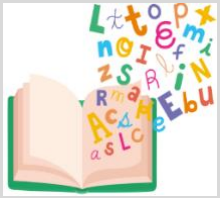
TJS Computing Curriculum

Together Everyone Achieves More

"Technology is best when it brings people together."
Matt Mullenweg

Our Computing curriculum equips pupils with the knowledge and skills to thrive in a digital world. Through a carefully sequenced programme, children learn to understand and apply the principles of computer science, develop computational thinking, and become confident, responsible users of technology. We foster creativity, problem-solving, and resilience, ensuring pupils can design, create, and evaluate digital solutions while understanding the impact of technology on society.

Our computing curriculum encompasses the five key curriculum drivers in the following ways:

Numerate	Literate	Articulate	World Wise	Aspirational
				
Pupils apply logical reasoning and pattern recognition in algorithms and programming. They use data handling and computational models to solve problems.	Children develop precise language for coding and digital communication. They write clear instructions, comments, and explanations for programs and digital content.	Pupils present ideas confidently through digital media, explaining processes and solutions orally and in writing. They collaborate effectively online and in person.	Learners explore how technology shapes global communication, commerce, and culture. They understand digital citizenship and ethical use of technology.	We prepare pupils for future careers in STEM and digital industries, inspiring innovation and creativity through real-world projects and coding challenges.

Substantive Concepts		
Computer Systems and Networks	**Programming and Algorithms**	**Data and Information**
Understanding what a computer system is, how components work together, and how networks enable communication	Knowing what an algorithm is, understanding sequence, selection, and repetition, and debugging code.	Collecting, organising, and representing data; understanding the difference between data and information.
Digital Media	**Computing Systems in the Real World**	**Online Safety and Digital Citizenship**
Creating, editing, and combining digital content responsibly.	Exploring the impact of technology on society and daily life.	Staying safe online, protecting personal information, and using technology ethically.

National Curriculum 2014
Design, write and debug programs to 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** on a range of digital devices to design and create 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.
Second order (disciplinary) concept development - throughout the year
▪ **Abstraction** Focusing on the important details and ignoring unnecessary complexity. ▪ **Algorithmic Thinking** Breaking down tasks into step-by-step instructions. ▪ **Decomposition** Splitting a complex problem into smaller, manageable parts. ▪ **Logical Reasoning** Predicting and explaining what a program will do. ▪ **Evaluation** Judging the effectiveness and efficiency of a solution. ▪ **Pattern Recognition** Identifying similarities in problems or data.

Our Computing Curriculum

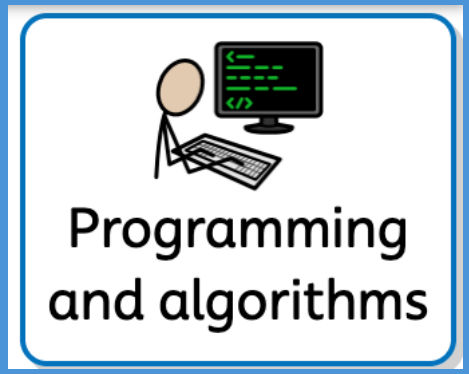
	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 3	**Computer Networks** N/C 2.2 Programming and coding 2.4 Computer systems 2.6 Creating media	**Programming sequences using sound** LAPTOPS - SCRATCH N/C 2.1 Algorithms 2.2 Programming and coding 2.3 Data and information 2.6 Creating media	**Stop frame animation** IPADS - Camera N/C 2.6 Creating media	**Organising data using databases** LAPTOPS - Oak Academy Websites N/C 2.6 Creating media	**Desktop publishing** LAPTOPS - Microsoft Office N/C 2.5 Networks & communications 2.6 Creating media	**Events and actions in programmes** LAPTOPS- SCRATCH N/C 2.1 Algorithms 2.2 Programming and coding 2.3 data and information 2.6 Creating media
Year 4	**Repetition in programmes** LAPTOPS - LOGO N/C 2.1 Algorithms 2.2 Programming and coding 2.3 Data and information 2.6 Creating media	**Using repetition in programming to create a game** LAPTOPS- SCRATCH N/C 2.1 Algorithms 2.2 Programming and coding 2.3 data and information 2.6 Creating media	**Photo editing** LAPTOPS- SCRATCH 2.5 Networks & communications 2.6 Creating media 2.7 Digital literacy and online safety	**Data logging** LAPTOPS - MICRO:BITS 2.2 Programming and coding 2.6 Creating media	**Audio production** IPADS - GARAGE BAND 2.5 Networks & communications 2.6 Creating media 2.7 Digital literacy and online safety	**The Internet** 2.4 Computer systems 2.5 Networks & communications 2.6, Creating media 2.7 Digital literacy and online safety
Year 5	**Introduction to computer systems** 2.1 Algorithms 2.2 Programming and coding 2.4 Computer systems 2.6 Creating media 2.7 Digital literacy and online safety	**Video production** IPADS - Cameras LAPTOPS - OPENSHOT VIDEO EDITOR 2.5 Networks & communications 2.6 Creating media 2.7 Digital literacy and online safety	**Exploring selection in physical computing** LAPTOPS - Crumble 2.1 Algorithms 2.2 Programming and coding 2.3 Data and information 2.6 Creating media	**Flat file databases** LAPTOPS - Oak Academy Websites 2.5 Networks & communications 2.6 Creating media	**Introduction to vector graphics** **LAPTOPS - VECTR** PROGRAMMES 2.6 Creating media	**Using selection in programming to develop a quiz** LAPTOPS- SCRATCH 2.1 Algorithms 2.2 Programming and coding 2.3 Data and information 2.6 Creating media
Year 6	**Communication and the internet** 2.1 Algorithms 2.4 Computer systems 2.5 Networks & communications 2.6 Creating media 2.7 Digital literacy and online safety	**3D modelling** LAPTOPS - TINKERCAD 2.6 Creating media 2.7 Digital literacy and online safety	**Using variables in programming to develop a game** LAPTOPS - SCRATCH 2.1 Algorithms 2.2 Programming and coding 2.3 Data and information 2.6 Creating media	**Introduction to spreadsheets** LAPTOPS -EXCEL 2.6 Creating media	**Web-page creation** LAPTOPS - Oak Academy Websites 2.5 Networks & communications 2.6 Creating media 2.7 Digital literacy and online safety	**Sensing movement with physical computing** LAPTOPS - MICRO: BITS 2.1 Algorithms 2.2 Programming and coding 2.3 Data and information 2.6 Creating media

Substantive Concepts: Threads Through Our Curriculum

Computer Systems and Networks is about investigating:

- How devices, systems, and networks connect and communicate to share information.
- The role of the internet in linking systems globally and enabling data transfer.
- How protocols and security measures keep information safe and ensure reliable communication.

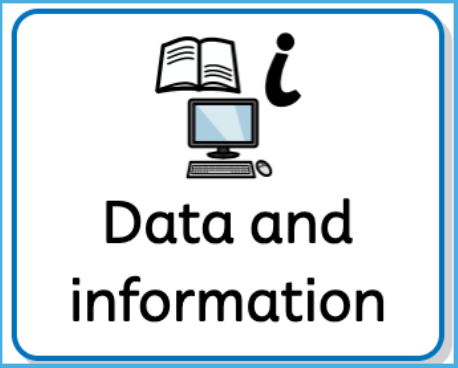
Key question to thread this concept across the topic:
How does understanding computer systems and networks help us connect and communicate effectively in a digital world?



Programming and Algorithms is about investigating:

- How algorithms provide step-by-step solutions to problems and why precision matters.
- The way programming languages turn algorithms into executable instructions for computers.
- How patterns, loops, and conditions make programs efficient and adaptable.

Key question to thread this concept across the topic:
How does understanding algorithms and programming help us solve problems and create useful solutions?



Data and Information is about investigating:

- How data can be collected, organised, and represented in different ways to make sense of information.
- The importance of accuracy and reliability when gathering and interpreting data.
- How data is used to answer questions, solve problems, and support decision-making.

Key question to thread this concept across the topic:
How does understanding data and information help us make sense of the world and communicate ideas clearly?

Digital media

Digital Media is about investigating:

- How digital tools allow us to design, create, and edit content across different formats such as images, audio, and video.
- The importance of making purposeful choices to communicate ideas effectively through digital media.
- How combining creativity with technical skills can produce engaging and meaningful digital products.

Key question to thread this concept across the topic:
How does using digital media creatively help us share ideas and express ourselves in powerful ways?

Computing systems in the real world

Computing Systems in the Real World is about investigating:

- How computing systems are embedded in everyday devices and processes, from household technology to global infrastructure.
- The ways these systems interact with humans and other systems to perform tasks and solve problems.
- How understanding real-world applications of computing helps us design solutions that are efficient, safe, and purposeful.

Key question to thread this concept across the topic:
How does recognising computing systems in the real world help us understand and shape the technology we use every day?

Online safety and digital citizenship

Online Safety and Digital Citizenship is about investigating:

- How to stay safe and protect personal information when using digital devices and online platforms.
- The importance of respectful, responsible behaviour when communicating and collaborating online.
- How understanding risks such as cyberbullying, scams, and misinformation helps us make smart choices.

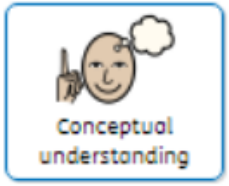
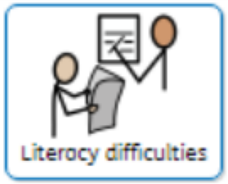
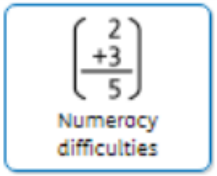
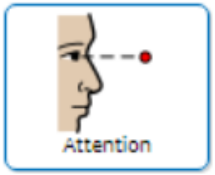
Key question to thread this concept across the topic:
How does practising online safety and digital citizenship help us use technology confidently and responsibly?

Computing and SEND

Any adaptations to the Computing curriculum should be based on pupils' individual needs. These adaptations should focus on **how the subject is taught rather than reducing the core concepts and skills** pupils are expected to learn. This is because exposure to key ideas such as algorithms, systems, and digital literacy is essential for progression.

Reducing the curriculum can limit pupils' ability to develop confidence and independence with technology and should be avoided. Instead, adaptations should include **scaffolding for problem-solving and practical tasks**, visual supports for processes and vocabulary, and strategies to reduce unnecessary demands on working memory. Supporting pupils to access key computing concepts and apply them in meaningful contexts will ensure they can participate fully and make sustained progress.

Area of need	Adaptive practice
	▪ Begin each lesson with a **review of previous key terms** (e.g., algorithm, program, input/output). ▪ Use **visual word banks** with icons for all new vocabulary. ▪ Refer to key computing vocabulary throughout the lesson and link to other subjects (cross-curricular connections). ▪ Create **interactive displays** with computing keywords and diagrams. ▪ Provide additional opportunities for **verbal reasoning** through short explanation tasks. ▪ Use **talk scaffolds** (sentence starters like *The algorithm works because…*, *I predict the output will…*). ▪ Include **diagrams and real-world examples** for concrete understanding.

	▪ **Pre-teach tricky concepts** (e.g., loops, variables, networks) in small groups. ▪ Use **dual coding** (word + image + flowchart) for algorithms and processes. ▪ Provide **worked examples** for debugging and program design. ▪ Connect new learning to previous units (e.g., sequencing → repetition → variables). ▪ Use **graphic organisers** for program structure and system diagrams. ▪ Incorporate **stories or scenarios** to explain computing concepts (e.g., how data travels across a network). ▪ Use **physical artefacts or props** for unplugged activities (cards for algorithms, role-play as devices). ▪ Discuss **common misconceptions** (e.g., "computers think", confusion between hardware and software). ▪ Offer **immersive experiences** (coding challenges, virtual tours of data centres). ▪ Enable **non-writing activities** (sorting commands, matching symbols, oral quizzes).
	▪ Provide **visual word banks** and personalised icon cards during input. ▪ Use **oracy-based activities**: pair programming discussions, explain-your-code tasks. ▪ Offer **choice of outcomes** (speaking, drawing flowcharts, recording explanations on iPad). ▪ Encourage **collaborative learning** (paired debugging, group problem-solving). ▪ Scaffold reading with **accessible code snippets** or teacher-read walkthroughs. ▪ Use **sentence starters** for explanations (*The loop repeats because…*, *The variable stores…*).
	▪ Explicitly teach **numbers and logic** using scaled visuals (e.g., number lines for loops, flowcharts for decisions). ▪ Use **timelines or sequences** for ordering steps in algorithms.
 	▪ Establish **clear routines** for logging in and starting tasks. ▪ Organise workspaces with **visual task planners** (step-by-step coding checklist). ▪ Use **stimuli** (short videos, props) to maintain engagement. ▪ Provide **movement breaks** (unplugged computing games like "Human Algorithm"). ▪ Chunk learning into **short, manageable tasks**. ▪ Give **pre-exposure to resources** (sample code, vocabulary cards). ▪ Provide **countdowns for transitions** (e.g., moving from unplugged to coding activity).

Assessment Assessed after each unit using Insight						
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.	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 programs, systems and content that accomplish given goals, including colleting, analysing, evaluating and presenting data and information.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviours; identify a range of way to report concerns about content and contact.
Y3 Units 2 & 6 **Y4** Units 1 & 2 **Y5** Units 3 & 6 **Y6** Units 3 & 6	**Y3** Units 2 & 6 **Y4** Units 1 & 2 **Y5** Units 3 & 6 **Y6** Units 3 & 6	**Y3** Units 2, 3 & 6 **Y4** Units 1 & 2 **Y5** Units 1, 3 & 6 **Y6** Units 3 & 6	**Y3** Units 1 & 5 **Y4** Unit 6 **Y5** Units 1 & 2 **Y6** Unit 1	**Y3** Units 1 & 4 **Y4** Units 3 & 6 **Y5** Units 1 & 2 **Y6** Units 1 & 5	**Y3** Units 2, 3, 4, 5 & 6 **Y4** Units 1, 2, 3, 4 & 5 **Y5** Units 2, 3, 4, 5 & 6 **Y6** Units 2, 3, 4, 5 & 6	**Y3** Units 1 & 5 **Y4** Units 3, 5 & 6 **Y5** Units 1, 2 & 4 **Y6** Units 1 & 5