# Lesson 12 – Bit:Bot Race Car Project – One Lap Test

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| The Big Picture – Why Is This Relevant? | Learning Objectives |
| * Getting Learners to think about algorithms in sections or modules that can be plugged together | * Apply what you have learned to make the car complete one lap autonomously * Complete one safe lap as quickly as possible * Create a section plan for each race section * Combine to create a complete algorithm for the racetrack |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * Learners enjoy watching their vehicle follow the instructions. * Encourage the use of trial and error | **Expected Progress:**   * Learners are able to convert a track section into an algorithm   **Good Progress:**   * Learners convert algorithm to working code for sections of the track   **Exceptional Progress:**   * Learners are able to combine their algorithms and complete a full lap of the track |
| Links to KS3 Programme of Study | |
| * create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability | |
| Key Concepts | Key Words |
| * Designing algorithms to solve problems * Breaking a problem down into easy to solve sections | * Autonomous * Algorithm * Decomposition |
| Differentiation | Resources |
| Some Learners will want to try and solve the lap in one go.  Encourage Learners to break it into sections and test each section one-by-one. | * Lesson 12 ppt * Lesson 12 Activity Sheet * Racetrack Modules * Bit:Bot * PC * Access to <https://makecode.microbit.org> * Paper planning |
| Lesson Flow | |
| * Share objectives and remind Learners of the project aim * Discuss and explore the current development of self-drive cars (Google car, Waymo, Tesla etc) * Remind Learners that they need to program their cars to self-drive round the course once * Get them to break the circuit into sections and create a plan for each section * Remind them that this is decomposition * Remind them to take measurements and consider speed carefully * Remind Learners of when they used the line drawer to calculate angles, review this lesson * Give them the rough guide of 600 power, 1 sec = 30cm and 600 power, 100ms, Spin = 45 degrees but remind them that speed and surface impact this * Get Learners to combine their programs and time trial their run. You could add time penalties for any collisions * Students should then be given ‘tinker time’ to make any necessary changes to their algorithms prior to completing the final competitive run. | |
| Making | |
| No making activities in this lesson. | |