FIRST® TECH CHALLENGE

FIRST® RES-Q℠

2015-2016
Canadian Championship

École Maurice-Lavallée, Edmonton, Alberta

Presenting Sponsor

DOW®

FIRST® Tech Challenge Official Program Sponsor

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FIRST® Tech Challenge
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Software Sponsor

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Official Control System
Sponsor

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FIRST

FIRST LEGO LEAGUE JR.	FIRST LEGO LEAGUE	FIRST TECH CHALLENGE	FIRST ROBOTICS COMPETITION
Grades K-3	*Grades 4-9*	*Grades 7-12*	*Grades 9-12*

Welcome to the FIRST® Tech Challenge (FTC®):

FIRST® Tech Challenge is designed for students in grades 7-12 to compete head to head, using a sports model. Teams are responsible for designing, building, and programming their robots to compete in an alliance format against other teams. The robot kit is reusable from year-to-year and is programmed using a variety of languages. Teams, including Coaches, Mentors and Volunteers, are required to develop strategy and build robots based on sound engineering principles. Awards are given for the competition as well as for community outreach, design, and other real-world accomplishments.

"...to create a world where science and technology are celebrated...
where young people dream of becoming science and technology leaders."
- *FIRST* Founder, Dean Kamen

About FTC

FTC is an exciting and fun global robotics program that ignites an enthusiasm for science, technology and discovery in young people and teaches them STEM skills and concepts, principles of leadership, and how to work as a team.

The competitions are the result of focused brainstorming, dedicated mentoring, project timelines and teamwork. Paired with technical mentors, teams learn from and play with the "pros" to experience engineering problem solving first-hand.

- Entices kids to think like scientists and engineers
- Provides a fun, creative, hands-on learning experience
- Teaches kids to experiment and overcome obstacles
- The skills that they learn make math and science tangible, accessible and real
- FTC is endorsed by the National Association of Secondary School Principals
- Teams learn to document their design ideas and discoveries
- Builds self-esteem and confidence
- 90% of students in FTC report learning how STEM can solve real-world problems

Event Schedule

8:00 ..... Team registration, pit opens
8:15 - 9:30 ..... Inspections, practice matches
8:20 - 9:30 ..... Judge presentation
9:45 ..... Drivers' meeting, matches schedule distribution
10:00 ..... Opening ceremony
10:30 - 12:00 ..... Qualification matches
12:00 - 12:30 ..... Lunch
12:30 - 2:30 ..... Qualification matches resume
2:30 - 3:00 ..... Alliance selection
3:00 - 4:00 ..... Elimination – Semi final rounds
4:00 - 4:30 ..... Elimination – Final matches
4:30 - 5:00 ..... Award and closing ceremony

Times are approximate and subject to change.

Match Play and Elimination Rounds

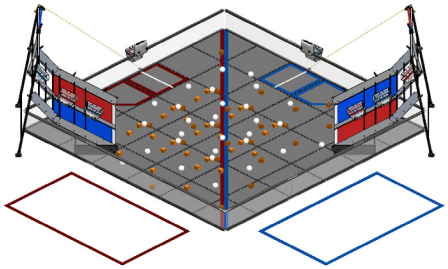
During the **Qualifying Matches**, teams are randomly assigned into alliances of 2 teams. A team's alliance partner in one match may be their opponent in the next match.

Teams will be ranked from first through last on the basis of their total Qualifying Points (QPs). If multiple teams have the same QP total, then teams will be ranked on the basis of their Ranking Points (RPs). If multiple teams have the same RP total as well, then teams will be ranked on the basis of their highest match score. If still tied, the next highest match score will be used until the tie is broken.

> **Qualifying Points:** Teams receive 2 points for a Win, 1 point for a Tie and 0 points for a loss or disqualification (DQ).
>
> **Ranking Points:** All teams receive the score of the losing alliance unless they have a DQ (which gives the team 0 RP).

Alliance Selections are held after all of the qualifying matches take place. Four alliance captains are selected based on the team rankings. These captains then pick one or two (depending on the size of the event) additional teams to be their alliance partners for the Elimination Matches.

During the **Elimination Matches**, Alliances compete to be the first to win two matches in a standard best two out of three elimination round.



The Game:
FIRST® RES-Q℠ is played on a 12 ft. x 12 ft. square field with approximately 1 ft. high walls and a soft foam mat floor. Mountains consisting of alliance-specific climbing areas and goals are located in two corners of the playing field. Alliance-designated Zip Lines extend from the top of the Mountains to the playing field wall. Two alliance-specific Rescue Beacons in need of "repair" by autonomous robots are located on the playing field perimeter wall.

Scoring elements are 14 Climber figurines and 80 Debris in the shape of blocks and spheres. At the start of a match, Debris are randomly located throughout the playing field floor. Each team starts with up to two Climbers that can be pre-loaded onto their robot.

Two randomly selected teams are paired together as an alliance to play one match against a second alliance. Alliances are designated as either "red," or "blue."

Matches have two distinct periods of play: a 30-second Autonomous period followed by a two minute Driver-Controlled period which includes a 30 second End Game.

Autonomous Period:
The game starts with a 30-second Autonomous period where robots are operated via pre-programmed instructions only. Robots gain points by: "resetting" Rescue Beacons, delivering Climbers to a Shelter, parking on the Mountain, and parking in the Rescue Beacon Repair Zone or Floor Goal.

Driver-Controlled Period:
During the Driver-Controlled period, teams retrieve up to five Debris at a time from the playing field and place them in Mountain Goals or Floor Goals. Debris may not be de-scored from the Mountain Goals but may be de-scored from the Floor Goals. Robots also scale the Mountains to release Climbers that slide down a Zip Line to safety.

End Game:
The final 30-seconds of the Driver-Controlled period is called the End Game. In addition to the Driver-Controlled period tasks, robots earn bonus points in the End Game by hanging from the Pull-up Bar on the topmost vertical section of the Mountain and claiming an All Clear Signal for their alliance.

Autonomous Period Scoring:	Points
Robot Parked in a ResQ Beacon Repair Zone	5
Robot Parked in a Floor Goal	5
Robot on the Mountain and Touching the Floor	5
Robot Parked on the Mountain Low Zone	10
Robot Parked on the Mountain Mid Zone	20
Robot Parked on the Mountain High Zone	40
ResQ Beacon Illuminated for an Alliance	20 / side
Climber in a Shelter	10 / Climber

Driver-Controlled Period Scoring:	
Debris Scored in a Floor Goal	1 each
Debris Scored in a Mountain Low Zone Goal	5 each
Debris Scored in a Mountain Mid Zone Goal	10 each
Debris Scored in a Mountain High Zone Goal	15 each
Robot on the Mountain and Touching the Floor	5
Robot Parked on the Mountain Low Zone	10
Robot Parked on the Mountain Mid Zone	20
Robot Parked on the Mountain High Zone	40
Climber Released/Slid Down the Zip Line	20 each
Climber in a Shelter	10 / Climber

End Game Scoring:	
Robot Completely Supported by the Pull-up Bar	80
Claim an All Clear Signal	20 / Signal

Team Advancement

Teams advance from the FTC Canadian Championship Tournament directly to the FTC World Championship in the order indicated below, according to the number of spots available.

1. Inspire Award Winner
2. Winning Alliance Captain
3. Inspire Award, 2nd place
4. Winning Alliance Partner
5. Inspire Award, 3rd place
6. Think Award Winner
7. Finalist Alliance Captain
8. Finalist Alliance Partner
9. Rockwell Collins Innovate Award Winner
10. PTC Design Award Winner

Participating Teams

Team	Team Name	School/Organization	City
521	Bots of Thunder	Blessed Sacrament School	Wainwright
3491	FIX IT	Victoria Robotics Club	Victoria, BC
4169	Space Cadets	Lacombe Composite High School	Lacombe
5009	Helios	École Maurice-Lavallée	Edmonton
5424	Blake Cores Team	Lacombe Composite High School	Lacombe
5425	404 Team Name Not Found	Lacombe Composite High School	Lacombe
8287	Thurber 1	Lindsay Thurber Compre. High School	Red Deer
8288	Thurber 3	Lindsay Thurber Compre. High School	Red Deer
8289	Thurber 4	Lindsay Thurber Compre. High School	Red Deer
8038	The Bright Sparks	Lillian Osborne High School	Edmonton
9555	Y Robots	Lillian Osborne High School	Edmonton
9726	Thunderbots	Blessed Sacrament School	Wainwright
10015	SWAT Bots Minions	Airdrie Community Team	Airdrie
10036	Tiger Terminators	Gilbert Paterson Middle School	Lethbridge
10049	URL	Lacombe Composite High School	Lacombe
10325	Wilson Middle School Robotics	Wilson Middle School	Lethbridge
10544	Cyber Eagles	Strathcona Christian Academy Secondary	Sherwood Park

FIRST Tech Challenge Awards

Dean's List Finalists

FIRST Dean's List Finalists are outstanding student leaders whose passion for and effectiveness at attaining FIRST ideals is exemplary. These students were nominated by their teams for their direct contributions and impact on others exemplifying leadership and commitment, on their FTC team, in their school, and in their community. FIRST Dean's List Finalists, recognized here today, are also our nominees for the FIRST Dean's List at the Championship.

Inspire Award

This judged award is given to the team that truly embodied the 'challenge' of the FTC program. The team that receives this award is a strong ambassador for FIRST programs and a role model FTC team. This team is a top contender for many other judged awards and is a gracious competitor. The Inspire Award Winner is an inspiration to other teams, acting with Gracious Professionalism™ both on and off the playing field. This team is able to communicate their experiences, enthusiasm and knowledge to other teams, sponsors, their community, and the Judges. Working as a unit, this team will have demonstrated success in accomplishing the task of designing and building a robot.

The winner of the Inspire Award at each tournament level has received an automatic invitation to the next tournament level. Once a team has won an Inspire Award at a Championship, they are no longer eligible to win the Inspire Award at additional championship tournaments they may attend. Similarly, once a team wins an Inspire Award at a Qualifying tournament or League Championship, they are no longer eligible to win the Inspire Award at subsequent Qualification tournaments or League Championships within the same region.

Rockwell Collins Innovate Award

Bringing great ideas from concept to reality.

The Rockwell Collins Innovate Award celebrates a team that not only thinks outside the box, but also has the ingenuity and inventiveness to make their designs come to life. This judged award is given to the team that has the most innovative and creative robot design solution to any or all specific field elements or components in the FTC game. Elements of this award include elegant design, robustness, and 'out of the box' thinking related to design. This award may address the design of the whole robot, or of a sub-assembly attached to the robot. The creative component must work consistently, but a robot does not have to work all the time during matches to be considered for this award. The team's Engineering Notebook should be marked with journal entries to show the design of the component(s) and the team's robot in order to be eligible for this award, and entries should describe succinctly how the team arrived at that solution.

PTC Design Award

Industrial design at its best.

This judged award recognizes design elements of the robot that are both functional and aesthetic. All successful robots have innovative design aspects; however, the PTC Design Award is presented to teams that incorporate industrial design elements into their solution. These design elements could simplify the robot's appearance by giving it a clean look, be decorative in nature, or otherwise express the creativity of the team. The winning design should not compromise the practical operation of the robots but complement its purpose. This award is sponsored by Parametric Technology Corporation (PTC), developers of the CAD tools, Creo and Mathcad. PTC gives licenses to the FTC student teams for these software products to help them with their designs.

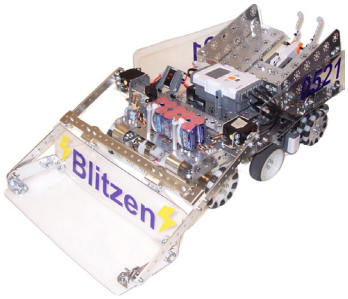
Think Award

Removing engineering obstacles through creative thinking.

This judged award is given to the team that best reflects the journey the team took as they experienced the engineering design process during the build season. The Engineering Section of the notebook is the key reference for judges to help identify the most deserving team. The team's Engineering Section should focus on the design and build stage of the team's robot. Journal entries should include those describing the underlying science and mathematics of the robot design and game strategies, the designs, re-designs, successes, and those interesting moments when things weren't going as planned. A team is not a candidate for this award if they have not completed the Engineering Section of the Engineering Notebook.

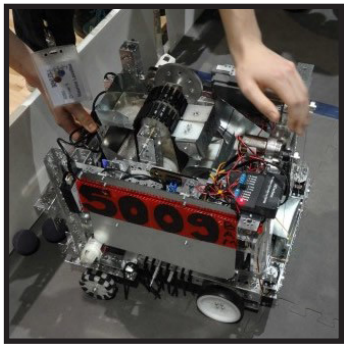
FTC Alberta Inspire Award Hall of Fame

2010-2011: Get Over It!



Team 521
BSS Thunder
Blessed Sacrament School
Wainwright, Alberta

2011-2012: Bowled Over!

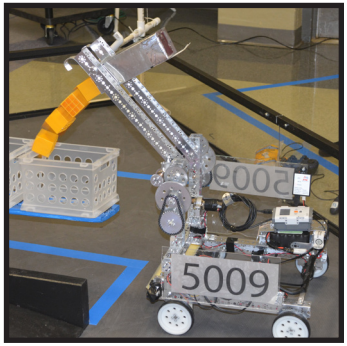


Team 5009
Les coureurs des bois
École Maurice-Lavallée
Edmonton, Alberta

2012-2013: Ring It Up!

Team 5955
SWAT Bots
Airdrie Community Team
Airdrie, Alberta

2013-2014: Block Party!



Team 5009
NetZero
École Maurice-Lavallée
Edmonton, Alberta

2014-2015: Cascade Effect

Team 5009
Helios
École Maurice-Lavallée
Edmonton, Alberta

2015-2016: FIRST RES-Q

Will it be your team???

Thank You!

Thank you to all who help make this program possible for our youth. FIRST® could not exist without the support of the army of mentors, parents, teachers, and volunteers who step up to provide their time and expertise to inspire our young people to get excited about science, technology, engineering and math.

Our Volunteers!

David Caron: Head referee
Dugal Caufield: Referee
Jean-Marc Cloutier: Field Technical Advisor
Marc de Montigny: Judge
Ronald Déry: Game announcer
Félix Dionne: Robot inspector
Michel Gariépy: Field manager
Éric Gorsy: Scorekeeper
Serge Grenier: A/V & Streaming
James Hryniw: Control System Advisor
Kevin Khan: Referee
Rock Larochelle: Registration desk
Nathan Liebrecht: Help desk
Philippe Manseau: Tournament director
Sandra Manseau: Referee
Katherine McKinnon: Dean's List
Brian McLachlin: Judge advisor
Modeste Messou: Help me!
Jean Mongrain: Judge
Dhiren Patel: Photographer
Raoul Pelchat: Queuer
Vlad Pasek: Judge
Russell Weir: Dean's List

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École Maurice-Lavallée