**Year 5 Computing Curriculum – Spring Term**

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| Theme: Selection in Physical Computing |
| **Curriculum objectives** | **Vocabulary** | **Links across the curriculum** |
| Learners will use physical computing to explore the concept of selection in programming using the Crumble programme. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program it to control components (including output devices — LEDs and motors). Learners will make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the ‘if...then...’ structure) and write algorithms and programs that utilise this concept. To conclude the unit, learners will design and make a working model of a fairground carousel. | **Keyword** | Definition | sequences | a pattern or process in which one thing follows another. | [Science – Electricity (Year 4)](https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study) Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches, and buzzers. [Design and Technology (KS2)](https://www.gov.uk/government/publications/national-curriculum-in-england-design-and-technology-programmes-of-study) Design- annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design Make- Select from and use a wider range of materials and components, including construction materials, textiles, and ingredients, according to their functional properties and aesthetic qualities. Evaluate - Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. |
| design |  to think up and plan out in the mind | decompose | Break down into smaller and manageable ‘chunks’ |
| Count-controlled loop | A count-controlled loop is a form of repetition in which a set of commands are carried out a specific number of times. | Condition-controlled loop | A condition-controlled loop is a form of repetition in which a set of commands stop being carried out when a condition is met.  |
| debug | to fix  | conditions | Conditions are statements that need to be met for a set of actions to be carried out |
| commands | to order or instruct | program | a plan of what will be done |
| Infinite loop | An infinite loop is a loop that commands the instruction/set of instructions to repeat forever. | algorithms | a determined and finite procedure for solving a problem |
| **Prior Knowledge:**EYFS – To follow two step instructions. Year 1 – Commands for a robot. Year 2 – plan and debug algorithm Year 3 - Sequencing Sounds Year 4 – repetition in Shapes | **Future Knowledge:**Year 6 - To choose how to improve a game by using variables |
| **Lesson Sequence** | **Key Knowledge** | **Key Skills** |
| To control a simple circuit connected to a computer  | * To know what a microcontroller is and their function
 | * create a simple circuit and connect it to a microcontroller
* program a microcontroller to make an LED switch on
* explain what an infinite loop does
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| To write a program that includes count-controlled loops | * To know what an output is.
* A count – controlled loop will control the outputs.
 | * connect more than one output component to a microcontroller
* use a count-controlled loop to control outputs
* design sequences that use count-controlled loops
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| To explain that a loop can stop when a condition is met | * A condition-controlled loop is a form of repetition in which a set of commands stop being carried out when a condition is met. The condition could be anything from when the ‘score’ in a game reaches a certain value to when a key on a keyboard has been pressed.
 | * explain that a condition is either true or false
* design a conditional loop
* program a microcontroller to respond to an input
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| To explain that a loop can be used to repeatedly check whether a condition has been met | * Conditions are statements that need to be met for a set of actions to be carried out. They can be used in algorithms and programs to control the flow of actions. When a condition is met, it is referred to as ‘true’ and when it is not met, it is referred to as ‘false’.
 | * explain that a condition being met can start an action
* identify a condition and an action in my project
* use selection (an ‘if…then…’ statement) to direct the flow of a program
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| To design a physical project that includes selection | * Selection is implemented in programming using if...then... statements. Selection is used to control the flow of actions in algorithms and programs by checking if a condition has been met. If it has been met, the identified actions will be carried out.
 | * identify a real-world example of a condition starting an action
* describe what my project will do
* create a detailed drawing of my project
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| To create a program that controls a physical computing project | * Programs are an implementation of an algorithm, and that when the program does not produce the required output, the algorithm should be debugged. This should then be implemented in the program.
 | * write an algorithm that describes what my model will do
* use selection to produce an intended outcome
* test and debug my project
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| **Themes and links** |
| **Computing themes** | **Where these are covered:** | **Links across the Computing curriculum** |
| **Technology around us** Autumn 1  | * Crumble links to the real world and computer games the children know.
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| **EYFS** | To listen to instructions |
| **1** | Commands for a Robot |
| **2** | Robots and Debugging  |
| **4** | Repetition in Sounds – decomposition  |
| **5** | Simple circuits  |
| **6** | Variables in programming |

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| **Digital painting** Autumn 2  | * Design, make and evaluate process
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| **Programming A** Spring 1  | * the concept of selection in programming using the Crumble programme
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| **Data /information** Spring 2  | * Storing the commands and the effect on language on the outcome of your commands.
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| **Creating media** Summer 1  | * Your own designs of Crumble
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| **Programming B** Summer 2  | * Using crumble to implement an algorithm as a code
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