



Introduction to FIRST and FLL

by Circuit Breakers - FTC Team 13353



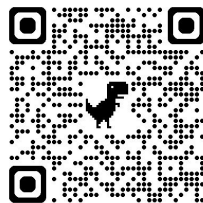
LOUDOUN ROBOTICS

BUILDING TOMORROW'S INNOVATORS TODAY!



**FIRST
LEGO
LEAGUE**

VIRGINIA + WASHINGTON, D.C.



Introduction

Welcome to our FTC Robotics Team Educational Outreach Session! We're thrilled that you are here and we are excited to share our knowledge about the amazing world of STEM and robotics.

Our team: We are the "Circuit Breakers - Team 13353" an FTC robotics team from Aldie, Virginia. Our team consists of passionate high school students who love to design, build, and program robots to solve complex challenges.

Today's agenda: In this session, we'll provide an overview of FIRST, FIRST robotics programs, FLL Explore specifically, and lead a hands-on robotics exercise.

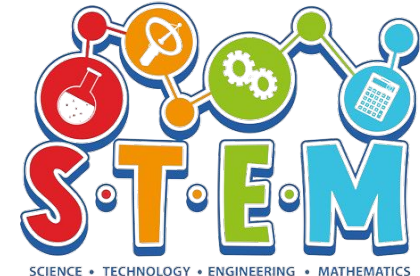
Get ready for an engaging and informative experience!



Importance of STEM

STEM stands for Science, Technology, Engineering, and Mathematics. These disciplines are crucial for solving real-world problems and driving innovation in various fields.

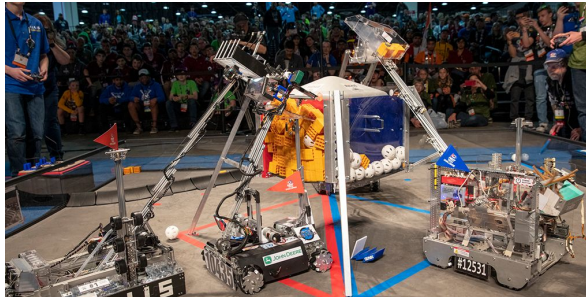
STEM careers offer exciting opportunities, competitive salaries, and the chance to make a positive impact on society. From developing new medical treatments to designing sustainable solutions, STEM professionals are at the forefront of shaping our future.



Benefits of FIRST Robotics

Participating in FIRST robotics programs helps students develop valuable skills such as problem-solving, teamwork, and leadership.

FIRST robotics offers opportunities for scholarships and networking. Many colleges and universities recognize the value of FIRST experience and offer exclusive scholarships to participants. Additionally, students can connect with industry professionals and mentors who can provide guidance and support throughout their academic and professional journey.



Overview of FIRST Programs

FIRST Lego League (FLL): Grades Pre-K - 8



FLL introduces younger students to the basics of robotics and research projects. Participants work in teams to design and program LEGO robots to complete missions on a themed playing field. They also research and present solutions to real-world problems related to the annual challenge theme. Sub programs: Discover, Explore and Challenge

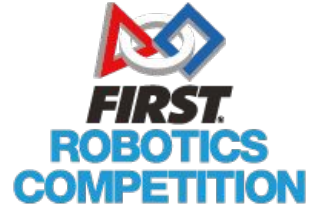
FIRST Tech Challenge (FTC): Grades - Middle and High school



FTC is a mid-level robotics competition where teams design, build, and program robots using an Android-based control system. The robots compete on a 12'x12' field, completing tasks such as scoring objects, navigating obstacles, and interacting with game elements. FTC emphasizes gracious professionalism and coopertition (cooperation + competition).



Overview of FIRST Programs



FIRST Robotics Competition (FRC): High School

FRC is an advanced robotics competition where high school students work alongside professional mentors to design, build, and program large-scale robots. The robots compete in a fast-paced, exciting game that changes every year. FRC teams have just six weeks to build their robot before competing in regional and championship events. Table comparing key features of FLL, FTC, and FRC:



FLL Explore & the 2024-2025 SUBMERGEDSM Season

FLL Explore: Where Young Minds Explore, Create, and Share!

Target Age Group: Children ages 6-10 (Grades K-4).

Team Structure: Teams of 2-6 children, guided by 1-2 adult coaches.

Focus: Introduces STEM concepts through a fun, hands-on, and engaging annual theme.

Learning Philosophy: Non-competitive, celebration-focused. It's about the journey and discovery, not winning.



FLL Explore - Core Values

The Core Values - The Heart of FIRST and Guiding Principles for Everything We Do

- **Discovery:** We explore new skills and ideas.
- **Innovation:** We use creativity and persistence to solve problems.
- **Impact:** We apply what we learn to improve our world.
- **Inclusion:** We respect each other and embrace our differences.
- **Teamwork:** We are stronger when we work together.
- **Fun:** We enjoy and celebrate what we do!



FLL Explore - What does a team do?

Annual Theme: Each year presents a new real-world challenge.

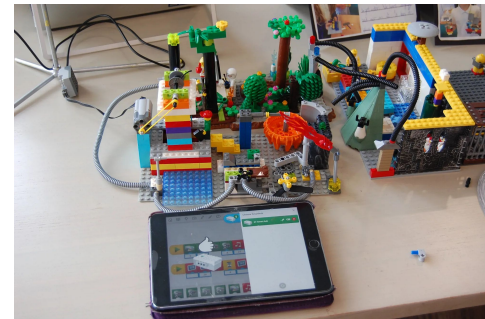
Explore Set: A unique LEGO set tied to the theme, providing inspiration and special parts.

LEGO Model: Teams design and build a model related to the theme, incorporating a motorized part using LEGO Education SPIKE™ Essential or WeDo 2.0.

Show Me Poster: Teams create a poster to share their research, model, and team journey.

Engineering Notebooks: Individual journals for ideas, drawings, and learning.

Team Meetings: Guided sessions to research, build, code, and practice Core Values.



FLL Explore - Season Spotlight: 2024-2025 SUBMERGEDSM

Dive Deep into the SUBMERGEDSM Challenge!

Theme Overview: Teams will explore the fascinating world of our oceans.

Learning Focus (Explore specific): Investigate the journey of water and energy within marine environments.

- Where does energy come from in ocean ecosystems?
- How is it used by marine life?
- What is the impact of human activities?

Challenge: Imagine and innovate ways to understand, protect, or interact with our underwater world.

Explore Set: Will include elements to build ocean-themed models and explore marine concepts



FLL Explore - The SUBMERGEDSM Season Journey (Example)

What a Team Might Explore in SUBMERGEDSM

Research: Learn about different ocean zones, marine animals, renewable ocean energy (e.g., tidal, wave), or the impact of pollution.

Model Building:

- Design a LEGO submersible exploring a coral reef.
- Create a model showing how an underwater creature uses bioluminescence.
- Build a representation of a clean-up solution for ocean plastic.

Motorization: Make a part of their ocean model move (e.g., a spinning propeller on a sub, a moving sea creature, a wave machine).

Show Me Poster: Display facts about a chosen marine topic, drawings of their model, pictures of their team working, and how they used the Core Values.



FLL Explore - The Culminating Event: The Expo/Festival

Celebrating Learning and Achievement!

- Non-Competitive: A fun, fair-like atmosphere.
- Sharing: Teams share their LEGO model and Show Me Poster with "Reviewers" (friendly volunteers).
- Learning from Others: See what other teams have created.
- Recognition: All teams are celebrated for their hard work and receive awards/medals.
- Emphasis on Core Values: Reviewers look for how teams practiced these values.



More Than Just LEGOs!



FLL Explore - How to Get Involved (Coaches/Mentors)



You Can Make a Difference! (No Experience Necessary!)

- Role of a Coach: Facilitator, guide, mentor. You don't need to be a STEM expert!
- Resources: FIRST provides a Team Meeting Guide, online resources, and support.
- Commitment: Typically 1-2 hours per week for team meetings, plus prep time and the Expo.
- Steps to Start a Team:
 - a. Learn more at firstinspires.org.
 - b. Recruit 2-6 interested children (ages 6-10).
 - c. Find a co-coach (recommended).
 - d. Register your team (opens late spring/early summer).
 - e. Order materials (Explore Set, robotics kit if needed).
 - f. Plan your meetings and have fun!



Coaches/Mentors

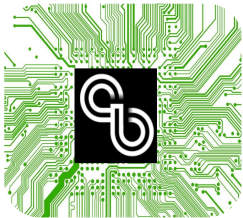
Parents



- Encourage your child if they show interest.
- Volunteer to help an existing team (assist coach, provide snacks, help with poster).
- Consider coaching or co-coaching if a team needs leaders.
- Celebrate their efforts and learning, regardless of the outcome.
- Ask them questions about what they are learning and creating.

Thank You!!

Website:



<https://circuitbreakers.club/>
<https://bit.ly/cb13353>

Instagram:



Facebook:



Youtube:



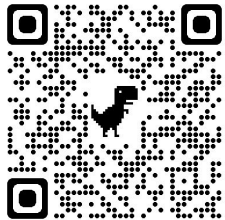
Get Involved in FIRST and Robotics

If you're excited about what you've learned today and want to get involved in FIRST robotics, there are many ways to do so!

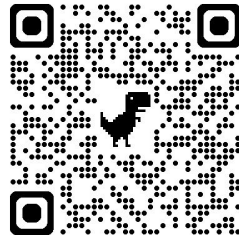
- Join or start a FIRST team at your school or in your community. You can find information on how to get started on the FIRST website (<https://www.firstinspires.org/ways-to-help/start-a-team>).
- Attend upcoming FIRST events and competitions



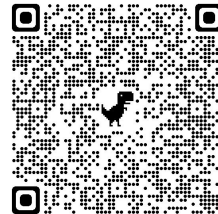
FIRST



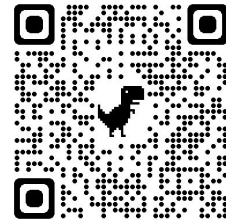
FTC VA



FLL VA



Circuit Breakers



Q&A and Wrap-up

We've covered a lot of information today, and we hope you've found it valuable and inspiring. Now it's your turn to ask questions!

- If you have any further questions or would like to get involved with our team, please don't hesitate to reach out. You can find our contact information on the screen.
- Remember, whether you choose to pursue robotics or another STEM field, the skills and experiences you gain will serve you well in any future endeavor. Keep exploring, keep learning, and keep making a difference!



KEEP CALM! THINK STEM, ROBOTICS and FIRST