

Year 3 Teach Computing - Computing systems and networks – Connecting computers

Although it was felt that the Purple Mash scheme of work (at the time of writing) contained some questions and references to the ways in which technology works, these key areas of learning were not outlined as specific learning intentions that underpinned entire lessons. As such, we looked elsewhere for a scheme of work that could provide this sequence of learning and ensure that it was accessible enough for the children introduce these ideas at a young age. The Teach Computing Scheme of work does provide an excellent sequence of learning in this area, with a progressive build-up of skills and knowledge throughout. Their lessons are easy to follow, and introduce vocabulary to the children at a pace they can absorb, with a number of entertaining activities within them which prevent this topic from becoming too dry and factual. In the year 2 Information Technology Unit (which follows the Teach Computing: Computing Systems and Networks – IT around us) children learn what Information Technology is, they recognise IT in and beyond school and discuss the benefits that the role of IT plays in the wider world. Pupils will have discussed the nature of networks and how computers connect to the Internet lightly in KS1 (Unit 2.5 *Effective searching*), but the content covered in the below lessons will provide them with a much firmer grounding and understanding of what these things are and how they work. Teachers should anticipate classes to initially have some knowledge of this content, but new vocabulary will need to be constantly revisited and reviewed throughout the unit. All lesson plans and resources can be found here: <https://teachcomputing.org/curriculum/key-stage-2/computing-systems-and-networks-connecting-computers> (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	
(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.	Y3 - IT2 - I understand that appropriate messages can be sent digitally (via e-mail).
(2.5) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Y3 - IT3 - I can use an appropriate search engine effectively.
(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.	Y3 - IT1 (KPI) - I can communicate my ideas well using the right software and formats. Y3 - IT4 - I can use software to collect and present data in a way that is easy to understand. Y3 - IT5 - I can create a presentation that is easy to understand and that is interesting.

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(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	L.I I can explain how digital devices function Y3 - IT1 (KPI) Y3 – IT2 Y3 - IT3 Y3 – IT4 Y3 - IT5	S.C: I can explain that digital devices accept inputs I can explain that digital devices produce outputs I can follow a process	Key Questions: *Prior knowledge* What do these things have in common? (Show a range of digital devices) How can the word 'input' be broken up into pieces to help us understand what it means? What about output? What is the <i>process</i> in this <i>input/output</i> machine?	Examine learners' prior knowledge and determine whether they can identify digital devices. Ask them how they would sort objects into two groups (digital/non-digital) Children complete a range of input/process/output machines to get children to become familiar with the new vocabulary. Lots of repetition throughout and encouragement from the teacher for children to use the new terms they've learned when explaining their answers.
Lesson 2	L.I I can identify input and output devices Y3 - IT1 (KPI) Y3 – IT2 Y3 - IT3 Y3 – IT4 Y3 - IT5	S.C: I can classify input and output devices I can describe a simple process I can design a digital device	Key Questions: *Prior knowledge* What is this digital device? What does it do? What is its input/process/output? Is this an 'input' device, an 'output' device, both or neither? What is a <i>process</i>?	Knowledge review from last lesson for the first half of the lesson – refamiliarise the children with the new terminology and practise using it by discussing and sorting different digital objects. Children design their own digital device. They then highlight all digital devices mentioned in a passage of text.
Lesson 3	L.I To recognise how digital devices can change the way that we work Y3 - IT1 (KPI) Y3 – IT2 Y3 - IT3 Y3 – IT4 Y3 - IT5	S.C I can explain how I use digital devices for different activities I can recognise similarities between using digital devices and using non-digital tools I can suggest differences between using digital devices and using non-digital tools	Key Questions: *Prior knowledge* - What can you use a digital device for? - How did you feel about doing the activities? - Which method did you prefer? - Which bits did you find easier or harder in each activity? - How did you fix mistakes in each activity? - What input devices did you use? - Do you think all artists would use a computer if they had access to one? - Do you need to be good at using a computer in order to produce good art?	Assess whether learners can identify the capabilities of digital device – activity, explaining what can be done on different devices. Assess learners' understanding of the similarities and differences between digital devices and non-digital tools. Children to reproduce digitally a piece of artwork they've done in class. Assess whether learners can articulate the differences between producing art digitally and non-digitally and explain which they prefer. Children review and assess differences and benefits/challenges of different media.
Lesson 4	L.I I can explain how a computer network can be used to share information Y3 - IT1 (KPI) Y3 – IT2	S.C I can recognise different connections I can explain how messages are passed through multiple connections	Key Questions: *Prior knowledge* - What do you think the word 'connection' means? - What is a network?	Assess learners' understanding of connections and how information can flow between connections – activity to show links between themselves and others.

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	Y3 - IT3 Y3 – IT4 Y3 - IT5	I can discuss why we need a network switch	• Is this a good way to share information? • How is the network working? • What is working well? • What is frustrating? • What is a connection? • How can we share information effectively between connections? • What does a network switch do?	Assess learners' feedback on the method of sharing information explored in this activity – children pass on paper messages around the classroom. Evaluate learners' answers in the 'think, pair, share' activity. Introduces new vocabulary - a network switch
Lesson 5	L.I I can explore how digital devices can be connected Y3 - IT1 (KPI) Y3 – IT2 Y3 - IT3 Y3 – IT4 Y3 - IT5	S.C I can recognise that a computer network is made up of a number of devices I can demonstrate how information can be passed between devices I can explain the role of a switch, server, and wireless access point in a network	Key Questions: *Prior knowledge* • In the 'class network' we made last lesson, what were the problems with it? • How did a 'network switch' help it? • Which computers can access a file stored on the server? • Would it matter if computer 1 was now switched off? • Where is the file now? Answer: Saved on the server. • Which computers can access a file on the server? Answer: Any computers connected to the network. • Would it matter if computer 1 was now switched off? Answer: No, because other computers can still access the file on the server.	Assess learners' understanding of how information flows around a network through a switch – activity to build a small network using a small group of children, then add in new 'computers' one at a time. Assess learners' understanding of the function of a server – activity 2 introduces a server and explains why one is beneficial. Assess learners' understanding of wireless connections in a network – activity 3 introduces wireless access points. Key teaching point: A Wi-Fi connection is not an Internet connection; it's just a wireless way of connecting to a network.
Lesson 6	L.I I can recognise the physical components of a network Y3 - IT1 (KPI) Y3 – IT2 Y3 - IT3 Y3 – IT4 Y3 - IT5	S.C I can identify how devices in a network are connected together I can identify networked devices around me I can identify the benefits of computer networks	Key Questions: *Prior knowledge* • What is a switch/server/wireless access point? • What kind of tasks does the school computer network let learners and staff members do? • Why is it useful for more than one person to be able to access information in school?	Assess whether learners can explain the benefits of computer networks – activity 1. Assess whether learners can identify real-world network devices – activity 2, tour the school to find key components of the computer network. Assess whether learners can explain how different components are connected with one another in a computer network – activity 3, mapping the school network Plenary explains how the Internet is simply a connection of all networks together.