Welcome to FIRST Robotics Team 2168
The Aluminum Falcons

An overview of FIRST Robotics and the Aluminum Falcons
What is FIRST?

- (F.I.R.S.T.) For Inspiration & Recognition of Science & Technology.
- FIRST has four levels:
  - FRC (FIRST Robotics Competition)
    Grades 9-12
  - FTC (FIRST Tech Challenge)
    Grades 9-12
  - FLL (FIRST LEGO League)
    Grades 4-8
  - Jr. FLL (Junior FIRST LEGO League)
    Grades K-3
What is FIRST?

- Founded in 1989, in Manchester, NH by Dean Kamen
- FIRST is an international program that facilitates Robotics competitions for all pre-college grade levels
- Impact:
  - 248,000+ students
  - 22,475 teams
  - 20,675 robots
  - 66,000+ mentors
  - 33,000+ volunteers
  - 3,500 corporations.
The FIRST Logo.

- Designed by Jack Kamen, the father of Dean Kamen, the FIRST logo was inspired by Archimedes' mathematical discovery.
- Archimedes researched the combination of these geometric shapes, inspired by their symbolic meaning to life.

\[ V_{cone} = \frac{1}{3} V_{cyl} \quad \text{and} \quad V_{sph} = \frac{2}{3} V_{cyl} \]

Thus the total volume of cylinder is equivalent to the volumes of the sphere and cone combined.
Who is Dean Kamen?

- Inventor / Engineer / Entrepreneur
- Attended WPI for Mechanical Engineering
- Recipient of numerous Ph.Ds.
- Founder of the Dekka Corporation
- Recent Inventions:
  - Self Balancing Wheel Chair
  - Segway
  - Mobile Water Purifier
  - Robotic Prosthetic Limbs
Other Important People in FIRST.

- Dr. Woodie Flowers – Professor Emeritus – M.I.T.
  - Co-Founder and National Advisor of FIRST

- Dr. Walt Havenstein – CEO of SAIC – Engineer/Marine
  - Chairman of the Board for FIRST

- John Dudas – Under Secretary of Commerce – Lawyer
  - President of FIRST
Who else supports FIRST?

- Morgan Freeman – Academy/Oscar Winner
  - Will Smith – 2 Time Oscar Nominee
- President Barack Obama – 44th President
  - Grant Imahara – Myth Busters, TV Star – Robotics
- Will.I.Am – Black Eye Peas – 7 Grammy Awards
  - John Jay – 2012 World Series Champion – St. Louis Cards
Why was FIRST started?

- To transform our culture by creating a world where science and technology are celebrated by young people.

- To inspire young people to be science and technology leaders, by engaging them in exciting, fun mentor-based programs that build science, engineering and technology skills, that inspire innovation.

- To foster in students well-rounded life capabilities including self-confidence, communication, and leadership.
What is a FIRST FRC season like?

- **Fall** *(From September to December)*
  - Team building / bonding / relationships established through team programs
  - Learning about engineering, marketing, leadership, communication through hands on projects / classes / mentoring
  - Community outreach / demos / fundraising / sponsor appreciation develop videos / newsletters / website / team apparel / presentation
  - Attend off season competitions / work on new ideas for the spring
  - Mentor elementary and middle school robotics teams in building & programming robots / presentations / working as a team
Pictures from our 2011 Fall Season

Community Service

Team building & socials

Outreach & Pancake Breakfast

Team activities

Car Wash Fundraising
What is a FIRST FRC season like? ...cont’d

- **Spring** (*From January to May*)
- Game is released the 1\textsuperscript{st} week of January
- Teams have six weeks to design, build, and practice with their robot
- Teams bag up their robot at the conclusion of six build weeks around the end of February
- Teams compete in regional competitions around the world for the next six weeks
  - 3 day long events usually (Thurs, Fri, Sat)
- Qualified teams attend World Championships in St. Louis in April to compete for the World Championship.
  - 4 day long event usually (Wed, Thurs, Fri, Sat)
Pictures from our 2012 Spring Season

The challenge ➔ Design ➔ Build ➔ Wire & Test ➔ Compete... ➔ Success! ➔ Generating inspiration
What does FIRST do for me?

- **Now**
  - Provides you an opportunity to participate in the hardest fun you’ll ever have
  - Teaches you how to be a leader, an innovator, a thinker, a role model
  - Fosters motivation, dedication, inspiration, strong character, compassion
  - Educates you in everything from science & engineering to business & leadership

- **In the Future**
  - More scholarship money / More prestigious colleges / More internship opportunities / More engaging job offers
  - Meet and interact with top engineers / CEOs / scientist / entrepreneurs / artist / people with the same passion as you
  - Prepares you for a fast evolving world in both technology and the way the world does business
Nearly $14 million in scholarship opportunities from more than 140 providers, including:
Who the ---- are the Aluminum Falcons?
The team started in 2007, known as Cyber Falcons, after seeing many teams incorporate the word “cyber” into their team name, we looked for a creative distinction.

Like most rookie FIRST teams, the Aluminum Falcons took several years before team began to experience success.

For four years the team did not compete in eliminations and barely had any support from sponsors or school staff.

In 2009 the remaining faithful and patient team members re-organized and renamed to the Aluminum Falcons.

Since the 2011 Season the Aluminum Falcons are 60-17-0, winning 2 events, and expanding every year.
Who the ---- are the Aluminum Falcons? ... cont’d

**Fitch Robotics Culture**
- Mission
- Vision
- Values

**Fitch Robotics Strategic Goals**
- Increase Presence of FIRST in Local Schools
- Increase Participation from Minorities
- Expand our Community Service Effort
- Multiply our Mentoring Activities

**Magnify Community Awareness of FIRST programs**

**Team Brand**
- Challenging students to redefine the future, with their innovation in the present.

**Local & FIRST Communities perception of us**
- Working to improve students education
- Always improving the community
- Innovative Engineering
- Highly Competitive
- Full of Spirit and Determination
Meet the Mentors!

Mr. Chidley
- Team Leader
- Physics Teacher (Fitch HS)

James Corcoran
- Programming Team Leader
- Computer Engineer
- (Electric Boat)

Josh Miller
- Lead Mentor / Driver Coach
- Electrical Engineer
- (Electric Boat)

Aram Mead
- Mechanical Team (CAD)
- Mechanical Engineer
- (Electric Boat)

Justin Foss
- Mechanical Lead
- Mechanical Engineer
- (Parker Hanafin)

Kevin Harillal
- Programming Mentor
- Electrical Engineer (PhD Student)
- (Columbia University)
Meet the Mentors!

**Chris Drew**
- Mechanical Team (Pit Leader)
- Systems Engineer
- (Electric Boat)

**John Holroyde**
- Marketing Team Leader
- Retired Chemist
- (Pfizer)

**Steve Pickering**
- Mechanical Team (Design/Fabrication)
- Mechanical Engineering
- (Electric Boat)

**Kevin Brown**
- Mechanical Team (Design/Build)
- Mechanical Engineer
- (Electric Boat)

**Marie Alyse Pereira**
- Marketing Team
  (Photography / Art / Website)
- Ocean Engineering / Computer Science Student
- (University of Rhode Island)

**TJ Fournier**
- Mechanical Team (CAD)
- Team Support
- Designer
  (Electric Boat)
Meet the “incredible” dedicated Parents!

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<th>Mrs. Entwistle</th>
<th>Mrs. Nado</th>
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<td>- Sponsorship Advisor</td>
<td>- STEM Outreach Lead</td>
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What do we do in the Fall?

- Fall lecture series / Solid Works class / programming class (Approx. 13 weeks)
- Drive team training (Approx. 13 weeks)
- Awards/presentation class (Approx. 3 weeks in November)
- Mock Kick-off (1-2 weeks in December)
- Mentor FLL teams (8-10 weeks (September – October)
- Fall mechanical build projects (Approx. 6 weeks October – December)
- Community fundraisers (2-3 one to two day events September – December)
- Big / Little Falcon program activities (Approx. 12 weeks September – December)
- Sponsorship drives / recruitment (Approx. 8 weeks September – October)
What do we do in the Spring?

- **(January -- Week 1)**
  - Kick-off / brainstorm / strategize / prototype / photos & videos / build practice field

- **(January -- Week 2)**
  - Design & submit robot drive train / photos & videos / award prep. / software dev. / place parts order

- **(January -- Week 3)**
  - Assemble & wire drive train / design & submit superstructure & end effectors / machine robot parts

- **(January -- Week 4)**
  - Assemble & wire superstructure & end effectors / software dev. / team apparel design

- **(February -- Week 5)**
  - Test code and mech. functionality through practice / review awards subm. / draft of scout software

- **(February -- Week 6)**
  - Improve robot performance through code / machine & manufacture spare parts / bag it

- **(March – April -- 8 weeks)**
  - Celebrate, recoup, & prepare / submit awards / driver & scout training / attend regional competitions

- **(January – March-- 10 weeks)**
  - Award preparation / competition handout material / pit display / chairman’s video / robot promo video
  - Drive team training / competition publicity / student & mentor recruitment
What do we do in the Summer?

- Off Season competitions (2-3 events May – July)
- Sponsor Appreciation and Robot Demos (May – August)
- FLL Teacher Training and STEM Outreach Growth (May – August)
- Team Fundraisers (1-2 events June – July)
- Limited Drive Team Training (June – August)
- Website updates / newsletter distribution
- Participation in local parades and fairs
- Reflect on a season well done and prepare for even better upcoming season
Fall Learning Opportunities

- Fall Design Lecture Series (w/hands on projects)
  - Physical Principles / Pneumatic Design / Drive Train Design
  - Gears & DC Motors / Lever Arms & Lifts / Advanced Design

- Programming Class
  - Learn to program FRC robots with Java
  - Learn to program FLL robots with RoboLab from LabView

- Solid Works CAD Class
  - Learn to design robots in Solid Works

- Drive Team Training
  - Learn to drive the robot for competition (see drive team coach for requirements)

- Presentation & Awards Class
  - Mini Series on Presenting / Presentation Development / Awards Development
Roles for Students (Marketing)

- Sponsorship / Grant Acquisition
- Community Fundraising Events
- Website management & design / Newsletter design & distribution
- Award Videos / Promotional Videos / Videography's / Photography
- Artistic pit displays / Team banners / Team apparel
- Award submissions / Presentation development / Presenting
- Demo’s / Community Philanthropy / New Student Recruitment
Roles for Students (Programming & Electrical)

- Beta Testing new FIRST Software & Hardware
- Development of Java code for Kinect control of Robot
- Development of Java code for competition Robot drivetrain & end effector mechanisms
- Developing code for vision processing via the Robot camera.
- Wiring, soldering, connecting the Robots sensors, motor controllers, power distribution, DC motors, solenoids, breakout boards, etc. for competition and test platforms
- Building and testing custom circuits for incorporation into design ideas
Roles for Students (Scouting & Strategy)

- Develop excel based scouting program that provides:
  - Printable stand and pit scouting sheets
  - Fast data entry
  - Downloads match schedule/results from FIRST for data validation
  - Provides trending graphs and statistical graphs
  - Provides pick list and match prediction
  - Provides and compares teams stats from previous competitions
  - Provides photo on scouted teams page

- Attend scouting and strategy classes

- Analyze game and develop match strategy pre-competition season

- Scout matches in the stands and perform pre-match pit scouting

- Video matches for drive team analysis and pre-match strategy
Roles for Students (Mechanical)

- Fall (Off Season) design/build projects
- Off Season robot modifications / maintenance
- Off Season CAD and design classes
- In Season brainstorming / prototyping
- Robot design (via Solid Works)
- Robot part machining and manufacturing
- Robot assembly, test, and improvement
- Robot spare parts manufacturing
- Pit crew members for competition
Team Fall/Spring Programs

- **Big Falcon / Little Falcon Program (Fall & Spring)**
  - A team mentorship / team building program
  - Monthly fun competitions (mini golfing, laser tag, bowling)
  - Group dinners
  - Fun small engineering challenges

- **FLL Mentorship Program (Fall)**
  - Aluminum Falcon students mentor local FIRST FLL teams grades (3-7)
  - Aluminum Falcon students will mentor FLL students on:
    - strategizing for the game
    - building their robot
    - programming their robot
    - improving their robot
    - competing with their robot
    - creating project presentations
Where do you fit in?

- This is a learning and growing opportunity, there are no exams, there are no class grades, only mentors & friends working with you to help you learn and succeed.

- Don’t bite off more then you can handle, FIRST is a commitment and school grades are your priority.

- We expect our student team members to be involved, committed, energetic, considerate, role models, and ready to have fun.

- There are opportunities in all disciplines to be a leader, we look for you to step up.

- You can be involved in multiple groups on the team, just make sure you can support your commitments in each before you take on more.

- We all come with different personalities & experiences, we all have different heritages, we on the Aluminum Falcons respect and support any gender, orientation, and race.
Welcome to the Family!
Thank You!

Questions?