

# **To Infinity and Beyond My Vex Robot: How Vex Model Building Stokes My NASA Ambitions**

Report By

**Eshaan Vivek**

Team 91343C

Vintage Elementary School, North Hills CA - 91343

My name is Eshaan, a fifth grader at Vintage Magnet Elementary School. I am the main builder in our school robotics team, 91343C. For my project, I chose to research the Jet Propulsion Lab (JPL) in Pasadena, California because I think space and rockets are awesome! I had visited JPL with my parents (Picture 1) in 2019 (unfortunately that was the last time, public tours were allowed) and wish to be an aerospace engineer or build cool Mars rovers when I grow up. My dad helped me read some of the big words on the JPL website about how their engineers make spacecraft to explore our solar system.



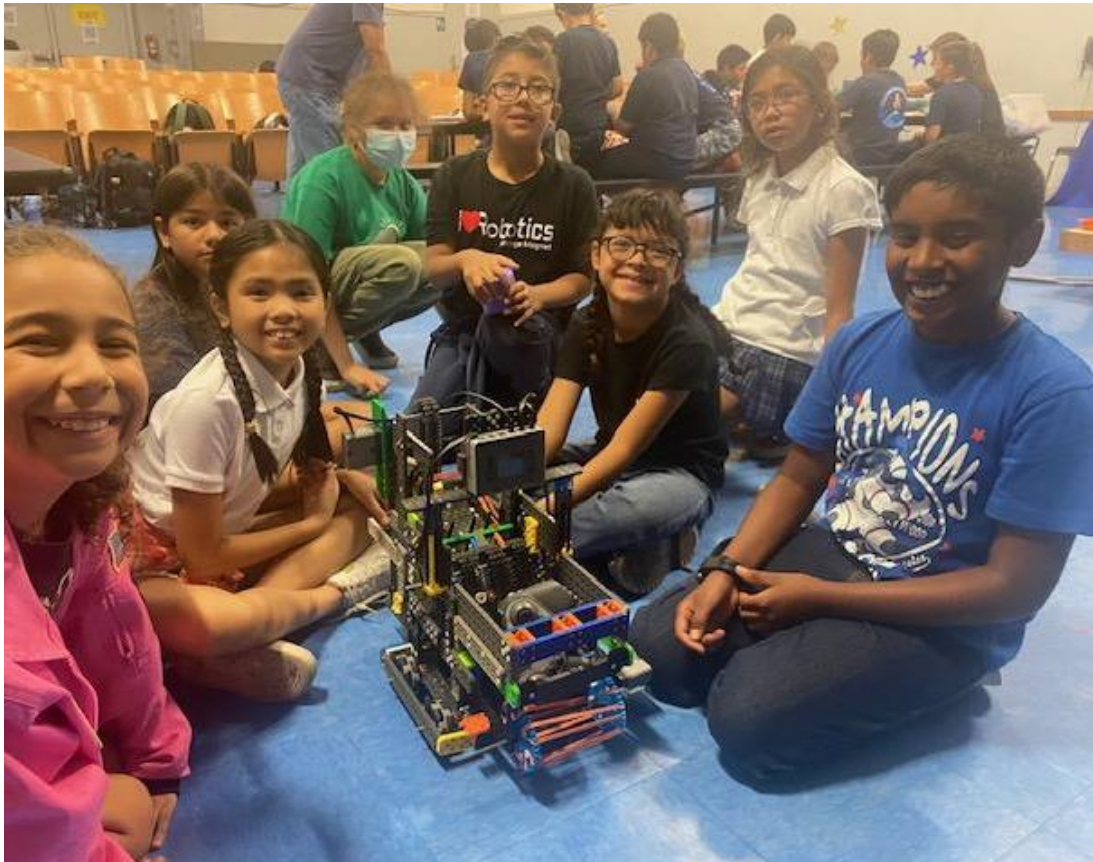
Pic.1. Me and my mom at JPL (May 18, 2019)

Did you know NASA engineers had to figure out how to land the Curiosity rover on Mars using a flying crane? Crazy right? I made a model of it out of Lego pieces (Picture 2) and it was so much fun. I attached my phone to the rover (using Lego Technic AR app) and made a video of how it collected samples on the ground. Not only that, but I felt like an engineer, testing out prototypes to get the correct design. Now I know why they test a lot before sending the real rover - it's fun and hard!



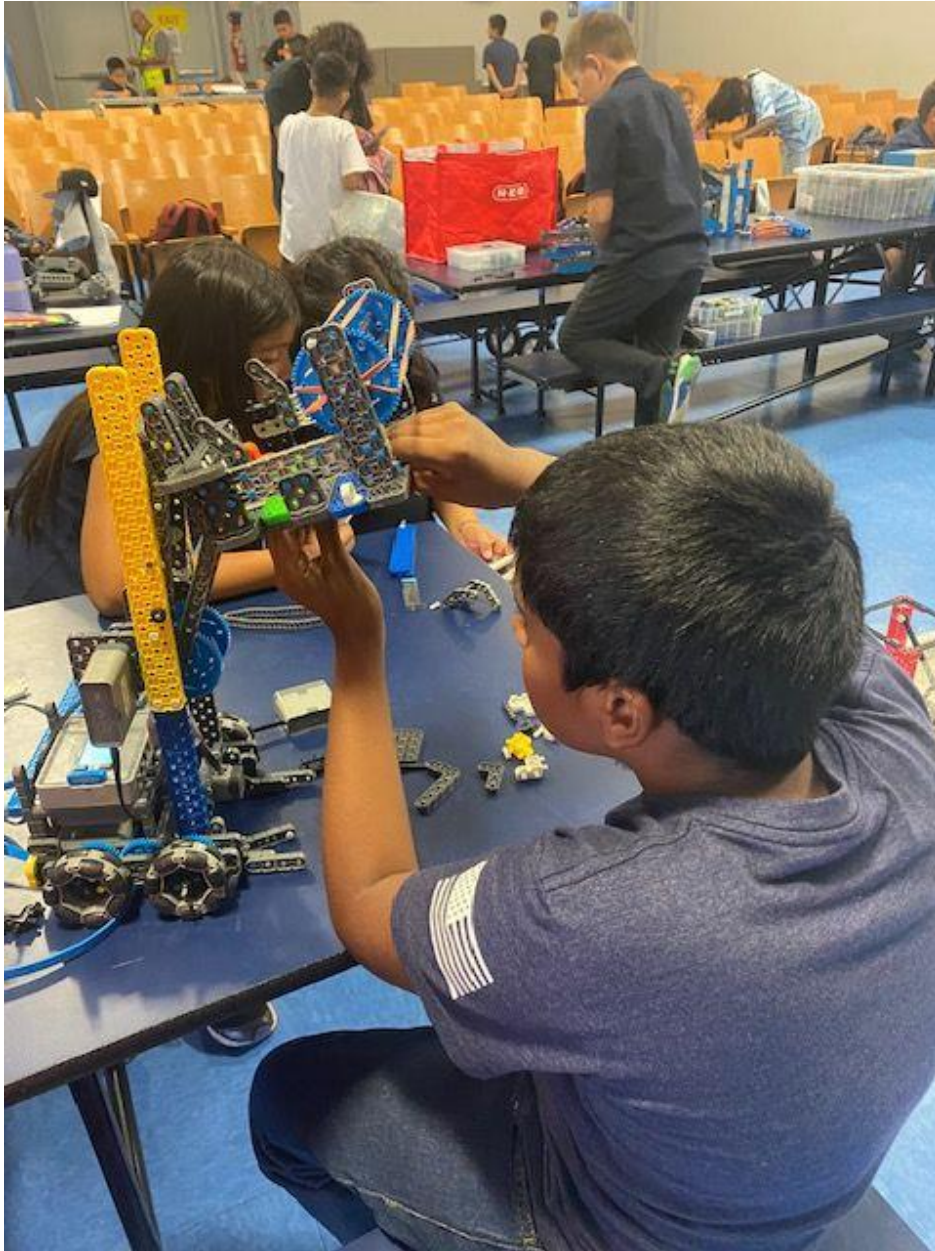
Pic 2. Lego rover model built by me by putting together 6535 pieces.

The JPL site used a lot of complicated engineering words I didn't always understand, so I asked my robotics teacher about the design process. He explained how JPL engineers probably brainstormed tons of ideas, then built different prototype Mars landers to evaluate, before picking the final one. The steps JPL uses sound sort of like how my Robotics team built our bots over many weeks. We came up with funny ideas at first, then worked on a better one (we are still working on the best) but changed the attachments a bunch.



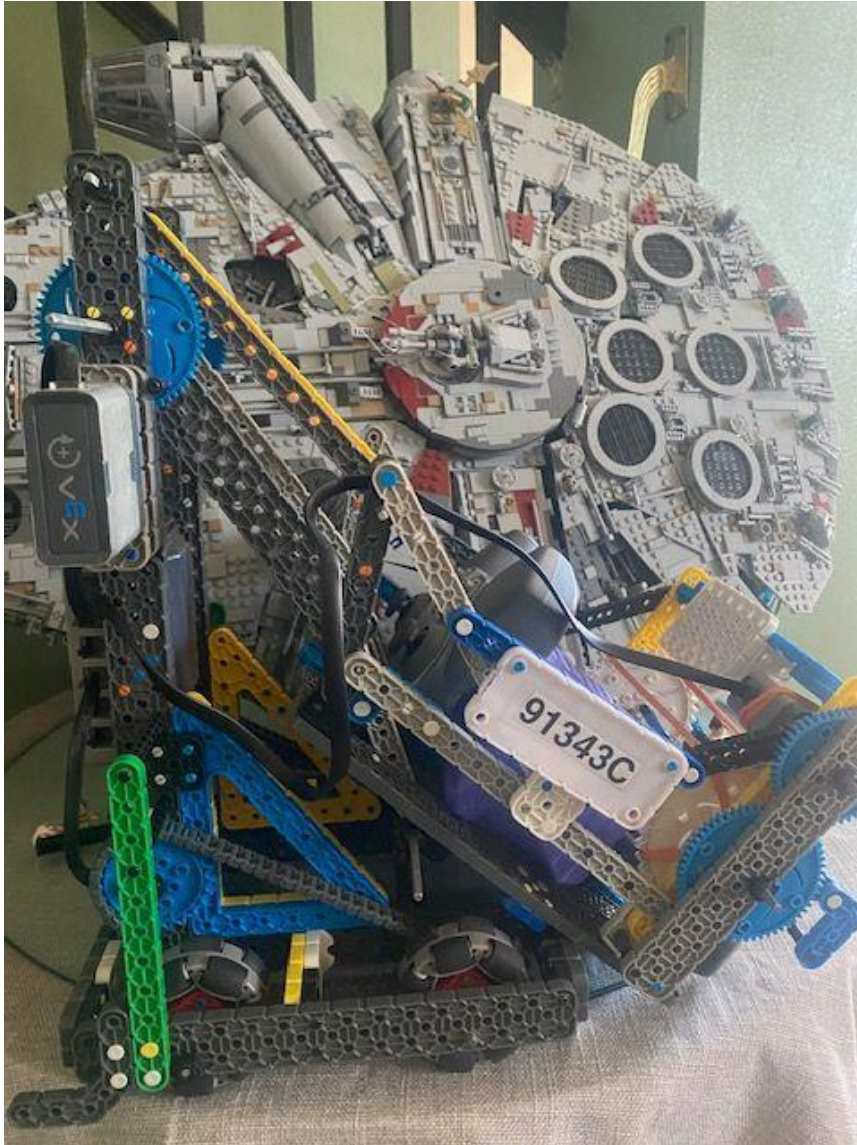
Pic. 3. My robotics team with our first build for 2023-24 full volume challenge

Pictures 3,4,5 shows the experimentation and progression we have made during the season. When the basket to collect the cubes fell off during matches, we reinforced them for the next round. We always learned (and still learning) from the shortcomings and mistakes, fixing and building the robot to the needs. The difference is, we are playing with robotics pieces, while JPL creates actual space technology to send 318 million miles to Mars - that's unbelievable! Their jobs are so cool but seem super challenging.



Pic.4. Picture of me building the second version of our robot

My robotics team brainstorms ideas and builds robots to compete, but it's different from real aerospace engineering. I understand that the engineers must follow strict rules to make sure their ships won't blow up in space and hurt astronauts! We, as students, get to be creative, making our robots for competitions, though on a smaller scale. My VEX robot might break, but it won't explode to Mars or anything. I think it would be cool to build real rockets someday. For now, I'm proud of my robot, even if it's not going to Mars, will head to the Vex Worlds Competition in Dallas, Texas.



Pic.5. Latest version of our vex robot placed in front of a Lego falcon model.

Working on my Lego rover and VEX robot made me realize that engineers must think about tons of little stuff to make real Mars rovers! Understanding more steps adults take, to design real-world projects, makes me feel more ready to someday solve big problems, too. My dream to build a Mars treehouse for astronaut sleepovers can start in Robotics Club - as long as we get more pieces to build!

**Reference:**

1. JPL website- <https://www.jpl.nasa.gov/missions/mars-2020-perseverance-rover>
2. American Institute of Aeronautics and Astronautics website- <https://www.aiaa.org/>
3. Pictures-All 5 pictures inserted are from personal collection of my parents