Christ the King Catholic High School: Computing – Curriculum Overview 2023 - 2024

KEY STAGE 2

At KS2 students should be taught to:

• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output

• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

• Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration

• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

TERM 1 / TERM 2 / TERM 3

YEAR 7

Unit 1 - Introduction to CTK and Impact of Technology: This unit has been designed to ensure 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.

End of unit knowledge check via Oak Academy (or Teach Computing) and MS TEAMS. This term also encompasses CAT tests Baseline tests—online

Unit 2 - 3D Modelling: Learners will develop their knowledge and understanding of using a computer to produce 3D models. Learners will initially familiarise themselves with working in a 3D space, moving, resizing, and duplicating objects. They will then create hollow objects using placeholders and combine multiple objects to create a model of a desk tidy. Finally, learners will examine the benefits of grouping and ungrouping 3D objects, then go on to plan, develop, and evaluate their own 3D model of a building.

End of unit knowledge check via Oak Academy (or Teach Computing) and MS TEAMS

Unit 3 - Gaining Support for a Cause: During this unit, learners develop their understanding of information technology and digital literacy skills. They will use the skills learnt across the unit to create a blog post about a real-world cause that they would like to gain support for. Learners will develop software formatting skills and explore concerns surrounding the use of other people's work, including licensing and legal issues.

End of unit knowledge check via Oak Academy (or Teach Computing) and MS TEAMS.

Unit 4 - Visual programming: Scratch is an application which allows you to 'code'. It allows you to 'create' and 'program' 'Sprites', which are simply programmable objects. For example, we can program these Sprites so that they move and interact with each other and with the user.

End of unit knowledge check via CSUK and MS TEAMS

Unit 5 – Modelling: The unit develops an understanding of the basic concepts of modelling by including cell referencing, spreadsheet basics, and the comparison of spreadsheets with manual models. End of unit knowledge check via EduSchemes, Seesaw and MS TEAMS.

Unit 6 - Flowol: Students will start by producing systems that use simple loops and basic outputs, and then move on to look at systems that have multiple inputs and outputs. They will refine their solutions using subroutines and variables.

End of unit knowledge check via PG Online and MS TEAMS.

YEAR 8

Unit 1 - Computing Systems: 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.

End of unit knowledge check via Oak Academy (or Teach Computing) and MS TEAMS

Unit 2: Binary Bits and Bobs
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, numbers, images and sound. The concepts are linked to practical applications and problems that the learners are familiar with.

End of unit knowledge check via CSUK and MS TEAMS

Unit 3 – Visualisation: In this unit they move into the modern, trendy world of the 'infographic' by analysing existing graphics and creating their own for a concert

End of unit knowledge check via EduSchemes, Seesaw and MS TEAMS

Unit 4 - Games Programming: Scratch Shooter Game. In this unit of work, we will look to build on our Scratch game making skills by designing and developing a 'Shooter' platform game. We will remind ourselves how we can program movement, scoring and levels, and learn how to simulate gravity and code a shooter, along with collision detection logic.

End of unit knowledge check via CSUK and MS TEAMS

Unit 5 - Networks and Semaphore: This unit begins by defining a network and explaining 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.

End of unit knowledge check via Oak Academy (or Teach Computing) and MS TEAMS

Unit 6 - Introduction to Python: 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. A range of pedagogical tools is employed throughout the unit, with the most prominent being pair programming, live coding, and worked examples.

End of unit knowledge check via PG Online and MS TEAMS

YEAR 9

Unit 1 - Computer Crime and Cyber Security: This unit takes the learners on an eye-opening journey of discovery about techniques used by cybercriminals to steal data, disrupt systems, and infiltrate networks. The learners will start by considering the value of their data to organisations and what they might use it for. They will then look at social engineering techniques used by cybercriminals to try to trick users into giving away their personal data. The unit will look at the more common cybercrimes such as hacking, DDoS attacks, and malware, as well as looking at methods to protect ourselves and our networks against these attacks.

End of unit knowledge check via Oak Academy (or Teach Computing) and MS TEAMS

Unit 2 - Representation – going audio visual: In this unit, learners will focus on digital media such as images and sounds, and discover the binary digits that lie beneath these types of media. Just like in the previous unit, where learners examined characters and numbers, the ideas that learners need to understand are not really new to them. You will draw on familiar examples of composing images out of individual elements, mixing elementary colours to produce new ones, and taking samples of analogue signals, to illustrate these ideas and bring them together in a coherent narrative.

End of unit knowledge check via Oak Academy (or Teach Computing) and MS TEAMS

Unit 3 - Data Science: 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.

End of unit knowledge check via Oak Academy (or Teach Computing) and MS TEAMS

Unit 4 - Python Continued: In this unit, we will continue to learn how to code, using the python programming language, revisiting previously learnt skills and learning about a new programming construct, known as iteration. But first, let's remember what we learnt in the previous Python unit.

End of unit knowledge check via CSUK and MS TEAMS

Unit 5 - Spreadsheet Modelling: The unit further develops an understanding of the concepts of modelling by including Formulae and functions, Conditional formatting, Whatif scenarios, COUNTIF, representing data in a suitable graphical format, Importing RAW data and converting CSV files. This is in preparation for BTEC DIT Component 2 in Year 11

End of unit knowledge check via PG Online and MS TEAMS

Unit 6 – Theory: Preparation for BTEC National DIT course, Computer Science and Business Studies This includes: Modern Technologies and their impact on society, Threats and Cyber Security, The Wider Implications of ICT and Planning and Communicating. Taught via Know It All Ninja and Pearson

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YEAR 10

Unit 1: BTEC Level 1/Level 2 Tech Award in Digital Information Technology

Students will select and investigate two different types of user interface.

They will assess how:

• Effectively the user interface meets the audience's requirements, including their accessibility needs, skills level and demographics

• Effectively different design principles have been used to allow both appropriate and effective user interactions with hardware devices

• techniques have been used to allow different types of users to efficiently interact with the interface.

• Assessment via homework tasks and completion of KnowItAllNinja worksheets

• Homework to be completed in homework booklets and MS TEAMS

• Students will investigate different project planning techniques. Students will:

• Select appropriate project planning tools and methodologies to create a project plan, including outlining the timescales, possible constraints and risks in their project

• produce an initial design for a user interface that meets user, input, output and accessibility needs. Their initial design should show the designs for at least four different screens in their user interface.

• Students will follow their plan and create a user interface. Students will then:

• obtain feedback from potential users and refine the user interface until it is complete, evaluate the strengths and weaknesses of their user interface, evaluate the strengths and weaknesses of their project plan.

• Assessment via homework tasks and completion of KnowItAllNinja worksheets and MS TEAMS

COMPLETION OF COMPONENT 1 COURSEWORK

• Homework ensures work is up to date.

Students will investigate the role and impact of using data on individuals and organisations:

• Assess data collection methods and features used and how they affect the quality of data and decision making in two sectors, drawing detailed justified conclusions.

• Discuss data collection methods and features used and how they affect the quality of data and decision making in two sectors, drawing justified conclusions.

• Explain how data collection methods and their features affect the quality of data across two sectors, with relevant examples. Explain how data is used to make decisions across two sectors, with relevant examples.

• Assessment via homework tasks and completion of KnowItAllNinja worksheets and MS TEAMS.

YEAR 11

Unit 1: BTEC Level 1/Level 2 Tech Award in Digital Information Technology

Students will investigate the role and impact of using data on individuals and organisations:

• Assess data collection methods and features used and how they affect the quality of data and decision making in two sectors, drawing detailed justified conclusions.

• Discuss data collection methods and features used and how they affect the quality of data and decision making in two sectors, drawing justified conclusions.

• Explain how data collection methods and their features affect the quality of data across two sectors, with relevant examples. Explain how data is used to make decisions across two sectors, with relevant examples.

• Select and use relevant methods to effectively and accurately manipulate data and produce a fully efficient and comprehensive dashboard.

• Select and use relevant methods to effectively and accurately manipulate data and produce an effective dashboard that clearly summarises data.

• Select and use methods to carry out some manipulation of data, which is largely accurate. Produce an appropriate dashboard that clearly summarises data.

• Assessment via homework tasks and completion of KnowItAllNinja worksheets and MS TEAMS

• Assess the effectiveness of the dashboard's presentation of data and how it affects the conclusions drawn and the recommendations made, using justified examples.

• Analyse how the dashboard's presentation of data influences the conclusions drawn and the recommendations made, using relevant examples. Use the dashboard to draw conclusions, with some appropriate recommendations.

• Explain the methods used to present data so that it can be clearly Understood, with detailed examples.

• Assessment via homework tasks and completion of KnowItAllNinja worksheets and MS TEAMS

COMPLETION OF COMPONENT 2 COURSEWORK

Component 3.

Effective Digital Working Practices

• Modern technologies
• Impact of modern technologies
• Cyber security
• Threats to data
• Prevention and management of threats to data
• The wider implications of digital systems
• Legal and ethical
• Planning and communication in digital systems
• Forms of notation
• Assessment via homework tasks and completion of KnowItAllNinja worksheets and MS TEAMS

Cultural capital: The Computing curriculum at Christ the King Catholic High School significantly boosts students' cultural capita as students need to be educated digital citizens, introducing them to the best that has been thought and said and helping to engender confidence, an appreciation of human creativity and achievement throughout the years.

Extra-curricular: The Computing Department offers a wide array of enriching extra-curricular opportunities including STEM Club, IDEA, STEM competitions and App design.

Christ the King Catholic High School: Computing Department - 2023 - 2024

	ENRICHMENT & PERSONAL DEVELOPMENT	CAREERS EDUCATION
YEAR 7		Careers are highlighted in the majority of units that we teach; however, it is difficult as the majority of Computing / technical jobs do not exist yet.

Computer Science careers include game design, software development, system designs, database administration, encryption specialist. Other careers that you can use Computer Science include scientific research, medicine, engineering, police and security services and many more. |
| **YEAR 8** | There are various Computing / Coding competitions throughout the year and we aim to try to get students to enter these regional and National events.

STEM club is run every Wednesday in conjunction with Science | |
| **YEAR 9** | | |
| **YEAR 10** | | Careers are implicitly taught as part of the BTEC DIT and Computer Science course and students are encouraged to search for suitable careers in Computing.

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| **YEAR 11** | | |
| **LITERACY & NUMERACY** | Numeracy is ever present during all tasks involving spreadsheets, use of formulae and functions. Also, in Computer Science with the use of Binary, Denary and Hex.

Digital literacy is the ability to effectively, responsibly, safely and critically navigate, evaluate and create digital artefacts using a range of digital technologies.

The creation of digital artefacts will be integral to much of the learning of computing. Digital artefacts can take many forms, including digital images, computer programs, spreadsheets, 3D animations and this website. | **CATHOLIC ETHOS** Students are encouraged to display all the different aspects of THE CTK WAY: working hard, being kind & conscious, following instructions in a respectful way, carrying out tasks to the best of their ability and encouraged to be the best person they can be, assisting others & always displaying kindness. |

Christ the King Catholic High School: Computer Science (GCSE) - Curriculum Overview 2023 - 2024

KEY STAGE 3

See Curriculum Overview for Key Stage 3.

YEAR 10

TERM 1

OCR Computer Science - J277 /01
Introduction to the course
- Systems Architecture
- Memory
- Storage

Homework—CraigNDave flipped learning and Cornell notes
Assessment via CraignDave

OCR Computer Science -J277 /01
- Wired and wireless networks
- Network topologies
- protocols and layers
- legal, moral, environmental and ethical implications of computing

Homework—CraigNDave flipped learning and Cornell notes
Assessment via CraignDave

TERM 2

OCR Computer Science -J277 /01
- System security
- System Software
- Ethical, Legal, Cultural & Environmental Concerns

Homework—CraigNDave flipped learning and Cornell notes
Assessment via CraignDave

TERM 3

OCR Computer Science - J277 /01
Completing revision booklet

Homework—CraigNDave flipped learning and Cornell notes
Assessment via CraignDave
Mock exams

OCR Computer Science - J277 /03-04
Practical Introduction
- Programming techniques
- Analysis
- Design
- Development
- Testing and evaluation and conclusions.

Homework—CraigNDave flipped learning and Cornell notes
Assessment via CraignDave

YEAR 11

OCR Computer Science - **J277 /02**

- Algorithms
- Programming techniques
- Producing robust programs

Homework—CraigNDave flipped learning and Cornell notes

Assessment via CraignDave

OCR Computer Science - J277 /02
Practical Investigation
CCA 20 Hours
- Programming techniques
- Analysis
- Design
- Development
- Testing and evaluation and conclusions.

Homework—CraigNDave flipped learning and Cornell notes
Assessment via CraignDave

OCR Computer Science - J277 /02
- Computational logic
- Translators and facilities of languages
- Data representation

Homework—CraigNDave flipped learning and Cornell notes
Assessment via CraignDave

OCR Computer Science - J277 /02
- Tests on ClickSchool
- Tests on CraigNDave
- Tests on Isaac Computing
- Past papers
- Talking past exam

Homework—CraigNDave flipped learning and Cornell notes
Assessment via CraignDave

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