Mistakes:

I made many mistakes during my designing process, starting with chamfering the edges of my first design in Fusion. I tried to do this for aesthetic purposes, but it caused problems when setting up the CAM toolpaths. I ended up not chamfering my design as it would be too hard to learn to do an angled cut in fusion. Besides the wrongly chosen chamfer feature, my first design. also had the wrong angle. This made it not able to hold up a whiteboard in the vertical direction. To fix this, I redesigned my second whiteboard holder to have a sharper angle. This second design did not have the proper tabs for the ShopBot. I actually did not include tabs in previous designs, thought in this cut, the lack of tabs damaged the wooden legs severely. Mr. Rudolf taught me to tab my design in Fusion, which quickly fixed this mistake. My final design, however, did not cut entirely through. I believe this is because the bit slipped before I cut the wood, as I recut the same design and it cut all the way through.

Issues:

Besides the mistakes I makes, I faced various issues with supplies and logistics. I initially wanted to use 1 inch wood in my holders. As we the lab did not have enough of this wood, I switched to 0.5 inch wood which was more practical and obtainable. I had problems securing this 0.5 inch wood to the ShopBot, but Mr. Dubick bought screws that easily went into the ShopBot without stripping. This also solved my time issue, as I often could not finish setting up in one class period. As I learned to use the tools thought, I easily finished in the 45 minutes. Before I became more confident with the ShopBot, I did have to come in during my free periods, lunches, and after school. Along with the time issue, I struggled with the long lines to use the ShopBot. I

fixed this issue by coming in during early periods, when no one was there so I could avoid the lengthy in-class lines. The most present issue appeared near the end of my project, as I did not have the money for supplies. Mr. Dubick allowed me extra time over the summer to finish my project, as I did not receive funding from the physics department enough time before the due date.

Challenges:

The main challenge I faced was an overscheduling issue. As this project took place during the months of January to May, I often found myself struggling to balance all my STEM responsibilities. The problems lied in two science competitions; eCybermission and Science Olympiad. Mr. Dubick helped me by allowing me class time to prepare before the big events. Because of the extra time I was allotted, I was able to place in two events for Science Olympiad and was invited to compete in eCybermission Nationals.

Important Decisions:

Along my design process I had to make three significant decisions. My first decision was my idea for my Engineering Design II project. I was struggling to decide whether to continue with my Heely project, or switch to make the whiteboard holders. I finally decided on making the whiteboard holders, as I was interested in learning to mass produce a prototype. I also wanted to make something that could be used by my peers and not just me. My next decision was deciding whether to use 1 inch wood or 0.5 inch wood. As discussed above, my deduction was partially made for me as we did not have enough 1 inch wood. Finally, I had to decide what

hinges to use. I initially bought jewelry box hinges which were not durable enough to last in the future. The physics teachers requested that I use piano hinges and cut them to my desired length to save money, but after a trip to Lowe's, I learned you cannot cut piano hinges. I quickly decided to buy bigger hinges, which would cost more, but I found cheap packs of two which helped the price. My dad also decided to buy the hinges for me which took away the pricing problem. One additional smaller decision was deciding which stain color to use. I chose a clear stain, because I liked the lighter wood color.