

Introduction to *FIRST* LEGO League Challenge

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UNEARTHED



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REBUILT

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Three *FIRST* Programs (K-12)

FIRST LEGO League:

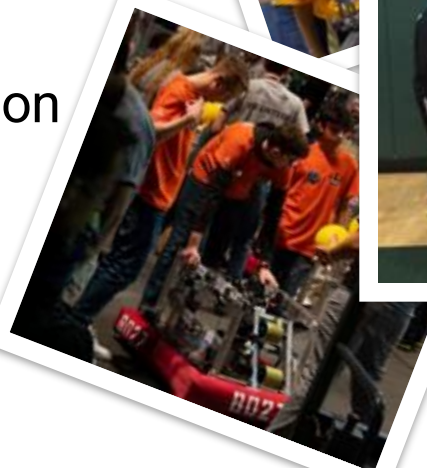
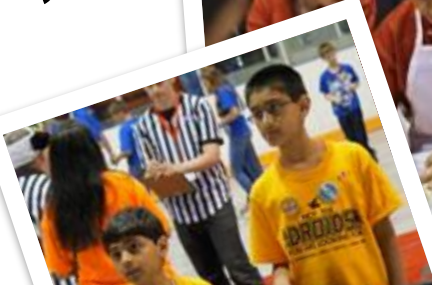
Discover

Explore

Challenge

FIRST Tech Challenge

FIRST Robotics Competition



“I don’t use kids to build robots. I use robots to build kids”

- Dean Kamen

Table of Contents

- Overview of *FIRST* LEGO League Challenge
- Innovation Project
- Robot Game
- Robot Design
- Core Values

Team

- North America (ages 9 to 14/grades 4-8); Elsewhere (ages 9-16)
- Check with local organizers for variations
- Teams consists of 2-10 students
- Two official adult coaches with clearances per team
- Kids on the team do the work, coaches/mentors guide the overall process

Approximate Timeline

August 5, 2025: Challenge documents released

August-November 2025: Team meets weekly to solve the challenge

November-December 2025: Qualifiers

December 2025 - February 2026: State/Regional Championship

April 2026: World Championships

May-June 2026: Official Open Invitationals run by Program Development Partners

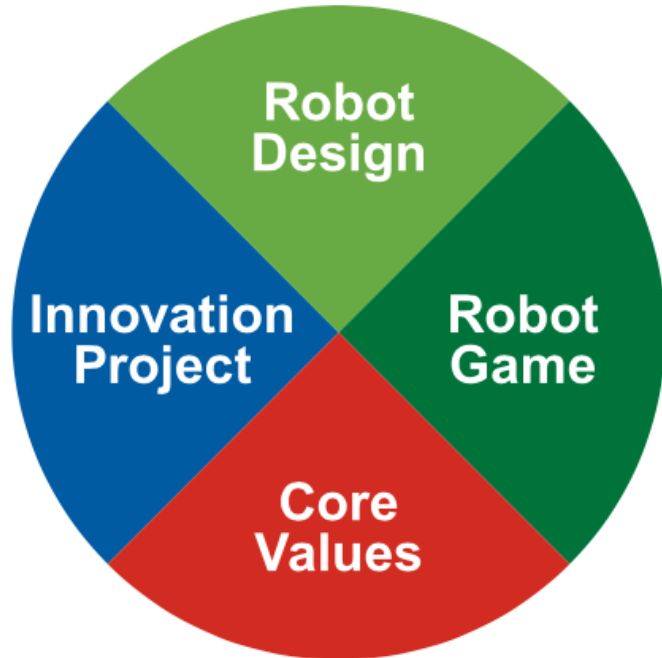
Timelines vary by region. Contact your local organizers for specifics.

Team Costs

- LEGO Robot - approx. \$500.00 (Core Set + Expansion Set)
 - SPIKE Prime, MINDSTORMS EV3, MINDSTORMS Robot Inventor
 - Purchase from *FIRST* or directly from LEGO Education
- Wooden Robotics Table – approx. \$100.00
- National Team Registration – \$275
- Challenge Set - \$75 (expect 2%-4% increase)
- Local Tournament Registration Cost - \$75-250+
- Travel Expenses
- Team Shirts/Supplies

Cost vary by region. Contact your local organizers for specifics. Above costs are in USD and for North America only.

Four Parts of *FIRST* LEGO League Challenge



- Four equally weighted parts
Each accounts for 25% of your total performance
- Evaluated using rubrics and points scored on the game

Innovation Project

Innovation Project is based on a yearly theme

2024-25 SUBMERGED – Solve a problem related to ocean exploration

2020-21 RePlay Season - Help people get more active

2017-18 Hydrodynamics Season - Improve the way people find, transport, use, or dispose of water

2014-15 World Class – Improve the way we learn something

Research Project Process

- **Identify** a problem
- **Design** a solution
- **Create** a prototype
- **Share** the solution
- **Iterate** your design



Sample Project (SUBMERGED)

PROBLEM:

- Marine biologists and experts find sampling and carrying seafloor sediments (20 - 40 m) to be difficult
- Embedding the corers is hard, even sometimes having to use small hammers to do it
- They must be kept in a vertical position to not mix the different layers of collected samples

EXISTING SOLUTIONS

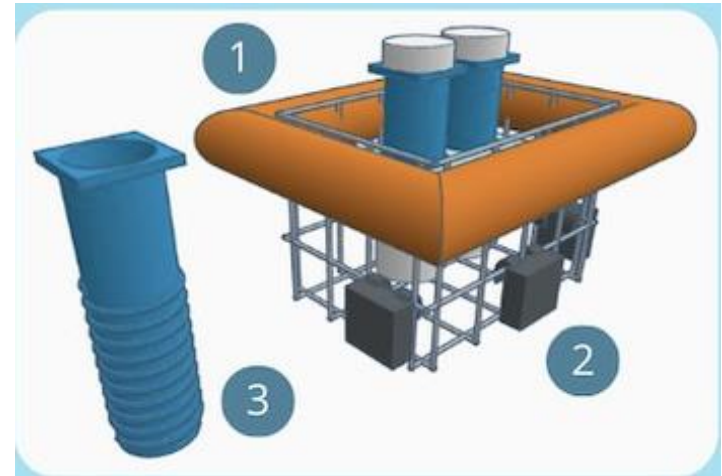
- Baskets to transfer corers vertically must be carried by hand
- Nets to store the corers can still tip over.
- In both cases, balloons can be used to lift samples to the surface, although they must be inflated with air from the diver's tank and their pressure needs to be controlled while ascending

Sample Project (SUBMERGED)

SOLUTION: ScuBasket

Basket that holds 6 corers that descends to the seafloor and comes back up on its own.

1. An inflatable connected to a small CO₂ bottle activated by the diver, with an automatic valve controlled by pressure.
2. A ballast to control the buoyancy and stability of the corers in vertical position.
3. Each corer has a screw-like shape to make the insertion into the seafloor easier, using a hand crank.



Robot Game

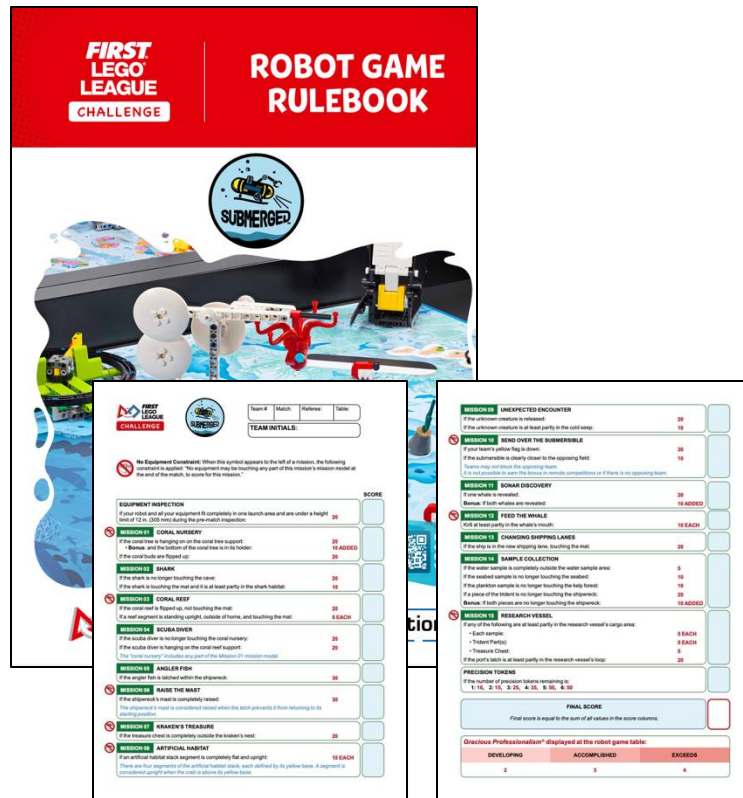
Overview

- 4ft x 8ft table with a mat
- LEGO-based missions
- LEGO MINDSTORMS or SPIKE Prime to solve the missions
- Theme changes early
- 2 tables placed next to each other at competition



Robot Runs

- 3 matches, best score counts
- 2.5 minutes to complete as many missions as you can (Note: majority of teams will not do all the missions)
- Points vary by mission
- Each mission has its own set of rules and instructions
- Referees score you at the end of each match using a scoresheet



2025-26 Season: UNEARTHED (Archaeology)



Robot Design

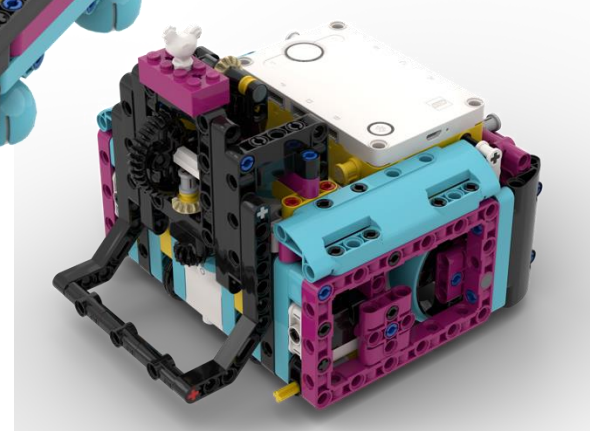
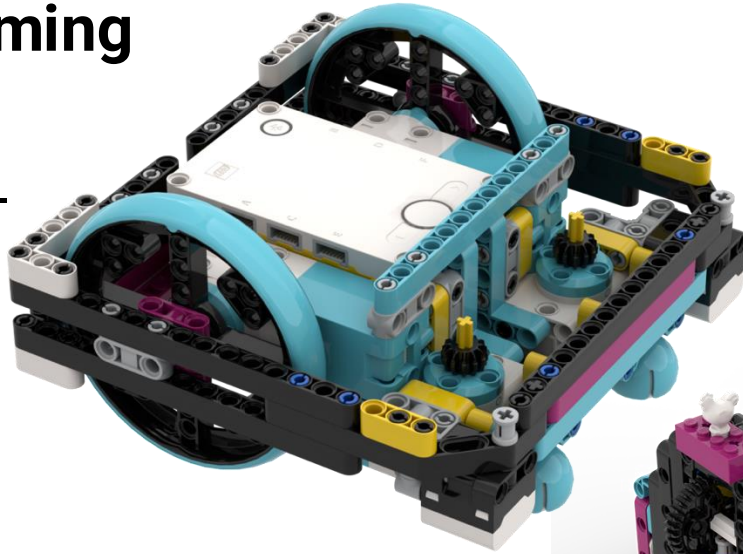
Focus on the Engineering Design Process

- Step 1:** Analyze the missions and develop a strategy
- Step 2:** Build and program a robot to meet that strategy
- Step 3:** Test the robot and make improvements as needed
- Step 4:** Develop solutions to individual missions
- Step 5:** Test code and solutions
- Step 6:** Iterate code and robot as needed
- Step 7:** Document the process to share with judges



Building and Programming

- Programming in block-based or text-based languages
- Learn physics and engineering concepts
- Optional CAD skills



Core Values

What are Core Values?

- The cornerstones of the program
- The set of ideas that every FIRST team should live by



We are stronger
when we work
together.



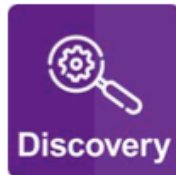
We respect
each other and
embrace our
differences.



We apply what we
learn to improve
our world.



We enjoy and
celebrate what we
do!



We explore new
skills and ideas.



We use creativity
and persistence to
solve problems.

What is Gracious Professionalism and Coopertition?

Gracious Professionalism:

- High-quality work, emphasis on the value of others
- Respect for individuals and the community.
- Competition and mutual gain are not separate notions.

Coopertition:

- The idea you should respect and support teams you compete against.



Learning Life Skills through *FIRST*

- Teamwork
- Communication
- Problem Solving
- Helping one another
- Giving back to community

