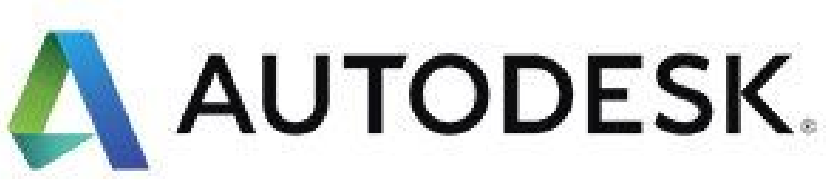
IronMechs
99157A

2020 Make It Real CAD Engineering Challenge



THE PROBLEM

A problem many beginners in VEX face is being able to tell the difference between different screw and spacer sizes. It is frustrating to pick up a screw or spacer only to realize it is too big or too small for what you are building. As the team becomes more experienced in building, this problem usually occurs less, but it is still a big hurdle to overcome when first starting out. VEX is not only for future engineers or scientists, it's for every student who wants to become better at problem solving. Getting stuck in little technicalities such as this one can demotivate new participants from continuing. Due to this problem, our team came up with this design:

THE VEX SCREW / SPACER SIZING AID

This sizing aid will help builders across all experience levels ensure that they use the right size screw for the right application. No more confusing 0.875" screws with 1" screws or picking up a 3/8" spacer instead of a 1/2" one! This sizing aid comes with the ability to be attached to a keychain, so you can take it with you anywhere. Additionally, it can be folded away to take up less space.

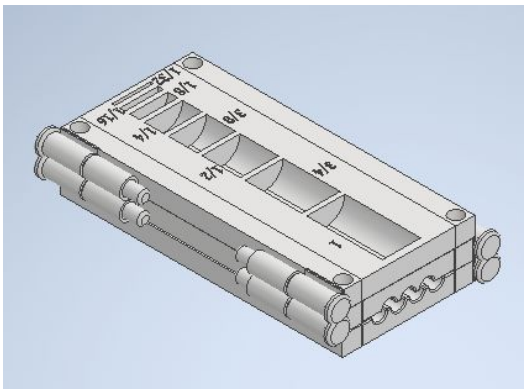
DESIGN PROCESS

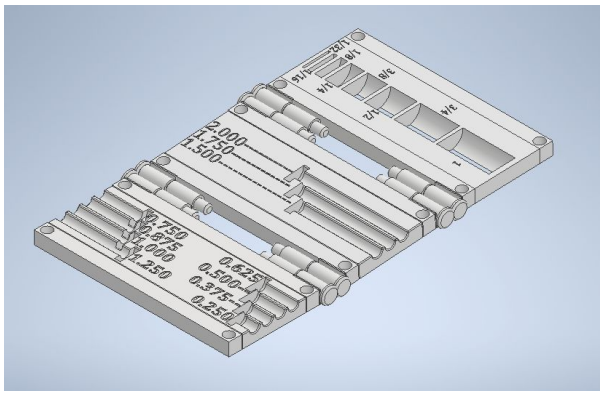
We created this part using Autodesk Inventor Professional 2020.

There were 3 main parts to this design - 1 spacer side and 2 screw sides. These parts would later be attached together like a hinge to be able to close.

First, we constructed the main measuring parts of the device, which were the long and thinner holes for the screws and the shorter and wider holes for the spacers. Then, we designed a hinge that would be used to attach the different parts of the device together. The hinge required numerous modifications, because we wanted it to be simple but effective.

Below are some final CAD images of our design:





CONCLUSION

While this part may not be directly useful in improving a robot's functionality, it is very convenient for advanced and novice builders alike.

This design went through many iterations, from having all the measurements on one plate to having 5 different plates for them! It was very interesting to see how this design evolved and became more efficient in completing the designated task.

While making this part, we became more familiar with the Autodesk Inventor software. We will definitely use the skills we learned from building this part in the future.