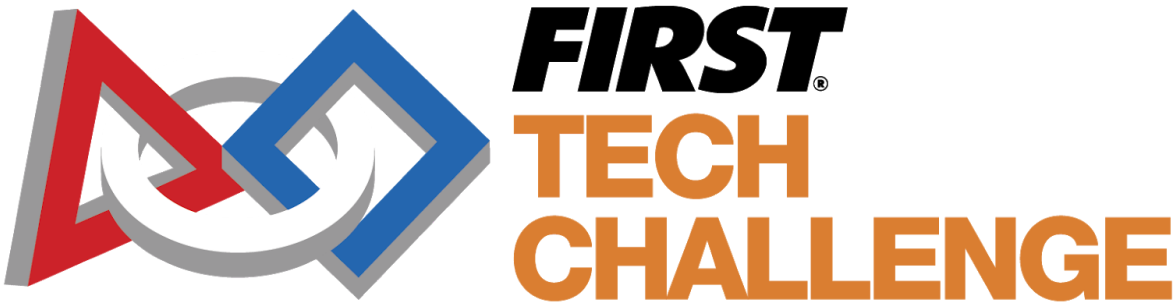

Team 3044 FTC Starter Guide

Team 3044 0xBe4

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What is FIRST?

“FIRST (For Inspiration and Recognition of Science and Technology) was founded in 1989 to inspire young people's interest and participation in science and technology. Based in Manchester, NH, the 501(c)(3) not-for-profit public charity designs accessible, innovative programs that motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.”

- FirstInspires.Org

FIRST is meant to focus on more than just robots at all levels (FLL Jr., FLL, FTC, FRC).

What is FTC?

FTC (First Tech Challenge) was created to challenge kids in grades 7-12 to design, build, program, and control robots in a head-to-head competition with an alliance. It’s similar to FRC but not as large of a tournament and robot. The season generally runs from September to January. During this time teams must build, program, and compete with their bot trying to complete the task at hand in the current year’s game. Students who go from FTC to FRC will find that many things are the same, acting as a great stepping stone to the big show.

Cost and Requirements for Starting an FTC Team

Now as you see, FTC is a really cool program which we think that every kid should be able to do but what are the requirements?

- 2 or more adult coaches and some mentors
- Up to 15 students willing to put in time; about 4-6 hours a week (there are lots of jobs such as wiring, building, and programming the robot)
- A good place to meet, either public or private. It should be able to accommodate a 12x12 foot playing field, and should have internet access
- The desire to learn, explore, strategize, build comradery, share ideas and talents, make new friends, be accepted, and HAVE FUN!

For new teams, costs will be $2,250 for the season (according to the First website). Team cost varies year to year as teams can reuse the kit of parts each year.
This includes:

- team registration
- robot kit of parts
- event registration
- travel costs

Building Your Robot

The FTC game requires a robot capable of completing some or all of that season's game challenges. These vary from season to season, but skills learned one season can be applied to another season. The robot can be built from the kit of parts and other parts the team can buy or make. The kit of parts is also reusable. The robot design is left completely to the team, based on what they want to accomplish. However, the team should build to their strengths. They shouldn't feel that they have to accomplish everything (ex: if your team is lacking mechanical members, don't try to accomplish all the tasks of the game).

Tips:

- Designing your robot on AutoCAD is helpful because you will be able to see how everything will fit together before you build. After the CAD is finished, you can build based off of the documents. Team 3044 uses Autodesk Inventor 2018 which is free for students for 3 years.
- Getting help from other FTC teams or FRC teams is advisable, as they are a huge source of knowledge and support, especially for a rookie team.

Typical Tools/Programs

In order for the team to be able to accomplish building their robot, there are a few basic tools and programs needed.

Tools:

- Allen key set
- Flathead, Phillips screwdrivers
- Socket set
- Wrench set
- Computer with latest windows update

Software Programming:

- Java
- C++
- Android studio (Used by 3044's FTC Teams) (tutorial in links)
- Block programming, similar to scratch

Teams

There are several types of FTC teams that can be set up. The first type of team is based outside of school. This team could meet after school and/or in the evenings or weekends. The second one is based inside of school as a class. The class would be responsible for designing, building, and programming the robot like normal. The teacher would be their coach and a mentor for the team's questions. There could also be an afterschool

team established as a club. Another idea could be to set up a team with a local organization such as 4H.

Links

Link to full FTC robot starter kit with parts, electronics, and motors:
http://www.revrobotics.com/REV-45-1170/

Link to official FIRST programming guides:
https://www.firstinspires.org/resource-library/ftc/technology-information-and-resources

Link to official FIRST guide to building a pushbot/vertical reach bot:
https://www.firstinspires.org/sites/default/files/uploads/resource_library/ftc/pushbot-build-guide-vertical.pdf

Link to programming training manual:
https://www.firstinspires.org/sites/default/files/uploads/resource_library/ftc/blocksprogramming-trainingmanual.pdf

Autodesk Inventor:
https://www.autodesk.com/products/inventor/overview

Android Studio:
https://developer.android.com/studio/index.html

Microsoft Visual Studio (C++)
https://www.visualstudio.com/vs/features/cplusplus/

Java Eclipse:
http://www.eclipse.org/downloads/eclipse-packages/

Android Studio Tutorial:
https://github.com/ftctechnh/ftc_app/wiki/Android-Studio-Tutorial