

Bringing STEM to Life

Engaging Students Through Robotics Programs



WHY ROBOTICS?



Creativity and
Problem Solving



Collaboration and
Teamwork



Applied STEM and
Communication Skills



Community Building
and Workforce
Development

It's not just about building robots.

**FIRST
LEGO
LEAGUE**

EXPLORE



Grades 1-4

**FIRST
LEGO
LEAGUE**

CHALLENGE



Grades 4-8

**FIRST
TECH
CHALLENGE**



Grades 6-12

**FIRST
ROBOTICS
COMPETITION**



Grades 9-12

FIRST LEGO LEAGUE EXPLORE

Grades 1-4



FIRST LEGO League Explore



Students participate in the following

- Use LEGO SPIKE Essentials robot and learn introductory coding and engineering.
- Learn about and explore a seasonal theme
- Design and create a LEGO model with a motorized part.
- Learn to work as a team.
- Share what they have learned at a Festival.



FIRST LEGO League Explore | Team Basics



Team Requirements

- 2-6 Students
- LEGO SPIKE Essential or We-Do robot kit*.
- National Team Registration with *FIRST*.
- Event Registration with High Tech Kids.

Yearly Costs

- \$250 National Team Registration, includes mat & models
- \$130 Festival Team Registration
- Robot is a one-time investment, prices vary.



*As of June 2026 the LEGO SPIKE Essential Kit has been retired. Kits can be found from 3rd party sellers. Check the Minnesota *FIRST* LEGO League Facebook Group for local sellers.



FIRST LEGO League Explore | Engagement



Engaging and Learning Through Play.

- Teams use LEGO bricks to turn their ideas into physical creations.
- Introduction to programming and technology.
- Students realize there is not one right answer. They are encouraged to use creativity to imagine, design, build, test, and improve.
- Students learn how to be on a team by cooperating and learning how to agree.
- Teams showcase their work at Festivals building confidence as they share.

FLL Explore is a great entry point into team robotics and can easily be integrated into the school day.



FIRST LEGO LEAGUE CHALLENGE

Grades 4-8



FIRST LEGO League Challenge



FLL Challenge teams will engage in the following:

- Build, design, and program a LEGO robot.
- Develop a robot strategy to accomplish missions for a 2 ½ minute Robot Game.
- Research a real-world problem and develop a solution.
- Present the Research solution and Robot Design process to a panel of judges.
- Celebrate *FIRST* Core Values – *Discovery, Innovation, Impact, Inclusion, Teamwork,*



FOUNDERS EDITION



FUTURE

EDITION

FIRST LEGO League Challenge | Team Basics



Team Requirements

- 2-10 Students
- LEGO SPIKE Prime, EV3 or NXT Robots*.
- National Team Registration with *FIRST*.
- Event Registration with High Tech Kids.

Yearly Costs

- \$285 National Team Registration
- \$105 Challenge Kit (robot game mission models & mat)
- \$250 Qualifier Registration.
- Robot is a one-time investment, prices vary.

*As of June 2026 the LEGO SPIKE technology has been retired. EV3 and NXT MINDSTORMS kits are also retired. Kits can be found from 3rd party sellers. Check the Minnesota *FIRST* LEGO League Facebook Group for local sellers.

FOUNDERS EDITION



FIRST LEGO League Challenge | Engagement



Hands-on building, coding, and teamwork puts computer science concepts into practice.

- Teams research a real-world challenge and connect with industry experts.
- Students experience firsthand that engineering is an ongoing process as they test, troubleshoot, and improve their robot and research project solutions.
- Students take ownership and have an active role in deciding how to strategize and problem solve.
- Teams learn how to effectively share their ideas, practice their public speaking and presentation skills.
- A sense of belonging is created. Kids become part of a team and larger STEM community.



FLL Founders Edition v. Future Edition



Founders Edition (traditional FLL Challenge)

- Allowable robots: SPIKE Prime, EV3, NXT
- 2-10 Students per team
- Robot is fully autonomous and game is played on an 8' x 4' field
- Competition structure – 2 judging sessions, 4 robot matches
- Advancement opportunities to State Championship, World Festival, and Invitationals

Future Edition

- Allowable kit: LEGO Education Computer Science & AI Kit
- 4-8 Students per team
- Two (2) Kits are required to play the game
- Robot is driven and game is played on a 4' x 4' field
- Competition structure is still TBD.
- Advancement opportunity to Invitational(s)



Note: *FIRST* will be developing a new K-8 program for the 2027-28 season.

FIRST TECH CHALLENGE

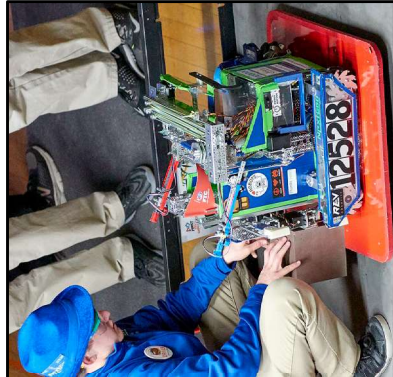
Grades 6-12



FIRST Tech Challenge

An exciting program designed to encourage participants to think outside the box and work as a team.

- Teams develop a game strategy, build & program a robot, and participate in community outreach.
- Teams continue to iterate their robot throughout the season as they compete in multiple events.
- Teams are encouraged to go into the community to connect with industry and participate in advocacy.
- *FIRST Core Values – Discovery, Innovation, Impact, Inclusion, Teamwork, Fun!*



***FIRST*Tech Challenge | Team Basics**

Team Requirements

- 2-15 Students
- 2 Adult Coaches
- Robot Kit (goBuilda, REV, Studica, AndyMark)
- National Team Registration with *FIRST*
- Event Registration with High Tech Kids

Yearly Costs

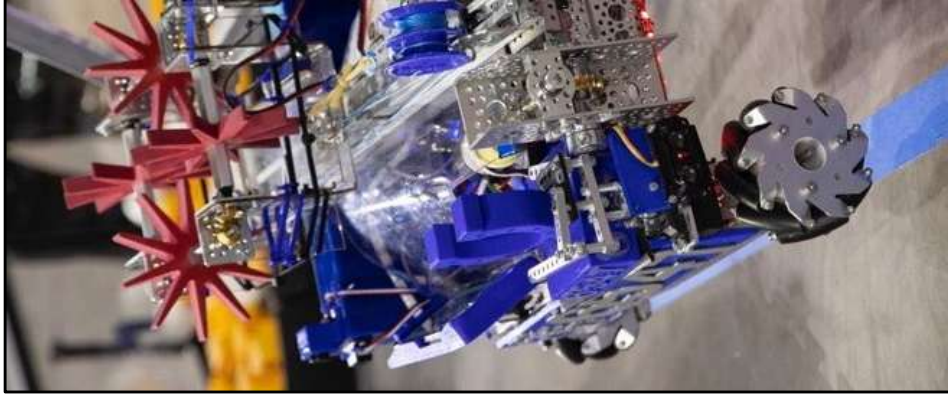
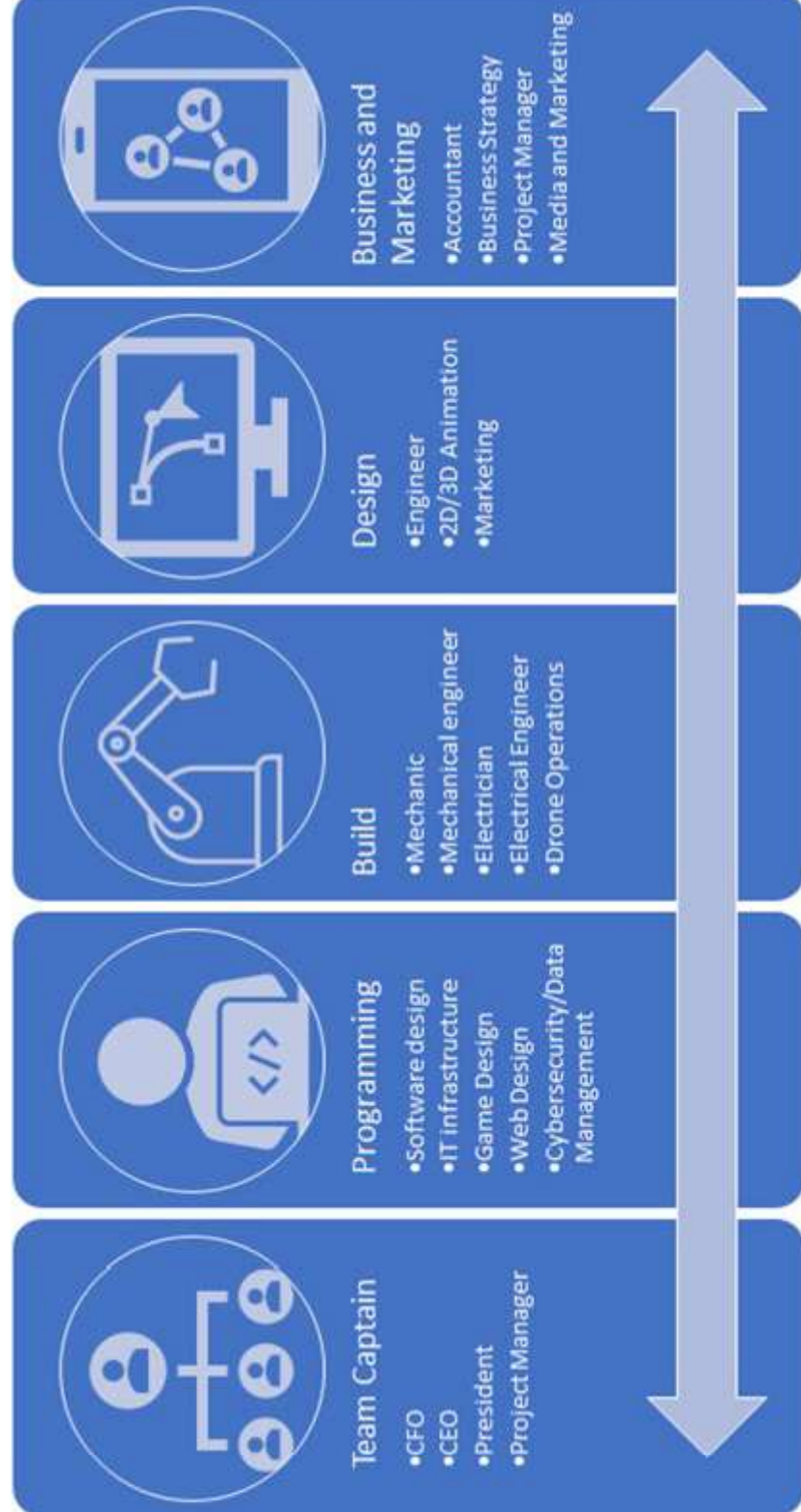
- \$350 National Team Registration
- \$566 Robot Game Elements (optional to purchase)
- \$355 Qualifier Registration (per team, per event)
- Robot & Field Perimeter are one-time investments, prices vary



FIRST Tech Challenge | Engagement

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Preparing Students for Careers





STUDENT OUTCOMES

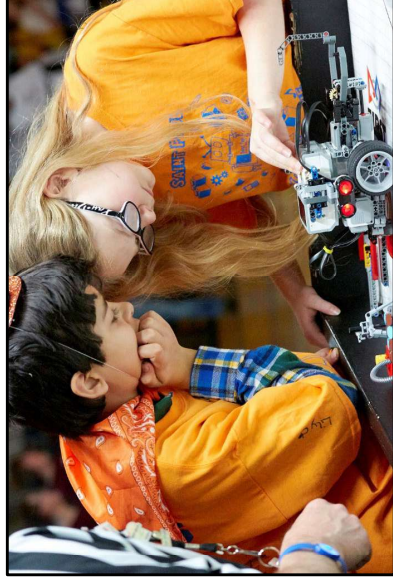
Increasing interest in STEM



Student Outcomes

STEM workforce skills learned instill a sense of accomplishment and self-confidence.

- STEM and technical skills including Strategy, Innovation, and Iteration.
- Building and the Engineering Design Process.
- Programming skills including JAVA, Blocks, CAD, 3D Printing, App development, Computer Vision & Object Detection.
- Research and data analysis, working all the way from research to final solution.
- Public Speaking, Presentation and Community Outreach Skills.
- Peer Collaboration and career focused hands-on learning in a team environment.





IMPLEMENTATION

Forming Teams and Getting Started



Season Schedule

Summer	National Registration Opens
Early August	FLL Game Release
Early September	FTC Kickoff
Late September/Early Oct	MN Event Registration
September – February	Design, Build, Iterate
November – January	Qualifying Events
February	High Tech Kids MN State Championship
May	FIRST World Championship



Team Models

School Based Team Model

- Managed by the school (admin or teacher) or parent organization.
- School determines student fee, if any.
- Teams led by school staff and/or parents (2 adults/team).
- Meets at the school in a dedicated space.

Alternate Models

- Community Education
- Student groups – 4H, Scouts, Robotics Clubs, etc.
- Group of Friends, often former FLL team.
- Integrated into the school day.



Forming Teams and a Program

Identify Your Students & Choose your Program

- What age group are your students and what is their experience level?
 - Elementary – FLL Explore or FLL Challenge (Future or Founders)
 - Middle School – FLL Challenge or FTC
 - High School – FTC



Choose Your Meeting Place

- It should be large enough and have the resources such as internet access, building space, storage, etc.

Talk with your Organization/School

- If you are part of an organization discuss any student fees and rules.
- Can they provide a meeting space?
- Can they offer support? Use of a Fab Lab or other equipment? Bussing to events?
- If they collect fees, will they pay your team registration and event fees?

Team Grants

Team Grants

- See the High Tech Kids Team Funding page.
 - MN only grants, use the HTK “Common App”.
 - Grants issued on a rolling basis until funds are depleted.
- National Grants are listed on the *FIRST* site.
 - Link found on the HTK Team Funding page.



Team Funding Page



Resources

Training Opportunities

- High Tech Kids offers a variety of training for all programs.
- FTC holds a Kickoff event for teams – September 12, 2026
- Most training is free of charge.
- Training schedules are listed on the HTK website.

Connect & Discover

- Join the FTC MN Coach Slack Channel.
- Join the Minnesota *FIRST* LEGO League FB group
- Follow High Tech Kids on FB and Instagram
- Check out the *FIRST* online guidebooks.
- Explore online tutorials.



Finding Help

Connect with High Tech Kids.

- High Tech Kids is an email or phone call away.
- Subscribe to our newsletter(s) and stay up to date.
- Have Fun. The kids will surprise you.



Subscribe

Robotics programs don't simply teach students how to build robots. They give students a reason to create, collaborate, solve problems, and keep going when things don't work the first time.

Our job is to create the opportunity and then get out of the way and let students discover what they're capable of.

THANK YOU!



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