Progression across the Key Stages

Algorithms and Programming

Year 1	Year 2
*To understand what algorithms are; how they are implemented as programs on digital devices; and that Programs execute by following precise and unambiguous instructions.	*To understand what algorithms are; how they are implemented as programs on digital devices. And that programs execute by following precise and unambiguous instructions
	*To create and debug simple programs
	*To use logical reasoning to predict the behaviour of simple programs
Explain that an algorithm is a way of solving a problem	Explain that an algorithm is a precise way of solving a problem
Know that algorithms can be followed by humans	Know that algorithms can be followed by humans and computers
Create algorithms with clear instructions	Create algorithms with precise and clear instructions
Give examples of algorithms in everyday life	Give examples of algorithms in everyday life beyond school
	Create and debug simple programs
	Use logical reasoning to predict the behaviour of simple programs

Year 3	Year 4	Year 5	Year 6
*To debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	*To write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	*To design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	*To design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
Debug programs created in a visual programming language	Write and debug programs created in a visual programming language	Design, write and debug programs created in a multiple programming language	Design, write and debug programs created in a multiple programming language
Explain that computers are controlled by sequences of precise instructions known as programs			Explain how HTML constructs the rendering of a web page
Solve problems by decomposing them into smaller parts	Solve problems by decomposing them into smaller parts	Solve problems by decomposing them into smaller parts	Solve problems by decomposing them into smaller parts
*To use sequence and repetition in programs	*To use sequence, selection and repetition in programs; work with variables	*To use sequence, selection and repetition in programs; work with variables and various forms of input and output	*To use sequence, selection and repetition in programs; work with variables and various forms of input and output
Explain and show algorithms can use selection (if) and repetition (loops) in programs	Explain and show algorithms can use sequence, selection (if) and repetition (loops) in programs	Explain and show algorithms can use sequence, selection (if) and repetition (loops) in programs	To effectively use sequence, selection (if) and repetition (loops) in programs
	Work with variables within programs	Work with variables and various forms of input and output	Work with variables and various forms of input and output
		Explain and show how programs can use procedures or subroutines, within a program	Explain and show how programs can use procedures or subroutines, within a program
To use logical reasoning to explain how some simple algorithms work to detect and correct errors in algorithms and programs	To use logical reasoning to explain how some simple algorithms work to detect and correct errors in algorithms and programs	To use logical reasoning to explain how some simple algorithms work to detect and correct errors in algorithms and programs	To use logical reasoning to explain how some simple algorithms work to detect and correct errors in algorithms and programs
Explain that computers need more precise instructions than humans and the need for precision to avoid errors	Explain and use programs to simulate environments to test hypothesis	Explain and show how programs can be planned , tested, corrected and documented	Explain and show how programs can be planned , tested, corrected and documented
Explain the need for accuracy in algorithms	Distinguish between an algorithm and the programs that implement that algorithms	To be able to annotate programs with simple comments	To be able to annotate programs with detailed comments
			Review and assess the quality of the code

Communication & E-safety

Year 1	Year 2
*To keep 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	To 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
Recognise what is personal information and keep it private	Use technology safely and respectfully to communicate and to keep personal information private
Know where to go for help and support when they have concerns about content on the internet	Know where to go for help and support when they have concerns about content or contact on the internet

Year 3	Year 4	Year 5	Year 6
*To use search technologies effectively	* To use search technologies effectively and be discerning in evaluating digital content	* To use search technologies effectively and be discerning in evaluating digital content	* To use search technologies effectively, appreciate how results are selected and ranked and be discerning in evaluating digital content
Use search technologies to locate simple information	Use search technologies to locate and evaluate information	Use search technologies effectively and be discerning in evaluating the located information	Use search technologies effectively and be discerning in evaluating the located information
			Explain the role of the search engines and what happens when a user requests a web page in a browser
*To use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content or contact	*To use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content or contact	*To use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content or contact	*To use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content or contact
		Explain the technological perspective on safety and security	Discuss career paths for those studying Computing
			Discuss social and ethical issues raised by the role of computers in the world

How Computers Work

Year 1	Year 2
*To recognise common uses of information technology	*To recognise common uses of information technology
Beyond school	
Name devices that contain computers	
Recognise common uses of computers in everyday life in school	
Recognise common uses of computers in everyday life outside of school	
Name the main parts of the computer and describe their function	Explain and describe the key characteristics of basic computer architecture (eg. CPU, memory, hard disk, mouse, display etc)
	Explain the same information can be represented in a computer in a variety of ways for example sound as mp3 or MIDI

Year 3	Year 4	Year 5	Year 6
*To understand computer networks and the opportunities they offer for communication and collaboration	*To understand computer networks and the opportunities they offer for communication and collaboration	*To understand computer networks including the internet; how they can provide multiple service, such as the WWW; and the opportunities they offer for communication and collaboration	*To understand computer networks including the internet; how they can provide multiple service, such as the WWW; and the opportunities they offer for communication and collaboration
Explain and describe the key characteristics of basic computer architecture (eg. CPU, memory, hard disk, mouse, display etc.)	Explain why there are sometimes different operating systems and application software for the same hardware	Explain what the WWW and the Internet are, and the difference	Outline the key features of the WWWand their relationships eg browsers, URLs, navigation methods
Explain why there are sometimes different operating systems and application software for the same hardware	To communicate online using the internet and describe the opportunities for collaboration	Outline how data are transported on the internet, including packets and the notion of a protocol	Explain Moore's Law and multi-tasking by computers

Data & Information

Year 1	Year 2
*To use technology purposely to organise digital content	*To use technology purposely to create, organise, store, manipulate and retrieve digital content
	Use technology purposely to create digital content
Use technology purposely to organise digital content	Use technology purposely to organise digital content
use technology purposely to manipulate digital content	Use technology purposely to manipulate digital content Can manipulate data in graphical ways
	Use technology purposely to store digital content
	Explain how the same information can be represented in a computer in a variety of ways for example sounds as mp3 or MIDI

Year 3	Year 4	Year 5	Year 6
*To select use and combine a variety of software to design and create a range of content that accomplish given goals, including collecting and presenting data and information	*To select use and combine a variety of software (including internet services) to design and create a range of content that accomplish given goals, including collecting and presenting data and information	*To 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, evaluating and presenting data and information	*To 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, evaluating and presenting data and information
Explain that data can have errors, how this might effect results and decisions based on the data and how errors can be reduced	Explain the importance of the human- computer interface design	Explain how the same binary data can be interpreted in different ways for example, an 8-bit value could be a character or a number	Explain how computers represent all data in binary, with a variety of examples: unsigned integers, text representation (for example ASCII) different sound data/file types and different graphics data/file types
	Explain and use the common trouble shooting techniques	Explain the importance of the human-computer interface design	
		Explain how the same information can be represented in a computer in a variety of ways eg sound as mp3 or MIDI	