



FIRST® Frequently Asked Questions

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What is FIRST®?

FIRST® is a robotics community that prepares young people for the future.

FIRST (For Inspiration and Recognition of Science and Technology) is the world's leading youth-serving nonprofit advancing science, technology, engineering, and math (STEM). Founded by inventor Dean Kamen in 1989, *FIRST* has evolved into a global movement by combining the excitement of traditional sports with the rigor of STEM learning, engaging millions of people with programs that have a proven impact on learning, interest, and skill-building inside and outside of the classroom. *FIRST* builds powerful mentorship relationships between young people and STEM professionals, helping kids of all backgrounds gain confidence to explore the innovation process while they learn valuable science, engineering, technology, teamwork, and problem-solving skills. *FIRST* creates the people who will change the world – today and tomorrow.

What are FIRST programs?

FIRST programs inspire innovation and leadership through engaging, hands-on robotics challenges developed to ignite curiosity and passion in students in grades PreK-12. *FIRST* offers a suite of robotics programs for PreK-12 (ages 4-18): the *FIRST*® Robotics Competition for Grades 9-12 (ages 14 to 18); the *FIRST*® Tech Challenge for Grades 7-12 (ages 12 to 18); and the *FIRST*® LEGO® League for Grades PreK-8 (ages 9 to 16; ages vary by country). Each program can be facilitated in school or after-school, and students can join at any level.

Who are some of the organizations that sponsor FIRST?

FIRST is supported by a strong network of corporations, educational and professional institutions, and individuals. Some of the world's most respected companies – including more than 200 of the *Fortune* 500 companies – provide funding, mentorship time and talent, volunteerism, equipment, and to make *FIRST* more accessible to students all over the world.

FIRST Strategic Partners – sponsors that support FIRST at the highest level – are:

The 3M Company, Amazon, Apple, The Argosy Foundation, BAE Systems, Bechtel Group Foundation, The Boeing Company, Bosch, Caterpillar, Inc., Collins Aerospace, DEKA Research & Development Corporation, DoD STEM, Dow, FedEx Corporation, Ford Motor Company, General Motors Company, Google, John Deere, LEGO® Education, Lockheed Martin Corporation, National Aeronautics and Space Administration (NASA), NI, Qualcomm® Incorporated, Raytheon Technologies, Rockwell Automation Inc., TE Connectivity, and the Walt Disney Company.

FIRST Founding Sponsors are:

Baxter International Inc., Boston Scientific Corporation, DEKA Research & Development Corporation, Delphi Corporation, FCA Foundation, General Motors Company, Johnson & Johnson, Kleiner Perkins, Motorola Solutions Foundation, and Xerox Corporation.

FIRST has Strategic Alliances in place with:

Alpha Omega Epsilon, American Society for Engineering Education (ASEE), Automation Federation/ISA, Boys & Girls Clubs of America, Electronic Components Industry Association (ECIA) Foundation, Girl Scouts of the USA, MIT Alumni Association, National 4-H Council, National Center for Women & Information Technology (NCWIT), National Fluid Power Association (NFPA), National Parent Teacher Association (PTA), National Robotics Week, Sigma Phi Delta Fraternity (SPD), Society of Professional Hispanic Engineers (SHPE), SIM Foundation, Society of Women Engineers (SWE), Triangle Fraternity, and Yale Science & Engineering Association (YSEA).

What does research show about participation in *FIRST*?

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*. 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:

- 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.
 - 81% of *FIRST* alumni declared a major in STEM compared to 58% in the comparison group.
 - 69% of *FIRST* alumni declared a major in engineering or computer science compared to 26% of the comparison group.
- 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.
 - 79% of female *FIRST* alumni declared majors in STEM by their third year in college compared to 51% of the comparison group.
 - Female *FIRST* alumni declared engineering majors at the same rate (51%) as male alumni and higher rates than comparison group men (38%) and women (15%).
- Compared to their peers, *FIRST* students are:
 - 2.4 times more likely to show gains in STEM interest
 - 1.7 times more likely to show gains in STEM knowledge
 - 1.8 times more likely to show gains in STEM activity
 - 2.1 times more likely to show gains in STEM career interest

- 2.0 times more likely to show gains in STEM identity

*Comparison group includes students who did not participate in *FIRST* programs but were enrolled in science and technology classes at the same grade schools.

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

Learn more at www.firstinspires.org/impact.

Who participates in *FIRST* programs?

During the 2019-2020 season, more than 679,000 students in approximately 110 countries participated in *FIRST* across programs. For the latest global statistics, please visit firstinspires.org/about/at-a-glance.

Who manages the teams and events?

FIRST is truly a volunteer-driven organization. The 2019-2020 season included 320,000 volunteer roles, with contributions in areas including mentorship, event management, recruitment, and team management. The growth and success of *FIRST* is a direct result of the efforts of the mentors, parents, teachers, community leaders, and citizens who volunteer their time and talent.

How can volunteers get involved?

The best ways to start discovering the rewards of *FIRST* are:

- Attend a *FIRST* event: Visit [the *FIRST* event search](#) to find a free event close to you;
- Contact a mentor from a [local team](#) to assist or sign up on the [FIRST Mentor Network](#) platform to easily find one or multiple teams to work with virtually or face to face, locally or across the country, for a few hours or a season.
- Visit [the *FIRST* volunteer website](#) for volunteer/event opportunities; or
- Contact *FIRST* at 1-800-871-8326 or email volunteer@firstinspires.org.

Interested volunteers can visit our website at www.firstinspires.org/ways-to-help/volunteer for more information about how to become a mentor, coach, or event volunteer.

What are the *FIRST* Core Values?

The *FIRST* Core Values emphasize friendly sportsmanship, respect for the contributions of others, teamwork, learning, and community involvement and are part of our commitment to fostering, cultivating and preserving a culture of equity, diversity, and inclusion. The *FIRST* Community expresses 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!*

What is *Gracious Professionalism*®?

Gracious Professionalism® is part of the ethos of *FIRST*. The idea and phrase are found throughout *FIRST*, but no one was a stronger champion than the late *FIRST* Distinguished Advisor, Dr. Woodie Flowers.

“Gracious Professionalism is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. With Gracious Professionalism, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy, but treat one another with respect and kindness in the process.”

What is *Coopertition*®?

Coopertition® produces innovation. At *FIRST*, *Coopertition* is displaying unqualified kindness and respect in the face of fierce competition. *Coopertition* is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete. *Coopertition* involves learning from teammates. It is teaching teammates. It is learning from mentors. And it is managing and being managed. *Coopertition* means competing always but assisting and enabling others when you can.

What is *FIRST* Equity, Diversity & Inclusion?

FIRST is committed to fostering, cultivating and preserving a culture of equity, diversity, and inclusion. We embrace and encourage differences in race, ethnicity, national origin, sex, gender, gender identity, gender expression, sexual orientation, disability, age, religion, income, language, learning difference, or any other characteristics that make our adult-force and students unique.

Exploring, developing and implementing strategies to become more inclusive and ensure access to our programs to all students (as well as access to key supports) is critical for *FIRST* to reach its goal and mission. ALL young people should have the opportunity to become science and technology leaders. *FIRST* will remove barriers to program participation for underserved, underrepresented students. Pursuant to that end, *FIRST* Equity, Diversity, & Inclusion is a concerted, organized effort to develop strategies to make its programs more accessible and inclusive. Learn more at firstinspires.org/diversity.

Who are *FIRST* Alumni?

FIRST alumni are high school graduates who participated in high school-level *FIRST* Tech Challenge and/or *FIRST* Robotics Competition. *FIRST* Alumni stand out to potential employers. They are innovative, leaders, and ready to hire. They have gone on to specialize in engineering, science, education, media, mathematics, theater, film, marketing, business, finance, health, art, communications, medicine, ecommerce, politics, technology, and much more.

FIRST helps alumni of *FIRST* programs take the next step, reach for the next breakthrough, and take their dream and see it through. No matter their dream, *FIRST* helps them get there. *FIRST* Alumni have access to networking opportunities, internships and jobs, community, inspiration, and more through *FIRST*. Learn more at firstinspires.org/alumni

How does the *FIRST* Scholarship Program work?

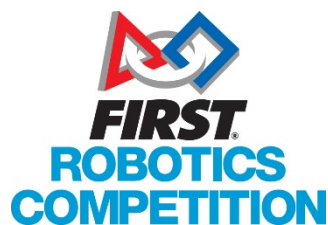
High school students who have participated or are participating on high-school-level *FIRST* Robotics Competition and/or *FIRST* Tech Challenge teams can apply for over \$80 million in *FIRST* Scholarships. *FIRST* Scholarships are offered and administered by the scholarship providers. Scholarship providers are primarily four-year colleges and universities, but also include community colleges, technical schools, corporations, and associations. Most *FIRST* scholarships are merit-based scholarships and may be renewable each year by maintaining an acceptable academic average. Each scholarship is unique and has its own award amount, eligibility requirements, application requirements, and application deadline. Learn more at firstinspires.org/scholarships.

What is *FIRST* Championship?

Hosted by *FIRST*, *FIRST* Championship is a culminating, international event for our youth robotics competition season and an annual celebration of science, technology, engineering, and math (STEM) for our community as we prepare young people for the future. Qualification and advancement to participate in *FIRST* Championship varies by program. Learn more at firstchampionship.org.

What is the Global Innovation Awards?

Hosted by *FIRST*, the *FIRST* Global Innovation Awards is an international event celebrating the next generation of innovators who will change the future. The award is open to participating *FIRST* LEGO League, *FIRST* Tech Challenge, and *FIRST* Robotics Competition teams in more than 100 countries. Twenty finalist teams from each program advance to the Awards to showcase their research and inventions, and present to industry leaders. Learn more at firstinspires.org/community/innovation.



What is the FIRST® Robotics Competition?

The FIRST® Robotics Competition for Grades 9-12 (ages 14 to 18) is an annual competition that helps young people discover the rewards and excitement of education and careers in science, engineering, and technology. The program challenges high-school-aged students – working with professional mentors – to design and build a robot and compete in high-intensity events that reward the effectiveness of each robot, the power of team strategy and collaboration, and the determination of students. In 1992, the initial FIRST Robotics Competition took place with 28 teams in a high school gym in New Hampshire. Over three decades, the program has grown to include thousands of teams from around the world.

Why involve a professional mentor?

FIRST® creates powerful mentoring relationships between the students and professional mentors. FIRST Robotics Competition teams include engineers and other professionals from some of the world's most respected companies working alongside dedicated educators. Mentors create authentic and relevant learning opportunities, bringing out individual pride, empowerment, and a sense of belonging that young people need in their lives.

How is the game played?

Each year's Kickoff event, held in January, unveils a new, exciting, and challenging game. From the Kickoff, teams have limited time to build and program a robot to compete in the game using a kit of parts provided by FIRST along with other components and a standard set of rules. Learn more about the current season game at www.firstinspires.org/robotics/frc/game-and-season.

Who participates in the competition?

Teams are comprised of adult mentors and 10 or more student members in grades 9-12. In addition, each FIRST team has one or more sponsors. Those sponsors include companies, universities, or professional organizations that donate their time, talent, funds, equipment, and much more to the team effort.

Is scientific, technology, or mathematic expertise required for students to participate in the FIRST Robotics Competition?

FIRST invites students who may not be predisposed to science, math, or technology to participate. In fact, FIRST Robotics Competition is designed to inspire, motivate, and encourage students to learn basic principles while challenging more experienced students. Since there are critical roles for students in everything from design and building, to fundraising and research, to marketing, every student can actively participate and benefit.

What do the students gain from participating?

Throughout their FIRST experience, students gain maturity, build self-confidence, learn teamwork, and gain an understanding of professionalism. Whether it's finding their people or

finding their path, students gain the skills and confidence to forge ahead and build their future with *FIRST*. Additionally, any *FIRST* Robotics Competition participant is eligible to apply for exclusive scholarships from leading colleges, universities, and technical programs, as well as other opportunities that create connections and open pathways to a wide variety of careers.

A series of awards honor accomplishments in areas including engineering, design excellence, competitive play, sportsmanship, and high-impact partnerships between schools, businesses, and communities. A judging committee of distinguished professionals makes award decisions. The most prestigious award is the Chairman's Award, which recognizes the team that best represents a model for other teams to emulate and best embodies the purpose and goals of *FIRST*.

What are the benefits to the sponsors, mentors, and volunteers who support teams?

Adults benefit from the community offered by *FIRST* as much as the students do. Sponsors benefit by finding future employees and interns and filling their talent pipelines. Mentors benefit from renewed inspiration and a reminder as to why they chose science, technology, engineering, and math (STEM) as a career. Volunteers are recognized as an integral and vital part of the way in which young people connect to the real world, in their own communities and in the world at large.



FIRST® Tech Challenge FAQ

What is FIRST® Tech Challenge?

It's way more than building robots.

International *FIRST* Tech Challenge teams (up to 15 members, grades 7-12) are challenged to design, build, program, and operate robots to compete with and against other teams in an exciting robotics game.

- Guided by adult coaches and mentors, students develop science, technology, engineering, and math (STEM) skills and practice engineering principles, while realizing the value of teamwork, innovation, and sharing ideas.
- The robot kit is reusable from year-to-year and can be programmed using a variety of languages. Teams also must raise funds, design, and market their team brand, and do community outreach for which they can win awards.
- Participants have access to over \$80 million in college scholarships to colleges, universities, and technical programs.
- Each season culminates with local and regional events where qualifying teams compete for awards and a spot in the international [FIRST® Championship](#).

What does every FIRST Tech Challenge team need?

- Two or more adult mentors/coaches who are willing and motivated to coach the team through the build and competition season and beyond.
- Other adults can volunteer to help with administration, fundraising, community outreach, technical advising, and other tasks.
- A suitable meeting place and space to design and build a robot about the size of a microwave oven.
- A standard kit of robot parts and a common set of game and robot rules issued by *FIRST* Tech Challenge.
- A budget and a fundraising plan.
- The desire to learn, explore, strategize, build camaraderie, share ideas and talents, make new friends, be accepted, and have fun!

When does FIRST Tech Challenge happen?

- The *FIRST* Tech Challenge season starts in May, when teams generally form and registration opens. Season game details are announced in early September, which kicks off the design and build season.
- Tournament season varies by region and can begin as early as October and continues through the *FIRST* Championship events. There are also many fun off-season events where teams compete, strategize, hone their skills, learn new technology, and meet other teams.

What is the time commitment?

- **Mentors or adult volunteers** meet with their team at least once per week during the build and competition season (September – April). Many mature teams also meet throughout the school year, and some compete in off-season events or perform community outreach. You, your family, and your available free time can decide together how much time you can devote to the program.
- As a **team member**, the same applies. Students meet at least once per week from mid-September through April. Like any sport or other after-school activity, the more time you invest, the better you will become at your task(s).

Any special skills required?

- **All skill levels are welcomed and needed, technical and non-technical.** Teams need all kinds of skills to succeed, so what are you good at? Chances are we have a job for you. And we'll probably teach you a few new ones while you're with us.
- Student and adult **team members** are encouraged to bring any skills they already have, like programming, electronics, metalworking, graphic design, web creation, public speaking, videography, and many more. *FIRST* Tech Challenge *welcomes every student, with or without specialized skills.*

How is the game played?

Each year's Kickoff event, held in September, unveils a new, exciting, and challenging game to be played on a themed 12'x12' playing field. From the Kickoff, teams have limited time to build and program a robot to compete in the game, typically composed of three sections: autonomous, driver-controlled, and the end game. Teams can use advanced *artificial intelligence (AI)*, *augmented reality (AR)*, and *machine learning (ML)* technologies to improve the performance of their competition robots during play. Points are added throughout game play, and penalties are assigned at the end of the match. Learn more about the current season game at www.firstinspires.org/robotics/ftc/game-and-season.



FIRST® LEGO® League FAQ

What is FIRST® LEGO® League?

FIRST® LEGO® League introduces science, technology, engineering, and math (STEM) to children ages 4-16 (ages vary by country and division) through fun, exciting hands-on learning. Participants gain real-world problem-solving experience through a guided, global robotics program, helping today's students and teachers build a better future together.

Our three divisions inspire youth to experiment and grow their critical thinking, coding, and design skills through hands-on STEM learning and robotics. From Discover (ages 4-6), to Explore (6-10), and then to Challenge (9-16), students will understand the basics of STEM and apply their skills in an exciting competition while building habits of learning, confidence, and teamwork skills along the way.

FIRST LEGO League is an international program for children created in a partnership between *FIRST* and the LEGO® Group in 1998. Each year, the program announces an annual Challenge to teams, which engages them in authentic scientific research and hands-on robotics design using LEGO products.

What is the LEGO Group's role?

The LEGO Group is the Founding Partner of *FIRST* LEGO League. Since its inception, the LEGO Group has supported the growth and success of the program by contributing each year to the development, management, and funding of customized Challenge Sets, Robot Sets, marketing communications resources, volunteers, and more. During the 2015-2016 season, LEGO® Education became a *FIRST*® Strategic Partner.

What is the role of FIRST?

FIRST is responsible to provide the overall vision and mission to inspire young people's interest and participation in science and technology. This vision guides all *FIRST* decisions and led to the development of the *FIRST* LEGO League program.

The *FIRST* LEGO League program includes developing the annual Challenge, the standards for the program and Championship Tournaments, and supporting program documents.

Is the FIRST LEGO League experience rooted in real-world issues?

Absolutely. Every year, as *FIRST* LEGO League designs the Challenge around the season theme, we look to the real-world practitioners and experts in the chosen subject area for guidance, input, and opinion, so that children are engaged in practical and realistic activities. Every *FIRST* LEGO League Challenge reflects an important real-world issue as a way to not only bring visibility to it among young children, but also as a way to show students how science and technology can contribute to solving problems. The themes are selected to engage students in STEM learning via a topic relevant to their real-life.

What do the students win?

FIRST LEGO League Challenge includes competitive tournaments where students are judged in three areas: Innovation Project; Robot Design; and Core Values. A judging committee of distinguished professionals makes award decisions. The highest honor, the Champion's Award, goes to the team that is strongest across all four performance categories. At some events, each child may receive a participation medal or other optional team recognition awards.

FIRST LEGO League Discover and Explore offer a non-competitive introduction into the world of science, technology, and innovation. Teams are not judged but are encouraged to present their research findings to family and friends or at a Festival event. Volunteers often organize festivals where each child may receive a participation medal or other optional team recognition awards.

What is the role of the *FIRST* LEGO League Program Delivery Partners?

FIRST LEGO League relies on volunteers to run the program at many levels, from managing a region to coaching an individual team. *FIRST* and LEGO Education partner with and manage organizations with similar missions to deliver the program in specified regions. *FIRST* LEGO League Program Delivery Partners roll out the program in their respective regions. These individuals fundraise, run Championship Tournaments, hold workshops and demonstrations, market the program locally, handle public relations, and recruit volunteers and teams.

What other sponsors are involved?

FIRST LEGO League is delivered annually through the support of global sponsors LEGO Education, the LEGO Foundation, and Rockwell Automation, Inc. Also, *FIRST* LEGO League Championship Tournaments are made possible by hundreds of local sponsors, as well as universities/colleges participating in the program.