

<u>Strand</u>	<u>Program of Study</u>	<u>LI and SC</u>	<u>Activity Suggestions</u>	<u>Learning Outcome – By the end of this unit children should be able to...</u>
ICT	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	<ul style="list-style-type: none"> ● See separate sheet 	To be taught cross-curricularly e.g. making an animation in Literacy or making a table with animal information in Science	<ul style="list-style-type: none"> ● See separate sheet
What are Computers?	recognise common uses of information technology beyond school	LI: to recognise computers and understand what they do I must remember: ○ A computer is a device that performs a range of functions according to how it is programmed.	Show a range of devices which have a 'computer' inside of them e.g. SatNav, mobile phone, iPad include some less common things like a level crossing or automatic doors, and ask children how the objects know what we want - this can lead to inputs Use something like a Makey Makey as an example that anything can be an input as long as the computer is told what to do	<ul style="list-style-type: none"> ● I can explain and use a range of input and output devices. ● I can understand that a computer receives input through a circuit ● I know how programs specify the function of a general purpose computer. ● I can discuss what might be inside devices e.g. a microphone/camera inside a mobile phone ● I know the difference between data and information
Algorithms	understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	LI: to know that algorithms are a set of instructions for a computer I must remember: ○ To think carefully about the order of instructions ○ That I can repeat a set of instructions using a loop	Children write a set of instructions (can just be how to walk from their space to the classroom door!) for a simple task making sure they are clear and specific. Children then 'read' their program as someone acts out their instructions - if they're incorrect then they need to 'debug' the system. Inefficient systems might take you on a longer route whilst still getting you there in the end. Teacher could model this and ask children to improve. Compare to 3 stars on a game like 'Angry Birds' - has to be efficient Sorting and searching algorithms are similar to games such as the Tower of Hanoi. There are some good unplugged activities to start discussions.	<ul style="list-style-type: none"> ● I can plan a more complex algorithm using a flowchart ● I can write an algorithm for a task using loops and selection ● I can debug my algorithm after testing it ● I can discuss sort and search algorithms ● I can evaluate the efficiency of an algorithm
Programming	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	LI: To program a computer I must remember: ○ A computer will only do what it has been programmed to do ○ To break instructions down into small steps ○ Programs run in order from start to finish	Children look at a simple program (shouldn't be software specific - could be Probot instructions, Scratch and Wedo; could be a carousel) and discuss what they think it does. Explore making changes and running it to see if they're correct! Start with an obstacle course - it's too complicated to write instructions for everything at once. Start with the first obstacle how are you going to navigate that? Recreate this with a computer program either using Probots or Scratch (differentiation) Use aspects in real life for repeats such as dancing or making music Explain to the children what your program does and run it, when it does something different ask them to investigate why - this is debugging!	<ul style="list-style-type: none"> ● I can understand that a computer program runs sequentially ● I can discuss what a program does based on its code ● I can break down a problem into its smaller steps ● I can plan what needs to be written for each stage ● I can write a computer program containing a loop, conditionals and variables ● I can debug a program after testing it

Year 4 Computing Curriculum Overview

<p>Networks and The Internet</p>	<p>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</p>	<p>See separate sheet (by strand for individual LIs and SCs)</p>	<p>Use children to map out the different infrastructures involved in the network e.g. server, switch, office computers and wireless macs. Children hold a photo and act as that device. String is used (or network wires if you have those?) to connect the devices (not the wireless one). Model messages, information and documents being set through the wires to allow the users to open and save files</p> <p>Brainstorm what we can use the Internet for. Ask the children to group these ideas – are there any patterns e.g. browsing websites, playing games through a browser, email, playing games on consoles online, Skype calls etc. The ‘Internet’ is just the name for lots of computers connected together – we can use it in different ways.</p> <p>Explain the journey of an email. Compare a computer network to a postal system (eg. Both need address, destination and are taken from one place to the next). Create an infographic comparing the two way of sending information.</p> <p>Children tasked with explaining the difference between email and chat. Focus on the purpose – what are each likely to be used for? Which do they think might be more secure? Children create an information leaflet for younger children explaining the difference</p> <p>Discuss with children how the world wide web works. When I type in ‘www.haslett.org.uk’ what happens? A website is just a file saved on a computer. The computer uses radio waves to send information to the wifi router and then down the wires hunting for the right computer – it gets passed on and on until it finds what it needs. Chn could make a presentation or animation showing the request being sent and the website being returned.</p>	<ul style="list-style-type: none"> ● I can identify the different parts in a network e.g. switch, server ● I know the difference between the Internet and internet services e.g. world wide web ● I can explain how email works ● I can explain the difference between email and chat ● I can explain how a website is retrieved from a web server e.g. a request sent through wires until it finds the right one ● I can explain that information travels through radio waves (wifi) and wires
<p>Searching</p>	<p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p>	<p>LI: To know how a search engine works</p> <p>I must remember:</p> <ul style="list-style-type: none"> ○ A search engine identifies the words typed into the search box and matches them to a database. ○ A search engine has an index list of websites, which contain these keywords. 	<p>Give children a search term e.g. ‘Vikings’ what websites do they think it would find? What would be near the top? What would be near the bottom? Chn create their own index writing down a website next to key words and then clicking a link to another page.</p> <p>If I want to find out about what the Tudors wear, what would be a good search term? Choose what you’d write in the box and then what you think would come up. Compare this to what does come up.</p> <p>Remind children that they would get different results in school to at home – why is this?</p> <p>Children create a ‘guide’ to good searching</p>	<ul style="list-style-type: none"> ● I can use TASK (title, author, summary, kids) to help me retrieve appropriate content ● I can use some advance search filters ● I can explain how a search engine uses key word! ● I can explain that some results are paid for to ensure they rank higher
<p>Digital Citizenship</p>	<p>use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies</p>	<ul style="list-style-type: none"> ● See separate sheet 	<p>Tell the children you want them to guess your code - it only has letters in it and it’s 3 characters long, what could it be? See if they can guess. Explain that there are only 15600 possibilities - it might take them a while but it would only take a computer seconds to guess. How could they make the code more tricky to guess? Link this to passwords - it’s the same thing. The longer and the more varied the better.</p> <p>Model commenting about someone’s work - how do we phrase disagreement/criticism? It’s fine to give negatives but we need to do so tactfully.</p> <p>Use websites such as the Tree Octopus. Explain that the entire website is fake and give clues to why.</p> <p>Use resources such as the journey of a tweet to see how quickly one piece of information can reach the world. If I deleted the original message, other people’s would still exist.</p>	<ul style="list-style-type: none"> ● I can choose a sensible password including letters and numbers ● I can show the same behaviours online as I do offline ● I can explain what to do if I find something inappropriate ● I can explain that not everything on the internet is true ● I can understand how quickly information on the internet can spread ● I can understand that information can still be on the internet even if the original source is deleted

