

**KS3**

	<b>Sept- Oct</b>	<b>Oct-Dec</b>	<b>Jan-Feb</b>	<b>Feb-April</b>	<b>April –May</b>	<b>June-July</b>
<b>7</b>	Housekeeping/software ESafety based on Office skills	App Builder (Vodafone)	Binary via Workbooks	How Computers Work	Small Basic	Photoshop Photofakery
<b>Foundation</b>	E Safety	Scratch	Apps	How computers work		Photoshop
<b>8</b>	ESafety (viruses, apps, more linked to computing)	Apps Thinkable	Spreadsheets	Computational Thinking and Logic gates (Teach ICT)	Adventure game, modular programming	Algorithm/Flowol
<b>Foundation</b>	E safety	Office Skills (ECDL)	Cont. last term	Binary and Logic Gates		

**ICT BTEC**

	<b>Sept- Oct</b>	<b>Oct-Dec</b>	<b>Jan-Feb</b>	<b>Feb-April</b>	<b>April –May</b>	<b>June-July</b>
<b>9</b>	Rotation bases on Spreadsheets	Rotation	BTEC DIT Unit 1 Component 1	BTEC DIT Unit 1 Component 1	BTEC DIT Unit 1 Component 2	BTEC DIT Unit 1 Component 2
<b>10</b>	BTEC DIT Unit 1 Component 3	BTEC DIT Unit 1 Component 3	BTEC DIT Unit 2 Component 1	BTEC DIT Unit 2 Component 1	BTEC DIT Unit 2 Component 2	BTEC DIT Unit 2 Component 2
<b>11</b>	BTEC DIT Unit 2 Component 3	BTEC DIT Unit 2 Component 3	BTEC DIT Unit 3	BTEC DIT Unit 3	BTEC DIT Unit 3	BTEC DIT Unit 3 Exam

**Computing**

	<b>Sept- Oct</b>	<b>Oct-Dec</b>	<b>Jan-Feb</b>	<b>Feb-April</b>	<b>April –May</b>	<b>June-July</b>
<b>9</b>	Rotation	Rotation	Visual Basic	Visual Basic	Visual Basic	Visual Basic
<b>10</b>	Theory CW	Carry out CW Task	Computational logic Translators & Language Facilities	Data represnetation Binary	Social, Legal and Ethical effects of computing Revision	Mock Works Exp Finiliase Social, Legal, Ethical.
<b>11</b>	System Artitecture Memory Storage	Wide and wireless Netorwks Network Topology	System Security System Software	Revision	Exam	NA

## TMWS Computing and Computer Science Curriculum

### Rationale

It is the aim of the department to enable students to develop skills and knowledge in computer science and digital technologies to prepare them for a future in a world where the use of this technology is fully embodied. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. We wish to enthuse students to have an understanding far deeper than the interface that they currently operate.

We aim to enable students to develop a love of learning for the subject and an understanding that there are no limits to their own development in programming and IT. An important life skill for anyone is to problem solve. Using the strands of computational thinking this will aid learners with their Computer Science studies and, as it is embedded within everyday life activities, they will understand the importance of taking a risk and acting upon the outcome, positive or negative. Students will be given guidance on how to work safely on-line so that it will be second nature to carry out all the necessary steps for their own safety as well as those around them.

The national curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

At KS3 students will be given the opportunity to develop their computer coding and digital technology skills. Learning the language of code or developing strong IT skills is important to students as they will be able to use, build and create using their own knowledge. This will allow them to take their studies onto KS4 and to Further and Higher education if they desire and ultimately secure a career within a large range of industries in a digital world.

### Skills and Knowledge

We aim to teach the course in a digital environment. KS3 primarily will be based on practical lessons as this supports the hardware and software required to meet the needs of the curriculum and building skills for pupils to utilise in future lessons and other subjects.

We will deliver lessons in a number of ways, teaching the pupils with the use of a presentation, shared work with pupils via Impero, Google Classroom or paper based tasks.

We hope pupils arrive at TMWS with the skills needed to complete basic computer tasks. Pupils will be able to log on, create, open and save files. These skills will be monitored in the first few lessons and linked to the initial unit of work in September covering E safety to ensure pupils are able to protect their online identity and privacy, recognise inappropriate content, contact and conduct and know how to report concerns.

**In Year 7**, students will need to be confident in using Microsoft and Google suites, having a clear understanding of selecting the correct software to complete a task. Students will be introduced to Computing basics, how computers are made up of different components, Binary and Boolean logic. Students will also

develop a website using HTML and repurpose digital artefacts for a specific audience with the support of Photoshop.

This is broken down into:

1. E Safety
2. Vodafone App Challenge
3. Scartch
4. How computers work
5. Small Basic
6. Photoshop

**Year 8**, students will develop their confidence further and understand programming as we develop skills using spreadsheets, using Excel and introduce text based programming with small basic and developing skills with Adventure Game programming, to ensure a clear understanding of text based programming.

This is broken down into:

1. E Safety
2. Spreadsheets
3. Binary
4. Computational Thinking and Logic gates
5. Adventure Game, modular Programming
6. Algorithm/Flowol

#### KS4

Pupils will be taught to

- develop their capability, creativity and knowledge in computer science, digital media and information technology
- develop and apply their analytic, problem-solving, design, and computational thinking skills
- understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns.

We offer both BTEC ICT and Computing GCSE courses.

Computing OCR encourage students/ to understand the fundamental principles of Computer Science, analyse problems in computational terms through practical experience.

Think creatively, innovatively, logically and critically.

Understand the components that make up digital systems, how they communicate with each other

Understand the impacts of digital technology to the individual and wider society

Apply mathematical; skills relevant to CS.

BTEC ICT, new course Tech Award Digital Information Technology has been running for one year. First examined in 2021. As a vocational qualification students are can draw on knowledge acquired from other subjects, English, Maths and Science and other GCSE where appropriate allowing students to broaden their knowledge and opportunity to apply skills to everyday work contexts.

Two internal and one external assessment make up the course, this helps to develop pupils resilience and planning skills to meet deadlines. Units are linked to KS3 knowledge of computer systems, software applications, creating programs and develop understanding of how to represent information in different ways to give it meaning. The third unit will build on student knowledge of how to use technology responsibly, digital

organisations and cyber security. The third unit also builds on knowledge, understanding and skills acquired and developed during the course, assessed with 1hr 30 min assessment.

Both course will be taught using the same technology and pedagogy as KS3. We will teach in a computer suit using the computers when necessary. Some lessons will lend themselves to group work, paper based work, online tests and research. Lesson resources will be shared in the same way pupil are experienced with, Impero Downloads, Google Classroom and email.

### **Key vocabulary**

Both subject have language that is specific to them, pupils will be guided to these in lessons. They will be supported to understand them and demonstrate their use in lessons. It is expected that pupils will learn spellings and teachers will support with misconceptions.

### **Pedagogical Methodology**

- Each topic will begin with an introduction to - and explicit teaching of – key subject knowledge
- All key aspects of knowledge will be taught explicitly in the unit and formatively assessed throughout. These form the bare minimum of what all students should know and be able to do by the end of the topic, regardless of ability. They will be revisited frequently both within and across topics.
- Teachers will explicitly highlight links within and between topics.
- Key knowledge will be recapped on a regular with the use of quizzes and seen through student skills.
- Teachers should formatively mark student responses using the agreed department feedback codes, this can be online or in folders for KS4.
- Students will be given the opportunity to make corrections and improvements on google classroom after each marking cycle (DIT time).

## KS3 Units

## E Safety

<b>Links to NC</b>	<i>Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability</i>  <i>Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns</i>
<b>Topics</b>	Passwords, social media, up to date news stories, Fake news, Identity fraud, Phishing.
<b>Software</b>	Google Classroom, Microsoft, Browser, iDea,
<b>Links</b>	<a href="https://idea.org.uk/">https://idea.org.uk/</a>
<b>No Weeks</b>	6

## App Lab Vodafone Challenge

<b>Links to NC</b>	<i>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</i>
<b>Topics</b>	Planning process, iterative processes, research methods, App design and development, team work
<b>Software</b>	Microsoft, Google suit, App Lab,
<b>Links</b>	<a href="http://www.code.org.uk/applab">www.code.org.uk/applab</a>
<b>No Weeks</b>	7

## Scratch

<b>Links to NC</b>	<i>use 2 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</i>
<b>Topics</b>	Introduction, Basic sequencing and selection via "IF" Simple flowcharting from the blocks, Loops and angles, Software testing and test plans, Self evaluation, Basic sequencing and use of variables Maths operators, String concatenation, Software testing and test plans in extension lesson
<b>Software</b>	<b>Scratch, online or desktop</b>
<b>Links</b>	<a href="http://www.scratch.mit.edu">www.scratch.mit.edu</a>
<b>No Weeks</b>	6

## How computers work

<b>Links to NC</b>	<i>Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems</i>
<b>Topics</b>	Hard and Software, CPU, Bletchley Park, Colossus, Moores Law, Networks, transmission, The Internet, Assessment
<b>Software</b>	Microsoft, Google suit, Hardware – computer to name parts
<b>Links</b>	
<b>No Weeks</b>	6

## Small Basic/MicroBit

<b>Links to NC</b>	<i>use 2 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</i>
<b>Topics</b>	Introduction , Sequencing, variables and lists, iteration and selection, loops, if, and calculations. Microbit topics: Accelerometer, Music, networking, Assessment
<b>Software</b>	BBC Microbit, powerpoint, google classroom and Small Basic
<b>Links</b>	<b>Microbit.org smallbasic.com</b>
<b>No weeks</b>	6

### Photoshop

<b>Links to NC</b>	<i>Undertake creative projects that involve selecting, using, and combining multiple applications</i> <i>Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability</i>
<b>Topics</b>	Digital Imaging, Images as Pixels, Spoof Images, Newspaper stories, Stop motion in Serif, Portfolio, Assessment
<b>Software</b>	Photoshop, Serif Draw, Serif Web, Google Classroom
<b>Links</b>	
<b>No Weeks</b>	7

### Year 8

#### E Safety

<b>Links to NC</b>	<i>Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns</i>
<b>Topics</b>	Passwords, social media, up to date news stories, Fake news, Identity fraud, Phishing.
<b>Software</b>	Google Classroom, Microsoft, Browser, iDea,
<b>Links</b>	<a href="https://idea.org.uk/">https://idea.org.uk/</a>
<b>No Weeks</b>	6

### Spreadsheets

<b>Links to NC</b>	<i>design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</i>
<b>Topics</b>	Intro, Formatting and Formulas, Graphs, Count if, VLookup, Assessment
<b>Software</b>	Excel, Google Suit
<b>Links</b>	
<b>No Weeks</b>	7

### Binary

<b>Links to NC</b>	<i>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.</i>
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	<i>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]</i>
<b>Topics</b>	<b>Binary Intro,</b> Addition, conversion, encoding, HEX, Images, Sound, Compression, assessment
<b>Software</b>	Microsoft, Google Suit Hardware – Binary workbook to support
<b>Links</b>	
<b>No Weeks</b>	<b>6</b>

### Computational thinking and Logic Gates

<b>Links to NC</b>	<i>understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming;</i>
<b>Topics</b>	Computational thinking covers , Decomposition, Pattern recognition, Abstraction, Algorithms  Logic gates introduces Boolean logic, AND, OR and NOT logic gates and their corresponding truth tables. It covers these concepts in easy to follow steps which students readily understand.
<b>Software</b>	Microsoft, Google Suit, Teach ICT
<b>Links</b>	
<b>No Weeks</b>	<b>5</b>

### Adventure Game/Modular Programming

<b>Links to NC</b>	
<b>Topics</b>	
<b>Software</b>	
<b>Links</b>	
<b>No weeks</b>	<b>5</b>

### Algorithms/Flowol

<b>Links to NC</b>	<i>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</i>
<b>Topics</b>	Understanding Algorithms, key terms, planning, Computational thinking, use of mimics to complete the flowol activities
<b>Software</b>	Flowol, Flowgorithm, Microsoft, Google suit
<b>Links</b>	
<b>No Weeks</b>	<b>7</b>

### End of Unit Tests

At the end of each unit of work students either complete an online knowledge test or a practical test dependant on the type of unit studied. Each student will be given feedback using Google Classroom, they will be given time at the start of the lesson following marking to respond to this. Staff will be looking for WWW Strengths, and EBI weaknesses in relation to the work and feedback, we expect this will feedback into their work for the following unit. This is all completed online.

Through this exercise students are able to reflect on their own progress and also rectify any misconceptions they may have about the unit studied

### End of unit feedback/Student Voice

At the end of each unit pupils have an anonymous 5 question questionnaire to complete. This allows them to express their views on the strengths and weaknesses of the unit of work. As a team we can use this to develop SOW and resources for the next teaching but also adapt resources for the next unit.

### Year 9 Rotation.

In the rotation 5 weeks (approx. 10 lessons) we aim to give the students a broad overview of the subject. This is to allow them to understand the concept of the GCSE course to make an informed decision about its suitability to the pupil. Also to allow pupils who are not looking to continue with their studies on either course some final skills and knowledge into business use of ICT they can take with them to support in future studies.

### ICT BTEC DIT

	Topic.	Transferable Skills
1	Course Outline	
2	Introduction to User Interface	Knowledge of different UI and how they look
3	Written report on the difference in UI and what they show with examples	Use of annotation and screen shot/snipping tool.
4	Additional tasks to reinforce the differences in the three UI	Research (task using word, keyboard shortcuts and annotation of websites. Creating a help sheet, support different types/skill level of user.
5	UI worksheets	Gold, Silver Bronze tasks ...
6	UI Consolidation	
7	Spreadsheets the basics	Basic skills to use a Spreadsheet to collate information and carry out the basic functions.
8	Spreadsheet activities	Activities to test skills in basic formula +,-,*,/ sum, avg.
9	Check progress of the activities and understanding.	
10	Cyber Security	Threats to computers, viruses, how to be safe online.

### Computing OCR

1	Small Basic Input/Output	Transfer to VB for GCSE
2	Small Basic – Using Variables	
3	SB – If then Else	
4	SB – For next loops	
5	SB – While loops	
6	Theory – What is a computer system	Develop understanding of the GCSE and how a typical lesson will look.
7	Theory – Primary Memory	
8	Theory – Secondary Storage	
9	Theory – Binary Maths	
10	Computational Thinking - Light Bot	

KS4

ICT



We offer Edexcel BTEC Tech Award Digital Information Technology (DIT).

The course is examined over three units.

Two are internal assessment, marked and verified, the third is externally assessed.

**Unit one:** 30% Exploring User Interface Design Principles and Project Planning Techniques. Learners will develop their understanding of what makes an effective user interface and how to effectively manage a project. They will use this understanding to plan, design and create a user interface. This unit builds on KS3 learning about computer systems and software applications. Assessment is via three assessments, internally marked.

**Unit two:** 30% Collecting, Presenting and interpreting data. Learners will understand the characteristics of data and information and how they help organisations in decision making. They will use data manipulation methods to create a dashboard to present and draw conclusions from information. This unit builds on KS3 creating program skills and knowledge. Assessment is via three assessments, internally marked.

**Unit three:** 40% Effective Digital Working practices. Learners will explore how organisations use digital systems and the wider implications associated with their use. This external component builds on knowledge, understanding and skills acquired and developed across the qualification. It requires learners to select and integrate knowledge and understanding synoptically from all components. It is assessed through an external assessment that is set and marked by Pearson. Questions will require learners to apply knowledge and understanding to the given scenarios or context. The external assessment will include questions totalling 60 marks. The test duration is 1 hour 30 minutes. Assessment availability is twice a year: February and May from 2020 onwards. Sample assessment materials will be available to help centres prepare learners for assessment.

As we are in the first run of the new course, we hope to complete the course:

Yr9: Jan – July Component 1 Assignment A&B

Year 10: Sept- Dec Component 1 Assignment C

Jan-Jul Component 2

Year 11: Component 3.

## Computing

OCR's GCSE (9–1) in Computer Science will encourage learners to:

- understand and apply the fundamental principles and concepts of Computer Science, including abstraction, decomposition, logic, algorithms, and data representation
- analyse problems in computational terms through practical experience of solving such problems, including designing, writing and debugging programs
- think creatively, innovatively, analytically, logically and critically
- understand the components that make up digital systems, and how they communicate with one another and with other systems
- understand the impacts of digital technology to the individual and to wider society
- apply mathematical skills relevant to Computer Science.

The course offers a simple and intuitive assessment model, consisting of two papers, one focusing on computer systems and one with a focus on programming, computational thinking, and algorithms. Both papers have identical weighting and mark allocations.

Content Overview	Assessment Overview	
<p><b>Computer systems</b></p> <ul style="list-style-type: none"> <li>• Systems Architecture</li> <li>• Memory</li> <li>• Storage</li> <li>• Wired and wireless networks</li> <li>• Network topologies, protocols and layers</li> <li>• System security</li> <li>• System software</li> <li>• Ethical, legal, cultural and environmental concerns</li> </ul>	<p>Computer systems (01) 80 marks 1 hour and 30 minutes Written paper (no calculators allowed)</p>	<p>50% of total GCSE</p>
<p><b>Computational thinking, algorithms and programming</b></p> <ul style="list-style-type: none"> <li>• Algorithms *</li> <li>• Programming techniques</li> <li>• Producing robust programs</li> <li>• Computational logic</li> <li>• Translators and facilities of languages</li> <li>• Data representation</li> </ul>	<p>Computational thinking, algorithms and programming (02) 80 marks 1 hour and 30 minutes Written paper (no calculators allowed)</p>	<p>50% of total GCSE</p>
<p>* Algorithm questions are not exclusive to Component 02 and can be assessed in either component.</p>		
<p><b>Programming Project</b></p> <ul style="list-style-type: none"> <li>• Programming techniques</li> <li>• Analysis</li> <li>• Design</li> <li>• Development</li> <li>• Testing and evaluation and conclusions</li> </ul>	<p>20 timetabled hours</p>	<p>Formal requirement Consolidates the learning across the specification through practical activity.</p>