Welcome
SPECTATORS!

FIRST® Progression of Programs *FIRST®* is the world's leading child-serving nonprofit advancing science, technology, engineering, and math (STEM). For nearly 30 years, *FIRST* has evolved into a global movement by engaging millions of people with a proven game-changer for preparing kids to solve the world's greatest problems. *FIRST* programs inspire innovation and leadership through engaging, hands-on robotics challenges developed to ignite curiosity and passion in students in grades K-12. *FIRST* builds powerful mentorship relationships between young people and STEM professionals, helping kids gain confidence to explore the innovation process while they learn valuable science, engineering, technology, teamwork, and problem-solving skills. *FIRST* creates the people who will change the world – today and tomorrow.

FIRST
LEGO® LEAGUE JR.

FIRST® LEGO® League Jr. teams build and program a model that moves using LEGO® Education WeDo and present their research journey on a *Show Me* poster.

Children, Ages 6-10 (Grades K-4), get to:

- Design and build a Challenge-related model and make it move using LEGO WeDo
- Create a *Show Me* Poster and practice presentation skills
- Explore challenges facing today's scientists
- Discover real-world math and science
- Begin developing teamwork skills
- Participate in expos
- Engage in team activities guided by *FIRST* LEGO League Jr. Core Values

FIRST
LEGO® LEAGUE

FIRST® LEGO® League teams build LEGO®-based robots and develop research projects based on a real-world Challenge that changes annually. Their activities are guided by *FIRST* LEGO League Core Values.

Students, Ages 9-16* (Grades 4-8), get to:

- Create innovative solutions to challenges facing today's scientists
- Strategize, design, build, program, and test an autonomous robot using LEGO MINDSTORMS® technology
- Apply real-world math and science concepts
- Develop career and life skills including critical thinking, time management, collaboration, and communication while becoming more self-confident
- Become involved in their local and global community
- Participate in official tournaments and local events
- Engage in team activities guided by *FIRST* LEGO League Core Values

*Ages vary by country

FIRST
TECH CHALLENGE

FIRST® Tech Challenge students learn to think like engineers. Teams build robots from a reusable kit of parts, develop strategies, document their progress, and compete head to head.

Students, Ages 12-18 (Grades 7-12), get to:

- Design, build, and program robots
- Model a real-world engineering process
- Apply math and science concepts
- Develop strategic problem-solving, organizational, and team-building skills
- Build life skills while building robots and work towards participating in tournaments and *FIRST* Championship
- Compete and cooperate in Alliances at tournaments
- Access exclusive scholarships from hundreds of colleges/universities

Rockwell Collins is the *FIRST* Tech Challenge Official Program Sponsor
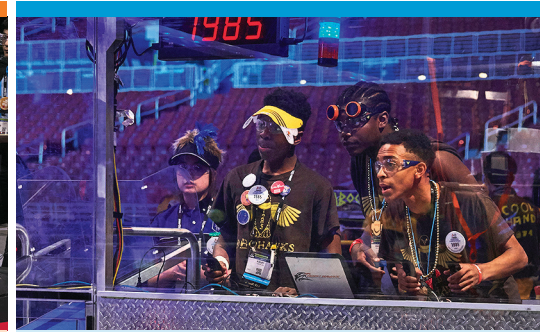
FIRST
ROBOTICS COMPETITION

FIRST® Robotics Competition teams compete with 120-pound robots of their own design, combining the excitement of sport with the rigors of science and technology.

Students, Ages 14-18 (Grades 9-12), get to:

- Work alongside professional engineers
- Build and compete with a robot of their own design
- Learn and use sophisticated hardware and software
- Develop design, project management, programming, teamwork, strategic thinking, and *Coopertition®* skills
- Earn a place in the *FIRST* Championship
- Access exclusive scholarships from hundreds of colleges/universities

At the heart of *FIRST* are its Core Values, which emphasize the contributions of others, friendly sportsmanship, teamwork, learning, and community involvement. These include: **Gracious Professionalism®** – *Respect for others, being a good sport, and sharing what you learn.* **Coopertition®** – *Competing hard, but also helping the other teams.*

FIRST

FOR INSPIRATION & RECOGNITION OF SCIENCE & TECHNOLOGY

For information about *FIRST®* in your area: **www.firstinspires.org/contactus**

FIRST® Tech Challenge Game

FIRST® **RELIC RECOVERY**ˢᴹ Presented by Qualcomm® Incorporated is played on a 12 ft. × 12 ft. (3.7m × 3.7m) square field with approximately 1 ft. (0.3m) high walls and a soft foam mat floor. The object of the game is to attain a higher score than the opposing alliance by (1) scoring Glyphs into the Cryptoboxes and completing rows, column, and ciphers, (2) transferring Relics to the Recovery Zone, (3) retrieving Jewels, (4) parking on the Balancing Stones, and (5) navigating to specific parts of the Playing Field.

The field is divided in the middle into a "red" and a "blue" side corresponding to the two alliances. In the center of the field is a taped off area that hold the Glyphs. The scoring elements for *FIRST* RELIC RECOVERYˢᴹ are 48 alliance-neutral Glyphs (24 gray and 24 brown), 8 alliance-specific Jewels (4 per alliance) and 4 alliance-specific Relics (2 per Alliance). There are 4 alliance-specific Cryptoboxes (2 per Alliance) with taped off safe zones in front of each. There are 4 alliance-specific Balancing Stones (2 per Alliance) on which Robots begin and end the game. There are also 2 off-field alliance-specific Recovery Zones where robots place recovered Relics at the end of the match.

Matches have two distinct periods of play: a 30-second Autonomous period followed by a two-minute Driver-Controlled period. The last 30 seconds of the Driver-Controlled period is called the End Game which adds new scoring opportunities for robots to achieve.
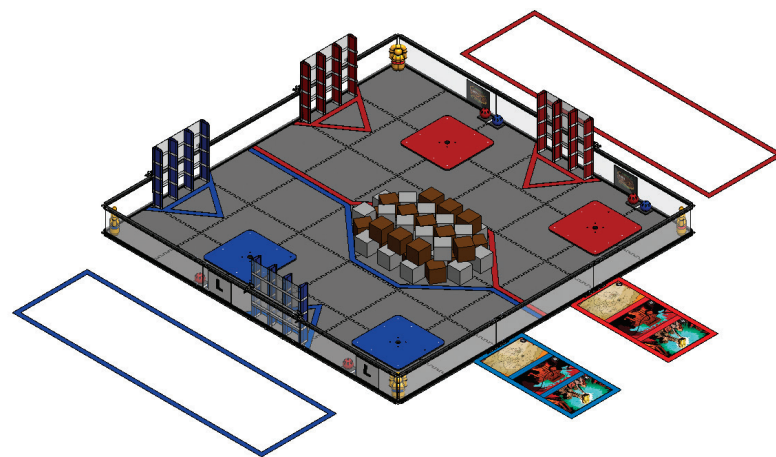
AUTONOMOUS PERIOD
During the Autonomous period, Robots operate using only pre-programmed instructions. Alliances earn points by: (1) selecting and removing opponent colored Jewels from platforms, (2) scoring Glyphs into the Cryptoboxes, and (3) parking their Robot in a Safe Zone in front of their Cryptobox.

DRIVER-CONTROLLED PERIOD
During the Driver-Controlled period, alliances earn points by: (1) Scoring Glyphs into their Alliance's Cryptoboxes and (2) Creating Cipher patterns with their Glyphs in the Cryptoboxes.

END GAME
The final 30 seconds of the Driver-Controlled Period is called the End Game. In addition to the previously listed Driver-Controlled Period scoring activities, alliances earn points by (1) moving their Relics to safety in their Recovery Zone and (2) balancing Robots on the Balancing Stones.

Autonomous Period Scoring	Points
Alliance-specific Jewel remaining on platform	30 points
Glyph scored in Cryptobox	15 points/glyph
Glyph bonus for Cryptobox Key column	30 points
Robot Parked in Safe Zone	10 points

Driver-Controlled Period Scoring	Points
Glyph scored in Cryptobox	2 points
Completed Row of 3 in Cryptobox	10 points
Completed Column of 4 in Cryptobox	20 points
Completed Cipher	30 points

End Game Scoring	Points
Relic in Recovery Zone #1	10 points
Relic in Recovery Zone #2	20 points
Relic in Recovery Zone #3	40 points
Bonus for keeping Relic Upright	15 points
Robot balanced on Balancing Stone	20 points

PRESENTING SPONSOR

Qualcomm

FIRST TECH CHALLENGE