Robot Movement Testing: Testing the robot's ability to move forwards in a straight line.

Goal: Determine why robot does not move forward in a straight line.

Global conditions: Running program SpeedTest.njx, in which robot moves forwards, then backwards, then spins on the spot, at a motor speed of 700/1000. Single ball bearing rear wheel. Motors labelled A and B, wheels labelled A and B. Battery fully charged.

Testing ground: Second pitch.

Test Case	Test Description	Result	Comments
1	Motor A, wheel A on left, plugged into motor port A. Motor B, wheel B on right, plugged into motor port C. Run 5 times.	Robot veered strongly to the left 5/5 times.	
2	Motor A, wheel A on left, plugged into motor port C. Motor B, wheel B on right, plugged into motor port A. Run 5 times.	Robot veered to left strongly four times out of five and only slightly once.	Motor ports do not seem to be a factor.
3	Motor A, wheel B on left, plugged into motor port A. Motor B, wheel A on right, plugged into motor port C. Run 5 times.	Robot veered slightly to the right four times out of five and slightly to the left once.	
4	Motor A, wheel B on right, plugged into motor port C. Motor B, wheel A on left, plugged into motor port A. Run 5 times.	Robot veered strongly to the right 5/5 times.	Wheel B seems to be a problem. Robot veers to the side of wheel B; possibly it has less traction, more worn, etc.
5	Motor B, wheel B on left, plugged into motor port A. Motor A, wheel A on right, plugged into motor port C. Run 5 times.	Robot veered to the right very strongly 5/5 times. Worst deviation from course so far.	Hypothesis: motor A runs at a slightly different power/speed from motor B?
6	Motor B wheel B on left, plugged into motor port C. Motor A, wheel A on right, plugged into motor port A. Run 5 times.	Robot veered to the right 5/5 times.	Ports not a factor.
7	Motor B, wheel A on left, plugged into motor port C. Motor A, wheel B on right, plugged into motor port A. Run 10 times, as results from first 5 runs were very ambiguous.	-Robot veered to the left strongly once, and slightly twice. -Robot veered to the right strongly twice and slightly three times. -Robot retained a straight course twice.	Possibly the faults in one of the motors and one of the wheels cancel each other out? However, the sheer speed of the robot amplifies even a slight deviation from the straight *as it is positioned*.

Conclusions: A combination of unequal motor power and unequal wheel wear cause the robot to veer off course. The robot's speed causes these deviations to be amplified.

Possible Solutions: Acquire totally new wheels with minimal wear. IF POSSIBLE try new motors, is some can be acquired. Finally, limit the robot's top speed, as these deviations from the straight only occur to such a large extent when the motor speed is set to > 650/1000.