Lesson 19 – Project –Bike Collision Detection

Develop and Test Code

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| The Big Picture – Why Is This Relevant? | Learning Objectives |
| * Crash or collision detection systems are an extremely important safety system in vehicles, especially self-driving cars. Changes in acceleration are used to indicate what a vehicle is doing and respond in an appropriate way. | * Develop program code for one axis * Develop the code for two or more axes * Test the program code and adjust the values as required |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * Bring a real bike into the classroom and ask students to talk about their own experiences * The bike crash detector can be comical although the teacher will need to be aware if learners have had / or family been involved in accidents. * The testing section will allow for group work which can engage and motivate the learner | **Expected Progress:**   * Learners program measures acceleration on one axis   **Good Progress:**   * Learners program measures acceleration on two or more axes and micro:bit responds with feedback   **Exceptional Progress:**   * Learners add additional feedback such as music, and alarm, speech or a warning light |
| Key Concepts | Key Words |
| * Develop the program code * Taking acceleration reading and responding to the value on at least one axis * Taking acceleration reading and responding to the values on two or more axes | * Variables * Acceleration * *x, y, z* axis |
| Differentiation | 47BResources: |
| Learners will benefit by working in groups, if the learners are organised with a mixture of skills and abilities.  Teacher to support learner to get the *x*-axis working first and then build up the *y*- and *z*-axes. This will ensure that the project is easier to complete. | * Lesson 19 ppt * 1 micro:bit per learner * 1 USB cable to connect the micro:bit to a PC * A PC * Access to <https://python.microbit.org/v/1.1> * Arts and crafts * Bike |
| Lesson Flow | |
| * Teacher to refer to the Activity Sheet and the example program code * Learners to develop and then test program on the *x*-axis * Learners to test and adjust the values of the program to return suitable values * Learners build in suitable feedback (LED display, message, sound etc.) * Test program responds as expected * Learners to develop and then test program on the *y*- and *z*-axis * Teacher to support learners and groups as required | |
| Making | |
| There are no making activities in this lesson | |