The Meadows Primary Academy

COMPUTING

Logic	Computational logic is the process of working step-by-step to understand a problem and develop a solution. It describes the decision-making process used in programming and writing algorithms.
Abstraction	Abstraction is an important part of computer programming. In computing, abstraction is the technique used to arrange computer systems and hide the complexity of programs to make it more accessible to the everyday user.
Machines	A computing machine is a device used to perform calculations and process data.
Algorithms	An algorithm is a process or set of rules followed in calculations or other problem-solving operations, especially by a computer.
Program	A computing program is a collection of instructions that performs a specific task when executed by a computer.
Data	Data is any sequence of one or more symbols given meaning by specific acts of interpretation. Computer data is information processed or stored by a computer.

The Meadows Primary Academy - COMPUTING progression through EYFS
Understanding the World: Computing Overview

Playing & Exploring - Engagement	Active Learning - Motivation	Creating & Thinking Critically - Thinking
• Finding out & exploring • Playing with what they know • Being willing to 'have a go'	• Being involved & concentrating • Keep on trying • Enjoying achieving what they set out to do	• Having their own ideas (creative thinking) • Making links (building theories) • Working with ideas (critical thinking)

ELG
NO ELGs are represented for this area.

Focus	Electronic Communication Understanding Technologies	Text and Multimedia	Research and E-Safety	Digital images and audio	Algorithms Handing information	Vocabulary- To be used daily.
Nursery Skills	• Shows an interest in technological toys with knobs or pulleys, real objects such as cameras, and touchscreen devices such as interactive screen, table top computer and tablets	• Knows how to operate simple equipment, e.g. turn on CD player, uses a remote control, can navigate touch-capable technology with support	• Know how to handle equipment safely • Begin to know that they shouldn't use devices without supervision	• Knows that information can be retrieved from digital devices and the internet	• Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images	Choices, equipment, buttons, movement, screen, keyboard, count, organise,
Nursery Knowledge	Autumn 1 Ourselves	Autumn 2 celebrations	Spring 1 Moving on up	Spring 2 What a wonderful world	Summer 1 What's the story	Summer 2 Rescue me
	•Explore different toys in role play such as telephones, cameras, keyboards.	•Can operate a simple CD player by pressing start and stop to play music.	•Understands that we can search for information on 'google' by typing in a word to find out more.	•Can use a simple I board touch programme to draw a picture by changing tools and colours using the on-screen options.	•Can operate simple games on the iPad and know to open and end a programme.	Can follow instructions when operating a device

Children to be exposed to key vocabulary daily in provision. High quality resources will be provided for daily accessibility.
Role-play will be a key area where a range of technologies will be used in play - telephones, microwaves, cookers, keyboards. These should be modelled.
Interactive screen and table top computer as part of continuous provision

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Playing & Exploring - Engagement	Active Learning - Motivation	Creating & Thinking Critically - Thinking
• Finding out & exploring • Playing with what they know • Being willing to 'have a go'	• Being involved & concentrating • Keep on trying • Enjoying achieving what they set out to do	• Having their own ideas (creative thinking) • Making links (building theories) • Working with ideas (critical thinking)

ELG
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Focus	Electronic Communication Understanding Technologies	Text and Multimedia	Research and E-Safety	Digital images and audio	Algorithms Handing information	Vocabulary- To be used daily.
Reception Skills	• Completes a simple program on electronic devices	• Begin to list different IT in their home	• Begin to give reasons why we need to stay safe online • Can use the internet with adult supervision to find and retrieve information of interest to them	• Can create content such as a video recording, stories, and/or draw a picture on screen	• Develops digital literacy skills by being able to access, understand and interact with a range of technologies	Internet, website, mouse, images, paint, technology, share, collect, set, sound, communicate, videos, photos, programme
Reception Knowledge	**Autumn 1** "Who am I?"	**Autumn 2** "Who am I?"	**Spring 1** "Food to fork"	**Spring 2** "Food to fork"	**Summer 1** "where will we go now? Water water everywhere"	**Summer 2** "where will we go now? Water water everywhere"
	•Can turn on an iPad or a Kindle to open a programme and follow instructions. •Can explain how to stay safe when using the internet.	•Can follow the teacher's instructions when using an online interactive programme such as paint or draw.	•To collect information about the measurement of plants and see which was the best environment for growing in.	•Can write a variety of CVC words using a keyboard.	•Can use the iPad or Kindle to take their own images •Can send a group class email to a different class and wait for a response.	•Can use 'Google' to find out more information about animals and use the images to support their own representations. .

E-Safety	Computer Skills	Programming	Word Processing skills	Data Collection

Children to be exposed to key vocabulary daily in provision. High quality resources will be provided for daily accessibility.
Role-play areas will be a key area where a range of technologies will be used in play- telephones, microwaves, cookers, keyboards, tills. These should be modelled.

KS1	
KS1: POS • 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	**Understanding technologies** • Show an awareness of the range of devices and tools they encounter in everyday life • Show an awareness that why they create one a computer or tablet can be shown to others via another device (e.g. printer, projector, Apple TV) • Show an awareness of a range of inputs to a computer (Interactive whiteboard, mouse, touch screen, keyboard • Begin to show an awareness that computers can be linked to shared resources
Text and Multimedia • Work with others and with support to contribute to a digital class resources which includes text, graphic and sound • Open and close windows • Turn a device on • Type using both hands • Generate their own work combing in text, graphics and sound • Save, retrieve and edit work	**Research and E-Safety** • Explore information from a variety of sources • Save a picture from the internet • Use a search engine to find specific and relevant information to use in a topic • Use key words to search for specific information
Digital Images and audio (photos, paint, animation) • Use a range of simple tools to modify a picture/create a picture/use a paint package • Use a range of tools and software to create or modify a picture to communicate an idea • Create a simple animation to tell a story	**Algorithms (Control)** • Control simple everyday devices to make them produce different outcomes. • Control a device, on and off screen, making predictions about the effect their programming will have

KS1 – Cycle A– End points	
Programming on screen	• Have a clear understanding of algorithms as sequences of instructions. • Convert simple algorithms to programs. • Predict what a simple program will do. • Spot and fix (debug) errors in their programs
Exploring how computer games work	• Describe carefully what happens in computer games. • Use logical reasoning to make predictions of what a program will do. • Test these predictions. • Think critically about computer games and their use. • Be aware of how to use games safely and in balance with other activities
Taking photographs	• Consider the technical and artistic merits of photographs. • Use a digital camera or camera app. • Take digital photographs. • Review and reject or rate the images they take. • Edit and enhance their photographs. • Select their best images to include in a shared port
Researching a topic	• Develop collaboration skills through working as part of a group. • Develop research skills through searching for information on the internet. • Improve note-taking skills through the use of mind mapping. • Develop presentation skills through creating and delivering a short multimedia presentation
Collecting clues	• Understand that email can be used to communicate. • Develop skills in opening, composing and sending emails. • Gain skills in opening and listening to audio files on the computer. • Use appropriate language in emails. • Develop skills in editing and formatting text in emails. • Be aware of online safety issues when using email.
Collecting data about bugs	• Sort and classify a group of items by answering questions. • Collect data using tick charts or tally charts. • Use simple charting software to produce pictograms and other basic charts. • Take, edit and enhance photographs. • Record information on a digital map

KS1 – Cycle B– End points	
Using programmable toys	• Understand that a programmable toy can be controlled by inputting a sequence of instructions. • Develop and record sequences of instructions as an algorithm. • Program the toy to follow their algorithm. • Debug their programs. • Predict how their programs will work
Filming the steps of a recipe	• Understand that a programmable toy can be controlled by inputting a sequence of instructions. • Develop and record sequences of instructions as an algorithm. • Program the toy to follow their algorithm. • Debug their programs. • Predict how their programs will work
Illustrating an eBook	• Use the web safely to find ideas for an illustration. • Select and use appropriate painting tools to create and change images on the computer. • Understand how this use of ICT differs from using paint and paper. • Create an illustration for a particular purpose. • Know how to save, retrieve and change their work. • Reflect on their work and act on feedback received.
Finding images using the web	• Find and use pictures on the web. • Know what to do if they encounter pictures that cause concern. • Group images on the basis of a binary (yes/no) question. • Organise images into more than two groups according to clear rules. • Sort (order) images according to some criteria. Ask and answer binary (yes/no) questions about their images.
Producing a talking book	• Use sound recording equipment to record sounds. • Develop skills in saving and storing sounds on the computer. • Develop collaboration skills as they work together in a group. • Understand how a talking book differs from a paper-based book. • Talk about and reflect on their use of ICT. • Share recordings with an audience
Creating a card digitally	• Develop basic keyboard skills, through typing and formatting text. • Develop basic mouse skills. • Use the web to find and select images. • Develop skills in storing and retrieving files. • Develop skills in combining text and images. • Discuss their work and think about whether it could be improved

<table>
<tr><th colspan="2">LKS2 – Year 3 and 4</th></tr>
<tr><td><u>KS2: POS</u>
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.
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
Recognise common uses of information technology beyond school</td><td><u>Understanding technologies</u>
Begin to show discernment in their use of computing devices and tools for a particular purpose and explain why their choice was made
Show an understanding that their password is the key to accessing a personalised set of resources and files
Show an awareness of where passwords are critical in everyday use (parents accessing bank details)
Make choices about devices and tools used for specific purpose and explain in relation to context
Begin to show an awareness of specific tools used in working life
Show an awareness of the need for accuracy in spelling and syntax to search effectively</td></tr>
<tr><td><u>Text and Multimedia</u>
Record and present information integrating a range of appropriate media combining text and graphics in printable form
Include sound and video for on-screen presentations which include hyperlinks
Show an awareness of audience
Seek feedback</td><td><u>Research and E-Safety</u>
Using another curriculum area as a starting point, children ask their own question then use ICT sources to find answers, making use of search engines
Children talk about using ICT to find information/resources showing an emerging understanding of internet safety
Make use of copy and paste becoming aware and showing an understanding of plagiarism
Understand not all information on the internet is accurate</td></tr>
</table>

	• Develop a growing awareness of how to stay safe when using the internet (in school and at home) • Understand the school's internet policies
Digital Images and audio (photos, paint, animation) • Manipulate digital images using a range of tools in appropriate software to convey a specific mood or idea • Make a short film/animation from images (still and/or moving) that has been sourced, captured or created	**Algorithms (Control)** • Able to type a short sequence of instructions and to plan ahead when programming devices on and off screen • Use control software devices or simulate this on screen (Scratch) • Predict, test and refine programming
Handling information (databases and graphs) • Use a simple database (the structure of which has been set up for the) to enter and save information on a given subject • Follow straight forward lines of enquiry to search data • Work as a class or group to create a data collection sheet and use it to set up a simple database • Enter information and interrogate it (by searching, sorting and graphing etc)	**Electronic Communication** • Show good understanding and awareness of the need to abide by school e-safety rules • Share work that has been done electronically (email) • Seek and respond to feedback

LKS2 – Year 3– End points	
Programming an animation	• Create an algorithm for an animated scene in the form of a storyboard. • Write a program in Scratch to create the animation. • Correct mistakes in their animation programs.
Finding and correcting bugs in programs	• Develop a number of strategies for finding errors in programs. • Build up resilience and strategies for problem solving. • Increase their knowledge and understanding of Scratch. • Recognise a number of common types of bug in software
Videoing performance	• Gain skills in shooting live video, such as framing shots, holding the camera steady, and reviewing. • Edit video, including adding narration and editing clips by setting in/out points. • Understand the qualities of effective video, such as the importance of narrative, consistency, perspective and scene length.
Making and sharing a short screencast presentation	• Use a search engine to learn about a new topic. • Plan, design and deliver an interesting and engaging presentation. • Search for and evaluate online images. • Create their own original images. • Create a video slidecast of a narrated presentation. • Develop understanding of how the internet, the web and search engines work

Communicating safely on the internet	• Use a search engine to learn about a new topic. • Plan, design and deliver an interesting and engaging presentation. • Search for and evaluate online images. • Create their own original images. • Create a video slidecast of a narrated presentation. • Develop understanding of how the internet, the web and search engines work
Collecting and analysing data	• Understand some elements of survey design. • Understand some ethical and legal aspects of online data collection. • Use the web to facilitate data collection. • Gain skills in using charts to analyse data. • Gain skills in interpreting results

LKS2 – Year 4 – End points	
Developing a simple educational game	• Develop an educational computer game using selection and repetition. • Understand and use variables. • Start to debug computer programs. • Recognise the importance of user interface design, including consideration of input and output.
Prototyping an interactive toy	• Design and make an on-screen prototype of a computer-controlled toy. • Understand different forms of input and output (such as sensors, switches, motors, lights and speakers). • Design, write and debug the control and monitoring program for their toy
Producing digital music	• Use one or more programs to edit music. • Create and develop a musical composition, refining their ideas through reflection and discussion. • Develop collaboration skills. • Develop an awareness of how their composition can enhance work in other media
Editing and Writing HTML	• Understand some technical aspects of how the internet makes the web possible. • Use HTML tags for elementary mark up. • Use hyperlinks to connect ideas and sources. • Code up a simple web page with useful content. • Understand some of the risks in using the web

Producing a Wiki	• Understand the conventions for collaborative online work, particularly in wikis. • Be aware of their responsibilities when editing other people's work. • Become familiar with Wikipedia, including potential problems associated with its use. • Practise research skills. • Write for a target audience using a wiki tool. • Develop collaboration skills. • Develop proofreading skills
Presenting the weather	• Understand different measurement techniques for weather, both analogue and digital. • Use computer-based data logging to automate the recording of some weather data. • Use spreadsheets to create charts • Analyse data, explore inconsistencies in data and make predictions • Practise using presentation software and, optionally, video

<table>
<tr><th colspan="2">UKS2 – Year 5 and 6</th></tr>
<tr><td><u>KS2: POS</u>
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</td><td><u>Understanding technologies</u>
Show an understanding of the school network and how it links computers in school and beyond
Compare this with other known networks that may be encountered at home or in the wider world (e.g. banks, hospitals)</td></tr>
<tr><td><u>Text and Multimedia</u>
Use advanced tools in word processing such as text formatting, line spacing etc
Use effects to convey meaning rather than to impress</td><td><u>Research and E-Safety</u>
Understand the purpose of copyright regulations and the need to repurpose information for a particular purpose
Independently and with due regard for safety, search the internet using a variety of techniques to find a range of information and resources on a specific topic
Check websites for security features
Understand the effects of cyberbullying and stereotyping
Use appropriate methods to validate information and check for bias and accuracy</td></tr>
<tr><td><u>Digital Images and audio (photos, paint, animation)</u>
Use images created or captured as part of a bigger project
Create multiple track compositions that contain a variety of sounds
Use images created, manipulated or captured as part of a bigger project</td><td><u>Algorithms (Control)</u>
Create command sequences to control devices in response to sending (i.e. uses inputs as well as outputs)
Design, build, test, evaluate and modify a system; ensuring that it is fit for intended purpose</td></tr>
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Handling information (databases and graphs)	**Electronic Communication**
• Design and create a range of programs, systems and content that accomplish given goals which include collecting, analysing, evaluating and presenting data and information	• Recognise binary code • Write basic HTML • Understand webpages as a form of communication • Share work electronically • Understand networks as part of the World Wide Web • Show an understanding of how filtering and monitoring tools affect their use of the school network and internet

UKS2 – Year 5 – End points	
Developing an interactive game	• Create original artwork and sound for a game. • Design and create a computer program for a computer game, which uses sequence, selection, repetition and variables. • Detect and correct errors in their computer game. • Use iterative development techniques (making and testing a series of small changes) to improve their game
Cracking codes	• Be familiar with semaphore and Morse code. • Understand the need for private information to be encrypted. • Encrypt and decrypt messages in simple ciphers. • Appreciate the need to use complex passwords and to keep them secure. • Have some understanding of how encryption works on the web
Fusing geometry an art	• Develop an appreciation of the links between geometry and art. • Become familiar with the tools and techniques of a vector graphics package. • Develop an understanding of turtle graphics. • Experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from their peers. • Develop some awareness of computer-generated art, in particular fractal-based landscapes.
Creating a website about cyber safety	• Develop their research skills to decide what information is appropriate. • Understand some elements of how search engines select and rank results. • Question the plausibility and quality of information. • Develop and refine their ideas and text collaboratively. • Develop their understanding of online safety and responsible use of technology

Sharing experiences and opinions	• Become familiar with blogs as a medium and a genre of writing. • Create a sequence of blog posts on a theme. • Incorporate additional media. • Comment on the posts of others. • Develop a critical, reflective view of a range of media, including text.
Creating a virtual space	• Understand the work of architects, designers and engineers working in 3D. • Develop familiarity with a simple CAD (computer aided design) tool. • Develop spatial awareness by exploring and experimenting with a 3D virtual environment. • Develop greater aesthetic awareness

UKS2 – Year 6 – End points	
Making a text-based adventure game	• Learn some of the syntax of a text-based programming language. • Use commands to display text on screen, accept typed user input, store and retrieve data using variables and select from a list. • Plan a text-based adventure with multiple 'rooms' and user interaction. • Thoroughly debug the program
Mastering algorithms for searching, sorting and mathematics	• Develop the ability to reason logically about algorithms. • Understand how some key algorithms can be expressed as programs. • Understand that some algorithms are more efficient than others for the same problem. • Understand common algorithms for sorting and searching. • Appreciate algorithmic approaches to problems in mathematics
Creating a short television advert	• Think critically about how video is used to promote a cause. • Storyboard an effective advert for a cause. • Work collaboratively to shoot suitable original footage and source additional content, acknowledging intellectual property rights. • Work collaboratively to edit the assembled content to make an effective advert
Exploring computer networks including the internet	• Appreciate that computer networks transmit and receive information digitally. • Understand the basic hardware needed for computer networks to work. • Understand key features of internet communication protocols. • Develop a basic understanding of how domain names are converted to numerical IP addresses.

Using media and mapping to document a trip	• Research a location online using a range of resources appropriately. • Understand the safe use of mobile technology, including GPS. • Capture images, audio and video while on location. • Showcase shared media content through a mapping layer
Creating a year book or magazine	• Manage or contribute to large collaborative projects, facilitated using online tools. • Write and review content. • Source digital media while demonstrating safe, respectful and responsible use. • Design and produce a high-quality print document