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This season of *FIRST*,<sup>a</sup> a global community of young people and forward-looking adults came together to build *FIRST* City, a place where we celebrate our differences and embrace innovative concepts and technology to **strengthen our future cities**. In our thriving culture, collaboration and collective wisdom **elevate new ideas** and **foster growth**.

#### OUR COMMUNITY IS BRIMMING WITH INSPIRATION, CREATIVITY, AND - MOST IMPORTANTLY - HOPE.

Through evidence-based robotics programs designed to **ignite young minds** and the incredible support of mentors, educators, volunteers, sponsors, donors, and alumni, we're helping young people **realize their power** to find a sense of belonging, reach new heights, and **build a better future**.

#### TOGETHER, WE RISE.

For the 2019-2020 *FIRST*<sup>®</sup> season, *FIRST* teamed up with Lucasfilm and parent company Disney for *FIRST* RISE<sup>™</sup> **powered by** *Star Wars: Force for Change*, setting out to inspire the next generation of heroes and innovators. Together with all our sponsors, volunteers, partners, and supporters, we met that goal. Here are some key moments from the season.

#### amazon future engineer

#### AUGUST 1, 2019

Amazon partners with *FIRST* on Amazon Future Engineer Robotics Grants to bring *FIRST* programs and professional development to schools, reaching thousands of students from underrepresented and underserved communities across the U.S.



FIRST introduces new, accessible Class Pack editions, which provide tools to educators to implement FIRST programs flexibly with 30+ students in classrooms or structured after-school programs.

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## **LEADERSHIP** LETTER

*FIRST* was created over 30 years ago to inspire young people to become science and technology innovators and leaders, ready to solve the world's greatest challenges. We've always known *FIRST* isn't about the robots. That's especially true this season.

Our 2019-2020 season began with a big theme. *FIRST* RISE powered by *Star Wars*: *Force for Change* set out to empower young people to help the places they call home reach new heights and build stronger, more sustainable communities.

After our global competition season ended early, in March, due to the COVID-19 pandemic, **our students and alumni used their** *FIRST*-built skills for good. They applied their *FIRST* learnings to 3-D print face shields for front-line workers, build grocerydelivery robots for at-risk populations, and much more (see page 13).

Our partners stepped up in the face of challenge, too: Many sponsors and donors were able to shift to unrestricted funding to support the *FIRST* mission, and we are so grateful. Thank you to all our sponsors, donors, mentors, volunteers, educators, alumni, parents, and supporters who help drive our mission forward.

The pandemic reinforces that inspiring science and technology innovators and leaders is critical, and our community's impact shows the *FIRST* mission is working: Even when teams aren't competing, they're still learning, growing, and innovating together.

There's so much to be proud of this season: **We impacted more young people** with our programs than ever before. Youth participation worldwide grew 18%, reaching more than 679,000 students in approximately 110 countries.

We believe the opportunities offered by *FIRST* belong in every school and community, accessible to every student. As part of our strategic objectives, we are investing in removing barriers to entry and ensuring greater, more equitable access to *FIRST* (see page 10).

In the robotics and STEM education landscape, *FIRST* leads in the development of critical life skills and creating pathways for the future. To expand the range of youth we reach, **we launched flexible new** implementation options for PreK-12 learning spaces in our **Class Pack** program, including a new division of *FIRST*<sup>®</sup> LEGO<sup>®</sup> League designed to introduce the fundamentals of STEM to children ages 4-6 (see page 8).

We invest in rigorous impact reporting. The latest update to our unrivaled longitudinal impact study continues to show positive impacts on STEM-related interests six years after students enter our programs – impacts that are evident across all major population groups and persist into college (see page 6).

To ensure a sustainable community, **we continue to engage and support** *FIRST* **alumni**, including with the *FIRST* Scholarship Program (see page 38). Funded by generous donors, we're creating a new grant for graduating *FIRST* students: The Woodie Flowers Memorial Grant is named in memory of the late *FIRST* Distinguished Advisor and educator Dr. Woodie Flowers (see page 24).

Our priority, as always, is the safety and wellness of the *FIRST* community. As an organization that inspires young people to solve problems and innovate, we are doing the same, developing remote programming options to ensure we are fulfilling our mission and enabling our community to stay engaged with *FIRST* programs in the challenging years ahead – and long after.

After seeing our community respond to the challenges of the global pandemic, we're even more confident that, together, we are building a better world filled with innovation, inspiration, inclusion, creativity, and promise for a stronger future. We hope you'll join us as we move forward – and up. **Together, we RISE.** 

Sincerely,

Larry Cohen, President, *FIRST* Kelly Ortberg, Co-Chair, *FIRST* Board of Directors Dean Kamen, Founder, *FIRST* Bob Tuttle, Co-Chair, *FIRST* Board of Directors



## INTRODUCING LARRY COHEN, FIRST PRESIDENT

Larry Cohen joined *FIRST* HQ in late 2019 after 35 years in various leadership roles driving business transformation, technology innovation, and talent development. He was most recently a Partner and Head of Operations and Technology at AllianceBernstein (AB), a global investment management and research firm. Highly engaged in AB's corporate responsibility, diversity, and workforce development efforts, he established a partnership with *FIRST* to sponsor and mentor high school robotics teams and a partnership with Year Up to provide training and career opportunities to young adults, leading to AB's recognition as an Outstanding Employer by the New York City Employment and Training Coalition.

Larry's long history of advancing global causes and giving back to his community also includes:

- Nearly a decade of service on the Board of Directors and Executive Advisory Board for NYC FIRST, New York City's Program Delivery Partner for all FIRST programs.
- Bridge Builder and Past Chair of the Board of Directors for Bridges to Prosperity.
- Mentor at Columbia University for the Master's Program in Technology Management.

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#### AUGUST 15, 2019

FIRST and LEGO<sup>®</sup> Education announced FIRST LEGO League Discover for PreK-1, as the BOOMTOWN BUILD<sup>™</sup> and CITY SHAPER<sup>™</sup> Challenges kick off to inspire children to build cities of the future.

John Deere joins as a FIRST LEGO League Global Sponsor.





#### The 2020 FIRST Scholarship Program launches to make available over 3,000 scholarship opportunities to FIRST alumni from 200 FIRST Scholarship Providers.

#### SEPTEMBER 7, 2019

Qualcomm hosts *FIRST* Tech Challenge teams for a livestreamed kickoff event at their headquarters in San Diego, California, for SKYSTONE<sup>™</sup> presented by Qualcomm.



## OUR RISING IMPACT

Evidence from the ongoing *FIRST* Longitudinal Study, conducted via a multi-year partnership with Brandeis University, demonstrates that *FIRST* is meeting our mission and goals to increase the number of young people interested in STEM – and *FIRST* alumni's interest extends beyond their participation in the program to their educational and career choices.

At the end of six years of rigorous data collection (May 2020), there is strong evidence that *FIRST* participation leads to long-term impact, including sustained attitudes and interest in STEM and persistence in STEM pathways into college and related careers. Both male and female *FIRST* alumni are declaring majors in STEM at greater rates than the study's comparison group.<sup>\*</sup> Young women in *FIRST* show the largest gains in STEM attitudes and persistence – significant for a group traditionally underrepresented in STEM fields like computer science and engineering.

#### FIRST PREPARES STUDENTS FOR A STEM FUTURE

#### Sustained attitudes and interest in STEM

Positive impacts on STEM-related attitudes and interests are evident six years after entering a *FIRST* program. Those impacts are consistent regardless of race, gender, income, or community type and persist into college.

FIRST students are significantly more likely to show gains in STEM outcomes than comparison students:



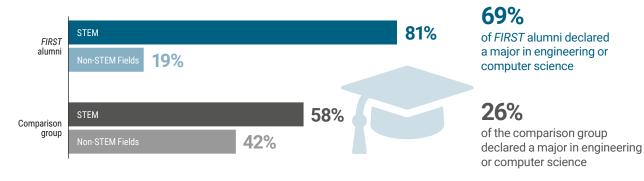


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#### Persistence in STEM in college

*FIRST* alumni are significantly more likely to pursue college pathways into computer science and engineering than comparison students, including indicating high interest in, taking courses in, and declaring a major in those fields.

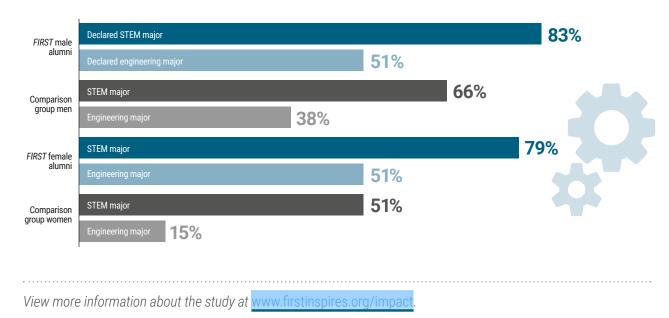
### Among the *FIRST* alumni in the study who had declared a major by the end of year 3 in college, most had chosen a STEM field, and the majority selected engineering or computer science:



#### Sustained STEM career paths for female FIRST alumni

Female *FIRST* alumni continue to show significant sustained impacts related to STEM interest and career pathways. In most cases, those gains for female *FIRST* alumni were significantly larger than those for male *FIRST* alumni.

Both male and female *FIRST* alumni declare majors in STEM at greater rates than their comparison groups. By year 3 in college, female *FIRST* alumni declared engineering majors at the same rate as male alumni and higher rates than comparison group men and women:





"Many programs don't have the foresight to collect data on the long-term impacts of their activities. FIRST did ... This unique longitudinal data set generates critical insights not only for FIRST, but provides valuable data on the effectiveness of after-school STEM programs for the larger field of after-school programming. The FIRST Longitudinal Study is now providing one-of-a-kind data on the impacts of FIRST participation through college, including impacts on course-taking, college majors, and eventually career decisions. FIRST's investment in rigorous data collection and analysis represents an important contribution to the field and reflects its commitment to tracking the impact of its programs and to using data to strengthen and grow its programs."

 Tatjana Meschede, Ph.D., Lead Evaluator, FIRST Longitudinal Study The Brandeis Center for Youth in Communities (CYC), The Heller School for Social Policy and Management

SOURCE: FIRST® Longitudinal Study: Findings at 72 Month Follow-Up, The Center for Youth and Communities, Brandeis University, May 2020; All differences statistically significant, p ≤ .05.



SEPTEMBER 26, 2019 New digital video series Galactic Builders powered by Star Wars: Force for Change premieres on StarWarsKids.com, following *FIRST* teams as they meet with designers and engineers and explore how STEM is used behind the scenes. The series garners more than 1 million views.

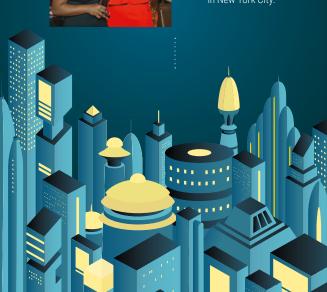
#### OCTOBER 9, 2019

Thanks to advocacy from the *FIRST* community, the U.S. Christa McAuliffe Commemorative Coin Act becomes law. The U.S. Treasury will mint coins honoring the teacher and astronaut and designating additional funds to *FIRST*.





Journalist Soledad O'Brien and FIRST alum Tia Singh are honored at the fifth annual FIRST, Inspire Gala in New York City.



## PROGRESSION OF **PROGRAMS**

*FIRST* combines the rigor of STEM learning with the fun and excitement of traditional sports and the inspiration that comes from community through a progression of programs that have a proven impact on learning, interest, and skill-building inside and outside of the classroom.

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#### FIRST<sup>®</sup> LEGO<sup>®</sup> League Divisions



#### FIRST LEGO LEAGUE DISCOVER

This playful introductory STEM program ignites children's natural curiosity and builds their habits of learning with hands-on activities in the classroom and at home using LEGO® DUPLO® bricks.

<b>FIRST</b> LEGO	ages 6-10
LEAGUE	GRADES
EXPLORE	2-4

#### FIRST LEGO LEAGUE EXPLORE

Teams of students focus on the fundamentals of engineering as they explore real-world problems, learn to design and code, and create unique solutions made with LEGO bricks and powered by LEGO® Education WeDo 2.0.

<b>FIRST</b> LEGO	ages 9-16*
LEAGUE	GRADES
CHALLENGE	4-8

#### FIRST LEGO LEAGUE CHALLENGE

Teams of students engage in research, problem solving, coding, and engineering – building and programming a LEGO® Education SPIKE™ Prime or LEGO® MINDSTORMS® robot that navigates the missions of a robot game. They also participate in the Innovation Project to identify and solve a relevant real-world problem.

\*Varies by country



#### Young Innovators Use Skills and Imagination to Solve Problems as a Team

#### THE CHALLENGE

Through a guided, global robotics program, students are introduced to STEM learning and exploration at an early age. Children can begin with Discover (ages 4-6) and progress through Explore (ages 6-10) and Challenge (ages 9-16<sup>°</sup>), or join at any division based on their age or grade level.

#### THE JOURNEY

Young children are introduced to STEM concepts and develop habits of learning through engaging, fun challenges and competitions using LEGO Education materials.

#### THE OUTCOME

Students gain real-world problem-solving experiences that inspire them to experiment and grow their critical thinking, coding, and design skills while building confidence, growing their knowledge, and developing habits of learning.

\*Ages vary by division and country

#### Grades 7-12 · Ages 12-18



#### It's Way More Than Building Robots

#### THE CHALLENGE

Teams of students design, build, code, and operate Android-smartphone-controlled robots to compete head-to-head in an alliance format. Students are encouraged to create team brands and be an ambassador for *FIRST* and STEM in their communities.

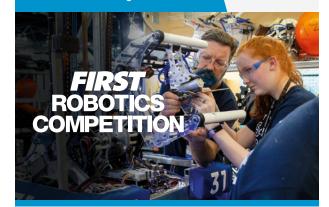
#### THE JOURNEY

Teams compete at local and regional events, qualifying up to the *FIRST* Championship. They earn awards based on their teamwork, creativity, innovation, and the engineering design process.

#### THE OUTCOME

While developing their STEM skills and mastering engineering principles, students learn the value of persistence, innovation, teamwork, and the engineering design process. High school students are eligible to apply for more than \$80 million in scholarships from colleges, universities, and technical programs.

#### Grades 9-12 · Ages 14-18



#### An Exciting Sport Built Around the World of STEM

#### THE CHALLENGE

Under strict rules, with limited time and resources, high school teams use sophisticated technology to build and program industrial-size robots for a challenging field game. Each team develops a brand, raises funds to meet its goals, and works to promote STEM in the local community.

#### THE JOURNEY

At district and regional events, cheering crowds root for qualifying teams as students compete with their robots for prestigious awards and a coveted spot at the *FIRST* Championship.

#### THE OUTCOME

As students learn real-world engineering concepts, they build their confidence and workforce skills and connect with professional team mentors and sponsors who can help them succeed. Plus, they can apply for more than \$80 million in college, university, and technical program scholarships.

#### NOVEMBER 21, 2019

Nine underserved communities receive *FIRST* STEM Equity Community Innovation Grants to address inequities in access to STEM education, reaching more than 3,000 youth with *FIRST* programs.



#### DECEMBER 7, 2019

Newly appointed *FIRST*  **President Larry Cohen** attends the **New Hampshire** *FIRST* LEGO **League State Championship**, his inaugural <u>event as president</u>.



FIRST hosts a global celebration of life and remembrance for Dr. Woodie Flowers (1943-2019), EAB Chair Emeritus & Distinguished Advisor (see page 24).

#### JANUARY 4, 2020

With help from *Star Wars* cast and droids, *FIRST* unveils the 2020 *FIRST* Robotics Competition season game, INFINITE RECHARGE,<sup>5M</sup> in a live global broadcast from Manchester, N.H.





## WE RISE TO REACH ALL STUDENTS

#### WE BELIEVE THE OPPORTUNITIES OFFERED BY *FIRST* BELONG IN EVERY SCHOOL AND COMMUNITY, ACCESSIBLE TO EVERY STUDENT.

For several years, our organization has made equity, diversity, and inclusion (EDI) a strategic priority. Our goal is to serve a population of students that represents the demographic make-up of the communities we serve, and, in addition, to be deliberate and strategic in reaching communities we are not currently serving.

Supported by generous *FIRST* sponsors and donors, our strategy is focused on removing barriers to access and participation while

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increasing opportunities so that any student, anywhere can participate. That includes increasing our capacity to focus on EDI, creating training and resources to support diverse, inclusive programs and teams, and investing in community-based partnerships that help us better reach underserved communities.

We're also investing in reaching more students through schools by increasing our ability to empower educators through curriculum options, professional development, flexible classroom bundles, and other support.

Through these strategies, we are RISING to meet the needs of more students with our programs.



#### COMMUNITY INNOVATION THROUGH STEM EQUITY GRANTS

*FIRST* launched its **STEM Equity Community Innovation Grants** program in 2016 to provide diverse students and disadvantaged communities with hands-on learning opportunities and support inclusion strategies through \$5,000-\$50,000 grants. During the *FIRST* RISE season, grant recipients reached more than 3,000 youth participants with *FIRST* programs; 93% were economically disadvantaged, 45% were girls, and 31% were Black.

One grant went to the **School District of Palm Beach County in Florida** to increase access to *FIRST* LEGO League Explore in Title I schools through on-going training and a rotation of sessions that allowed for resource sharing among four School Packs. Through a collaboration with local *FIRST* Program Delivery Partner Green Mouse Academy, the district's K-12 STEM Department, and additional community partners, over 65 classroom and after-school groups participated, engaging 1,462 students – three times the grant goal. "The shared resource/rotation model demonstrated an affordable, scalable operating model," said Green Mouse Academy's Shane Vander Kooi.

While working creatively, Palm Beach County students practiced taking turns in various roles, communicating with teammates, and working towards a common goal. "Students had no idea they were learning so many 21<sup>st</sup> century skills while building robots and working together. They were learning through play and enjoying every minute," said one site coordinator.





#### BUILDING CAPACITY WITH THE AMERICORPS VISTA PROGRAM

*FIRST* partners with the <u>AmeriCorps VISTA Program</u> to recruit members to work in low-income communities in the United States, with a focus on building program capacity to serve a more diverse population. Since 2013, *FIRST* VISTA members have recruited over 25,000 volunteers and participants, trained nearly 30,000 supporters, and secured more than \$4 million in cash and in-kind donations.

*FIRST* hosted VISTA members at 22 sites during the *FIRST* RISE season, including four members in Puerto Rico. Dr. Maria del Pilar Angulo, Nimia Ramos Beauchamp, Heleen Bennett, and Kathleen McTigue supported *FIRST* locally in building more effective and sustainable practices for outreach, growth, and local engagement. With a range of expertise, they helped build relationships with local schools, add local sponsors, translate materials, and apply for grants. For example, in her first month of service, Kathleen engaged leaders at Becton Dickinson to fund *FIRST* LEGO League in a public school near a company plant. That school now has the program running in the entire fifth grade.

With the VISTA members' support, *FIRST* in Puerto Rico reached 25% more students this season. "We are still a small region, but with this powerhouse team, we know that is going to change fast," said Program Delivery Partner Miray Ramy.

#### RECRUITING TEAM MENTORS THROUGH COMMUNITY PARTNERSHIPS

Collaboration with community-based youth-serving organizations is critical to successfully reach underserved youth with *FIRST* programs. *FIRST* mentors and coaches who understand the students they serve and have access to resources for the team are better positioned to build strong teams. In 2019, *FIRST* joined forces with nonprofit **100 Black Men of America Inc.**, recognized as the top African American-led mentoring organization in the U.S., to provide \$5,000 grants to four chapter locations to establish and support their *FIRST* Tech Challenge teams.

In Chicago, the "Brogrammers" are a team of seventh-totenth grade students who were primarily new to robotics and programming, mentored by volunteers from **100 Black Men of Chicago** and **Chicago Professional Chapter of the National Society of Black Engineers (NSBE)**, a *FIRST* Alliance. By the end of the *FIRST* RISE season, the Brogrammers built and programmed a competitionready robot to compete in three division meets and alongside seasoned teams at the Chicago South League Championships. "Given the impact of the program as evidenced in the impressive rookie year performance, I look forward to the continuation and expansion of the *FIRST* program," said team coach and 100 Black Men of Chicago volunteer mentor Aaron D. Dorsey.

#### FEBRUARY 25, 2020

Ford

FIRST is part of a key storyline on the ABC sitcom "black-ish" featuring several real FIRST teams and a cameo from Dean Kamen.



THAT MEANT THE WORLD TO ME

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#### MARCH 10, 2020

FIRST announces Ford Motor Company has joined more than 20 innovative companies as a FIRST Strategic Partner, the highest level of sponsorship of the FIRST mission.

#### MARCH 12, 2020

Following the global outbreak of COVID-19, *FIRST* suspends the event season and cancels the international 2020 *FIRST* Championship. *FIRST* teams mobilize to solve pandemic-related challenges in their communities.

#### APRIL 10, 2020

FIRST launches FIRST @ Home, a free online resource with opportunities for remote learning/skills development, FIRST-supported activities, and staying engaged remotely.



PRESENTED BY QUALCOM

#### MAY 2, 2020

Dean Kamen awards the annual *FIRST* Founder's Award to the *FIRST* Community during the *FIRST* Virtual Showcase presented by Oualcomm, an online gathering to recognize achievements of *FIRST* teams, mentors, and volunteers during the season.





#### SCHOOL DISTRICT PARTNERSHIPS INCREASE ACCESS

During the *FIRST* RISE season, more than one-third of public K-12 districts had at least one *FIRST* team, and 45% of U.S. public schools with *FIRST* programs were Title I schools, meaning they serve a high percentage of students from low-income families – students who historically don't get access to the same meaningful opportunities as their peers. To close the gap, many districts implement *FIRST* programs through generous sponsor funding and support from the *FIRST* School District Partnership Program. This season, *FIRST* worked with sponsors to bring millions in funding to school districts in need around the country to increase access to *FIRST*.

The mantra at Greenfield Union School District, which serves approximately 3,600 PreK-8 students in Greenfield, Calif., is "ALL means ALL." With 95% of students from socioeconomically disadvantaged families and 59% English learners (many speak Spanish at home), equity and access are critical when implementing new programs. "We want to make sure that, whatever we do, we do it on a large scale, so every student has that experience," said Superintendent Zandra Jo Galván.

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In support of the district's goals, *FIRST* Strategic Partner Apple provided funding for *FIRST* Class Packs, *FIRST* Certified Professional Development, and other materials and support that enabled Greenfield to bring an in-classroom *FIRST* LEGO League experience to every PreK-6 student in the district. The district also plans to bring *FIRST* Tech Challenge opportunities to middle school, when students have access to career pathway electives. "The Apple funding has opened doors for our students through innovative technology, professional training, creative spaces, and thoughtful exposure and opportunity to STEM careers," Zandra said. "Imagine the amazing skill level of our students that are going to be entering careers within the vast STEM fields because of Apple and because of *FIRST*."

COVID-19 interrupted the district's plans for an intra-school celebratory *FIRST* event, but that hasn't slowed excitement for *FIRST* from teachers, parents, and students. "They learn so much conceptually by being able to build and design. They're able to use reading and mathematics and writing and the languages they're learning as it applies to engineering and designing their robots. The kids love it," Zandra said.



## FIRST COMMUNITY RISES AS A FORCE FOR CHANGE

Inspired by the *FIRST* Core Values and the *FIRST* RISE powered by *Star Wars: Force for Change* season, the *FIRST* community created meaningful change at home this year. The stories that follow are just a sample of the thousands in our community worldwide who embody what it means to be a "force for change."

#### FIRST CORE VALUES

We express the *FIRST* philosophies of *Gracious Professionalism®* and *Coopertition®* through our Core Values:

**DISCOVERY** We explore new skills and ideas.

**INNOVATION** We use creativity and persistence to solve problems.

**IMPACT** We apply what we learn to improve our world.

**INCLUSION** We respect each other and embrace our differences.

**TEAMWORK** We are stronger when we work together. **FUN** We enjoy and celebrate what we do!



FIRST is featured on an episode of Food Network's "Duff Takes the Cake," where celebrity baker Duff Goldman delivers a FIRST RISE droid cake to teams at the INFINITE RECHARGE<sup>SM</sup> Los Angeles North Regional competition.

JUNE 29, 2020 Twenty international *FIRST* LEGO League Challenge teams are honored for their innovative solutions during the remote broadcast of the 10<sup>th</sup> annual *FIRST* LEGO League Global Innovation Award presented by Disney.

#### TOGETHER, WE RISE





Students from  $\ensuremath{\textit{FIRST}}$  Robotics Competition team "Frog Force" deliver PPE in Michigan.



Students from the "Afghan Dreamers" work on a ventilator prototype in Afghanistan.

#### FIRST TEAMS SOLVE COVID-19 CHALLENGES

Amid a global crisis, the *FIRST* community has demonstrated *Gracious Professionalism*, compassion, and a commitment to community. *FIRST* teams around the world are using available resources, their STEM skills, and *FIRST* values to lend a helping hand to their communities as they navigate the COVID-19 pandemic.

Whether they were **3D-printing PPE** for healthcare workers, **donating items** to local businesses in need, or finding **creative ways to stay connected virtually** or from a safe distance, *FIRST* students, mentors, coaches, and volunteers stepped up to make a positive impact in an unprecedented situation.

For example, the "Afghan Dreamers," an all-girl *FIRST* team in Herat, Afghanistan, used their limited resources to create a ventilator prototype out of used car parts and provide aid to their community. "It was very important to us if we could save one life through this effort," team member Nahid Rahimi told Fast Company.

In response to the severe shortage of personal protective equipment (PPE) available to frontline workers in the United States, *FIRST* in Michigan launched the nationwide <u>1 Million PPE Challenge</u>. As of September 2020, *FIRST* teams across 13 states have created and donated a combined 2,261,713 units of PPE to their local hospitals and medical providers.

These stories are a true testament to why Dean Kamen founded *FIRST* 31 years ago: to inspire generations of young people to develop a passion for STEM and innovation and apply their skills to the most pressing challenges humanity faces.



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#### TEAM INVENTS ECO-FRIENDLY CONSTRUCTION MATERIAL

When tasked with identifying a real-world problem and providing a solution to improve their local community during the *FIRST* LEGO League Challenge CITY SHAPER<sup>SM</sup> season, team **"Aldeatron Robotix"** of **Canary Islands, Spain**, rose to the challenge. "We live on an island where resources are scarce, forcing us to import [materials] from the Mainland, increasing environmental contamination and product costs," said team coach Tony Cuesta.

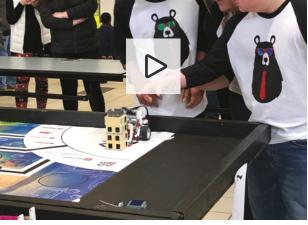
The team, winner of the 2020 Global Innovation Award presented by Disney, put their creative minds together to find a solution and developed E-Wall, a low-cost, light-weight building block made from recycled cardboard and fountain grass, an invasive species in the Canary Islands. E-Wall can be manufactured locally and takes the place of conventional building blocks and insulation, making affordable, comfortable, and eco-friendly homes for everyone in their island community.



#### STUDENT ADVOCATES FOR STEM IN HER COMMUNITY

As a young African American woman, *FIRST* Robotics Competition student Nialah Crosby of Detroit, Michigan, recognized the underrepresentation of people who look like her in STEM fields first-hand. Determined to help transform the statistics, she has dedicated her high school years to growing her STEM skills while advocating for Black rights, recruiting more girls on her robotics team, and making her voice heard in her community.

Because of her commitment to seeing more women of color in STEM, Nialah was crowned the very first Miss Juneteenth in Michigan: "I try to live my life being a 'force for change' as a member of *FIRST* and as the first to be crowned Miss Juneteenth in Michigan. Usually, Miss Juneteenth is an adult. Why did they crown me? Because despite my young age, I am a 'force for change.' Less than 1% of pilots in the world are African American women, but I am changing that. 19% of robotics engineers are women, but I am changing that."



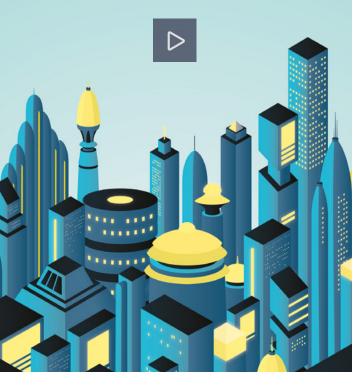
#### EDUCATOR EXPANDS ACCESS TO STEM OPPORTUNITY

When <u>Danielle Jenkins</u> found herself immersed in the world of *FIRST* through her daughter's *FIRST* LEGO League team, she quickly came to realize that they were part of something life changing. As a special education teacher, Danielle decided to form a *FIRST* LEGO League Challenge team for her students with intellectual disabilities – the first team of its kind in her state of Georgia – to ensure that her students receive the same STEM opportunities as others. Not only has being a part of *FIRST* LEGO League changed the ways in which her students view their abilities, but it has also impacted the ways others do too.

"My students are paving the way for other students with disabilities to become more engaged in robotics education. I don't think they realize quite how big their impact has been, but I do know that their confidence levels have sky-rocketed throughout this process," Danielle said.









## A SEASON IN NUMBERS

20+ million

volunteer hours served

4 infrastructure-themed challenges 579,000+

students in ~110 countries

3,000+ scholarship opportunities totaling \$80+ million from 200+ providers

320,000+

3,70C

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# CITY SHAPER

Students worked together to build cities of the future. In **BOOMTOWN BUILD**<sup>SM</sup> Discover and Explore teams<sup>\*</sup> used their imaginations to create a building that solves a problem and improves quality of life, built a LEGO<sup>®</sup> model, and tracked what they learned in an Engineering Notebook. Explore teams brought their model to life using LEGO<sup>®</sup> Education WeDo 2.0. In **CITY SHAPER**<sup>SM</sup> Challenge teams<sup>\*</sup> identified a problem with a building or public space in the community and designed a solution. Each team also built and programmed an autonomous LEGO robot to solve architecture-themed missions on a playing field.





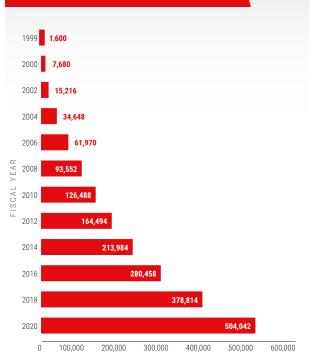
**SEASON SNAPSHOT** Twenty *FIRST* LEGO League Challenge teams were honored for their innovative solutions during the 10<sup>th</sup> annual Global Innovation Award presented by Disney, which was held as a remote broadcast on FIRST tv on June 29. Reviewed by a remote panel of expert judges, submissions ranged from biometric hardhats and sustainable road sealants to inclusive communication tools in playgrounds and created spaces to reduce food deserts. "Team Aldeatron Robotix" (shown above) of the Canary Islands, Spain, won the top \$20,000 prize. Runner-up teams "8 To Automate" of Dublin, Ohio, U.S.A., and "QuickBots" of Dayton, Ohio, each won \$5,000.

"I've been passionate about technology and engineering since I was little. I started a community FIRST LEGO League team after checking out an event in fourth grade with my Dad. After getting hands-on experience, I discovered a specific love for mechanical engineering and plan to major in it in college. I was also able to land an internship last summer, and I adapted much quicker than a typical intern because of all the skills I learned on my FIRST team."

<u>shaan Oberol</u>, FIRST alum, Rockville, Maryland, United States, FIRST LEGO League Challenge Team "Mindstorm Mastermind" and FIRST Tech Challenge Team "Wizards.Exe" (2019 Inspire Award recipients)

# Challenge individual teams

#### STUDENT PARTICIPANTS BY YEAR



#### SEASON FACTS

4,562

**Discover** Class Packs

38,609

Challenge Class Packs

students in ~100 countries explored STEM concepts and gained real-world problem-solving experiences through the guided, global FIRST LEGO League program.

504,000

Explore individual teams

337 Explore Class Packs

236 **Explore** School Packs

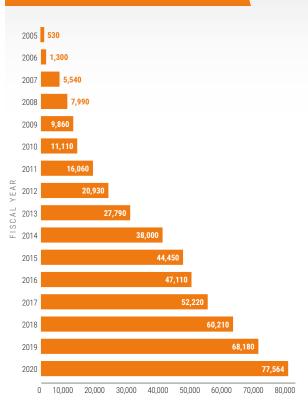




In **SKYSTONE<sup>SM</sup> presented by Qualcomm**, teams worked in an alliance to build a superstructure within a burgeoning future city. Students programmed their robots to compete in two-and-a-half minutes of game play with autonomous and driver-controlled sections. Tasks included laying their foundation in their building site, delivering stones from the loading zone to the building zone, placing stones on their foundation, navigating their robots under the bridge, and topping their structure off with a final capstone of their own design.



STUDENT PARTICIPANTS BY YEAR



**SEASON SNAPSHOT** In this episode still from ABC sitcom "black-ish," Jack Johnson (actor Miles Brown) shows his dad, Dre (Anthony Anderson), "LeBot James," his robotics team's robot. The robot (real name: "Sally Ride") was built by *FIRST* Tech Challenge Team 3526 "Marlbots" for the ROVER RUCKUS<sup>SM</sup> presented by Qualcomm season and repainted for use on the "black-ish" set. <u>Several *FIRST* teams participated</u> in filming the episode, which featured scenes at a *FIRST* event and a cameo from Dean Kamen.

"Robotics changed the outlook of my life. I started to find my purpose. Bruce was there along the way to say, 'You can do this.'"

eAnna Kinds, FIRST alum, Chicago, Illinois, United States



"I thought maybe I could learn something as much as I could teach."

– Bruce Peterson, FIRST Tech Challenge mentor, Chicago FIRST Tech Challenge Team 116 "The Crazy Eights"

#### SEASON FACTS

77, 560

students in **~60 countries** developed STEM skills, practiced engineering principles, and explored the value of teamwork through *FIRST* Tech Challenge.

7,610 individual teams

61 Class Packs





In **INFINITE RECHARGE**<sup>SM</sup> teams worked in alliances to protect *FIRST* City from approaching asteroids. Alliances, along with their trusty droids, were challenged to collect and score Power Cells and manipulate the Control Panel to energize their Shield Generator for maximum protection. Near the end of the two-and-a-half-minute game match, droids raced to their Rendezvous Point and lifted to activate their Generator Switch in order to protect the city.



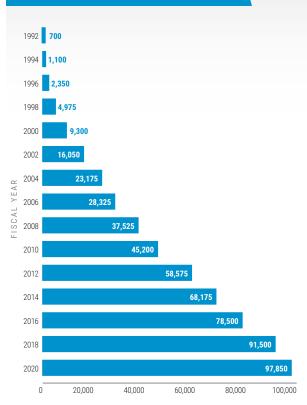
**SEASON SNAPSHOT** Star Wars droid R2-D2 makes an appearance at the 2020 INFINITE RECHARGE<sup>SM</sup> Kickoff event in Manchester, N.H., on January 4, 2020. The event is an opportunity for teams from all over the world to come together as a community to share in the excitement of seeing the new game unveiled. Teams at nearly 160 Kickoff sites in countries all over the world such as Australia, Canada, Dominican Republic, Israel, Mexico, Turkey, and the United States watched the proceedings via live broadcast.

"Before joining FIRST, I was really shy and didn't really fit into the norms of my region. I joined FIRST on a whim. I was plopped into the captain and driver roles by my lead mentor. By the end of the season, my shell had broken. Now I am one of the two lead mentors of our program. I try to carry and develop the same experiences and lessons I learned as a student to my students. I want to make sure the per-student impact is as high as possible, which means a combination of interpersonal development and thoughtful approach to design."

- <mark>Jaci Brunning</mark>, FIRST alum and mentor, Perth, Western Australia

FIRST Robotics Competition Team 5333 "Can't C#" and Team 5663 "Ground Control"

#### STUDENT PARTICIPANTS BY YEAR



SEASON FACTS

## 97,850

students in **36 countries** unlocked real-world engineering concepts, self-confidence, and workforce skills, supported by professional team mentors and sponsors.

3,914 individual teams 340 rookie teams



## **A LEGACY RISES:** REMEMBERING DR. WOODIE FLOWERS

#### FIRST EXECUTIVE ADVISORY BOARD CHAIR EMERITUS AND DISTINGUISHED ADVISOR

Dr. Woodie Flowers, "Woodie" as he was known to all in the *FIRST* community, passed away on October 11, 2019, at the age of 75. Woodie, an innovative and beloved Pappalardo Professor Emeritus of Mechanical Engineering at the Massachusetts Institute of Technology, collaborated with *FIRST* Founder Dean Kamen to develop the *FIRST* Robotics Competition and coined the phrase *Gracious Professionalism*, which encourages high-quality work, emphasizes the value of others, and respects individuals and the community in pursuit of a meaningful life.

Survived by his wife and partner, Margaret Flowers, the couple had no biological children, but she said in an interview, "the MIT kids and the *FIRST* kids were our children." Throughout his 30 years of involvement with *FIRST*, the couple, together, were tireless advocates for the organization.

On December 9, 2019, *FIRST* hosted a global celebration of life and remembrance for Woodie as part of communitywide efforts to celebrate his life and honor his legacy. His legacy will live on as the *FIRST* community continues to embody his words and actions.



Several previous Woodie Flowers Award recipients presented the 2019 honor to FIRST alum and mentor Allen Gregory IV at the 2019 FIRST Championship.

#### WOODIE FLOWERS AWARD

The <u>Woodie Flowers Award</u> (WFA) celebrates effective communication in the art and science of engineering and design. Dr. William Murphy founded this prestigious award in 1996 to recognize mentors who lead, inspire, and empower using excellent communication skills – starting with Woodie himself. WFA winners serve as valued advisors to *FIRST*. The 2020 WFA was awarded to Lucien Junkin, mentor for *FIRST* Robotics Competition Team 118 "Robonauts" from Houston, Texas, who has been involved with *FIRST* for nearly as long as Woodie, mentoring the Robonauts for more than two decades. Also like Woodie, with his boundless enthusiasm and contagious intensity, Lucien's unique style of teaching has ignited a passion for engineering within his students.

#### WOODIE FLOWERS MEMORIAL GRANT

Starting in late 2020, *FIRST* will award the <u>Woodie Flowers Memorial Grant</u> annually to one winner of the *FIRST* Tech Challenge or *FIRST* Robotics Competition Dean's List Award, which celebrates outstanding student leaders whose passion for and effectiveness at attaining *FIRST* ideals is exemplary. The Grant, funded by generous donors, is for \$10,000 per year, renewable up to four years, and is applicable for majors in a STEAM discipline and may be used by recipients attending an accredited university of their choice.

#### WALK LIKE WOODIE

Founded by students from "Camdenton LASER 3264" *FIRST* teams and embraced by the *FIRST* community, **#WalkLikeWoodie** invites *FIRST* community members to post photos and memories of Woodie on social media, and to share acts of *Gracious Professionalism* and ways they intend to follow in his footsteps. Many posted photos wearing Converse, part of Woodie's signature style.



The 2020 WFA was awarded to Lucien Junkin, mentor for *FIRST* Robotics Competition Team 118 "Robonauts" from Houston, Texas.



#WalkLikeWoodie was founded by students from "Camdenton LASER 3264" *FIRST* teams and embraced by the *FIRST* community.

"Think of FIRST as a catalyst in a chain reaction. Each collision releases human potential which feeds an exponential expansion of additional human potential. FIRST students seize this opportunity by being informed, being creative, and thinking hard – all three, all the time." -Dr. Woodie Flowers



## FIRST HONORS SOLEDAD O'BRIEN, PRAISES YOUNG INNOVATORS

The fifth annual *FIRST*, Inspire Gala brought hundreds of *FIRST* supporters to New York City on November 7, 2019, to raise funds to further expand students' access to life-changing STEM experiences that spark interest, inspire self-confidence, and build critical workforce skills.

"In our culture, you get the best of what you celebrate. There aren't a few million positions available in the NBA, the NFL, or Hollywood. There are a few million positions open in STEM industries, and they are desperate for skilled people to fill these roles. It's time to accelerate the rate at which FIRST is adopted." – Dean Kamen, FIRST Founder

→ Thank you to our *FIRST*, Inspire Gala sponsors who appear on page 37 of this report.



Award-winning journalist, speaker, author, and philanthropist Soledad O'Brien received the "Make It Loud" Award. Since 2014, the Make It Loud Award honors the individual(s) who significantly contributed to raising awareness of *FIRST* amongst the general public. O'Brien was recognized for her many efforts to "make it loud" for *FIRST* throughout her career, including a recent in-depth feature for HBO's *Real Sports with Bryant Gumbel*. At the gala, O'Brien sat down with Megan Gupta-She, a student on *FIRST* Tech Challenge Team 310 "Stuy Fission," for an uplifting and empowering conversation about education, the importance of storytelling, and the value of hard work.



*FIRST* alum Tia Singh, an aspiring CTE (Career and Technical Educator), received the "Evelyn Kamen Rising Star" Award for her dedication to continuing to live the *FIRST* ethos in a way that is inspiring the next generation of *FIRST* participants. Singh is pursuing an Instructional Technology Master's Degree at New York Institute of Technology and teaching and industry opportunities. As a *FIRST* alum, she volunteers at *FIRST* events, mentors her high school *FIRST* Robotics Competition Team 1796 "RoboTigers," and helps support team sustainability in the *FIRST* community through workshops and other support.

## SPONSORS AND CONTRIBUTORS

Through *FIRST* programs, kids of all ages and backgrounds are building pathways for their futures. As a nonprofit more than three decades into our mission, we know we would not have this impact without the support of our sponsors, suppliers, donors, and other financial contributors. Their partnership, acknowledged on these pages, enables our participants to have the tools they need to succeed and build a better world.

#### Together, we RISE.

-						

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"FIRST demonstrated to me how life-changing educational access and experiential learning can be to a student's trajectory and how it can set the next generation up for success. Initially I started volunteering to stay connected to the FIRST community and to pay my own experience as a student forward. The longer that I have volunteered, the more important the mission of FIRST, and therefore supporting it financially, has become to me." – Pam Wong, FIRST alum, donor, and volunteer

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"Star Wars has always inspired young people to look past what is and imagine a world beyond. It is crucial that we pass on the importance of science and technology to young people – they will be the ones who will have to confront the global challenges that lie ahead. To support this effort, Lucasfilm and Disney are teaming up with FIRST to bring learning opportunities and mentorship to the next generation of innovators." - Kathleen Kennedy, president, Lucasfilm

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"As a scientist, the biggest reward for volunteering is the inspiration from the creativity of youth. I also enjoy the bonding with my children and their friends. It is satisfying to observe in real time that they are gaining confidence through their work and passions and are feeling the real-world impact they have made on themselves and others." - Dawei Lin, FIRST coach, volunteer, and parent

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CANADA

ALBERTA FIRST Robotics Society ••••

BRITISH COLUMBIA FIRST Robotics British Columbia ••••

NEW BRUNSWICK Rothesay Netherwood School•

**NEWFOUNDLAND AND LABRADOR** FIRST Robotics Newfoundland and Labrador ••

NOVA SCOTIA Acadia University •

ONTARIO FIRST Robotics Canada ••••

**QUÉBEC** Robotique *FIRST* Québec •••

CHILE Fundación SparkTalents ••

CHINA Semia Limited • CUYRA •

CHINESE TAIPEI Kids Kingdom, Inc.

COLOMBIA Uniminuto

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CROATIA Zavod Super Glavce • CYPRUS EDUAct ••

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FRANCE West Side Robot Lab • Educabot • GERMANY HANDS on TECHNOLOGY e.V. ••

GHANA CODERINA •

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GUATEMALA Computation Avanzada S.A.\* ••

HONDURAS Honduras STEM Foundation\* •

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HUNGARY HANDS on TECHNOLOGY e.V. ••

ICELAND FIRST LEGO League á Íslandi •

INDIA InfinityX •

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INDIA – WEST Duck Learning ••

INDONESIA PT Edukasi Kreatifitas Anak/ CK Education ••

\*Local Partner Representative



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For over 30 years, *FIRST* volunteers have united to build tomorrow by encouraging millions of young people to embrace innovation and collaboration. Our hundreds of thousands of volunteers are part of an international support system we've built to inspire a generation of global citizens to create a strong, sustainable "force for change."

> We are proud to honor the 2020 *FIRST* Volunteer of the Year Award recipients:

#### FIRST LEGO LEAGUE EXPLORE

Cindy Nader Milford, MI Brian Boyer Chichester, NH

#### FIRST LEGO LEAGUE CHALLENGE

Desh Bagley Riverview, FL Sam Last Cary, NC

#### FIRST TECH CHALLENGE

Phil Malone McHenry, MD Kevin Thorp North Charleston, SC

#### FIRST ROBOTICS COMPETITION

Sarah Plemmons Orlando, FL Laurie Shimizu Minneapolis, MN IRELAND The Institution of Engineering and Technology (The IET) •• FIRST Tech Challenge UK •

ISRAEL FIRST Israel & Technion ••••

ITALY Fondazione Museo Civico di Rovereto ••

JAMAICA Jamaica College Foundation •

JAPAN FIRST Japan ••

JORDAN Jubilee Center for Excellence in Education ••

KAZAKHSTAN USTEM Robotics Kazakhstan/Central Asia Robotics Development Foundation\*

KENYA CODERINA ••

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LEBANON Education and Technology Center ••

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MALAYSIA Sasbadi Sdn Bhd ••

MÉXICO RobotiX •• Explora, Descubre y Crea, A.C. ••

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MOROCCO Play Academy ••

NETHERLANDS Stichting Techniekpromotie •• STEAMUp •

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SAUDI ARABIA

SINGAPORE Duck Learning ••

SLOVAKIA FIRST LEGO League Slovensko, o.z.

SLOVENIA Zavod Super Glavce ••

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TUNISIA Edurobot Tunisia ••

TURKEY Bilim Kahramanlari Bulusuyor (BKD) •• Fikret Yüksel Foundation •

UKRAINE Innovative Education Solutions ••

UNITED ARAB EMIRATES ATLAB •• ATLAB and AUS •

#### UNITED KINGDOM

The Institution of Engineering and Technology (The IET) •• FIRST Tech Challenge UK • UNITED STATES **ADVENTIST ROBOTICS LEAGUE** Adventist Robotics League ••

ALABAMA FIRST in Alabama •••

ALASKA Juneau Economic Development Council ••• *FIRST* Washington •

ARIZONA Arizona State University •• Coconuts Robotics •

ARKANSAS Science and Technology Group Inc. •••

CALIFORNIA – CENTRAL Clovis Unified School District ••

**CALIFORNIA – LOS ANGELES** Alt-NEXT • LA Robotics •

**CALIFORNIA – NORTHERN** Playing at Learning •••

CALIFORNIA – SAN DIEGO Matt Nilsen •

CALIFORNIA - SOUTHERN Southern California Robotics League ••

**COLORADO** Colorado *FIRST* •••

**CONNECTICUT** NE *FIRST* ••••

DELAWARE Delaware State University •• First State Robotics • FIRST Mid-Atlantic • DISTRICT OF COLUMBIA FIRST Chesapeake •• James Madison University •• USRA ••

FLORIDA Tampa Bay Robotics •

FLORIDA – CENTRAL Renaissance Jax, Inc. ••

FLORIDA - NORTHEAST Renaissance Jax, Inc. ••

FLORIDA - NORTHWEST DEFENSEWERX Inc. ••

FLORIDA – SOUTH Green Mouse Academy ••

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GUAM SIFA ●●

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IOWA Iowa State University •• University of Iowa • KANSAS – CENTRAL Oklahoma Science and

Engineering Foundation (OKSEF) ●

KANSAS - KANSAS CITY REGION KC STEM Alliance ••

KANSAS - SOUTHWEST Mid-America Air Museum/ City of Liberal ••

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MARYLAND FIRST Chesapeake •• University of Maryland Baltimore County •

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NORTH DAKOTA

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Pennsylvania FIRST •

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TEXAS - CENTRAL FIRST in Texas ●●

TEXAS - EAST FIRST in Texas ●● San Jacinto College ●

TEXAS - NORTH DFW Technology and Education Council • Perot Museum • *FIRST* in Texas •• University of Texas at Dallas • **TEXAS – PANHANDLE** *FIRST* in Texas ••

TEXAS - SOUTH FIRST in Texas ●●●

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"FIRST is not just a competition. FIRST students don't just make robots. You are proof that it is a movement of inspiration. It is growing leaders and collaborators every day."

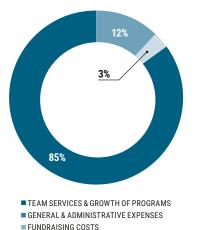
– Dean Kamen, FIRST Founder



## **FINANCIALS**

Before the COVID-19 pandemic. FIRST was on track for another year of programmatic growth and financial stability. While we did serve more participants than ever before in fiscal year 2020, the pandemic caused the suspension of our season and cancellation of FIRST Championship, which significantly decreased our revenues, leading to an operating deficit for the first time in over 17 years.

In the spring, we decreased expenses significantly and many FIRST contributors released funds from restrictions, helping to mitigate some of the financial impacts of the pandemic. However, we expect even greater financial challenges in fiscal year 2021 and look forward to a recovery afterward.



As noted in the pie chart above, and in keeping with longtime practices, FIRST continues to apply the maximum percentage of funds possible to directly benefit FIRST participants. Within the modest G&A expenses are ongoing investments in our Youth Protection Program, Program Evaluations, Equity, Diversity & Inclusion Program, and Education Initiative.



FIRST achieved its 15<sup>th</sup> consecutive four-star rating from Charity Navigator, certifying our continued commitment to

accountability, transparency, and sound fiscal management. This consecutive rating places FIRST in the top 1% of the U.S. charities annually evaluated by Charity Navigator.

STATEMENTS OF ACTIVITIES	JUNE 30, 2020	JUNE 30, 2019
Revenues and other support:		
Program registration fees	15,091,513	32,718,347
Contributions and grants	11,896,431	18,469,938
Other income	1,017,589	2,154,040
Special event income, net of expenses of \$406,309 in 2020 and \$396,560 in 2019	424,959	496,506
Net assets released from restrictions	39,856,978	30,951,062
Total revenues (losses) and other support	\$ 68,287,470	\$ 84,789,893
Expenses:		
FIRST Program Expenses	57,950,115	71,557,755
Net cost of building space occupied by unrelated not-for-profit organizations	320,651	295,730
General, administrative, and supporting services	8,330,803	8,990,597
Fundraising and Development	2,400,224	2,387,833
Total expenses	\$ 69,001,793	\$ 83,231,915
Operating surplus (deficit)	(714,323)	1,557,978

STATEMENTS OF FINANCIAL POSITION	JUNE 30, 2020	JUNE 30, 2019
Assets:		
Cash and cash equivalents*	42,609,063	27,748,958
Short-term investments*	8,250,000	12,000,000
Pledges, receivables, program supply inventory, and other assets	15,932,819	15,498,863
Net property, plant, and equipment	5,221,972	5,176,264
Total assets, end of year	\$ 72,013,854	\$ 60,424,085
Liabilities and net assets:		
Total liabilities, end of year	\$ 9,133,142	\$ 7,653,948
Net assets:		
Unrestricted	28,677,577	29,391,900
Tanan ana vila ya atvi ata al	34,203,135	23,378,237
Temporarily restricted		_=;=:;=:;=::
Total net assets, end of year	\$ 62,880,712	\$ 52,770,137

For each of the two fiscal years summarized above, FIRST received unmodified (unqualified) opinions from its independent auditor, BerryDunn.

\*NOTE: The cash and short-term investments are comprised of both unrestricted funds and donor temporarily restricted funds. The increase in restricted funds includes pre-payments of future restricted sponsorships from certain grantors. The total liquid assets balance available to FIRST, for operating purposes, at June 30, 2020, is equivalent to approximately seven months of FIRST operating expenses.

The financial information presented here is condensed and does not include the value of all donated services and materials. Audited Financial Statements (AFS) are readily available on our website at www.firstinspires.org under "About/Annual Report & Financials."

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## FIRST® IS A ROBOTICS COMMUNITY PREPARING YOUNG PEOPLE FOR THE FUTURE.

#### VISION

"To transform our culture by creating a world where science and technology are celebrated and where young people dream of becoming science and technology leaders."

– Dean Kamen, FIRST Founder

#### MISSION

To inspire young people to be science and technology leaders and innovators, by engaging them in exciting mentor-based programs that build science, engineering, and technology skills, that inspire innovation, and that foster wellrounded life capabilities including self-confidence, communication, and leadership.

#### IMPACT

For three decades, *FIRST* participants have developed self-confidence in STEM, meaningful friendships, and valuable, real-world skills that open pathways and help young people build a better future. *FIRST* programs are proven to encourage students to pursue education and careers in STEM-related fields, but they also inspire kids to become leaders and innovators in any industry.



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