**Long Term Curriculum Planning**:

**Subject:** Computing and Business

**Mastery**

A Chamberlayne *Computer science student* in Year [?]is somebody who can…

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| **7** | * undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
* create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
* understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns
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| **8** | * design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
* understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
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| **9** | * design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
* understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
* use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
* understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]
* understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
* understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
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| **10** | In yr 10 learners can explain business concepts and issues concerning the activities of a business. They can explain the purpose and role of a business from first spotting an enterprising opportunity through to the growth of an established business. They can explain the role of marketing and human resources. |
| **11** | In yr 11 pupils can explain the use of operations and finance and describe external influences on business. They can explain the importance of these influences and how businesses change in response to them. Finally, pupils can use content from both component 01 and component 02 to make connections between different elements of the subject. |

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| **Year** | **Term** | **Unit of Work** | **Core Knowledge** | **Core Skills** |
| **7** | **1** | **Flowol** | * Identify everyday situations where computer control is used
* Identify common types of sensors used by control systems
* Identify control flowchart symbols and understand how they are used to break down problems
* Explain why control systems might fail and how this might impact on safety
 | * Produce flowchart-based solutions for control systems that include sequences and loops
* Produce control solutions for problems that include subroutines
* Produce control solutions for problems that include variables
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|  | **Computer systems (Basic)** | *Pupils learn about: inputs/outputs; parts of the computer; health and safety of using computers; wireless and wired networks;*  | *Pupils decode binary into other forms of data.* |
| **2** | **Programming****(Kodu)** | *Pupils learn the fundamentals of games programming using Kodu Game Lab. Pupils are encouraged to use video guides/help cards to help them increase the complexity of the game that they have created.* | *Using Kodu Game Lab pupils will develop a range of key skills which include drawing and sculpting a world, adding character and objects. The use of When and Do instructions to control characters and objects including the use of paths and pages. Once pupils have built their skills they are required to design, create, test and evaluate their own game.* |
|  | **Data, Information and Knowledge (Basic)** | *Pupils learn how data is represented in computer systems. They will learn how data becomes information and then eventually knowledge.* | *They willpractice converting units of data measurement (Nibble, Bit, Byte, KB etc).* |
| **3** | **MicroBit** | Students can learn much about the idea of abstraction by thinking about the different layers of systems that have to operate together to make the BBC micro:bit work, as illustrated by the relationship of TouchDevelop or Blockly to C++ and to the ARM mbed machine code that runs on the chip itself. There’s scope here to get students thinking algorithmically, carefully planning their programs before they write any code. Some key algorithms could be implemented on the BBC micro:bit too, from finite state machines (Challenge 2: Digital pet) to ‘guess my number’ games using binary search. Students could compare programming the same algorithm in both the Blocks and TouchDevelop code editors.  | They can also learn to design and develop modular programs using user-defined functions in TouchDevelop. There’s chance to explore Boolean logic using the AND, OR and NOT operators built in to the language and the A and B input buttons on the BBC micro:bit. |
|  | **Internet (Basic)** | **Internet (Basic)** *CS**Pupils learn* about t*he WWW and the internet, the differences between the two. They learn about the different services that can be used on the internet e.g. Voice over Internet Protocol.*  | *They will be able to outline the key features of the World Wide Web and their relationships– e.g. browsers, URLs, navigation methods and how to use search engines to do a basic query.* |
| **8** | **1** | **Programming (HTML)** | *The aim of the unit is for pupils to create the virtual tour in HTML as independently as possible.* | *Following on from the Interactive media unit, pupils will take the rich media files and combine them with HTML code to create a virtual tour of St Michaels. Pupils will learn HTML code and be presented with a range of self-teaching guides that range in complexity (Easy, Intermediate and Hard).* |
|  | **E-safety** | *Pupils will go through several different scenarios of inappropriate content and learn how to report concerns.* | *Pupils complete an online survey of their online behaviours. Based on the response of the pupils several lessons have been planned that can be delivered on using technology safely, respectfully, responsibly and securely.* |
| **2** | **Programming (Scratch)** | *Pupils learn how to create a game in scratch by learning the fundamental way blocks are used. Pupils will learn the use of variables and conditional statements.* | *Once pupils have built their skills they are required to design, create, test and evaluate their own game. Pupils are encouraged to use help cards to help them increase the complexity of the game that they have created.* |
|  | **Networks** | *Pupils learn* about the different *wired and wireless network, hardware used, software used and network topologies.* |  |
| **3** | **Data, Information and Knowledge (Advance)** | *Pupils will build on the prior knowledge from the “Data, Information and Knowledge (Basic)” unit of work. They will see how binary works and how computers use binary including ASCII code. They will see how different file types lead to different size files and the implications for file storage, and file transfer (bandwidth issues).* |  |
|  | **Programming****(JavaScript)** | *Pupils learn the difference between a compiler and an interpreter.*  | *Using JavaScript they will create several programs using the textwindow and graphics window. Each program will be amid to solve a computational problem, for example: using tables in order to create an electronic phonebook.*  |
| **9** | **1** | **Understanding****Computer systems** | *Pupils learn the concepts behind the fetch-execute cycle and relate it to the von Neumann architecture. They will then learn about how data is store into memory and the basic function and operation of location addressable memory. They will learn about the different range of operating systems and application software.* |  |
|  | **Internet (Advance)** | *Pupils learn* *advance query searches using a search engine and know how search engines rank search results.* *They will learn about data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching. They will learn the purpose of the hardware and protocols associated with networking computer systems.* |  |
| **2** | **Programming****(Python)** | *Pupils learn how to use pseudo code to create algorithms that then are converted into programs in Python.*  | *Pupils will go through a series of challenges that teach them the concepts of programming and will build upon on the prior knowledge of the previous lessons. The final task is for pupils to create an entirely independent program using the knowledge obtained from the previous lessons.* |
|  | **Interactive media (Flash, Video, Sound, Graphics)** |  | *Pupils will undertake a creative project where they create/edit an animation, video, sound and graphic. Pupils are to create the interactive rich media for a virtual tour of St Michaels. The rich media files will then be used in the following academic year to create the Virtual Tour in HTML. Pupils will use a range of devices such as digital cameras, microphones etc. in order to create the media files. The target audience for the virtual tour will be future parents/potential pupils of the school.* |
| **3** | **Programming****(Turtle in Python)** | *Pupils learn how to write a program in order to control an on screen turtle.*  | *Pupils will create algorithms to solve several problems which in turn they will program into Small Basic.*  |
|  | **Databases** | * Give examples of databases used by organisations which are accessible to the public via the Internet
* State the purpose of a primary key in a database
 | * Create a database table using several fields with different data types
* Create a basic input form to input data
* Query the database using more than one criterion to find answers to user queries
* Create a basic report with suitable headings
* Create a front-end application menu with buttons linking to a form and a report

**Most pupils will be able to:*** Add features to an input form to make it more user-friendly
* Fully customise their input forms and reports

**Some pupils will be able to:*** Create the relationship between two linked tables
* Create a complex query which uses two tables in a relational database
* Create a report which uses data from linked tables
* Edit a report structure and add subtotals and/or a total to the report
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| **10** | **1** | **Business Activity** | * The role of business enterprise and entrepreneurship
* Business planning
* Business ownership
* Business aims and objectives
* Stakeholders in business
* Business growth
 | demonstrate knowledge and understanding of the concept of enterprise in businessanalyse and discuss the role of the entrepreneur in identifying business opportunities and assisting the start of new business analyse and discuss the nature and rewards of risk takingdemonstrate knowledge and understanding of government, and other, support for enterprisedemonstrate knowledge and understanding of the factors which can lead to the success or failure of a business enterprise. |
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| **2** | **Marketing** | * The role of marketing
* Market research
* Market segmentation
* The marketing mix
 | • demonstrate knowledge and understanding of, and evaluate, methods of market research • identify methods of, and explain reasons for, market segmentation • understand and discuss the significance of SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis in a marketing context • distinguish between different types of market. • analyse and discuss the individual elements of the marketing mix • formulate and evaluate a marketing strategy • discuss how the marketing mix evolves over time |
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| **3** | **People** | * The role of human resources
* Organisational structures and different ways of working
* Communication in business
* Recruitment and selection
* Motivation and retention
* Training and development
* Employment law
 | • analyse and discuss the recruitment and selection process • analyse and discuss types of, and the importance of, training • analyse and discuss monetary methods of motivation • calculate changes in employee remuneration • analyse and discuss non-monetary methods of motivation • analyse and discuss the laws which relate to employment • analyse and discuss the role of trade unions. |
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| **11** | **1** | **Operations** | * Production process
* Quality of goods and services
* The sales process and customer service
* Consumer law
* Business location
* Working with suppliers
 | • demonstrate an understanding of job, batch, process and flow methods of production • analyse and discuss reasons for choice • analyse and discuss the importance of adding value in a dynamic competitive environment. |
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| **2** | **Finance** | * The role of the finance function
* Sources of finance
* Revenue, costs, profit and loss
* Break-even
* Cash and cash flow
 | • calculate, interpret and analyse cash flow forecasts • recommend methods of dealing with forecast cash flow problems • evaluate cash flow forecasts as a decision making tool • demonstrate understanding of profit as a reward for enterprise and risk taking • calculate, interpret, and make use of, revenue, cost and profit data. |
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| **3** | **Influences on Business** | * Ethical and environmental considerations
* The economic climate
* globalisation
 | • demonstrate knowledge and understanding of how business and consumers use the environment as a resource • demonstrate knowledge and understanding of how business and consumers have, and are, responding to pressure for greater environmental responsibility • discuss the social costs and benefits of business activity • demonstrate knowledge and understanding of environmental issues; analyse and discuss the responsibility of, and opportunities for, business • analyse and discuss sustainability and business • demonstrate knowledge and understanding of ethical business behaviour. |
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|  | **4** | **The independent nature of business** |  |  |