

FRC Team 456 FAQ

FIRST Robotics Competition (FRC) Team 456 is comprised of high school students and adult mentors and parents that support the Science, Technology, Engineering, and Math (STEM) programs of FIRST and compete in the annual FIRST Robotics Competition. Below are frequently asked questions (FAQ) and answers related to FIRST, FRC, and FRC Team 456.

Q) **What is FIRST?**

A) FIRST stands for *For Inspiration and Recognition of Science and Technology*. FIRST is a non-profit organization that was founded in 1989 by inventor Dean Kamen to promote Science, Technology, Engineering, and Math (STEM) in America's youth. FIRST does this through a family of programs including FIRST Lego League (FLL Jr) for grades K-3 (ages 6-9), FIRST Lego League (FLL) for grades 4-8 (ages 9-14), FIRST Tech Challenge (FTC) for grades 7-12, and FIRST Robotics Competition (FRC) for grades 9-12. For more information on all things FIRST, including the JrFLL, FLL, FTC, and FRC programs, please visit: www.firstinspires.org.

Q) **What is FRC?**

A) FIRST Robotics Competition (FRC) is an annual engineering competition primarily for high school students. FRC challenges the students to design and build a robot, and then compete in high-intensity events that reward robot effectiveness, team strategy, collaboration, and determination. For more extensive information on FRC please visit: www.firstinspires.org/robotics/frc

Q) **How long has FRC been around?**

A) The first FRC competition was held in a high school gym in New Hampshire in 1992.

Q) **How big is FIRST and FRC?**

A) FIRST is an international organization with tens of thousands of teams worldwide and growing every year. FLL is the largest of the FIRST programs with more than 30,000 teams in more than 80 countries around the world. FRC is the oldest of the four FIRST programs and currently has approximately 4,000 teams from more than 20 countries. There are more than 150 FRC competitions held annually in the U.S. and abroad, including two International FIRST Championships.

Q) **How does FRC work?**

A) FRC combines the excitement of sport with science and technology to create a unique varsity "Sport for the Mind"™. FRC is designed to help high-school-aged students discover how interesting and rewarding the lives of engineers and scientists can be.

FRC teams are first given a technical challenge, or short game, that must be performed by a robot. The robot is designed and built during a six week period by the team of high-school-aged students working with a handful of mentors who are local engineers, scientists, and professionals. The students also write the programs to control the robot, and remotely control the robot during competition rounds. Teams are formed in the fall. Two championship events caps the season in the spring. Referees oversee the competitions. In addition to the robot competition, judges evaluate the teams for awards in design, technology, sportsmanship, and commitment to FIRST.



As an inventor, he holds more than 440 U.S. and foreign patents, many of them for innovative medical devices that have expanded the frontiers of health care worldwide. While still a college undergraduate, he invented the first wearable infusion pump, which rapidly gained acceptance from such diverse medical specialties as chemotherapy, neonatology, and endocrinology. In 1976, he founded his first medical device company, AutoSyringe, Inc., to manufacture and market the pumps. At age 30, he sold that company to Baxter Healthcare Corporation. By then, he had added a number of other infusion devices, including the first wearable insulin pump for diabetics.

Following the sale of AutoSyringe, Inc., he founded DEKA Research & Development Corporation to develop internally generated inventions as well as to provide research and development for major corporate clients.

Notable inventions include an advanced prosthetic arm in development for DARPA which should advance the quality of life for returning injured soldiers, the Hydroflex™ surgical irrigation pump for C.R. Bard, the Crown™ stent, an improvement to the original Palmaz---Schatz stent, for Johnson & Johnson, the iBOT™ mobility device, and the Segway® Human Transporter.

Kamen has received many awards for his efforts. Notably, Kamen was awarded the National Medal of Technology in 2000. Presented by President Clinton, this award was in recognition for inventions that have advanced medical care worldwide, and for innovative and imaginative leadership in awakening America to the excitement of science and technology. Kamen was also awarded the Lemelson-MIT Prize in 2002, and was inducted into the National Inventors Hall of Fame in May 2005. He is a Fellow of the American Institute for Medical & Biological Engineering, and has been a member of the National Academy of Engineering since 1997.

Q) Who is Woodie Flowers?

A) Dr. Woodie Flowers is the *FIRST* Executive Advisory Board Co-Chair & Distinguished Advisor. Dr. Woodie Flowers is the Pappalardo Professor Emeritus of Mechanical Engineering at the Massachusetts Institute of Technology and a Distinguished Partner at Olin College. Dr. Flowers serves as Distinguished Advisor to *FIRST* and participated in the design of the *FIRST* Robotics Competition game for many years.

Dr. Flowers helped create MIT's renowned course "Introduction to Design." Dean Kamen was inspired by Dr. Flowers' "Introduction to Design" course at MIT and worked with Dr. Flowers to create the *FIRST* Robotics Competition.

Dr. Flowers received national recognition in his role as host for the PBS television series *Scientific American Frontiers* from 1990 to 1993 and received a New England EMMY Award for a special PBS program on design. He is a member of the National Academy of Engineering and a Fellow of the American Association for the Advancement of Science and of the American Society of Mechanical Engineers. He recently received The Joel and Ruth Spria Outstanding Design Educator Award from ASME, a Public Service Medal from NASA, and a Doctor Honoris Causa from Andreas Bello University in Chile. He is a MacVicar Faculty Fellow at MIT for extraordinary contributions to undergraduate education. He was also the Inaugural Recipient of the Woodie Flowers Award by *FIRST*. Currently, Dr. Flowers is a director of three companies. He and his wife Margaret live in Weston, Massachusetts.



Q) What awards can a FRC team win at a competition?

A)

- Winner - Celebrates the Alliance that wins the competition.
- Finalist - Celebrates the Alliance that makes it to the final match of the competition.
- Chairman's Award - The most prestigious award at FIRST, it honors the team that best represents a model for other teams to emulate and best embodies the purpose and goals of FIRST.
- Creativity Award sponsored by Xerox - Celebrates creativity in design, use of component, or strategy of play.
- Engineering Inspiration Award - Celebrates outstanding success in advancing respect and appreciation for engineering within a team's school and community.
- Entrepreneurship Award sponsored by Kleiner Perkins Caufield & Byers - Celebrates the entrepreneurial spirit by recognizing a team that has developed the framework for a comprehensive business plan to scope, manage, and achieve team objectives.
- Excellence in Engineering Award sponsored by Delphi - Celebrates an elegant and advantageous machine feature.
- FIRST Dean's List Award - Celebrates outstanding student leaders whose passion for and effectiveness at attaining FIRST ideals is exemplary.
- Gracious Professionalism® Award sponsored by Johnson & Johnson - Celebrates the team that exemplifies the core values of FIRST in their relationships with other teams and by their demonstrated Gracious Professionalism®
- Highest Rookie Seed Award - Celebrates the highest---seeded rookie team at the conclusion of the qualifying rounds.
- Imagery Award in honor of Jack Kamen - In honor of Jack Kamen, Dean's father, for his dedication to art and illustration and his devotion to FIRST. This award celebrates attractiveness in engineering and outstanding visual aesthetic integration of machine and team appearance.
- Industrial Design Award sponsored by General Motors - Celebrates form and function in an efficiently designed machine that effectively addresses the game challenge.
- Industrial Safety Award sponsored by Underwriters Laboratories - Celebrates the team that progresses beyond safety fundamentals by using innovative ways to eliminate or protect against hazards.
- Innovation in Control Award sponsored by Rockwell Automation - Celebrates an innovative control system or application of control components electrical, mechanical, or software to provide unique machine functions.
- Judges' Award - During the course of the competition, the judging panel may decide a team's unique efforts, performance, or dynamics merit recognition.
- Quality Award sponsored by Motorola - Celebrates machine robustness in concept and fabrication.
- Rookie All---Star Award - Celebrates the rookie team exemplifying a young but strong partnership effort, as well as implementing the mission of FIRST to inspire students to learn more about science and technology.
- Rookie Inspiration Award - Celebrates a rookie team's outstanding success in advancing respect and appreciation for engineering and engineers, both within their school, as well as in their community.



“regional” competition they wish provided there is an open slot at the competition (and, of course, they can afford the travel costs and entry fee). There are “regional” competitions throughout the United States and the world (Canada, Mexico, Israel, Australia, China, etc.). “Regional” competitions are typically larger events (~50 to ~70 teams), held in larger venues, and are 3 day competitions. FRC Team 456 is not part of a “district” and competes in the “regional model” so we go to “regional competitions”, a.k.a. “regionals”.

Q) When is “off season” and what does FRC Team 456 do then?

A) “Off season” is the rest of the year outside of the “build and competition seasons”. “Off season” is May through December. FRC Team 456 remains active year round. During the “off season” we are conducting community demonstrations, fund raising, assisting with the GEMS (Gains in Engineering, Mathematics and Science) summer STEM camps at ERDC, mentoring and assisting local FLL Jr, FLL, and FTC teams, volunteering at and hosting FLL and FTC tournaments, conducting community outreach, and working on fun robotics projects at the shop for training. Just because “build season” and the official FIRST competitions are over doesn’t mean we are through competing either. There are lots of unofficial “off season” competitions hosted by teams around the country and we typically compete in 3 or 4 of those as well during the summer. FRC Team 456 typically meets a few times a week during “off season”.

Q) How long has FRC Team 456 been around?

A) FRC Team 456 was founded at Warren Central High School during the 1999-2000 school year. FRC Team 456 is one of the original and sustaining FRC teams in Mississippi.

Q) What is “Siege Robotics”?

A) “Siege Robotics” is our team nickname. It is equally accurate to refer to us as either “FRC Team 456” or “Siege Robotics”. They are one and the same. “FRC Team 456” was initially, and for many years, nicknamed “Viking Robotics” reflecting the original team foundation at Warren Central High School. When the team decided to include students from other schools in the Vicksburg area the team selected the new nickname of “Siege Robotics” in honor of the Siege of Vicksburg and to better reflect our local Vicksburg heritage and commonality that unites all in Vicksburg.

Q) What is the significance of the number “456”?

A) FIRST issues each competing team a team number much the same as racing teams have an assigned team number. “456” is our team’s permanently assigned team number. In general, the lower the team number the older the team.

Q) Who is eligible to be a member of FRC Team 456?

A) FRC Team 456 actively recruits and encourages any junior high or high school aged student to apply and join the team. This includes public, private, and home schooled students. Please visit our team website (www.Team456.org or www.SiegeRobotics.org) for more information and to apply online to join our team. Just click the link at the top of the main page titled “Read Application Instructions & Apply Online”.

Q) What do I need to know about “robotics” to join FRC Team 456?

A) Nothing! Really! We do not expect new students to have any prior robotics experience before joining FRC Team 456. FRC Team 456 is a diverse group of individuals (students and adults) with lots of

varying interests and backgrounds. If you have previous experience that you feel might be applicable by all means let us know but it is by no means a requirement.

Q) Is this “robotics” thing only about building a robot, or what can I do on a “robotics” team if I don’t want to use shop tools?

A) While we would like for all team members to gain hands-on experience with the robot, there are other areas that might be of interest, including awards preparation, being a team representative for meeting with sponsors and making a presentation at competitions, updating the team website, writing articles for the local newspaper, etc.

Q) How many members are there on FRC Team 456?

A) FRC Team 456 is comprised of both high school students and adult mentors who are professionals, scientists, and engineers. It varies somewhat from year to year, but typically there are around 30-35 students on FRC Team 456 at the beginning of “build season”. By the time “competition season” has concluded there are typically 20-25 students that travel to one or more competitions. During the “off season” somewhere between 10-15 students continue to come up to the “robotics shop” during the summer and when summer activities and vacations end the numbers gradually increase again through the fall. There are currently 6 adult team mentors active with the team year round, and additional parents that typically come to the meetings.

Q) Where does FRC Team 456 meet?

A) FRC Team 456 meets at the US Army Corps of Engineers (USACE), Engineering Research and Development Center (ERDC), Future Workforce Development (FWD) Center, located in building 1003. ERDC is located at 3909 Halls Ferry Road, Vicksburg, MS 39180.

Q) When does FRC Team 456 meet and how much time is required?

A) It depends on the time of year. During the January through April “build and competition season” FRC Team 456 meets daily at the ERDC STEM center. Weekdays starting about 5:30 PM – until, Saturdays usually 10:00 AM – until, and Sundays usually 1:00 PM – until. The remainder of the year (May – December) we call “off season” and usually continue to meet multiple times a week. We recognize that this is a lot of time. The adult team leadership believes that the more time and effort that is put into the team the better the team will be as a whole and the more the students will benefit from their experience on the team. In other words, the more time you put in, the more value you will get out. With that said, we (the adult team leadership) recognize that everyone has other responsibilities and commitments in their lives and must thus gauge for themselves how much time they can commit to FRC Team 456. FRC Team 456 does not require a “minimum hours” to be part of the team. Some students become very interested in FRC Team 456 and want to spend lots of time “at the shop”. Others may only stop by occasionally. The amount of time spent at the 456 robotics shop is entirely dependent on the individual and must be gauged by that individual and their parent(s). Do keep in mind there are costs involved in joining the team and so again, the more time you put in, the more value you will get out. We DO NOT expect ANY student to be at the robotics shop for all the meetings. We adopt more of a “we want to see you as much as possible so come when you can” sort of attitude. We may also be at the shop outside of the “normal” meeting times such as on weekends during the “off season” as the need arises.



Q) How much does it cost?

A) Competing in the FIRST Robotics Competition isn't cheap. There are costs in building the robot, competition entry fees, travel costs, team shirts, etc. FRC Team 456 typically spends about \$20,000 for robot construction (parts, materials, tools, prototyping, competition robot, spare parts, etc.) per season. Entry fees are on the order of \$5,000 per competition. Travel costs (hotel rooms, fuel, bus, etc.) are on the order of \$8,000 to \$15,000 per competition depending on the size of the team (number of hotel rooms, etc.) and the location of the events. Typically, FRC Team 456 spends about \$50,000 - \$65,000 per year. Much of the funding is obtained through fundraising and corporate grants and sponsorship. However, FRC Team 456 requires each student to pay an activity fee to join, currently **\$250**. In addition, students that travel to competitions will also be assessed a travel fee per trip to help offset the travel expenses. The "travel fee" is typically on the order of \$150 depending on the location of the travel. Students will also need to bring their own funds for meals and personal incidentals.

Q) Where does Team 456 compete?

A) FRC Team 456 competes in "regional" competitions typically in the south east United States. We consider the "Bayou Regional" in Kenner/New Orleans, LA, to be our "home" regional competition and always try to compete there. Typically, we try to compete at more than one regional competition if funding allows. In addition to our "home" regional in New Orleans ("Bayou Regional"), we have competed in FRC regional competitions in Huntsville, AL, Orlando, FL, Houston, TX, Dallas, TX, Knoxville, TN, Fayetteville, AR, Atlanta, GA, and even Denver, CO. We have competed as far away as Morgantown, WV during "off season" competitions.

Q) What do I do at competitions?

A) At competitions, students will typically be part of one or more team groups responsible for the maintenance of the robot (pit crew), programming needs, driving the robot during competitions, a human player during the competition, a scout of other teams, safety team, and other responsibilities. There will always be a mentor with the team. When we are at a competition, some FRC Team 456 adult mentors volunteer in official capacities to help run the events, including Lead Robot Inspector (LRI), Robot Inspectors (RI), Judges, and other duties as needed. We encourage 456 students to volunteer at FIRST events as well.

Q) What about my child's safety?

A) FRC Team 456's first priority is EVERYONE'S safety. The adult team mentors take safety very seriously and endeavor to instill safety as a core value among all members of FRC Team 456 whether they are a student, adult mentor, or parent. The adult team mentors of FRC Team 456 wish to assure all parents that all activities of FRC Team 456 are and will be as safe of an environment as we can make them. Due to the very nature of competitive robotics, it will be necessary for students to be exposed to and to individually use tools (both powered and non-powered) that have the very real potential for personal injury and even death if used improperly. Every member (student and adult) of FRC Team 456 undergoes extensive annual safety training regarding proper shop practices and tool operation (powered and non-powered) prior to "build season". While we acknowledge that no amount of instruction can mitigate all potential of injury we provide as safe of an environment as we possibly can. FRC Team 456 has been consistently awarded the Industrial Safety Award by Underwriters Laboratory at our competitions for the last 10 years in a row due to our consistent and extensive safety program. All team mentors have passed Youth Protection Program (YPP) background investigations conducted through FIRST and all mentors employed at ERDC have passed background investigations initiated by the



ERDC security office to include local checks by the Warren County Sheriff's Department and national federal background investigations.

Q) What about parent involvement?

A) We encourage parental involvement on FRC Team 456. It has been the general experience among the adult leadership of the team that the students whose parents are actively involved with the team tend to be more involved as well and thus get more out of the experience. There is, of course, the concept of "too many cooks in the kitchen". So, it is important for parents of new student team members to understand, and remember, that most of the adult mentors on FRC Team 456 have been involved in FRC for a long time, in some cases well over a decade. The adult mentors have a firm grasp of "how things work in FIRST and FRC" and often have a larger picture in mind based on historical knowledge and, well, leading high school students through the trials and tribulations of building robots and competing in robotics competitions. If you have particular experience that you feel could benefit the team as a whole please don't hesitate to let the team mentors know. We also understand that some students aren't comfortable with their parents "hanging out" at their activities. Be assured that the adult mentors encourage parents to drop by the robotics shop and at least check out what's going on from time to time and stay involved with the team and contribute where they can. Since we referenced "too many cooks in the kitchen", there is one tradition on FRC Team 456 that parents typically are involved in and for which the mentors and students are extremely grateful. That is food. During the "build and competition season" chaos we all spend quite a lot of time at the robotics shop. Literally thousands of man hours. We are often so engrossed in what we are working on we forget to take a break and eat. Teenagers (and adult mentors) get hungry! It has become a tradition on Saturday and/or Sunday evenings during the "build and competition season" for various parents to sign up to bring a meal and we all take a coordinated break and sit down and have a meal together and just take a break from the roboting for a little while. Typically meals are spaghetti, tacos, chili, jambalaya, or even sandwiches or anything that a teenager will eat. There is only so much pizza anyone can eat though even if you are in high school!

Q) How do I get Team 456 to conduct a robot demonstration at my school/event/etc.?

A) FRC Team 456 is always eager to conduct demonstrations within the community. We often do demos at schools, churches, museums, children's programs, community events like RiverFest or Play-A-Day, etc. Sometimes it doesn't work out due to scheduling conflicts and/or the fact that we prefer the students to be involved in demos and they are usually in school during the day, however, we will always make every effort to accommodate requests for community demonstrations if possible. Please contact the FRC Team 456 mentors at info@456Robotics.org for more information.

Q) I would like to help. How can I or my company sponsor the team? How do I get involved personally?

A) FRC Team 456 is always looking for assistance whether it is individual applicable mentor expertise, corporate sponsorships and partnerships, or other assistance, donations, or support. FRC Team 456 firmly believes in the "it takes a village" philosophy and welcome support from the local community and beyond. FRC Team 456, "Siege Robotics", is an outstanding organization worthy of your support and local students will benefit directly from any time, effort, and/or financial or other in-kind support you are willing to share. "456 Robotics" is a IRS 501(c)(3) non-profit specifically setup to assist FRC Team 456 ("Siege Robotics") in fundraising and grant opportunities for the team. Any donations to "456 Robotics" are tax deductible. Please contact info@456Robotics.org for more information.