HEPHAESTUS 6390

BUSINESS PLAN

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1.0 EXECUTIVE SUMMARY

OUR MISSION

We are Hephaestus 6390, and we live by our mission statement, to "Empower youth through diversity and teamwork in communities locally and globally". We are devoted to learning and developing new skills, sharing knowledge with others, delve into STEM fields and spread awareness of FIRST principles. We are aiming to achieve these statements by brainstorming, prototyping, building, programming, testing and completing the code and robot ready to compete in the FRC Infinite Recharge challenge. A brief summary of our team:

- We are from North Surrey Secondary, Surrey, British Columbia, Canada
- We have over 50 members and 4 mentors
- Mr. China – Lead Mentor, Build Team Mentor: Joined 2017/2018 Season
- Mr. Chedwiggen – Field Elements Construction Mentor: Joined 2018/2019 Season
- Ms. Mackie – Administrative Mentor: Joined 2018/2019
- Brian – Build Team Mentor: Joined 2018/2019

OUR SPONSORS

IBEW 213, Microsoft, North Surrey Secondary PAC, Basant Motors, Precision Pulley & Idler, Cloverdale Optometry, Andian Technologies Ltd, TD Bank, High Point Electrical Ltd, Select Steel Ltd, Douglas College and our numerous friendship level sponsors.

WHAT OUR TEAM DOES

- Host the Annual BC Lower Mainland FLL Tournament
- Starting and mentoring multiple FLL Jr. Teams and FLL Teams
- Hosting FLL Jr. expositions at our school to display the work of our students
- Spread the awareness of FIRST and STEM in our community
- Provide support and content for Rookies teams
- Helping the community by spreading knowledge on mental health
- Contributing to the environment by starting initiatives to recycle batteries
- Providing information to our sponsors, community, parents and the FIRST community
- Hosting and participating in numerous Fundraising and Outreach events
- Offering many opportunities for students in our community to discover and learn about STEM programs

SUMMARY OF TEAM'S GROWTH

- Hephaestus 6390 was founded by Scott Smith in North Surrey Secondary
- Hephaestus 6390 won the Rookie All-Star award in Calgary, Alberta
- Hephaestus 6390 competed in the FIRST Robotics World Championship in Houston, Texas

- Hephaestus 6390 grew to 60 members with 6 mentors
- Hephaestus 6390 won Canadian Pacific Regional Competition and competed in the FIRST World Robotics Championship in Houston, Texas
- Mentored 4 FRC teams

- Hephaestus 6390 grew even further to 62 members with 4 mentors
- Hephaestus 6390 started 2 First Lego League teams and 6 First Lego League Jr. teams
- Hephaestus 6390 won the Engineering Inspiration Award and participated in the FIRST World Robotics Championship in Houston, Texas

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2.0 TEAM INFORMATION

2.1 - TEAM HISTORY

We are FRC team Hephaestus 6390, we come from North Surrey Secondary in SD36, Surrey, British Columbia. Our team was created during the 2016/2017 STEAMWORKS season, by two of our past mentors, Mr. Smith and Mrs. Occleshaw. We are currently in our fourth year as a team and are working like never before to be able to progress our team and enjoy our season. In our team, we have members ranging from Grade 8-12 which represents our belief in diversity and inclusion. We also pride ourselves in the fact that 35% of our members are female, 40% of our mentors are female and 43% of the alumni from our team is female. We are a club that provides opportunities to all their members, despite their experience level as we believe that everyone who has an interest and can commit to robotics should participate. As a result, we do not require any pre-existing knowledge or skills. Our members learn and discover FIRST and STEM together, simultaneously encouraging a "Growth" mindset. We are team Hephaestus 6390; we aspire to raise awareness about FIRST and educate others through mentorship about STEM.

Rookie Year	2016-2017 (FIRST Steamwork)
Location	North Surrey Secondary School
School Affiliation	North Surrey Secondary School
Team	Boys – 77% Girl – 23%
Mentors	Bryan China (Lead Mentor) Tammy Mackie (Administrative Mentor) Ryan Chegwidden (Field Elements Mentor) Brian
Sponsors	(Sponsors)
Website	http://www.hephaestus6390.com/
Social Medias	Instagram (@frc6390) Twitter (@NSS_Hephaestus)
Past Robots	Maja (2016-2017 FIRST Steamwork) Atlas (2017-2018 FIRST Power Up) Nightmare (2018-2019 FIRST Deep Space)
Current Robot	Kevin

2.2 - TEAM STATISTICS

- 35% of our members are females
- 40% of our mentors are females
- 43% of our team alumni are females
- We have had a ((new team members/35)x100)% increase of members from our rookie year
- We went to worlds thrice during our first three years as a team

2.3 – BENEFITS OF THE TEAM

FIRST Robotics provides high-school students with invaluable experiences such as the opportunity to explore their curiosity of STEM and develop their STEM skills.

The culture of FIRST embodies the employability traits of individuals who sustain successful careers in any chosen field. The practice of gracious professionalism is something that we are able to instill in our members at this impressionable age, and the core values of FIRST will help develop characteristics that will serve them well throughout their lives. We are having a positive impact on the world by doing our small part to educate a generation of thoughtful, collaborative-minded young people, which in turn will have a positive influence on the world around them.

FIRST pairs theoretical knowledge with practical, hands-on applications in a challenging and supportive environment. Our program is a safe place for students to learn as much on their own and from one another, as they do from their mentors. Through involvement in our FRC team, our members learn about collaboration, inquiry-based learning and teamwork. Students learn and develop both their technical and leadership skills, thus providing opportunities that would otherwise not have been available to them without the gracious professionalism of the FIRST community. Our program nurtures development at all grade levels and allows students with little or no pre-existing knowledge of STEM to enjoy the benefits of exposure to this field.

Team members are also developing the necessary employability skills that employers seek. Our students have the opportunity to network with other teams from around the world, as well as professionals and representatives from a variety of post-secondary institutes.

We are preparing our students for a variety of potential careers of the future, by exposing them to new fields and helping them acquire and develop a wide range of new skills and knowledge.

FOR STUDENTS

- Learn how to plan and build a working robot
- Develop confidence, communication and leadership skills
- Have fun
- Be part of a community and work as a team
- Help others through community outreach
- Gain opportunities to earn scholarships and obtain internships
- Get a head start in studying a STEM related field such as engineering etc.
- Develop multi-tasking and time-management skills
- Work with and learn from adult mentors who have professional experience in the areas of science, technology, engineering, math and business

FOR MENTORS

- Share knowledge and experience with students to help them accomplish their tasks, in both engineering and business areas
- Have fun
- Be part of a community and work as a team
- Help others through community outreach
- Help give the students a "real life" learning experience they cannot get in the regular classroom

FOR SCHOOL

- Support an outstanding student development program
- Support STEM and business interests in students

3.0 ORGANIZATIONAL PLAN

- Increase name recognition as a school that helps develop outstanding students
- Gain insight of professionals outside of academia to help set curriculum
- Help support students through scholarship opportunities

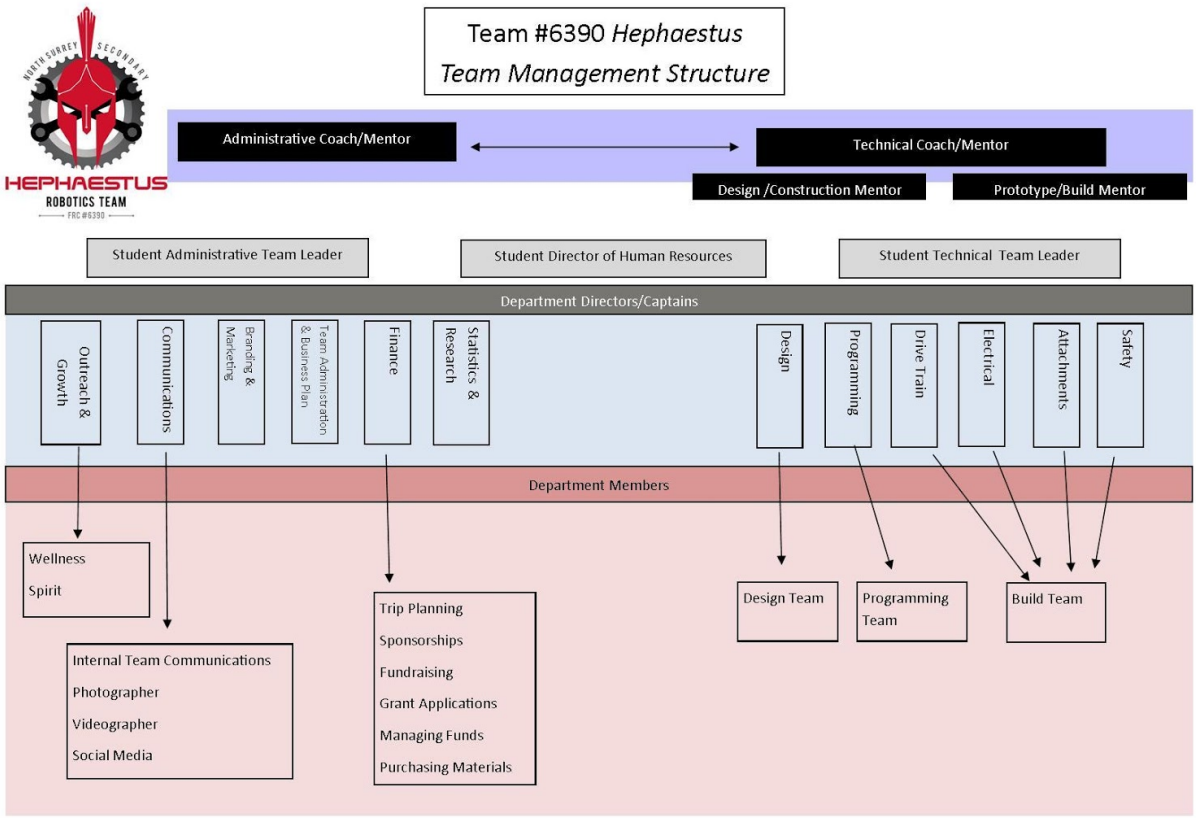
FOR SPONSORS

- An opportunity to market their company
- Reach out to the community in a positive way
- Develop future employees
- Help inspire students to enter STEM and business fields
- Provides opportunity to be good corporate citizens

2.4 – TEAM MENTORS

During the 2019/2020 season, Mr. China will be continuing as the lead build mentor and has taken up the role of being the lead mentor for our team. He has stepped into a vital role where he is involved in every aspect of the team. This season we also recruited 3 new mentors to help; Mr. Chedwiggen who leads our construction team in building field elements, Ms. Mackie to be our lead Administrative mentor and last but not least Brian who helps mentor our build team.

3.1 – TEAM STRUCTURE

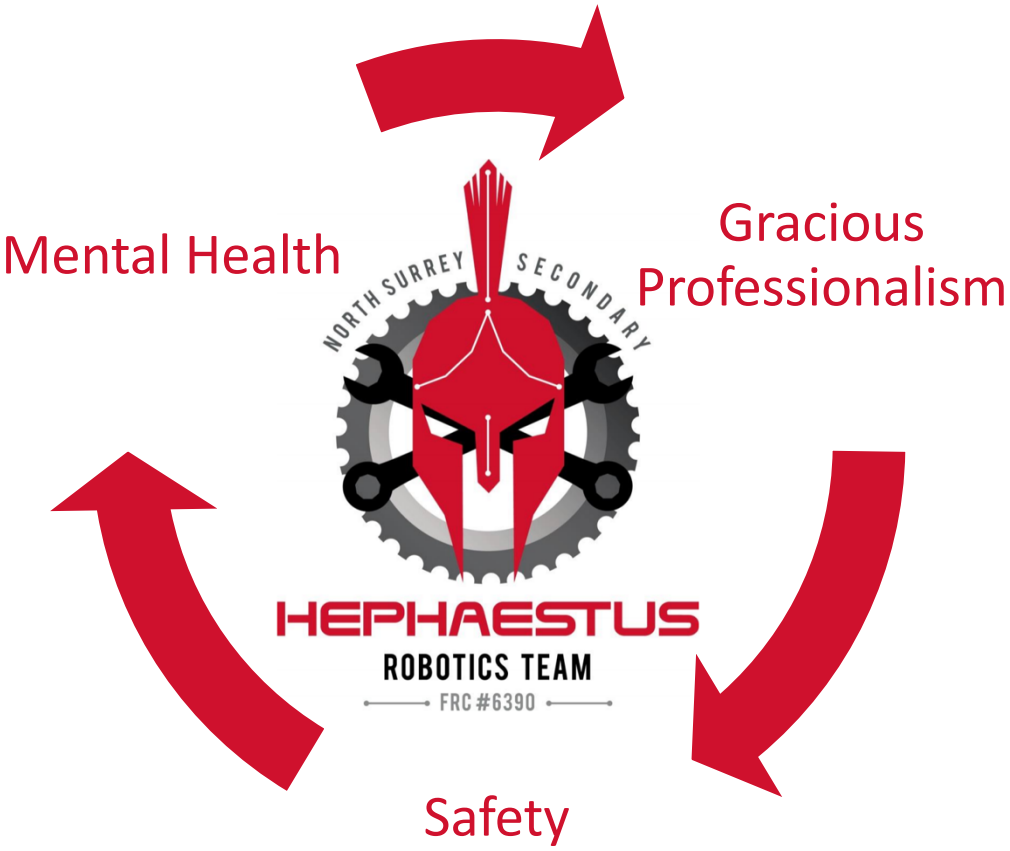


TEAM ROLES

Each member of our team has a significant role to play in contribution to the team's overall development and success. Each member has a key focus area to which they hold themselves accountable, however every member serves the team in multiple supportive roles. Many of our students have designated leadership roles within their key focus area. The team's leadership structure is demonstrated in the diagram provided above.

3.2 – Core Principles

Throughout the robotics season, we teach many principles to our members. Our top three include Safety, Mental Health and Gracious Professionalism. We prioritize these three because we believe it will help our students with their involvement on our team and in their communities. We support many Mental Health initiatives in our community as well as display an excellent range of gracious professionalism in all places.



SAFETY

Safety is a top priority for our team. We ensure that our members are supervised at all times. Every student is given proper equipment and safety training/assessments prior to any hands-on activities in the shops. We will continue to provide in-service training as necessary throughout the year, including Internet Safety lessons. We have designated safety captains to oversee all safety matters and to educate the team on game safety. We encouraged all team members to complete the online Safety Quiz to earn

their safety badge as evidence of their knowledge of safety precautions. We do have certified first aid staff supporting the team, should there be a need.

SAFETY PRECAUTIONS & CONSIDERATIONS

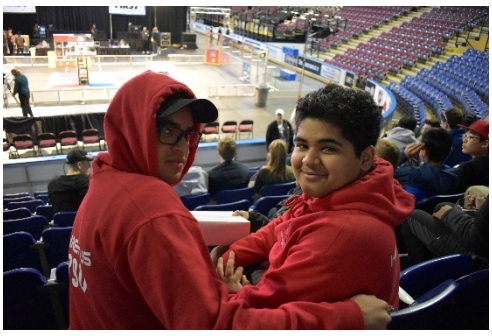
- Learn how to use your tools properly
- Be cautious and aware of your surroundings at all times
- Stored energy hazards:
- Electrical
- Pneumatic
- Batteries
- Springs
- Harmful dust and/or fumes
- Moving parts (gears, chains etc.)
- Electrical hazards
- Personal Protective equipment (safety glasses)
- Proper clothing
- Proper lifting technique
- Report unsafe conditions
- Dispose of worn-out batteries safely
- File down sharp edges on newly cut parts
- Internet Safety is also a concern due to our online presence and social media platforms

SAFETY RULES

- Safety glasses are MANDATORY at ALL times
- Only operate machinery under the supervision of a team Mentor
- Use common sense
- Safety Test is mandatory
- MUST be wearing closed toed shoes to work in shop

3.3 – HUMAN RESOURCES

We recruit students of different talents and strengths to join our team so they can explore their potential and learn new skills whilst participating in robotics events. Announcements are broadcast to notify students who are interested and motivated to attend meetings that gradually introduce them to the well-known FIRST community.



We follow three stages of F.I.R.S.T. programs, the first is FLL Junior for children from Kindergarten to Grade 4 in our catchment area to explore the ideas of S.T.E.M. (Science, Technology, Engineering and Mathematics) on an easily understandable level. The education program featured in our school, grow as the kids themselves grow. For students in Gr. 8, we offer a program called FLL. FLL expands upon the topics previously learned in FLL Junior. Even though some students did not attend FLL Junior, older and more experienced mentors are more than happy to help the younger students with any trouble they may encounter. After the students have passed through Gr. 8, they advance to the highest level of F.I.R.S.T. education that our school provides, FRC (FIRST Robotics Competition).

Team Hephaestus values the behaviour presented by our members. We expect our members to be committed to their responsibilities on the team and attend when most suitable for their schedule. We do not tolerate any abusive language or behaviour towards any of the other students and mentors. Our team believes in a nurturing environment to encourage the learning of all STEM concepts.

4.0 COMMUNITY INVOLVEMENT

4.1 – COMMUNITY OUTREACH GROWTH PLAN

We strive in our outreach by attending events such as Surrey Steps Up, YouthFest, North Surrey Secondary school's carnival and the SD 36 Robotics showcase to reach the community outside of our school. We held robotics workshops in the Surrey Public Library to allow young children to explore and discover STEM. We have reached over 10,000 people through these community events and volunteered over 5,000 hours of our time. Our goal is to introduce as many people as possible to the world of FIRST and STEM. We take initiative to spread the message of FIRST and continue to grow STEM in B.C. We are constantly gaining followers on multiple social media mediums, through which we update our followers on news and events currently going on in our team.

4.2 – MENTORING AND ASSISTING OTHER TEAMS

In previous years, we have mentored three teams: Team 7451 from Cumming, Georgia, Team 7461 from Redmond, Washington, Team 7583 from Sydney, Australia and assisted Team 7805 from Langley, B.C. This year was no exception as we have helped a new team, Team 8082 from Surrey, BC. We graciously offered to assist these teams, guiding them into a FIRST environment whilst helping them grow. We provided the teams with documents such as our sponsorship package, lessons learned, a programming manual as well as other blogs, vlogs and documents that can be found on our website.

4.3 – OFF-SEASON EVENTS

We hold many off-season events for students and prospective members after and before each season. Team Hephaestus continued FLL Jr. last season in 2018 which was successful in mentoring six teams. These teams participated in an Expo where they had a chance to share their creations with

the community and local news. These students attended workshops and finished their project during the off-season. These teams attended the Lower Mainland FLL Jr. Expo. We have now established more teams in Langley and Coquitlam. Continuing off of Last year Team Hephaestus' FLL teams were very successful. We used FLL to give the new grade 8's an experience in stem before the big leap up to FRC. It allows them to be exposed to the FIRST community and helps them get a grasp of what FIRST is all about. This helps to spark their passion for STEM and Robotics, this helps us keep our team going by having an influx of students who are passionate and eager to learn as much as they can.

During the Summer, we initiated a summer robotics camp in our school. Taught by our mentors, we educated students about robotics and the design process. The students used various forms of VEX and Lego Mindstorm kits to learn and create. They got a solid introduction into STEM and what FIRST is like. They worked in teams to solve various challenges. Each group was mentored by one or two of our team members guiding and helping them throughout the program.

4.4 – FUNDRAISERS

Beyond our sponsorship efforts, we have also participated in fundraising efforts to help raise money to have the opportunity to attend FRC events. We offer individual students the opportunity to fundraise in order to offset their individual cost of travel to events. It is a "Scratch-Card" fundraising activity where students could earn up to $100 in fundraising per scratch-card. We partnered with the Spartan Smoothie Co. at our school in a cooperative venture where for a designated time all proceeds from the sales would be donated to our team. We plan to continue to run this activity several times throughout the school year. In the spring/fall and we are looking into holding car washes to raise funds. Along with these fundraisers, we do smaller ones such as Pizza sales, donut sales and more.

5.0 COMMUNITY INVOLVEMENT

5.1 – TEAM GOALS (SHORT & LONG TERM)

- To encourage other schools in our district and across the Lower Mainland to start their own robotics programs.
- Support other FRC teams through mentorship.
- To maintain and grow our membership. To inspire lifelong members who wish to continue to be involved with FIRST beyond secondary school.
- To model and promote Gracious Professionalism in all aspects of our lives.
- Establish partnerships with a Post-Secondary Institute or sponsoring partner with machine capabilities, and potential team mentorship.
- Build a strong foundation for our team that we can develop and build upon each year.
- During our season, we intend to develop a strong network of support for our team through strategic partnerships with a variety of mentors and financial sponsors.
- We aim to provide a positive and enriching learning opportunity which will aid our students in the development of both STEM and leadership skills.

5.2 – LONG TERM GOALS (OVERVIEW)

Year 1: 2016-17

- Attract and maintain membership
- Establish our team identity
- Build a functioning robot
- Introduce ourselves to the community through social media (twitter, Facebook, Instagram, and website)
- Cultivate relationships with experienced FIRST teams
- Educate ourselves on FRC
- Start FLL Jr. teams with our catchment elementary schools
- Acquire necessary tools for our shop
- Skills Development
- Participate in the Western Canadian Regional FRC (and be a contender for

the Rookie All-star award)
- Attend the World Championships in Houston, Texas
- Host FLL Jr. Expo

Year 2: 2017-18
- Continue developing FRC team
- Continue FLL Jr. Teams and bring on a second feeder school to create new teams
- Host a Teacher Information Night to Recruit new FRC teams
- Host FLL Jr. Expo
- Initiate FLL team
- Host Lower Mainland FLL Tournament
- Continue with outreach and mental health initiatives
- Mentor 4 rookie teams (one international team from Mexico)
- Participate at the BC Regional FRC (be picked for an alliance and a contender for the Entrepreneurship or Engineering Inspiration award)
- Bring on 1-2 additional technical mentors with design/engineering expertise

Year 3: 2018-19
- Continue developing FRC and FLL teams
- Continue FLL Jr. Teams and bring on a third feeder school to create new teams
- Host FLL Jr. Expo
- Host Lower Mainland FLL Tournament
- Continue with outreach and mental health initiatives
- Mentor rookie teams
- Participate at the BC Regional FRC (be a first-round pick for an alliance and a contender for the Entrepreneurship or Engineering Inspiration award)
- Participate in the Western Canadian Regional FRC (be a first-round pick for an alliance and a contender for the Entrepreneurship award)

Year 4: 2019-20 (Current Team)
- Continue with all existing teams (include remaining feeder schools on FLL Jr. Teams)
- Host FLL Jr. Expo

- Host Lower Mainland FLL Tournament
- Continue with outreach and mental health initiatives
- Continue mentoring other teams
- Participate at the BC Regional FRC (be an alliance captain and a contender for the Entrepreneurship or Engineering Inspiration award)
- Participate in the Western Canadian Regional FRC (be an alliance captain and a contender for the Industrial design or Engineering awards)

Year 5: 2020-21

- Continue with all existing teams (FRC, FLL, FLL Jr.)
- Initiate FTC team
- Continue with outreach and mental health initiatives
- Host FLL Jr. Expo
- Host Lower Mainland FLL Tournament
- Continue mentoring other teams
- Appeal to Surrey School District to make North Surrey Secondary a choice school for Robotics and Engineering
- Officially make North Surrey Secondary a choice school for Robotics and Engineering within the Surrey School District
- Participate at the BC Regional FRC (be an alliance captain and a contender for the Chairman's Award)
- Participate in the Western Canadian Regional FRC (be an alliance captain and a contender for the Chairman's Award)
- Return to the World Championships in Houston, Texas

5.3 – FRC YEAR 3 TIMELINE (2019/2020)

September

- Youth Fest
- Youth Transforming Society Volunteer Fair
- Advertise the Robotics club and attract student interest
- Seek out possible mentors
- Apply for grants
- Team Building
- Team Management Structure/Roles and Responsibilities
- Safety Training

- Update website and social media platforms
- Establish team communication systems (agendas, meeting schedules, emails...)
- Parent meeting

October

- Halloween fashion show
- BCTF Tech Conference
- Team Parent Night
- Secondary Teacher FIRST Information Night
- Newsletter Sent Out

November

- Pizza Fundraising
- Post-Secondary Information Night
- Sponsorship solicitation began
- Applied for SD36 Priority Practices Grant
- FLL and FLL Jr. Programs
- Update mechanisms on our ShopBot (A basic robot built for generic programming practice)
- Design challenges
- Sourced quotes for T-shirts
- Programming Team practices with our ShopBot
- Ordered additional game pieces
- Parent-Teacher Conference

December

- Pizza Fundraising
- FLL Jr. Expo
- Lower mainland FLL Tournament
- Mailed out Holiday greetings to sponsors, mentors, SD36 district personnel and additional community members
- Sent thank-you letters for Argosy Foundation Grant and Microsoft Grant

January

- FRC Deep Space Kick-off at BCIT

- Build Season Start
- Pizza Fundraising
- Parent meeting
- Organize Parent Volunteers to feed team during build season using Sign-up.com
- Build Season
- Game Strategy
- Design & Prototyping
- Electrical
- Programming
- Order extra parts and materials
- Sponsorships
- Weekend work sessions added to the build schedule
- Researched Veteran FRC teams to learn best practices
- Blue Alliance Research
- Strategy development practice (analyzing previous game challenges)

February

- Robot Built
- Pit Crew, Drive Team and Scouting teams formed
- Chairman's Award Submitted
- Woodie Flowers Finalist Award Submitted
- Dean's List Award Nominations
- Elementary Teacher FIRST Information Night
- Peer Awards Created
- Cut-off for Sponsors to appear on this year's Banners and T-shirts
- Field Trip forms for Victoria Event
- Researched Veteran FRC teams to learn best practices
- Blue Alliance Research (Stronghold season)
- Strategy development practice (analyzing previous game challenges)
- FRC 2020 Reveal Video Created
- Button Making
- Order Mentor and Team Competition T-shirts
- Develop Pick-List Scouting System

March

- Surrey Steps-Up
- Canadian Pacific Regional
- Pit Materials
- Parent-Teacher Night
- PAC meeting demonstration
- Drive team practice
- Complete business plan and judging materials
- ADST elementary weekly workshops continued
- Watch Live-Streaming of Events on weekends
- Order Banners
- Print Thank You Cards
- North Surrey Secondary Staff Meeting Presentation
- Youth Mental Health Association visit
- FLL Jr. Orientation meeting with parents
- Newsletter Sent out
- Researched Veteran FRC teams to learn best practices
- Blue Alliance Research April
- Championships (TBD)
- Newsletter Sent out
- North Surrey Community Carnival

May

- Elementary school visits with robot
- ADST elementary weekly workshops continued
- Surrey Central Library Workshop Program
- Media Releases (recap of season and results)
- YMHA Speak Your Mind Conference at UBC

June

- DST elementary weekly workshops continued
- Elementary school visits with robot
- June 16th Host FLL Jr. Expo (TBD)
- Year-end celebration
- Fundraising (Car washes)
- Robot Demonstrations for Sponsors and Newsletter sent out

6.0 MARKETING PLAN

As a large influence in the FIRST community in BC, we strive to spread knowledge of FIRST all over BC. We engage in many outreach activities and work hard to bring awareness about STEM in BC. We display FIRST and our team in an array of events that many of our teammates volunteer for. These are the mediums at which we use to spread our brand.

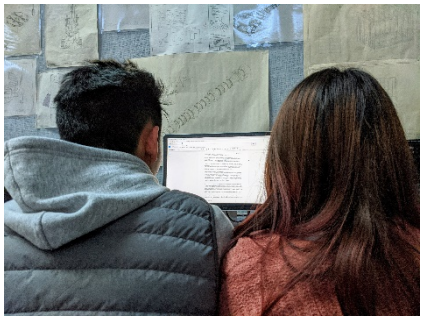
6.1 – MARKETING MEDIUMS

Robot Demonstrations

Team Hephaestus demonstrates our robot to our peers through school events such as Parent-Teacher meetings, Grade 7 visit nights, annual Halloween school fashion show and events such as the District Coding and Robotics Showcase. We are enthusiastic about showing our robot at events like these and enjoy having people who are interested try our robot and experience the same passion we have towards robotics.

FLL/FLL Jr. Expos

Our team has a keen interest in mentoring youth and engaging them in STEM at an early age. We use FLL and FLL Jr. as resources to help spark a passion for STEM in the youth that we mentor. They get full exposure to a FIRST event that we ourselves host at our school. This event attracts hundreds of people from our community and get put in the news.



Newsletters

We send newsletter to our community, sponsors, and parents on a regular basis to notify them about what we are working on and the goals we desire to achieve.

Social Media

on our website and platforms such as Facebook, Twitter and Instagram, we constantly upload events that occurred and progress we have made. Additionally, through our YouTube channel, we post weekly vlogs to help rookie teams.

Community Events

We promote our self at community events such as Surrey Steps Up, libraries, city centres, elementary schools, and "Spartival" (Our school's community carnival). Through these events, we share our interest through explaining what we stand for and what our aspirations are.

7.1 – MEMBER FEE

To join our robotics team, we charge $100 per member annually to partially subsidize the costs for travel and to help to pay for FRC event admission. This allows for financial sustainability for our team in the beginning of the season. This creates a solid foundation for subsidizing travel costs and more. This enables every member to experience FIRST.

7.2 – EXPENDITURES AND INCOME

MONTHLY EXPENSES

FRC Pacific Regional Registration:	$6,500.00
FRC Hawaii Regional Registration:	$6,500.00
FLL and FLL Jr. Lego Kits:	$2,000.00
Bus Travel to Event:	$5,000.00
Robot Parts and Materials:	$4,000.00
Food:	$1,200.00
Cost for Hawaii Regional:	$24,000.00
Transportation/Accommodation:	$10,000.00
Administrative:	$1,000.00
Marketing Banners/Materials:	$1,000.00
Miscellaneous (Computers, One-time purchases, etc.):	$5,000.00

7.3 – SPONSORS

Sponsors are the primary method by which we receive financial support. Our goal is to obtain enough funding to cover the costs of both FIRST registration fees and robot parts. Currently, we have around 11 sponsors and have received donations from several friends and family of team members. We also strive to obtain at least 2 sponsors every year and keep all partners from the previous year. This is accomplished through sponsor recognition, appreciation letters and newsletters.

7.4 – Fundraisers

Beyond our sponsorship efforts, we have also participated in fundraising efforts to help raise money to have the opportunity to attend FRC events. We offer individual students the opportunity to fundraise in order to offset their individual cost of travel to events. It is a "Scratch-Card" fundraising activity where students could earn up to $100 in fundraising per scratch-card. We partnered with the Spartan Smoothie Co. at our school in a cooperative venture where for a designated time all proceeds from the sales would be donated to our team. We plan to continue to run this activity several times throughout the school year. In the spring/fall and we are looking into holding car washes to raise funds. Along with these fundraisers, we do smaller ones such as Pizza sales, donut sales and more.

8.0 STRATEGIC PLAN

8.1 – TEAM STRATEGIES

Team Hephaestus has a plan that supports our mission statement and is used all year to manage risk and enhance team sustainability. The plan identifies four long-term strategies.

HEPHAESTUS TEAM STRATEGIES
GROW A MODEL TEAM
BUILD A SUCCESSFUL ROBOT BY LEARNING
DEVELOP STRONG TEAM LEADERSHIP
DEVELOP A STRONG PRESENCE IN THE FIRST COMMUNITY

8.2 – ACTION PLANS & RISK MITIGATION

We use a variety of approaches to reach out to potential sponsors including personal connections, parts suppliers, online applications, cold-call emails, phone calls and personal visits. This got us the sponsors we needed so that we do not need to solely rely on our school or district to fund us. This also helps us to create connections within our community and surrounding areas. These connections are vital because it opens doors for us in terms of potential sponsors and even mentors. Throughout our first two years we found that getting our name out into the community was vital to getting sponsors. We found this out when a group of team members contacted companies to potentially sponsor us and they had no idea what we were all about! We knew that we needed to become more well known in the community. To accomplish this, we are going out and spreading STEM and FIRST at assorted events throughout our community. All in all, the more connections we have in our community the less risks we will have to deal with. It allows us to have mentors, funds, support in terms of space even but it doesn't protect us from risks like losing support of the school or from key members in leadership positions leaving. To prevent these risks from becoming a reality, we keep good relations with the school board and district to ensure our support. On top of that we have our members in key positions

mentoring the younger generations to prepare them to have to be the leaders on the team someday.

8.3 – SWOT ANALYSIS FOR TEAM HEPHAESTUS

Strengths	Opportunities
● Lots of people = specialized teams, different ideas, more people to spread the message of FIRST ● History of success = knowledge base ● Good image/brand ● Veterans teach new team members mentoring, FLL and FLL Jr. teams ● Community outreach ● Members have strong interest in STEAM curriculum ● Diverse team with good teamwork ● Solid financial resources	● New sponsors (generally one per year) ● Outreach in mentoring FLL and FLL Jr. teams ● Travelling ● Expand Knowledge in STEM
Weaknesses	**Threats**
● Some inefficiency ● Stretched too thin = too many things going on ● Keeping in touch with sponsors ● Limited school support ● Overlapping responsibilities ● Quality control planning ● Reactive purchasing ● Rushing to get things done ● Inconsistent understanding of team member expectations	● Loss of mentors in key team roles ● Loss of financial support ● Loss of build space/equipment ● Loss of School Support ● Loss of means to transport robot ● Loss of members in leadership positions

The Impact of the Club on North Surrey Secondary School and its Students and Community

Our FRC team has had a positive impact on the students of North Surrey Secondary School and our community in several ways.

Team members are directly impacted by this unique learning opportunity. They learn collaboration and team building skills, in addition to a myriad of technical skills, which can then be applied to real-world situations. It is rare for students to have opportunities to apply their learning in such a direct way, and FIRST provides for this previously unmet need for our students.

Our robotics club is a place where students have the opportunity to work as a member of a team. Most of our members have never participated on an athletic team or joined a school club, but have found a place to be part of something bigger than themselves by joining this team. The bond and friendships that the members of the team have created provide the students with a sense of connectedness to our school community that may otherwise not have been established for these students.

A number of our team members are international students whose first language is something other than English. Over the course of the year, we have witnessed a significant improvement in our international students' communication skills and confidence as a result of their participation on the team. The international student coordinator at our school has remarked how impressed she is with the student's growth over the past year as a result of their joining the team.

The robotics team members started the year with little or no leadership experience. Most of the students on our team are grades 8 through 10 and have not had the opportunity to lead in any real capacity in the past. Over the course of the year, these seemingly shy, quiet and self-conscious young people have risen to the leadership challenges that FIRST has presented.

Many have taken on designated leadership roles and learned a great deal in the process. Their individual confidence has grown exponentially over the past year as a result of their participation on the FRC team. We have seen some of our youngest students rise to become our team's most respected and appreciated leaders. The future leadership of this team is truly inspiring, and we have no doubt that it will only develop further with each passing year.

One of the pillars of our FRC team is our commitment to Mental Health. We use our outreach initiatives and our social media platforms to connect with our community and share awareness of and supports for mental health related issues. Through this initiative, our team is able to educate ourselves and others, while having a positive impact on the world in the process. This commitment began as a quest to bring meaning to a tragic loss that our school community experienced in March of 2014, as a result of a beloved staff member's life being taken by a family member with severe mental health issues. Through our outreach, we strive to give support and help heal our community in the hopes that we may help those in need and potentially save a life.

Robotics team members have the opportunity to explore careers related to STEM, Business and Fine Arts. They develop a variety of skills in each of these areas and participation in our program helps open doors and networking opportunities that may lead to internships or potential employment, as well as post-secondary connections that can benefit the students' career paths.

The Scholarship opportunities that FIRST provides and the additional scholarships that our team members qualify for as a result of their participation in the program will open doors for many of our students who would otherwise struggle to pay for their post-secondary education.

We are removing barriers for young women to explore STEM related studies and potential careers. Throughout this year, we have attracted and maintained all of our female membership and our female members have had opportunities to participate in a variety of unique learning experiences as a result. Our female members have participated on work experience placements at Telus World of Science, The Vancouver Aquarium and the SD36/BCIT Women in the Electrical Trade workshop.

Our school is situated closely to a secondary school that is our district's designated choice "Science Academy" school and as such, North Surrey Secondary School's science and technology programs tend to be overshadowed by our neighboring school. With the implementation of our FIRST programs we have already had a significant shift in thinking amongst our feeder elementary schools. Through our outreach program we visit different elementary schools across our district every Wednesday to share our knowledge of STEM. Our visits prompt positive responses from the staff and we have found that students are enthusiastic about attending our school in grade 8 so they can join the FLL team. Students from outside of our catchment area routinely express their disappointment to find out that they cannot come to North Surrey Secondary to join our robotics team, however we plan to use this interest to encourage teams to form and develop across the district. Mentoring our FLL Jr. teams has also contributed to inspiring young people to explore STEM education.

The FIRST programs directly align with the re-designed BC Education Curriculum, and through the implementation of our FIRST programs, we have been leading the way for many departments in our school, as they attempt to find ways to address the curricular shift. Through FIRST we have been able to demonstrate, in a tangible way, how learning can be engaging and relevant for our students. Additionally, the inquiry based, cross-curricular learning that FIRST inspire is an excellent model for all departments within our school.