

Ninety Degree Four Post Hex Nut Retainer

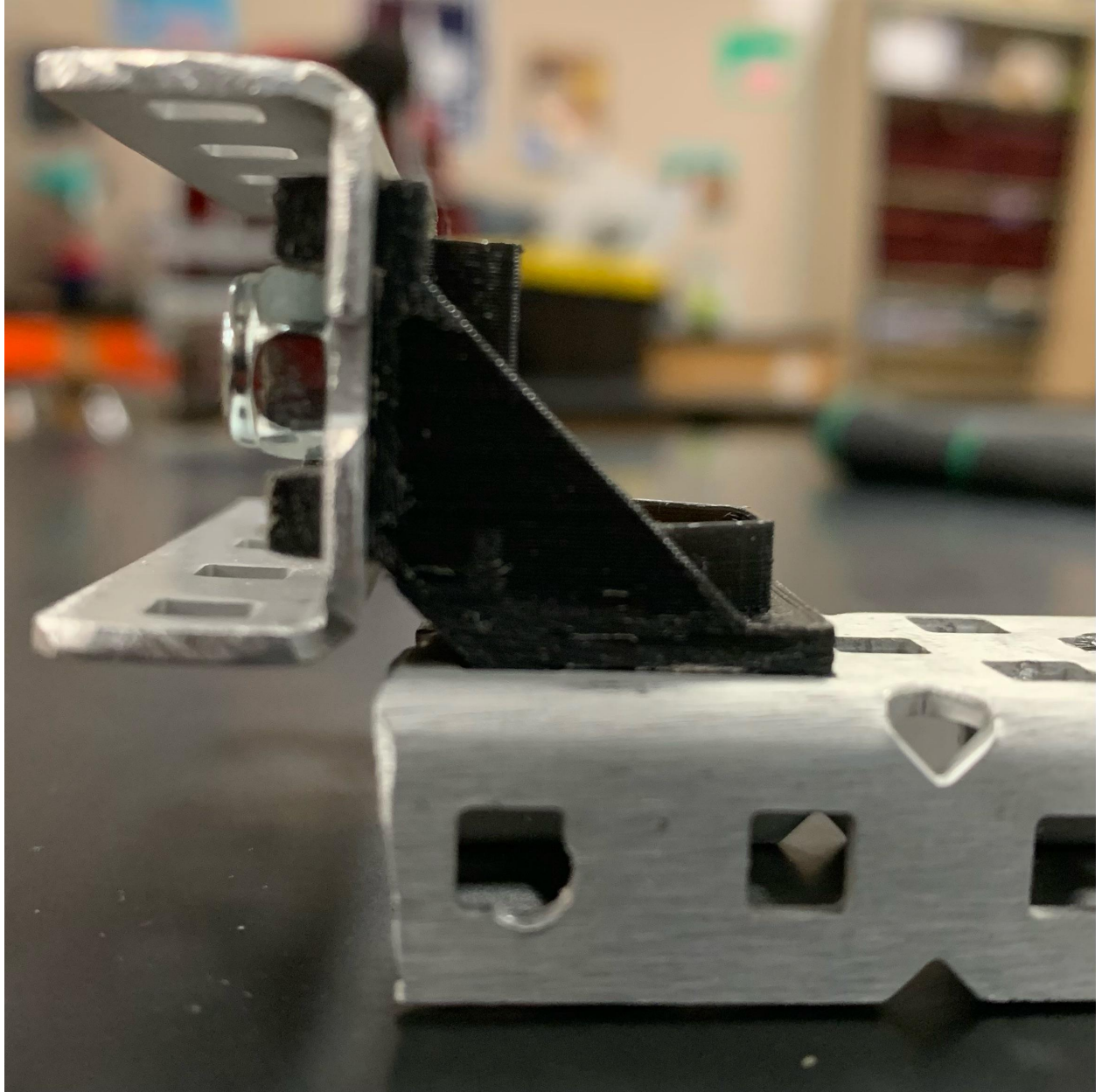
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The piece we designed for the "Make it real" challenge is effectively a ninety degree angled four post hex nut retainer connector. The reason this was our design was because sometimes parts cannot be moved to attach to the side of a piece of metal and the only other option for ninety degree attachments like that is the metal gussets which bend easily and thus makes them less than structurally stable. This is the reason for our design, we have previously had situations where the structural instability of the gussets caused us to change our design so the ability to have a strong way to attach pieces at a ninety degree angle to each other.

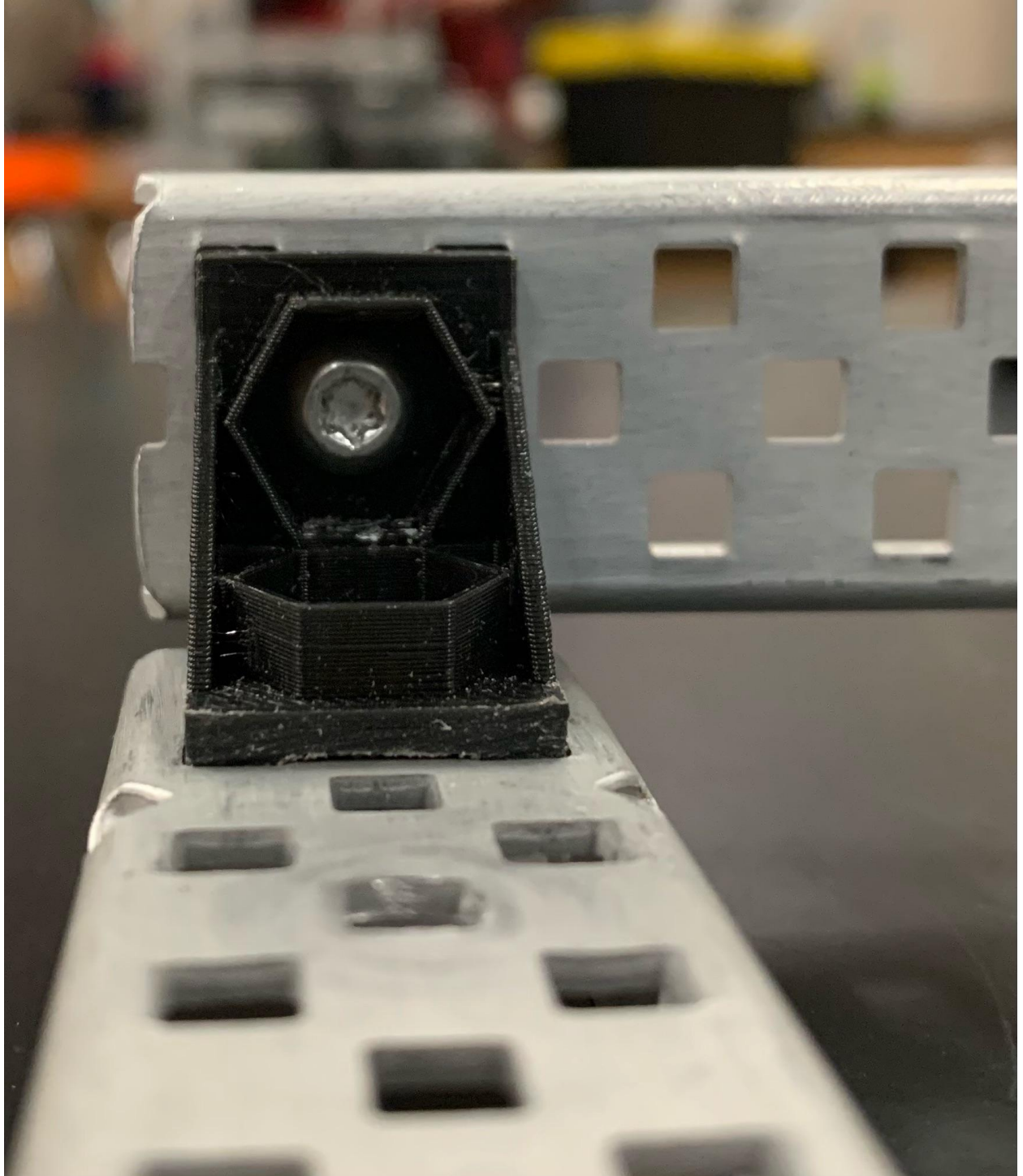
I designed this piece by first measuring all of the dimensions of a regular four post hex nut retainer with a micrometer. I then went into Tinkercad and started using their prebuilt squares and altering them to the sizes necessary to recreate a singular four post hex nut retainer. I then copied that design and rotated it, raised it up till the base plates were level and merged them. I then added supports to the sides of the base plates to add structural stability, smoothed out some of the rough edges to make it more visually appealing. After the cad model was made we sent it down to the library where we have our 3D printers, we talked to the librarian. He agreed to help us so he taught us how to print the model and tune it so it was printed without any major issues. Even with his teachings we still had bad prints which we threw away in favor of better prints. When we eventually got a successful print it still was slightly incorrect by about two tenths of a millimeter so we filed it down. Once the prints were fitting as we wanted them to we did a small photoshoot of most of our designs and how they fit.



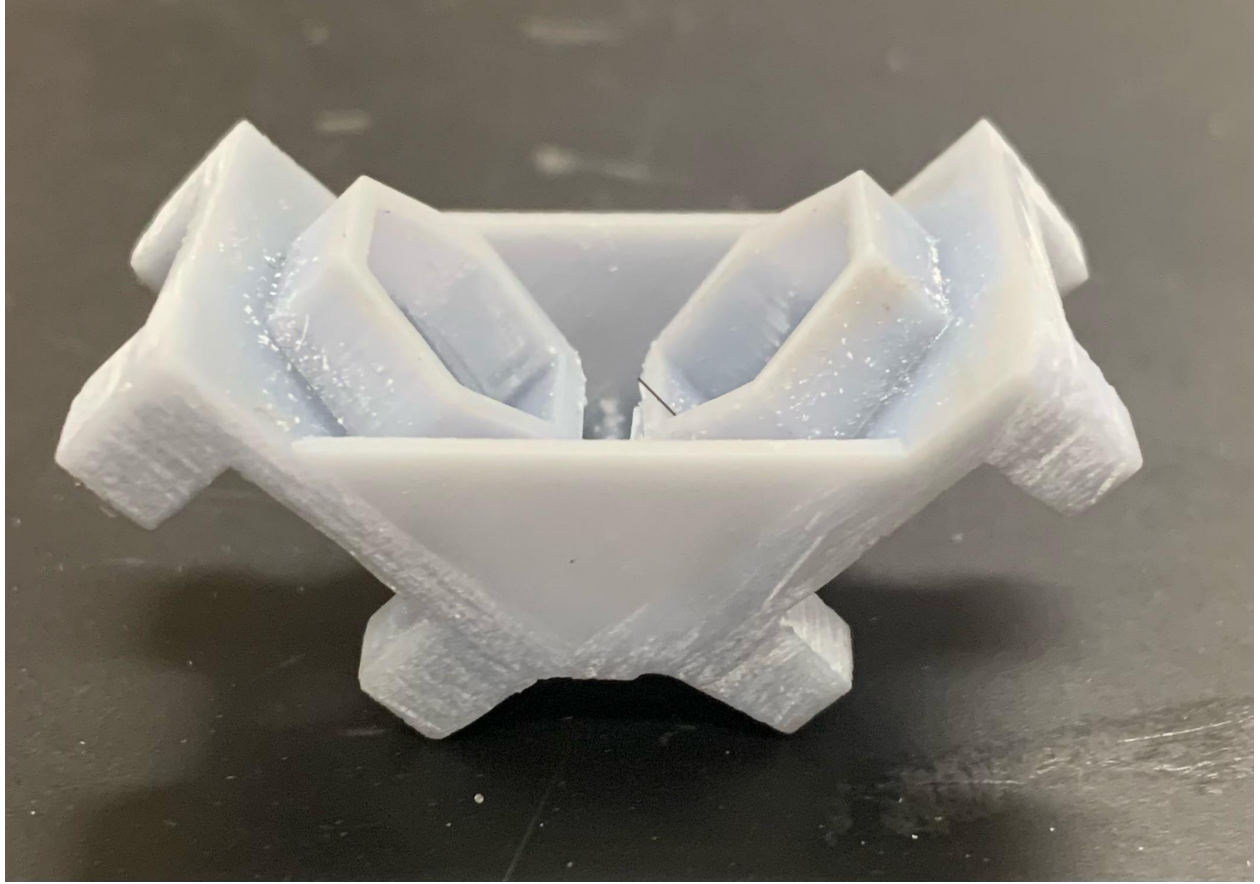
First Design, poor print quality and poor fit in all aspects



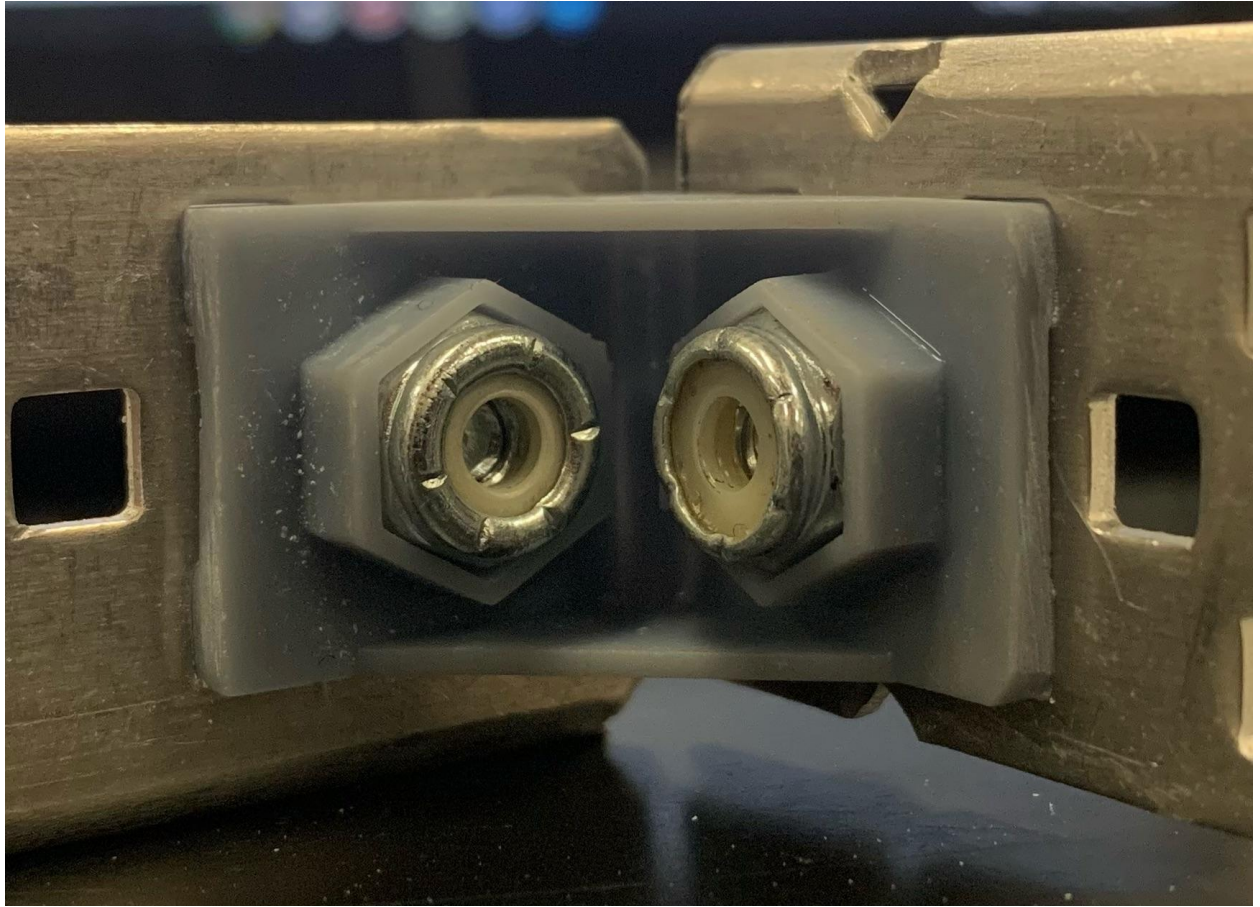
Same poor quality print but installed into some metal



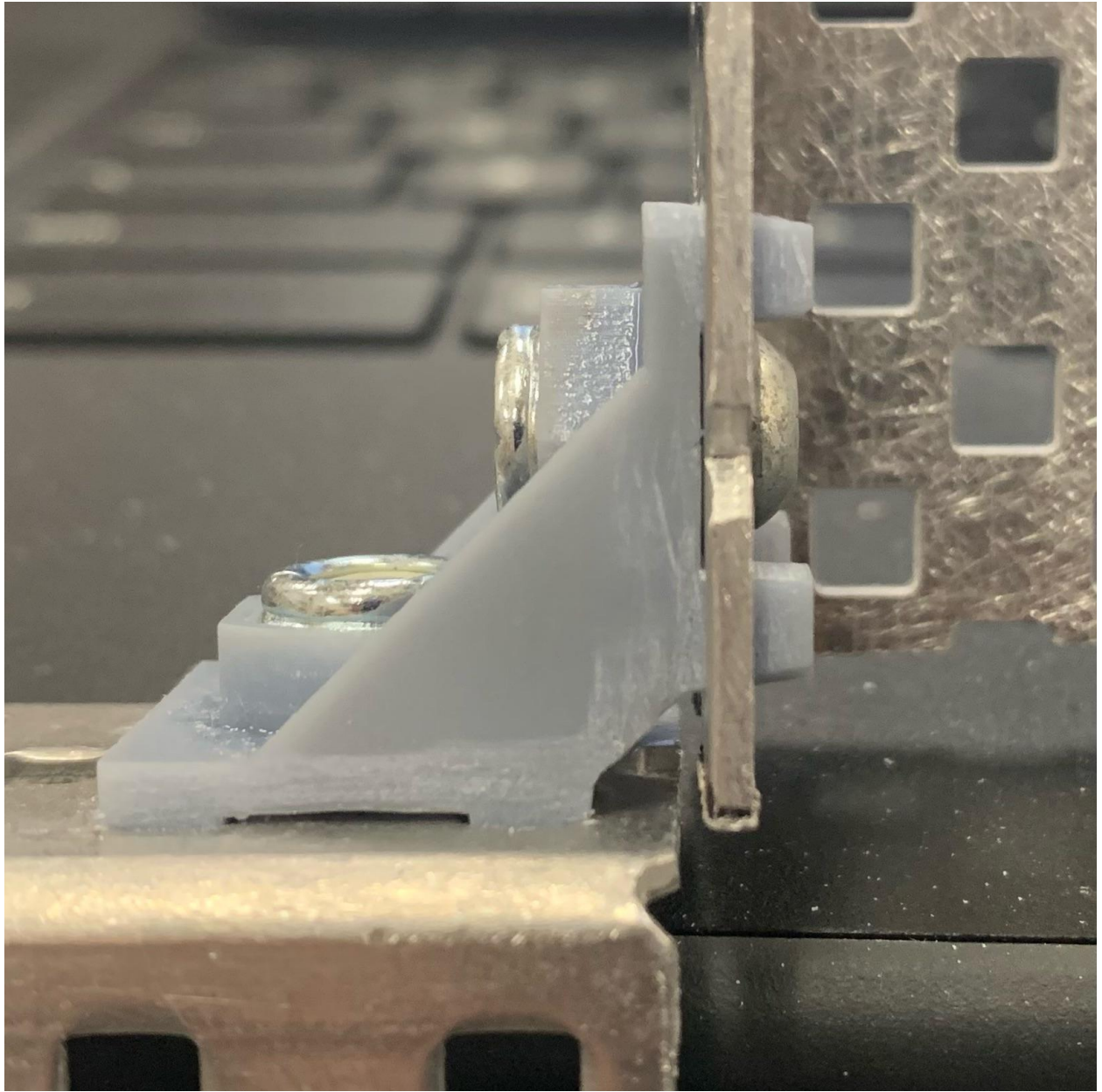
Another angle of the bad print



The last print on the resin printer which still needed some filing



Final print, fits the VEX nuts and fits into the metal nicely



Side view of same nice print