><b>Computing Systems and Networks – The Internet 1</b>  <b>Creating Media – Audio Editing – 2</b>  <b>Programming A – Repetition in Shapes – 3</b>  <b>Data and Information – Data Logging– 4</b>  <b>Creating Media – Photo Editing – 5</b>  <b>Programming B – Repetition in Games- 6</b></p>	<p><b>Year 5</b></p> <p><b>Computing Systems and Networks – Sharing Information - 1</b>  <b>Creating Media – Video Editing – 2</b>  <b>Programming A – Selection in Physical Computing– 3</b>  <b>Data and Information – Flat-file Databases – 4</b>  <b>Creating Media – Vector Drawing – 5</b>  <b>Programming B – Selection in Quizzes- 6</b></p>	<p><b>Year 6</b></p> <p><b>Computing Systems and Networks – Internet Communication 1</b>  <b>Data and Information – Spreadsheets- 2</b>  <b>Programming A – Variables in games – 3</b>  <b>Programming B – Sensing – 4</b>  <b>Creating Media – Webpage Creation – 5</b>  <b>Creating Media – 3D Modelling – 6</b></p>
<p>2.1 design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p>	<p>To explore a new programming environment 3            To identify that commands have an outcome 3            To explain that a program has a start 3            To recognise that a sequence of commands can have an order 3            To change the appearance of my project 3            To create a project from a task description 3            To explain how a sprite moves in an existing project 6            To create a program to move a sprite in four directions 6            To adapt a program to a new context 6            To develop my program by adding features 6            To identify and fix bugs in a program 6            To design and create a maze-based challenge 6</p>	<p>To identify that accuracy in programming is important 3            To create a program in a text-based language 3            To explain what 'repeat' means 3            To modify a count-controlled loop to produce a given outcome 3            To decompose a task into small steps 3            To create a program that uses count-controlled loops to produce a given outcome 3            To develop the use of count-controlled loops in a different programming environment 6            To explain that in programming there are infinite loops and count controlled loops 6            To develop a design that includes two or more loops which run at the same time 6            To modify an infinite loop in a given program 6            To design a project that includes repetition 6            To create a project that includes repetition 6</p>	<p>To explain that computers can be connected together to form systems 1            To recognise the role of computer systems in our lives 1            To recognise how information is transferred over the internet 1            To explain how sharing information online lets people in different places work together 1            To contribute to a shared project online 1            To evaluate different ways of working together online 1            To control a simple circuit connected to a computer 3            To write a program that includes count-controlled loops 3            To explain that a loop can stop when a condition is met 3            To explain that a loop can be used to repeatedly check whether a condition has been met 3            To design a physical project that includes selection 3            To create a program that controls a physical computing project 3            To explain how selection is used in computer programs 6            To relate that a conditional statement connects a condition to an outcome 6            To explain how selection directs the flow of a program 6            To design a program which uses selection 6            To create a program which uses selection 6            To evaluate my program 6</p>	<p>To identify how to use a search engine 1            To describe how search engines select results 1            To explain how search results are ranked 1            To recognise why the order of results is important, and to whom 1            To recognise how we communicate using technology 1            To evaluate different methods of online communication 1            To define a 'variable' as something that is changeable 3            To explain why a variable is used in a program 3            To choose how to improve a game by using variables 3            To design a project that builds on a given example 3            To use my design to create a project 3            To evaluate my project 3            To create a program to run on a controllable device 4            To explain that selection can control the flow of a program 4            To update a variable with a user input 4            To use an conditional statement to compare a variable to a value 4            To design a project that uses inputs and outputs on a controllable device 4            To develop a program to use inputs and outputs on a controllable device 4</p>

<p>2.2 use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p>	<p>To explain how digital devices function 1  To identify input and output devices 1  To recognise how digital devices can change the way we work 1  To explain how a computer network can be used to share information 1  To explore how digital devices can be connected 1  To recognise the physical components of a network 1  To explore a new programming environment 3  To identify that commands have an outcome 3  To explain that a program has a start 3  To recognise that a sequence of commands can have an order 3  To change the appearance of my project 3  To create a project from a task description 3  To explain how a sprite moves in an existing project 6  To create a program to move a sprite in four directions 6  To adapt a program to a new context 6  To develop my program by adding features 6  To identify and fix bugs in a program 6  To design and create a maze-based challenge 6</p>	<p>To identify that accuracy in programming is important 3  To create a program in a text-based language 3  To explain what 'repeat' means 3  To modify a count-controlled loop to produce a given outcome 3  To decompose a task into small steps 3  To create a program that uses count-controlled loops to produce a given outcome 3  To explain that data gathered over time can be used to answer questions 4  To use a digital device to collect data automatically 4  To explain that a data logger collects 'data points' from sensors over time 4  To use data collected over a long duration to find information 4  To identify the data needed to answer questions 4  To use collected data to answer questions 4  To develop the use of count-controlled loops in a different programming environment 6  To explain that in programming there are infinite loops and count controlled loops 6  To develop a design that includes two or more loops which run at the same time 6  To modify an infinite loop in a given program 6  To design a project that includes repetition 6  To create a project that includes repetition 6</p>	<p>To explain that computers can be connected together to form systems 1  To recognise the role of computer systems in our lives 1  To recognise how information is transferred over the internet 1  To explain how sharing information online lets people in different places work together 1  To contribute to a shared project online 1  To evaluate different ways of working together online 1  To control a simple circuit connected to a computer 3  To write a program that includes count-controlled loops 3  To explain that a loop can stop when a condition is met 3  To explain that a loop can be used to repeatedly check whether a condition has been met 3  To design a physical project that includes selection 3  To create a program that controls a physical computing project 3  To explain how selection is used in computer programs 6  To relate that a conditional statement connects a condition to an outcome 6  To explain how selection directs the flow of a program 6  To design a program which uses selection 6  To create a program which uses selection 6  To evaluate my program 6</p>	<p>Using code.org children are exposed to programming and debugging a variety of simulations.   To define a 'variable' as something that is changeable 3  To explain why a variable is used in a program 3  To choose how to improve a game by using variables 3  To design a project that builds on a given example 3  To use my design to create a project 3  To evaluate my project 3  To create a program to run on a controllable device 4  To explain that selection can control the flow of a program 4  To update a variable with a user input 4  To use an conditional statement to compare a variable to a value 4  To design a project that uses inputs and outputs on a controllable device 4  To develop a program to use inputs and outputs on a controllable device 4</p>
<p>2.3 use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p>	<p>To explore a new programming environment 3  To identify that commands have an outcome 3  To explain that a program has a start 3  To recognise that a sequence of commands can have an order 3  To change the appearance of my project 3  To create a project from a task description 3  To explain how a sprite moves in an existing project 6  To create a program to move a sprite in four directions 6  To adapt a program to a new context 6  To develop my program by adding features 6  To identify and fix bugs in a program 6  To design and create a maze-based challenge 6</p>	<p>To identify that accuracy in programming is important 3  To create a program in a text-based language 3  To explain what 'repeat' means 3  To modify a count-controlled loop to produce a given outcome 3  To decompose a task into small steps 3  To create a program that uses count-controlled loops to produce a given outcome 3  To develop the use of count-controlled loops in a different programming environment 6  To explain that in programming there are infinite loops and count controlled loops 6  To develop a design that includes two or more loops which run at the same time 6  To modify an infinite loop in a given program 6  To design a project that includes repetition 6  To create a project that includes repetition 6</p>	<p>To control a simple circuit connected to a computer 3  To write a program that includes count-controlled loops 3  To explain that a loop can stop when a condition is met 3  To explain that a loop can be used to repeatedly check whether a condition has been met 3  To design a physical project that includes selection 3  To create a program that controls a physical computing project 3  To explain how selection is used in computer programs 6  To relate that a conditional statement connects a condition to an outcome 6  To explain how selection directs the flow of a program 6  To design a program which uses selection 6  To create a program which uses selection 6  To evaluate my program 6</p>	<p>Using code.org children are exposed to programming and debugging a variety of simulations.   To identify how to use a search engine 1  To describe how search engines select results 1  To explain how search results are ranked 1  To recognise why the order of results is important, and to whom 1  To recognise how we communicate using technology 1  To evaluate different methods of online communication 1  To define a 'variable' as something that is changeable 3  To explain why a variable is used in a program 3  To choose how to improve a game by using variables 3  To design a project that builds on a given example 3  To use my design to create a project 3</p>

				<p>To evaluate my project 3</p> <p>To create a program to run on a controllable device 4</p> <p>To explain that selection can control the flow of a program 4</p> <p>To update a variable with a user input 4</p> <p>To use an conditional statement to compare a variable to a value 4</p> <p>To design a project that uses inputs and outputs on a controllable device 4</p> <p>To develop a program to use inputs and outputs on a controllable device 4</p>
<p>2.4 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>	<p>To explain how digital devices function 1</p> <p>To identify input and output devices 1</p> <p>To recognise how digital devices can change the way we work 1</p> <p>To explain how a computer network can be used to share information 1</p> <p>To explore how digital devices can be connected 1</p> <p>To recognise the physical components of a network 1</p>	<p>To describe how networks physically connect to other networks 1</p> <p>To recognise how networked devices make up the internet 1</p> <p>To outline how websites can be shared via the World Wide Web (WWW) 1</p> <p>To describe how content can be added and accessed on the World Wide Web (WWW) 1</p> <p>To recognise how the content of the WWW is created by people 1</p> <p>To evaluate the consequences of unreliable content 1</p>	<p>To explain that computers can be connected together to form systems 1</p> <p>To recognise the role of computer systems in our lives 1</p> <p>To recognise how information is transferred over the internet 1</p> <p>To explain how sharing information online lets people in different places work together 1</p> <p>To contribute to a shared project online 1</p> <p>To evaluate different ways of working together online 1</p>	<p>To identify how to use a search engine 1</p> <p>To describe how search engines select results 1</p> <p>To explain how search results are ranked 1</p> <p>To recognise why the order of results is important, and to whom 1</p> <p>To recognise how we communicate using technology 1</p> <p>To evaluate different methods of online communication 1</p>
<p>2.5 use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p>	<p>To recognise how text and images convey information 5</p> <p>To recognise that text and layout can be edited 5</p> <p>To choose appropriate page settings 5</p> <p>To add content to a desktop publishing publication 5</p> <p>To consider how different layouts can suit different purposes 5</p> <p>To consider the benefits of desktop publishing 5</p>	<p>To describe how networks physically connect to other networks 1</p> <p>To recognise how networked devices make up the internet 1</p> <p>To outline how websites can be shared via the World Wide Web (WWW) 1</p> <p>To describe how content can be added and accessed on the World Wide Web (WWW) 1</p> <p>To recognise how the content of the WWW is created by people 1</p> <p>To evaluate the consequences of unreliable content 1</p> <p>To identify that sound can be digitally recorded 2</p> <p>To use a digital device to record sound 2</p> <p>To explain that a digital recording is stored as a file 2</p> <p>To explain that audio can be changed through editing 2</p> <p>To show that different types of audio can be combined and played together 2</p> <p>To evaluate editing choices made 2</p> <p>To explain that digital images can be changed 5</p> <p>To change the composition of an image 5</p> <p>To describe how images can be changed for different uses 5</p> <p>To make good choices when selecting different tools 5</p> <p>To recognise that not all images are real 5</p>	<p>To explain what makes a video effective 2</p> <p>To identify digital devices that can record video 2</p> <p>To capture video using a range of techniques 2</p> <p>To create a storyboard 2</p> <p>To identify that video can be improved through reshooting and editing 2</p> <p>To consider the impact of the choices made when making and sharing a video 2</p>	<p>To identify how to use a search engine 1</p> <p>To describe how search engines select results 1</p> <p>To explain how search results are ranked 1</p> <p>To recognise why the order of results is important, and to whom 1</p> <p>To recognise how we communicate using technology 1</p> <p>To evaluate different methods of online communication 1</p> <p>To review an existing website and consider its structure 2</p> <p>To plan the features of a web page 2</p> <p>To consider the ownership and use of images (copyright) 2</p> <p>To recognise the need to preview pages 2</p> <p>To outline the need for a navigation path 2</p> <p>To recognise the implications of linking to content owned by other people 2</p>

		To evaluate how changes can improve an image 5		
2.6 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>To explain how digital devices function 1</p> <p>To identify input and output devices 1</p> <p>To recognise how digital devices can change the way we work 1</p> <p>To explain how a computer network can be used to share information 1</p> <p>To explore how digital devices can be connected 1</p> <p>To recognise the physical components of a network 1</p> <p>To explain that animation is a sequence of drawings or photographs 2</p> <p>To relate animated movement with a sequence of images 2</p> <p>To plan an animation 2</p> <p>To identify the need to work consistently and carefully 2</p> <p>To review and improve an animation 2</p> <p>To evaluate the impact of adding other media to an animation 2</p>	<p>To describe how networks physically connect to other networks 1</p> <p>To recognise how networked devices make up the internet 1</p> <p>To outline how websites can be shared via the World Wide Web (WWW) 1</p> <p>To describe how content can be added and accessed on the World Wide Web (WWW) 1</p> <p>To recognise how the content of the WWW is created by people 1</p> <p>To evaluate the consequences of unreliable content 1</p> <p>To identify that sound can be digitally recorded 2</p> <p>To use a digital device to record sound 2</p> <p>To explain that a digital recording is stored as a file 2</p> <p>To explain that audio can be changed through editing 2</p> <p>To show that different types of audio can be combined and played together 2</p> <p>To evaluate editing choices made 2</p> <p>To identify that accuracy in programming is important 3</p> <p>To create a program in a text-based language 3</p> <p>To explain what 'repeat' means 3</p> <p>To modify a count-controlled loop to produce a given outcome 3</p> <p>To decompose a task into small steps 3</p> <p>To create a program that uses count-controlled loops to produce a given outcome 3</p> <p>To explain that data gathered over time can be used to answer questions 4</p> <p>To use a digital device to collect data automatically 4</p> <p>To explain that a data logger collects 'data points' from sensors over time 4</p> <p>To use data collected over a long duration to find information 4</p> <p>To identify the data needed to answer questions 4</p> <p>To use collected data to answer questions 4</p> <p>To explain that digital images can be changed 5</p> <p>To change the composition of an image 5</p> <p>To describe how images can be changed for different uses 5</p> <p>To make good choices when selecting different tools 5</p> <p>To recognise that not all images are real 5</p> <p>To evaluate how changes can improve an image 5</p>	<p>To explain that computers can be connected together to form systems 1</p> <p>To recognise the role of computer systems in our lives 1</p> <p>To recognise how information is transferred over the internet 1</p> <p>To explain how sharing information online lets people in different places work together 1</p> <p>To contribute to a shared project online 1</p> <p>To evaluate different ways of working together online 1</p> <p>To explain what makes a video effective 2</p> <p>To identify digital devices that can record video 2</p> <p>To capture video using a range of techniques 2</p> <p>To create a storyboard 2</p> <p>To identify that video can be improved through reshooting and editing 2</p> <p>To consider the impact of the choices made when making and sharing a video 2</p> <p>To use a form to record information 4</p> <p>To compare paper and computer-based databases 4</p> <p>To outline how grouping and then sorting data allows us to answer questions 4</p> <p>To explain that tools can be used to select specific data 4</p> <p>To explain that computer programs can be used to compare data visually 4</p> <p>To apply my knowledge of a database to ask and answer real-world questions 4</p> <p>To identify that drawing tools can be used to produce different outcomes 5</p> <p>To create a vector drawing by combining shapes 5</p> <p>To use tools to achieve a desired effect 5</p> <p>To recognise that vector drawings consist of layers 5</p> <p>To group objects to make them easier to work with 5</p> <p>To evaluate my vector drawing 5</p> <p>To explain how selection is used in computer programs 6</p> <p>To relate that a conditional statement connects a condition to an outcome 6</p> <p>To explain how selection directs the flow of a program 6</p> <p>To design a program which uses selection 6</p> <p>To create a program which uses selection 6</p> <p>To evaluate my program 6</p>	<p>To identify how to use a search engine 1</p> <p>To describe how search engines select results 1</p> <p>To explain how search results are ranked 1</p> <p>To recognise why the order of results is important, and to whom 1</p> <p>To recognise how we communicate using technology 1</p> <p>To evaluate different methods of online communication 1</p> <p>To review an existing website and consider its structure 2</p> <p>To plan the features of a web page 2</p> <p>To consider the ownership and use of images (copyright) 2</p> <p>To recognise the need to preview pages 2</p> <p>To outline the need for a navigation path 2</p> <p>To recognise the implications of linking to content owned by other people 2</p> <p>To define a 'variable' as something that is changeable 3</p> <p>To explain why a variable is used in a program 3</p> <p>To choose how to improve a game by using variables 3</p> <p>To design a project that builds on a given example 3</p> <p>To use my design to create a project 3</p> <p>To evaluate my project 3</p> <p>To create a program to run on a controllable device 4</p> <p>To explain that selection can control the flow of a program 4</p> <p>To update a variable with a user input 4</p> <p>To use an conditional statement to compare a variable to a value 4</p> <p>To design a project that uses inputs and outputs on a controllable device 4</p> <p>To develop a program to use inputs and outputs on a controllable device 4</p> <p>To identify questions which can be answered using data 5</p> <p>To explain that objects can be described using data 5</p> <p>To explain that formulas can be used to produce calculated data 5</p> <p>To apply formulas to data, including duplicating 5</p> <p>To create a spreadsheet to plan an event 5</p> <p>To choose suitable ways to present data 5</p> <p>To use a computer to create and manipulate three-dimensional (3D) digital objects 6</p> <p>To compare working digitally with 2D and 3D graphics 6</p>

				<p>To construct a digital 3D model of a physical object 6</p> <p>To identify that physical objects can be broken down into a collection of 3D shapes 6</p> <p>To design a digital model by combining 3D objects 6</p> <p>To develop and improve a digital 3D model 6</p>
<p>2.7 use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</p>	<p>To explain that animation is a sequence of drawings or photographs 2</p> <p>To relate animated movement with a sequence of images 2</p> <p>To plan an animation 2</p> <p>To identify the need to work consistently and carefully 2</p> <p>To review and improve an animation 2</p> <p>To evaluate the impact of adding other media to an animation 2</p> <p>Children learn about online safety as part of a whole school focus. They are reminded about using technology responsibly in Computing lessons and how to report concerns in PSHCE lessons.</p> <p>Lifewise units: How to stay safe online/Social media safety/What is screen time</p> <p>Digital Citizenship</p>	<p>To describe how networks physically connect to other networks 1</p> <p>To recognise how networked devices make up the internet 1</p> <p>To outline how websites can be shared via the World Wide Web (WWW) 1</p> <p>To describe how content can be added and accessed on the World Wide Web (WWW) 1</p> <p>To recognise how the content of the WWW is created by people 1</p> <p>To evaluate the consequences of unreliable content 1</p> <p>To identify that sound can be digitally recorded 2</p> <p>To use a digital device to record sound 2</p> <p>To explain that a digital recording is stored as a file 2</p> <p>To explain that audio can be changed through editing 2</p> <p>To show that different types of audio can be combined and played together 2</p> <p>To evaluate editing choices made 2</p> <p>To explain that digital images can be changed 5</p> <p>To change the composition of an image 5</p> <p>To describe how images can be changed for different uses 5</p> <p>To make good choices when selecting different tools 5</p> <p>To recognise that not all images are real 5</p> <p>To evaluate how changes can improve an image 5</p> <p>Each term children are reminded about online safety, with lessons on personal digital safety delivered in class and by the police force</p> <p>Lifewise unit: How much time do we spend using screens/How screen time can affect our health and relationships</p> <p>Digital Citizenship</p>	<p>To explain that computers can be connected together to form systems 1</p> <p>To recognise the role of computer systems in our lives 1</p> <p>To recognise how information is transferred over the internet 1</p> <p>To explain how sharing information online lets people in different places work together 1</p> <p>To contribute to a shared project online 1</p> <p>To evaluate different ways of working together online 1</p> <p>To explain what makes a video effective 2</p> <p>To identify digital devices that can record video 2</p> <p>To capture video using a range of techniques 2</p> <p>To create a storyboard 2</p> <p>To identify that video can be improved through reshooting and editing 2</p> <p>To consider the impact of the choices made when making and sharing a video</p> <p>Each term children are reminded about online safety as applicable to the current topic learning. (AU1, AU2, SPR1, SPR2, SU1, SU2).</p> <p>Children learn about E-Safety in a range of technologies in short series of specific lessons (SPR2).</p> <p>Lifewise unit: Rules around digital relationships/The digital world – netiquette and safety online</p> <p>Digital Citizenship</p>	<p>To identify how to use a search engine 1</p> <p>To describe how search engines select results 1</p> <p>To explain how search results are ranked 1</p> <p>To recognise why the order of results is important, and to whom 1</p> <p>To recognise how we communicate using technology 1</p> <p>To evaluate different methods of online communication 1</p> <p>To review an existing website and consider its structure 2</p> <p>To plan the features of a web page 2</p> <p>To consider the ownership and use of images (copyright) 2</p> <p>To recognise the need to preview pages 2</p> <p>To outline the need for a navigation path 2</p> <p>To recognise the implications of linking to content owned by other people 2</p> <p>To use a computer to create and manipulate three-dimensional (3D) digital objects 6</p> <p>To compare working digitally with 2D and 3D graphics 6</p> <p>To construct a digital 3D model of a physical object 6</p> <p>To identify that physical objects can be broken down into a collection of 3D shapes 6</p> <p>To design a digital model by combining 3D objects 6</p> <p>To develop and improve a digital 3D model</p> <p>Each term children are reminded about online safety, with lessons on personal digital safety delivered in class and by the police force</p> <p>Digital Literacy: Positive use of mobile phones and online gaming etiquette/cyber bullying/Post to be private</p> <p>Digital Citizenship</p> <p>Children are asked to search for a variety of topics using age appropriate search engines (Kiddle).</p>

All year groups have an online safety unit to include