

DYNAMITE ROBOTICS

BUSINESS PLAN



Team Number: 2819
Team Home: Oxon Hill High School
Prince George's County Public Schools
Robot Name: S.A.M. (Super Awesome Machine)

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Executive Summary

One of the guiding principles at Oxon Hill High School is to create opportunities to foster a positive environment for learning for all students. We would like to expand our science and technology signature program in the future, and FRC will serve as an introduction to robotics. The FIRST Robotics Competition

- ❖ occurs on an annual basis, with a new “game” offered every year,
- ❖ requires partnerships and participation from a diverse group of students, and
- ❖ offers an exciting, fun way for everyone to appreciate and celebrate science and technology.

Oxon Hill School has an opportunity to integrate a hands-on approach to learning into the existing curriculum. FRC reinforces current initiatives at Oxon Hill High School to extend learning opportunities for students meet annual State achievement targets in reading and mathematics and State targets that have been established for graduation from high school. These initiatives include peer tutoring, extended day programs and Institute for Learning (IFL)’s effort-based achievement system. FRC incorporates opportunities for freshmen, sophomores, junior and seniors to get involved and receive the support that they need to stay involved.

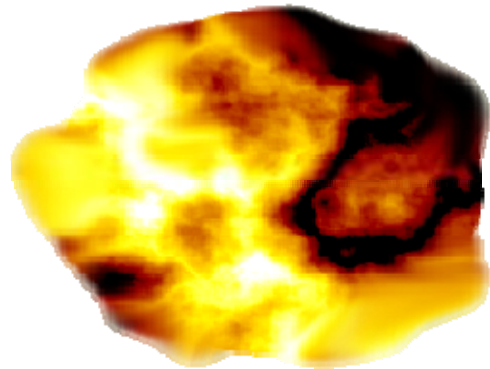
Mission Statement

“Dynamite is sheer explosive power!”

Once ignited as a rookie FRC team, our influence in the Oxon Hill High School, the surrounding community and the FIRST community will expand rapidly and produce a great impact in the process. Most people think of dynamite as something that blows things apart, but when contained and focused (for example, inside an engine), this sheer explosive power can provide useful work.

Success will be defined for Team Dynamite in terms of:

- ❖ partnering with our mentors, teachers, alumni and supporters who believe that we can do anything that we set our minds to
- ❖ setting and achieving our team’s specific goals
- ❖ respecting and valuing the contributions of each and every team member
- ❖ participating in the regional competition and working with other teams from around the nation and world
- ❖ sharing what we learn with others, giving back to our community by encouraging robotics programs at all levels
- ❖ encouraging our team members to stay in school, to graduate on time and pursue degrees in the field of science, technology, engineering and mathematics



FIRST Description



FIRST (For Inspiration and Recognition of Science and Technology) was founded in 1989 to inspire young people's interest and participation in science and technology. Based in Manchester, NH, the 501 (c) (3) not-for-profit public charity designs accessible, innovative programs that motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

FIRST Programs include:

- ❖ [FIRST Robotics Competition for high-school students](#)
- ❖ [FIRST Tech Challenge for high-school students](#)
- ❖ [FIRST LEGO League for 9 to 14 year-olds](#)
- ❖ [Junior FIRST LEGO League for 6 to 9 year-olds](#)
- ❖ [FIRST Place for ages 6 to adult](#)

2009 [FIRST Scholarship Program](#)

- ❖ Over \$9 million in college scholarships
- ❖ Over 600 individual scholarship opportunities
- ❖ Over 120 scholarship providers

FIRST Robotics Competition (FRC) is a unique varsity sport of the mind designed to help high-school-aged young people discover how interesting and rewarding the life of engineers and researchers can be.

The *FIRST* Robotics Competition challenges teams of young people and their mentors to solve a common problem in a six-week timeframe using a standard "kit of parts" and a common set of rules. Teams build robots from the parts and enter them in competitions designed by Dean Kamen, Dr. Woodie Flowers, and a committee of engineers and other professionals.

FIRST redefines winning for these students because they are rewarded for excellence in design, demonstrated team spirit, [gracious professionalism](#) and maturity, and the ability to overcome obstacles. Scoring the most points is a secondary goal. Winning means building partnerships that last.

Team Description

We know that this won't be easy, and we can't possibly do this without the full support of our students, leadership team, teachers, veteran teams and mentors – those with engineering/technical backgrounds and others with valuable skills and experience.

Our students will form the core of our team, reflecting various backgrounds, grade levels and diverse skills that not only focus on the design and building of the robot, but incorporate business/management skills, budgeting, computer programming, marketing, communications/media, artistic skills and web design. Our school's Art Department will be invaluable in designing logos and T-shirts for our team. To support each other, our team will monitor grades of participants, offer peer-to-peer tutoring, and track college acceptances and scholarships.



Oxon Hill's enthusiasm as a rookie team and the strength of our partnerships will set us apart from other teams competing in this year's FIRST Robotics Competition. We are fired up and ready to go! Due to our location in southern Prince George's County, it does require greater effort for our school to solidify partnerships and participate in science and technology initiatives that schools in central and northern Prince George's County routinely enjoy. Our STP program is an active member of the National Consortium of Specialized Secondary Schools of Mathematics, Science and Technology (NCSSSMST). Oxon Hill High School was an affiliate of the NCSSSMST Student Conference 2007 which took place from October 18-21, 2007 in Washington, DC. Our students placed first in the Robotics Competition during the conference. But Oxon Hill High School has never participated in a FIRST robotics competition at any level. We will change that fact this year, thanks to NASA and other sponsors.

Our Sponsors include:



BAE Systems (British Aerospace Electronic Systems) is a global company engaged in the development, delivery, and support of advanced defense and aerospace systems in the air, on land and at sea.

<http://www.baesystems.com/>



NASA (*National Aeronautics and Space Administration*) is the leading force in scientific research and in stimulating public interest in aerospace exploration.

<http://www.nasa.gov/>



National Society of Black Engineers - Alumni Extension, Washington DC (NSBE-AEDC) objective and goal is in the advancement of ethnic minority engineers. They as well promote the development of student interest in science.

<http://www.nsbe-aedc.org/>



Oxon Hill High School (OHHS)

<http://www.pgcps.org/~oxonhill/aboutohhs.htm>

History

Oxon Hill High School, located in Oxon Hill, Maryland, is a Comprehensive High School with a Science and Technology Center (STP) for southern Prince George's County, and an ESOL Center. Oxon Hill High School has set the goal to build a World-Class High School with our Attitudes, Actions, and Achievements. We have enjoyed a long history of outstanding achievements, and we have faced some challenges as well. Our Air Force Junior ROTC program is strong with voluntary participation by over 420 cadets. We have championship track and wrestling teams. Our vocal and instrumental music programs are exceptional and have been recognized at the state, national and international levels, including a recent performance in Beijing, China. Science and Technology Program students at Oxon Hill have been recipients of a high number of college and/or military scholarships, grants, and awards since the inception of the program. Scholarship award opportunities for Oxon Hill High School have exceeded twenty-three million dollars (\$23,000,000.00) annually.

Our challenges include persistent overcrowding, aging facilities and administrative turmoil. We serve a population that is approximately 85% African American, and 25% of our students are eligible for free or reduced-price lunch. We are located in a neighborhood in the burgeoning southern tier of the county, close to the D.C. state line in the Southeast region of the District. Despite our challenges, Oxon Hill maintains high graduation rates and low truancy rates.

In Dedication to Mr. Joseph Mrad

Like dynamite's inventor, we are sad, but not defeated.

After returning to Sweden in 1863, inventor Alfred Nobel concentrated on developing nitroglycerine as an explosive. Several explosions, including one (1864) in which killed his brother Emil and several other persons, convinced authorities that nitroglycerine production was too dangerous. They shut down further experimentation with nitroglycerine in Stockholm. Alfred Nobel had to move his experimentation to a barge on Lake Mälaren. Although Alfred was sad, he was not discouraged and kept on trying. In 1864 he started mass production of nitroglycerine. Despite the challenges, dynamite brought Nobel a great fortune, which he used to found the Nobel Prize, which is occasionally awarded to those who persevered through critical moments in a process despite the risk of failure.



On November 24, 2008, Team Dynamite lost a critical member of our team to cancer. Mr. Joseph Mrad was a beloved teacher at Oxon Hill High School since August 1999. He was a whiz at woodwork, and all things mechanical, including metal shop and electronics. Our machine shop at the school has been closed due to lack of expertise with the tools and equipment. Although we are sad, we are not defeated as Team Dynamite dedicates our rookie season to the memory of Mr. Joseph Mrad, former Technology Education teacher for the Science and Technology Program at Oxon Hill High School. We will persevere through this critical rookie season despite the challenges that we face.

Goals

Our team is divided into five sub-teams that each help with the robot in some way. All of the individual teams have goals based on what their jobs are, but we also have overall goals.

Team Dynamite's overall team goals include:

- ❖ Partnering with our mentors, teachers, alumni and supporters who believe that we can do anything that we set our minds to
- ❖ Setting and achieving our team's specific goals
- ❖ Respecting and valuing the contributions of each and every team member
- ❖ Participating in the regional competition and working with other teams from around the nation and world
- ❖ Sharing what we learn with others, giving back to our community by encouraging robotics programs at all levels
- ❖ Encouraging our team members to stay in school, to graduate on time and pursue degrees in the field of science, technology, engineering and mathematics

Sub-team Goals

Build Team:

- ❖ Build a working and successful robot
- ❖ Complete a conveyor belt system
- ❖ Build a container with an adjustable floor

Electronic Team:

- ❖ Install electronic pieces to the wooden board
- ❖ Test on the robot, to see if it was done properly

Programming Team:

- ❖ Load and activate software
- ❖ Perform bench top testing and set-up control system properly
- ❖ Write code in order to operate the robot in arcade mode
- ❖ Write code to engage false floor motor control for dumping orbit balls

Business Team:

- ❖ Keep team organized and focused
- ❖ Maintain the budget
- ❖ Attract sponsors and business partners
- ❖ Work on necessary business materials

Website/History Team:

- ❖ Gain experience in website design
- ❖ Maintain an informative website that educates people about *FIRST* and encourages engineering prowess (<http://dynamiterobots.ucoz.org/>)
- ❖ Keep the team updated regularly on important events

Safety Team:

- ❖ Keep an eye out for any dangerous actions
- ❖ Make sure everyone that is working on or near the robot have safety goggles and gloves on
- ❖ Assist anyone who needs advice or safety help

Management and Organization

Our school principal, Ms. Deborah Franklin, and our Science and Technology Program Coordinator, Mrs. Olivia Pearson, remain our champions and chief supporters. Both were very enthusiastic upon learning about the possibility of a robotics team this year at Oxon Hill High School. Ms. Franklin and Mrs. Pearson offer full support when it comes to working with students, parents, and other members of our school community to assist students in meeting our high expectations.

Mrs. Pearson and Mr. Marshall provide needed supervision during team meetings, technical expertise, overall guidance and dispute resolution. We know that it will be a sacrifice for our teachers who are already managing heavy work schedules to help us with this, but the more teachers we have on board, the more likely it will be that our robotics team will be successful and continue in future years.

Oxon Hill High School has a Technology Education Department, and our team will have supervised access to onsite facilities with basic machine shop equipment for use in the robot fabrication process.

We encourage our teachers to serve as mentors for our team. Several experienced coaches and engineers have stepped up to volunteer as mentors for our team, among them members of the National Society of Black Engineers Alumni Extension Chapter of Washington, DC.

2009 Team Dynamite Mentors

Mrs. Sharon Anderson
Ms. Elizabeth Bell
Mrs. Ruby Crichton
Ms. K Cunningham
Mr. Keir Ham
Mrs. Veronica Henry
Mr. C Keck
Mrs. Denise Lewis
Mr. Keith Marshall
Mrs. Shirley Moore
Dr. Barbara Nichols
Mr. Joe Renaud
Ms. Allison Richo
Mr. Jesse Shelton
Mrs. Paula Shelton
Mr. Wendell Simmons
Mrs. Olivia Weaver-Pearson
Mr. Marcus Young

Our mentors provide professional expertise and management tips so that we can design and build a competitive robot, given the short time frame that we have to work with (six weeks). We are deeply grateful for our mentors and our gratitude was shown January 22, 2009 when we celebrated Thank Your Mentor Day. All of our mentors received e-cards, which showed how thankful we are for them.

Other than the help of our mentors, we also need our parents and guardians, Oxon Hill High School alumni and community members to help with logistics, transportation, providing snacks/food for team meetings and encouragement. On December 31, 2008, we invited recent Oxon Hill graduates to return to our school to work with our team, and we will create a roadmap to build relationships within our community.

We also rely on the assistance of veteran FIRST Robotics Competition teams. On December 13, 2008 during a workshop, rookie and veteran teams were matched, and our team was fortunate to be matched with Patriots Technology Training Center/Bowie High School –FRC Team 1195. On Saturday, February 11, 2009, FRC Team #1885 of Battlefield High School in Haymarket, VA invited us to their school for the day. We learned a lot and had a great time. We thank our veteran teams for sharing their expertise with us. This is what gracious professionalism is all about.

Sub-teams include:

BUILD Sub-team Responsibilities: Drive Train, Communication with Programming and Electronics Sub-Teams, Build Shipping Crate

PROGRAMMING Sub-team Responsibilities: Programming, Drivers, Communication with Build and Electronics Sub-Teams

ELECTRONICS Sub-team Responsibilities: Design Board, Make Wires, Improve Electronics, Heavy Testing

WEBSITE/HISTORY/ANIMATION Sub-team Responsibilities: Website development and updates, newsletter articles, photographs, video, scrapbook

SAFETY Sub-team Responsibilities: Safety Rules and Requirements

BUSINESS Sub-team Responsibilities: Business Plan, Finance, Corporate Relationships, Mentor Appreciation, Scholarships, Marketing, Brochures, Buttons, “Booth” Pit, Spread the message of US FIRST

Budget

As a rookie team, we are advised that our budget should realistically be between \$10K - \$15K. The generous support of the NASA grant in the amount of \$6K will be used to cover our registration fee for the DC Regional Competition. Since Oxon Hill High School is located close to the District of Columbia, our team won't have to travel extensively or require lodging to participate in events. We hope to obtain school sponsorship for local travel expenses (bus transportation to the DC Regional 2/26- 2/28). As for tools, we will pursue a Lowe's grant which can assist with that expenditure. Our budget includes:

- \$6K for registration
- \$1,000 – \$1,500 for tools and equipment
- \$1,000- \$1,500 for additional parts and materials for the robot
- \$200 - \$300 for building the robot shipping crate
- \$500 for team T- shirts and team giveaways (buttons, promotional material)

Budget	Total Dollars
Revenue Sources:	
▪ Sponsors	
○ Bae Systems Grant	\$1,000.00
○ NASA Grant (DC Regional)	\$6,000.00
▪ Donations	
○ Ms. Veronica Henry	\$70.70
▪ Fundraising	
TOTAL REVENUE:	\$7,070.70
Expenses:	
▪ Registration Fees	
○ Workshop (12/13/08) (Pd. By Ms. D. Lewis)	20.00
○ Event Registration (DC Regional)	\$6,000.00
▪ Travel	
▪ Meals	
○ Pizza Hut (1/14/09) (Pd. By Ms. D. Lewis)	\$86.18
▪ Safety Materials	
▪ Robot Materials	
○ Three Orbit Balls (1/9/09) (Pd. By Ms. D. Lewis)	\$43.66
○ Batteries – AA (1/24/09) (Pd. By Ms. D. Lewis)	\$6.86
○ Aluminum/Steel L-Rods (Pd. By Mr. K. Ham)	\$200.00

○ Plywood/Plexiglass/other supplies	\$70.70
▪ Crate Materials	
▪ Pit Materials	
▪ Business Materials	
○ Button Supplies (2/1/09) (Pd. By Ms. D. Lewis)	\$50.03
TOTAL EXPENSES:	\$6,477.43
SURPLUS FUNDS	\$593.27

Community Involvement

We hope to lead after school robotics initiatives (with high school students serving as mentors for younger students), and visit feeder middle schools and local elementary schools to promote academics, science and technology. We currently support John Hanson Montessori Elementary School by having our seniors serve as judges for their annual science fair. On Tuesday, January 6, 2009 students participated in a presentation at John Hanson's Parent Teacher Student Association (PTSA) meeting. On February 3, 2009 we learned from the PTSA President, Mr. Andre Nottingham that The John Hanson Montessori School Executive Board has agreed to partner with FIRST to host an afterschool robotics program (FIRST LEGO League) starting next fall. The principal has agreed to cover half of the cost for the program.

We plan to visit Oxon Hill Elementary School soon after the MSA in April to introduce their students to robotics and encourage them to participate in Junior FIRST LEGO League and FIRST LEGO League teams. Also, we are scheduled on March 12, 2009 to visit The Maryland International Day School to support their science fair and share our

Our goal is not only to involve younger schools, but also to get businesses to help us. We cannot feed our entire team and supply materials that we need by ourselves, so our business team created the *Feed a Hungry Team* Campaign and *Monetary Donation* applications, which were taken to as many businesses as possible for their support.