Progression of skills, knowledge and concepts within the Computing Curriculum

Curriculum Intent for Computing

At Lady Bay, we believe that computing is a subject that not only stands alone but is woven throughout other subjects and should be an integral part of all learning. A robust computing curriculum ensures that children will be digitally literate and able to join the rest of the world on its digital platform. Children will be equipped, not only with the skills and knowledge to use technology effectively and for their own benefit, but more importantly – safely. We want our children to understand the consequences of using the internet and also make sure that they are aware of how to keep themselves safe online.

Our intent for our Computing curriculum is for all pupils to:

- become responsible, competent, confident and creative users of information and communication technology
- understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems

Implementation

Through the study of Computing, children will develop a wide range of fundamental skills, knowledge and understanding that will actually equip them for the rest of their lives.

Covering all the areas of study required by the National Curriculum, our Computing curriculum is broad and robust. We have selected the Early Learning Goals that link most closely to the Computing National Curriculum. The FS curriculum includes 'Understanding the World' (Technology) and children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.

We have carefully developed our Y1 -Y6 computing projects to ensure that there is balance, progression and challenge - not just within a year group but across the school.

Discreet lessons are used to develop depth of knowledge and skills in the areas of *Information Technology, Digital Literacy and Computer Science*. These skills are then deepened as they are used to aid and enhance learning in other areas of the curriculum.

Evaluation

Learning in computing will be enjoyed across the school. Teachers will have high expectations and quality evidence will be presented in a variety of forms. Children will use digital and technological vocabulary accurately, alongside a progression in their technical skills. They will be confident using a range of hardware and software and will produce high-quality purposeful products. Children will see the digital world as part of their world, extending beyond school, and understand that they have choices to make. They will be confident and respectful digital citizens going on to lead happy and healthy digital lives.

	Year 1	Year 2
PROGRAMMING **Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions**	Explore what happens when you press the different buttons on the Bee-Bot. Use Bee-Bot symbols to represent an instruction. Use clear and go. Understand the set of instructions is called an algorithm.	Recognise the importance of giving clear instructions Use an algorithm to program a sequence on a floor robot Plan algorithms for different parts of a task Identify that a program needs to be started
Create and debug simple programs	Debug my program Plan a simple program Use commands to move a Bee-Bot Use the Go button to start the program Test the programs I have created	Create an algorithm to meet my goal Test and debug each part of the program Decide which blocks to use to meet the design Build the sequences of blocks I need Create a program based on my own design Compare my project to my design Debug my program
Use logical reasoning to predict the behaviour of simple programs	Explain what my program should do Predict the outcome of a command on a device	Explain what my algorithm should achieve Predict the outcome of a sequence

	Predict the outcome of a sequence involving forwards and backwards commands Predict the outcome of a sequence involving up to four commands	Compare my prediction to the program outcome Predict the outcome of a sequence of commands Work out the actions of a sprite in an algorithm
COMPUTING SYSTEMS AND NETWORKS **Recognise common uses of information technology beyond school**		Recognise the uses and features of information technology Identify that a computer is a part of IT Identify the uses of information technology in the school Talk about uses of information technology beyond school e.g. in a shop
DATA HANDLING **Use technology purposefully to create, organise, store, manipulate and retrieve digital content**	Label objects Identify that objects can be counted Describe properties Count and group objects	Recognise that objects can be represented as pictures Create a pictogram Select objects by attribute Explain that we can present information using a computer

CREATING MEDIA **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**	**Text**	Use letters, numbers, space and back key Type capital letters Use the arrow keys to move the cursor Use bold, italic and underline Change the font style, size and colour Explain why I used the tools that I choose	Use cross-curricular opportunities to consolidate previous learning from Year 1
	Images	Use the freehand, shape, fill and line tools Change colour and brush styles Make careful choices when painting a digital painting	Use a digital device to take a photograph Take photos landscape and portrait Explore the effect of light on a photo Recognise that images can be altered Use tools to change an image

	Year 3	Year 4	Year 5	Year 6
PROGRAMMING Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems	Successfully modify a program Create a sequence of commands using a block	Plan a program using a block language which includes repetition Debug errors in increasingly complex	Plan a program which includes selection to produce a given outcome	Plan a program which includes variable to produce a given outcome Test programs on an emulator

	language to produce a given outcome Use an event block to start a program Debug errors to accomplish specific goals	programs to accomplish specific goals Evaluate the effectiveness of a program	Debug errors in increasingly complex programs to accomplish specific goals Evaluate the effectiveness of a program and ways it could be improved	Use a range of approaches to debug errors in increasingly complex programs to accomplish specific goals
PROGRAMMING Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	Explain the order (sequence) of commands can affect the outcome (same commands, different order -> same or different outcome) Identify different sequences can achieve the same outcome	Identify patterns (repetition) in a sequence Understand repetition in programming is also called looping Identify a loop in a program Understand, identify and justify when to use 'infinite' or 'count - controlled' loops Explain the importance in instruction order in a loop	Define that conditional statements (selection) are used in computer programs Program a microcontroller to control lights and a motor Explain a loop can stop when a condition is met (number of times or event) Explain a that program flow can branch according to a condition Use a condition in an if…then… statement to produce a given outcome	Define 'variable' as something that is changeable Explain that a variable has a name and a value Identify a variable in an existing program Use a variable in a conditional statement to control the flow of a program Program a microcontroller with selection and variables

PROGRAMMING Solve problems by decomposing them into smaller parts	Work with support to decompose a problem into smaller steps in planning a project	Independently decompose a problem into smaller steps in planning a project	Plan a solution to a problem using decomposition	Solve problems using decomposition, tackling each part separately
COMPUTING SYSTEMS & NETWORKS 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	Explain how digital devices function (input, output, process) Identify input and output devices Explain how a computer network can be used to share information Recognise the physical components of a network (switch, server, wireless access point)	Describe how networks physically connect to other networks Describe the internet as a network or networks Describe how the world wide web is part of the internet Describe how content can be added and accessed on the World Wide Web Recognise how the content of the WWW is created and shared by people	Explain that computers can be connected together to form systems Describe a computer system Recognise the role of computer systems in our lives	Describe different ways people communicate online Choose a method of communication to suit a particular purpose Recognise how information is transferred over the internet using packets Explain how sharing information online lets people in different places work together Contribute to a shared project online Evaluate different ways of working together online

COMPUTING SYSTEMS & NETWORKS Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	Search for information in a single site Understand that search engines select pages according to keywords found in the content	Use a standard search engine to find information	Refine searches to be more effective Use of a range of search engines appropriate to finding information that is required Understand that search engines rank pages according to relevance. Understand that search engines follow rules and criteria to rank results Understand the impact and limitations that searchers, search engines, and webpage creators have on the effectiveness of a search. Understand how search engines make money	
DATA HANDLING Collecting, analysing, evaluating and presenting data and information	Identify object attributes needed to collect relevant data	Collect data using a digital device	Explain 'fields' and 'records'	Identify questions that can be answered using data

	Create a branching database Identify objects using a branching database Compare branching database structures and comment on their effectiveness Compare information shown in a pictogram with a branching database Explain that data can be used to answer questions	Recognise that a sensor can be used as an input device for data collection Use a larger data set to find information Use a computer program to sort data by one attribute Export information and present data in a table and a graph Interpret data that has been collected and draw conclusions	Navigate a flat -file database Apply knowledge of a database to ask and answer real -world questions Design a structure for a flat -file database Choose tools to select and analyse data to answer questions Use 'AND' and 'OR' to refine data selection Select an appropriate graph to visually compare data	Create a spreadsheet for a purpose Apply a formula that can be used to produce calculated data Recognise data can be calculated using different operations Evaluate results in comparison to the question asked Choose suitable ways to presents data such as a graph

CREATING MEDIA 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	**TEXT**	Identify the advantages and disadvantages of using text and images Change font style, size and colour for a given purpose Consider how different layouts can suit different purposes Define the term 'page orientation' Type with increased confidence and speed using age appropriate punctuation Recognise a document can be formatted with placeholders Identify the use of desktop publishing in the real world	Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3	Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3	Recognise components of a webpage layout Create a webpage including text, images, hyperlinks and embedded content Understand the need for a navigation path

	IMAGES	Change orientation of images Capture images to use either by internet download or photos to photo album Manipulate images on an iPad. Create a multipage comic combining text & images to tell a story. Create text on iPad. Choose colour, fonts, size & use of speech bubbles. Reposition. Use floating cells. Transparent cells.	Use a computer to (further) manipulate images Change the composition of an image Recognise images can be changed for different purposes Describe positive and negative effects that retouching can have on an image Use the most appropriate tool for a particular purpose	Recognise vector drawings are made using shapes Add, remove, modify and combine objects to create graphical drawing on a computer Change the order of layers in a vector drawing Group objects to create a single object Edit and refine work	Create 3D graphical objects on a computer Rotate and re-position a 3D space Modify multiple 3D objects Combine 3D objects to create desired effect Apply blank 3D objects as placeholders to create holes

	MULTIMEDIA		Press/tap buttons to start and stop recordings Recognise recorded audio is stored as a file Edit and alter recorded audio Layer sounds Save/export an audio file Consider the results of editing choices made Understand how animation works Plan an animation Use onion skinning to create small changes between frames Review and improve an animation	Identify the features of a good video Plan a video production using a story board Use a computer to make a video Make edits to a video to improve the outcome Consider the impact of changes made on the quality of the video	

			Add and evaluate the impact of adding other media to an animation		