Computer Science Curriculum Overview 2016 - 2017

Year 5 Curriculum overview

Term	Main focus of teaching each term
Autumn 1	**5.1: We are Photographers** This unit introduces pupils to the processes of digital photography and some of the basics of how it is represented through pixels before moving on to image manipulation and the creation of their own albums. **5.2: We are Architects** Pupils in this unit use Google SketchUp for 3-D modelling and create a virtual gallery. This allows pupils to understand the way in which computer science can make 3 dimensional representations of data as well as creating a virtual way of presenting their own work.
Autumn 2	
Spring 1	**5.3: We are Advertisers** In this unit pupils will produce an advert using video editing software that will give an appreciation of the role of the different types of media that are available to use in computing and give an appreciation of how large files can be made smaller to allow media to be viewed in different formats. Pupils design their adverts based around new and future technologies. **5.4: We are Problem Solvers** This unit will introduce pupils to how computers are used to solve real life problems through a sequence of instructions that will include making decisions, loops and ensuring the sequence is in the correct order to ensure the correct operations take place.
Spring 2	
Summer 1	**5.5: We are Programmers** Pupils have the opportunity to create their own programs. We will use the visual programming language, Scratch, to create shapes/patterns and then move onto making a spider maze game. Scratch is free to download for those wanting to try it out at home.
Summer 2	

Year 6 Curriculum Overview

Term	Main focus of teaching each term
Autumn 1	**6.1: We are Explorers** This unit allows pupils to explore the power of Google earth alongside discovering more about digital photography and the data representation of images. The outcome of the unit is a geo-tagged trail of the school grounds. **6.2: We are Simulators** This unit is concerned with how data is used to create complex models to test real-life situations and scenarios through spreadsheet modelling and simulation software. Pupils explore how they work in real-life and also have the opportunity to create their own models and test data to analyse how they work.
Autumn 2	
Spring 1	**6.3: We are Web Developers** This unit will allow pupils their first opportunity of developing a website where an introduction to the basic structures of a webpage will be examined. In addition, pupils will be introduced to the concepts of how the internet works and how messages are sent across the internet. This unit allows flexibility in the topic that will be used as the underlying concepts will remain the same. **6.4 We are Advanced Problem Solvers** This unit will follows on from the problem solving that pupils were introduced to in year 5. It will again be based around solving real life problems through a sequence of instructions, using flowchart software, ensuring that instructions are in the correct order with the most efficient solutions being chosen.
Spring 2	
Summer 1	**6.5: We are Game Developers** In this unit, pupils will research and develop their own games using Scratch software, which is a visual programming tool that acts as an excellent first step in programming. Do you remember the classic game of Pacman? Our year 7 pupils will develop their own versions in making their first games and taking a first step in programming. The nature of the game allows for lots of customisation and the creation of their own rules. The Scratch programming software is freely available to download if you want to try at home.
Summer 2	

Year 7 Curriculum overview

Term	Main focus of teaching each term
Autumn 1	**7.1: Understanding Computer Systems – What's inside the box?** Pupils will learn about the different components that make up a computer, the types of devices that are available and the classification of them and how they work over the internet. There will be an opportunity to look inside some of our old PC's and identify and investigate the different components.
Autumn 2	**7.2 Data Structures – Magic Pictures** In this unit pupils investigate the way in which computers structure and use data. We will cover an introduction to binary numbers and how to convert between binary numbers into decimal. We will also cover how data is represented using bit patterns: including numbers, text, music and pictures. The magic pictures subtext is based around creating pictures by just using data.
Spring 1	**7.3 Algorithms – An introduction: Problem Solving** Although the word algorithm sounds like an incredibly complex word it is actually just a solution to a problem in its most pure form. The vast majority of us will have a book of algorithms in our houses but we call them recipe books! Pupils in this unit will be given problems to solve and asked to solve them in a stepped sequence, mostly using flowcharts. They will test their solutions using flowchart software that allows real life problems to be mimicked within our classroom.
Spring 2	**7.4: HCI Developing Interactivity** HCI stands for Human Computer Interface. Pupils explore the different physical and virtual interfaces that computer scientists and software designers encounter before designing their own interfaces to create an interactive quiz, with the topic chosen from major events happening around the time of the unit being delivered. Pupils are also able to access some text based programming in this unit using VBA macro coding.
Summer 1	**7.5 Programming – Creating a Game** In this unit, pupils will research and develop their own games using Scratch software, which is a visual programming tool that acts as an excellent first step in programming. Having created maze type games in their first two years pupils will have the opportunity to develop other types of games (including shark eating fish and the classic pong) to broaden their knowledge and skills further in Scratch.
Summer 2	

Year 8 Curriculum overview

Term	Main focus of teaching each term
Autumn 1 **Autumn 2**	**8.1: Networks** This is a theoretical unit covering the basic principles and architecture of local and wide area networks. Pupils will learn that the World Wide Web is part of the Internet, and how web addresses are constructed and stored as IP addresses using DNS. Pupils will learn about data transmission and through an understanding of different network topologies and network hardware, they will plan the structure of a local area network. Client-server, peer-to-peer networks and the concept of cloud computing are all described. Ways of keeping data secure and simple encryption techniques are also covered. In the final lesson, pupils will sit a multiple choice test which will form the Unit assessment. **8.2: Databases** This unit covers essential theory of databases in order to prepare pupils for GCSEs in either Computing or ICT. Supporting the basic theory, this unit has a practical focus, covering the creation and use of a single-table database and/or a simple relational database involving two tables in a one- to-many relationship using MS Access.
Spring 1 **Spring 2**	**8.3: Algorithms – Next steps and an Introduction to Phython** This is an introduction to Python, a powerful but easy-to-use high-level programming language. The focus is on getting pupils to understand the process of developing programs, the importance of writing correct syntax, being able to formulate algorithms for simple programs and debugging their programs. Pupils will look at **If** statements and **While** loops whilst covering concepts such as validation and searching. The pupils' final programs are put into a learning portfolio with evidence of correct running, for assessment purposes. Pupils will also be given the opportunity to understand key algorithms such as sorting and searching algorithms. **8.4: Spreadsheet Modelling** This unit is suitable for pupils who have a basic knowledge of spreadsheets including cell references, simple formulae and formatting, although these topics are revised in the first lesson, making it also suitable for pupils new to spreadsheets. The unit is centred around creating a financial model for a TV show. Pupils start by looking at different types of model and then use basic spreadsheet techniques to create and format a simple financial model to calculate the expected income from viewers' voting. The model is then extended to include sales from merchandising, with the introduction of "what if" scenarios. Finally the pupils create a seat booking system to book seats and calculate income from seat sales. Spreadsheet features covered include SUM, MAX, IF and COUNTIF functions, cell naming, conditional formatting, validation, charting and simple macros.

Term	Main focus of teaching each term
Summer 1	**8.5: Programming – Advanced Games Development** In this unit, pupils progress from their first steps in Scratch to a more powerful visual programming environment. Game Maker is an object oriented programming language. One of Game Makers strengths is its duality of "click and drag" programming combined with its ability to allow the user to simply type in the code. This duality allows the system to start one way and progress to another very quickly. In this unit pupils will have the opportunity to develop a platform game of their own design.
Summer 2	