BISHOP ULLATHORNE CATHOLIC SCHOOL

KS3 CURRICULUM PLAN

DEPARTMENT: Computer Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	**How Computers Work** • understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems		**Spreadsheets** • design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems • 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		**Scratch** • design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems • 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 • 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	
Year 8	**Databases** • a flat-file or two-table relational database of their own, using suitable field types and adding in appropriate validations • an input form with help text, combo boxes and list boxes • queries and a report using data from one or both tables • a front end menu for their application linking to the database input form and report		**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. 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.		**Python** • 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	

			This unit will form very good preparation on the topic of networks at GCSE level.		problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
Year 9	**Computer Crime & Cyber Security** This unit covers some of the legal safeguards regarding computer use, including overviews of the Computer Misuse Act, Data Protection Act and Copyright Law and their implications for computer use. Phishing scams and other email frauds, hacking, "data harvesting" and identity theft are discussed together with ways of protecting online identity and privacy. Health and Safety Law and environmental issues such as the safe disposal of old computers are also discussed.	**Binary** This unit is suitable for pupils in KS3 and covers the following criteria from the new computing programmes of study from the Department of Education published in September 2013: • 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 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	**Computational Thinking** This unit is suitable for pupils in KS3 and GCSE and covers the following criteria from the KS3 computing programmes of study from the Department of Education published in September 2013: design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems	**Graphics** This is an introduction to graphics and graphic file types. The unit explores how bitmap and vector images are represented and stored by the computer. There is also opportunity for pupils to practise skills in design, photo editing and image manipulation using layers to create a movie poster using a suitable graphics package such as Photoshop. The pupils' final posters are put into an assessment portfolio.	**Web Design** The unit is subdivided into six learning hours spread across six lessons in order to fit with most school timetables. In the first three lessons, pupils will learn the basics of HTML and CSS, and how to create a responsive design which adapts to any size of screen for viewing on, say, a mobile phone or a PC. They will learn how to create text styles and add content, including text and graphics, in a specified position on a page, as well as navigation links to other pages on their website and to external websites. The basics of good design are covered and, with the help of worksheets, pupils will develop their own templates in a text editor such as Notepad. They will decide on a topic for their websites, document their designs and collect suitable text and images. They will then use their HTML templates to create their websites, including a web form. Pupils can view the data collected by the web form into a simulated database. This also helps to stimulate discussion on the privacy of data.

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Year 10	**The Bigger Picture** The unit is subdivided into three learning hours and an end-of-unit assessment spread across four lessons in order to fit with most school timetables. It covers Section 6.1 of the Edexcel GCSE (9-1) in Computer Science (1CP1). Emerging trends, issues and the ethical, environmental and legal impacts of technology are described.	**Computers** The unit is subdivided into seven lessons (plus a test) in order to fit with most school timetables. It is a theoretical unit covering all of Topic 4: Computers of the Edexcel GCSE (9-1) Computer Science specification (1CP1). The first three lessons cover the components of a computer system and their function, including the role of the CPU components. A lesson on Boolean logic is followed by lessons on the operating system, utility and simulation software. The final lesson describes high-level and low-level programming languages, the use of an assembler and the functions of a compiler and interpreter, giving the	**Data** The unit is subdivided into seven learning hours plus an end-of-unit assessment spread across eight lessons. It is a theoretical unit covering Topic 3 of the 2016 Edexcel Computer Science specification 1CP1. The conversion of integers from denary to binary (including sign and magnitude and two's complement) is covered in the first lesson. In subsequent lessons, the use of hexadecimal numbers and character encoding is described. Binary addition and logical and arithmetic binary shifts are also covered. Representation of images and sound are covered in two separate lessons with two final lessons covering lossy and	**Communication & The Internet** The unit is subdivided into six learning hours spread across six lessons, plus a test, in order to fit with most school timetables. It is a theoretical unit covering Section 5 of the Edexcel GCSE (9-1) 1CP1 Computer Science specification. Each lesson contains a worksheet to be done in class to consolidate students' knowledge and understanding, as well as a homework sheet to give them plenty of practice in answering exam-type questions. The unit starts with a description of how the Internet is structured, and what is meant by the World Wide Web. It also covers	**Programming** The unit is subdivided into eight lessons (plus a test) in order to fit with most school timetables. It covers the Edexcel Level 1/Level 2 GCSE (9-1) Computer Science specification 1CP1, Topic 2: Programming. The first lesson in the unit covers data types and arithmetic operations. Sequence, selection and iteration are covered in the next two lessons, followed by lessons on arrays, subprograms, errors and testing, user input and validation. The final lesson covers reading from and writing to a text file. Although the lessons can be delivered without students having to use computers, they will benefit from translating their pseudocode solutions to program code and testing them. All the worksheets contain exercises which provide opportunities for practical programming in the language of choice. Sample solutions are provided in Python to many exercises.	

		advantages and disadvantages of each.	lossless compression techniques, encryption and databases. In the final lesson students sit an assessment test comprising questions similar to those found on the GCSE exam paper.	wireless networks. Lesson 2 covers different types of network (LAN and WAN) and different network topologies, and Lesson 3 describes the role of different protocols and the layers in the TCP/IP protocol stack. The lessons move on to network security issues and threats, with a look at different ways our networks can be made more secure. At the end of the unit, students sit an assessment test comprising questions similar to those found on the Edexcel exam paper.		
Year 11	**Problem Solving** The unit is subdivided into seven lessons (plus a test) in order to fit with most school timetables. It is a theoretical unit covering all of Topic 1: Problem solving of the Edexcel GCSE (9-1) Computer Science specification (1CP1). Lessons on developing algorithms using flowcharts and pseudocode and followed by one on interpreting and correcting algorithms. Standard searching and sorting algorithms are then covered, before a lesson on choosing and evaluating algorithms. The final lesson recaps the concepts of computational thinking; abstraction, decomposition and algorithmic thinking.	**NEA** This unit covers some of the legal safeguards regarding computer use, including overviews of the Computer Misuse Act, Data Protection Act and Copyright Law and their implications for computer use. Phishing scams and other email frauds, hacking, "data harvesting" and identity theft are discussed together with ways of protecting online identity and privacy. Health and Safety Law and environmental issues such as	**Revision** Completion of the NEA and past paper questions & revision - completed knowledge organisers along with 6 A Day questions	**Revision** Past paper questions, revision lessons & 6 A Day worksheets to be completed before final assessments/exams	Examinations

		the safe disposal of old computers are also discussed.			