

CIVIL ENGINEERS

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The STEM (Science, Technology, Engineering, and Mathematics) career that we have picked is a civil engineer. We picked this occupation because it is closely related to robotics. Civil engineers are responsible for the creation of lots of public infrastructures. Much of their job is spent designing and constructing public works such as roads, bridges, canals, and many more. We figured this out by researching civil engineers. If you look at civil engineers in-depth, you can see that they use many elements of the engineering design process to carry out various projects. To recap, the engineering design process is 1) Define the problem 2) Generate ideas 3) Select a Solution 4) Make the item 5) Evaluate the item 6) Make needed changes, and 7) Present the Results. If we connect this to civil engineers, you can see that they definitely define the problem. When on a project, they need to figure out how large what they're building will be, where it will be, how much money it'll take, and all the logistics of the project. If we look at the second step, we see that it is generating ideas. To solve problems, civil engineers need to brainstorm ideas so that they have a plan to solve whatever problem they're facing. The third step is select a solution. After the engineers brainstorm ideas, they must choose the best one suited to solve the problem. The fourth step is to make the item. This step is not regularly used with the engineers, since the engineers come up with the ideas, while the construction workers deal with the physical work. The fifth is evaluating the item. Engineers definitely use this step, as after they finish their project, they have to evaluate it and see if it needs any more changes. The sixth step is to make needed changes. If there is a problem with the structure, the engineers will definitely have to make changes to the structure, to make sure it functions properly. Finally, the last step is to present the results. After the engineers finish the project, they will then present it to the public.

The approach used by my team to build our robot was to work from the bottom to the top. First, we worked on the drivetrain. Next came the shooter. After that came the intake, or how we were going to get the disks. Subsequently, we built the mechanisms for the dispensers. Finally, we

perfected the arm that would reach over the wall to double our points. Professional engineers also use this strategy. They prefer to begin from the bottom, or the foundation and work their way up to the top of whatever architectural wonder they're creating. As we look at this comparison, we can see that our team's approach to creating a robot is pretty similar to the plan of a professional civil engineer.

Participation in VEX robotics has changed our lives. We learned about building robots, gear ratios, programming, and so much more. VEX is such a pivotal part of our lives that we can hardly imagine it not being there. VEX's program requires us to be able to build, program, learn, and drive. VEX has prepared us for many different careers, including engineers, programmers, and mechanical designers. We will continue to remember VEX for the remainder of our lives because of how much of an impact it has had on us.