FLL to FTC

TEAM 13380 QUANTUM STINGERS

FLL vs FTC

- For FLL teams, FTC is the next competition in the FIRST progression

- FIRST Tech Challenge is a very different competition to FLL
  - **Robot Building:** FTC involves a jump from the LEGO bricks used in FLL and FLL Jr to metal structural parts
  - **Judging:** There is no core values or project judging in FTC
  - **Outreach:** FTC teams have to engage in outreach, which is spreading FIRST and robotics throughout their community
  - **Engineering Notebook:** FTC teams must create their own engineering notebooks which scrupulously document their season
  - **Budget:** FTC teams have a much larger budget, going from costs of around $1,000 in FLL to up to $10,000 in FTC
  - **Events:** FTC teams can attend up to 3 qualifier events, unlike FLL teams who only have one chance per season to advance to regionals
  - **Season Length:** Due to this, there are many more FTC tournaments and the FTC regionals happen around 2 months after FLL regionals

Robot Building

- Size
  - While FLL robots can be made up of thousands of pieces, they are nowhere near as large as FTC robots
  - The size limit for FTC robots is 18x18x18 inches, and most robots are built very closely to those guidelines

- Material
  - In FLL only LEGO parts were allowed to be used in robot building
  - In FTC, almost any part or material can be used, including acrylic and 3d printed parts. Only certain parts, like pneumatics, are banned
    - For more info, look at this link: https://www.firstinspires.org/sites/default/files/uploads/resource_library/ftc/game-manual-part-1.pdf

- Mid Game Changes
  - In FLL, many teams use things called attachments, changing the robot in the Home Base during the game to be able to do different missions
 - In FTC, you can not touch any robots once the round starts

Robot Building (Cont.)

- Design Process
  - Most robots in FLL are built on the fly; You have an idea in mind which you build up from.
  - 3D design systems like Fusion 360, OnShape and SolidWorks allow FTC teams to completely design robots before building or buying parts

- Tools
  - No tools were needed in FLL robot building
  - In FTC, you will need to use tools like screwdrivers, drills, saws, 3d printers, wrenches, grips, etc.
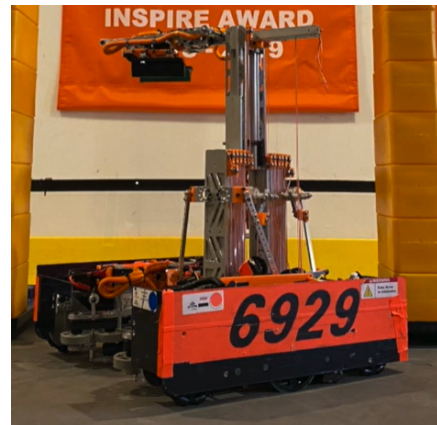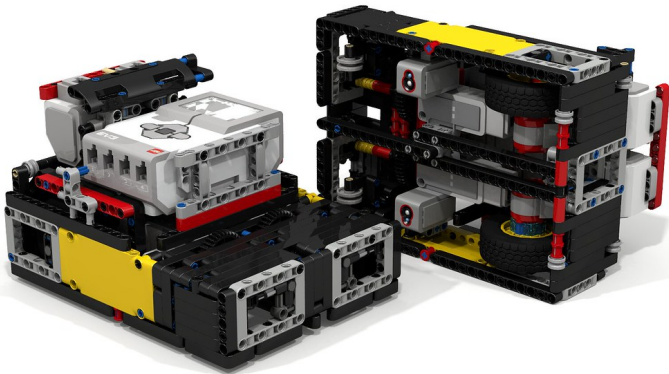
Robot Game

- In FLL, the robot game is all pre-programmed and your score is based only on your own performance

- In FTC, the first half minute is pre-programmed and the next two minutes are driver controlled

- Your score in FTC is based upon not only your score, but also your alliance partner's score
    - In FTC, games are played in alliances of 2 competing against each other, with the winning duo securing 2 ranking points
    - There is no individual score, only your alliance's score matters
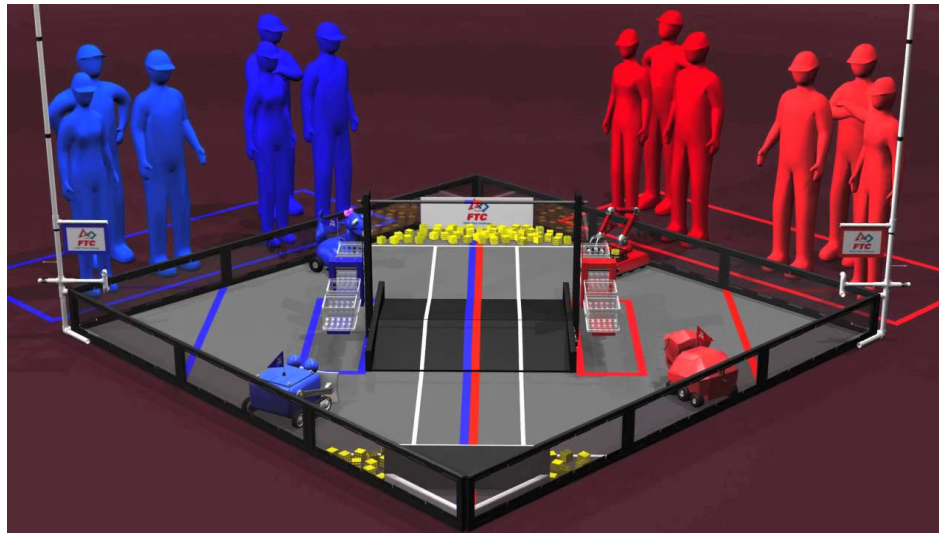
Judging

- Project and Core Values
    - In FLL, there are 3 separate judging events
        - Robot Design
        - Core Values
        - Project
    - In FTC, there is only one judging round. It is 10 minutes long, with 5 minutes for a team's presentation and 5 minutes for questions
    - During this judging, the things tested are robot design, the engineering notebook and outreach (more info on these in next slide)
    - Gracious Professionalism, which is similar to core values, is tested throughout the day, during judge's pit visits and also by referee's during rounds

Judging(Cont.)

- Outreach
  - Outreach is spreading FIRST, robotics and STEM throughout the community
  - Some outreach events include having booths at events, organizing robotics info sessions or classes, or mentoring other FTC/FLL teams
  - Most FLL teams did something similar to Outreach when presenting their project to people in their community, so they will have some experience with this already

- Engineering Notebook
  - Unlike in FLL, FTC engineering notebooks are required if you want to be eligible for most awards
  - Only one engineering notebook is required per team, and they are usually between 150 and 300 pages
  - Each award has a corresponding part in the engineering notebook that has to be present for eligibility for that award

Budget

- In FLL, robot related expenses usually do not exceed $600 per season

- In FTC, however, robot costs are significantly more.
  - For your first season, robot building costs may be around $3000 - $7000
  - Every season after that, it will continue to get less as you accumulate more and more parts

- Other than this, FTC also has many other expenses
  - The yearly challenge kit (The Mission Models) can cost up to $450
  - Qualifier registration can also be quite a lot depending on which region you're team is centered in

Budget (Cont.)

- In FTC, however, there are also many more ways that you can deal with this price surge

- FTC teams can be up to 15 students, meaning that the money can be split more ways than in FLL

- FTC teams have many grants available to them. Qualcomm offers rookie grants to all teams who apply for them, and many other technology companies such as Google and Apple also offer teams who have one of their employees as a mentor grants

- Many companies have 1:1 matching
  - If teams donate $5,000 to a non profit or school, the company will also donate $5,000. Thus, you will have an account of $10,000 with the non profit or school

Events

- Qualifiers
  - In FLL, you can only attend one qualifier event to qualify for the regionals event
  - Qualifiers go on for up to 3 months depending on the region your team is based in
  - In FTC, each team can attend up to 3 qualifier events to reach the regionals
  - Qualifiers go on for up to 5 months depending on the region your team is based in
- Scoring
  - In FTC, every round's score matters, unlike in FLL
  - While only your top score matters in FLL, you are judged based on wins and losses in FTC, so consistency is of paramount importance

Credits

- This lesson was written by Dhruv Gupta from Quantum Stingers Team 13380 for FTCTutorials.com

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- More lessons for FIRST Tech Challenge are available at www.FTCtutorials.com