



Why Participate in FIRST Robotics?

Sponsors, FIRST Staff, Mentors, and Students
Describe the Power of the Program

Compiled by Rich Kressly
FIRST Senior Mentor, Pennsylvania
kresslr@lmsd.org



Why Participate in FIRST Robotics? Sponsors, FIRST Staff, Mentors, and Students Describe the Power of the Program

Table of Contents

NASA and FIRST - Student Inspiration Through Practical Engineering Dave Lavery, NASA Program Executive for Solar System Exploration	1
Commander Commits his Career to FIRST Steven R. Chism, Senior Director of Programs at FIRST & Ret. Navy Commander	4
The True Meaning of “Mentor” Andy Baker, Sr. Mechanical Designer, Advanced Equipment Development, Delphi Corporation	6
A Teacher on the Educational Value of FIRST Rich Kressly, FIRST Senior Mentor & High School Teacher, Lower Merion HS	8
From FIRST to Mechanical Engineer and Back Again Natalie Diascro, Application Engineer, Allen-Sherman-Hoff Co.	10
Lessons Learned in FIRST are Life-Long Lessons John Vielkind-Neun, Student, Clarkson University	11
FIRST Prepares Students for the Future Patrick Bogard, Student, Johns Hopkins University	13
Growing Through FIRST D.J. Fluck, Student, Purdue University Kokomo	14
FIRST Provides Rare and Meaningful Opportunities Allison Guerin, Student, Ursinus College & 2003 Allarie Medalist	15



NASA and FIRST - Student Inspiration Through Practical Engineering

Prepared by Dave Lavery, NASA Program Executive for Solar System Exploration

What is FIRST?

FIRST (For Inspiration and Recognition of Science and Technology) is a 501(c)(3) non-profit organization which is dedicated to increasing interest in science, technology and mathematics among the youth of the United States. In part, this is accomplished by conducted a series of activities and events which provide experiences with, and exposure to, applications of engineering and science. These activities include an annual robot competition for high school youth, a table top robotics program for middle school youth, and a teacher development program. The FIRST Competition is a national contest in which high school students team with engineers from government, industry and universities to get a hands-on, realistic exposure to the engineering and technical professions. The partnerships developed between schools, government, businesses, and universities provide an exchange of resources and talent, build cooperation, and expose students to new career choices. Working very closely with the engineers, high school students experience the connections between the math and science they have been studying and the practice of engineering. The program inspires students to learn more about science, math, and technology and to develop an enthusiasm for further studies in engineering, the sciences, and design.

The FIRST Robotics Competition is the major activity of the program. During the fall of each year high schools, corporations, government organizations, and/or universities get together to form teams composed of high school students and professional engineers, scientists, and technologists. Frequently parents, teachers, and university students also participate in the teams. Total team size may be anywhere from 10-70 participants; a typical team may consist of 35 students and five engineers. Early in January the teams attend a kick-off meeting during which the challenge for the competition is unveiled (the challenge is different each year), and the teams are provided with a standard kit of parts and materials from which they must assemble a robot to solve the challenge. The kits contain a variety of pieces, from raw materials such as steel plate, aluminum stock, polycarbonate sheets, and wood, to more advanced components such as automobile seat motors, portable drill motors, microswitches, rate gyros, and joysticks, to a single-board computer that the team programs with their custom control system. The teams then have 6-1/2 weeks to construct their robot and ship it to the competition. During this very brief period, the team must complete a full engineering product life-cycle including requirements analysis, brainstorming, concept development, detailed design, fabrication, assembly, software development, integration, documentation, testing, debugging, operator training, and shipping the final product to the competition. The goal isn't simply to build a robot; the robot is a vehicle for learning much more. The real goal is building a collaborative team, a supportive community and a solid strategy for problem solving during the competition.

The competition itself is structured like a professional athletic event, with the annual challenge structured so that the teams compete against each other on a shared play field as they attempt to complete the assigned task. Depending upon the particulars of the annual challenge, three or four teams compete in two-minute rounds as they attempt to complete the task while simultaneously preventing the opposing teams from completing the same activity. Thus, the



challenge involves developing both offensive and defensive capabilities. The robots also must be robustly constructed, as there is frequently rough contact between the machines as they compete over the challenge objectives. This is a significant design driver, as the robots can be over eight feet tall and weigh up to 130 pounds.

Based in Manchester, NH, FIRST was founded by entrepreneur Dean Kamen, who is also the founder and CEO of Deka, Inc., a bio-medical engineering products company, and the inventor of the Segway personal transporter. More information about FIRST can be found on their web page at <http://www.usfirst.org/>

What is NASA’s involvement in FIRST?

NASA has been a growing participant in the FIRST program since 1995. Starting with one team that year, NASA is now sponsoring nearly 200 of the 950 teams participating in the 2004 competition. In terms of the number of teams and students sponsored, NASA is the largest single organization participating in the program by a factor of 10. Other organizations, such as Motorola, General Motors, Ford, and Johnson & Johnson, also play significant roles in the program. However a major component of their involvement is typically in the form of direct cash and in-kind product contributions to FIRST, and they may sponsor five to ten teams.

In addition to NASA’s financial support for the sponsored teams, there is a very considerable time investment and commitment on the part of the NASA engineers that work with the sponsored teams. Each team is organized differently, but in general the engineers working with the teams are volunteering their personal time in the evenings and on weekends to work with the students in the design and construction of the robots for the competition. Frequently, this can add up to over 250 hours of volunteered time over the course of competition, during which they are able to share their expertise, knowledge, insights and experiences with the students.

The competition schedule culminates with the FIRST National Championship, held in April. A series of regional competitions are conducted across the country leading up to the National Championship. Beginning in 1998, NASA has sponsored several of the regional competition events as part of our overall strategy to make the program accessible to broader population of students. The regional competitions are smaller events, usually involving 40-70 teams, vs. the 300 teams that participate in the national competition. This year (2005) there are 27 regional competitions being held around the country in March and April.

NASA’s Robotics Outreach Program, including FIRST Participation:

<u>Year</u>	<u>Teams</u>	<u>Regionals</u>	<u>Funding</u>
1995	1	0	\$70,000
1996	2	0	\$100,000
1997	11	0	\$310,000
1998	18	1	\$310,000
1999	31	2	\$575,000
2000	91	4	\$1,100,000
2001	131	4	\$2,000,000
2002	193	7	\$3,000,000
2003	207	7	\$3,000,000
2004	186	6	\$3,000,000



Funding for the NASA-FIRST collaboration is provided by the Space Science Enterprise, as part of their technology outreach effort. NASA and FIRST signed a Memorandum of Agreement in 1999 to cooperatively expand the availability of technology education and inspiration programs to students throughout the country.

Why is NASA participating in FIRST?

Science and technology education and outreach is one of the agency's primary missions (as directed in the National Aeronautics and Space Act of 1958, and detailed in the NASA Strategic Plan and NASA Space Science Enterprise Strategic Plan). Thus, the agency charter supports participation in programs such as FIRST that promote science and technology education.

But at an even more fundamental level, we believe that supporting programs such as FIRST is critical to the survival of the agency. We have used the following statement to address the question of "why should NASA, universities and companies be interested in FIRST?"

"NASA plans to build and fly nearly a dozen planetary exploration missions over the next decade which feature robotic explorers. We know that our demand for expert roboticists to help us design, build and operate these explorers will outstrip the supply currently emerging from academia. We just don't have the experts we need to build all these future systems. It is in our best interest to increase the future supply of robotics engineers by increasing awareness and interest in robotics and engineering technology at the high school level, in the anticipation that enough of them remain in these technical disciplines through graduate school that they can help us develop the "grandchildren" of the Mars Pathfinder Sojourner rover. If NASA is able to support 1000 high school students per year through programs that increase their interest in science and technology, and just 5% of them continue all the way through graduate school in a robotics-related discipline, which is still 50 new robotics experts each year that will become available to help the space program.

"And the important thing is that every company that manufactures a product, every company that sells or resells something manufactured in this country, every assembly plant, retailer, VAR, repair shop, and production facility in the country is going to have exactly the same concern within the next ten years. They may not know it yet, but they are going to run into the same shortage that we have already recognized. As manufacturing, production and assembly operations become more automated, even more expert roboticists and engineers will be needed to design, implement and maintain those systems. So, like NASA, it is in the best interest of all these companies to support programs which inspire young students to enter technical fields."

Dave Lavery
NASA Program Executive for Solar System Exploration
Manager, NASA Robotics Outreach Project
dlavery@hq.nasa.gov

FIRST Programs



To a potential FIRST supporter,

My name is Steven R. Chism and I am currently the Senior Director of Programs at FIRST, a not for profit organization founded by Dean Kamen and based in Manchester, NH. This letter is in response to a request from Mr. Rich Kressly, on behalf of anyone desiring to start or bolster a FIRST team, to outline my experience and transition as a Commander in the US Navy to FIRST Management, the importance of the program, the need to ensure science and technology in the future of US youth, and the long term payoff in providing engineering time and resources.

I retired from the US Navy as a Commander on December 1, 2003, while stationed at the Naval Research Laboratory (NRL) in Washington, D. C., and after twenty-three and a half years of service. I am a registered professional engineer in the state of Florida in mechanical engineering. I have received a Bachelors degree in Electrical Engineering from the University of Southern California, a Masters Degree in Mechanical Engineering from the Navy's Postgraduate School and from Johns Hopkins University and a Degree of Mechanical Engineer from the Navy's Postgraduate School. I am currently enrolled in a doctorate program in mechanical engineering from Johns Hopkins University.

Previous to my last tour at NRL, I was stationed at the Naval Sea Systems Command (NAVSEA) at the Washington Navy Yard, Washington, D. C. There I was assigned to SEA 92, the Submarine Directorate at NAVSEA. The tour before my NAVSEA tour I was stationed at the US Naval Academy (USNA) as the Associate Chairman for the Naval Architecture, Marine and Ocean Engineering (NAOME) Department of the Weapons Science and Engineering Division. My tour at USNA was from August 1996 to August 1998. It is in 1997 that I became heavily involved in the FIRST Robotics Competition (FRC) program when Professor Miner, in the Mechanical Engineering Department at USNA, and I started Team 165. Team 165 used mechanical and electrical engineering midshipman to mentor the high school students from local private and public high schools. This team is still an active team in the FRC program. The next year after starting Team 165 I started judging for the FRC program. The judges serve as role models to the students in areas of science and technology. These role models are usually people that have accomplished great things in their career fields and usually represent the sponsors of the FRC events. I soon became a judge advisor, basically the person that leads and facilitates the judges in determining what teams will receive the awards that FIRST give out at each FRC event. Not satisfied with the involvement and time I volunteered to the FRC program, I put together a fantastic planning committee while stationed at NRL and we were able to establish an outstanding FRC Regional Event at USNA named the Chesapeake Regional. Hopefully, from this short history you can get a sense of how strongly I believe in the FRC program and the impact it can have in changing the lives of the students who dare to undertake this program. It was as the Chairman of the Chesapeake Regional Planning Committee that I was asked by FIRST Management to consider filling the open and new position of Senior Director of Programs at FIRST.

FIRST Programs



Aside from my own personal belief in and commitment to the FRC program, I see a huge benefit to the military services and support organizations in trying to inspire the US youth to aspire to careers in science and technology. While at NAVSEA, I tried to get more involvement from the command to support financially and with engineers and scientists as mentors. I had minimal success in getting either from NAVSEA. At NRL, I was able to get involvement of engineers and the commanding officer to be judges at the Chesapeake Regional. The only other service that has embraced the FRC program is the Coast Guard through involvement of the US Coast Guard Academy. With the reported decline in students graduating in the engineering and scientific fields by US students and the increased number of engineers graduating in countries like India and China, programs like the FRC program are crucial in getting the US students to fill the many technical jobs that go unfilled every year because of the lack of qualified candidates.

The FRC program is an intense program and can be a life changing experience for those students who choose to undertake this program. A kit of various parts, such as motors, pneumatics, sensors, and control systems, are given to every registered team at the beginning of January of every year after the new game is unveiled for that year. The teams then have six weeks to design, build, and test a robot that will compete at various events that teams have registered to attend against other teams doing the same thing. The game is designed new every year to level the playing field for new as well as veteran teams and has numerous engineering tasks sequenced to play a game. The mission of FIRST is to design accessible, innovative programs to build self-confidence; knowledge and life skills while motivating young people to pursue opportunities in science, technology and engineering.

The mentors and financial support of teams and FRC events are crucial to the success of FIRST programs. So, if you are in a position to provide mentors or financial support, then please highly consider supporting the FRC program. Consider this especially if you feel that inspiring the US youth to pursue careers in science and technology is vital to the future of the US and its security and economic well being. If you want further information or have questions, I would be happy to speak with you or get you the right person within the FIRST organization to speak with you. You can contact me by calling 800-871-8326 x428 or emailing me at src@usfirst.org.

Very Respectfully,

Steven R. Chism, PE

November 21, 2004

To all prospective FIRST participants,

My name is Andy Baker, and I have been a fan of FIRST since 1992 and a mentor since 1998. I would like to take the time and tell you why I enjoy FIRST, and why more individuals and companies should be involved.

I am fortunate to work for a company who strongly supports FIRST Robotics. Delphi is a founding sponsor of FIRST and has sponsored the team I am on for the past 13 years. I am one of many engineering mentors who have helped make what our team is, impacted hundreds of students, and have been a representative for Delphi in our local and FIRST community.

Oddly enough, I hired in at Delphi within one week from our team's initial involvement in FIRST. It was 1992, and I was fresh out of college with a mechanical engineering degree. I happened to share a cubicle with our team's lead designer of our FIRST robot that year, but it took me 6 more years to get involved with the team as a mentor. During those 6 years, I spent much time on activities that were only self-supporting. I continued playing sports, as I did in high school and college, as I am very competitive by nature. As I got older, married, and "settled down", I got involved in activities which I helped others and made an impact on kids' lives. To me, this was a thrill. I realized that I could make a difference to someone else and make their life better.

In 1998, the Delphi-sponsored FIRST team needed more engineering mentors. I decided to join, but mainly for the reason that I wanted to compete with other teams. I wanted to be a part of a winning team and beat other FIRST teams sponsored by expert designers from famous organizations. This was my hook. I took the bait and got very involved. After a successful year of competing, I realized that I was just a part of something great. I realized that while I was getting personal thrill out of competing, I was making a bigger impact on helping students realize what they want to do with their lives. These kids looked up to me, and it felt good. This surprised me. Being a role model, I did not expect that.

As I spend time as a FIRST mentor, my wife and I also are growing our family. In 2001, we agreed that my time in FIRST was done and I needed to focus solely on being a husband and father. So, seeing my involvement as a "last hurrah", I volunteered to help at FIRST events. A friend needed my help out at a new regional in Los Angeles, and I agreed to go. My wife went with me, as a "get-away" trip for her. She was able to visit friends as I "played" at the competition. On the last day of the event, she was there to see something special happen. Toward the end of the event, a student came up to me and asked me for an autograph. I was stunned, as it was the first time this had happened. My wife happened to be right next to me at the same time. She was impressed that some kid, 2000 miles away from our house, asked me for an autograph. It made an impact on how we thought of my involvement in FIRST. On the plane ride back, we were both quiet. About half way home,

she looked to me and said, "You can't quit this, you are doing great things." I agreed, and told her that I would give up any other extra-curricular thing so I can stay in FIRST.

My golf clubs collect dust and my softball mitt sits on the shelf unused, and I have no regrets. I am making a difference, and having a great time doing it. I thank Delphi for letting me be involved in such a great thing as FIRST.

Sincerely,

Andy Baker
Sr. Mechanical Designer
Advanced Equipment Development
Delphi Corporation
Lead Engineer, TechnoKats Robotics Team
2003 Championship Woodie Flowers Award Winner
andrew.r.baker@delphi.com

November 20, 2004

To those interested in FIRST involvement,

The 2001 Philadelphia Regional was the first FIRST event I ever attended. The most unusual thing about my story is that, in FIRST, the improbable has become commonplace for thousands of students and adults worldwide. Almost everyone I meet in FIRST talks about a life-changing experience and a culture that is producing incredible experiences for students that are prepared to lead us to a stronger and more socially responsible future. With that, here's the story of one teacher.

I had just finished coaching basketball for the year and my wife was so glad I was going to be home more (oops). As an English teacher, I helped the students on Team 103 edit a few newsletters during the year at the request of team leader Cathy Beck. I had also seen the team robot one time at a faculty presentation, but that was my whole exposure to FIRST until Cathy and her husband Dave asked me if I wanted to attend a competition. I said, "Sure." Heck it was a day off of school.

After an early morning bus ride I sat down with the group at the Drexel University field house and asked Dave and Cathy what I could do. They told me to just enjoy my day. That lasted maybe twenty minutes. I walked around the pits and sensed the energy in the place. Then the first match started and, as a coach and educator, I became instantly energized.

I noticed alliance strategy sessions taking place before matches and I saw 103 really had little scouting/strategy going on. The coaching instincts kicked in and I asked Dave, "Do you mind...". He proceeded to give me two team members and said, "Go for it." With some blank paper and a vague idea of the game we developed a scouting/strategy system on the fly. As luck would have it, 103 had an awesome day and I got swept up in the excitement. Seeing the teams cooperate the way they did totally blew me away. As a coach I was much more used to opponents being enemies. Saturday I couldn't go back with the team, but followed match scores over the web (just 24 hours earlier I had no clue what FIRST was), and lo and behold 103 was a member of the winning alliance.

Needless to say I was more than interested, but Monday morning in the school hallway Dave came walking towards me with a gold medal, "Here, we really appreciate what you did for us."

I replied, "I can't take that. I was only with you for one day."

Dave insisted, "We talked about it and the kids want you to have it."

That was it. I was done. I was in Florida two weeks later leading scouting operations at the Championship. Upon my return I scheduled an appointment with the principal to ask him how he felt about me resigning as a basketball coach to be a full time member of Team 103. Almost four

years, another teaching job at a new school, a new team in the works, and an appointment as a senior mentor later, my wife is still waiting for me to come home.

If you are considering FIRST participation, please visit a FIRST competition, talk to the students, mentors, and judges, and research www.usfirst.org . This is a unique opportunity to better the future and help the next generation toward more ethical and noble behavior than we have witnessed in recent decades. Within three months of my first exposure, I resigned as a coach to become a FIRST mentor full time. This type of profound personal impact is not unique, as it has happened to students and adults across the country and overseas. As we continually look for ways to prepare students for the challenges of the 21st Century, one needs to look no further than FIRST.

Enthusiastically,

Rich Kressly
FIRST Senior Mentor & HS Teacher,
Lower Merion High School
kresslr@lmsd.org

From FIRST to Mechanical Engineer and Back Again

Submitted by Natalie Diascro, November 2004

In the fall of 1997, the science department at Lansdale Catholic High School decided to try US FIRST Robotics as part of the curriculum. It was offered as an alternative to the school's science fair requirement. At that time, my experience with robotics involved watching them from inside a ride at Disney World. I signed up more for the reason of skipping the monotony of growing plants or building volcanoes rather than the excitement of building a robot. And it never hurt to have another extra-curricular activity on a college application. It started out slow; we had a few meetings and watched videos of previous competitions, but were told that we wouldn't start building until January.

Then on a Sunday morning in January we arrived at school to see what we had ourselves involved in. We were given numerous boxes of parts and told our task for that year was to put balls into a trough, and the entire project was to be completed in six weeks. How did they expect us to design and build a robot to do that in only six weeks when most of us had no idea what we were doing? We were lucky enough to have a handful of volunteers, parents, teachers, and professionals, with the knowledge and patience to work with us. These mentors taught us the basics of mechanics, wiring, and programming we needed to successfully build our robot. They inspired us to try new things and test our abilities. We worked after school and on weekends up until the very last second. Instead of gossip at the lunch table, we started making quick design sketches on our notebooks and debated game strategies. And for those who weren't technically driven, the program includes marketing, time management, team work and other business principles.

After only six weeks, we had come together and built what we thought wasn't possible months before. The 'Cyber Crusader' was mostly PVC and not very sturdy, but it did the job. In March we went to our first competition and placed no higher than 48th out of 52 teams. I remember being so proud of 48th because we the students had designed, built and competed our robot. We took what we learned, and used it to prepare for the next year. By my senior year in 2000, we fought our way into the top ten at Drexel University's Philadelphia Regional Competition.

After three years of doing FIRST, all we wanted to do was build robots. It became a passion that you can only gain from first hand experience. It was no surprise to our teachers that most of my friends and I applied to college as engineering majors, inspired by our mentors from FIRST. After having successfully graduated from Villanova with a Mechanical Engineering degree, I again build robots in my spare time with the students at Lansdale Catholic. Their program now hits the ground running in September with smaller projects and events for the students until the official competition starts in January. We have motivated not only other area high schools to become involved, but also grade school students for whom we sponsor a Junior Robotics LEGO League in our area. A program like FIRST Robotics brings the community together. From the business sponsors, to the adult mentors, it gives the students the opportunity to see there is more to engineering than nuts and bolts.

Natalie Diascro
Application Engineer,
Allen-Sherman-Hoff Co.
nmdiascro@a-s-h.com

Lessons Learned in FIRST are Life-Long Lessons

Prepared by John Vielkind-Neun, November 2004

Dear Potential FIRST Supporter,

Through my experiences in the FIRST robotics competition, I have not only developed a love for problem solving and engineering, but also learned teamwork and leadership skills which will serve me for the rest of my life.

As a high school participant in this program, I got the unique opportunity to work with engineers from General Electric Power Systems in (what amounts to be) a real life engineering challenge. By working with these professional engineers, I gained a multitude of new skills in the fields of design, manufacturing, and project management. All of these are a huge part of the FIRST challenge, and mastery of these skills is a necessity for success. Also important was development of team work, leadership, and communication skills. These have, and will continue to serve me well as I finish up my education and begin work as a Mechanical Engineer. The best part of this experience, however, was not the skills I acquired, but the friendships I developed. Many of the engineers I was working with not only became my mentors, but my role models and even my friends. Having someone show me how much fun engineering is, and that it can be cool to use your brain definitely impacted my life. Having a strong role model engineer started me down the path I am still on today.

When the time came to decide on a college, I chose to major in Mechanical Engineering at Clarkson University (in upstate New York). One of the deciding factors in this decision was a generous scholarship that Clarkson offers for high school participation in FIRST. (Now, there are over \$5 million available in scholarships for FIRST high school kids.) Once I was at Clarkson, I found the skills and experience gained through FIRST helped me out exponentially. The knowledge of real-world engineering, and its applications helped me through many of my classes. Clarkson also has a FIRST Robotics team. Now, I became the engineer, mentor, and role model for a whole new group of high school students.

The chance to mentor students in this program is one of the most rewarding experiences of my life. It is an incredible opportunity to be able to give back to the program that has given me so much, and to be able to pass on the things I have learned, and the advice that was given me. It is truly a remarkable thing; as a college student majoring in Mechanical Engineering, I can be a role model (and even a hero) for young students to look up to. This opportunity also brought with it incredible responsibility. Certainly, this entire experience caused me to grow as a person; though it was challenging, it was also rewarding. Designing a FIRST robot and participating in a design competition with other engineers from across the country is incredibly FUN! Meeting other engineers from across the country and sharing our experiences by “talking robots” is truly one of the best parts of the program. FIRST is a giant networking opportunity, as well as a support group. The engineers from other teams I’ve met are some of my best friends today. We keep in touch year round, even if we see each other only once or twice a year.

Lessons Learned in FIRST are Life-Long Lessons

Prepared by John Vielkind-Neun, November 2004

This past year, when I was searching for a summer engineering internship I saw another impact of FIRST which I hadn't realized before. The economy was lagging, and not many companies were hiring interns. However, I still managed to get 4 offers for the summer. The same skills I had been learning throughout this program were apparently what potential employers wanted from an engineer. I am confident that my involvement in this program as a student participant, and as a mentor made me into a better engineer. I am grateful for the opportunities I have been presented with, and enthusiastic about providing these same opportunities to others. I have recently accepted a job from one of FIRST's official suppliers, and will begin working there when I graduate next May. I hope to continue to support this program, and hope to some day give back as much as it has given me.

Sincerely,

John Vielkind-Neun
Clarkson University
Mechanical Engineering Student
john.vneun@gmail.com

FIRST Prepares Students for the Future

Submitted by Patrick Bogard, November, 2004

My first recollections of the FIRST robotics program are not of me being a first year member of the team. Rather they are from 1997 when I was in middle school, and our high school's robotics team brought the robot to one of my classes to show us what they had built. At that moment my life was changed forever. Although I could never foresee the impact FIRST would have on my life, I knew that I wanted to be a part of that robotics team when I got older.

I entered Palisades High school in 1998 as a freshman, and the first thing I did was join the FIRST team, arguably the best decision I made at that point in my life. I didn't exactly know what joining would entail, but I was intrigued when our advisor told us, "You'll be asked to do unreasonable things and to push yourself farther than you ever have."

Currently I am a junior Public Health Studies major at the Johns Hopkins University in Baltimore, MD. I also work in an infectious bacteria lab at the Johns Hopkins Bloomberg School of Public Health, studying the Type III secretion system of the bacteria *Yersinia Enterocolitica*. I plan on pursuing my PhD, in a biology related field, and hopefully become a professor/researcher after I complete my schoolwork.

I believe that if it wasn't for my involvement in FIRST, I would not be where I am today. FIRST allowed me to become a leader and allowed me to learn how to deal with many different types of people. The robotics program taught me how to manage my time, brainstorm, think outside of the box, and how to deal with the unexpected problems that always arise in a project. By participating in FIRST I was able to meet students from all corners of the country, a chance I would have never had in most other after school activities. Not only did I meet students, but I met people who make a difference in this world, be it Dean Kamen, Dr. Woodie Flowers, Gov. Jeb Bush, Paul Allaire, Dr. Bart Kamen, or any of the other various CEO's, business and political leaders who judge the competitions. Most importantly I would never have been able to become so close with the mentors and engineers of my team.

The team was my second family, and they are still here today. I know that no matter what the circumstances are, the relationships I made will always be there. FIRST allowed me to see what opportunities are out there for the future, to work hand in hand with an engineer, and be treated like their peer is an amazing feeling. These are people we look up to, and they are here helping us accomplish a task and at the same time teaching us so much.

Even though I chose a scientific field of study, I feel that FIRST prepares students for all types of futures. It does not matter if you plan on building robots for your life, because FIRST is not about the end product, it is about the process. That is what makes this program special, otherwise it would just be another competition. FIRST is more than just robots, it is a way of living life, a way of interacting with people, a way of expanding your horizons, and most importantly it is a way to have fun while creating a better future.

If you have an opportunity to be involved in FIRST, please consider being a part of this incredible program. Whether you're a student, a teacher, an engineer, a tradesperson, a potential sponsor, or a parent the rewards that are found in FIRST are unmatched elsewhere.

Sincerely,

Patrick Bogard
Student, Johns Hopkins University
pbogard1@jhu.edu

Growing Through FIRST

Submitted by D.J. Fluck, November 2004

My name is D.J. Fluck and I am currently a college student at Purdue University's Kokomo Regional Campus (soon transferring to main campus) majoring in Electrical Engineering Technology and I got involved in the FIRST Robotics Competition back in 2000, when I joined the Kokomo High School Technokats Robotics Team (#45) from Kokomo, Indiana. I was a young freshman that had no direction or any idea on a career goal for my future. My father wanted me to join the team because it would “look good on my college application” and this was around the time when the Technokats started getting local recognition for their success in the FIRST Robotics Competition.

Along the way I met some interesting people. Andy Baker, an engineer at Delphi Corporation (and also the main sponsor of the team) was the engineering leader all throughout my four years with the team. His leadership and excitement for the program helped fuel the team and especially myself over my years in high school.

When I first joined, I learned about all the different ways I could help the team, such as joining the robot design team or the competition team. I joined the robot design team on the electrical systems side. While I could have joined the mechanical design team, I felt that I was more interested in the electronics part of the robot. Also I joined the competition team and tried out to drive or operate the robot. The competition team is much more than operating and driving, match strategy, scouting (a very important part), and overall observation during matches of your drivers helped make the team better. Ask your team leaders and other experienced members for advice and other opportunities with your team.

As time progressed and I got more experienced and interested in the program and engineering, I eventually earned my way up to being electrical leader my junior and senior year. Also as I worked my way up the ladder I eventually became one of the leaders and go to people on my team. It was a great honor and it also taught me a lot about leadership and responsibility. Eventually my high school time ended and it was time to move onto college. Only four short years ago I had no idea what I wanted to do, but I knew exactly what I wanted to do and that was a career in electronics.

None of this would have been possible without FIRST, Delphi and their extremely generous partnership/sponsorship with Kokomo High School and everyday teachers and engineers like Andy Baker, Tim Railey, Chris Byam, Mark Koors, Steve Butler, and many others not just in Kokomo, but all across the United States and Canada.

Without the FIRST program and the sponsorship from Delphi Corporation, I probably would have never become interested in considering a field of engineering or engineering technology and I probably would have ended up going straight into college with an undecided major. FIRST requires a lot of commitment, but the benefits and rewards that it can lead to are definitely well worth it and could very possibly shape your future. I know for a fact that it shaped mine.

Sincerely,

D.J. Fluck
Student, Purdue Univ. Kokomo
djfluck@insightbb.com

FIRST Provides Rare and Meaningful Opportunities

Submitted by Allison Guerin, November, 2004

As I sit here, now a sophomore in college, remembering back to high school, I know that I would not be where I am today without the influence of my robotics team and FIRST. When I decided to join the Cybersonics Technology Team in tenth grade, I was hoping to learn something new and make some good friends. However, after three years, I realized that I got so much more out of my experience than I had ever bargained for.

As vice-president, treasurer, head of our communications department and scouting department, as well as editor of our monthly newsletter, I learned so much about the importance of being able to work with others as well as how to function in a corporate atmosphere. I was able to refine my public speaking skills by giving numerous presentations to potential corporate sponsors, community members, as well as other professionals in their respective fields at the regionally and nationally held robotics competitions. I learned many vital interpersonal skills such how to deal with problems between team members and how to work under strict time constraints, since we only had six weeks to create our award entries. I was also able to gain skills in desktop publishing and techniques to publicize and market an organization. I even had the chance to work with professionals from BAE Systems in Lansdale, Pennsylvania in this area. Then, when it came to the scouting end of our operations at the robotics competitions, I was given the opportunity to meet students, teachers, mentors, and professionals from all over the world. Walking around a robotics competition, I always thought how amazing it was that so many people were able to gather with the same interests and share the knowledge they have with others in a competitive, but also very cooperative environment.

Even though I learned so much through FIRST, I know that none of it would have ever been possible without the participation of mentors, teachers, sponsors, and other professionals. On our team, we had almost ten mentors who would come and help us each night build our robot, create our animation, or whatever aspect of our operation they wanted to be a part of. These mentors were engineers, scientists, and other professionals who took time out of their lives to help students. They were there as a support and offered help whenever anyone needed it, while bringing so much knowledge and experiences for members of our team to learn from. Through FIRST I had the opportunity to visit many professional businesses such as Amplifier Research in Souderton and BAE Systems in Lansdale, Pennsylvania and talk with professionals within these companies.

Currently, I am attending Ursinus College in Collegeville, Pennsylvania pursuing a bachelor's degree in Business and Economics as well as my teaching certification in the same area. Under normal circumstances I would never have been able to attend a school such as Ursinus because of my family's limited income. However, my experiences in FIRST and the skills my experiences brought me helped me to win the Steinbright Scholarship, a full tuition scholarship offered through the college as well as the Allaire Medal. In order to win the Steinbright Scholarship, Ursinus not only looked at my academic record, but they also required a thirty-minute interview with the dean and various faculty. I know that all of my experience talking with professionals and giving presentations through FIRST as well as the rare experiences I was able to share with the Ursinus faculty were a large factor in their decision to grant me this scholarship. Also, the Allaire Medal is given to the FIRST team that wins the National Chairman's Award, the most prestigious award FIRST offers to teams. Another team member and I were

FIRST Provides Rare and Meaningful Opportunities

Submitted by Allison Guerin, November, 2004

awarded this scholarship because of the impact we had on our team and the FIRST community as a whole.

Even now, two years after I graduated from high school and left my robotics team, FIRST is still having an impact on my life. Because of the friendships and connections I made with mentors and engineers over the year, I was able to obtain employment at Amplifier Research as an assistant in their Accounting Department. Under normal circumstances, I would have never been able to find a job that provided so much experience that I could apply to what I am learning at school. However, this is just another example of how FIRST has influenced my life.

Overall, I feel that through FIRST students are provided with many rare opportunities that are not feasible in a classroom setting. The ability to connect with engineers and professionals in the real world and gain practical knowledge in the fields of science and technology is invaluable. I know that personally, I would be willing to help in any way possible to see that more teams in the Philadelphia region are started so more students are able to share the amazing opportunities that were presented to me throughout my four years of high school.

Sincerely,

Allison Guerin
Student, Ursinus College
alguerin@ursinus.edu