Software

Website

Equipment

Computing – Long Term Curriculum Overview

EYFS –Beebots, Microsoft Paint (dazzle), phonics and maths games on computers (use of mouse, keyboard), typing own names, Green screen, whole class (possibly), Scratch jr. (possibly) and unplugged activities

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
7 Units across the year	8 Units across the year	10 Units across the year	10 Units across the year	10 Units across the year	10 Units across the year
E-safety	**E-safety**	**E-safety**	**E-safety**	**E-safety**	**E-safety**
There is an e-safety unit folder. Start each lesson for all units with an e-safety task or lesson, using these lessons as a guide.					
1. Computing systems and networks - Technology around us	**1. Computing systems and networks – IT around us**	**1. Computing systems and networks – Connecting computers**	**1. Computing systems and networks – The Internet**	**1. Computing systems and networks – Systems and searching**	**1. Computing systems and networks – Communication and collaboration**
Children will understand the term 'technology'. They will classify what is and is not technology and demonstrate their understanding of how technology helps us in different ways.	Children will understand what Information Technology (IT) is and will begin to identify examples. They will investigate how IT improves our world and how to use it responsibly.	Children will develop their understanding of digital devices with a focus on inputs, processes, and outputs. Children will be introduced to computer network, including devices that make up a network's infrastructure, such as wireless access points and switches. **Microsoft paint or online paint app:** Paintz and **Access to school's server, switch and wireless access points.**	Children will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. Children will use the World Wide Web to learn about who owns content and what they can access, add and create. Children will also evaluate online content to decide how honest, accurate or reliable it is and understand the consequences of false information. **Music software:** Chrome music lab	Children will understand how information is transferred between computer systems and devices. Children will explain the input, output and process aspects of a variety of different real-world systems. They will learn how search engines work (including how they rank and select) and what influences searching by comparing different search engines.	Children will understand how data is transferred over the internet before moving onto the makeup and structure of data packets. Children will complete shared projects online and evaluate different methods of communication. **Website creation:** Google Sites
2. Creating media – Digital Painting	**2. Creating media – Digital photography**	**2. Creating media – Stop-frame animation**	**2. Creating media – Audio production**	**2. Creating media – Video production**	**2. Creating media – Web page creation**
Children will understand a range of tools used for digital painting. They will create their own digital paintings, while gaining inspiration from a range of artists' work. **Microsoft paint or online paint app:** Paintz	Children will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing and improving photos. Children will use this knowledge to recognise that images they see may not be real. **Photo editing:** Pixlr	Children will create a stop-frame animation, then a story-based animation. Children will then add music and text to their animation. **Stop-frame animation software**	Children will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Children will discuss the ownership of digital audio and copyright implications. Children will record their own audio to produce a podcast. **Audio recording: Audacity**	Children will create short videos in pairs or groups. They will develop the skills of capturing, editing and manipulating video. Finally, children will have the opportunity to reflect on and assess their progress in creating a video. **Video editor: Microsoft Video Editor** **Green screen equipment**	Children will identify what makes a good web page and use this information to design and evaluate their own website. Children will learn about copyright and fair use of media, the aesthetics of the site and navigation paths. **Website creation:** Google Sites

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3. Programming A – Moving a robot	**3. Programming A – Robot algorithms**	**3. Programming A – Sequence in music**	**3. Programming A – Repetition in shapes**	**3. Programming A – Selection in physical computing**	**3. Programming A – Variables in games**
Children will be introduced to early programming concepts through the use of algorithms. Children will explore using individual commands, both with other children and as part of a computer program. **Bee-Bots**	Children will understand instruction in sequences and the use of logical reasoning to predict outcomes. They will design algorithms and then test those as programs and debug them. **Bee-Bots**	Children will learn how to sequence in programming through Scratch. Children will use motion, sound and event blocks to create their own programmes, featuring sequences. Finally, children will make a representation of a piano. **Scratch**	Children will create programs by planning, modifying and testing commands to create shapes and patterns. They will use Logo, a text based programming language. **Logo – either Turtle Academy or FMSLogo**	Children will use physical computing to explore the concept of selection in programming through the use of the Crumble programming. Children will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connect. **Crumble Controller/ Micro:bits**	Children will explore the concept of variables in programming through games in Scratch. First, children will understand what variables are and relate them to real-world examples of values that can be set and changed. Then they will use variables to create a simulation of a scoreboard. Finally, children will use the 'Use-Modify-Create' model before creating their own project. **Scratch**
4. Data and information – Grouping data	**4. Data and information – Pictograms**	**4. Data and information – Branching databases**	**4. Data and information – Data logging**	**4. Data and information – Flat-file databases**	**4. Data and information – Introduction to Spreadsheets**
Children will be introduced to data and information and the important aspects such as labelling, grouping and searching. Children will assign data (images) with different labels in order to demonstrate how computers are able to group and present data. Children will also be opening and saving documents onto pupil share.	Children will begin to understand what the term data means and how to collect data in the form of a tally chart. Children will learn the word 'attribute' and use this to help them organise data. They will progress onto presenting data in the form of pictograms and finally block diagrams. Using the presented data, children will ask and answer questions. **Data website:** j2e pictogram	Children will develop their understanding of what a branching database is and how to create and test their own. Using yes/ no questions children will gain an understanding of what attributes are and how to use them to sort groups of objects. **Data website:** j2e branch	Children will consider how and why data is collected over time. Children will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Children will collect and access data captured over long periods of time. They will then use a computer to review and analyse this data. **Data logging equipment stored in yellow boxes (Sound gatherers and light level sensors)**	Children learn how a flat-file database can be used to organise data in records. Children will use tools within a database to order and answer questions about data. Children will create graphs and charts from their data to help solve problems. **Data website:** j2e database	Children will organise data into columns and rows to create their own data set. Children will be taught the importance of formatting data to support calculations. Children will be introduced to formulas and begin to understand how they can be used to produce calculated data. Children will create charts and evaluate their results. **Microsoft Excel**

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5. Creating media – Digital writing	**5. Creating media – Making music**	**5. Creating media – Desktop publishing**	**5. Creating media – Photo editing**	**5. Creating media – Introduction to vector graphics**	**5. Creating media – 3D Modelling**
Children will understand how to create and manipulate text on a computer by using a keyboard and mouse. Children will consider how to change the look of their text and justify these choices.	Children will listen to a variety of pieces of music and consider how much can make them think and feel. Children will look at patterns and use a computer to purposefully create music. **Music software:** Chrome music lab	Children will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Children will be introduced to the terms 'templates', 'orientation' and 'placeholders' and understand how these can be used to make their own template for a magazine front cover. **Children need to create an Adobe Spark account**	Children will understand how digital images can be changed, edited and then resaved and reused. They will consider the impact that editing images can have and evaluate the effectiveness of their choices. **Photo editing: Paint.net or Pixlr**	Children start to create vector drawings using different drawing tools to help them create images. Children will recognise that images in vector drawings are created using shapes and lines. Google drawings **Vector drawing program:** Vectr	Children will develop their knowledge and understanding of using a computer to produce 3D models. Children will work in a 3D space by moving, resizing and duplicating objects. They will create hollow objects using placeholders to combine multiple objects to create a model. Tinkercad
6. Programming B – Introduction to animation	**6. Programming B – An introduction to quizzes**	**6. Programming B – Events and actions in programs**	**6. Programming B – Repetition in games**	**6. Programming B – Selection in quizzes**	**6. Programming B – Sensing movement**
Children will be introduced to on-screen programming and algorithms through Scratch Jr. Children will investigate sprites and backgrounds. They will use programming blocks to use, modify and create programmes. **Scratch Jr.**	Children will re-cap their learning from Y1, using Scratch Jr. Children will understand that sequences of commands have an outcome and make predictions based on their learning. Children will use blocks of code and modify designs to create their own quiz questions in Scratch Jr. **Scratch Jr.**	Children will explore the links between events and actions, while consolidating prior learning of sequencing. Children will move a sprite in four directions and then explore movement within the context of a maze. Children will design and code their own maze-tracing program. **Scratch**	Children will explore the concept of repetition through using Scratch. They will look at the difference between count-controlled and infinite loops and use their knowledge to modify existing animations and games using repetition. Finally, they will design and create a game which uses repetition. **Scratch**	Children will develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming and learning how the 'if…then…else…' structure can be used to select different outcomes depending on whether a condition is 'true' or 'false'. **Scratch**	This unit brings together all of the four programming constructs: sequence, repetition, selection and variables. Children will build a simple program and test it before transferring it to their micro:bit. Children will make their own design to create their own micro:bit-based step counter. **Micro:bits**
	Lego WE Do 2.0 - Getting Started Project	**Lego WE Do 2.0** - Core Set, Lessons 5-8	**Lego WE Do 2.0** - Core Set, Lessons 9-12	**Lego WE Do 2.0** Core Set, Lessons 13-16	**KS3 Lego Mindstorm – EV3**
	Part A: Milo, the Science Rover Children will discover ways that scientists and engineers can use rovers to explore places where humans cannot go. **Lego WE Do Software and equipment**	**Pulling** Children will investigate the effects of balanced and unbalanced forces on the movement of an object. **Lego WE Do Software and equipment**	**Plants and Pollinators** Children will use a LEGO representation to model the relationship between a pollinator and flower during the reproduction phase. **Lego WE Do Software and equipment**	**Predator and Prey** Children will create a model to show the behaviour of predators and their prey. **Lego WE Do Software and equipment**	Children use the Lego Mindstorm EV3 Software to create their own designs. Children can use the EV3 Model – Core sets to help, such as the Colour Sorter, Gyro Boy, Puppy and Robot Arm instructions. **KS3 Lego Mindstorm – EV3 Software and equipment**

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	Part B: Milo's Motion Sensor Children will discover how to use the motion sensor to detect the presence of a special plant specimen. **Lego WE Do Software and equipment**	**Speed** Children will investigate the factors that make a car go faster to help predict future motion. **Lego WE Do Software and equipment**	**Prevent Flooding** Children will design an automatic LEGO floodgate to control water according to various precipitation patterns. **Lego WE Do Software and equipment**	Animal Expression **Children will model the various methods of communication used in the animal kingdom.** **Lego WE Do Software and equipment**	
	Part C: Milo's Tilt Sensor Children will learn how to use the Tilt Sensor to help Milo send a message to the base. **Lego WE Do Software and equipment**	**Robust Structures** Children will learn which characteristics of a building would help to make it resistant to an earthquake, using a simulator constructed from LEGO bricks. **Lego WE Do Software and equipment**	**Drop and Rescue** Children will design a device to reduce the impact on humans, anumals and the environment after an area has been damaged by a weather-related hazard. **Lego WE Do Software and equipment**	**Extreme Habitats** Children will model the influence of a habitat on the survival of an animal specials. **Lego WE Do Software and equipment**	
	Part D: Collaborating Children will explore the importance of collaborating during projects. **Lego WE Do Software and equipment**	**Frog's Metamorphosis** Children will model a frog's metamorphosis using a LEGO representation and identify the characteristics of the organism at each stage. **Lego WE Do Software and equipment**	**Sort to Recycle** Design a device that sorts objects using their physical properties, including shape and size. **Lego WE Do Software and equipment**	**Space Exploration** Children will design a LEGO prototype of a rover that world be ideal for exploring planets. **Lego WE Do Software and equipment**	
		Micro:bits	**Micro:bits**	**3D Modelling Unit in Tinkercad**	**Sonic Pi**
		1. Create a Dice Children will make a dice on their micro:bit so that when you shake it, random numbers will appear. **BBC Micro:bits Website and Coding Website: Micro:bit Coding** **Micro:bits**	**1. Interactive Badge** Children will make an interactive bade, that shows their mood to your friends. **Code Club Website and Coding Website: Micro:bit Coding** **Micro:bits**	Children will be able to draw 2D shapes or lines and simple 3D models. Children will be able to manipulate these models and use a range of tools including shape, push, pull, zoom, erase and fill. Finally, children will create their own room in Tinkercad. **Tinkercad**	Children will compose a simple refrain on Sonic Pi. Sonic Pi
		2. Create a Graphical Dice Children will create a graphical dice which looks like a real dice with patterns of dots instead of numbers. **BBC Micro:bits Website and Coding Website: Micro:bit Coding** **Micro:bits**	**2. Against the Clock** Children will create a timer to challenge their friends. They will be able to start and stop the timer. **Code Club Website and Coding Website: Micro:bit Coding** **Micro:bits**		

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		3. Create a Magic 8-ball Children will re-create the classic toy from the 1950s on their micro:bit. They can customise it to make it their own. BBC Micro:bits Website and Coding Website: Micro:bit Coding **Micro:bits**	**3. Reaction** Children will create a 2-player game to see who has the fastest reactions. The game will work by showing an image after a random amount of time – whoever presses their button first is the winner. Code Club Website and Coding Website: Micro:bit Coding **Micro:bits**		

Software and equipment used across the school

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Bee-bots	Bee-bots	Bee-bots	Stop-frame animation software	Audacity	Green screen	Green screen
Green screen	Scratch Jr.	Scratch Jr.	Scratch	Scratch	Scratch	Scratch
Microsoft Paint	Microsoft Paint	Pixlr (Photo editing)	Microsoft paint or online paint: Paintz app	Photo editing – Paint.net or pixlr	Vector drawings: Google drawings or Vectr	Google sites (Website creation)
		j2e pictograms (Data website)	j2e branch (Data website)	Data Logging Equipment (stored in the yellow boxes)	Microsoft Video editor	Microsoft Video editor
		Lego WE Do	Lego WE Do	Lego WE Do	Lego WE Do	KS3 Lego Mindstorm EV3
		Chrome Music Lab (Music creator)	Micro:bits	Micro:bits	Micro:bits	Micro:bits
			Adobe Spark	Chrome Music Lab (Music creator)	Tinkercad	Tinkercad
					Logo (Turtle academy or FMS Logo)	Microsoft Excel

Definitions of key vocabulary:

Algorithm	A set of instructions for solving a problem. Split into little steps.
Classify	Separating objects or ideas into a predetermined category.
Coding	The language used to give instructions to computers.
Debug	To identify and fix errors in a computer program.
Flat-file database	A collection of data stored in a two-dimensional database where information is stored as records in a table.
Input	Something that is used to put information into a computer.
Network	Is a collection of computers connected to each other.
Output	Something that sends information out from a computer.
Process	An instance of a program running in a computer.
Program/ Sequence	A set of step-by-step instructions created so a computer can do a task.
Repetition	A line of code will be run multiple times.
Search engine	A webpage where you can look up different information.
Selection	A programming construct where a section of code is run only if a condition is met.
Technology	Any and all electronic media and services, including computers, software etc.
Un-plugged	Working without a digital device.
Variables	A value that can change, depending on conditions or on information passed to the program.

Other useful things:

- Quizlet.com
  - Useful website for children to gain understanding of key vocabulary – great assessment tool. Starter to a lesson.
  - Username: lyppardgrange
  - Password: computing
- Bebras Cards
  - Use for starters for lessons
    - PDF file saved in the Computing Folder
  - Other 'Bebras' activities: https://www.bebras.uk/index.php?action=user_competitions
- Touch typing starters
  - Dance Mat Typing: https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z3c6tfr
  - 2Type (on desktop)