Computing Curriculum Overview

Why is *Computing* important?

The society and world that is developing in front of us is increasingly reliant on humans being comfortable with the use and understanding of computers. Not every single person will work in a related field but it can be argued they will be in contact with someone that is. If we do not teach young people to be digitally literate, and prepared for the future, then society will suffer.

We are becoming ever more reliant on technology in every aspect of our lives. Many of the jobs that we have now will not be around in the coming years. Likewise there will be jobs that don't exist yet that will need to be filled in the future, with AI, robotics, automation and cyber security coming to the forefront. With all of that in mind, it is imperative that children leave school with a good grounding of computational thinking and problem solving so they are prepared for opportunities that will arrive their way.

Summary of the Department

The Computing department is fully resourced with 4 dedicated IT suites, each with recently upgraded computers, a full class set of Raspberry Pi computers, BBC Micro:bit computers, green screen facilities and even a radio studio.

The teachers

Mr D Allgood – Curriculum Leader

Miss L Dandy – Second in Department

Mr A Williamson – Teacher and Website & Social Media Manager

Key Stage 3

Year 7

The Computing syllabus has been designed to cover the three main areas of Digital Literacy, Computer Science and Information Technology. In year 7 the students will be introduced to the IT skills they will need to support other subjects across the curriculum. The year 7 curriculum has been designed to ensure learners have sufficient knowledge to stay safe online and use computers safely in life. The curriculum also provides a focus on developing resilient learners who are able to recover from mistakes and effectively solve problems. The topics in year 7 give a basis of knowledge, skills and understanding to allow students to progress onto either ICT or Computer Science at KS4 and will provide exposure to those subjects so that students can make an informed decision on their GCSE choices.

Assessment

Students will undertake a baseline assessment at the start of the year.

In addition to this the following key pieces of work will be assessed:

1. *Internet Searching – Plan a holiday to Blackpool*
2. *Spreadsheets – Data Modelling*
3. *Computer Hardware*
4. *Programming – Pong for the Micro:bit*

Year 8

The Computing syllabus has been designed to cover the three main areas of Digital Literacy, Computer Science and Information Technology. In year 8 the students will build on the skills and understanding that they developed in year 7. We study the topic of 'Fake News', which aims to develop student's digital literacy by raising an awareness of how the internet is not always a reliable source of information. We also ensure that students are able to use databases appropriately and efficiently. We want to ensure that students are not only able to use computers, but have a clear understanding of how they work. This will be achieved by combining the history of computing with an introduction to the topics of binary and Boolean logic. The Information Technology strand is covered by the topics of Mythbusters, it is intended that students will be able to use these skills across the curriculum to present work in a different electronic format, opposed to the usual PowerPoint presentations or Word documents.

Assessment

In year 8 the following key pieces of work will be assessed:

1. *Create a database for Workington Music Festival*
2. *Mythbusters Magazine article*
3. *Binary conversions*
4. *Programming – Python in Minecraft*

Year 9

The Computing syllabus has been designed to cover the three main areas of Digital Literacy, Computer Science and Information Technology. In year 9 the students will build on the skills and understanding that they developed in year 7 and year 8 whilst preparing them should they wish to study Digital Media or Computer Science at GCSE. We first study the topic of 'Podcasting', which encourages the students to consider how developments in technology have changed broadcasting and how we access digital content. This also teaches students audio editing skills, as well as how to produce pre-production documentation which is essential for anyone wishing to study Digital Media in the future.

The 'Digital Detectives' topic follows on from 'Mythbusters' in year 8 and e-safety from year 7. We examine real and fake images, and develop graphics editing skills to show students how easy it can be to manipulate the images that they may see on a daily basis. This topic will also cover basic IT skills by requiring students to produce a newsletter and students will be given the option of presenting their assessed work as a podcast.

'Back to the Future' covers some of the 'essentials' that students should learn under the Computer Science Strand of the curriculum, we study important figures in computing such as Alan Turing, George Boole and Charles Babbage while introducing students to encryption, logic and sorting algorithms. The final topic of term 2 develops the Minecraft/Python programming that was taught in Year 8. By the end of the topic students will be competent in the basic of a text based programming language including data types, the use of variables and selection.

The final topic of year 9 is a project that acts as a synoptic assessment for key stage 3. Students are required to plan 'Workington Music Festival' which will require them to conduct research, model data using a spreadsheet, organise data in a database, product promotional materials in the form of a radio advert, teaser trailer and posters.

Assessment

In year 9 the following key pieces of work will be assessed:

1. *Creating a Podcast in response to a client brief*
2. *Fake News Newspaper*
3. *Encryption and Algorithms*
4. *Python programming challenges*
5. *Synoptic Assessment – Workington Music Festival*

Key Stage 4

We currently offer two courses at Key Stage 4; GCSE Computer Science, and Level 1/2 BTEC Creative Media Production.

GCSE Computer Science

Exam Board: OCR

Specification: J277

Course Overview

Component 1: Computer systems

Topics studied: Systems Architecture, Memory and Storage, Computer Networks, Network Security, System Software, Ethical Legal Cultural and Environmental Issues

Assessment: The topic is formally assessed at the end of the course by a 1 hour 30 minute written exam, worth 80 marks and 50% of the overall qualification. The examination consists of a mix of multiple choice, short answer, long answer and extended response questions assessing a student's theoretical knowledge.

Component 2: Computational thinking, algorithms and programming

Topics studied: Algorithms, Programming Fundamentals, Producing Robust Programs, Boolean Logic, Programming Languages and IDEs.

Assessment: The topic is formally assessed at the end of the course by a 1 hour 30 minute written exam, worth 80 marks and 50% of the overall qualification. The examination consists of a mix of

multiple choice, short answer and longer answer questions assessing a student's practical problem solving and computational thinking skills.

Practical programming experience

Students will be provided with opportunities to design, develop and test computer programs to solve a range of problems without the pressure of it counting towards the GCSE.

Additional Information

Students will also sit interim assessments and produce a revision workbook for each topic as they are studied.

Students will have 3 lessons a week, with at least one of these being dedicated to programming.

Students will be taught in a mixed ability class.

BTEC Creative Media Production

Exam Board: Pearsons

Specification: 603/1238/5

Course Overview:

The BTEC Tech Award in Creative Media Production is a practical introduction to life and work in the industry, students can explore the sector while:

- *developing technical skills and techniques*
- *producing a digital media product in response to a brief*
- *reviewing and reflecting on the process and outcome.*

The course has two internally assessed components, and one that's externally assessed:

Component 1: Exploring Media Products

Weighting: 30% of qualification

Aim: earn about the sector and investigate media products across the following sub-sectors:

- *audio/moving image (TV programmes, films, video shorts, animations, radio broadcasts)*
- *publishing (newspapers, magazines, books, e-magazines, comics)*
- *interactive (websites, mobile applications, mobile games, video games, online games).*

Assessment: Internally assessed assignments.

During Component 1 students will explore:

- *Content and purpose of digital media products*
- *Style and the use of digital design principles*
- *Idea generation and the production process*
- *Industry regulations and professional practices*

Component 2: Developing Digital Media Production Skills

Weighting: 30% of qualification

Aim: develop technical skills and techniques in the chosen discipline(s) of audio/moving image, publishing and interactive.

Assessment: Internally assessed assignments.

During Component 2 students will:

- *Experiment with a variety of media production skills and techniques*
- *Apply the technical skills that they learn.*
- *Reflect on their progress and use of skills, as well as how they could improve.*

Component 3: Create a media product in response to a brief

Weighting: 40% of qualification

Aim: apply digital skills and techniques by responding to a digital media brief

Assessment: externally assessed task where students respond to a brief to create a media product.

During Component 3 students will:

- *Learn how to respond to a media brief*
- *Plan their response to the brief*
- *Apply skills and techniques to a production*
- *Justify the process and outcome that they have developed*
- *Reflect on their application of skills, time management and use of resources*

Additional Information

Students will have 3 lessons a week, and will be taught in a mixed ability class.

Key Stage 5

We currently offer 3 courses at Key Stage 5; A-Level Computer Science, Cambridge Technicals in Digital Media Level 3, Cambridge Technicals in Information Technology Level 3

A-Level Computer Science

Exam Board: OCR

Specification: H046/H446

Course overview: students will sit the AS exams at the end of Year 12 and the A Level exams at the end of Year 13.

Component 1: Computer Systems

Topics studied: Structure and function of the processor, Types of Processor, Input Output & Storage, Operating System Software, Application Generation, Software Development, Types of Programming Language, Compression Encryption and Hashing, Databases, Networks, Web Technologies, Data Types, Data Structures, Boolean Algebra, Computer related legislation and Ethical, Moral and Cultural Issues.

AS Assessment: 1 hour 15 minutes written exam, 70 marks, worth 50%.

A-Level Assessment: 2 hour 30 minutes written exam, 140 marks, worth 40%

Component 2: Computational thinking, algorithms and programming

Topics studied: Computational thinking, Programming techniques, Computational methods, Algorithms.

AS Assessment: 1 hour 15 minutes written exam, 70 marks, worth 50%.

A-Level Assessment: 2 hour 30 minutes written exam, 140 marks, worth 40%

Component 3: Practical programming experience (A-Level Only)

This assesses student's ability to use the knowledge and skills gained through the course to solve or investigate a practical problem.

Assessment: Marked by your teacher and moderated by OCR, 70 marks, worth 20%.

Cambridge Technicals in Digital Media Level 3

Exam Board: OCR

Specification: 05844 Extended Certificate

Course overview: Students will complete 3 mandatory units and 2 optional units; they will sit 2 exams at the end of Year 12 with the option of re-sitting in Year 13.

Unit 1: Media Production and Audiences (Mandatory and Externally assessed)

Whichever sector of the media students want to work or specialise in, all media institutions work to create products that meet the needs of specific target audiences.

The aim of this unit is for students to develop their understanding of how different media institutions operate in order to create products that will appeal to specific target audiences. Students will learn about the different ownership models within media industries, and they will learn how to analyse different media products within the sector in order to understand the fundamentals of how meaning is created for audiences. Students will learn about how audiences are categorised, researched and targeted by media producers. They will also learn about how media institutions distribute and advertise their products to audiences.

Unit 2: Pre-production and planning (Mandatory and Externally assessed)

This is a mandatory unit that forms the foundation of the course. The knowledge and understanding developed in this unit is transferable to a number of other units. By completing this unit, your students will understand the pre-production process the creative media industry follows when creating a product. They will learn how to carry out research in the planning stage of a media production and about the various acts of legislation that need to be considered. Students will learn about the constraints that need to be considered when planning a new media production, including timescales and resources. They will understand how to create preproduction documents in relation to client requirements and how to plan projects to meet these needs.

Unit 3: Create a media product (Mandatory and Internally assessed)

Media products have a range of different purposes. Whether it is to advertise and promote a product or service, inform an audience of a cause or engage and entertain an audience.

The aim of this unit is for students to develop knowledge and understanding of the production processes of producing a media product from one of the following:

- *Print-based product*
- *Audio-visual product*
- *Audio product.*

Students will apply their learning gained in Units 1 and 2 to plan and produce a media product. They will complete planning materials to take forward in the production and post–production stages of an intended media product. Students will plan, produce and edit original content for their intended product.

By completing this unit students will have the skills to:

- *Create a proposal to meet a client brief*
- *Produce planning materials*
- *Create and manage original content for the product*
- *Apply editing techniques*

Unit 16: The creation and use of sound in media (Optional and Internally assessed)

Sound is now an important part of most media products, be this the actual dialogue of a production or music, effects or atmospheric sounds. The effective use of sound can change the mood and feel of media productions. Sound is now found in the majority of media products from film and television through to interactive media and computer games. By completing this unit students will understand the sound elements used in media products and how they are produced. Students will be able to develop ideas for, and plan the production of, a soundtrack containing a range of sound elements. They will gain some practical skills by recording and editing sound elements for use in the production of a final soundtrack.

Unit 20: Advertising Media (Optional and Internally assessed)

Advertising media is around us on a daily basis, from billboards in the street to adverts watched daily on the television. Different types of advertisements are used together to create campaigns that grow

a brand and an organisation's image, and promote all types of products and services used to entice the public at large.

In completing this unit, students will understand advertising campaigns and how audio-visual, print based or audio advertising media are used within them. They'll plan an advertising campaign for a product or service, selecting the appropriate media components to produce it. Students will produce original media components for incorporating into a campaign, considering the market and its target audience, as well as legal and ethical constraints, to ensure that all components comply with the required codes and conventions of the genre.

Cambridge Technicals in Digital Media Level 3

Exam Board: OCR

Specification: 5840 Introductory Diploma

Course overview: Students will complete 2 mandatory units and 3 optional units; they will sit 2 exams at the end of Year 12 with the option of re-sitting in Year 13.

Unit 1: Fundamentals of IT (Mandatory and Externally Assessed)

A sound understanding of IT technologies and practices is essential for IT professionals. 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.

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 such as CompTIA A+, CompTIA Mobility+ and Cisco IT Essentials.

Unit 2: Global Information (Mandatory and Externally Assessed)

The purpose of this unit is to demonstrate the uses of information in the public domain, globally, in the cloud and across the Internet, by individuals and organisations. Your students will discover that good management of both data and information is essential and that it can give any organisation 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 will encounter. The skills gained by completing this unit will give them knowledge of the functionality of information and how data is stored and processed by organisations. They will also learn about how individuals use information of various types.

This unit will help students to understand the legislation and regulation governing information which flows in to and out of an organisation and the constraints and limitations that apply to it. They'll also learn the relationship between data and Information.

Knowledge gained in the study of this unit will also help prepare students for relevant industry qualifications such as VM Ware.

Unit 5: Virtual and Augmented Reality (Optional and Internally assessed)

Virtual Reality is a simulated environment that is intended to replicate the physical experience of being in places in the real or imagined worlds, by giving the user sensory experiences that match those which would be experienced were the user actually in that environment. Augmented Reality is the process of changing the user's view of the real world in order to give them an improved, or more detailed view of what they are seeing.

Students will learn about both technologies and how they are used. They will research both technologies and design both a Virtual and an Augmented Reality resource. Finally, they will use their research skills learnt whilst designing and creating resources to suggest future applications of Virtual and Augmented Reality.

The unit supports the development of skills, knowledge and understanding relevant to a job role in the areas of 3D modelling, digital transformation and even the film and games industry.

Unit 13: Social Media and Digital Marketing (Optional and Internally assessed)

The use of social media has increased massively over recent years and is now a world-wide phenomenon. Users of social media are able to share ideas and files, compare opinions and pass comment on the activities of their friends and contacts. In doing so, they are not only generating huge amounts of data about themselves, but also allowing others the opportunity to contact them and monitor some of their online activities. Social media also allows users to collaborate with others across the globe.

Digital marketing is part of the overall process of marketing as is the use of digital media to increase awareness of a product or service. As social media offers such a wealth of data and the ability to contact potential customers in their own homes across a range of media channels, it is only natural that digital marketing seeks to use social media as part of the marketing mix for goods and services.

This unit looks at digital marketing as a concept and then offers students the opportunity to explore the possible impacts, both positive and negative, that may be generated by the use of social media as a digital marketing tool.

Unit 17: Internet of Everything (Optional and Internally assessed)

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. Using their knowledge they'll carry out a feasibility study for a potential idea. They will pitch their idea to potential stakeholders and use their feedback to revise their proposal.

Knowledge gained in the study of this unit will also help prepare students for relevant industry qualifications such as Cisco IoE.

Outside the classroom

We offer a variety of extra-curricular clubs including a Year 7 Code Club, Raspberry Pi Club. We have also run trips to IT and Business Live! At Disney Land Paris, and will be running a trip Computing trip to London when permitted.
