

95070G

Entrants: Makela, Anthony,
Sophie, Kevyn, Fiona

Redwood Robotics
California



tipping towards balance,
one step at a time

Introduction

Women have long been **discriminated in fields of STEM**, and other workplaces of such, from an **underpaid salary to unjust treatment**.

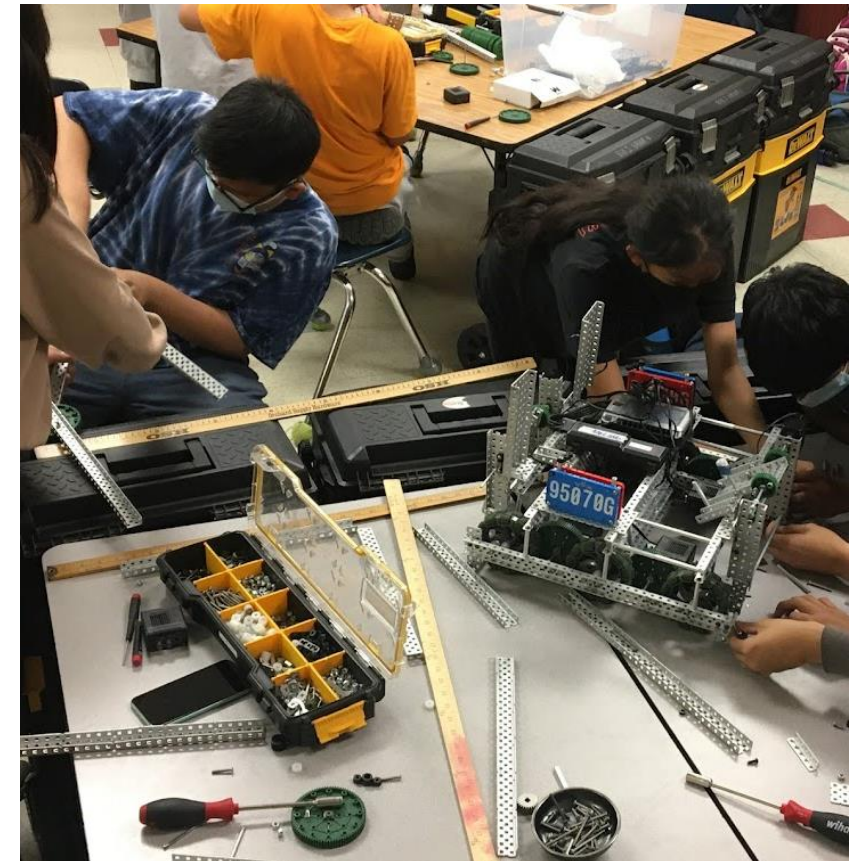
95070G is a team of **seven girls and five boys**; and we're taking a stand for **Girl Power**—a phrase that means to us, **the idea of diversity, inclusion**, and most importantly, **collaboration**.



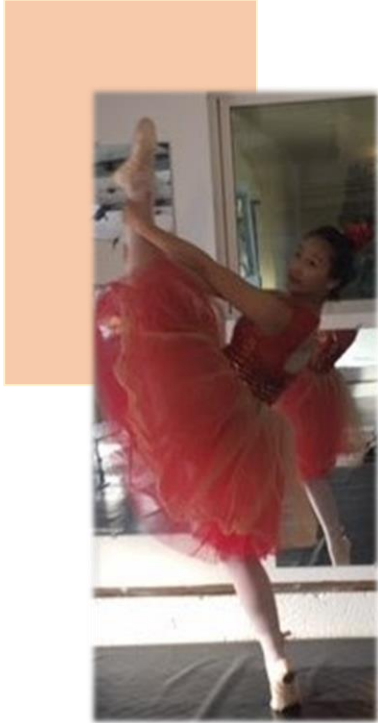
Team discussing strategy at NorCal (MS+HS) 1/8 Tournament

Origin of Our Team

From a STEM summer camp in 4th grade (and all the other ones before it), to becoming a member of a middle-school robotics team in 5th grade and leading her team to the 2020-2021 Worlds previously, this year Makela has become our school's robotics club's **first-ever 6th grade female project manager** and the **Vice President** of the club. Throughout this journey with her, an important thing we've learned together as a team is that the **diversity of perspectives** that each member **brings to the team** is crucial to **success**. This year, **every single girl has a major role** on the team, and their inputs are **invaluable** to the team.



Meet the Team!



Makela Shen

team project manager,
driver, mechanic, main
programmer



Mridhula Vudali

coach, notebook,
overall mechanic!



Katherine Zeng

first year, backup
driver, backup
spotter

Every member has tried a different role on the team. To make sure everyone is involved, we rotate out spotters, main mechanics, main programmers, and scouts at every competition. By rotating out the third person on the drive team (spotter), all can share the competition experience of thinking on the spot and strategy.



Sophie Qin

notebook lead, lift
mechanic, backup spotter!



Fiona Liu

first year, backup spotter,
lift mechanic!



Chloe Zeng

first year in VEX and in 6th
grade—lift mechanic!



Alyssa Tham

first year, drivetrain &
manipulator mechanic!

We are a **team full of new members**, but **everybody contributes** in their own way, **no matter age nor experience!**



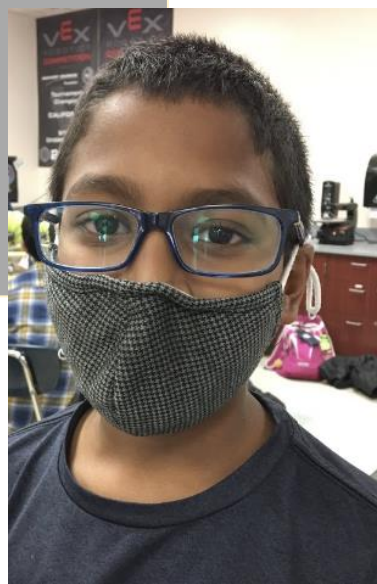
Kevyn Fritz

first year, lead mechanic
and the person who keeps
our spirits up with humor!



Aidan Liu

first year in VEX and in 7th
grade—drivetrain
mechanic



Aakarsh Ekollu

drivetrain mechanic (and
a vigorous gamer)!



Anthony Tran

the whole brain behind
our four-bar lift, backup
spotter (can you believe it's
his first year?)



Maxwell Tham

second year in VEX and in
7th grade—drivetrain
mechanic!

Design Includes Everyone's Ideas!

Inclusion is **vital** to the team; not only does it help us grow as a team, but it also contributes to our design. **Everyone has weaknesses and strengths**, which allows every member to offer their opinion from their own unique perspective; this helped us **refine our robot** in ways one person could not have done. We brainstormed and discussed together, and finally produced the overall idea **using a decision matrix to include everyone's opinions**. We give everyone an **equal chance** to make a statement and **let their voices to be heard**, including **new and old members**!

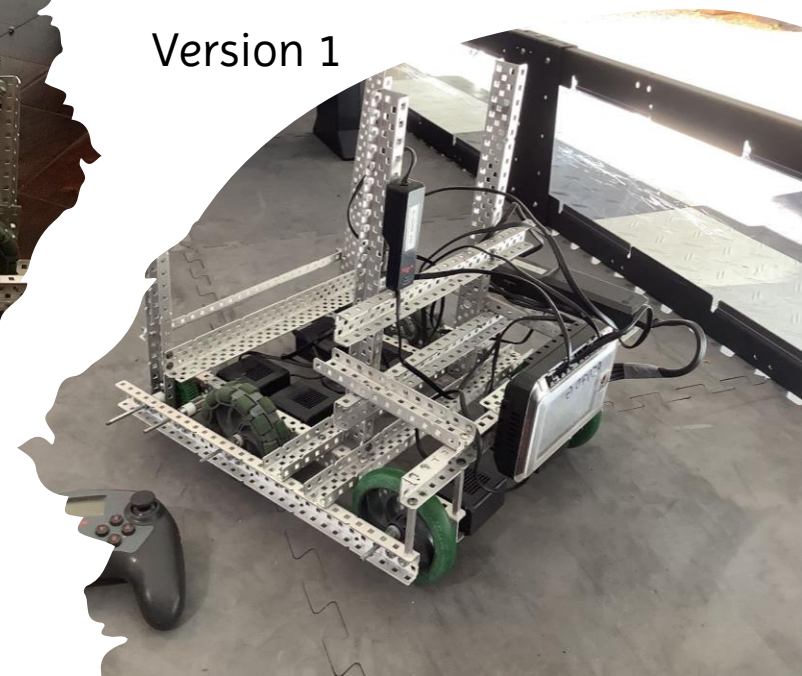
Decision Matrix

Movement Speed	Scoring System
3.80	2.80
3.80	3.00
3.40	3.00
3.60	3.00
3.60	3.00



Version 2

Version 1



Communication

Because of **COVID-19**, our club developed a system of build sessions. But Makela **was too young to be eligible for vaccination**, so she couldn't attend any build sessions in-person. She joined on **Zoom calls** frequently, but it wasn't enough; there was nobody to guide the team. And because nearly all progress was made in build sessions, it was **equivalent to not having a project manager**.

When Makela became vaccinated, things became better as she could lead the team. Another solution we developed was **documenting in the digital notebook** of what we did daily, so others could be informed. We also held **weekly team meetings** on Zoom where everybody could be caught up.

The communication issues impacted us a lot in tournaments (we were **near last** in the first one) and how our team worked together; but after the challenges, we **grew stronger** as a team.

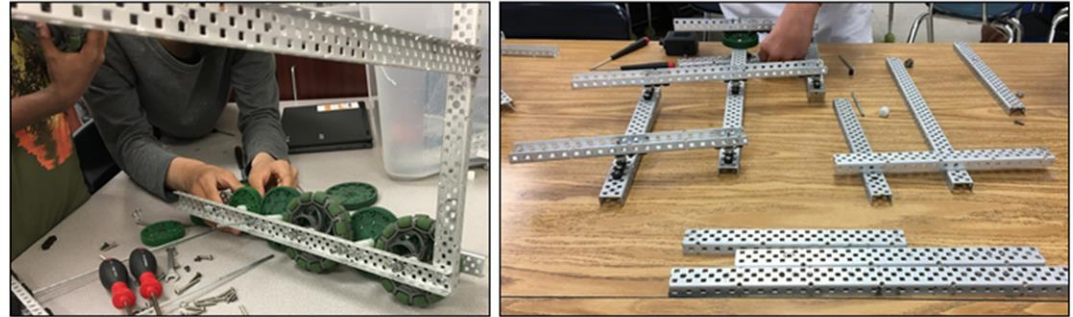
In-Person Monday 10/11/21:

Attending Members: Maxwell, Aidan, Katherine, Fiona, Aakarsh, Mridhula

Goal: Finish first six-bar and start second six-bar, as well as finish the drivetrain

In-person build progress

Today, Aidan, Aakarsh, and Maxwell worked on the drivetrain. They managed to finish both sides and started connecting them.



From Last to FINALISTS...

At our second tournament, we were **dead last in preliminary**, and didn't **even make it to eliminations**. This was our last competition with a no-lift drivetrain, but the main problem was that **communication was lackluster**. After this tournament we were determined to be better. The **four-bar lift** was built in **four days over Thanksgiving**, we coded a two-neutral goal autonomous—and we made it to **tournament finalists** at Robolabs (MS+HS) 12/5 Tournament!



STEM Idol

Alexander Hamilton is our STEM role model because he inspired us to **work harder in robotics** and **overcome obstacles**; although he came from **an underprivileged family** like many of us, he accomplished so much and **worked to be a self-starter** and **inspires us to do the same**. He founded the **nation's financial system** as the **first Secretary of the Treasury**, which inspired us to **embrace math and entrepreneurship**. He additionally **founded the U.S. Coast Guards** as well, which encouraged us to **think outside of the box and be innovative**. He also, early on, recognized the **value of inclusion and diversity** by **opposing slavery** before it was popular to do so; he **contributed the ideas of diversity** to our team. He came from a **humble background** but made **his own way**; Makela is the **youngest driver at every competition**, but Alexander Hamilton inspired our team to **never give up** no matter **what other people think**, no matter **where we came from**.

Making the Way to Success

By **empowering girls**, listening to **everyone's opinions**, having **respect for everyone**, and embracing a **welcoming environment**, we set an **example to all the STEM students** out there. We were successful in **female participation** in this team, and can use this **model to encourage people elsewhere**, such as in **STEM and other workplaces**.

We're not quite there yet, but we're making our way down that path, to **tip toward balance** of genders in STEM, **one step at a time**.

