

# Make It Real CAD Engineering Challenge Sponsored by Autodesk ®

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## VEX Robotics – T-piece Design

One day, whilst we were building our robot, we found that we had no pieces that would do the job we required. As our teacher always said problem solve, and so did. We found that the angle gusset, would work if we “flattened it” - so we had to bend it so that we could attach two C-channel bars.



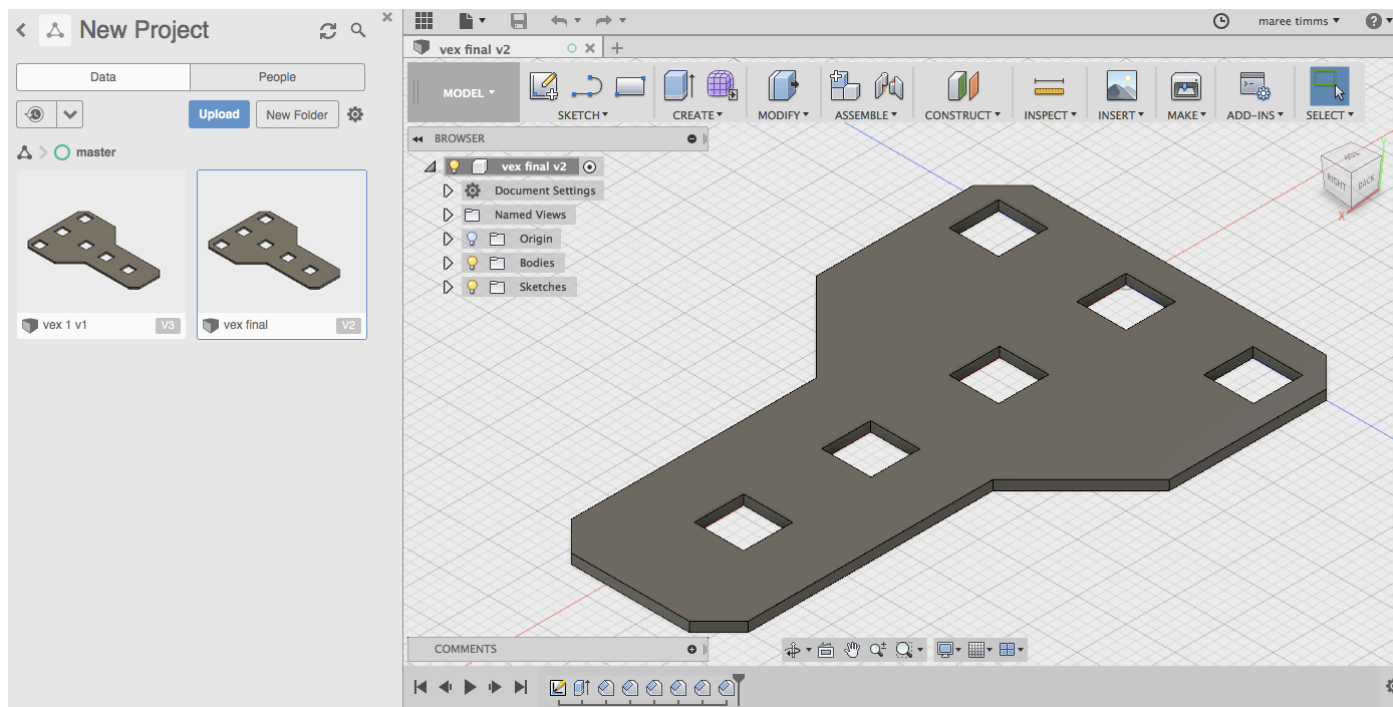
Whilst Lachlan was bending the piece, Mr Webber, one of our VEX Teachers, suggested to the team: “Why don’t you design the piece for the VEX Online Challenge and that way you will get to learn more about CAD design and Fusion 360”. So that’s why we are designing it.

If our T-piece part, was a real piece, our Robot will would require about 6 of them. Instead we had to be inventive and show our initiative, because it’s not a real piece we had to bend the angle gusset pieces.

Our T-piece makes the robot stronger but also uses the least amount of space possible. The part is a flat plate used to connect parts that are against each other but are flat on top.

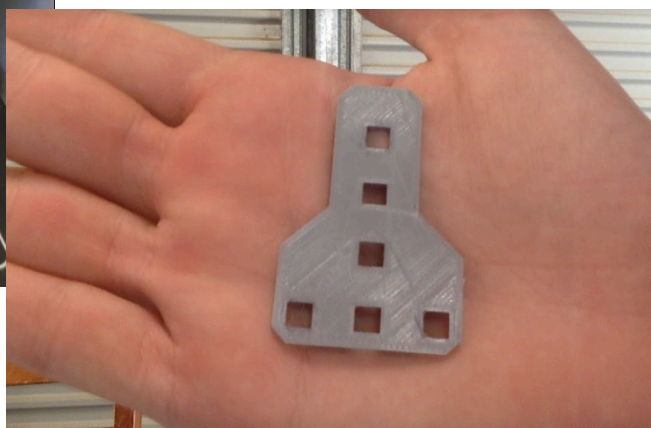
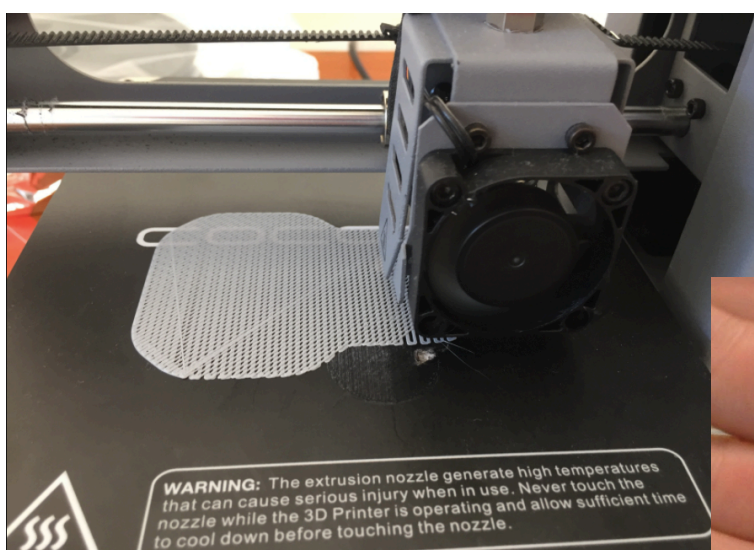


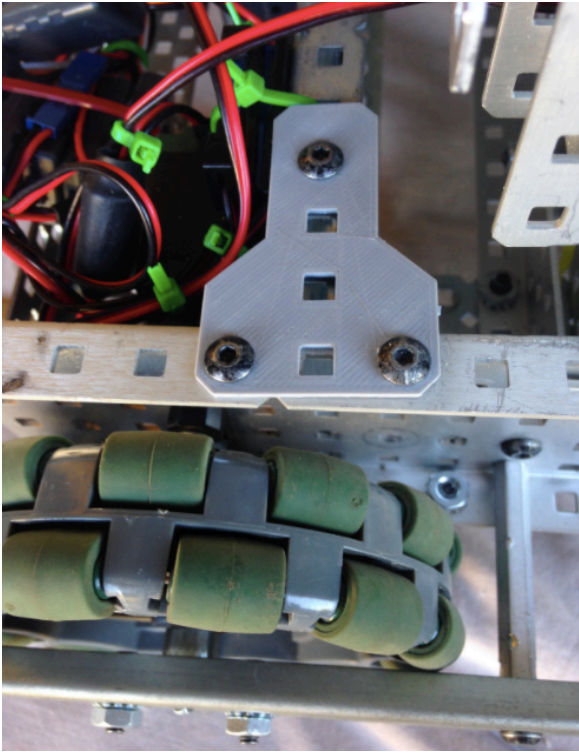
We used fusion 360 version 2.03800 to create our T-piece. Even though it is a simple design, we feel it would work well as a T-shape metal plate. There are already flat VEX pieces but this is a shape that is needed, as there are many angled gussets and corner gussets, but there are no T-shape ones, which is what we need.



When we were building our robot we made our base as big as possible so there was less chance of tipping over. But this meant that the long metal piece that connect the left and right side were either too long or so short and they didn't fit. But if we had this T piece we could connect the short bar to them easily.

We were able to test out our design price by creating a 3D test print of the piece and fit it to our robot.





This was our first ever time using fusion 360 so we watched YouTube videos and just followed them. We found it a little challenging at first, but in the end it was fairly easy to learn. Our teachers were very impressed with us and how we used the program and we will continue to use this application in the future. We plan to learn more about it and use it in the future as we hope to be able to start incorporating our robot design and for our Engineering and Design Note Book. Also if we ever need to design more parts.

Learning this software will help us all with a future career because 3D design and printing is getting used more and more and will become a big part in the future. Engineers, architects and even game design and animators use 3D creation. Now with developments in VR the applications and career pathways of 3D design and using 360Fusion will be endless. It is an exciting future that we are heading into.