

Capitol City Robotics Impact Report 2023-2024

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Executive Summary

Capitol City Robotics is a DC based 501(c)(3) organization whose goal is to create a robust pipeline of underrepresented students in engineering and technology. Our program provides students access to advanced STEM learning while also developing their critical thinking skills.

Since CCR started 6 years ago, we have grown from 1 program with 8 teams and 32 students to 8 programs with over 50 teams and almost 300 students. The 2023-2024 school year was especially exciting because we expanded and now offer programs from PreK through 12th grade.

Each year, CCR guides teams of students as they prepare for and participate in local, national, and international robotics events. And each year, CCR teams win local and national tournaments, qualify for international tournaments, and win awards and recognition. CCR also supports programs that introduce students to robotics in non-competitive environments. Across all of these programs, CCR earned recognition and won awards for the 2023-2024 school year.

CCR and its programs have been lauded by students, parents, school administrators, and robotics program administrators for the high-quality experiences it provides. And the organization has a very high year-over-year student retention rate – even during the pandemic – and has succeeded in its goal to recruit girls and students of color into the programs.

In addition to the programs CCR runs, we also continue to build strong partnerships that provide additional opportunities and resources for our students. Most notably, our students are engaging in cross-age-group mentoring and expanding their roles as STEM ambassadors to other underrepresented students, helping CCR realize its mission.

Mission & Vision

Capitol City Robotics' mission is to provide underrepresented students access to education in STEM through robotics engineering and computer science so they can become the innovators and explorers of tomorrow. Our vision is to create a future where science and robotics careers are a place for everyone, regardless of gender, race, or economic background. A place to make, create, and invent a future for us all, together.

We do this by coaching student teams through the process of preparing for and participating in competitive robotics programs. Through our work, students learn hard skills, including engineering, coding, and design, and soft skills such as leadership, teamwork, and oral and written presentation. Many of our teams have won awards in regional, national, and international championship competitions. Through our program, students gain a love for STEM and a sense of self-efficacy (“I can do it!”) that inspires them to pursue STEM education and careers.

Using competitive robotics as a frame, we aim to:

- Deepen student engagement in STEM
- Teach hard skills such as robotics engineering, coding, and design,
- Coach soft skills such as teamwork, collaboration, and problem solving,
- Build a sense of self-efficacy (“I can do it!”) in STEM, and
- Build a sense of self-concept (“I can be it!”) in STEM.

We are focused on achieving these goals with students that are traditionally underrepresented in STEM, especially girls and students of color. Through our work, we open student minds to new possibilities for their lives. We show them how they can contribute to society through the life-changing opportunities in STEM. STEM can also be a path to higher wage jobs, which can improve life for our students and their families over the long term.

2023-2024 Impact

2023-2024 was another highly successful and impactful school year for Capitol City Robotics, in terms of both the students and the organizations we worked with.

Our overall successes for the school year include:

- Exposed almost 300 students from 60+ schools to robotics programming
- Won over 50 awards at highly competitive tournaments.
- 4 teams qualified for the VEX world championship tournament
- 1 team qualified for the RECF Aerial Drones national championship tournament
- 1 team qualified for RECF Aerial Drones regional championship tournament
- Achieved 41% female representation in the program
- 50%+ of the students served are students of color and 40% of the students are Latin and Black.

We launched the Capitol City Robotics Internship Program this school year. A pipeline program can have many goals; our Internship Program teaches our students to act responsibly and professionally and they get paid for their work.

- Our first group of interns are seasoned VEX Robotics veterans and help and learn from our staff so we can employ them in the future.

Capitol City Robotics serves students in DC, Virginia, and Maryland. We focus on recruiting girls and students of color and our teams include students from all walks of life. For the school year 2023-2024, CCR managed:

- 9 teams of elementary and middle school students competing in the RECF Aerial Drones program
- 11 teams of elementary school students participating in the First LEGO League program
- 6 teams of elementary school students participating in the VEX 1-2-3 program
- 13 teams of elementary school students participating in the VEX GO program
- 10 teams of elementary and middle school students competing in the VEX IQ program
- 5 teams of high school students competing in the VEX Robotics Competition

The VEX Robotics Competition team is made up of students who have been members of CCR for years, having competed in lower-level competitions (e.g., First LEGO League, VEX IQ). We have a high student retention rate year-over-year and anticipate that most of our middle school students will graduate into the VEX Robotics Competition so we expect to grow our high school programs dramatically in the next few years. CCR ultimately aims to ignite and maintain a passion for STEM in students from PreK to college.

Capitol City Robotics teams participate in local, regional, national, and global competitions. Our students consistently win or/are recognized whenever we participate. In the 2023-2024 school year, CCR earned a record 50+ awards and the organization qualified for highly competitive regional, national, and global tournaments.

VRC		
CCR VRC Competition	DC 2024 VRC Championship	World Robotics Championship
Design Award	Excellence Award	Build Award
	Design Award	
	Judges Award	

VEX IQ				
Full Volume Competition	DC Fall Competition	CCR Fall Competition	DC Winter Competition	DC State Championship
Excellence Award	Excellence Award	Excellence Award	Design Award	HS Excellence Award
Design Award	Design Award	Design Award	Judges Award	MS Excellence Award
Judges Award	Judges Award	Amaze Award	Build Award	Design Award
Teamwork Champion	Innovate Award	Teamwork Champion		Judges Award
Robot Skills Champion	Teamwork Champion			Sportsmanship Award
	Robot Skills Champion			Teamwork Champion
				Robot Skills Champion

Aerial Drone Competition			
DC Fall Competition	Unity Reed Competition	Winter Classic	National Championship
Excellence Award	Excellence Award	Flight Operations Award	Flight Operations Award
Flight Operations Award	Judges Award	Judges Award	
Judges Award	Inspire Award	Inspire Award	
Teamwork Champion	Think Award		
Skills Champion			

FIRST LEGO League		
VA/DC Regional Qualifier	VA/DC State Championship Qualifiers	VA/DC State Championship
Core Values, 1st Place, Division 2	Team 53146: Lucky LEGOs	Gracious Professionalism Award
Tournament Champion, 1st Place, Division 2	Team 53147: Lafayette LEGOs	State Champions: Team 46458
Tournament Champion, 2nd Place, Division 1	Team 46458: Blinged Out Bumble Bees	State Champions: Team 46457
Robot Performance, 1st Place, Division 2	Team 46457: LEGO Llamas	
Robot Performance, 1st Place, Division 1	Team 46454: Bob's Llama's Food	
Innovation Project Award, 1st Place, Division 1		
Core Values, 1st Place, Division 1		
Judges Award		

Community Partners

Over the years, CCR has developed many strong partnerships, particularly with local schools, other local robotics coaches (usually school staff), and regional management at the FIRST Robotics and VEX headquarters office. We are known to be well-organized and well-managed as an organization. We are also known for the success of our student teams. As a result, there has been high demand for our services by these entities.

In recent years, we have also established relationships with associations of STEM professionals including the Society of Hispanic Professional Engineers and STEM for Her, who have supported us with funding, volunteers, and promotion.

Finally, we have also established relationships with STEM-driven corporations including Blue Origin (Jeff Bezos' space company), STEM for Her, and Black Girl Ventures. Blue Origin hosted CCR students for the unveiling of their Blue Moon lunar lander (2019), sponsored a virtual mission to the Moon (2021), and arranged for a female engineer to speak to our students (2021).

Board Members

CCR currently has four board members. Three members are parents of CCR students. They are well-connected in DC, have communication and fundraising skills, and are passionate about CCR's mission. In 2020, we added Kenneth Harris, a local, African American, NASA engineer recognized as a Forbes 30 Under 30 in Science. Kenneth is on the Board of Education for Prince George's County, which is home to 277,000 students that are predominately students of color. He is passionate about inspiring more students of color to pursue STEM education.

Board members must be formally renewed annually. As we add new board members, we are seeking individuals that can:

- Make meaningful, personal, financial, and non-financial contributions annually;
- Secure financial and in-kind contributions from other individuals and organizations; and
- Support our efforts to continue recruiting girls and students of color.

CCR is small, so board members are expected to be fully engaged in fundraising and promoting the organization, while also providing strategic operational support, as needed.

Impact Above & Beyond

Capitol City Robotics aims to go above and beyond in making an impact with its students as well as its broader community.

Tabling and Presentation. CCR takes any opportunity to spread the message of our mission while offering the opportunity to learn oral communication to our students. CCR tabled and presented the following events in the 2023-2024 season:

- **Women in Data: Making Sense of Data 2023**, a data and STEM learning event. Four CCR girls tabled a booth to interact with DC elementary and middle school students through hands-on STEM activities at the National Children's Children's Museum.
- **STEM for Her Day**: Our CCR staff attended SFH's annual conference to inspire girls to get into STEM careers at the International Monetary Fund.
- A CCR VEX IQ Robotics Competition team, the Bobabots, tabled a booth at a WNBA game, The Washington Mystics, event called **DeMystifying STEM** at Monumental Entertainment & Sports Arena. They interacted with students from DC Public Schools to show them that STEM is for everyone.
- At the **DC Electric Vehicle Grand Prix**, VEX V5 RC students made young DC residents aware of STEM opportunities in the District.

Student Association for Stem Advocacy. Capitol City Robotics students learn how to apply STEM advocacy at the Congressional level.

- Students are exposed to advocacy efforts that impact STEM initiatives and they also have an opportunity to advocate first-hand.

Student Elevation Opportunities

- Program Managers: Paid student staff oversee all competitive science programming, gaining leadership and organizational experience.
- Club Mentorship: Students mentor younger teams, receiving stipends for their contributions and leadership.
- Club Internships: Students are paired with managers to learn the intricacies of program management.
- Summer Employment: Students have the opportunity to work as summer camp counselors or counselors-in-training.
- Internships: We collaborate with our partners to offer summer internships, helping students build their resumes, gain valuable experience, and pipeline them into STEM colleges and careers.

Expenses

Founder and Executive Director Ryan Michael (“Mike”) Daza is the only full-time employee. He leverages parents, high school students, and STEM professionals as volunteers.

- Parents and STEM professionals act as team mentors and competition judges.
- Local high school students also serve as team mentors and support weekly meetings for robot building and coding practice.

Program costs include staff time to run weekly coaching sessions for each of the teams; competition fees; and hardware costs, including robots and robot parts. We use a tiered tuition structure (based on household income) and charge parents for their students to participate each semester (Fall and Spring).

Program Tuition	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
	Household Income: <\$30K Scholarship: 60-75%	Household Income: \$31-\$50K Scholarship: 45%	Household Income: \$51-\$100K Scholarship: 30%	Household Income: \$101-\$150K Scholarship: 15%	Household Income: >\$150K Scholarship: N/A
VRC \$800	\$200	\$440	\$560	\$680	\$800
VEX IQ \$700	\$280	\$385	\$490	\$595	\$700
Drones (RADC) \$700	\$280	\$385	\$490	\$595	\$700
FIRST LEGO League \$600	\$240	\$330	\$420	\$510	\$600
FIRST LEGO League Discover \$600	\$240	\$330	\$420	\$510	\$600
VEX 1-2-3 \$600	\$240	\$330	\$420	\$510	\$600
VEX GO Competition \$600	\$240	\$330	\$420	\$510	\$600

Tuition covers league registration fees, tournament registration fees, team robot kit and replacement parts, clubhouse access, workshop access, tournament materials, invitations to sponsored events, and access to sponsor scholarships.

Expenses	VEX	FLL	RECF Drones
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Registration: Annual	\$200/team	\$250/team	\$175/team
Registration: Competitions	\$75-\$500/team	\$275/team	\$100/team
Supplies: Robots	\$600-\$5,000/robot	\$600/team	\$400/drone
Supplies: Field & Elements	\$800-\$4,000/team	\$1,000/team	\$1,200/team
Total Costs: 2023- 2024	\$1,900-\$6,700/team	\$2,125/team	\$2,175/team
Indirect Costs: Mentors	\$5,500	\$5,500	
Indirect Costs: Interns	\$5,300	\$5,300	\$5,300
Total Costs: 2023-2024	\$12,700-\$17,500/team	\$12,925/team	\$9,350/team

Sponsorship Opportunities

Our sponsors and mentors provide critical support. We have spent over \$80,000 to design, build and field our robotics teams, each equipped with their own robot. And we have non-competitive teams with their own robots that also present on their accomplishments at an expo.

As part of our mission, we specifically target students who are underrepresented in STEM, especially girls (70%+ of participants) and students of color (60%+ of participants). Many of these families cannot afford even a nominal fee and over XX members each session rely on the support provided through materials, mentoring, and financial assistance.

Additionally, the demand for STEM programming has grown exponentially and we struggle to keep up with that demand. We have to turn down students every semester and we maintain an active waiting list of students who want to participate in our programs. We are looking for support to help us meet the demand we're experiencing so we can ensure all students find a path to the careers of the future.

	Bronze \$5,000	Silver \$10,000	Gold \$20,000
Listed as a sponsor for local events and competitions			
Listed as a sponsor for regional events and competitions			
Listed as a sponsor for national and international events and competitions			

Sponsorship recognition includes banner, t-shirts, social media, robot, and competition pit.