Bromley Heath *Junior School*

Computing progression map – knowledge and skills

National Curriculum statement

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.

	Year 3	Year 4	Year 5	Year 6
Online safety	Creating and using passwords. Connecting with internet. Adverts on websites. Communicating online vs in person. Using email. Making purchases online. Dangers of mobile technology. Keeping safe while online.	Being a responsible and respectful digital citizen. Identity theft. Sharing information online. Impact of cyberbullying. Using keyword searches. Online identity. Dangers of online gaming.	Consequences of online behaviour. Dealing with spam. Fact and opinion on websites. Share information on social network sites. Plagiarism. Protecting devices from harm.	Talking safely online Digital citizenship Secure websites Privacy policies Privacy seals of approval Cyberbullying Stereotypes
Data and Information	Branching Databases	Data logging	Flat-file databases	Spreadsheets
Programming	Project A – Sequence in music Project B – Events and Actions	Project A – Repetition in shapes Project B – Repetition in games	Project A – Selection in physical computing Project B – Selection in quizzes	Project A – Variables in games Project B - Sensing
Creating Media	Project A - Animation Project B – Desktop publishing	Project A – Audio Editing Project B – Photo Editing	Project A – Vector Drawing Project B – Video Editing	Project A – Web page creation Project B – 3D Modelling

	Year 3
Online safety	To know the benefits of using passwords and strategies for creating strong and secure passwords.
	To know that people can connect through the internet and that this can create an online community.
	To know that some websites are designed to encourage people to buy something and what features are used on sites to do this.
	To know the differences between communicating in person and online and how to write clear and respectful messages.
	To communicate effectively by email considering the purpose and audience and adapting the tone accordingly.
	To know that you can pay for things online including in-app purchases and how to avoid incurring costs.
	To identify some dangers of using mobile technology and how to keep safe.
Key concepts revisited	Keeping yourself safe from dangers
	Keeping personal information safe
	Uses of the internet
Data and information	**Branching Databases**
	To create questions with yes/no answers
	To identify the object attributes needed to collect relevant data
	To create a branching database
	To identify objects using a branching database
	To explain why it is helpful for a database to be well structured
	To compare the information shown in a pictogram with a branching database
Key concepts revisited	Using a computer program to represent information in different ways
	Creating and interpreting pictograms
Programming	**Project A - Sequence in Music**
	To explore a new programming environment
	To identify that each sprite is controlled by the commands I choose
	To explain that a program has a start
	To recognise that a sequence of commands can have an order
	To change the appearance of my project
	To create a project from a task description
	Project B – Events and Actions
	To explain how a sprite moves in an existing project
	To create a program to move a sprite in four directions
	To adapt a program to a new context
	To develop my program by adding features
	To identify and fix bugs in a program
	To design and create a maze-based challenge
Key concepts revisited	Using simple algorithms to program a sequence
	Testing and debugging parts of a program
	Using a computer to make a musical pattern

Media	**Project A – Animation**
	To explain that animation is a sequence of drawings or photographs
	To relate animated movement with a sequence of images
	To plan an animation
	To identify the need to work consistently and carefully
	To review and improve an animation
	To evaluate the impact of adding other media to an animation
	Project B – Desktop Publishing
	To recognise how text and images convey information
	To recognise that text and layout can be edited
	To choose appropriate page settings
	To add content to a desktop publishing publication
	To consider how different layouts can suit different purposes
	To consider the benefits of desktop publishing
Key concepts revisited	Taking digital photographs, considering focus, lighting and orientation.
	Recognising that images can be changed.

	Year 4
Online safety	To know how to be responsible and respectful digital citizens in offline and online communities. To know how to protect themselves from identity theft by considering the information they share online. To know that websites use the information you post online to target advertising and how to manage this. To know about the impact that hurtful online messages can have and how to deal with cyberbullying and support each other. To use keywords to refine searches. To know how to compare and refine keyword searches and explain their results. To know that the type of content you post on line can influence how people see you and the implications for generating positive content. To know about the dangers of online gaming and how to keep safe
Key concepts revisited	Respectful behaviour online Protecting their online personal information Dangers of mobile technology
Data and information	**Data logging** To explain that data gathered over time can be used to answer questions To use a digital device to collect data automatically To explain that a data logger collects 'data points' from sensors over time To use data collected over a long duration to find information To identify the data needed to answer questions To use collected data to answer questions
Key concepts revisited	Using a computer program to represent information in different ways
Programming	**Project A – Repetition in shapes** To identify that accuracy in programming is important To create a program in a text-based language To explain what 'repeat' means To modify a count-controlled loop to produce a given outcome To decompose a program into parts To create a program that uses count-controlled loops to produce a given outcome
	Project B – Repetition in games To develop the use of count-controlled loops in a different programming environment To explain that in programming there are infinite loops and count controlled loops To develop a design which includes two or more loops which run at the same time To modify an infinite loop in a given program To design a project that includes repetition To create a project that includes repetition

Key concepts revisited	Using commands to control sprites Creating a program to move a sprite Fixing and debugging programs
Media	**Project A – Audio Editing** To identify that sound can be digitally recorded To use a digital device to record sound To explain that a digital recording is stored as a file To explain that audio can be changed through editing To show that different types of audio can be combined and played together To evaluate editing choices made
	Project B – Photo Editing To explain that digital images can be changed To change the composition of an image To describe how images can be changed for different uses To make good choices when selecting different tools To recognise that not all images are real To evaluate how changes can improve an image
Key concepts revisited	Creating digital images Recognising that images can be altered an edited

	Year 5
Online safety	To know about the consequences online behaviour can have.
	To know what spam is, the forms it takes and strategies for dealing with it.
	To be able to distinguish between fact and opinion presented online.
	To know that websites try to influence our views and recognise how to distinguish between fact and opinion.
	To know how social networking sites share and use information and the risks of this.
	To know what plagiarism is and how and when they can use the work of others.
	To know how to protect devices from harm.
	To be able to use a range of features to protect their devices.
Key concepts revisited	Being responsible and respectful digital citizens
	Protecting their online identity
	Advertising used online
	Cyberbullying
	Dangers of online gaming
Data and information	**Flat-file Databases**
	To use a form to record information
	To compare paper and computer-based databases
	To outline how grouping and then sorting data allows us to answer questions
	To explain that tools can be used to select specific data
	To explain that computer programs can be used to compare data visually
	To apply my knowledge of a database to ask and answer real-world questions
Key concepts revisited	Using a computer program to represent information in different ways
	Collecting relevant data
	Understanding structure of databases
	Identifying the data needed to answer questions
	Using data collected to answer questions
Programming	**Project A - Selection in physical computing**
	To control a simple circuit connected to a computer
	To write a program that includes count-controlled loops
	To explain that a loop can stop when a condition is met, e.g. number of times
	To conclude that a loop can be used to repeatedly check whether a condition has been met
	To design a physical project that includes selection
	To create a controllable system that includes selection

	Project B - Selection in quizzes To explain how selection is used in computer programs To relate that a conditional statement connects a condition to an outcome To explain how selection directs the flow of a program To design a program which uses selection To create a program which uses selection To evaluate my program
Key concepts revisited	Using count-controlled loops in a different programming environment Creating a program that uses count-controlled loops Creating a program in a text-based language Creating a project that includes repetition
Media	**Project A – Vector Drawing** To identify that drawing tools can be used to produce different outcomes To create a vector drawing by combining shapes To use tools to achieve a desired effect To recognise that vector drawings consist of layers To group objects to make them easier to work with To evaluate my vector drawing
	Project B – Video Editing To recognise video as moving pictures, which can include audio To identify digital devices that can record video To capture video using a digital device To recognise the features of an effective video To identify that video can be improved through reshooting and editing To consider the impact of the choices made when making and sharing a video
Key concepts revisited	Recording images and sound digitally Editing pictures and audio recordings Evaluating how changes can improve images and sound

	Year 6
Online safety	To understand that the Internet is a great place to develop rewarding relationships.
	To understand that they should not to reveal private information to a person they know only online.
	To understand how to be a responsible digital citizen.
	To communicate and exchange information (including digital information) effectively, safely and responsibly.
	To understand that children's websites must protect their private information.
	To know how to identify these secure sites by looking for their privacy policies and privacy seals of approval.
	To understand how cyberbullying is similar or different to bullying in person and know strategies for handling cyberbullying.
	To understand how the media can play a powerful role in shaping ideas about gender stereotypes.
Key concepts revisited	Being a respectful and responsible digital citizen
	Protecting personal information online
	Cyberbullying
	Influences that websites can have on our views
Data and information	**Spreadsheets**
	To identify questions which can be answered using data
	To explain that objects can be described using data
	To explain that formula can be used to produce calculated data
	To apply formulas to data, including duplicating
	To create a spreadsheet to plan an event
	To choose suitable ways to present data
Key concepts revisited	Using a computer program to represent information in different ways
	Identifying the data needed to answer questions
	Collecting relevant data
	Using data collected to answer questions
	Using computer programs to compare data visually
Programming	**Project A – Variables in games**
	To define a 'variable' as something that is changeable
	To explain why a variable is used in a program
	To choose how to improve a game by using variables
	To design a project that builds on a given example
	To use my design to create a project
	To evaluate my project
	Project B – Sensing
	To create a program to run on a controllable device
	To explain that selection can control the flow of a program
	To update a variable with a user input
	To use an conditional statement to compare a variable to a value
	To design a project that uses inputs and outputs on a controllable device
	To develop a program to use inputs and outputs on a controllable device

Key concepts revisited	Controlling a simple circuit connected to a computer Creating a controllable system Evaluating projects
Media	**Project A – Web page creation** To review an existing website and consider its structure To plan the features of a web page To consider the ownership and use of images (copyright) To recognise the need to preview pages To outline the need for a navigation path To recognise the implications of linking to content owned by other people
	Project B – 3D modelling To use a computer to create and manipulate three-dimensional (3D) digital objects To compare working digitally with 2D and 3D graphics To construct a digital 3D model of a physical object To identify that physical objects can be broken down into a collection of 3D shapes To design a digital model by combining 3D objects To develop and improve a digital 3D model
Key concepts revisited	Understanding plagiarism Creating and editing images, audio and video. Creating vector drawings