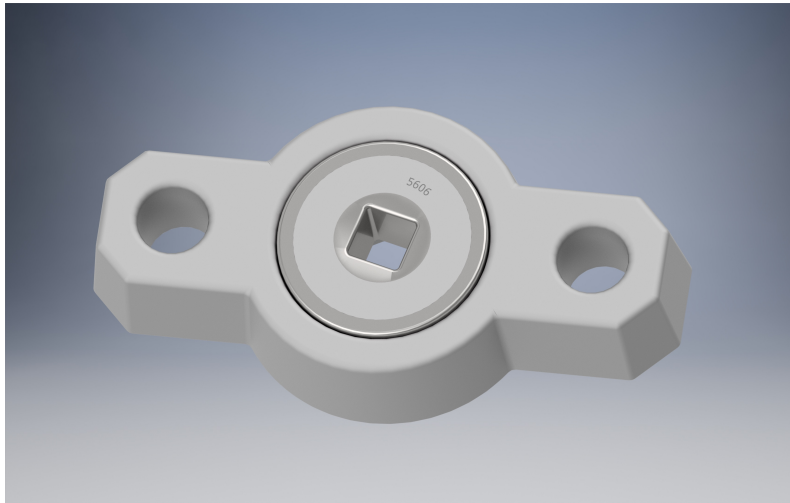


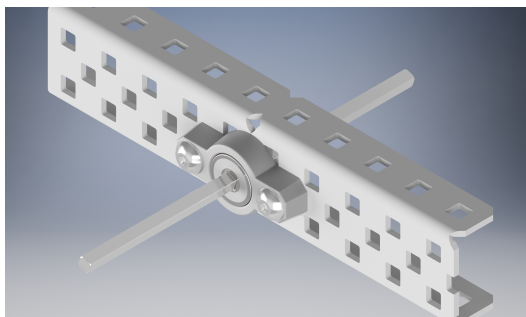
# Bearing All



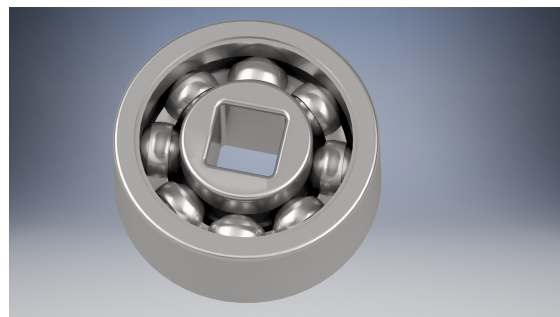
Are you tired of trying to fit a square peg into a round hole? Well, I present to you the solution. I have created the new and improved Bearing Block to enable the VEX shafts to easily rotate with minimum friction and wobble. As with conventional Bearing systems, I have used small steel bearings in the centre. This part will reduce sideways wobble in the shaft because of the tight grip nature of the square hole. The

Bearing and the Block are two different parts that fit together due to their different materials, as opposed to the original one whole part. The Bearing is metal to allow the steel ball bearings in the centre to move easier, and the Block is plastic to reduce weight and manufacturing costs.

In the standard VEX EDR Competitions, even a small amount of friction and wobble can impact heavily on the overall performance of the robot. There are many advantages with a Bearing Block that significantly reduces unwanted movement, particularly in high speed or high torque games. For example, our robot design for the 'Nothing but Net' game involves a very high speed gear ratio to fling the balls across the field. Shaft wobble and friction will take away momentum from the system, therefore making the overall system less effective. This new Bearing Block will diminish the loss of momentum from the mechanism, allowing it to perform to a higher standard.



Bearing Block with shaft

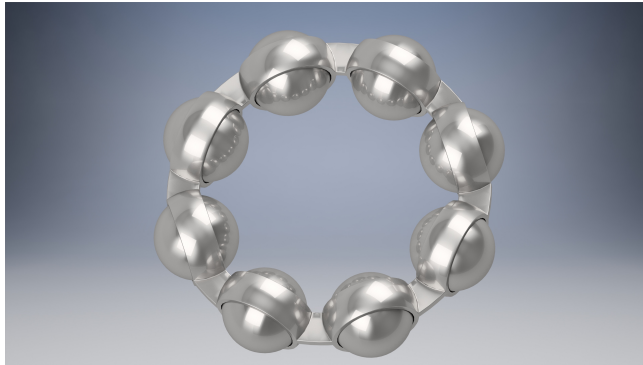


Bearing without top cover showing steel bearings

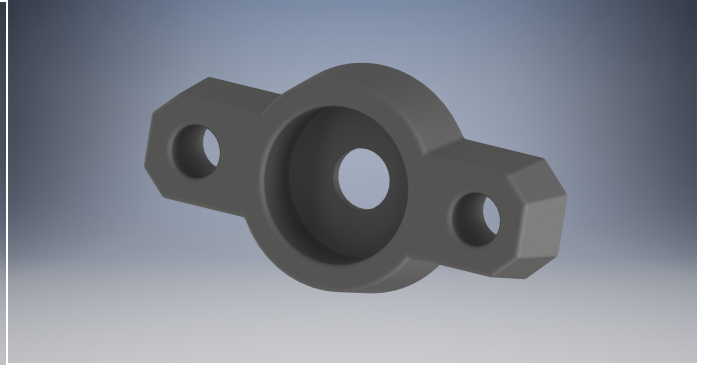
I used Autodesk Inventor Professional 2016 to design this part. The features and techniques I used were:

- Mirror Feature. I used this to ensure that the part would be symmetrical, and to make the process of designing this part more efficient
- Circular Pattern Tool to revolve a certain feature around a central axis
- Pattern Component. This was used to replicate the steel ball bearings into the correct positions in the assembly

- Fillet tool. I used this to round off all the sharp edges on the plastic block that Bearing goes into



Steel bearings in holder



Block, front view

From this project, I learned the importance of efficiency in creating parts and assemblies, and how to use available time effectively. Also, it was interesting to explore in more depth the tools of Autodesk Inventor that I want to use more regularly. I discovered different tools that I can use in future, such as the Pattern Component. In the Robotics club at my school, we use Autodesk Inventor heavily to save time building. We believe it is better to build something once and build it right, rather than spending time testing out undocumented designs. The advantage of this is that we can design even when the parts are unavailable to us, allowing us to think ahead with our robot and strategy. This is because we always design our robot on Autodesk inventor first before we build it. I will use Autodesk Inventor in the future because it is a programme that I enjoy working with due to its potential for creativity and imagination. I hope to one day have a career as a Design Engineer.