Vihaan Malik's Career Readiness

Physicist

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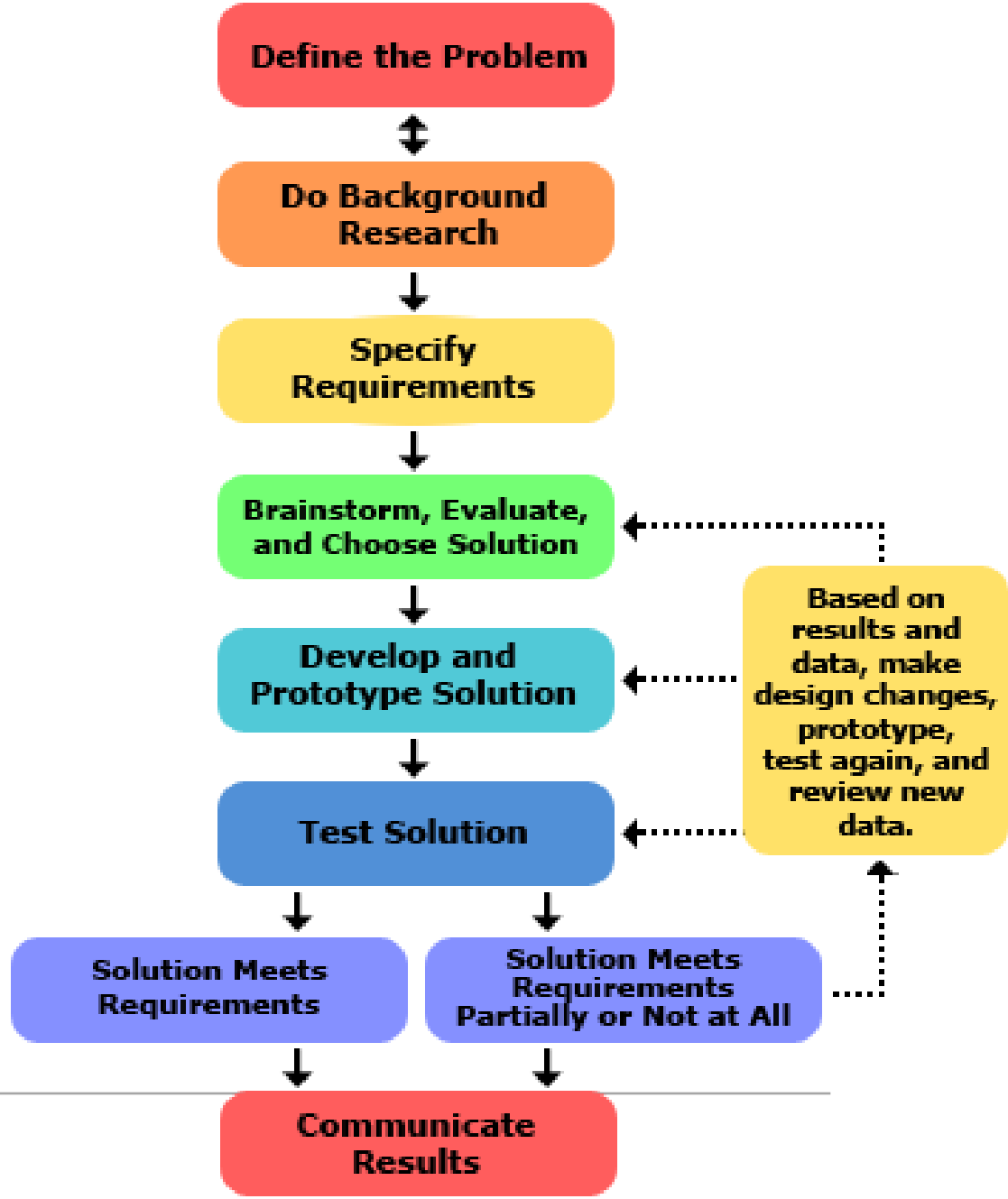
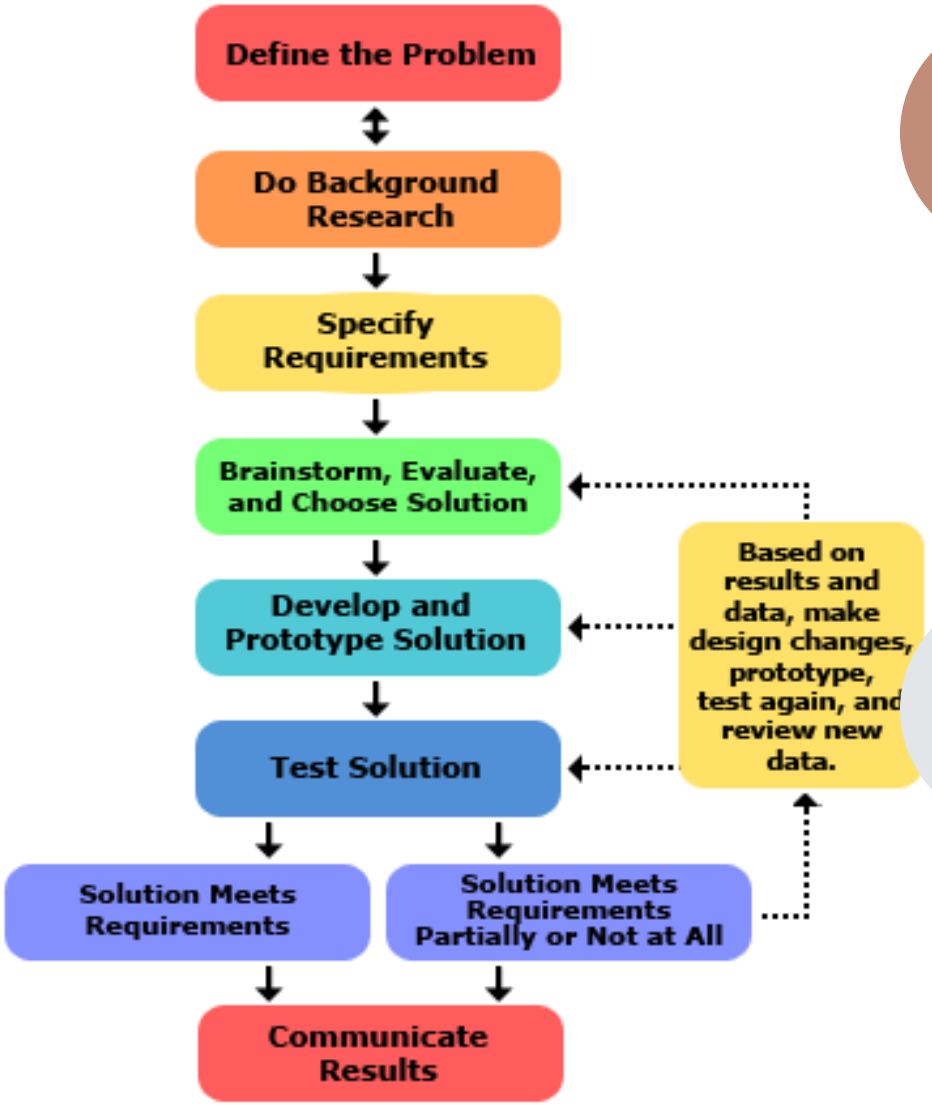
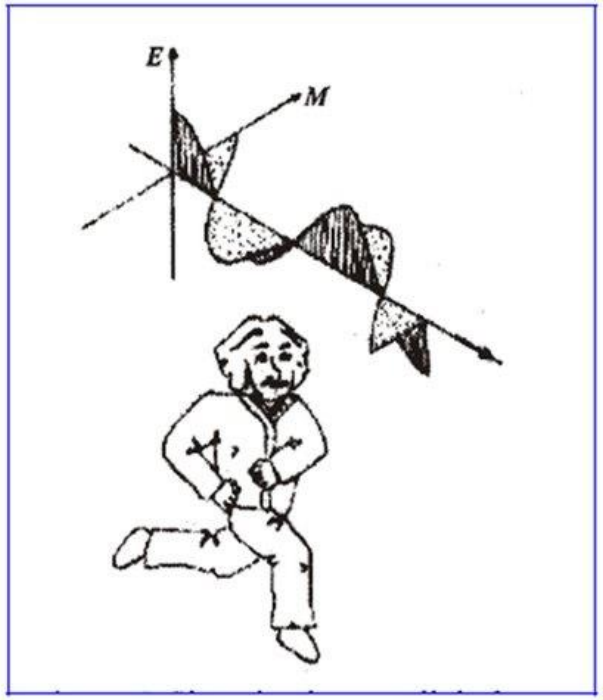

Define the Problem
Do Background Research
Specify Requirements
Brainstorm, Evaluate, and Choose Solution
Develop and Prototype Solution
Test Solution
Based on results and data, make design changes, prototype, test again, and review new data.
Solution Meets Requirements
Solution Meets Requirements Partially or Not at All
Communicate Results

- I would like to be a physicist in the future. This is because of my curiosity for the way things work in our universe from the tiniest quarks to the largest black holes. Discovering how energy, matter, and time interact and how we can apply this would be interesting. Physicists use the engineering design process everyday to create solutions to problems. The engineering design process goes from these steps: Define the problem, research, discuss, specify requirements, brainstorm, select an approach, create a prototype (which would be to create a beginning experiment for a scientist). Now create a final test, communicate results, and lastly reflect and make changes. We use this process in vex robotics as we need to build a robot from scratch that completes specific tasks.

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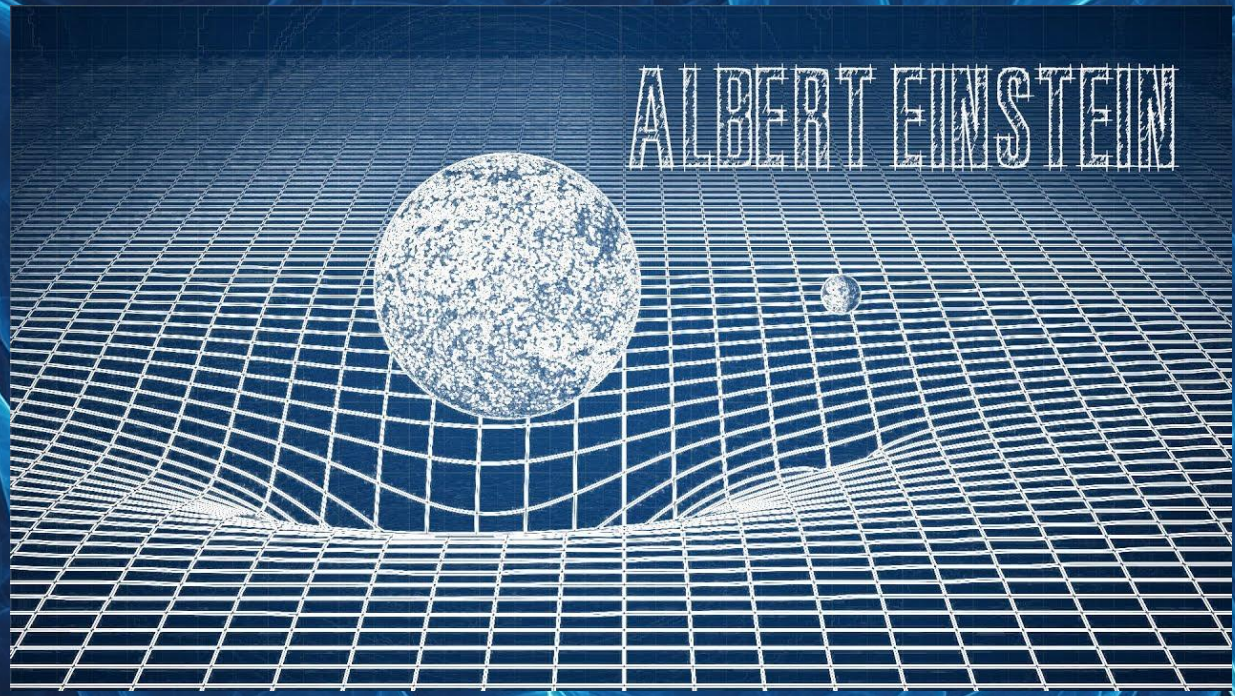
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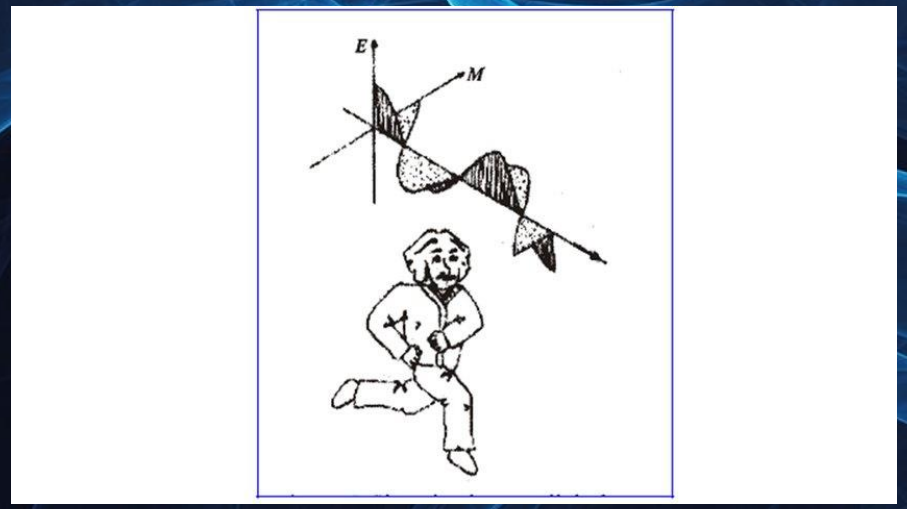
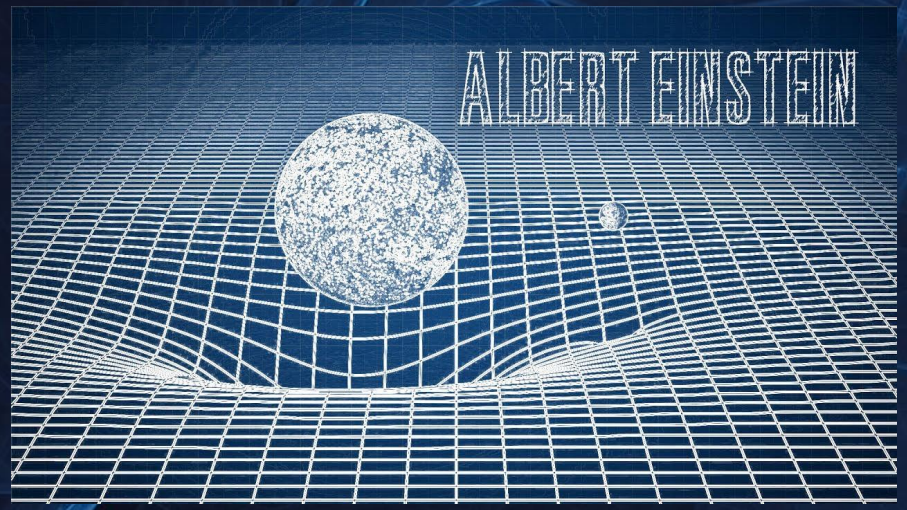
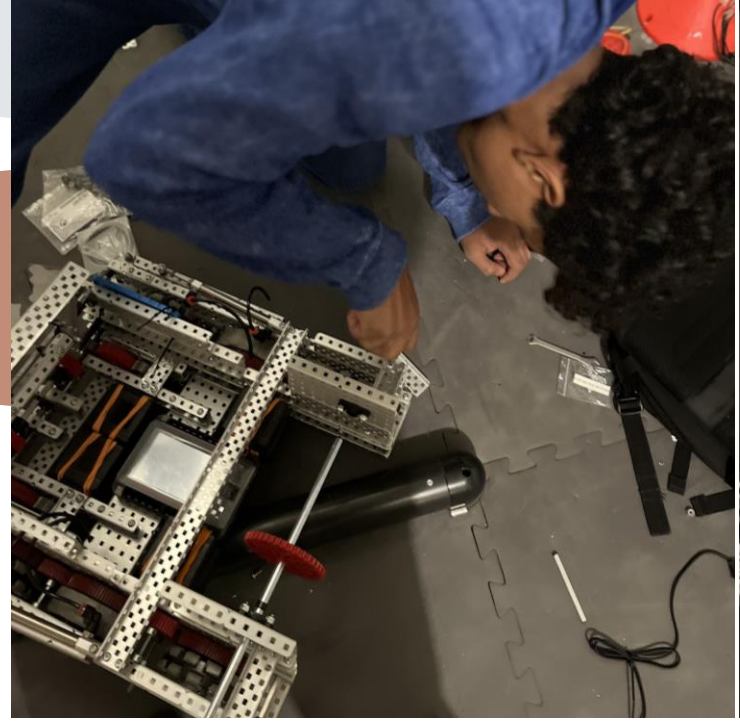


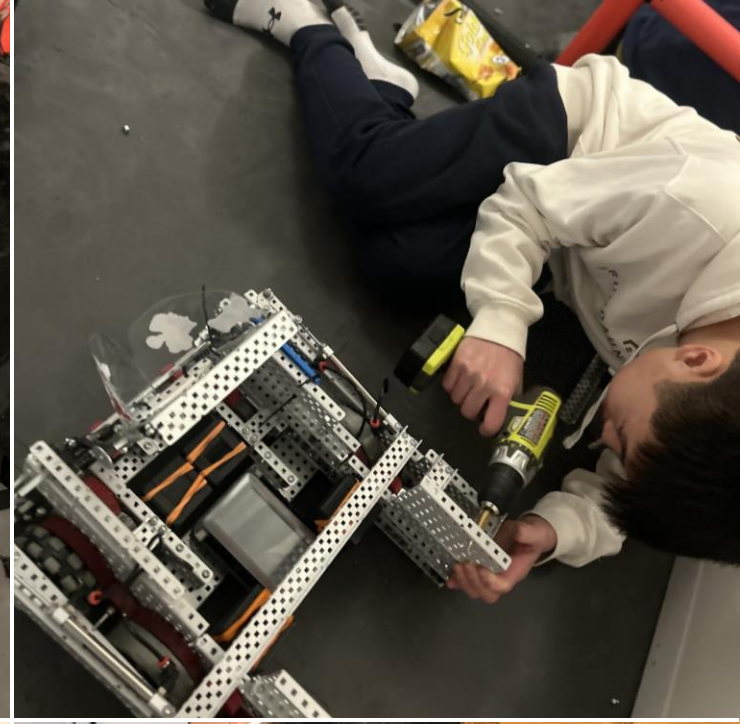


Some great physicists are Albert Einstein, Mary Curie, Isaac Newton, Stephen Hawking, Max Planck, Niels Bohr, Werner Heisenberg, and Erwin Shrödinger. These physicists used processes like the engineering design process to make discoveries and differences in the way we live and think. I would like to also make a change like that one day. To show ways that physicists have used this process we can look at Albert Einstein who asked a lot of questions like what would happen if you travel with a beam of light. He then looked at the laws of physics at the time, did a lot of imagining, thinking, discussing with other great physicists and mathematicians, and decided how he would solve some of the things he was wondering about the universe. He would then come out with the theories that would make him who he is. These theories would be then tested and confirmed. This is an example of the engineering design process!

- Our team has used the engineering design process to create an efficient robot that can do some of these tasks. Doing vex robotics helps build bonds with your teammates just like we will in our respective jobs. We also learn how to put our interests second to what's best for the team. I have learned that sometimes I should let the other kids build and do other tasks even if they're not as interesting. This is because everything we do helps the team like coding, online challenges, and notebook. I know this experience would be very helpful in any profession and especially for a physicist.

- NASA is one of the largest employers of physicists in the world. Physicists in NASA work with engineers to create methods of transportation that can take humans far into space. Let's dive into the similarities of their engineering process to ours.

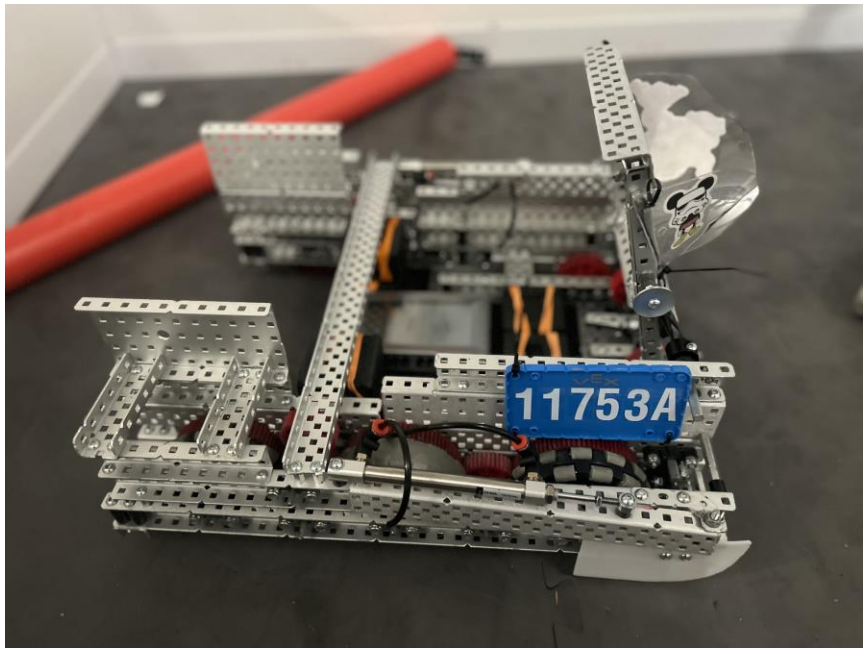


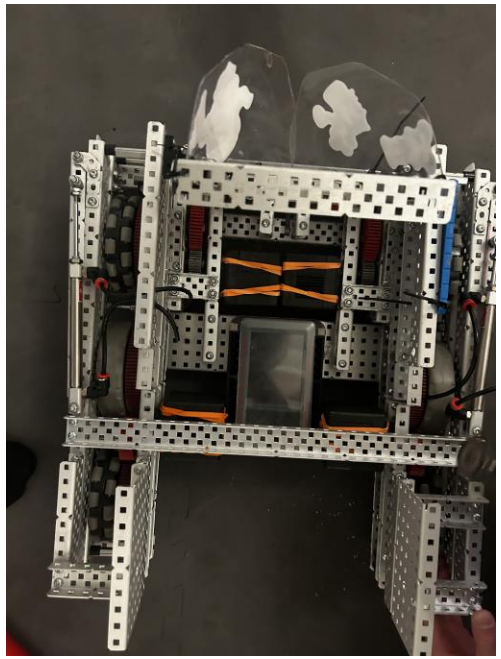


Define The Problem

As a team we will define the problem to get started. In our example the problem is we want to build a catapult but don't know how to create a system that could fire the catapult fast.

NASA has to define problems all a lot from figuring out what new research is needed, what their next mission will be, or just problems with their equipment or latest spacecraft.

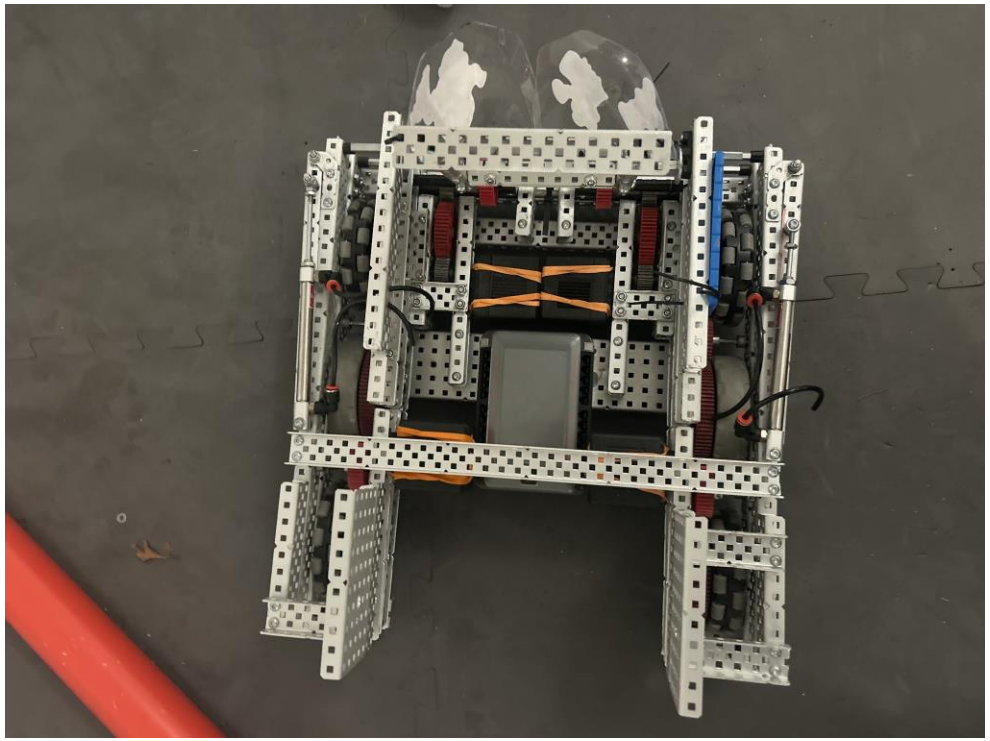


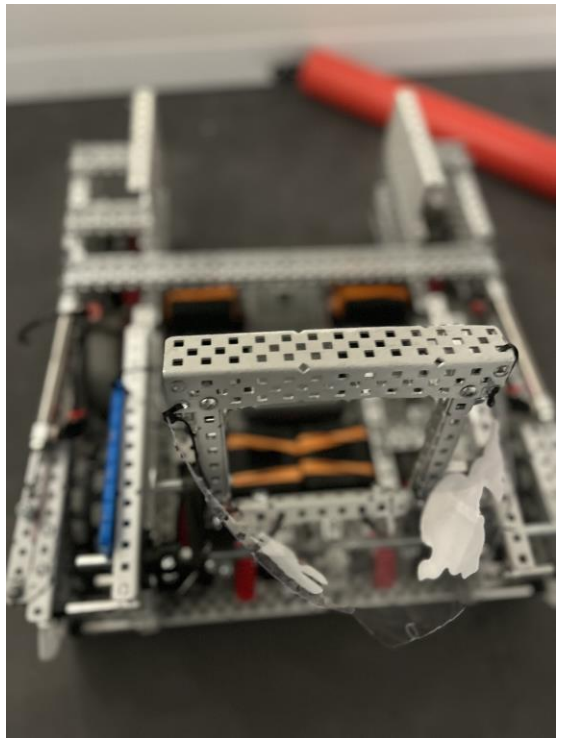


Do Background Research

Now we get to researching. We look online for robots that have optimal designs. We create charts and rate each of their efficiency at each task.

NASA physicists also research. They can use information that they collect from professionals and their equipment.





Define Requirements and Discuss Ideas

We now see the different ideas and look at our requirements. We discuss as a group to find the best catapult design. Now we can look through our chart and decide on a good design.

NASA physicists now have to see how they are going to solve their problem by looking at the requirements. They also discuss ideas with peers.

Select an approach/solution

Now we know our options we can select the catapult design we like the best and change it up to make it better. For example we researched and liked the idea of having a slip gear.

NASA physicists will now see which approach is the best for their tasks. They will use the information and opinions from hundreds of professionals for this decision.

Develop and Prototype Solution

Now we start to CAD (computer-aided design) our design for the catapult. After, we build our prototype.

NASA scientists and engineers will use a high tech CAD. They will put down an early design with all the requirements. Then they will build using professional engineers.

Test Solution

We will now see what are prototype can do. In our example we would see if the catapult works. If it does we will document the speed (in triballs launched/minute), power(do the triballs get under the net or to other side?), and angle. We can create another chart to see the test results

NASA scientists will perform tests to see if their prototype works and is safe. NASA has to do a lot of testing because human lives and a lot of money are at risk.

Communicate Results

Now we know the results of our test. We will communicate these results through our engineering notebook and to our teammates

NASA now has to work and communicating their results. NASA will communicate their test results to the whole world, especially if the test was for an important

Reflect and Make Necessary Changes

We have the test results. If we need to make changes we can make them now. We might have to repeat the engineering design process to make our design better.

NASA is now analyzing and making the changes needed. NASA wants to create the best design possible and will now need to refine their design using the engineering design process.

Thank you for Reading!