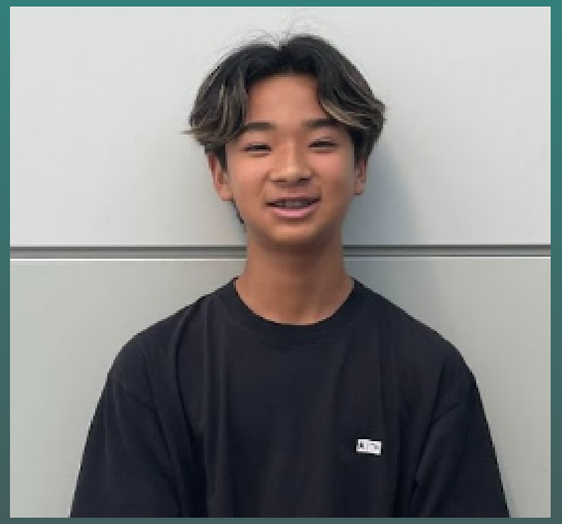
“Impacting the world, one step at a time”

PAVEGEN



By: Dylan Fan

393Y

Legacy Robotics

Tustin, Ca

Who we are

Legacy Magnet Academy

LMA

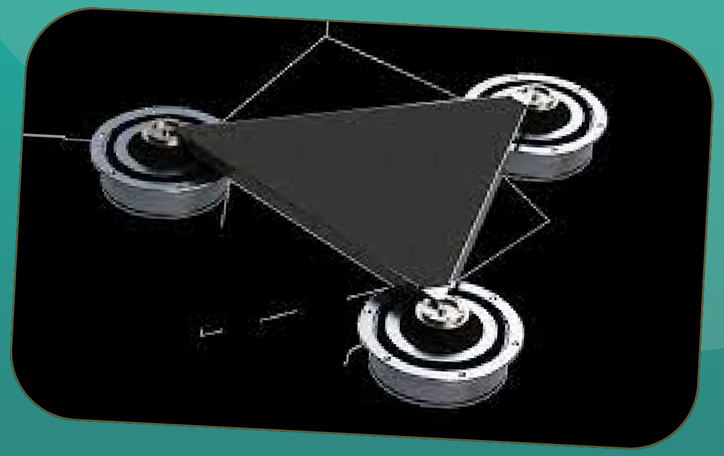
OUR LEGACY **TIDE** WILL

R I S E

AT SCHOOL • IN THE COMMUNITY • AT HOME

We are team 393Y and we are from LMA Legacy Magnet Academy. A school that is based around entrepreneurship and business and lets us excel through projects that represent rise and tide. RISE represents Reflect, Ideate, Support, and Engage. TIDE represents Technology, Innovation, Design, and Entrepreneurship. As a team, this season we are planning to use the elements of RISE and TIDE through our successes this season.

PAVEGEN



When a person steps on this tile, it falls down about half an inch and produces around 3 watts of energy

Pavegen is a company that has found a way to have walking, create energy. This company mainly based on STEM built a tile so that everytime someone steps on it, produces 3 watts of energy.

Since 2009, Pavegen has been producing energy for the past decade. Within those years, they have given all of the energy back to the public by powering street lights.

1. Define the problem

Pavegen started by finding a problem and what was causing it. This step is mostly everyone collaborating on a possible problem they can solve. In this situation, they found that they needed a more eco-friendly way to produce energy. They then realized their constraints and found a way to solve them creating a really cool product.

Our way of defining the problem was thinking of ways how we could make a robot to score points. This part meant all of us would have to watch the reveal of the game this year and read the rulebook while writing the criteria and constraints to then solve them in an efficient way to eventually win matches.

2. Brainstorm

Once they found a problem, they all brainstormed ideas on how to solve the problem. This task allowed everyone to let their brain think of as many ideas as possible. For example, they needed to think of a way to access energy from an eco-friendly source. After they would communicate as a team their brainstorms to see what everyone came up with and evaluate which idea was the best.

For our team, we needed to brainstorm ideas for our robot. There are multiple methods that teams use but we decided for everyone on the team to brainstorm each possible subsystem on the bot. we each brainstormed this step individually so everyone's ideas would be original.

3. Choose the best idea

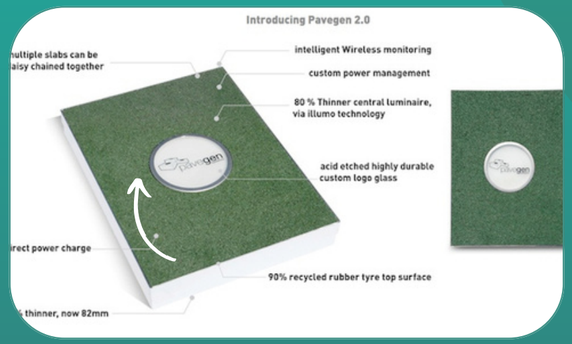
help everyone understand what the best options are to put onto your robot according to their Strength, Speed, and Time to build, then add all of their points to find their total. The first part is chassis, the chassis is the base of the robot which contains the drivetrain, it also allows the robot to move certain ways holding wheel and gears.

Chassis:	Strength:	Speed:	Time to Build:	Total:
Design #1 H-Chassis	8	9	9	26
Design #2 Square-chassi	10	8	7	25
Design #3 U-chassis	5	7	9	21
Design #4 Holonomic-chassis	9	9	6	24

Pavegen starts this step by everyone collaborating on possible solutions from everyone brainstorming. Without this step, Pavegen, won't be able to use solutions to solve the problem. This step allows everyone to share their ideas and gives them a chance to express their ideas. Once all the ideas are said, they all decide on which one is the best.

Our team decided to use a decision matrix to choose our idea. A decision matrix is a table of multiple choices for one subsystem. We then each vote on which idea is the best for each subsystem. The thing we look for in each subsystem is how efficient it is, how easy it is to build, and how effective it will be for our robot.

4. Build and prototype

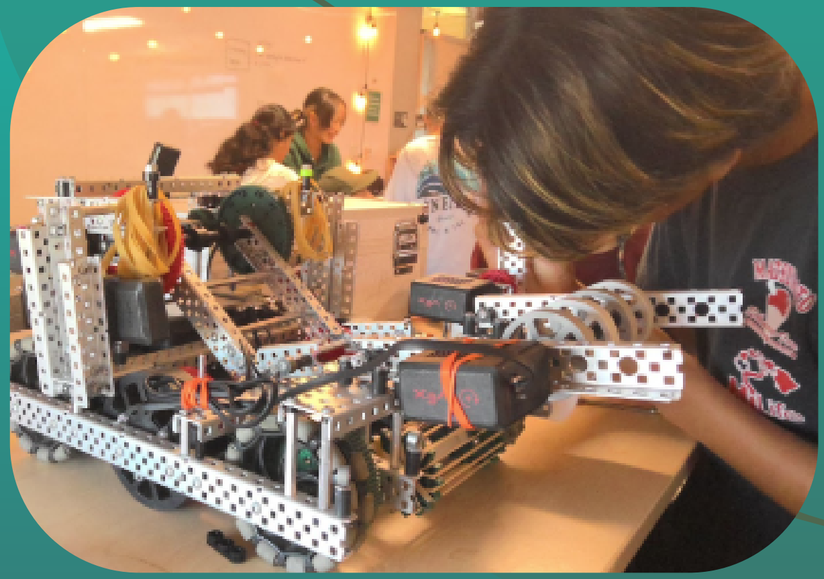


Original designs

Once they pick an idea, they start to execute it. Pavegen started by having two designs when they prototyped it. They thought having more than one design would be needed so they could compare them to see how effective they would be. Their two original designs were a triangle tile and a rectangle tile

For our team, we had multiple designs for each of the subsystems on our bot. All of the subsystems on our bot to this day aren't the same today. Since we prototyped, it was all about testing and to see how effective it would be for our team.

5. Improve Design

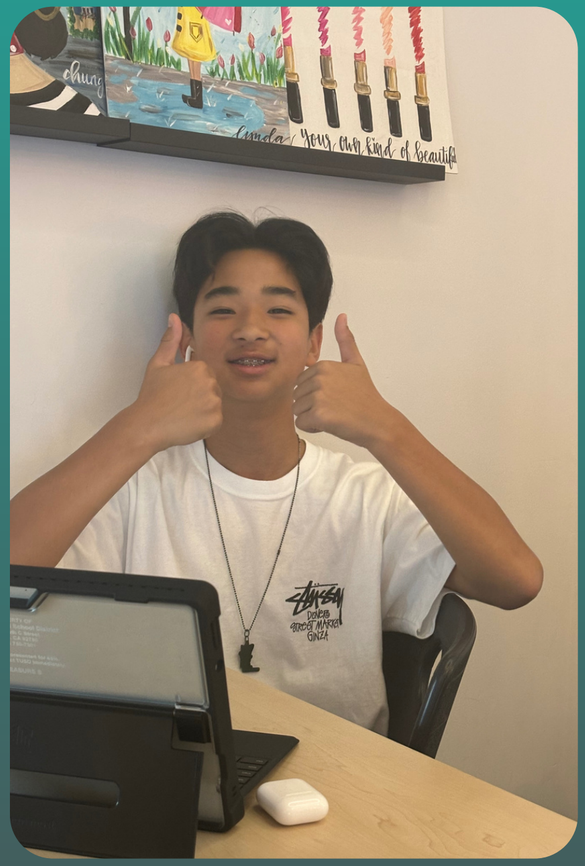


Once Pavegen found a design, they needed to improve it. This step is mainly going back to their product and improving it to their own liking. In this case, they changed the amountof energy the tile can create so each step would produce more to the public.

Our robot always can be improved to be better than the last. In the past, we have had to make multiple adjustments to make our robot more efficient for our team. Even to this day, we still make improvements so our bot can be the best as it can.

How Vex Robotics will prepare me for the future

Vex robotics will prepare me for the future by giving me the ability to work with others and engineering skills. Working well with others isn't only necessary to work at Pavegen but also a great life skill. In the past, I've met others that would rather work independently and argue with their group but I have learned how to work with others and learn their strengths and weaknesses. Engineering also will give me a great background with this company. They have had some of the best engineers on their team and are always willing to work hard. Within my experience in the last 5 years, I have learned so many skills that will prepare me for the future and I'm very excited to continue my robotics path for my high school years.



Thank you for going through my Career Readiness Challenge

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