Make It Real CAD Engineering Challenge

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The design used for this challenge is a derivative of the VEX Hinge piece. The issue with the original piece was that there was no way to make the hinge rigid. This became problematic when the piece was used to hinge heavier pieces or components. The newly designed piece is different because it is made up of two pieces and a friction screw. The friction screw holding the two pieces together fix the issue that the hinge piece had. It would allow for the designer to build the component and keep it rigid at the designated angle. This would allow for better positioning and a more rigid structure.

This new design 4” x 1/2” x 1/16” when the entire component is assembled.  The individual parts are 2.125” x 1/2” x 1/16”. The friction screw that holds the two main parts together is 0.125” in diameter. The piece can be incorporated onto the end of any VEX piece and has three connection points per part. This allows for a solid connection with any other VEX piece as well the ability to connect multiple pieces. It would be used in the robot to allow rotation of the longer VEX parts. The original hinge piece could not do this because it was not a solid connection and the hinge itself was not rigid. Because of this teams would not use the hinge piece and just bend the VEX parts to the proper angle. Eventually this would lead to the piece breaking and therefore being unusable for all future projects. This new piece prolongs the usability of multiple VEX parts and also allows for more precise positioning of the rotation.

The part is designed in Inventor Professional 2015. Each part was individually designed as an ipt drawing. After these parts were finished, they were brought together in a .iam file as an assembly. Here the complete rotational abilities of the part was tested within the program. Furthermore, the new piece was tested along with previous VEX parts.

This projects has allowed me to learning a lot about the Inventor Professional Program. Previously I was only able to the most basic designs. This project taught me how to use the assembly program as well as giving me experience in 3D printing. While I did use Inventor before working on this challenge, it is a much more viable option for 3D designs now. While it helps with the VEX designs, I can also use it in my future career path of aerospace engineering. This experience with 3D design will prove irreplaceable during the rest of my high school and college car

