Student Worksheet – How fast? TASK #3

Group Name_____ Group Members_____

Overview: To accurately be able to command the robot, you need to understand how fast it can go and what properties may change its performance. NASA have requested a detailed report, supported by data that you have gathered from your robot.

Make your robot drive forward for 5 rotations at 50% power

How long did it take to go 5 rotations? _____ sec

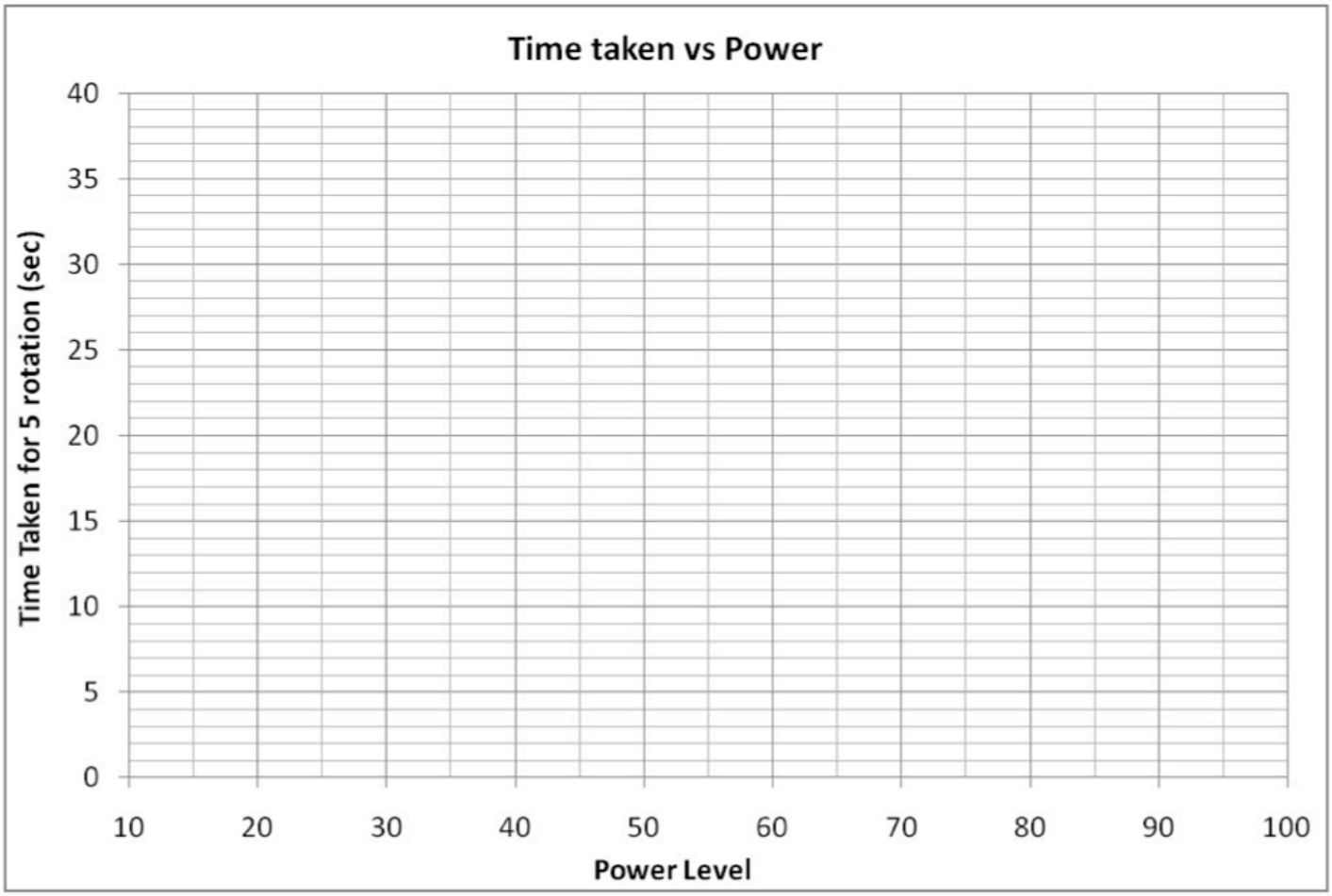
What about 10% power? _____ sec

70% power? _____ sec

Fill in the time taken to complete 5 rotations on this table and plot your average on the graph

Power Level (%)	Run 1	Run 2	Run 3	Run 4	Run 5	Average
10						
20						
30						
40						
50						
60						
70						
80						
90						
100						

Draw a line of best fit through the data you have taken.



Based on this data, make a prediction as to how long it will take to do 5 rotations at 65% power. _____ seconds

Mark your prediction on your graph in a different colour. Program your robot and see what happens. How close were you?

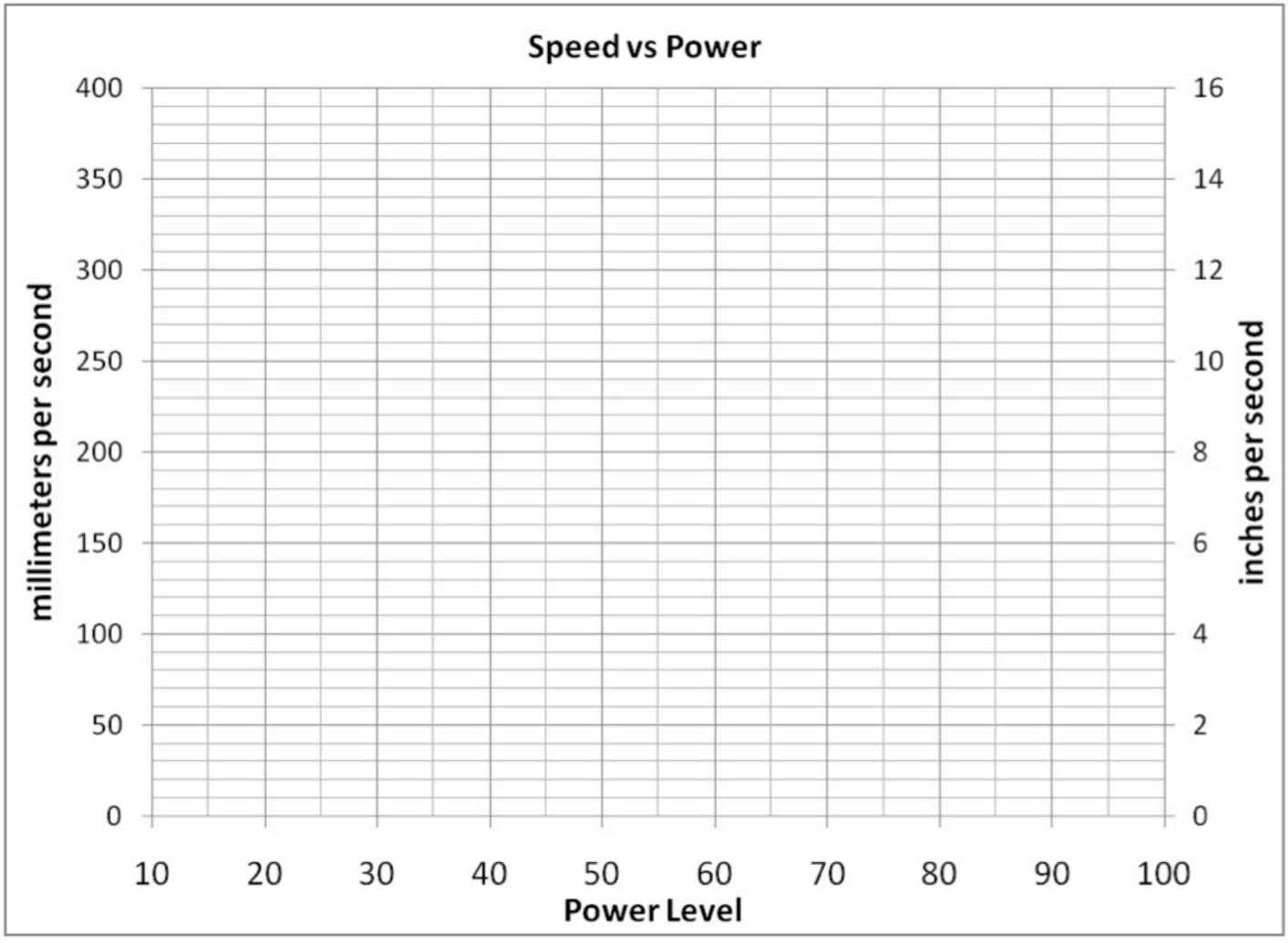
Let us now convert this time taken into a speed.

How far does 5 rotations of the wheel take us? _____

Now convert each of these times and distances into a speed for each different power level. Fill in your answers in the table below.

Power Level (%)	Time for 5 rotations	Speed (m/sec OR inches/sec)
10		
20		
30		
40		
50		
60		
70		
80		
90		
100		

Plot the speed of your robot against the power level on the following graph.



NASA have indicated that in some parts of NXTopia, the loose sand will make it difficult to drive quickly. They have calculated that the robot cannot exceed a maximum speed of 25 mm/s OR 10 inches/sec.

What power level is required to meet this speed? _____ % power level

Mark the speed on your graph in a different colour. Program your robot to travel for 10 seconds and check to make sure your robot stays within the guidelines.

What would happen if we were to run the same experiment on carpet?

What was the most difficult part of this challenge? _____

How did you go about solving it? _____