UNIT OVERVIEW & LEARNING JOURNEY

YEAR 8 – COMPUTING: TERM 1 (2nd half term)

COMPUTING SYSTEMS

Welcome, incredible thinkers! Get ready to embark on an amazing adventure into the heart of computers with our "Computing Systems" unit. Have you ever wondered what makes your games run, your apps work, or how your computer knows what to do? In this unit, we're going to pull back the curtain and discover the secrets inside every computing system!

We'll take a tour through all the different layers: from the programs you use every day, to the 'brain' (the operating system) that controls everything, all the way down to the tiny physical parts that store and run these programs. We'll even peek at the super-basic building blocks (binary digits!) that make it all possible.

This unit will give you a clear picture of how computers work, without getting lost in tricky details. Plus, we'll explore exciting modern topics like artificial intelligence (AI) and open-source software, seeing how they connect to everything you're learning. Get ready to become a true computing systems explorer!

Your artist's toolkit: What you'll learn and achieve

What I Already Know! (My Digital Superpowers from before!)	New Adventures This Term! (What We'll Learn!)	Where We're Heading Next! (Your Future Digital Journey!)
How to use general digital devices and run apps	Recall that a general-purpose computing system runs programs.	Dive deeper into programming languages and software development.
You understand that programs follow instructions	Explain the difference between a general-purpose computer and a device made for just one job	Design and build your own simple computing systems or robots
You've used networks (like Wi-Fi) and may know about data representation from Year 7	Describe what each part of a computer does (like processor, memory, storage)	Explore advanced topics like cybersecurity and data science
You might have played games like Noughts and Crosses	Explain how computer parts work together to run programs	Understand the ethical impacts of advanced technology like AI
	Identify that all computing systems have a similar basic structure	Discover more about different operating systems and how they work.
	Define what an operating system is and its role in controlling programs	Create more complex logic circuits and digital designs
	Describe the NOT, AND, and OR logical rules and how they form expressions	Explore careers in computing systems, AI, and software engineering
	Use logic gates to build simple circuits and connect them to logical rules	Understand how computer hardware is designed from basic building blocks
	Describe how hardware is built from increasingly complex logic circuits	
	Recall that data and instructions are represented using binary digits (0s and 1s)	
	Provide broad definitions for Artificial Intelligence (AI) and Machine Learning (ML)	
	Identify real-world examples of AI and ML and how they differ from traditional programming	

Weekly missions: Developing your computing superpowers

Week 1: Get in Gear - Discover what makes computing systems so special			
Skills:	**Key words:**		
• Recall that a general-purpose computing system is a device that runs programs • Explain the difference between a general-purpose computer and a device made for just one specific job • Recall that a program is a list of instructions that tell a computer what to do with data	Computer | System | Device | Program | Software | Instructions		
RAG rate your confidence with this lesson	:(	:|	:)
Week 2: Under the Hood - Explore the physical components that make up a computer			
Skills:	**Key words:**		
• Describe what each hardware component does in a computer system • Describe how these hardware parts work together to run programs • Recall that all computers have a similar basic structure	Computer | System | Device | Program | Instructions | Data | Hardware | Processor | Memory | Storage | Communication | Input | Output | Architecture		
RAG rate your confidence with this lesson	:(	:|	:)
Week 3: Orchestra Conductor - Learn how the operating system manages everything inside your computer			
Skills:	**Key words:**		
• Understand how computer hardware components work together to run programs • Define what an operating system is and its role in controlling how programs run	From previous lesson and Operating system		
RAG rate your confidence with this lesson	:(	:|	:)
Week 4: It's Only Logical - Start your very own open-ended vector graphics project, choosing what you want to create.			
Skills:	**Key words:**		
• Describe the NOT, AND, and OR logical rules and how they are used to form logical expressions • Use logic gates to build simple logic circuits and connect them to logical rules • Describe how computer hardware is built from increasingly complex logic circuits • Recall that both data and instructions need to be represented using binary digits (0s and 1s)	Logical operators (NOT, AND, OR) | Logical expressions | Truth values (true, false) | Truth tables | Logic gates | Logic circuits | Hardware components		
RAG rate your confidence with this lesson	:(	:|	:)
Week 5: Thinking Machines - Explore what Artificial Intelligence is and its impact on the world			
Skills:	**Key words:**		
• Provide broad definitions for Artificial Intelligence (AI) and Machine Learning (ML) • Identify examples of AI and ML in the real world • Describe how machine learning is different from traditional programming • Connect the use of AI with moral dilemmas	Artificial intelligence | Machine learning | Data |Training | Testing | Programming		
RAG rate your confidence with this lesson	:(	:|	:)
Week 6: Sharing & Quizzing - Test your knowledge and learn about sharing computer code			
Skills:	**Key words:**		
• Explain the important ideas behind sharing program code (like open-source software) • **Completing an end-of-unit assessment on Microsoft Forms**	Free and open-source software		
RAG rate your confidence with this lesson	:(	:|	:)