

Business Plan

Executive Summary

Mission: We are FRC Team 1912 Combustion from Northshore High School and Salmen High School in Slidell, Louisiana. As a cohesive family of students and mentors, we are committed to building an awareness and appreciation for STEM throughout our community and the Gulf Coast region.

Founders: Nineteen students and seven mentors formed Team 1912.

History: Team 1912 Combustion was founded in the fall of 2005 at Northshore High School. Over the past nine years, the team has competed at the Lone Star Regional in Houston, the Bayou Regional in New Orleans, the Razorback Regional in Fayetteville, the Orlando Regional, and the World Championships in Atlanta and St. Louis. In January of 2014, students from Salmen High School joined the original Northshore High School team due to funding problems.

Personnel: Team Combustion consists of fifty-two students and fifteen mentors with three teacher sponsors.

Structure: There are two elected officers: President and Vice President. Mentors appoint eight captains who lead our crucial sub-teams: Challenge, Chassis, Controls, CAD, Strategy, Safety, Finance, and Media. Each captain selects a deputy who assists and learns from them. Within sub-teams there may exist other official roles. The Media team includes the Webmaster and the Historian and the Strategy Team includes the Scout. The Challenge, Chassis, Controls, CAD, and Safety teams are devoted to building and competing with a competitive robot each season. The Strategy team develops the team's approach to the game, knows the rules, and scouts the competition. The Finance team works to maintain our relationships with our current sponsors and obtain new sponsorships. The Media team maintains the website, documents the team's activities, and markets the Combustion brand through the creation of videos, animations, and other publicity materials. Three outreach initiatives, Ignition Team, FIRST Flames, and Torchbearers, work to spread FIRST and STEM throughout the region.

Location: Our team is registered under Northshore High School at 100 Panther Drive, Slidell, LA and Salmen High School at 300 Spartan Dr, Slidell, LA. We operate out of a shop on Northshore's campus.

Sponsors: Team 1912 expresses its gratitude to all of its current sponsors: the National Aeronautics and Space Administration, St. Tammany Parish School Board, Northshore High School, Salmen High School, Naval Research Laboratory, National Defense Education Program, Textron Marine and Land Systems, Aerojet Rocketdyne, Jacobs Technology, the Lew Foundation, Gulf Coast Pain Institute, National Instruments, Sierra Lobo, Slidell Women's Civic Club, Alliance Laser, Signs Now, Qualis, and Clementi's Gladiators MMA.

Services and Products: Team 1912 Combustion designs and manufactures quality robots for competition in FRC events in the spring as well as for year-round community outreach purposes. We own a variety of machine shop tools including a mill, horizontal and vertical band saws, chop saw, drill presses, tack welder, lathe, and 3D printer. All of these tools, in addition to our assembled field pieces for each year's game, are available for the use of other FIRST teams in our region.

Our comprehensive outreach program finds and mentors other FIRST teams, volunteers in our local community, and promotes STEM education across the Gulf Coast. Team 1912 also coordinates and hosts FIRST events, such as FRC Jumpstart builds, District FLL Qualifiers, and the Louisiana Jr. FLL State Exposition. Team Combustion's website and social media outlets through Facebook, Twitter, Google+, YouTube, and Flickr connect the general public to FIRST.

Booster Club: The Team 1912 Booster Club, chartered by parents and mentors, is an independent organization created to diversify our financial base. With a tax exempt 501(c)(3) non-profit status, it pursues sponsorships outside of the school board framework and streamlines our financial processes. By allowing Team Combustion to manage its own finances, the Booster Club greatly enhances our sustainability and entrepreneurial opportunities.

Sponsorship

Sponsors are categorized into levels of support as follows:

LEVEL	CONTRIBUTION	RECOGNITION
Inferno Sponsors	Strategic Partnerships	Individual Recognition <ul style="list-style-type: none">• On Website• On Team T-Shirts• On Pit Banners• On Competition Robots
Wildfire Sponsors	\$1000 to \$9999	Individual Recognition <ul style="list-style-type: none">• On Website• On Team T-Shirts• On Pit Banners• On Competition Robots
Bonfire Sponsors	\$100 to \$999	Individual Recognition <ul style="list-style-type: none">• On Website• On Team T-Shirts
Torch Sponsors	\$10 to \$99	Individual Recognition <ul style="list-style-type: none">• On Website
Spark Donors	\$1 to \$9	Group Recognition <ul style="list-style-type: none">• On Website

In addition to the recognition outlined above, all sponsors are invited to our annual Open House to see our newest robot revealed to the public and are invited to all competition in which Team 1912 participates.

Team 1912 also shows its appreciation by visiting our sponsor's facilities, hosting sponsor luncheons, staying in touch via newsletters three times a year, and visiting sponsor events like the Take Your Kid to Work Days at NASA's Michoud Assembly Facility and NASA's John C. Stennis Space Center.

Program Summary

Operational Plan: As a student-led team assisted by mentors, we divide ourselves into five build teams: Chassis, Challenge, Controls, CAD, and Safety. The Strategist leads an analysis of approaches for each year's competition. Two administrative teams (Finance and Media) work concurrently to provide funding and publicity. Throughout the year, all students participate in our three outreach programs.

Production Plan: Following the January kickoff of a new season with a new challenge, the team works for six weeks to build a game-specific robot. Build sessions are held three nights each week from 5:30 to 9:00 P.M. Saturday build sessions are held from 9:00 A.M. to 4:00 P.M. Additional build sessions are added based on necessity. On the set Bag and Tag date, all work on the robot must cease and it is prepared for shipment to the competition, typically held between two and six weeks later.

Financial Plan: The overwhelming majority of funding for Team 1912 originates in the form of corporate sponsorships. The Finance Captain coordinates grant applications to a variety of businesses and maintains healthy partnerships with each sponsor. Each year, we hold fundraising activities to supplement the grants we receive. Annual ice cream sales at school, team merchandise marketing at our hosted events, and sponsored art raffles enable us to acquire additional funds.

Branding: The number 1912 was assigned by FIRST; as a team we chose the name Combustion based on the engine testing conducted at NASA's Stennis Space Center, one of our principal sponsors. For our team colors, electric blue is paired with orange and yellow on our team shirts, hats, and banners. Our logo, a gear blazing with yellow-orange flames, is engraved with 1912 in electric blue. These elements are combined in "Burnie", our animated mascot. An electric blue robot emblazoned with our logo, Burnie enthusiastically markets our team in safety animations, webpages, and other 1912 videos. Finally, our motto "Spread the Wildfire" symbolizes our fiery dedication to promoting STEM.

FIRST Description

For Inspiration and Recognition of Science and Technology (*FIRST*[®]) was founded in 1989 by Dean Kamen to build STEM enthusiasm in students. Its four programs empower students of all ages to learn and apply engineering skills in an encouraging environment. Starting at an elementary school level, Junior *FIRST*[®] LEGO[®] League (*Jr.FLL*[®]) instills STEM education with a research challenge. After exploring a topic and building a model, the students present their projects with teamwork and creativity. For middle school and junior high participants, *FIRST*[®] LEGO[®] League (*FLL*[®]) brings a more intense experience of competition. Students design, build, and program autonomous robots to achieve set tasks. There are two programs for high school students: *FIRST*[®] Tech Challenge (*FTC*[®]) and *FIRST*[®] Robotics Competition (*FRC*[®]). *FTC* provides a reusable kit of parts for small teams to build affordable robots. By using innovation and strategic thinking, students apply advanced engineering principles in a sports atmosphere. *FRC*, the "Varsity Sport for the Mind," focuses on large-scale design and fabrication of a complex robot. Students gain valuable engineering skills as well as effective project management experience through working with technical mentors.

Each level of *FIRST*[®] depends on Gracious Professionalism and Coopertition. Gracious Professionalism entails not only sportsmanship, but also community building. Whether serving the public, collaborating at regional tournaments, or forming friendships with fellow participants, *FIRST*[®] students enjoy the mutual thrill of respectful competition. Through Coopertition, opposing teams build each other through enthusiastic mentorship and coordinated innovation. Great challenges are overcome only by working together.

Team Description and History

The Combustion Triangle, a framework of sponsors, mentors, and students, encapsulates the spirit of Team 1912. Our sponsors, supplying essential tools and funds, act as the initial spark that kindles a blazing fire. Just as oxygen nourishes fire with energy, mentors provide their invaluable experience and knowledge. And, like a store of promising fuel, students are ready to be ignited with innovation and a passion for STEM.

Team 1912 has competed in eight previous FRC seasons. While the Bayou Regional in Louisiana has been our traditional home, we have also visited the Lone Star Regional in Texas, the inaugural Razorback Regional in Arkansas, the Orlando Regional in Florida, and the International Championships in Atlanta and St. Louis.

Our accolades include the Chairman's Award at the Bayou Regional (2010, 2011, 2012, 2013), a Regional Championship (2007), and the Woodie Flowers Award to founding mentors Dr. Dale Bibee (2009) and Ms. Wendy Holladay (2013). In addition, we have had five Dean's List Finalists and one Dean's List Winner; Rachel Holladay, who won the award in 2012. A full record of Team Combustion's history, including photo and video galleries as well as our award-winning submissions, can be found on the Team 1912 website.

Team Impact

Outreach Summary: The Ignition Team targets students at local schools by helping them form Jr.FLL, FLL, and FRC teams. We are always willing to provide technical assistance as well as access to our workshop and tools. To further support other teams, our website has a thorough collection of resources, including detailed documents on topics as varied as programming, corporate sponsorship, and competition scouting. Our FIRST Flames program concentrates on furthering a public appreciation of science and technology. During the summer, we organize two week-long STEM camps and robotics demonstrations at other local programs, such as the Slidell Fourth of July Heritage Festival, Girl Scout Camellia Camp, Fit as a Firefighter Camp, and the Boys and Girls Club of Yazoo City, MS. The FIRST Flames initiative also attends parish and city council meetings as well as school board meetings to advocate STEM education to local policymakers. Team 1912 has promoted FIRST to our State Congress and to Governor Bobby Jindal. Finally, the Torchbearers volunteer at a variety of community events. Over the past year, Team 1912 has helped at the Louisiana Special Olympics, the Hospice Foundation's Crawfish Cook-off, Slidell City Cleanups, and wetland restoration at Bayou Lacombe. By promoting service values, students present a positive FIRST ambassadorship to the public.

Students: Throughout the year, students learn vital engineering and management skills. Besides technical training, students have many opportunities to build core leadership proficiencies through elected and appointed offices. Overall, student leadership and expert mentorship transform STEM education into a life-enriching experience. To date, 100% of Team 1912 alumni have attended college, and 71% have majored in STEM fields.

Charity: Team 1912 conducts fundraising for donations for cherished causes like St. Jude's, FIRST friend Kevin Tremble, a cancer-stricken teacher's spouse, and Project Gratitude, our personal effort to comfort soldiers overseas. Team 1912 also collaborates with the Slidell Women's Civic Club, donating Christmas presents for the financially disadvantaged children of our community.

Team Structure and Organization

Team 1912 is based out of Northshore High School and Salmen High School. Our teacher sponsors communicate team needs with the principals.

Build Teams: The four build teams are responsible for designing and fabricating an integrated robot. Once a general design and strategy have been chosen, the CAD team outlines a detailed 3D model of the new robot, enabling precise fabrication. The Chassis team constructs the robot's frame and drivetrain as well as competition bumpers. The Challenge team builds upon the chassis by adding strategic mechanisms, such as a robotic arm or elevator. The controls team completes the robot by implementing the electrical system and programming necessary tasks.

Support Teams: The Strategy team develops a thorough understanding of the game and its rules to formulate our game strategy. The Strategy team also scouts our potential alliance partners in order to devise alliance strategies. Two administrative teams are responsible for providing the primary support required to enable the team's successes. The Finance team solicits grants from sponsors, spearheads fundraising activities, and collaborates with the teacher sponsors on fiscal matters. The Media team produces website content, documents, Chairman's Award videos, Safety Animation submissions, and any other materials required to promote the team's image.

Outreach Initiatives: Three outreach strategies provide most of Team 1912's service momentum. The Ignition Team founds and mentors FIRST teams. The FIRST Flames program supports youth-focused STEM events year-round. The Torchbearers volunteer at community events.

Team Risks and Risk Management

Like any organization, Team 1912 faces certain risks each year. We plan extensively to reduce their chance of occurrence and to minimize their impact should they occur.

Loss of major sponsors: Without adequate funding, we would be unable to order sufficient materials, travel to competitions, or expand our outreach. To strengthen our partnerships with our current sponsors, we show our appreciation with luncheons, demonstration visits, and by maintaining close contact via newsletters and emails. In addition, we seek out new sponsors each year.

Absence of key mentors or students: During the build season, circumstances beyond the team's control may force a critical mentor or student to leave. By teaching skills early in the season (September – December), we avoid dependence on a single individual. The team can still function effectively even without its expected leaders.

Time constraints: The six weeks of the build season delineate a brief period of intense action. We set reasonable deadlines to prevent falling behind schedule, allowing time for ordered materials to arrive. If the usual build session calendar is insufficient to complete critical tasks, we arrange additional work days to compensate. By remaining flexible we can recover from unexpected delays.

Team Goals and Challenges

Short Term Goals:

- Team Combustion will build simple, low-cost robots to demonstrate at other schools as an example of student-led engineering.
- We will host additional Jr.FLL and FLL events for our community.
- We will expand the engineering curriculum at our schools by introducing a specialized robotics class.
- We will strengthen financial contacts with regional and local businesses.
- Expand participation to additional local area schools unable to support their own FRC team.

Long Term Goals:

- Team Combustion seeks to increase outreach impact to a national level.
- We will ignite FRC teams in every high school in Louisiana.
- Through our alumni, we intend to establish a FIRST scholarship at a major university.

Individual Member Goals:

- Students will embrace the principles of Gracious Professionalism and Coopertition.
- Students will participate in at least five outreach events during the off-season.

Challenges:

- Our build space on Northshore High School's campus is confined.
- A capable senior class graduates each year. To compensate, we mentor local FLL and VEX teams to recruit new members. We have also founded sister STEM clubs (Mu Alpha Theta and Zero Robotics SPHERES) to interest fellow high school students in STEM. By training diverse age groups of students, we maintain stability and continuity.