\<Digital Maker: Introduction to Coding\>

Programme: Digital Maker: Introduction to Microbit Programming　　　　　　　　　　**Level: Primary 4**

Theme / Challenge Statement: Create a Multiplication Game by coding

Summary

1. Introduction to Programming
2. Introduction to Micro:bit
3. Lesson 1: Introduction to basics (https://www.youtube.com/watch?v=xc0izNZMcSk)
4. Lesson 2: Introduction to Inputs (https://www.youtube.com/watch?v=Ko6XHybXzV0)
5. Lesson 3: Variables and Logic (https://www.youtube.com/watch?v=k3TmHkCjFkU)
6. Final Task: Create a Multiplication Game

Prior Knowledge:	Students should already know: 1. How to make a list of the first 12 multiples of a given 1-digit number and use this method to identify the common multiples of two given 1-digit numbers up to an equating to a 100 or less. 2. A general understanding of the impact of sequencing.
Learning Objectives:	By the end of the lesson, students should be able to: 1. have a general understanding of the nature of programming and its application in the real world 2. utilize the Microbit online platform for coding 3. utilize the functions within the basic tab of the Microbit online platform 4. utilize most of the functions within the input tab of the Microbit online platform which utilizes the inbuilt hardware on the Micro:bit chip 5. utilize coding with some commands from the variables and logic tab of the Microbit online platform at a basic level. 6. create a simple multiplication game with the knowledge acquired.

Lesson Plan

Time	Teacher Activities	Purpose	Resources Needed
Introduction/Pre-activity			
E.g. 1 Period / 30mins	Introduction to coding: Teacher to go through 'What is Coding powerpoint slides'	To generate interest and introduce application in real word context.	'What is Coding' Powerpoint Presentation Introductory Worksheet
Lesson development/Main activities			
Day 1 – 60 minutes	Lesson 1: Introduction to basics Teacher to play video and stop at relevant intervals for students to try out activities	Introduce students to 'Basics' Tab and create their first 'HELLO WORLD' Programming code. Introduce the general structure of coding.	Lesson 1: Introduction to basics (https://www.youtube.com/watch?v=xc0izNZMcSk) Laptop and Micro:Bit online coding platform http://microbit.org/code/ Micro:Bit Chip
Day 2 – 90 minutes	Lesson 2: Introduction to Inputs Teacher to play video and stop at relevant intervals for students to try out activities	Introduce students to 'Inputs' Tab and the different types of inputs possible based on the inbuilt hardware of the Micro:Bit chip Reinforce general structure of coding.	Lesson 2: Introduction to Inputs (https://www.youtube.com/watch?v=Ko6XHybXzV0) Laptop and Micro:Bit online coding platform http://microbit.org/code/ Micro:Bit Chip
Day 3 – 90 minutes	Lesson 3: Variables and Logic Teacher to play video and stop at relevant intervals for students to try out activities	Introduce students to the 'Variables' and 'Logic' Tabs and some options available to craft the code. Reinforce general structure of coding. Students to create coding using at least 3 different components such as sound, words, icons e.t.c., download and show to Teacher the product on micro:bit.	Lesson 3: Variables and Logic (https://www.youtube.com/watch?v=k3TmHkCjFkU) Laptop and Micro:Bit online coding platform http://microbit.org/code/ Micro:Bit Chip

Lesson Plan

Closure and consolidation			
Day 4 - 90 minutes	Multiplication Game: Teacher to introduce the concept of a Micro:Bit based multiplication game. **Differentiated Learning:** High progress Students will create the code themselves from scratch Middle progress Students may receive advice from the teacher at intervals Low progress Teacher will allow students to copy the code, explaining the significance of each line in the process.	Consolidation of skills learnt Completing the generation structure of coding with the introduction of output.	Low Ability: Final Task: Timetable Game Worksheet Laptop and Micro:Bit online coding platform http://microbit.org/code/ Micro:Bit Chip
Post-activity (Selected Group of students)			
Day 5 – 90 minutes	Focussed Group (High progress): Transportation Craft navigation and warning system based on P3 Interdisciplinary Project: The Great Mouse Escape.	Extended use of Micro:Bit through the use of add-ons from Homefix Kit. Creating a logical program to navigate crafts through the use of 8 point compass and warning system via accelerometer.	Laptop and Micro:Bit online coding platform http://microbit.org/code/ Micro:Bit Chip Homefix Add-on Kit Advanced course notes

Lesson Plan

	Teacher to introduce inbuilt compass function and accelerometer		
Day 6 – 90 minutes	Craft making, Installation and presentation of finished Product Teacher to facilitate craft building and testing on a water body.	Consolidation of skills learnt to produce an artefact. This is	Styrofoam and recyclables to build craft. Micro:Bit Chip Battery unit Homefix Add-on Kit

Lesson Plan

List of Projects (5 – 10 projects if possible) created by Students			
Project 1	water-based craft with Navigation and capsize warning system	Resources Needed Microbit Chip Homefix Add-on Kit Materials for craft building	Remarks / Tips to be shared Sturdy craft with a simple, specially designed holder for the electronics.
Project 2	water-based craft with Navigation and capsize warning system	Resources Needed Microbit Chip Homefix Add-on Kit Materials for craft building	Craft made of recycled materials

Lesson Plan

Project 3	water-based craft with Navigation and capsize warning system	Resources Needed Microbit Chip Homefix Add-on Kit Materials for craft building	Simple design with taller sides to keep electronics safer
Project 4	water-based craft with Navigation and capsize warning system	Resources Needed Microbit Chip Homefix Add-on Kit Materials for craft building	Plastic box waterproofs the electronics

Lesson Plan

Consolidated			Arrows after calibration is supposed to be pointing North always.

Additional Remarks:

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