

OCL Computing Curriculum: Long Term Plan

Year 7

Brief overview

In year 7 students will arrive with varying levels of computing knowledge from the primary school they have attended and the technology they have access to at home. In order to build their confidence students will start to use a variety of different software and web apps to improve their digital literacy starting from logging on in lesson 1.

Autumn 1 will give students opportunity to familiarize themselves with the computing lab and/or iPad. Many students will soon be creating social media accounts if they have not already. Student will be looking at what respectful online communication looks like and how messages online can be seen without context. Students will then look at cyberbullying and create a presentation on the subject using MS PowerPoint. This allows students to cover important e-safety topics while still getting hands on experience with their computer and commonly used software. In Autumn 2 students will use another common software package MS Excel to work with data. The purpose of this unit is for students to understand how data can be collected, analyzed, and used.

Spring 1 introduces students to networks and how they aid communication between computers. This unit will first look at the benefits of computer networks, how they are created and how they operate. The second half of the unit will focus on the Internet, smart devices and how this is changing the way we live our lives. Spring 2 will be the first experience of computer programming for many students. They will be using Scratch a web based visual programming language that allows students to create programs by connecting premade code blocks. Student will be able to explore the programming concepts of sequence, selection and iteration without worrying about syntax errors. This unit will set the foundation of students programming knowledge embedding key concepts that they will continue to explore throughout KS3 and KS4.

Summer 1 will focus on creating text and image media while also looking at legal issues such as copyright law and plagiarism. This unit will also look at credibility, sourcing information and fake news. Finally in summer 2 students will look at how computers work. Students will first study hardware and the role of different components. Then they will look at software in general terms, instead of focusing on specific packages they will understand the role of different archetypes of software and operating systems.

Software Packages: Students will use a combination of a web browser, Formative.com, MS Teams and MS OneNote throughout each unit. In addition throughout year 7 they will use MS Office(PowerPoint, Excel and Word), Scratch.mit.edu, and Photopea.com.

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Unit title	Using Technology Safely	Data Modelling (Spreadsheets)	Computer Networks	Scratch programming 1	Multimedia 1	Computer systems
Relevant core concepts	<ul style="list-style-type: none"> Use a wide range of software and technology. Display fundamental ICT Skills. Create and edit a variety of media. Be aware of the risks of technology and how they can be minimised. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Use a wide range of software and technology. Display fundamental ICT Skills. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Understand what networks are and how they are used. Recognise and predict technology trends Maximise the use of Horizons. 	<ul style="list-style-type: none"> Use a wide range of software and technology. Modify and create computer programs. Use computational thinking skills to solve real world problems. Understand simple Boolean logic. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Use a wide range of software and technology. Display fundamental ICT Skills. Create and edit a variety of media. Be aware of the risks of technology and how they can be minimised. Recognise and predict technology trends. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Use a wide range of software and technology. Display fundamental ICT Skills. Recognise computer hardware and understand how each component works. Maximise the use of Horizons.

<p>Relevant end points</p>	<ul style="list-style-type: none"> • Students will have the resilience to adapt to new software that may be required in their further education or professional careers. • Students will be able to select and use the correct device for a given task. • Students will be able to create presentation and deliver them to an audience. • Students will be aware of the common risks of technology involving cyberbullying and how to avoid or report instances of each. • Students will be able to effectively use their Horizons device in a variety of contexts. 	<ul style="list-style-type: none"> • Students will have the resilience to adapt to new software that may be required in their further education or professional careers. • Students will be able to select and use the correct device for a given task. • Students will be able to effectively use their Horizons device in a variety of contexts. 	<ul style="list-style-type: none"> • Students will be able to recognise the devices that make up computer networks. • Students will be able to predict future changes in technology with their understanding of computer networks history and fundamentals of how computers communicate. • Students will be able to effectively use their Horizons device in a variety of contexts. 	<ul style="list-style-type: none"> • Students will have the resilience to adapt to new software that may be required in their further education or professional careers. • Students will be able to understand and create scratch code using block based coding. • Students will be able to develop a solution to a problem using computational thinking. • Students will be able to use Boolean logic (AND, OR, NOT) to make complex decisions in their programs. • Students will be able to effectively use their Horizons device in a variety of contexts. 	<ul style="list-style-type: none"> • Students will have the resilience to adapt to new software that may be required in their further education or professional careers. • Students will be able to select and use the correct device for a given task. • Students will be able to create and format documents in word processing software. • Students will understand the licensing rules on online media and how to find images under the creative commons licence. • Students will be able to recognise common features of written media such as blog posts and articles. • Students will be able to effectively use their Horizons device in a variety of contexts. 	<ul style="list-style-type: none"> • Students will have the resilience to adapt to new software that may be required in their further education or professional careers. • Students will be able to select and use the correct device for a given task. • Students will be able to recognise different computer hardware components and understand their role within the overall system. • Students will be able to effectively use their Horizons device in a variety of contexts.
<p>Core substantive knowledge</p>	<ul style="list-style-type: none"> • Logging on. • Recognising online dangers. • Cyberbullying and how to report/stop it. • Respectful comments and messages. • Recognising appropriate images. 	<ul style="list-style-type: none"> • Primary and secondary data • Data collection • Common excel formulas <ul style="list-style-type: none"> ○ Sum ○ Max ○ Min ○ Average ○ If ○ Counta ○ Countif 	<ul style="list-style-type: none"> • What a computer network is. • The hardware that supports computer networks. <ul style="list-style-type: none"> ○ Hub ○ Router ○ Server ○ Network Cable • What the internet is. • Services that run on the internet <ul style="list-style-type: none"> ○ WWW ○ Email ○ IoT ○ VoIP • The history and continued growth of computer networks. 	<ul style="list-style-type: none"> • Variables. • Subroutines. • Sequence. • Selection (if). <ul style="list-style-type: none"> ○ Count controlled (for) ○ Condition controlled (While) • Operators <ul style="list-style-type: none"> ○ Arithmetic operators (=, <, >) 	<ul style="list-style-type: none"> • Online content licenses and copyright. • Formatting documents. • Recognising appropriate images. • Credibility. • Plagiarism. • Citations. 	<ul style="list-style-type: none"> • Input/output devices. • What is inside a computer. • General purpose systems. • Memory and storage types. • Application software. • System software.

				<ul style="list-style-type: none"> ○ Logical operators (and, or, not) 		
<p>Core disciplinary knowledge</p>	<ul style="list-style-type: none"> • Email etiquette. • Finding and installing apps on the iPad. • Using MS Office applications (Ms PowerPoint) • Creating a presentation on Cyberbullying in Ms PowerPoint. • Finding and using appropriate images. • Students will present to their peers. 	<ul style="list-style-type: none"> • Using MS Office applications (Ms Excel) • Gathering and analysing data with MS Forms. • Creating and modifying spreadsheets. • Using the formulas they have learned to interrogate data. 	<ul style="list-style-type: none"> • Analysing how computers have aided communication around the world. • Analysing how each piece of hardware enhances a network. • Analysing the best network type for a given scenario. • Understanding the different internet services and what they do. • Describe what the internet is and what is used for. • Explain the need for IP addresses. • Explain how data is broken up into packets to be sent across networks. 	<ul style="list-style-type: none"> • Store and retrieve data from variables. • Design and create programs that execute in sequence. • Design and create programs that use selection to make decisions. • Combine operators to make more complex decisions. • Design and create programs that use iteration to repeat code. • Design and create subroutines that can be called by the main program as needed. 	<ul style="list-style-type: none"> • Format documents for readability. • Analyse the different types of licenses and what is allowed under each. • Finding and using appropriate images. • Finding appropriate sources. • Citing sources. • Planning and writing a blog post in MS Word. 	<ul style="list-style-type: none"> • Categorising peripherals by their purpose. • Describing internal hardware and their purpose. • Understand and define different types of memory. • Compare storage types and select the most appropriate type for a scenario. • Design a computer for a given scenario. • Define application and system software.

Year 8

Brief overview

In year 8 students will continue to develop their digital literacy with multiple opportunities to have hands of experience with a variety of software packages and web applications. Students will build upon their practical skills from year 7 particularly in programming and media creation. Students will also begin to look at how computers represent data and solve problems.

Autumn 1 will give students the opportunity to look at creating some more complex programs in Scratch. After a recap of selection and iteration student will start to look at how subroutines help us to organize and create one aspect of a program at a time, how instructions can be passed to other parts of a program and pull all this together to create a complex program. Autumn 2 will students will study the binary number system, why it is used by computers and how to convert between this and our denary number system. Once they have an understanding of binary numbers they will look at the logic gates AND, OR and NOT and their respective truth tables.

In spring 1 students will look at using computational thinking to model and solve problems. They will also explore different methods of representing algorithms including using flowcharts and written pseudocode. Spring 2 students will move onto their second programming language Python. This first unit will focus again on the core programming concepts of Sequence, Selection and Iteration. As a text based language students will now encounter syntax errors and will need to interpret error messages to help debug their own code.

In Summer 1 students will again have the opportunity to create and edit media. In this unit they will look at images in more detail studying both bitmap and vector graphics. Students will then look at using these image files to create keyframe animations. Finally in summer 2 students will have the opportunity to look at how websites are created and create their own website. While creating web pages students will also focus on good web design practiced and the importance of making websites accessible to everybody.

Software Packages: Students will use a combination of a web browser, Formative.com, MS Teams and MS OneNote throughout each unit. In addition they will use scratch.mit.edu, logic.ly, Python, MU IDE, photopea.com, wickeditor.com, Notepad ++

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Unit title	Scratch Programming 2	Binary and Boolean Logic	Computational Thinking and Algorithms	Programming with Python 1	Multimedia 2	Developing for the Web
Relevant core concepts	<ul style="list-style-type: none"> Use a wide range of software and technology. Modify and create computer programs. Use computational thinking skills to solve real world problems. Understand simple Boolean logic. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Understand simple Boolean logic. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Use a wide range of software and technology. Display fundamental ICT skills. Use computational thinking skills to solve real world problems. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Use a wide range of software and technology. Modify and create computer programs. Use computational thinking skills to solve real world problems. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Use a wide range of software and technology. Create and edit a variety of media. Maximise the use of Horizons. 	<ul style="list-style-type: none"> Use a wide range of software and technology. Create and edit a variety of media. Be aware of the risks of technology and how they can be minimised. Understand what networks are and how they can be used. Recognise and predict technology trends. Maximise the use of Horizons.
Relevant end points	<ul style="list-style-type: none"> Students will have the resilience to adapt to new software that may be required in their further education or professional careers. Students will be able to understand and create scratch code using block based coding. Students will be able to develop a solution to a problem using computational thinking. Students will be able to use Boolean logic (AND, OR, 	<ul style="list-style-type: none"> Students will be able to recognise the logic gates (AND, OR and NOT). Students will be able to complete truth tables for each logic gate and simple circuits. Students will be able to understand logic scenarios and draw the logic circuit that represents them. Students will be able to effectively use their Horizons device in a variety of contexts. 	<ul style="list-style-type: none"> Students will have the resilience to adapt to new software that may be required in their further education or professional careers. Students will be able to select and use the correct device for a given task. Students will be able to break down problems into manageable chunks and use algorithmic thinking to create solutions for them. Students will be able to effectively use their Horizons device in a variety of contexts. 	<ul style="list-style-type: none"> Students will have the resilience to adapt to new software that may be required in their further education or professional careers. Students will be able to create Python programs that utilise user input. Students will be able to debug Python programs using IDE error reporting tools. Students will be able to effectively use their 	<ul style="list-style-type: none"> Students will have the resilience to adapt to new software that may be required in their further education or professional careers. Students will understand the difference between bitmap and vector graphics. Students will recognise different styles and techniques used in animations. Students will be able to create animations. 	<ul style="list-style-type: none"> Students will have the resilience to adapt to new software that may be required in their further education or professional careers. Students will be able to create and edit webpages using HTML and CSS. Students will understand the importance of accessibility on the web and how to make web pages accessible to everyone. Students will understand how to link and move between different parts and to different media in a website.

	<p>NOT) to make complex decisions in their programs.</p> <ul style="list-style-type: none"> Students will be able to effectively use their Horizons device in a variety of contexts. 			<p>Horizons device in a variety of contexts.</p>	<ul style="list-style-type: none"> Students will be able to effectively use their Horizons device in a variety of contexts. 	<ul style="list-style-type: none"> Students will be able to effectively use their Horizons device in a variety of contexts.
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<p>Core disciplinary knowledge</p>	<ul style="list-style-type: none"> Store and retrieve data from variables. Design and create programs that execute in sequence. Design and create programs that use selection to make decisions. Combine operators to make more complex decisions. Design and create programs that use iteration to repeat code. Design and create subroutines that can be called by the main program as needed. 	<ul style="list-style-type: none"> Represent denary numbers in binary. Covert between binary and denary. Construct truth tables for logic gates (AND, OR, NOT). Construct truth tables for simple logic circuits. Create, modify and interpret simple logic diagrams. 	<ul style="list-style-type: none"> Understand different types of searching and sorting algorithms. Compare algorithms by best and worst case scenarios. Apply computational thinking techniques to real world problems. Represent algorithms in Pseudocode and using flowcharts. 	<ul style="list-style-type: none"> Store and retrieve data from variables. Design and create programs that execute in sequence. Design and create programs that use selection to make decisions. Design and create programs that use iteration to repeat code. Debug existing programs that do not execute correctly using IDE error reports. 	<ul style="list-style-type: none"> Create and edit graphics. Save and export images in the correct format. Create images of specific dimensions and quality. Use various animation techniques to create a short animation. 	<ul style="list-style-type: none"> Create webpages using HTML. Style webpages using CSS. Use the correct tags to add multimedia to a website. Make pages accessible to as many people as possible. Navigate between pages in a website by creating hyperlinks. Create a multipage about me website.

Year 9

Brief overview

In year 9 students have previously completed Computing as part of the technology rotation, Due to this, students in this year group have varying levels of knowledge. In order to build on this students will complete the same topics as Year 8 to help them build a better understanding of Computing.

Autumn 1 will give students the opportunity to look at creating some more complex programs in Scratch. After a recap of selection and iteration student will start to look at how subroutines help us to organize and create one aspect of a program at a time, how instructions can be passed to other parts of a program and pull all this together to create a complex program. Autumn 2 will students will study the binary number system, why it is used by computers and how to convert between this and our denary number system. Once they have an understanding of binary numbers they will look at the logic gates AND, OR and NOT and their respective truth tables.

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Software Packages: Students will use a combination of a web browser, Formative.com, MS Teams and MS OneNote throughout each unit. In addition they will use scratch.mit.edu, logic.ly, Python, MU IDE, photopea.com, wickeditor.com, Notepad ++

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