

Mountaineer Area RoboticS (MARS) was formed to “achieve greater youth involvement in science and technology by building robots in a team environment, and through gracious professionalism, collaborative learning, and community service, spread FIRST.”

Morgantown, WV, MARS headquarters, is a city of 88,000 that is leading the state in a shift away from an extraction based economy to software development, biometrics, and energy and medical research. Morgantown is a great location for a FIRST team to tackle the many challenges faced by WV. The MARS program has established well-defined goals that are aligned with meeting the needs of our students and our state.

WV is mostly rural and lightly populated. Only 16% of students in 9th grade complete any higher education, compared to the national average of 32%. Thus, a key goal of MARS is to increase students' chances of completing higher education by inspiring success in school and removing barriers. One element of the MARS student contract requires students to maintain a high GPA; peer tutoring is provided to team members who are struggling to make these grades. The GPA requirement assures that students on the MARS team automatically qualify for the WV Promise Scholarship. Promise Scholarships, along with FIRST scholarships, have enabled every MARS graduate to go to college on a full tuition scholarship. 100% of our graduates are in college and are majoring in STEM disciplines.

Instilling the concept of gracious professionalism is another goal of MARS. Although we are proud of our competitive accomplishments (MARS won awards and made it to the finals at every regional event we have attended), we are even more excited that as we have matured as a team we are able to help other teams each year. In 2009, we established an Orbit Ball distribution service by purchasing orbit balls throughout WV and then sending them to teams across the country (as far away as Hawaii). We also have created a Search for Rookie Team Inspiration Packet which we send to rookie teams at the Regionals we attend. At our Regionals, we have dedicated software teams that spend most of the event assisting teams with code troubleshooting. Software development is a particular strength of our team and we make every effort to ensure that every team can compete. On the lighter side, our mascot poses for pictures with each team and the photos are mailed to each team along with our team information to create a network of local FRC teams.

Access to college and gracious professionalism are goals that impact existing FIRST participants. Our larger goal is to change the culture of our community and to inspire our entire state. We are achieving this goal through our public activities and outreach/education programs. Because we live a small city, parades are a major part of the life of our town. People from all over attend parades to show their support for local organizations. Local children love the candy-throwing MARS robot that gets decked out in holiday lights for the annual Christmas parade. Our community partner, West Virginia University (WVU) now calls upon our public relations mascot robot for publicity events. In a recent dual ground breaking ceremony for a new physics building and for a new basketball practice facility, it was the MARS robot that cut the ribbon and planted the first shovel (prompting men's basketball coach Bob Huggins to ask if the team could build him a robot that rebounded as well). The MARS mascot robot even walked dogs at a charity event for the local animal shelter. Wearing a MARS shirt is almost a guarantee that a stranger will comment on the team or ask a question. Recently, an elementary age boy came up to a MARS t-shirt clad team member and asked him if he was one of the people who drove the robots in the parades. When he replied that yes he was, the boy exclaimed that MARS was the coolest part of the parade and said he wanted to build stuff like that. That simple exchange demonstrates how making an effort to be visible in our community is having an impact.

Our vision for inspiring our state goes well beyond just being visible in community events. Our goal is to build a solid foundation for FIRST teams throughout WV. We know that to effect change at a

local level, all WV students should have access to FIRST programs. Locally, we have partnered with our school board and those in surrounding counties to establish a vigorous FLL program. Last year, we set the goal of establishing an FLL team in every local middle school in five years. Just a year later, we have succeeded in starting an FLL team in every school except the most rural one. Many of these middle schools have multiple teams (some as many as three). We actively mentor each coach and team through our bi-weekly Saturday Morning Mentor sessions during the FLL season. The sessions take place at a facility provided by the Board of Education (BOE) and give each team the opportunity to receive help from trained MARS students and mentors. The sessions conclude with the annual MARS Pre-State Tournament Scrimmage. The scrimmage provides important practice for the teams and enables the community and our sponsors to see FLL in action. This year, over 250 people attended the scrimmage and following the model established by FIRST, our sponsors were the judges. Our students also serve as referees, judges, and guides at the state FLL tournament.

As we work towards establishing a team in our most rural middle school, we have begun building FLL programs in neighboring counties. This year we established our first FLL team in Preston County and we mentored a 4H team with 10 kids from 5 different counties. The partnership with 4H is a central element in our plan to enable access to FIRST programs throughout WV. Because our state is so rural, a number of FRC teams over the years have folded because they were not able to maintain the necessary student numbers and support. Based on student population data, we have devised a plan that divides the 55 state counties into counties where we will try to establish an FRC team, counties that will only be able to support an FTC team, and counties where we will establish an FTC team that can mature into an FRC team. The first step in this plan is the creation of FLL teams in each county. FLL teams provide a base of robotics interested youth and mentors trained in FIRST. The 4H program already has infrastructure in every county, and county extension agents now have access to 4H funds to pay for team registration. Through another partner of ours, the NASA IV&V facility in Fairmont, WV, each new FLL team can obtain a LEGO Mindstorms kit. This partnership gives our program immediate access to key people in each county as well as the resources to move forward. Our next step is to establish 4H-based FLL teams in our five surrounding counties.

Continuing to build partnerships with regional organizations remains a major focus of our growing program. Our largest sponsor, WVU provides us with funding, building space, machine shops, and mentors. Another key partner is our local BOE. After developing a relationship with the BOE in our rookie year, we are now financially supported by the BOE, provided with a FLL practice facility, and school absences for FIRST events now receive the same approval as athletic events. This year, MARS students worked with the BOE to transport 60 FLL students and coaches to the Pittsburgh Regional. MARS students organized the busses and substitute teachers to eliminate barriers to student and teacher participation. The BOE provided the drivers and paid for the substitute teachers.

Our partnership with the BOE enables MARS to have a significant impact on local school curriculum. This year, the science curriculum in three area middle schools was modified to include the FLL research project. We are also working with one middle school to create an FLL robotics-based class. With one high school, we have helped to establish an engineering 101 class for which participating students receive college credit. MARS students also host summer robotics camps for local elementary school children. These students all receive free or reduced lunch and are thus an at-risk population for completion of high school.

It is worth noting that WV is not a rich state and barriers to education have many forms. A major focus of our business plan is to ensure that every team member can fully participate in FRC events, no matter what their socioeconomic status, race, gender, or educational history. Even as our team grows, MARS continues to pay for all student travel costs and we incorporate food drives for local food pantries

into all our major events. Each year we update our business plan to reflect our goals and expected financial needs. We have established our program as a 503C non-profit organization through an umbrella community foundation and our donations range from pieces of carpet for playing fields to cash from corporations. Parents provide all team meals during build season so that students don't have to buy their own meals. Our team is also diverse. We have 18 boys and 11 girls who represent a variety of cultures and races. Currently we have three generations of a single family involved as mentors, students, and as a student turned mentor.

Each year we look forward to tackling Dean's homework. Dean's 2010 Homework, getting fans to events, is especially exciting to us as it triggered the effort to bring many of our FLL students to Pittsburgh. We continue to work on Dean's 2009 Homework; creating an alumni database. Because our team has only a few graduates, we are working to include all WV FRC alumni, including those from defunct teams, in the FRC database.

We are proud of the impact that the MARS has had and will have. Our team motto, "we came to be inspired, we stayed because we were inspired, we will become the inspiration" defines the very essence of the MARS program. WE ARE MARS!

Chairman's Award Questions

Briefly describe the impact of the FIRST program on team participants with special emphasis on the 2009/2010 year and the preceding two years

100% of our graduating seniors since the start of the Mountaineer Area Robotics program have received full tuition scholarships to college, where 100% are pursuing degrees in STEM fields. One previous student member has already returned as a mentor for the 2010 season. Through our partnership with a local NASA facility, all of our students can now apply for paid summer internships in science and engineering fields.

Examples of role model characteristics for other teams to emulate

Our state is very rural and the fraction of students who obtain post-secondary education is half the national average. Thus, we have made a major focus of our program the elimination of barriers for students to participate in FIRST. Our business plan is designed to ensure that every team member can fully participate in FRC events. The FLL competitions we host also include food drives for local food pantries. Our growth plan is designed to bring FIRST in reach of every WV high school student.

Describe the impact of the FIRST program on your team and community with special emphasis on the 2009/2010 year and the preceding two years

Our programs have led to the formation of 14 local FLL teams (in a town of 88,000) and our local FLL scrimmage is attended by over 250 people. We now run summer robotics camps in collaboration with the local school system and have helped to introduce new engineering and robotics curriculum into high school and middle school classrooms. As a result of robot dog walking charity events and university building groundbreakings, MARS is now a household name throughout north-central WV.

Team's innovative methods to spread the FIRST message

By partnering with local high-tech business and research organization leaders, we have established ourselves as key player in local discussions of education and workforce development. For example, each year our congressman organizes the "Teaming to Win" conference, designed to encourage the shift from an extraction-based to an information-based economy in WV. This year, MARS youth and robots were a highlighted attraction for the event – attended by many small business leaders and employees.

Describe the strength of your partnership with special emphasis on this year and the preceding two years

Our existing strong partnerships with WVU and local schools have provided key resources to sustain our program. In 2009 we added two new partners – the NASA IV&V facility (a software validation center) and 4-H. The NASA partnership provides key mentoring in program development and outreach as well as resources for starting FLL teams. Through 4-H and their extension agents, we now can reach into each of the 55 WV counties to establish FLL programs as part of our statewide vision.

Team's communication methods and results

Although we have an active website, a presence on Facebook, and a busy email listserve during build season, our most effective intra-team communication process is our community mealtime on weekends. During team meals our sub-teams review their progress and the information exchange knits the team together in a way that email blasts can never do. We communicate to the outside world through radio, TV, and print media as well maintaining a very visible public presence at community events.

Other Matters of Interest to the FIRST judge, if any

In 2008, FIRST was not a part of Morgantown, now 2 years (3 FRC seasons) later, FIRST programs are an integral part of the school and the community landscape. Our team has grown from 12 students and 2 mentors to 29 students and 11 mentors. Our FLL program has grown from 1 team to 14. We have worked to spread FIRST throughout our area, we have solid plans to expand across our entire state, and with our partners we are proposing to host the 2011 FLL National Championships in WV.

TIMS Questions

Team History	Mountaineer Area RoboticS was formed in 2008 by 5 ex-FLL members. MARS won the Rookie All-Star award and was on the winning alliance at the Pittsburgh Regional in 2008. Since 2008, the team has grown to 29 students from 4 high schools in 3 counties.
Team Goals	To achieve greater youth involvement in science and technology by building robots in a team environment, and through gracious professionalism, collaborative learning, and community service, spread FIRST – “It’s not about the robot.”
Team's FIRST Impact	We have formed 14 FLL teams and our FLL scrimmage is attended by > 250 people. We run summer robotics camps in collaboration with the schools and have introduced engineering and robotics curriculum into high school and middle school classrooms.
Community Description	MARS is based in Morgantown, WV. Although centered on the local university, much our county is rural. The region is moving away from an extraction-based economy and FIRST programs are seen by the community as playing an important role in that change.
Team Strengths	Our existing strong partnerships with WVU and local schools have provided key resources to sustain our program. In 2009 we added a key educational partner, 4-H. Through 4-H and their extension agents, we now can reach into each of the 55 WV counties.
Most Significant Challenge Overcome	This year, our toughest challenge has been managing team growth in a year of tight finances. Fundraising has been significantly harder, while the team has grown by ~ 50% over last year. New sponsors have come on board and costs have been met.
Robot and Game Strategy	We started the build season with a 2-day long design goal meeting. Bump crossing, agility, ball control, and scoring from all 3 zones were deemed critical, while hanging at the end and tunnel clearance were desirable. Our robot meets all these goals.
Most Competitive for Which Awards	With our 4 county FRC program and 2 county FLL program, MARS will be competitive for Engineering Inspiration. We will again feature a unique and high performance control system on a well-engineered robot capable of completing all the game tasks.
Funding Sources	Support comes from the local university, private foundations, large corporations, the local school system, small business, and individuals. MARS has a dedicated fundraising team that works throughout the year to identify possible funding sources.
Public Awareness	MARS is routinely featured in the local print, radio, and TV media. Our most novel approaches to increasing public awareness this season were our robotic dog walking charity event and the robotic groundbreaking we performed for the local university.