

**Faculty/Subject: STEM**

**Group Number: \_\_\_\_\_\_\_ Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit of work: Robotics Introductory Challenges (Group work)**

**Assessment weighting:** 30% Raw mark: \_\_\_/22

**Issue date:** week 5 (week 5 beginning of challenges)

**Section One: Due date:** last lesson of term 1 week 10

(Written problem solving feedback submitted term 1 week 10 but presented week term 2 week 1 by each group member receiving a separate marking for verbal presentation)

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| **Outcomes:**  **By completing this task your group will be able to:**  **STEMS**   * **Build and program a robot to carry out a range of functions.** * **Test a robot to carry out a range of functions.** * **Have a better understanding of the range of software and robot features to apply to your final robot.** * **Complete the three (3) Mathematics tasks. Show all working out** * **Complete the six (6) Robotics challenges** * **Record and very briefly give feedback on any problems encountered and how they were solved. (Group)**   **Syllabus Outcomes:**  Tech 4.2.1 4.5.2  Science SC4-WS5.3 SC4-WS6d SC4-WS6 SC4-WS7.2 SC4-10PW PW1  Mathematics : MA4 - 1WM , 2WM , 3WM |

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| **Tasks:**  To improve your skills and understanding in building a successful robot, you and your team must successfully complete the Robotics Introductory Challenges and the Maths Challenges featured in your mission manual. Your group must complete each challenge before you begin a new challenge by completing the “criteria for success” checklist.  **Robotic challenges** checked off by you and your teacher include:  **Section One:**   1. Moving straight 2. Turning challenge 3. Touch sensor 4. Loops 5. Switches   **Math challenges** checked off by you and your teacher:   * Task 1 - Part A - To investigate the movement of the robot – Conversions * Task 1 - Part B - To investigate the movement of the robot – Estimation * Task 1 - Part C - To investigate the movement of the robot - Time Trial   **Feedback on problems and solutions written using a word processor** and **briefly presented to the class maximum 3 minutes**   * Include group number and member's names * Describe problems encountered during the robotic challenges * Describe solutions to the problems encountered in the robotic challenges * Presentation component is quick feedback and does not require the use of any additional software. Group member needs to present problems and solutions |

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| **Assessment criteria:**  You will be marked on your ability to:   * Follow a series of instructions and successfully apply these instructions to your group’s robot. * Control and move your robot to complete set challenges * Experiment and test a series of instructions and successfully apply these instructions to your group’s robot. * Complete Math Challenges to gain a better understanding of the options available for your robot.  |  |  |  | | --- | --- | --- | | Component | Mark weighting | Group Mark | | * Successfully complete all 5 introductory robotic challenges (2 marks for each, a BONUS MARK) * Complete all 5 introductory robotic challenges * Successfully complete most of the 5 introductory robotic challenges * Partially complete the robotic challenges * Attempt the robotic challenges | 10  5-6  3-4  2  1 |  | | * Successfully complete all 3 maths challenges   (2 marks for each, a BONUS MARK)   * Complete all 3 maths challenges * Successfully complete most of the 2 maths challenges * Partially complete the maths challenges | 6  3  2  1 |  | | * Clearly describe any relevant problems and provide useful solutions encountered in the robot challenges. Clearly presented to your audience * Clearly describe any relevant problems and provide useful solutions encountered in the robot challenges * Describe any problems and provide solutions encountered in the robot challenges * Identify problems and solutions encountered in the robot challenges * Identify problems | 5-6  4  3  2  1 |  | | Total | 22 |  | |

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| **Steps to completing task successfully:**  In sequential order, what steps in the process does the student need to complete?   1. Install software. Load computer. Collect assigned robots. 2. Follow instructions and apply introductory robotics instructions watching power point/video. Step by step 3. Complete student task Sheets 4. Follow and apply instructions to complete assigned math challenge for that specific Robotic challenge 5. Complete all introductory robotics task sheets and math 6. Keep record (can be by video) of problems encountered and suggest solutions to these problems in written format. 7. Submit your booklet   **Guide to structuring your task and additional information:**  .   * Show evidence of robot functioning based on instructions * Experiment and test the robot and software features based on instructions * Carry out maths calculations and measurements to complete math challenges * Record problems and suggest solutions using paper, video or other software   **How to submit**   * Group demonstrates successful completion of challenges * Each group member submits booklet with the maths and robotics challenges completed * Group submits feedback on problems and solutions written using a word processor and then each group member presents on a problem and solutions (can be one per group member) |