Our Lady and St Edward's - Intent, Implementation and Impact in Computing

Intent

Computing skills are integral to everyday life and it is our intention at OLSE that we provide a curriculum where children learn how to make the most of digital opportunities and become digitally literate. They need to be able to learn, create, develop skills of computational thinking and be safe in a digital environment. Our Computing curriculum gives pupils the opportunity to develop a broad range of digital skills using a range of technology.

At OLSE, we teach a curriculum that enables children to become effective users of technology who can:

- Understand and apply the essential principles and concepts of Computer Science, including logic, algorithms and data representation;
- Analyse problems in computational term, and have repeated practical experience of writing computer programs in order to solve such problems;
- Evaluate and apply information technology analytically to solve problems;
- Communicate ideas well by utilising appliances and devices throughout all areas of the curriculum.

Implementation

Computing at OLSE is well resourced and regular training is given. It is taught in a number of ways. In the Early Years; the approach is through cross-curricular learning with an emphasis on hands on experiences and is assessed through the Understanding the World, Early Learning Goal. Teaching is through context-based and role play experiences using many resources such as I-Pads and programmable toys. From Year One upwards, we use Purple Mash as a cohesive scheme of work addressing the statutory aspects of the National Curriculum. As a school, we believe in delivering fun and engaging lessons which help to raise standards and allow all pupils to achieve to their full potential. Whilst our discrete Computing lessons use Purple Mash as a foundation for teaching, we also use technology as a tool for learning across the curriculum and build our understanding by using a range of other software. This ensures digital skills are embedded and further engage the pupils in leading their own learning. They are able to use technology imaginatively and creatively whilst also becoming efficient learners and critical thinkers. Cross-curricular teaching helps enthuse and equip children with the capability to use technology throughout their lives. We believe that this transference of skills can aid in teaching pupils the strategies and knowledge necessary to enable them to reap the benefits of the online world, whilst being able to minimise risk to themselves or others. We unsure the objectives from Education for a Connected World are taught and online safety is an integral part all lessons involving digital technology.

Impact

Progress is measured through ongoing teacher assessments. Work done through Purple Mash is saved electronically in the children's personal document folders and progress is tracked through the Purple Mash which is monitored by the subject leader. Evidence folders using Seesaw are used to collate cross-curricular work. Discussions with pupils will show they know how to stay safe when using digital technology.

Our Lady and St Edward's – Computing Curriculum Overview

	Autumn		Spring		Summer	
EYFS	Computers and Networks	Creating Media	Programming A	Data and Information	Creating Media	Programming B
Year 1	Technology Around Us	Digital Painting	Moving a Robot	Grouping Data	Digital Writing	Programming Animations
Year 2	IT Around Us	Digital Photography	Robot Algorithms	Pictograms	Digital Music	Programming Quizzes
Year 3	Connecting Computers	Stop-Frame Animation	Sequencing Sounds	Branching Databases	Desktop Publishing	Events and Actions in Programs
Year 4	The Internet	Audio Production	Repetition in Shapes	Data Logging	Photo Editing	Repetition in Games
Year 5	Systems and Searching	Video Production	Selection in Physical Computing	Flat-File Databases	Introduction to Vector Graphics	Selection in Quizzes
Year 6	Communication and Collaboration	Web Page Creation	Variables in Games	Introduction to Spreadsheets	3D Modelling	Sensing Movement

Our Lady and St Edward's – National Curriculum Expectations for Computing

KS1	KS2
Pupils should be taught to: • understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions; • create and debug simple programs; • use logical reasoning to predict the behaviour of simple programs; • use technology purposefully to create, organise, store, manipulate and retrieve digital content; • recognise common uses of information technology beyond school; • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	Pupils 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.

National Curriculum Coverage through our Curriculum

Computing Skills KS1	1.1 Technology Around Us	1.2 Digital Printing	1.3 Moving a Robot	1.4 Grouping Data	1.5 Digital Writing	1.6 Programming Animations	2.1 IT Around Us	2.2 Digital Photography	2.3 Robot Algorithms	2.4 Pictograms	2.5 Digital Music	2.6 Programming Quizzes
Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions			✓			✓			✓			✓
Create and debug simple programs			✓			✓			✓			✓
Use logical reasoning to predict the behaviour of simple programs			✓			✓			✓			✓
Use technology purposefully to create, organise, store, manipulate and retrieve digital content	✓	✓		✓	✓		✓	✓		✓	✓	✓
Recognise common uses of information technology beyond school	✓		✓				✓	✓				
Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	✓			✓	✓		✓	✓	✓	✓		

Computing Skills KS2	3.1 Connecting Computers	3.2 Stop-frame Animation	3.3 Sequencing Sounds	3.4 Branching Databases	3.5 Desktop Publishing	3.6 Events and Actions	4.1 The Internet	4.2 Audio Production	4.3 Repetition in Shapes	4.4 Data Logging	4.5 Photo Editing	4.6 Repetition in Games	5.1 Systems and Searching	5.2 Video Production	5.3 Selection in Physical Computing	5.4 Flat-file Databases	5.5 Introduction to Vector Graphics	5.6 Selection in Quizzes	6.1 Communication and Collaboration	6.2 Webpage Creation	6.3 Variables in Games	6.4 Introduction to Spreadsheets	6.5 3D Modelling	6.6 Sensing Movement
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.		✓		✓			✓	✓			✓		✓	✓						✓	✓		✓	

Year 1

Key Knowledge

Technology Around Us	Digital Painting	Moving a Robot	Grouping Data	Digital Writing	Programming Animations
• Technology is something that has been made by people to help us and make our lives easier. • Technology is man-made and not natural. • Technology includes things like computers, traffic lights and I-pads. • Some parts of a computer are: a mouse, a monitor, a keyboard. • Digital technology is the name for electronic items that create and story information. • The screen displays what the computer is doing. • The keyboard lets you type. • The mouse lets you select and move objects. • Laptops use a trackpad rather than a mouse.	• We can use digital devices to help us draw and paint pictures. • A program that we can use to paint a picture is 'Paint Z'. • There are different tools that we can use in paint apps to create different effects. • We can draw in different ways, including using freehand, lines and shapes. • We can change the sizes and colours for effect.				

Information Technology

Creating Media

Digital Printing	Describe what different freehand tools do
	Use the shape and line tool
	Make careful choices when painting a digital picture
	Explain why I chose the tools I used
	Use a computer on my own to paint a picture
	Compare painting a picture on a computer and on paper
Digital Writing	Use a computer to write.
	Add and remove text on a computer.
	Identify that the look of text can be changed on a computer.
	Make careful choices when changing text.
	Explain why I used the tools that I chose.
	Compare typing on a computer to writing on paper.

Data and Information

Grouping Data	Label object
	Identify that objects can be counted
	Describe objects in different ways
	Count objects with the same properties
	Compare groups of objects
	Answer questions about groups of objects

Computer Science

Programming

Moving a Robot	Explain what a given command will do
	Act out a given word
	Combine forwards and backwards commands to make a sequence
	Combine four direction commands to make sequences
	Plan a simple program
	Find more than one solution to a problem
Programming Animations	Choose a command for a given purpose
	Show that a series of commands can be joined together
	Identify the effect of changing a value
	Explain that each sprite has its own instructions
	Design parts of a project
	Use an algorithm to create a program

Computer Systems & Networks

Technology Around Us	Identify technology
	Identify a computer and its main parts
	Use a mouse in different ways
	Use a keyboard to type on a computer
	Use the keyboard to edit text
	Create rules for using technology responsibly

Year 2

Key Knowledge

IT Around Us	Digital Photography	Robot Algorithms	Pictograms	Digital Music	Programming Quizzes
• Information Technology (IT) includes computers, tablets and things that work with computers. It also includes things like USB sticks, digital cameras and SMART boards. • Information Technology is in lots of important items in our homes and around the world. • IT helps us in lots of different ways in our daily lives. • IT can help make things quicker and easier e.g. barcodes and scanners at the supermarket. • IT can also help to keep us safe e.g. traffic lights. • IT helps us to communicate with one another and have fun! It can connect us to the internet and allow us to play games, share and receive information. • We must use IT carefully in order to keep safe.	• We can use digital devices to help us take and edit photographs. • Many different digital devices can be used to take photographs, for example: cameras, phones, tablets and webcams. • There are lots of different apps that we can use to edit our photos. • Photos can be edited to improve the quality or effect of the image. • Sometimes it can be hard to tell if a photo is real or has been edited. • People sometimes edit photos in order to make something look better than it is. Sometimes this is done in order to advertise or sell an item.				

Information Technology

Creating Media

Digital Photography	Use a digital device to take a photograph
	Make choices when taking a photograph
	Describe what makes a good photograph
	Decide how photographs can be improved
	Use tools to change an image
	Recognise that photos can be changed
Digital Music	Say how music can make us feel
	Identify that there are patterns in music
	Experiment with sound using a computer
	Use a computer to create a musical pattern
	Create music for a purpose
	Review and refine computer work

Data and Information

Pictograms	Recognise that we can count and compare objects using tally charts
	Recognise that objects can be represented as pictures
	Create a pictogram
	Select objects by attribute and make comparisons
	Recognise that people can be described by attributes
	Explain that we can present information using a computer

Computer Science

Programming

Robot Algorithms	Describe a series of instructions as a sequence
	Explain what happens when we change the order of instructions
	Use logical reasoning to predict the outcome of a program
	Explain that programming projects can have code and artwork
	Design an algorithm
	Create and debug a program
Programming Quizzes	Explain that a sequence of commands has a start
	Explain that a sequence of commands has an outcome
	Create a program using a given design
	Change a given design
	Create a program using own design
	Decide how my own project can be improved

Computer Systems & Networks

IT Around Us	Recognise the uses and features of information technology
	Identify the uses of information technology in the school
	Identify information technology beyond school
	Explain how information technology helps us
	Explain how to use information technology safely
	Recognise that choices are made when using information technology

Year 3

Key Knowledge

Connecting Computers	Stop-Frame Animation	Sequencing Sounds	Branching Databases	Desktop Publishing	Events and Actions in Programs
• Digital devices have an input, process and output. • Information and data can be shared across networks. • Many devices are used to create networks. • In Computing, a connection describes a link between a computer and something else. For example: a computer might be connected to the internet through wires or Wifi. • Computers in a network can send and receive information to one and another.	• Animation is a technique used to make objects and drawings appear as if they are moving. • Stop-frame animation is a technique in which many photographs are taken of an object with small movements in between. • When the objects are quickly shown together, an illusion is created and they appear to move. • There are many apps and programs that can be used to create stop-frame animations, such as Imotion. • Lots of movies and TV programmes are animated, including cartoons like Wallace and Grommit and Chicken Run. • Music and sound effects can be added to make the animation more engaging.				

Information Technology

Creating Media

Stop-Frame Animation	Explain that animation is a sequence of drawings or photographs
	Relate animates movement with a sequence of images
	Plan an animation
	Identify the need to work consistently and carefully
	Review and improve an animation
	Evaluate the impact of adding other media to an animation
Desktop Publishing	Recognise how text and images convey information
	Recognise that text and layout can be edited
	Choose appropriate page settings
	Add content to a desktop publishing publication
	Consider how different layouts can suit different purposes
	Consider the benefits of desktop publishing

Data and Information

Branching Databases	Create questions with yes/no answers
	Identify the attributes needed to collect data about an object
	Create a branching database
	Explain why it is helpful for a database to be well structured
	Plan the structure of a branching database
	Independently create an identification tool

Computer Science

Programming

Sequencing Sounds	Explore a new programming environment
	Identify that commands have an outcome
	Explain that a program has a start
	Recognise that a sequence of commands can have an order
	Change the appearance of my project
	Create a project from a task description
Events & Actions in Programs	Explain how a sprite moves in an existing project
	Create a program to move a sprite in four directions
	Adapt a program to a new context
	Develop my program by adding features
	Identify and fix bugs in a program
	Design and create a maze-based challenge

Computer Systems & Networks

Connecting Computers	Explain how digital devices function
	Identify input and output devices
	Recognise how digital devices can change the way we work
	Explain how a computer network can be used to share information
	Explore how digital devices can be connected
	Recognise the physical components of a network

Year 4

Key Knowledge

The Internet	Audio Production	Repetition in Shapes	Data Logging	Photo Editing	Repetition in Games
• The internet is a network of networks that is used around the world. • The World Wide Web is a system on the internet that has websites and webpages. • Some content on the internet is protected. • Not all of the information on the internet is accurate. • The World Wide Web is part of the internet where we can visit web pages and websites. • When we visit the World Wide Web, routers help us to journey to different networks in different parts of the world. • Web browsers, such as Google Chrome and Internet Explorer, let us view different pages on the internet. • Websites are a set of web pages. • Websites and webpages can be found using web addresses starting with www.	• Recording and listening to sound requires input devices (a microphone) and output devices (speakers). • Podcasts can be planned, recorded and published and then listened to by an audience. • People have ownership over audio files and can have the audio copyrighted so that it cannot be copied without permission. • Garage Band and Audacity are examples of apps that can be used to edit audio and create podcasts. • A podcast needs a clear subject in order to make it suitable for a specific audience. • Sound on the apps is shown as a waveform. The larger the sound the bigger the wave.				

Information Technology

Creating Media

Audio Production	Identify that sound can be recorded
	Explain that audio recordings can be edited
	Recognise the different parts of creating a podcast project
	Apply audio settings independently
	Combine audio to enhance mu podcast project
	Evaluate the effective use of audio
Photo Editing	Recognise how text and image convey information
	Recognise that text and layout can be edited
	Choose appropriate page settings
	Add content to a desktop publishing publication
	Consider how different layouts can suit different purposes
	Consider the benefits of desktop publishing

Data and Information

Data Logging	Explain that data gathered over time can be used to answer questions
	Use a digital device to collect data automatically
	Explain that a data logger collects 'data points' from sensors over time
	Recognise how a computed can help us analyse data
	Identify the data needed to answer questions
	Use data from sensors to answer questions

Computer Science

Programming

Repetition in Shapes	Create a program in a text-based language
	Explain what 'repeat' means
	Modify a count-controlled loop to produce a given outcome
	Decompose a task into small steps
	Create a program that uses count-controlled loops to produce a given outcome
Repetition in Games	Develop the use of count-controlled loops in a different programming environment
	Explain that in programming there are infinite loops and count controlled loops
	Develop a design that includes two or more loops which run at the same time
	Modify an infinite loop in a given program
	Design a project that includes repetition
	Create a project that includes repetition

Computer Systems & Networks

The Internet	Describe how networks physically connect to other networks
	Recognise how networked devices make up the internet
	Outline how website can be shared via the World Wide Web (WWW)
	Describe how content can be added and accessed on the WWW
	Recognise how the content of the WWW if created by people
	Evaluate the consequences of unreliable content

Year 5

Key Knowledge

Systems and Searching	Video Production	Selection in Physical Computing	Flat-File Databases	Introduction in Vector Graphics	Selection in Quizzes
• Computer systems are built using a number of parts. • Computer systems can communicate with other devices. • There are many different types of computer systems all around the world. • In Computing there are protocols between how computers communicate with one another. • The digital information sent from one computer to another is called a 'packet'. • The internet can be used to keep each other updated with new information. • Shared 'cloud' spaces and online drives can allow one or more person to have access to / edit documents.	• Video is made up of a sequence of images shown in quick succession, giving the impression of movement. • Theme, setting, characters, colour, sound and dialogue are all important features of video. • Imovie is an example of an app used to edit videos.				

Information Technology

Creating Media

Video Production	Explain what makes a video effective
	Identify digital devices that can record video
	Capture video using a range of techniques
	Create a storyboard
	Identify that video can be improved through reshooting and editing
	Consider the impact of the choices made when making and sharing a video
Introduction to Vector Graphics	Identify that drawing tools can be used to produce different outcomes
	Create a vector drawing by combining shapes
	Use tools to achieve a desired effect
	Recognise that vector drawings consist of layers
	Group objects to make them easier to work with
	Apply what I have learned about vector drawings

Data and Information

Flat-File Databases	Use a form to record information
	Compare paper and computer-based databases
	Outline how you can answer questions by grouping and then sorting data
	Explain that tools can be used to select specific data
	Explain that computer programs can be used to compare data visually
	Use a form to record information

Computer Science

Programming

Selection in Physical Computing	Control a simple circuit connected to a computer.
	Write a program that includes count-controlled loops.
	Explain that a loop can stop when a condition is met
	Explain that a loop can be used to repeatedly check whether a condition has been met.
	Design a physical project that includes selection
	Create a program that controls a physical computing project
Selection in Quizzes	Explain how selection is used in computer programs
	Relate that a conditional statement connects a condition to an outcome.
	Explain how selection directs the flow of a program
	Explain how selection directs the flow of a program
	Evaluate my program

Computer Systems & Networks

Systems and Searching	Explain that computers can be connected together to form systems
	Recognise the role of computer systems in our lives
	Explain that computers can be connected together to form systems
	Describe how search engines select results
	Recognise why the order of results is important and to whom

Year 6

Key Knowledge

Communication & Collaboration	Web Page Creation	Variables in Games	Introduction to Spreadsheets	3D Modelling	Sensing Movement
• The internet is a useful communication tool with a number of different communication mediums for a range of purposes. • We can find information on the World Wide Web by using search engines such as Google, Bing or Yahoo!. • Search engines use programs known as crawlers to index the World Wide Web. • Searching for some results can bring many millions of results. • We need to make sure our searches are refined and specific in order to allow the search engine to select the information that is most relevant. • Search engines 'rank' the web pages (the highest ranked page is at the top) • Search engines use algorithms to do the above	• A webpage is a hypertext document that is part of the World Wide Web. • Websites are a collection of webpages about the same topic. • Websites are created for a chosen purpose and with a particular audience in mind. • Websites have a navigation path to ensure the user can move across the website with ease. • Navigation paths are also known as breadcrumb trails. • Hyperlinks allow different pages to be linked together. • Website creators must adhere to copyright and fair use of media rules.				

Information Technology

Creating Media

Web Page Creation	Review an existing website and consider its structure
	Plan the features of a web page
	Consider the ownership and use of images (copyright)
	Recognise the need to preview pages
	Outline the need for a navigation path
	Recognise the implications of linking to content owned by other people
3D Modelling	Recognise that you can work in three dimensions on a computer
	Identify that digital 3D objects can be modified
	Recognise that objects can be combined by a 3D model
	Create a 3D model for a given purpose
	Plan my own 3D model
	Create my own digital 3D model

Data and Information

Introduction to Spreadsheets	Create a data set in a spreadsheet
	Build a data set in a spreadsheet
	Explain that formulas can be used to produce calculated data
	Apply formulas to data
	Create a spreadsheet to plan an event
	Choose suitable ways to present data

Computer Science

Programming

Variables in Games	Define a 'variable' as something that is changeable
	Explain why a variable is used in a program
	Choose how to improve a game by using variables
	Design a project that builds on a given example
	Use a personal design to create a project
	Design a project that builds on a given example
Sensing Movement	Create a program to run on a controllable device
	Explain that selection can control the flow of a program
	Update a variable with a user input
	Use a conditional statement to compare a variable to a value
	Design a project that uses inputs and outputs on a controllable device
	Develop a program to use inputs and outputs on a controllable device

Computer Systems & Networks

Communication & Collaboration	Explain the importance of internet addresses
	Recognise how data is transferred across the internet
	Explain how sharing information online can help people to work together
	Evaluate different ways of working together online
	Recognise how we communicate using technology
	Evaluate different methods of online communication