Lesson 20 – Project –Bike Collision Detection

Final Test and Evaluation

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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. | * Complete project program code * Tests program on a real bike * Combine with container and hardware to attach to bike |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * Bring a real bike into the classroom an 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 demonstrate system responds to acceleration on one axis   **Good Progress:**   * Learners test system on a real bike * Learners demonstrate system responds to acceleration on two or more axes   **Exceptional Progress:**   * Learners demonstrate system responds accurately to all axes |
| Key Concepts | Key Words |
| * Taking acceleration reading and responding to the value on at least one axis * Testing the system on a real bike * Evaluation and conclusion of project. | * Variables * Acceleration * *x, y, z* axes |
| Differentiation | Resources |
| 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 20 ppt * Reflection document * 1 micro:bit per learner * 1 USB cable to connect the micro:bit to a PC * A PC * Access to [micro:bit Python Editor](https://python.microbit.org/v/3) * Arts and crafts * Bike |
| Lesson Flow | |
| * Teacher to recap the project * Learners to decide what the focus of the lesson will be, testing on bike, finalising the feedback, adjusting the values etc * Discuss staying safe on your bike and how you might know that you were unsafe, (leaning too far to one side, hard braking, cycling too fast etc.) * Teacher to ensure that all learners are safe when testing the system on a real bike * Learners create program code for one or more axes*, x y* and *z* * Try hardware on the bike to see what works well and make adjustments as required * Ask other learners to test out the system and provide feedback, issues and improvements * Teacher to support learners and groups * Learners to adjust program code as required * Learners to complete the evaluation and conclusion sections of the design sheet * Discuss the Success Criteria and how these have been met * Complete the Reflection document | |
| Making | |
| There are no making activities in this lesson. | |