



SAINT JOHN WALL CATHOLIC SCHOOL

A Catholic School For All



Departmental Schemes of Work

Curriculum Intent: “To educate each and every unique child in our care to hear and respond to what God calls them to be”.

KS3 Computing



Genesis 11:6

And the Lord said, “Behold, they are one people, and they have all one language, and this is only the beginning of what they will do. And nothing that they propose to do will now be impossible for them.”

Computing KS3 Programme of Study

Pupils should be taught to:

CS	1	design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
CS	2	understand several key algorithms that reflect computational thinking <i>[for example, ones for sorting and searching]</i> ; use logical reasoning to compare the utility of alternative algorithms for the same problem
CS	3	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 <i>[for example, lists, tables or arrays]</i> ; design and develop modular programs that use procedures or functions
CS	4	understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming;
CS	5	understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers <i>[for example, binary addition, and conversion between binary and decimal]</i>
CS	6	understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
CS	7	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
IT	1	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
IT	2	create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
DL	1	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

SUMMARY

Computational Thinking

Algorithms

Programming

Logic gates

Binary

Hardware, Software, Networking

Data Representation

Creative project

Web Browse effectively

E-safety

KS3 Computing

Computing, Enterprise, Media

Sequencing of topics

Year7

Topic

National Curriculum

1	Digital Literacy	DL1, IT1, IT2
2	Computer Systems (<i>HW, CPU, SW, Networking</i>)	CS6
3	Online Safety (<i>E-safety, Laws & Ethics</i>)	DL1
4	Graphics (Photoshop)	MEDIA, IT2
5	Spreadsheet Modelling	ENTERPRISE, IT1
6	Micro: Bits (<i>physical computing, block based code</i>)	CS3, ROBOTICS

Year8

Topic

National Curriculum

1	Web Development (<i>RocketCake</i>)	MEDIA, IT1, IT2
2	Dragons Den	ENTERPRISE, IT1
3	Python Pt1	CS3
4	Binary Data (<i>Binary, Data rep, Boolean Logic</i>)	CS4, CS5, CS7
5	Python Pt2	CS3
6	Computational Thinking (<i>Inc. searching & sorting algorithms</i>)	CS1, CS2

Calendared assessments

- All topics have 6 lessons including assessment at the end
- Exam style tests completed at the end of each topic.
- Either created and completed using MS Forms or through printed test papers
- When there is a Whole School assessment, questions related to knowledge of all topics taught to date will be included.

Personal Development
(Cross curricular, Jesuit Values, SMSCV, cultural capital)

Year 7	Cross curricular	SJW Values	SMSC	Cultural Capital	Careers
Digital Literacy	English – correctly writing emails and letters using work	Eloquent and Truthful – How can I best use technology to communicate with others?	Social - use social skills in different contexts/people.	Exposure to new systems to communicate with people in a professional fashion.	Office Assistant - https://www.monster.co.uk/advertise-a-job/hr-resources/hr-strategies/job-descriptions/office-assistant-job-description/
Computer Systems (HW, CPU, SW, Networking)	Engineering/Electronics – looking at the components that are used to build a computer and how they interconnect.	Attentive and Discerning – Do I know how computer technology really works?	Spiritual - reflect on their experiences. BAME Industry Leader: Raj Kalia Chief executive, Broadband Delivery UK	Being exposed and getting hands on look at the inside of real computers	IT Technician - https://www.betterteam.com/it-technician-job-description
Online Safety	Psychology/PSHE – knowing what is and is not healthy with regards to mental health in terms of online activity	Compassionate and Loving – How do I talk to others digitally and how does it make them feel?	Spiritual - know/respect others faiths, feelings, values. Moral - right v wrong, legal boundaries of civil and criminal law, understand consequences of their behaviour, views about moral & ethical issues & others views. BAME Industry Leader: Claudia Natanson - Information and cyber security specialist for Security Practitioners	Being made aware of the different digital experiences available but also the dangers of these.	Data Protection Officer - https://resources.workable.com/gdpr-data-protection-officer-job-description
Digital Graphics	Graphics/Art/Media – use of digital image editing software in creative ways to convey a message	Grateful and Generous – can I appreciate the Art work of others?	Spiritual - use imagination/creativity in learning. Cultural - respond positively to artistic, musical, sporting, cultural opportunities	Looking at the digital imagery from artists in different cultures.	Graphic Designer - https://www.truity.com/career-profile/graphic-designer
Spreadsheet Modelling	Maths/Statistics/Business – working with numbers and currency to model scenarios and make business decision	Intentional and Prophetic – Do I know how to manage resources and plan for the future?	Moral - understand consequences of their behaviour	Look at how money has to be managed in the world of work and that it isn't unlimited.	Accountant - https://www.prospects.ac.uk/job-profiles/chartered-accountant
BBC MicroBits (physical)	Maths – looking at comparative operators and	Curious and Active – what can be done with machines and	Spiritual - enjoy learning about themselves, others, world around them	Program robots using and learn about	Robotics Engineer - https://resources.workable.com/robotics-engineer-job-description

computing, block based code)	using numbers for distance and angles	programming in the physical world?	Cultural - appreciate cultural influences of own/others heritage	Britain's computing heritage (BBC Micro).	
------------------------------	---------------------------------------	------------------------------------	---	---	--

Year 8	Cross curricular	SJW Values	SMSC	Cultural Capital	Careers
Web Development (RocketCake)	Media – using interactive media to convey a message to a set audience	Eloquent and Truthful – How can I best use technology to communicate to many others?	Spiritual - use imagination/creativity in learning. Cultural - respect and learn about different faiths and cultural diversity in local/national/global communities	Creativity used when producing websites – site content can be looking at different cultures eg; holidays in other countries	Web Developer - https://www.prospects.ac.uk/job-profiles/web-developer
Dragons Den	Business – developing an idea for a product using market research Drama – pitching the product to a target audience	Faith-filled and Hopeful – How can I have faith in my own ability and fill an audience with optimism.	Social - use social skills in different contexts/people.	Having a industry expert in (or virtually) to speak to pupils about the business world and their experiences. Business is beyond the KS3 National Curriculum.	Entrepreneur - https://www.prospects.ac.uk/jobs-and-work-experience/self-employment/what-is-an-entrepreneur
Python Pt1 (basic) & Python Pt2 (advanced)	Maths – looking at comparative operators and using numbers, addition, subtraction, multiplication, division, decimals, variables	Learned and Wise – What can I use from prior learning to help with new learning? Learned and Wise – How can I extend new learning to make me a more efficient programmer?	Spiritual - reflect on their experiences.	Having professional programmer in (or virtually) to speak to pupils about programming projects in industry.	Programmer - https://www.truity.com/career-profile/computer-programmer
Binary Data (Binary, Data rep, Boolean Logic)	Maths – looking at comparative operators and using numbers, addition Electronics – using logic circuits to test Boolean equations	Curious and Active – how is the physical world translated to the digital world	Spiritual - enjoy learning about themselves, others, world around them	Create electronic circuits to see logic gates in action. Learn about Britain's computing heritage (Boole).	Computer Engineer - https://www.betterteam.com/computer-engineer-job-description

Computational Thinking (Inc. searching & sorting algorithms)	Maths – looking at comparative operators and using numbers, addition, division	Attentive and Discerning – How do algorithms fit in the wider world? How can we discern the most efficient way to complete a task?	Spiritual - reflect on their experiences. Cultural - appreciate cultural influences of own/others heritage BAME Industry Leader: Anne-Marie Imafidon - chief executive and co-founder, Stemettes	Learn about Britain’s computing heritage (Lovelace).	Computer Scientist - https://targetjobs.co.uk/careers-advice/job-descriptions/454127-computer-scientist-job-description
--	---	---	--	--	--

Progression model

Over the 2 year Curriculum:

Topic	What knowledge will pupils develop? <i>(Including key terminology)</i>	What skills will pupils develop? <i>(Including literacy & Numeracy)</i>
Digital Literacy	login, folder structure, documents, web browser, email, send/receive/subject/attachment/inbox MS teams, MS Word, MS PowerPoint. formatting	Log in to the network, use their email and MS teams, create a folder structure, be able to effectively use word and PowerPoint (LIT)
Computer Systems	Input/Output Device, Storage device, Hardware, CPU, RAM, Motherboard, Hard drive, Software, operating system, applications, Networking, hub, ethernet cable, wifi, router modem, www, internet, LAN, WAN, packets, IP, server	Explain different hardware of a computer, explain the purpose of the OS v applications. Explain the components of a network. Explain the difference between the www and the internet
Online Safety	E-safety, Cyberbullying, Predators, Sexting, Social Media, Spam and Viruses, CEOP, ThinkUknow, digital footprint	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
Digital Graphics	Photoshop, JPEG, BITMAP, graphic, copyright, creative commons, tools, fade, quality, crop, hue/saturation, colour balance, brightness/contrast, gradient, filter, canvas, layers	Follow the different copyright laws. Source high quality images, use Adobe Photoshop and its various tools to edit, manipulate and combine digital images (NUM)
Spreadsheet Modelling	Spreadsheet, row, column, cell, table, cell range, formatting, formulae, function, sort, filter, Graphs, Charts, condition formatting, data dashboard, tab	Effectively use MS Excel to create spreadsheets for collecting and analysing data and producing a data dashboard utilising charts and graphs (NUM)

Micro: Bits	BBC Micro:bits, block based code, If, Else, Variable, subprogram, rover, output, LED, Circuit	Using block based code (LIT/NUM) to programme a BBC micro bit to serve various purposes, eg a small game, a compass, a sign. Combine the micro:bits with rovers to be able to code and control the rovers movement.
Website Design	Dreamweaver, site, webpage, HTML, CSS, header, footer, Navigation, buttons, image, layout, embed, hyperlink, form	Effectively use Adobe Dreamweaver to create a linked multi page website using a variety of sourced content for an intended audience and purpose.
Dragons Den	Enterprise, generate ideas, entrepreneurs Unique Selling Point, customers, competitors Marketing, tagline, product name, Media and Advertising, Investors, Presenting and pitches	Conduct market research, design a product, consider competitors and how to bring the product to market. Create a presentation and pitch the product (LIT)
Python Basic	Python, IDLE, variable, data type, print, input, math operators, if, elif, else, data type,	Basic the programming techniques listed using Python and GUI IDLE. (LIT/NUM)
Python Advanced	While loops, For loops, l, Arrays, index, element, length, Procedures, parameters, call/define.	More advanced the programming techniques listed using Python and GUI IDLE. How to create a text based quiz/game using all python techniques learnt. (LIT/NUM)
Binary Data	Binary, base 2, denary, binary addition, overflow error, Data representation, digital sound, Boolean Logic, and/or/not gates logic circuit.	How to convert between binary and denary numbers and binary addition. Creating bitmap images and converting audio sound to digital recordings. Creating logic gate circuits (NUM)
Computational Thinking	Abstraction, decomposition, searching & sorting algorithms. Binary search, linear search, merge sort, bubble sort, insertion sort, bucket sort. Flowcharts	Explain how real word problems are tackled by computers such as searching and sorting algorithms. How algorithms can be show as a flowchart. circuits (NUM)

Development homework

Pupils will sign up to the **iDEA award**. An online platform that allows pupils to complete mini courses and achieve digital badges for improving their digital skills. Specific badges will be pointed to that relate to current classwork but pupils can also complete badges at their own speed. Enough badges can earn the pupils a bronze award and with enough they can achieve the silver award.

<https://idea.org.uk/>

