Year 5 Teach Computing - Computing systems and networks – Connecting computers

Year 5 Teach Computing - Computing systems and networks – Systems and searching

In year 3, the Teach Computing scheme introduced children to what digital devices are, what a network is, and built up their familiarity with technical terminology such as input/output. They also briefly learned about network hardware such as switches and routers; this was explored in more depth in year 4 to reinforce this learning. In this year's unit, learners develop their understanding of computer systems and how information is transferred between systems and devices. Learners consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Learners discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines. All lesson plans and resources can be found here: https://teachcomputing.org/curriculum/key-stage-2/computing-systems-and-networks-sharing-information (login needed).

Adaptive teaching – Recommended tried and tested practise in these lessons:

Due to the nature of Computing lessons and the common 'firefighting' required in lessons with technical issues or children who are individually confused over what may be considered small stumbling blocks, it is recommended that teachers put time and effort into reinforcing the use of school-wide learning ethos and systems (for example, the use of the 4B's – brain, board, buddy, boss) to encourage children to try to solve their problems in the right way rather than going straight to the teacher, or lessons will quickly become unmanageable. It is also recommended to follow our school's use of the Rosenshine model of mastery teaching strategy and teach lessons in a series of stages, with short, simple tasks being set, and children who finish early can be given encouragement to support and 'lifeguard' other students. This has twofold benefits; the process of teaching others cements and secures pupils' own mastery as well as ensuring the teacher isn't overwhelmed with personal requests for help. If one-to-one support is unavailable for high need children, it is a good idea to make sure these children are sat next to or near a higher ability student who may act as peer support for them, and these children are monitored carefully throughout lessons to ensure they stay on task and understand each objective given. Ensure that any hardware support that is required for individual's SEND requirements are adjusted appropriately and are tied to those students' individual log ins (e.g. Zoom tools or screen tints for students with visual impairments etc). Teachers should have a knowledge of Pupil Premium children, particularly those who have been seen to struggle in Computing lessons, and these children should be monitored alongside those with SEND during lesson time to help ensure they access lessons along with the rest of the class.

Knowledge covered:

NC-	Ladders Objectives
(2.1) Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	Y5 - CS1 - I can use a range of sensing tools (e.g. within programs such as Scratch) to control what happens (e.g. based on the positions of the sprite, mouse position or inputs such as sound level). Y5 - CS2 - I can recognise an error in a program, debug the program and explain the changes I have made. **Y5 - CS3 (KPI)** - I recognise the need to test and retest whilst a program is being developed. Y5 - CS4 - I understand why it may be useful to simplify a program as much as possible (e.g removing unnecessary code or using a REPEAT instruction) Y5 - CS5 - I understand that any system requires input devices (e.g. keyboard) and output devices (e.g. printer). Y5 - CS7 - I understand what decomposition and abstraction are
(2.2) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	
(2.3) Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	
(2.4) 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.	**Y5 - CS6 (KPI)** - I understand that computers can be linked together to create a network and that this can help me working with others online (collaboration) Y5 - CS8 - I can explain that computers can be connected together to form systems Y5 - CS9 - I can recognise the role of computer systems in our lives
(2.5) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	
(2.6) 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.	

(2.7) Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	

Medium Term Lesson Plan:

Lesson 1	Systems L.I I can explain that computers can be connected together to form systems **Y5 - CS6 (KPI)** Y5 – CS8 Y5 - CS9	S.C: I can explain that systems are built using a number of parts I can describe the input, process, and output of a digital system I can explain that computer systems communicate with other devices	Key Questions: *Prior knowledge* What do you think the word 'system' means? Where have you heard this word before? What do you think makes something a system? What could this toy's input/output be? (Reminder of last year's new vocabulary from this unit)	Learners are introduced to the concept of a system. They begin to understand that components can work together to perform a task. Finally, learners explore how digital systems can work and learn about physical and electronic connections. Introduction: You can record learners' initial understanding of 'system', which can be revisited later to show the growth in the learners' understanding. Activity 2: Learners can demonstrate their understanding of input and output devices as introduced in Year 3 – 'Connecting computers'. Activity 3: Learners can show their understanding of the different steps that make up a system.
Lesson 2	Computer Systems and Us L.I I can recognise the role of computer systems in our lives **Y5 - CS6 (KPI)** Y5 – CS8 Y5 - CS9	S.C: I can identify tasks that are managed by computer systems I can identify the human elements of a computer system I can explain the benefits of a given computer system	Key Questions: *Prior knowledge* In the previous lesson, how were computers used in the 'Smart Locker' system? How are computers used in the 'puffin crossing' system? How are these systems different from other types of crossing you?	Learners consider how larger computer systems work. They see how devices and processes are connected, and reflect on how computer systems can help them. Introduction: Learners can revisit the term 'system' from Lesson 1. Activity 1: Learners can show their understanding of sensors in a computer system and their understanding of how these systems affect those who use them. Activity 2: Learners are encouraged to break a larger process down into small steps, and can show their understanding of what must come before and after, to ensure all the parts work together. Plenary: Learners can show that they recognise the impact of computer systems on humans.