**TASK 1 – PART A**

*To investigate the movement of the robot.*

Syllabus Outcomes: MA4-1WM, MA4-2WM, MA4-3WM, MA4-4NA, MA3-9MG, MA4-15MG

Instructions: **Seconds**

1. Set the robot to move forward for 3 seconds.
2. Measure the distance travelled by the robot, in centimetres, in 3 seconds.

**ANSWER:**

1. Showing all necessary working out, use appropriate mathematical calculations to determine how far the robot would move in:

|  |  |  |  |
| --- | --- | --- | --- |
| **a)** | 1 second? | **b)** | 1 minute? |
| **c)** | 1 hour? | **d)** | 1 day? |

Required Conversions:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **÷ 60** |  | **÷ 60** |  | **÷ 24** |  |
| ***Seconds*** |  | ***Minutes*** |  | ***Hour*** |  | ***Day*** |
|  | **× 60** |  | **C:\Users\neil.laurence\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\C20H2PQM\stop_watch_-_cartoon[1].gif× 60** |  | **× 24** |  |

*Success Checklist:*

|  |  |  |
| --- | --- | --- |
| *1)* | *We set the robot for 3 seconds.* |  |
| *2)* | *We measured the distance travelled in 3 seconds and recorded it above.* |  |
| *3)* | *We calculated the distance travelled for the different times given above, showing all working out.* |  |

**TASK 1 – PART B**

*To investigate the movement of the robot.*

Syllabus Outcomes: MA4-1WM, MA4-2WM, MA4-3WM, MA4-4NA, MA4-5NA, MA4-15MG

Instructions: **Seconds**

1. Estimate, in seconds, how long you believe it would take the robot to move forward 50cm.

**ANSWER:**



1. Test your answer. How accurate was your estimate?
2. If your estimate was incorrect, how long does it actually take the robot to move forward 50cm?
3. What is the difference between the actual result and your estimate?

*Success Checklist:*

|  |  |  |
| --- | --- | --- |
| *1)* | *We estimated the time we believe the robot would take to move forward 50cm, and recorded it above.* |  |
| *2)* | *We tested our estimate and commented on its accuracy.* |  |
| *3)* | *We calculated the time the robot takes to move 50cm.* |  |
| *4)* | *We found the difference between our estimation and the actual answer.* |  |

**TASK 1 – PART C**

*To investigate the movement of the robot.*

Syllabus Outcomes: MA4-1WM, MA4-2WM, MA4-3WM, MA3-9MG, MA4-7NA

Instructions: **Seconds**

1. Choose any speed setting. **Do not** change it throughout Part C.

**SPEED SETTING:**

1. Choose 10 different time settings and measure the distance travelled for each in centimetres. Record the results in the table below.

|  |  |  |
| --- | --- | --- |
| **TRIAL** | **TIME (in seconds)** | **DISTANCE TRAVELLED ( in cm)** |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |
| **6** |  |  |
| **7** |  |  |
| **8** |  |  |
| **9** |  |  |
| **10** |  |  |

1. Transfer your data into the Excel spreadsheet “[Task 1 Part C](Task%201%20Part%20C.xlsx)”.
2. In the Excel spreadsheet, create a Distance-Time graph to represent your data, by following the steps below:
3. Highlight from cell B4 to C13.
4. Insert a Line Graph – any 2D.
5. Under ‘Chart Tools’:
6. Add the chart title “**Distance-Time Graph for Speed Setting \_\_\_\_\_**”
7. Add the axis titles: “**Time**” for horizontal and “**Distance**” for vertical.
8. Turn off the Legend.
9. Save ………

***CONT / …..***

1. What do you notice about your graph?
2. Compare your graph with another group who used a different speed setting. List the similarities and / or differences.

*Success Checklist:*

|  |  |  |
| --- | --- | --- |
| *1)* | *We chose our speed setting and recorded it above.* |  |
| *2)* | *We performed 10 time trials, measuring the distance of each trial, and recorded it in the table above.* |  |
| *3)* | *We correctly transferred our data to the spreadsheet.* |  |
| *4)* | *We followed the steps provided to create a line graph for our data.* |  |
| *5)* | *We saved our file correctly.* |  |
| *6)* | *We wrote about 2 or 3 features of our graph in the space provided above.* |  |
| *7)* | *We compared our results with another group and recorded our findings in the space provided.* |  |

**TASK 1 – PART D**

*To investigate the movement of the robot.*

Syllabus Outcomes: MA4-1WM, MA4-2WM, MA4-3WM, MA3-9MG, MA4-4NA, MA4-5NA,

MA4-18MG

Instructions: **Rotations**

1. A rotation indicates one full turn made by the wheel of the robot. In Mathematics, what type of angle shows a full turn **and** how many degrees is this angle?

**NAME: NUMBER OF**

 **DEGREES:**

1. Leaving the “*steering*” on , measure the distance travelled (in mm) when the robot moves ONE (1) full rotation.

**ANSWER:**

***NOTE:***  This distance actually indicates the perimeter of the wheel (the distance around the boundary of the wheel).

1. Using a mathematical calculation, how far would you expect the robot to move if the wheel makes the following rotations:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a) | 0.5 turn? | b) | ¼ turn? | c) | 5 turns? |

1. Using a ruler, measure the diameter (in mm) of the wheel.



**ANSWER:**

1. In a circle, what is the name of half the diameter?

**ANSWER:**

1. Showing your working out, divide your distance travelled (Q2) by the diameter of the wheel (Q4).

**ANSWER:**



1. Did you get an answer close to 3.14?

**DID YOU KNOW: When you divide the perimeter of a circle (we say its circumference) with its diameter, you will always get 3.14159….. . This number is known in Mathematics as Pi and we write it as π.**



$$π= \frac{Circumference}{Diameter}$$



*Success Checklist:*

|  |  |  |
| --- | --- | --- |
| *1)* | *We correctly named an angle that moves in one full rotation and its size.* |  |
| *2)* | *We measured how far the robot moved in one full rotation.* |  |
| *3)* | *We calculated the distance travelled by the robot in the given rotations.* |  |
| *4)* | *We measured the diameter of the wheel.* |  |
| *5)* | *We found the name of half of a circle’s diameter.* |  |
| *6)* | *We calculated distance travelled ÷ diameter, showing full working out.* |  |
| *7)* | *We compared our results with the answer provided.* |  |