Crosby Primary School	Computing Medium Term Plan Year 5/6 - Spring Term	Unit 5.3 Programming A – (6 Weeks) Selection in physical computing
National Curriculum (Core Learning) National Curriculum 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.Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. 3.Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. 4. 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. **Curriculum Links** Eg. Science (circuits) DT Design, make and evaluate	**Prior Knowledge** This is a new unit. **Assessment**: Via observation and end product . For example visit lesson 5	**Resources** **Visit:** Teach it website for For Unit Plan, Lesson Plans unit plans and Learning Graphs https://teachcomputing.org/curriculum/key-stage-2/programming-a-selection-in-physical-computing
	Vocabulary Generic vocabulary: battery, blocks, browser, code, coding,count, connection, crocodile clips, device, evaluate. LED, program, repetition, switch and usb cable. New Topic vocabulary: Algorithm-an algorithm is a list or set of instructions, used to solve problems or perform tasks. Input:A place where, or a device through which, energy or information enters a system. The signal being fed through the main input. Components:A part or element of a larger whole, especially a part of a machine. Code: Program instructions. Count controlled loop: A system made up of hardware components and software control functions needed for the measurement & adjustment of a variable. Condition:A condition is a statement that can be either true or false. Crumble:A crumble is an electronics controller that connects to a computer using a USB cable. Infinite Loop: A sequence of instructions in a computer program which loops endlessly. Input- a place where, or a device through which, energy or information enters a system. The signal being fed through the main input.Microcontroller: A small device that is designed & can be programmed to control components that are connected to it. (Also known as a compact integrated circuit designed to govern a specific operation in an embedded system). Motor: A machine, especially one powered by electricity that supplies motive power for a vehicle or for another device with moving parts. Output: A place where power or information leaves a system. Program: A series of coded software instructions to control the operation of a computer or other machine. Selection-A programmer might want a set of actions to be carried out if a condition is met.Sparkle: A multi-colour LED designed to work with the Crumble.	

Lesson Sequence

Learning Objective/Success Criteria	Core Knowledge	Additional Information
L1 Connecting Crumbles LO To control a simple circuit connected to a computer Success criteria: I can create a simple circuit and connect it to a microcontroller I can program a microcontroller to make an LED switch on I can explain what an infinite loop does	**Procedural Knowledge (Skills):** Choose a condition to use in a program. Create a condition controlled loop. Use a condition in an 'if... then…' statement to start an action; • selection to switch program flow; • 'if... then... else…	L1 See lesson plan https://teachcomputing.org/curriculum/key-stage-2/programming-a-selection-in-physical-computing/connecting-crumbles

L2 Combining output components LO To write a program that includes count-controlled loops Success criteria: I can connect more than one output component to a microcontroller I can use a count-controlled loop to control outputs I can design sequences that use count-controlled loops	to switch program flow in one of two ways. **Propositional Knowledge (Concepts):** Relate that a count controlled loop contains a condition. Compare a count controlled loop with a condition-controlled loop. Explain that: • a condition can only be true or false; • a condition-controlled loop will stop when a condition is met; • when a condition is met a loop will complete a cycle before it stops; • selection can be used to branch the flow of a program; • a loop can be used to repeatedly check whether a condition has been met; • the importance of instruction order in 'if... then... else...' statements.	L2 See lesson plan and presentation https://teachcomputing.org/curriculum/key-stage-2/programming-a-selection-in-physical-computing/combining-output-components
L3 Controlling with conditions LO To explain that a loop can stop when a condition is met Success criteria: I can explain that a condition is either true or false I can design a conditional loop I can program a microcontroller to respond to an input		L3 See lesson plan and presentation https://teachcomputing.org/curriculum/key-stage-2/programming-a-selection-in-physical-computing/controlling-with-conditions Use Key Question What information did you need to know to carry out the commands?
L4 Starting with selection LO To explain that a loop can be used to repeatedly check whether a condition has been met Success criteria: I can explain that a condition being met can start an action I can identify a condition and an action in my project I can use selection (an 'if…then…' statement) to direct the flow of a program		L4 See lesson plan and presentation https://teachcomputing.org/curriculum/key-stage-2/programming-a-selection-in-physical-computing/starting-with-selection Use Key Questions Can you identify the condition in the algorithm and program? What condition might have been met for someone to drink a glass of water? How could you represent this using selection?
L5 Drawing designs LO To design a physical project that includes selection Success criteria: I can identify a real-world example of a condition starting an action I can describe what my project will do I can create a detailed drawing of my project		L5 See Lesson plan and presentation https://teachcomputing.org/curriculum/key-stage-2/programming-a-selection-in-physical-computing/drawing-designs Key Q How will their output devices be used?How is selection used? Key statement .Use the **if…then…** structure to write an algorithm to show how selection might be used in an automated house.Ideas:Curtains or blinds, Heating or cooling or using Taps
L6 Writing and testing algorithms LO To create a program that controls a physical computing project Success criteria: I can write an algorithm that describes what my model will do I can use selection to produce an intended outcome I can test and debug my project		L6 See Lesson plan and presentation https://teachcomputing.org/curriculum/key-stage-2/programming-a-selection-in-physical-computing/writing-and-testing-algorithms Use Key statements TEST , DE-BUG , EVALUATE