Strand	Program of Study	LI and SC	Activity Suggestions	Learning Outcome – By the end of this unit children should be able to…
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	● See separate sheet	To be taught cross-curricularly e.g. making an animation in Literacy or making a table with animal information in Science	● 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 Create diagrams explaining how we know what the computer is doing	● I know that a range of digital devices can be considered a computer. ● I can explain that a computer responds to inputs e.g. keyboard, microphone, scanner, camera ● I can explain that a computer shows what it's doing through outputs e.g. monitor, printer, speaker ● I can understand that a computer receives input through a circuit
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.	● I can write an algorithm for a task I do regularly e.g. getting ready for school ● I can debug my algorithm after testing it ● I can evaluate the efficiency of an algorithm ● I can record a more complex algorithm using a flowchart ● I can show care and precision to avoid errors ● I can use some terminology for loops and selection when discussing 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!	● 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 simple computer program containing a loop to repeat an instruction ● I can debug a simple program after testing it

Networking and the Internet	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	LI: To know that computer networks exist in many different places I must remember: A network is two or more computers connected to each other that allow information to be shared LI: To know that a computer needs to be connected to a network to get to any of the information stored on it I must remember: ○ A network is two or more computers connected to each other	If possible, tie into topic e.g. shops, why do you think a shop like Tesco (just to differentiate from small local shops) need to use computers? Brainstorm ideas. The 'till', to order extra food, to communicate between stores etc. If a visit isn't possible you may want to show some videos of what happens there. Now discuss how the different computers might need to share information and how this might happen. Children could design their own system (fictional) showing their understanding that different elements are linked together. E.g. a cupcake machine where the scales know how much flour they need because someone typed the recipe in a computer. Then the computer tells the oven how long to cook it for etc. Ask the children what the internet is? (explanations don't need to be accurate) Can any computer access the internet? Talk about a time when a computer hasn't worked when trying to access the internet – what had happened? Draw children to the conclusion that if the computer is not connected it can't access the internet. Explain that it is the same with a network (there's no need to differentiate between networks and the internet at this point) Children could create an explanation poster/ebook/presentation explaining that computers have to be connected to the network for it to work	• I can explain that a computer needs to be connected to a network to access it e.g. Ethernet/wifi for the Internet • I can recognise other places where computer networks are used e.g. school file sharing
Digital Citizenship	use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and contact	● See separate sheet	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 trickier to guess? Link this to passwords - it's the same thing. The longer and the more varied the better. 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. Use websites such as the Tree Octopus. Explain that the entire website is fake and give clues to why. 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.	● 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