Higher Walton CE Primary School – Computing Curriculum Progression

RECEPTION				
AUTMN				
Development Matters Statements	**Progression of knowledge and skills**		**Linked texts**	**Key vocabulary**
Remember rules without needing an adult to remind them. (*PSED Three-Four Year Olds*) Match their developing physical skills to tasks and activities in the setting. (*PD Three-Four Year Olds*) Explore how things work. (UTW Three-Four Year Olds)	To know that different types of technology can be found at home and in school. Recognising that a range of technology is used for different purposes. To know that you can take simple photographs with a camera or iPad. To know that being able to follow and give simple instructions is important in computing. To know that you can program a Bee-Bot with some simple commands. Following instructions as part of practical activities and games. Learning to give simple instructions. To know that a pictogram is a way of showing information. To know that sorting objects into various categories can help you locate information. Exploring branch databases through physical games.			Computer, computer tower, monitor, camera, iPad, instructions, timer, describe, adjective, instructions, technology, power, electricity, batteries, click, push, pull, twist, on, off, back, backwards, right, left, arrow, circle, direction, sequence, straight on, sort, describe, texture, colour, pattern, size, weight, height, length.
SPRING				
Development Matters Statements	**Progression of knowledge and skills**		**Linked texts**	**Key vocabulary**
Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: sensible amounts of 'screen time. (PSED *Reception*) Develop their small motor skills so that they can use a range of tools competently, safely, and confidently. (PD *Reception*) Explore, use, and refine a variety of artistic effects to express their ideas and feelings. (EAD *Reception*)	Learning how to operate a camera to take photographs of meaningful creations or moments. Representing data through sorting and categorising objects in unplugged scenarios. Representing data through physical pictograms. Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. To understand that it is important for instructions to be in the right order. Using logical reasoning to understand simple instructions and predict the outcome. To understand that debugging means how to fix some simple programming errors. To be able to understand what a computer keyboard is and recognising some letters and numbers. To know that a mouse can be used to click, drag, and create simple drawings. To know that to use a computer you need to log in to it and then log out at the end of your session.			Computer, computer tower, monitor, camera, iPad, keyboard, mouse, letters, numbers, uppercase, lowercase, type, log in, log out, left click, right click, arrow, cursor, pictogram, graph, column, row, square, data, collect, record, count, more, less, in total, altogether, most popular, least popular share, divide, equal.

Early Years

Higher Walton CE Primary School – Computing Curriculum Progression

SUMMER			
Development Matters Statements	**Progression of knowledge and skills**	**Linked texts**	**Key vocabulary**
Be confident to try new activities and show independence, resilience, and perseverance in the face of challenge. Explain the reasons for rules, know right from wrong and try to behave accordingly. (PSED *ELG*.) Safely use and explore a variety of materials, tools, and techniques, experimenting with colour, design, texture, form, and function. (EAD *ELG*.)	Developing basic mouse skills such as moving and clicking. Recognising and identifying familiar letters and numbers on a keyboard. Using a simple online paint tool to create digital art. Learning to log in and log out. Experimenting with programming a Bee-bot/Blue- bot and learning how to give simple commands. To know that you must hold the camera still and ensure the subject is in the shot to take a photo. To know that using yes/no questions to find an answer is a branching database. To understand that an algorithm is a set of clear and precise instructions. Learning to debug instructions, with the help of an adult, when things go wrong. To understand why a set of instructions may have gone wrong.		Computer, computer tower, monitor, camera, iPad, keyboard, mouse, letters, numbers, uppercase, lowercase, type, log in, log out, left click, right click, arrow, cursor, two-part, instructions, algorithm, dial, memory, back, backwards, right, left, arrow, circle, direction, sequence, debug, program, straight on, branch database, sort, paint, stamp.

Expectation by the end of EYFS:
- **Using digital devices (e.g. tablets, computers, cameras, interactive whiteboards)**
- **Understanding that technology has different purposes.**
- **Beginning to select appropriate technology to achieve a goal.**
- **Developing basic operational skills (clicking, swiping, typing, using simple menus)**
- **Using programmable toys or simple apps (e.g. Bee-Bots) to give instructions and see outcomes.**
- **Talking about technology in everyday life.**

Reception (Early Learning Goals): Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.

KEY STAGE ONE	

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**

Expectation by the end of:

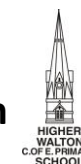| **Year 1**	**Year 2**
Hardware: Learning how to operate a camera or tablet to take photos and videos. Learning how to explore and tinker with hardware to find out how it works. Recognising that some devices are input devices and others are output devices. Learning where keys are located on the keyboard.	Hardware: Understanding what a computer is and that it's made up of different components. Recognising that buttons cause effects and that technology follows instructions. Learning how we know that technology is doing what we want it to do via its output. Using greater control when taking photos with cameras, tablets or computers. Developing confidence with the keyboard and the basics of touch typing.

(Computer Science — left vertical label)

Computational thinking: Learning that decomposition means breaking a problem down into smaller parts. Using decomposition to solve unplugged challenges. Using logical reasoning to predict the behaviour of simple programs. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm. Programming: Programming a floor robot to follow a planned route. Learning to debug instructions when things go wrong. Using programming language to explain how a floor robot works. Learning to debug an algorithm in an unplugged scenario.	Computational thinking: Articulating what decomposition is. Decomposing a game to predict the algorithms used to create it. Learning that there are different levels of abstraction. Explaining what an algorithm is. Following an algorithm. Creating a clear and precise algorithm. Learning that programs execute by following precise instructions. Incorporating loops within algorithms. Programming: Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program. Using loop blocks when programming to repeat an instruction more than once.

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**

Expectation by the end of:

Information Technology

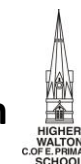| Year 1	Year 2
Using software: *Using a basic range of tools within graphic editing software.* *Taking and editing photographs.* *Developing control of the mouse through dragging, clicking and resizing of images to create different effects.* *Developing understanding of different software tools.* *Using email & internet devices:* *Recognising devices that are connected to the internet.* *Searching and downloading images from the internet safely.* *Understanding that we are connected to others when using the internet.* *Using data:* *Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc.* *Using representations to answer questions about data.* *Using software to explore and create pictograms and branching databases.* *Wider use of technology:*	*Using software:* *Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.* *Using email & internet searches:* *Using word processing software to type and reformat text.* *Using software (and unplugged means) to create story animations. Creating and labelling images.* *Searching for appropriate images to use in a document. Understanding what online information is.* *Using data:* *Collecting and inputting data into a spreadsheet.* *Interpreting data from a spreadsheet.* *Wider use of technology:* *Learning how computers are used in the wider world.*

Recognising common uses of information technology, including beyond school.
Understanding some of the ways we can use the internet.

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
-

Expectation by the end of:

Digital Literacy	**Year 1**	**Year 2**
	Digital literacy:	*Digital literacy:*
	Logging in and out and saving work on their own account.	*Learning how to create a strong password.*
	When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable.	*Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable Identifying whether information is safe or unsafe to be shared online.*
	Understanding how to interact safely with others online.	*Learning to be respectful of others when sharing online and ask for their permission before sharing content.*
	Recognising how actions on the internet can affect others. Recognising what a digital footprint is and how to be careful about what we post.	*Learning strategies for checking if something they read online is true.*

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

Expectation by the end of:

computer systems and networks	**Year 1**	**Year 2**
	To know that "log in and log out" means to begin and end a connection with a computer.	To know the difference between a desktop and laptop computer.
	To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art.	To know that people control technology.
	To know that passwords are important for security.	To know that buttons are a form of input that give a computer an instruction about what to do (output).
	To know that when we create something on a computer it can be more easily saved and shared than a paper version.	To know that computers often work together. To know that touch typing is the fastest way to type.
	To know some of the simple graphic design features of a piece of online software.	To know that I can make text a different style, size and colour.
		To know that "copy and paste" is a quick way of duplicating text.

Programming

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

Expectation by the end of:

Year 1	Year 2
To understand that an algorithm is when instructions are put in an exact order. To know that input devices get information into a computer and that output devices get information out of a computer. To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'. To understand the basic functions of a Bee-Bot. To know that you can use a camera/tablet to make simple videos. To know that algorithms move a bee-bot accurately to a chosen destination. *Programming a Floor robot to follow a planned route.* *Learning to debug instructions when things go wrong.* *Using programming language to explain how a floor robot works. Learning to debug an algorithm in an unplugged scenario.*	To understand what machine learning is and how that enables computers to make predictions. To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. To know that abstraction is the removing of unnecessary detail to help solve a problem. To know that coding is writing in a special language so that the computer understands what to do. To understand that the character in ScratchJr is controlled by the programming blocks. To know that you can write a program to create a musical instrument or tell a joke. *Using logical thinking to explore software, predicting, testing and explaining what it does.* *Using an algorithm to write a basic computer program.* *Using loop blocks when programming to repeat an instruction more than once.*

Creating Media

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

Expectation by the end of:

Year 1
To understand that holding the camera still and considering angles and light are important to take good pictures.
To know that you can edit, crop and filter photographs.
To know how to search safely for images online.

Creating media:
Using a basic range of tools within graphic editing software.
Taking and editing photographs.
Developing control of the mouse through dragging, clicking and resizing of images to create different effects.
Developing understanding of different software tools.

Year 2
To understand that an animation is made up of a sequence of photographs.
To know that small changes in my frames will create a smoother looking animation.
To understand what software creates simple animations and some of its features e.g. onion skinning.

Creating media:
Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.
Using word processing software to type and reformat text.
Using software (and unplugged means) to create story animations. Creating and labelling images.

Data Handling

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**

Expectation by the end of:

Year 1
To know how that charts and pictograms can be created using a computer.
To understand that a branching database is a way of classifying a group of objects.
To know that computers understand different types of 'input'.

Year 2
To understand that you can enter simple data into a spreadsheet.
To understand what steps you need to take to create an algorithm. To know what data to use to answer certain questions.
To know that computers can be used to monitor supplies.

Online Safety

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**

Expectation by the end of:

Year 1
To know that the internet is many devices connected to one another.
To know that you should tell a trusted adult if you feel unsafe or worried online.
To know that people you do not know are on the internet (online) are strangers and not always who they say they are.

Year 2
To understand the difference between online and offline.
To understand what information I should not post online.
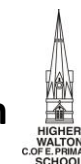To know what the techniques are for creating a strong password.

to know that sharing online means giving something specific to someone else via the internet and posting online means placing the information on the internet.	To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.' To understand that not everything I see or read online is true.

LOWER KEY STAGE TWO

	Pupils should be taught to: 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

Computer Science

Expectation by the end of:

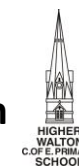| *Year 3:* *Hardware:* *Understanding what the different components of a computer do and how they work together. Drawing comparisons across different types of computers. Learning about the purpose of routers.* *Understanding the role of the key components of a network.* *Networks & data representation:* *Identifying the key components within a network, including whether they are wired or wireless. Understanding that websites and videos are files that are shared from one computer to another. Learning about the role of packets.* *Understanding how networks work and their purpose. Recognising links between networks and the internet. Learning how data is transferred.* *Computational thinking:* *Using decomposition to explain the parts of a laptop computer. Using decomposition to explore the code behind an animation.* *Using repetition in programs.* *Using logical reasoning to explain how simple algorithms work.* *Explaining the purpose of an algorithm. Forming algorithms independently.*	*Year 4* *Hardware:* *Using tablets or digital cameras to film a weather forecast.* *Understanding that weather stations use sensors to gather and record data which predicts the weather.* *Networks & data representation:* *Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.* *Computational thinking:* *Using decomposition to solve a problem by finding out what code was used.* *Using decomposition to understand the purpose of a script of code. Identifying patterns through unplugged activities.* *Using past experiences to help solve new problems.* *Using abstraction to identify the important parts when completing both plugged and unplugged activities.* *Programming:* *Creating algorithms for a specific purpose.*

	Programming: *Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Incorporating loops to make code more efficient.* *Continuing existing code. Making reasonable suggestions for how to debug their own and others' code.*	*Coding a simple game.* *Using abstraction and pattern recognition to modify code.* *Incorporating variables to make code more efficient.*

Information Technology

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

Expectation by the end of:

Year 3	Year 4
Using software: *Taking photographs and recording video to tell a story.* *Using software to edit and enhance their video adding music, sounds and text on screen with transitions.* *Using email and internet searches:* *Learning to log in and out of an email account.* *Writing an email including a subject, 'to' and 'from.'* *Sending an email with an attachment. Replying to an email.* *Using data:* *Understanding the vocabulary to do with databases: field, record, data.* *Learning about the pros and cons of digital versus paper databases.* *Sorting and filtering databases to easily retrieve information.* *Creating and interpreting charts and graphs to understand data.* *Wider use of technology:* *Understanding the purpose of emails.* *Recognising how social media platforms are used to interact.*	*Using software:* *Building a web page and creating content for it.* *Designing and creating a webpage for a given purpose.* *Use online software for documents, presentations, forms and spreadsheets.* *Using software to work collaboratively with others.* *Using email and internet searches:* *Understanding why some results come before others when searching.* *Using keywords to effectively search for information on the internet. Understanding that information found by searching the internet is not all grounded in fact.* *Searching the internet for data.* *Using data:* *Understanding that data is used to forecast weather.* *Recording data in a spreadsheet independently.* *Sorting data in a spreadsheet to compare using the 'sort by…' option. Designing a device which gathers and records sensor data.* *Wider use of technology:* *Understanding that software can be used collaboratively online to work as a team.*

Higher Walton CE Primary School – Computing Curriculum Progression

Digital Literacy

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

Expectation by the end of:

Year 3	Year 4
Digital Literacy:	*Digital Literacy:*
Recognising that different information is shared online including facts, beliefs and opinions.	*Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others.*
Learning how to identify reliable information when searching online.	*Learning to make judgements about the accuracy of online searches. Identifying forms of advertising online.*
Learning how to stay safe on social media. Considering the impact technology can have on mood.	*Recognising what appropriate behaviour is when collaborating with others online.*
Learning about cyberbullying.	*Reflecting on the positives and negatives of time spent online. Identifying respectful and disrespectful online behaviour.*
Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.	

Computer systems and networks

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

Expectation by the end of:

Year 3	Year 4
To know what a tablet is and how it is different from a laptop/desktop computer.	To understand that software can be used collaboratively online to work as a team. To know what type of comments and suggestions on a collaborative document can be helpful.
To understand what a network is and how a school network might be organised.	To know that you can use images, text, transitions and animation in presentation slides.
To know that a server is central to a network and responds to requests made.	
To know how the internet uses networks to share files.	
To know that a router connects us to the internet.	
To know what a packet is and why it is important for website data transfer	
To know the roles that inputs and outputs play on computers.	
To understand that email stands for 'electronic mail.'	
To know that an attachment is an extra file added to an email.	
To understand that emails should contain appropriate and respectful content.	

To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.

Programming

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

Expectation by the end of:

Year 3	Year 4
To know that Scratch is a programming language and some of its basic functions. To understand how to use loops to improve programming. To understand how decomposition is used in programming. To understand that you can remix and adapt existing code. *Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Incorporating loops to make code more efficient. Continuing existing code. Making reasonable suggestions for how to debug their own and others' code.*	To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch. To know what a conditional statement is in programming. To understand that variables can help you to create a quiz on Scratch. To know that combining computational thinking skills (sequence, abstraction, decomposition etc) can help you to solve a problem. To understand that pattern recognition means identifying patterns to help them work out how the code works. To understand that algorithms can be used for a number of purposes e.g. animation, games design. *Creating algorithms for a specific purpose. Coding a simple game. Using abstraction and pattern recognition to modify code. Incorporating variables to make code more efficient.*

Creating Media

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

Expectation by the end of:

Year 3	Year 4
To know that different types of camera shots can make my photos or videos look more effective. To know that I can edit photos and videos using film editing software. To understand that I can add transitions and text to my video.	To know some of the features of web design software. To know that a website is a collection of pages that are all connected. To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks. To know that websites should be informative and interactive

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

Expectation by the end of

Year 3	Year 4
To know that a database is a collection of data stored in a logical, structured and orderly manner. To know that computer databases can be useful for sorting and filtering data. To know that different visual representations of data can be made on a computer.	To know that computers can use different forms of input to sense the world around them so that they can record and respond to data. This is called 'sensor data'. To know that a weather machine is an automated machine that responds to sensor data. To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.

Online Safety

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**
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Expectation by the end of:

Year 3	Year 4
To know that not everything on the internet is true: people share facts, beliefs and opinions online. To understand that the internet can affect your moods and feelings. To know that privacy settings limit who can access your important personal information, such as your name, age, gender etc. To know what social media is and that age restrictions apply.	To understand some of the methods used to encourage people to buy things online. To understand that technology can be designed to act like or impersonate living things. To understand that technology can be a distraction and identify when someone might need to limit the amount of time spent using technology. To understand what behaviours are appropriate in order to stay safe and be respectful online.

UPPER KEY STAGE TWO

Computer Scie

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
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- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Expectation by the end of:

Year 5	Year 6
To know how search engines work.	To understand the importance of having a secure password and what "brute force hacking" is.
To understand that anyone can create a website and therefore we should take steps to check the validity of websites.	To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2.
To know that web crawlers are computer programs that crawl through the internet.	To know about some of the historical figures that contributed to technological advances in computing.
To understand what copyright is.	To understand what techniques are required to create a presentation using appropriate software.
To know the difference between ROM and RAM.	
	Computational Thinking:
Computational Thinking:	*Decomposing a program into an algorithm.*
Decomposing animations into a series of images.	*Using past experiences to help solve new problems.*
Decomposing a program without support.	*Writing increasingly complex algorithms for a purpose.*
Decomposing a story to be able to plan a program to tell a story.	
Predicting how software will work based on previous experience.	*Programming:*
Writing more complex algorithms for a purpose.	*Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem.*
	Using and adapting nested loops.
Programming:	*Programming using the language Python.*
Programming an animation.	*Changing a program to personalise it.*
Iterating and developing their programming as they work. Confidently using loops in their programming.	*Evaluating code to understand its purpose.*
Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.	*Predicting code and adapting it to a chosen purpose.*
Writing code to create a desired effect.	
Using a range of programming commands.	
Using repetition within a program.	
Amending code within a live scenario.	

Information Technology

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

Expectation by the end of:

Year 5	Year 6
Using software: *Using logical thinking to explore software more independently, making predictions based on their previous experience.* *Using software programme Sonic Pi/Scratch to create music.* *Using the video editing software to animate.* *Identify ways to improve and edit programs, videos, images etc.* *Independently learning how to use 3D design software package TinkerCAD.* *Using email and internet searches: (Independent)* *Developing searching skills to help find relevant information on the internet.* *Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.* *Using data:* *Understanding how data is collected in remote or dangerous places. Understanding how data might be used to tell us about a location.* *Wider use of technology:* *Learn about different forms of communication that have developed with the use of technology.*	*Using software:* *Using logical thinking to explore software independently, iterating ideas and testing continuously.* *Using search and word processing skills to create a presentation. Creating and editing sound recordings for a specific purpose. Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.* *Using design software TinkerCAD to design a product.* *Creating a website with embedded links and multiple pages.* *Using email and internet searches:* *Understanding how search engines work.* *Using data:* *Understanding how barcodes, QR codes and RFID work.* *Gathering and analysing data in real time.* *Creating formulas and sorting data within spreadsheets.* *Wider use of technology:* *Learning about the Internet of Things and how it has led to 'big data'. Learning how 'big data' can be used to solve a problem or improve efficiency.*

Digital Literacy

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

Expectation by the end of:

Year 5	Year 6
Digital literacy: *Identifying possible dangers online and learning how to stay safe. Evaluating the pros and cons of online communication.* *Recognising that information on the internet might not be true or correct and learning ways of checking validity.* *Learning what to do if they experience bullying online.* *Learning to use an online community safely.*	*Digital literacy* *Learning about the positive and negative impacts of sharing online.* *Learning strategies to create a positive online reputation.* *Understanding the importance of secure passwords and how to create them.* *Learning strategies to capture evidence of online bullying in order to seek help.* *Using search engines safely and effectively.* *Recognising that updated software can help to prevent data corruption and hacking.*

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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**

Expectation by the end of:

Year 5	Year 6
To know how search engines work.	To understand the importance of having a secure password and what "brute force hacking" is.
To understand that anyone can create a website and therefore we should take steps to check the validity of websites.	To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2.
To know that web crawlers are computer programs that crawl through the internet.	To know about some of the historical figures that contributed to technological advances in computing.
To understand what copyright is.	To understand what techniques are required to create a presentation using appropriate software.
To know the difference between ROM and RAM.	

Programming

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**

Expectation by the end of:

Year 5	Year 6
To know that a soundtrack is music for a film/video and that one way of composing these is on programming software.	To know that there are text-based programming languages such as Logo and Python.
To understand that using loops can make the process of writing music simpler and more effective.	To know that nested loops are loops inside of loops.
To know how to adapt their code while performing their music.	To understand the use of random numbers and remix Python code.
To know that a Micro:bit is a programmable device.	
To know that Micro:bit uses a block coding language similar to Scratch.	Programming:
To understand and recognise coding structures including variables.	*Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem.*
To know what techniques to use to create a program for a specific purpose (including decomposition).	*Using and adapting nested loops.*
Programming:	*Programming using the language Python.*
	Changing a program to personalise it.
Programming an animation. Iterating and developing their programming as they work. Confidently using loops in their programming.	*Evaluating code to understand its purpose.*
	Predicting code and adapting it to a chosen purpose.

	Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. *Writing code to create a desired effect.* *Using a range of programming commands. Using repetition within a program. Amending code within a live scenario.*	

Creating Media	**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

Expectation by the end of:

Year 5	**Year 6**
To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph. To know that decomposition of an idea is important when creating stop-motion animations. To know that editing is an important feature of making and improving a stop motion animation.	To know that radio plays are plays where the audience can only hear the action so sound effects are important. To know that sound clips can be recorded using sound recording software. To know that sound clips can be edited and trimmed

Data Handling	**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

Expectation by the end of:

Year 5	**Year 6**
To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock. To know what numbers using binary code look like and be able to identify how messages can be sent in this format. To understand that RAM is Random Access Memory and acts as the computer's working memory. To know what simple operations can be used to calculate bit patterns.	To know that data contained within barcodes and QR codes can be used by computers. To know that infrared waves are a way of transmitting data. To know that Radio Frequency Identification (RFID) is a more private way of transmitting data. To know that data is often encrypted so that even if it is stolen it is not useful to the thief. To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'. I know that devices or that are not updated are most vulnerable to hackers. To know the difference between mobile data and WiFi.

Online Safety	**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

Expectation by the end of:

Year 5	Year 6
To know different ways we can communicate online.	To know that a 'digital footprint' means the information that exists on the internet as a result of a person's online activity.
To understand how online information can be used to form judgements.	To know what steps are required to capture bullying content as evidence.
To understand some ways to deal with online bullying.	To understand that it is important to manage personal passwords effectively. To understand what it means to have a positive online reputation. To know some common online scams.
To know that apps require permission to access private information and that you can alter the permissions.	
To know where I can go for support if I am being bullied online or feel that my health is being affected by time onlie	

Italic: progression of skills

non-italic: progression of knowledge