



## APPLICANT 2 – A VEX ROBOT

What does/did your project aim to achieve? **Please write up to a maximum of 300 characters**

The goal was to build a robot to fit a range of criteria from previous and future vex competitions. For example, the robot needed to make tight turns, pick up/flip game pieces, knock off/place pieces on poles, fire balls at targets and support its own weight. The kit came with instructions for a basic design which was used as a starting point (square base, four wheels, arm and claw). All further features had to be designed, tested and implemented.

Please describe and explain your project making clear and direct reference to your supporting documentation. **Please write up to a maximum of 1000 characters**

Including a mechanism to fire balls (see image 1-3): In the original design, the arm was at the back of the robot, and brain was in the centre, blocking any further additions. The arm was moved to the centre of the robot so that there was space at the rear, but stability wasn't compromised. I designed a treadmill device with flexible paddles to collect and fire ping pong-sized balls, and I repositioned the brain and battery to act as walls to contain the ball.

What have been the successes and failures of you project so far? **Please write up to a maximum of 500 characters**

Determining options for the robot to lift itself off the ground: We considered a single lever hook above the ball firing mechanism that would latch onto a horizontal bar, but I determined that the gearing and power required to rotate and lift the robot around the pivot would be too great. I am designing a scissor lift using steel c-channels, because the movement will be directly vertical and not require rotation. We also need to add gearing to the treadmill to increase the firing range.

What lessons of an engineering nature have you learnt from working on this project? **Please write up to a maximum of 500 characters**

I have learned how to continuously test and develop designs to achieve multiple goals and make most efficient and effective use the physical structure and the electronic control systems. I have also learned how to adapt my thinking to accommodate limited resources and physical/technical restraints (i.e., gearing ratios). I have thoroughly enjoyed exploring the depth of precision and complexity of new components and technology that allow fine-tuned processes, even in a relatively simple project.

## VISUAL EVIDENCE

Image 1

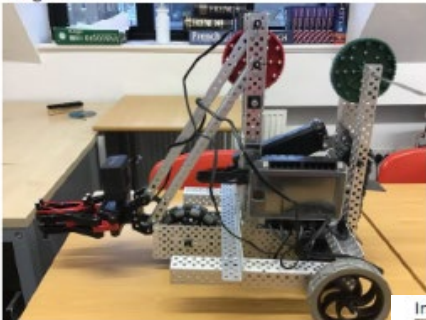


Image 3

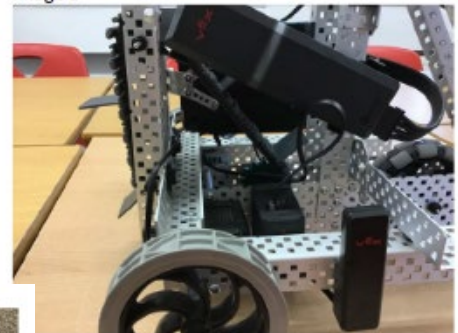
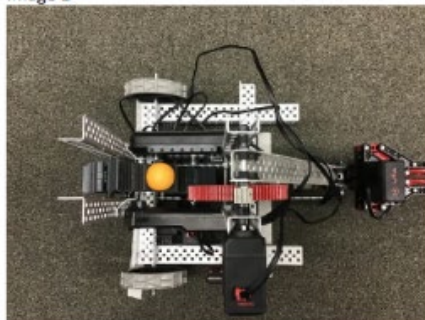


Image 2





## **MARKER'S COMMENTS**

Vex robots are becoming increasingly popular in schools and can be a good (group) project to write about. However, it is critical that it is made absolutely clear which aspects of the project – both design and practical - you have worked on. This candidate has written very well but it is not clear exactly which aspects of the robot the applicant was responsible for. The aim of this project, which is "...to fit a range of criteria..." is not clear. If it had been, then the last section – lessons learnt – could have been more focused and relevant. Vex robot kits are relatively easy to construct so the emphasis of the writeup should possibly focus more on the engineering aspects of the project, such as mechanisms; motorisation; control; etc.