Lesson 17 – Project –Bike Collision Detection  
Planning and Requirements

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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. | * Understand the requirements of the project * Plan the design and structure of solution * Decide what readings the system twill respond to and how |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * Bring a real bike into the classroom and ask Learners 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 Learners | **Expected Progress:**   * Learners complete the design sheet   **Good Progress:**   * Learners begin to plan the container for the system * Learners decide what features the system will respond to   **Exceptional Progress:**   * Learners decide how the system will respond to the readings * Learners plan some of the code |
| Key Concepts | Key Words |
| * Understanding the project brief * Planning a solution * Identify the target audience * Planning the program structure * What is acceleration * What is an accelerometer * *x*, *y* and *z* axes * Taking acceleration reading and responding to the value | * 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 17 ppt * Lesson 17 Activity Sheet * Example Python Code * Design Template sheet * 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 introduce the project * Discuss staying safe on your bike and how you might know that you were unsafe (leaning too far to one side, hard braking, cycling to fast etc.) * Discuss the Success Criteria and how these could be met – Learners could note down their ideas * Learners complete the Planning sheet and think about the design of the container that will be used to attach the micro:bit to the bike * Learners could work in groups and deploy one team to start thinking about the program code and one design the container system * Teacher to refer to the ‘ideas’ section in the Activity Sheet as possible ways to create a solution for the project | |
| Making | |
| There are no making activities in this lesson. | |