Curriculum Intent - IT/Computer Science

KS3 Computing (Y7 and Y8)

Module 1 - Impact of Technology / E Safety

WHY - This unit ensures that learners are given sufficient time to familiarise themselves with the school network. It also allows the teacher to discuss appropriate use of the school network, and to update and remind learners of important online safety issues. Whilst completing this unit, learners will also learn how to use presentation software effectively. In terms of online safety, this unit focuses on respecting others online, spotting strangers, and the effects of cyberbullying.

Module 2 - Binary and how computers communicate

This unit conveys essential knowledge relating to binary representations. The activities gradually introduce learners to binary digits and how they can be used to represent text and numbers. The concepts are linked to practical applications and problems that the learners are familiar with.

Module 3 - Networks

As networks have evolved, society has become increasingly reliant on the services that they provide. They have changed the way we learn, work, play, and communicate. This unit begins by defining a network and addressing the benefits of networking, before covering how data is transmitted across networks using protocols. The types of hardware required are explained, as is wired and wireless data transmission. Learners will develop an understanding of the terms 'internet' and 'World Wide Web', and of the key services and protocols used. Practical exercises are included throughout to help strengthen understanding.

Module 4 - Web Design

This unit introduces learners to the creation of websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process learners pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.

Module 5 - Scratch Programming

This unit is the first programming unit of KS3. The aim of this unit and the following unit ('programming 2') is to build learners' confidence and knowledge of the key programming constructs. Importantly, this unit does not assume any previous programming experience, but it does offer learners the opportunity to expand on their knowledge throughout the unit.

The main programming concepts covered in this unit are sequencing, variables, selection, and count-controlled iteration. All of the examples and activities for this unit use Scratch 3.

Module 6 - Spreadsheets

The spreadsheet unit for Year 7 takes learners from having very little knowledge of spreadsheets to being able to confidently model data with a spreadsheet. The unit uses engaging activities to progress learners from using basic formulas to writing their own COUNTIF statements. This unit will give learners a good set of skills that they can use in computing lessons and in other subject areas.

Computing Year 9 Curriculum (2021 - 2022)

Term/ Teacher Responsible	Curriculum content choices and sequencing	Topic List:	Key vocabulary	Rationale of schema sequencing
AT1	Cybersecurity	• Data • Social engineering • Hacking • Script kiddies • Bots • VPN • Cyberattacks	Networks Login Device Password Strong password Alphanumeric Esafety Online safety Cyber	This unit takes learners on a journey of discovery of techniques that cybercriminals use to steal data, disrupt systems, and infiltrate networks. The learners will start by considering the value their data holds and what organisations might use it for. They will then learn about social engineering and other common cybercrimes, and finally look at methods to protect against these attacks.
AT2	Computing Systems	• Under the hood • CPU • Logic • Machines • Sharing	CPU GPU RAM SSD HDD Binary Bits Bytes Number base Base 2 Decimal	This unit takes learners on a tour through the different layers of computing systems: from programs and the operating system, to the physical components that store and execute these programs, to the fundamental binary building blocks that these components consist of. The aim is to provide a concise overview of how computing systems operate, conveying the essentials and abstracting away the technical details that might confuse or put off learners.
SPR1	Coding	• Number crunching • If statements • If else • Loops • Text based Games	Code Programming Sequencing Selection Iteration Operators Indenting Strings Integers Sprites	This unit introduces learners to text-based programming with Python. The lessons form a journey that starts with simple programs involving input and output, and gradually moves on through arithmetic operations, randomness, selection, and iteration. Emphasis is placed on tackling common misconceptions and elucidating the mechanics of program execution.
SPR2	Vector Graphics	• Shapes • Icons • Tools • Logos	Shapes Icons Tools Logos	Vector graphics can be used to design anything from logos and icons to posters, board games, and complex illustrations. Through this unit, students will be able to

		• Grouping • Aligning and Distributing	Grouping Aligning and Distributing	better understand the processes involved in creating such graphics and will be provided with the knowledge and tools to create their own.
SUM1	Web Development	• Web Building blocks • HTML Tags • Searching the web • Create web pages	HTML CSS Javascript The web HTTPS HTTP SSL TAGs	In this unit, learners will explore the technologies that make up the internet and World Wide Web. Starting with an exploration of the building blocks of the World Wide Web, HTML, and CSS, learners will investigate how websites are catalogued and organised for effective retrieval using search engines. By the end of the unit, learners will have a functioning website.
SUM2	Data Science	• Delving into data science • Global data • Statistical state of mind • Data for action • Cleaning Data • Make a change	Data Information Encryption Decoding Data Harvesting	In this unit, learners will be introduced to data science, and by the end of the unit they will be empowered by knowing how to use data to investigate problems and make changes to the world around them. Learners will be exposed to both global and local data sets and gain an understanding of how visualising data can help with the process of identifying patterns and trends. Towards the end of the unit, the learners will go through the steps of the investigative cycle to try to solve a problem in the school using data.

Y10 Information Technology - OCR J808	
Learners will be assessed with an exam unit worth 50% of the course and a project worth the remaining 50% of the course. Unit 1:EXAM "Understanding tools, techniques, methods and processes for technological solutions" an exam of 1 hour 45 minutes. Learners will need to understand... ● the tools and techniques that can be used to initiate and plan solutions ● how data and information can be collected, stored and used ● the factors to be considered when collecting and processing data and storing data/information ● the different methods of processing data and presenting information.	Why Students will learn about tools and techniques for use in different digital hardware and software technologies, and how these can be integrated to create digital solutions to manage and communicate data and information. They will also be taught what data and information are and the legal, ethical and moral considerations when using technology to gather, store and present data and information, and how to mitigate the risks of cyber-attacks. Through this qualification they will be able to select and use the most appropriate technology safely and effectively, to complete a data management task, such as a cable TV provider monitoring customers' viewing to make recommendations for additional packages in the customer's subscription.

Y11 Information Technology - OCR J808 (2021-2022)	
Unit 2: "Developing technological solutions" an internally assessed coursework project. Learners should be able to... ● initiate and plan a solution to meet an identified need ● import and manipulate data to develop a solution to meet an identified need ● select and present information in the development of the solution to meet an identified need ● iteratively review and evaluate the development of the solution.	Why In this year,once students are familiar with core content, students will learn to follow a project life cycle of initiation, planning, execution and evaluation to complete a data management task and use their skills, knowledge and understanding of technology to complete each of the phases of the project life cycle.

Year 10 Computer Science - OCR J277 (2020-22 cohort)

What

Fundamentals of Computer Science (prep for Paper 1) - Computer Systems

- Systems Architecture
- Memory
- Storage/Data Representation
- Wired and wireless networks
- Network topologies, protocols and layers
- Network security
- System software
- Ethical, legal, cultural and environmental concerns

PAPER 1 Mock - 80 marks, 1 hour and 30 minutes, Written paper (no calculators allowed).
50% of total GCSE.

Comp 2 Computational thinking, algorithms and programming (PART)

- Algorithms
- Programming techniques

Why

This component will introduce learners to the Central Processing Unit (CPU), computer memory and storage, wired and wireless networks, network topologies, system security and system software.

It is expected that learners will become familiar with the impact of Computer Science in a global context through the study of the ethical, legal, cultural and environmental concerns associated with Computer Science.

Learners may draw on some of this content when completing the Programming Project.

Year 11 Computer Science - OCR J276 (2019-21 cohort)	
Comp 2 Computational thinking, algorithms and programming ● Algorithms ● Programming techniques + Practical Python Programming ● Producing robust programs ● Computational logic ● Translators and facilities of languages ● Data representation PAPER 2 Mock - 80 marks, 1 hour and 30 minutes, Written paper (no calculators allowed). 50% of total GCSE.	Why The 2nd year of the course will encourage learners to understand and apply fundamental principles and concepts of computer Science. This includes abstraction, decomposition, logic, algorithms and data representation. It will also encourage learners to analyse problems in computational terms through practical experience of solving such problems, including designing, writing and debugging problems. Learners are trained to think creatively, innovatively, analytically, logically and critically. This component incorporates and builds on the knowledge and understanding gained in the systems architecture/memory and storage sections of Component Learners will become familiar with computing related mathematics. This will then allow them to complete paper 2 which is the harder of the 2 papers. It will also allow students to complete a programming project which they can use to support their response in paper 2. They will start programming in Y10 as we are concerned that due to a lack of programming exposure at KS3,

Year 12 (what do students want year 12 to know by the end of the year and why?)

What

UNIT 1 - Fundamentals of IT - EXAM

1. Understand computer hardware.
2. Understand computer software.
3. Understand business IT systems.
4. Understand employability and communication skills used in an IT environment.
5. Understand ethical and operational issues and threats to computer systems.

Why

To provide students with a sound understanding of IT technologies and practices. The information learnt in this unit will create a solid foundation in the fundamentals of hardware, networks, software, the ethical use of computers and how businesses use IT.

These are all topics they will need to be string on for the exam they complete in May 2020. Also after completing this unit, the knowledge, skills and understanding students will have developed will underpin their study for the additional units. Knowledge gained in the study of this unit will also help prepare students for relevant industry qualifications.

Unit 2 - Global Information - EXAM

1. Understand where information is held globally and how it is transmitted
2. Understand the styles, classification and the management of global information
3. Understand the use of global information and the benefits to individuals and organisations
4. Understand the legal and regulatory framework governing the storage and use of global information
5. Understand the process flow of information

Why

This unit focuses on the uses of data/information in the public domain, globally, in the cloud and across the internet, by individuals and organisations. Students will look into why good management of both data and information is essential, and how good data management can give organisations a competitive edge.

This unit will provide students with a greater understanding of how organisations use information sources both internally and externally and the types of information they are likely to encounter. This unit gives the main focus of knowledge of the functionality of information and how data is stored and processed by organisations. Another very important aspect of this unit is that it will help students to understand the legislation and regulations governing information that flows into and out of an organisation and the constraints and limitations that apply to it.

As data is such a big commodity for businesses it is very important for students looking at careers in any industry to understand this and how data can be protected globally and in businesses,

Year 13 (what do students want year 13 to know by the end of the year and why?)	
What	Why
Unit 6 App Design (M/507/5005) 1. Understand how applications are designed 2. Be able to investigate potential solutions for application developments 3. Be able to generate designs for application solutions 4. Be able to present Application solutions to meet client and user requirements	The world is increasingly reliant on applications that help individuals, businesses and organisations achieve specific activities or purposes. In this unit students will explore potential ideas for a new application and develop the fundamental design for it. Students will then develop the designs for an application and how users will interact with it. The application that students design can be for any sector and for any purpose. students will have the opportunity to present students ideas, prototype them, and gain feedback before refining students design. Besides the technical knowledge that students will gain about designing an application, students will also learn key transferable skills such as liaising with clients, questioning people effectively to gain the information students need to develop successful designs, and presenting students ideas to an audience and getting feedback from them. This unit is mandatory to the application developer specialist pathway in the Level 3 Diploma suite of qualifications as it supports the development of skills, knowledge and understanding appropriate to a wide range of job roles requiring the development of applications in mobile technology, business software, graphics, game and web design. **Why chosen -** sought after skills in the IT job market, fast progression available.
Unit 21 Web design and prototyping (A/507/5024) 1. Understand the fundamentals of web design 2. Be able to plan the development of an	Organisations are increasingly reliant on their websites to market goods or services and interact with clients and customers. As technology develops, so does the scope of functionality of websites and the importance of an effective design that meets the needs of the organisation.

interactive website for an identified client 3. Be able to create prototype websites for an identified client 3. Be able to create prototype websites for an identified client **Why chosen -** sought after skills in the IT job market, fast progression available. There is an array of web designer graduate and entry level jobs available within Coventry and Warwikshire - https://www.indeed.co.uk/Web-Designer-jobs-in-Warwickshire	In this unit students will research, design and produce an interactive, responsive website that is specific to a client's needs, culminating in presenting the concept of the website using the prototype to the client. You will learn about the security risks in website design and how to minimise these threats. This unit will also allow students to incorporate existing interactive elements, as well as prototyping students own website. This unit is optional within the Application Developer specialist pathway. Job roles within this pathway include web app developers as well as website designers, although these are different jobs with differing requirements, they do require similar skills, knowledge and understanding with respect to website creation and prototyping.
Unit 17 Internet of Everything (IOE) 1. What is meant by the Internet of Everything 2. Repurpose technologies to extend the scope of the IoE 3. Able to present concept ideas for repurposed developments	This unit is about the use of the internet and how it is impacting people and society. Students will learn about the Internet of Everything (IoE) and how it is used. They will carry out a feasibility study for a potential idea and pitch the idea to potential stakeholders, using their feedback to revise the proposal. As the Internet of Everything is expanding, appearing in all of the everyday devices found in homes, businesses and Cities this is an essential unit of knowledge for those looking for careers in IT or other industries.