## Lessons 30–34 – Final Project – Smart Car Self Build

|  |  |
| --- | --- |
| The Big Picture – Why Is This Relevant? | Learning Objectives |
| * Putting it all together * Applying the techniques developed to create something new | * Design and build a self-drive car * Develop an algorithm for a self-drive car to complete and autonomous lap of the track * Test and refine the algorithm so it reacts to changes. |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * Give Learners plenty time and opportunity to be creative and build/test their vehicles * The use of budgets and price lists here adds an extra challenge which will give an additional focus for Learners | **Expected Progress:**   * Car designed and built, algorithm tested   **Good Progress:**   * Car designed, built and the algorithm tested and improved to complete a full lap   **Exceptional Progress:**   * The car makes a repeatable autonomous run with minimal if any collisions |
| Key Concepts | Key Words |
| * Use of materials * Team Work * Working to timescale * Test & Refine * Developing algorithms | * Design Considerations * Test & Refine * Iteratively * Incremental |
| 46BDifferentiation: | 47BResources: |
| Some Learners may become frustrated with the reliability of the sensor in classroom environments | * Lesson 30–34 ppt * Lesson 30–34 Activity Sheet * PC * Paper, Pens, Pencils * Build materials for car * Access to <https://makecode.microbit.org> * micro:bit * HC-SR04 Ultrasonic Sensor * Line sensor * Wires and clips as required |
| Lesson flow | |
| * Introduce the learning objectives * Refer to what they have done in their previous lessons * Introduce the Egg Family * Discuss the hardware available to them * Go through the worksheet with Learners * Get Learners to complete the parts pick list – no reason no part! * Support Learners team working skills as they build their vehicle, develop their algorithm and test their vehicles * Get Learner to use the worksheet to record details of their test runs and incremental design changes * Once all Learners have completed cars, test could happen with multiple cars on the tack * Encourage Learners to attempt the stretch tasks | |
| Making | |
| * Smart car chassis * Smart car body | |