

## Essay

FIRST is a science and robotics competition in which students design and build a robot to compete with other high school teams from around the world. Robots in the competition cost thousands of dollars and take hundreds of hours to design, build, and test. FIRST, however, is about more than just robots. FIRST is about inspiring a love for engineering in young people worldwide and promoting a level of cooperation among teams that is unseen in any other sporting event. Through regional competitions throughout the country, FIRST has reached over 42,100 high-school students. Even though this is Coronado's first year as a team, FIRS has already had a tremendous effect on our team members, our school, and the community.

During our rookie year, 37 student members and more than 15 mentors have participated in this FIRST challenge. It has given students the opportunity to live like engineers for six weeks, working with real life engineers from a variety of fields. During this time, we have grown in our problem solving and teamwork skills, and have become more passionate about a future in engineering. The amount of hands-on experience that the students have gained in this short time is remarkable. The robot, of course, was entirely constructed by students. Both the animation and website were 100% student made.

A huge part of our team's development has been learning to work together efficiently. At the beginning of the year, we spent three weeks just deciding on our nickname. However, because of the nature of the FIRST competition and the time pressure the teams are under, we have been forced to learn to make faster decisions that everyone can agree upon. This reinforces what has been taught in our school's pre-engineering program about coming to consensus, using decision-making tools, and working together as a team.

Our website ([team2996.com](http://team2996.com)) has improved communication within the team as the source of news and meeting times. It has also been an invaluable reference source for our sponsors and mentors, communicating various robot construction resources available, study guides for the required safety test, and a forum for more fluid discussion of ideas pertaining to the robot. Our RSS feed also helps to keep team members and mentors informed about what our team is doing and various other news items. Because information about each sub-team's activities and progress are posted on the website, team members not working in a specific area are able to easily learn about that team's responsibilities and how each group is contributing to the overall FIRST project.

FIRST creates a great environment for team members. Many activities high school students take part in can have a negative influence on their lives. FIRST is a positive activity where students can interact with quality mentors and learn skills that can be used throughout their careers and in college. The scholarships available from FIRST also help members to attend college and become successful engineers of the future.

Our team is organized into five distinct sub-teams to improve communication and to encourage participation across our very large team. The two largest teams are

the Manufacturing/Design team and the Programming/Electronics team, each having about 10 members. The Manufacturing/Design team is split into the chassis sub-team, the manipulator sub-team (which works on the device used to manipulate game pieces), and the bumper sub-team (the team that creates the bumpers required for this year's game). The Programming/Electronics team is split into the programming sub-team and the electronics sub-team. The other three teams are the drive team (which works on the robot drive train), the Web/Media team (which works on the website and promotional materials), and the CAD/Animation team (which works on CAD models of the robot and the Autodesk animation competition).

Our team has been very visible in our school and district. This event has had more impact in all areas of the school than any other club or sport. We have had several film clips on our weekly school TV show and have gained wide recognition as the fastest growing team at our school. We have been recognized as a sports team at school assemblies, and have appeared in nearly every issue of the school paper.

Although we are a Coronado based team, our team consists of students from three schools around the district.

Our team has contributed to this year's "engineering week" at our school, in which engineers from the local area come in and talk to students about the advantages of an engineering career and the importance of education to become an engineer. Engineers have spoken to all the engineering classes at Coronado during this week, and many other teachers have allowed their classes to come and listen to excellent speakers from leading aerospace, computer, and architectural companies. Teachers and students school-wide have been given presentations by team members about the 2009 game and our team. This has led to the administration, counseling, and English departments supporting us by providing lunch during our Saturday meetings.

We have gone to numerous middle schools around the district encouraging science and engineering careers and recruiting middle school students to be part of our engineering program and FIRST. During the school open house, we demonstrated our robot for incoming freshmen and spoke to them about the positive impact of FIRST and our engineering program. We are also in the process of starting a FIRST Lego League team at Holmes Middle School and West Middle School, and hope to help mentor the new team at Galileo Middle School. Members of our team have assisted some other middle schools with setting up and operating Lego robotics systems.

We have reached out to the community outside of our school to make people aware of FIRST and its vision. Along with the middle schools we are beginning to work with, our school has made many efforts to have a larger impact on our community. We have provided press releases to several major newspapers, and are ardently pushing for media attention during the robot shipment and the regional competition.

At the beginning of the year, Coronado's team didn't have any sponsors outside of our school. We now have six major sponsors: NASA, Aeroflex, IEEE, ITT, Vertec Tool, Colorado Springs School District 11. Students have prepared and presented presentations to two corporate sponsors. We greatly appreciate the funding we are receiving from these companies, but we are especially thankful for the

mentors provided from each: we have two Aeroflex mentors, one mentor from IEEE, several from ITT, and another from a company that works with Vertec, not to mention many other excellent mentors from Microsoft, L3 Communications, and the United States Air Force Academy. Some of these companies, such as Vertec - who provided the facilities to fabricate our outer frame - are actively involved in the event. Honeywell has expressed significant interest in sponsoring us and providing mentors to us in the future.

Our mentors have played an indispensable role in the development of our team and our project. Our corporate and parent mentors have contributed untold amounts of their time to share their expertise and experience with us. They are available to consult for advice and to share stories and information that give us an even better idea of what the field of engineering is like.

Another great thing about our team is that we have come to exemplify another FIRST ideal, gracious professionalism, in our dealings inside and outside. This year we have had several complications with our robot, but our team has been able to avoid placing blame on individuals or single sub-teams. Instead, we have chosen to succeed and fail as a whole, and help each other get through problems. An excellent example of this was a programming glitch we experienced at the scrimmage we attended just before we shipped the robot. A new driver-station update had been recently installed, and the robot would enter "watchdog" mode (the emergency shut-off) during the autonomous phase. With help from other teams and encouragement from within our team, team members were able to quickly rewrite the program and get a functioning robot on the floor by the end of the match.

As a rookie FIRST team, we are extremely excited to attend our first competition in March. Our "Bon Voyage" party (to celebrate the completion and shipment of our robot) included guests from nearly all of our sponsor corporations. We are inviting representatives from these companies to attend the competition as well. We also hope to bring Coronado staff and students that are not part of the team to the Denver regional.

As the biggest rookie team in the state, (and the only one with a dedicated website), Coronado's Team 2996 has had a tremendous positive impact on our members, school, district, and community. Although we have enjoyed our inaugural year immensely, we are thrilled that this is just the beginning of our FIRST robotics experience. We hope to create amazing robots and inspire students to become amazing people for many years to come.