# Lessons 5 and 6 – Maths Quiz Project

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| The Big Picture – Why Is This Relevant? | Learning Objectives |
| * This project introduces interaction which is a vital part of physical computing * This program has real world utility and could be used by younger learners to revise maths * Variables and success criteria are introduced which are key concepts of computer science | * Create a simple user interface * Use the button inputs to control the program * Understand what a variable is, how to name it and use one in a program * Use simple maths operators in a program * Learn how to generate random numbers within a range * Learn how to test a program |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * This program involves lots of interaction and learners should be encouraged to thoroughly test the program to ensure that it works as expected * A simple case can be made for the micro:bit and it should be decorated using a maths theme * This program can have real world utility for younger learners, encourage learners to consider the needs of another learner using their program and hardware * This is the first PBL activity. The lesson will introduce learners to the concept. As this is the first PBL activity they should work individually. In future many PBL activities will be completed as a pair. | **Expected Progress:**   * Learners will produce a simple multiplication program * Learners will produce a physical device to house the computer   **Good Progress:**   * Learners create the program and test it thoroughly. Learners will extend the program to include other maths operators and will evaluate their work against the success criteria   **Exceptional Progress:**   * Learners will complete all stretch tasks and will improve the program beyond the success criteria |
| Links to Program of Study | |
| * Use two or more programming languages to solve a variety of computational problems * Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users | |
| Key Concepts | Key Words |
| * Input, process, output * User interface * Variables * Multiplication * Meeting some success criteria | * Success criteria * Multiplication * Integer * Variable * Random * String |
| Differentiation | Resources |
| Most learners will be able to follow the instructions however some learners may need additional teacher support. More able learners could add other features such as addition and subtraction questions. | * Lesson 5 & 6 ppt * 1 micro:bit per learner * 1 battery pack for micro:bit * 1 USB cable to connect the micro:bit to a PC * A PC * Access to <https://makecode.microbit.org/> * Case template * A4 card * Scissors * Glue * Colouring pens / pencils * Velcro with sticky back / double sided tape |
| Lesson Flow | |
| * Explain to the learners that they will be making a maths revision product for younger learners * Go through the concept of success criteria * Briefly introduce the concept of a variable and demonstrate it if necessary * Show learners where the resources are on the PC * Learners should work through the making activity and aim to complete it by the end of the first lesson. They should then focus on the programming elements in the second lesson. Encourage learners to think about the overall theme of the product and the target age group. What type of decoration are they likely to find attractive? Black and white, colourful, maths based? Learners can use the template to hold the micro:bit in or they could cut out an area so that the user can see the screen and buttons which will allow them to interact with it without removing it from the box * Learners work through the resource independently; teacher intervenes where appropriate * Ensure learners have enough time to combine the programmed micro:bit and the case, and to test * Encourage more advanced learners to attempt the stretch tasks once they complete main task. They could independently explore the use of the built in speaker which could play a sound prior to the answer being displayed * Encourage learners to reflect on how their product could be improved | |
| Making | |
| * Make a simple case for the micro:bit that is decorated with maths symbols to show its purpose * Ensure the buttons and USB port are accessible * A simple box net should be used to introduce the making theme * Ensure the case is made suitably strong * Ensure the micro:bit is not permanently fixed to the case! | |