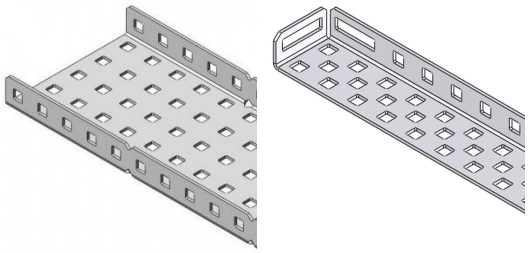
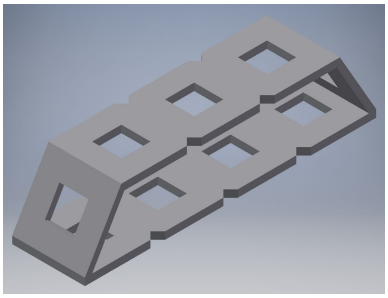
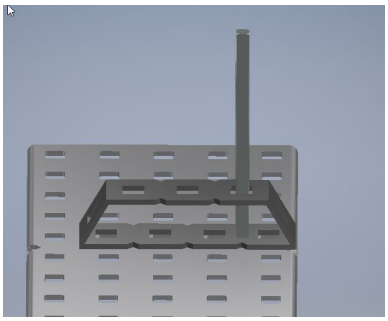
Shift Trapezoid by 278X Titan Team Hyperion

The shift trapezoid is a new piece to help with the problem of spacing. In Vex there are 2 wide c-channels that have holes that make it so you can put axles half a space over. All of the other sized c-channels, 3 wide and 5 wide, only have the holes at 0.32 inch intervals. The shift trapezoid makes it to where you can have a stand off, shaft, or screw between the normal holes. In this year's competition every inch counts with having to squeeze a mobile goal lift and a vertical lift to get cones into an 18"x18"x18" space.





To design the shift trapezoid, we used Autodesk Inventor Professional 2018. We stated by looking at the official Vex CAD files to make sure the size and spacing of the design matches with other previous Vex parts. In a part file we started with a four hole one bar and started building up off of that.



Along this project our team got a deeper understanding of how to use the parts file of Inventor. Before this year only two of our members had ever used CAD and only one had gone through a class to learn fully how to use CAD. 3D design software is super useful for getting a visual of a quick idea and even be 3D printed and become a real tangible object. This makes the engineering design process go much faster and we will definitely use it more in the future. In Vex, 3D design software is super helpful when used to see how sections of the robot fit together and move without having to build the whole system. Any job that has to do with designing and building can benefit from 3D software, from artists to rocket scientists.