Intro to FTC

(for FLL aficionados)

Presented by the Ponytail Posse

Who are we?

- 6 alumni, 1 senior, and 1 junior
- 9 years of robotics experience
  - 5 year in FLL
  - 4 years in FTC

team@theponytailposse.com

AGENDA:

1. Structure
2. Cost
3. Season Activities
4. Competition Day
5. Community

FIRST®

FOR INSPIRATION & RECOGNITION OF SCIENCE & TECHNOLOGY

FIRST® LEGO® LEAGUE JR.

K - 3rd

Create a LEGO model to demonstrate their research

** Non-competitive*

FIRST® LEGO® LEAGUE

4th - 9th

Build and program a LEGO robot, Research real-world problem and develop a solution

FIRST® TECH CHALLENGE

7th - 12th

Build and program an 18”x18” robot on a team of up to 15 students

FIRST® ROBOTICS COMPETITION

9th - 12th

Build and program an industrial-size robot on a team of over 20 students

HIGH TECH KIDS
BUILD. CREATE. THRIVE.™

***High Tech Kids**: MN local partner for FLL Jr, FLL, and FTC*

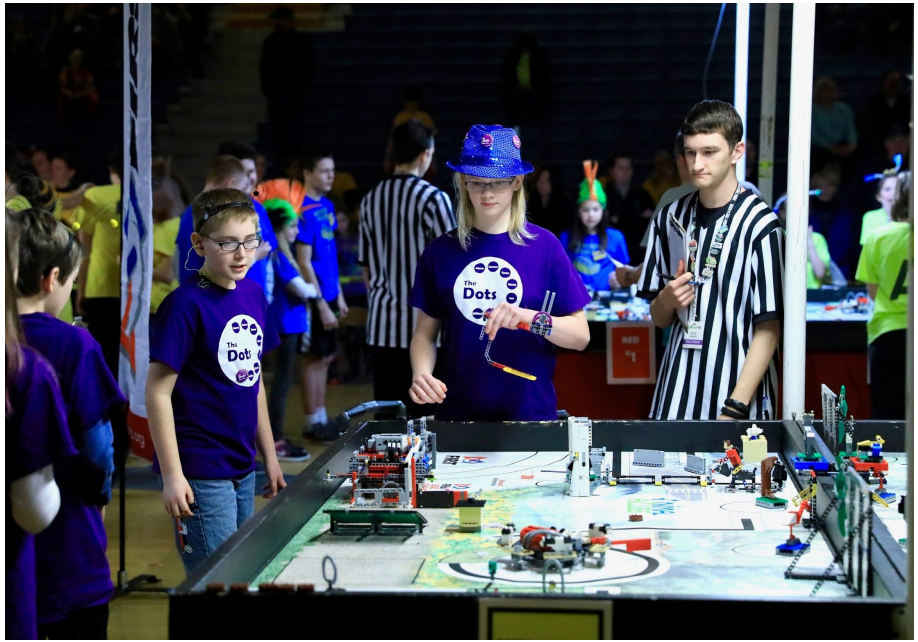
***MN FIRST**: MN local partner for FRC*

What are the differences between FLL and FTC?

FIRST LEGO LEAGUE

FIRST TECH CHALLENGE

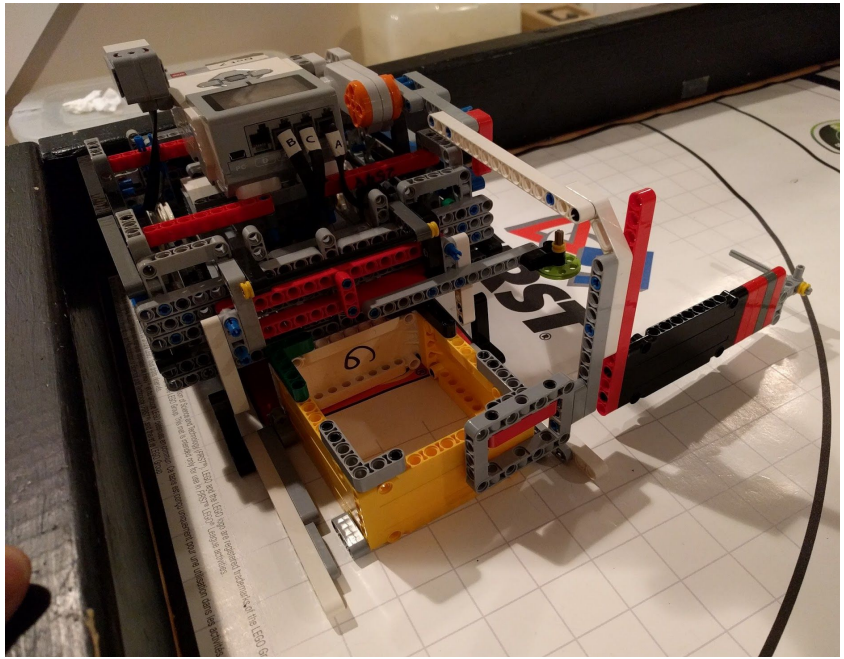
What are the differences between FLL and FTC?



FIRST LEGO LEAGUE

FIRST TECH CHALLENGE

What are the differences between FLL and FTC?



FIRST LEGO LEAGUE

FIRST TECH CHALLENGE

What are the differences between FLL and FTC?

	FLL	FTC
Team size	up to 10 students	3-15 students
Age	4th-8th grade	7th-12th grade
Season structure	From game release date (Aug. 1), you can build/make changes to your robot anytime	From game release date (Sept. 8), you can build/make changes to your robot anytime
Competition structure	Robots must fit in “base” and compete on a 4’x8’ playing field table	Robots fit in an 18” cube and compete on a 12’x12’ field
Robot match play	Matches are 2 minutes and 30 seconds of autonomous	Matches are 30 seconds of autonomous, then 2 minutes of tele-operated play
Judging	3 separate judging sessions: robot, project, core values	1 judging session includes robot, programming, outreach - **NO PROJECT!**

How much does FTC cost?

Registration (required)	$275
Qualifier Registration (2)	$350
Field Kit (game elements)	$450
AndyMark Field Tiles	$230
Official Field Perimeter	$600
Phones and connection cables (Control and Communication Set 2)	$200
Electronics Modules and Sensors Set (REV expansion hub, sensors, switch)	$150
2nd REV Expansion Hub	$200
Actobotics Robot Starter Kit	$500
Extra Robot Parts	$1000
Marketing	$150

Total:

$4,600

How much does FTC cost?

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Qualifier Registration (2)	$350
Field Kit (game elements)	$450
AndyMark Field Tiles	**$230**
Official Field Perimeter	**$600**
Phones and connection cables (Control and Communication Set 2)	**$200**
Electronics Modules and Sensors Set (REV expansion hub, sensors, switch)	**$150**
2nd REV Expansion Hub	**$200**
Actobotics Robot Starter Kit	**$500**
Extra Robot Parts	$1000
Marketing	$150

Total:
$4,600

One-time purchases:
$1,900

Recurring costs:
$2,700

How much does FTC cost?

Registration (required)	$275
Qualifier Registration (2)	$350
~~Field Kit (game elements)~~ Half Field Kit	~~$450~~ $340
~~AndyMark Field Tiles~~ Home Depot Field Tiles	~~$230~~ $170
~~Official Field Perimeter~~ DIY Field Perimeter	~~$600~~ $100
Phones and connection cables (Control and Communication Set 2)	$200
Electronics Modules and Sensors Set (REV expansion hub, sensors, switch)	$150
2nd REV Expansion Hub	$200
Actobotics Robot Starter Kit	$500
Extra Robot Parts	~~$1000~~ $500
Marketing	$150

Adjusted Total:

~~$4600~~ $2,900

One-time adjusted purchases: **$1,300**

Recurring costs:

$2,700

How do we pay for this?

Grants

FIRST Tech Challenge Rookie Team Grant

- $500 for national registration and some extra parts
- Must apply after you register with *FIRST* **BUT** before you pay

Company grants

ptc

ARCONIC

Boston Scientific

SERVOCITY.COM
WE HAVE THE PARTS FOR YOUR IDEAS

Fundraising

Local companies

- Monetary or in-kind donations

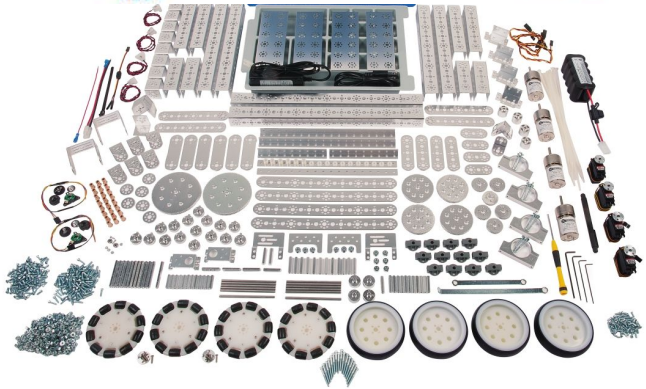
What is the process of building an FTC robot?

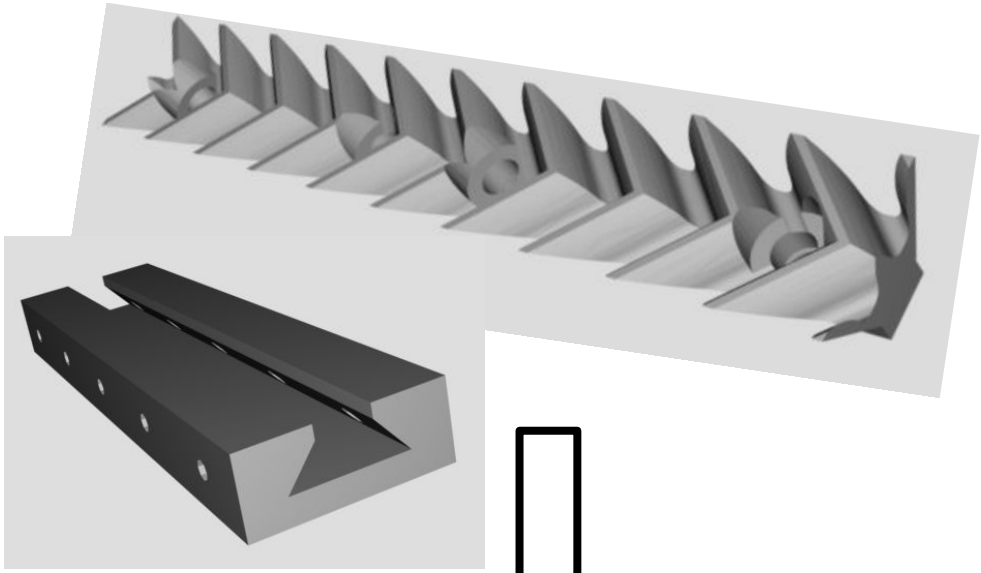
	FLL	FTC
Tools	No hand/power tools needed	Hand and power tools needed
Prototyping	Quick and easy to build/test prototype	Prototyping is a major part of the season
Wiring	Wires plug directly into EV3 and motors	More complicated - power moves through robot with red & black electrical wires
Communications system	None - all programs loaded into EV3	Communications system between robot motors and phones allow tele-operated driving
Programming language	Visual-based language - Mindstorms	Text-based, real-world language - Java

What is the process of building an FTC robot?

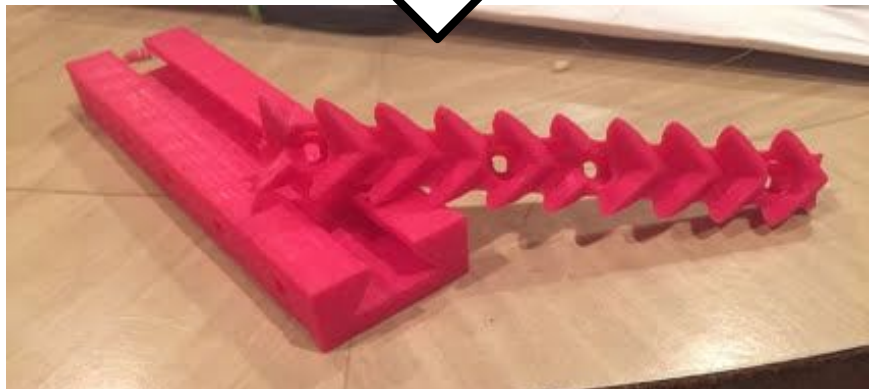
1. Keep yourself informed of the rules: Game Manual Part I and II
2. Kits vs. Custom-making parts

TETRIX BY PITSCO





ACTOBOTICS
DREAM • DESIGN • BUILD • REPEAT



What is the process of building an FTC robot?

1. Keep yourself informed of the rules: Game Manual Part I and II
2. Kits vs. Custom-making parts
3. CAD - layout your robot in advance OR use it as tool to model custom parts throughout the season

Software you download to your computer

OR

Cloud-based CAD--accessible online

creo®

AUTODESK®

Onshape

What is the process of building an FTC robot?

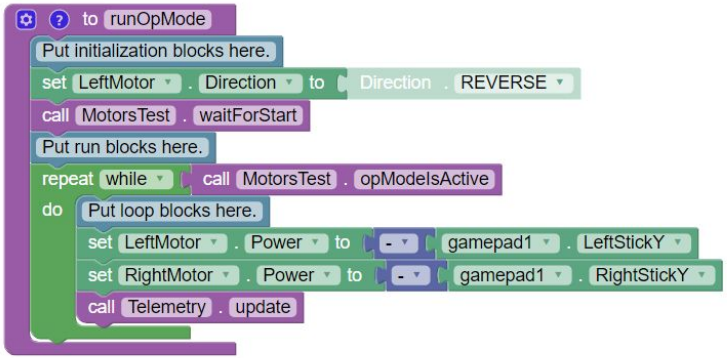
1. Keep yourself informed of the rules: Game Manual Part I and II
2. Kits vs. Custom-making parts
3. CAD - layout your robot in advance OR use it as tool to model custom parts throughout the season
4. Programming in Java - a learning curve

```
#pragma config(Motor,  mtr_S1_C1_1,     leftMotor,        tmotorTetrix, openLoop)
#pragma config(Motor,  mtr_S1_C1_2,     rightMotor,       tmotorTetrix, openLoop)
//*!!Code automatically generated by 'ROBOTC' configuration wizard               !!*//

#include "JoystickDriver.c"

task main()
{
  while(true)
  {
    getJoystickSettings(joystick);
    if(abs(joystick.joy1_y1) > 15)
    {
      motor[leftMotor] = joystick.joy1_y1;
    }
    if(abs(joystick.joy1_y2) > 15)
    {
      motor[rightMotor] = joystick.joy1_y2;
    }
    else
    {
      motor[rightMotor] = 0;
      motor[leftMotor] = 0;
    }
  }
}
```

OR



What is the Engineering Notebook?

- Similar to an FLL binder
- Required for judged awards
- Includes everything about your season
- Designs, Pictures, and more
- Many different ways to organize it

Our notebook from last season and another presentation about the EN are on www.theponytailposse.com/resources

What is outreach?

- Demos, scrimmages, mentoring, or starting other *FIRST* teams
- Different for each team
- Teams can host, organize, and participate in these events
- Helps teams become better known!

What does competition day look like?

Robot inspections
- Hardware and field
- Be on time!

Judge’s interview
- 15 minutes total
- Cover all topics

Driver’s meeting
- Bring your badges

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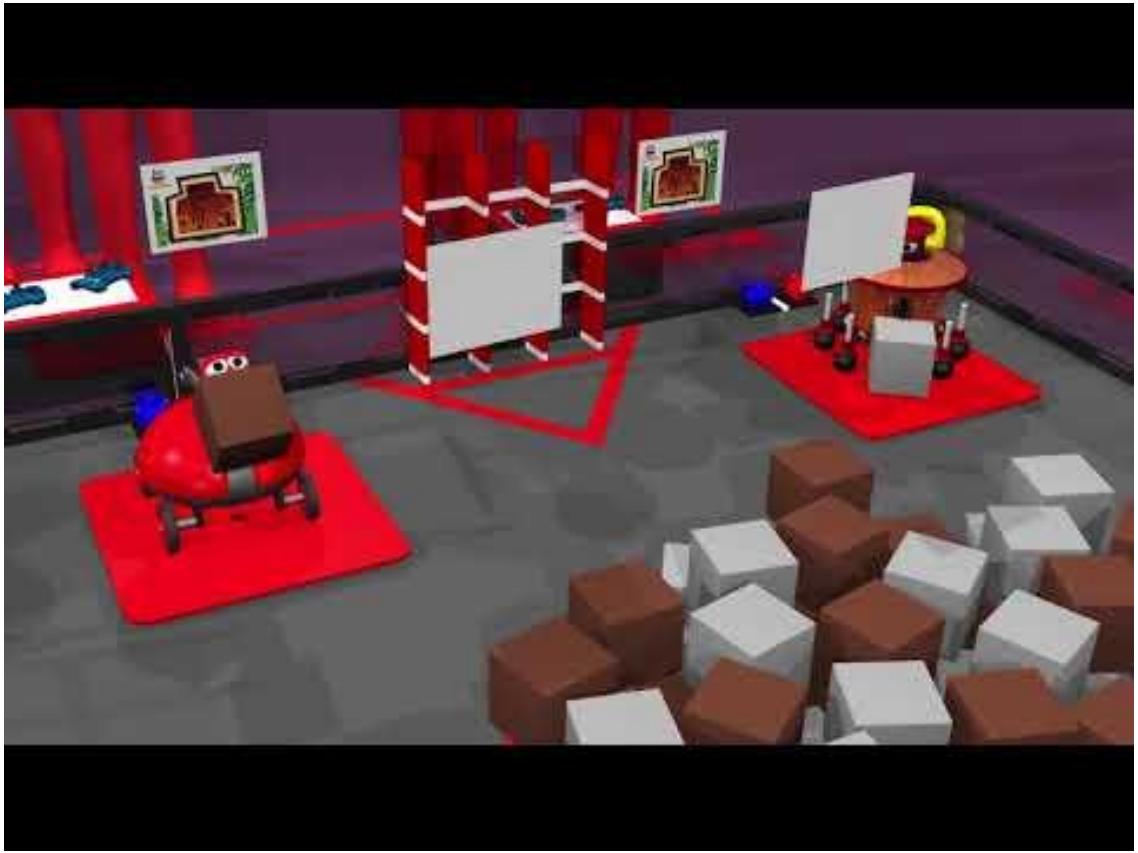
Judge’s pit visits
- Prepare talking points
- More like a conversation
- Figure out an alert system

Robot matches
- Queue five minutes ahead of time
- Talk to your alliance partner
- Elimination matches



www.youtube.com/watch?v=7Wc1LhG2FEs

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- Prepare talking points
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Robot matches
- Queue five minutes ahead of time
- Talk to your alliance partner
- Elimination matches

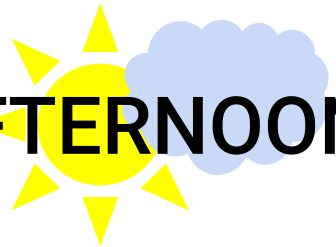
What does competition day look like?

MORNING

Robot inspections
- Hardware and field
- Be on time!

Judge's interview
- 15 minutes total
- Cover all topics

Driver's meeting
- Bring your badges



AFTERNOON

Judge's pit visits
- Prepare talking points
- More like a conversation
- Figure out an alert system

Robot matches
- Queue five minutes ahead of time
- Talk to your alliance partner
- Elimination matches

EVENING

Awards ceremony
- Don't leave early
- DANCE PARTY!
- Listen to award winner descriptions
- Pick up your engineering notebook and read feedback!

What does competition day look like?

FIRST LEGO LEAGUE

FIRST TECH CHALLENGE

What does competition day look like?

Can coaches/parents...

- Hang around the pit area all day? **NO**
- Talk during a judge's interview/pit visit? **NO**
- Touch the robot? **NO**

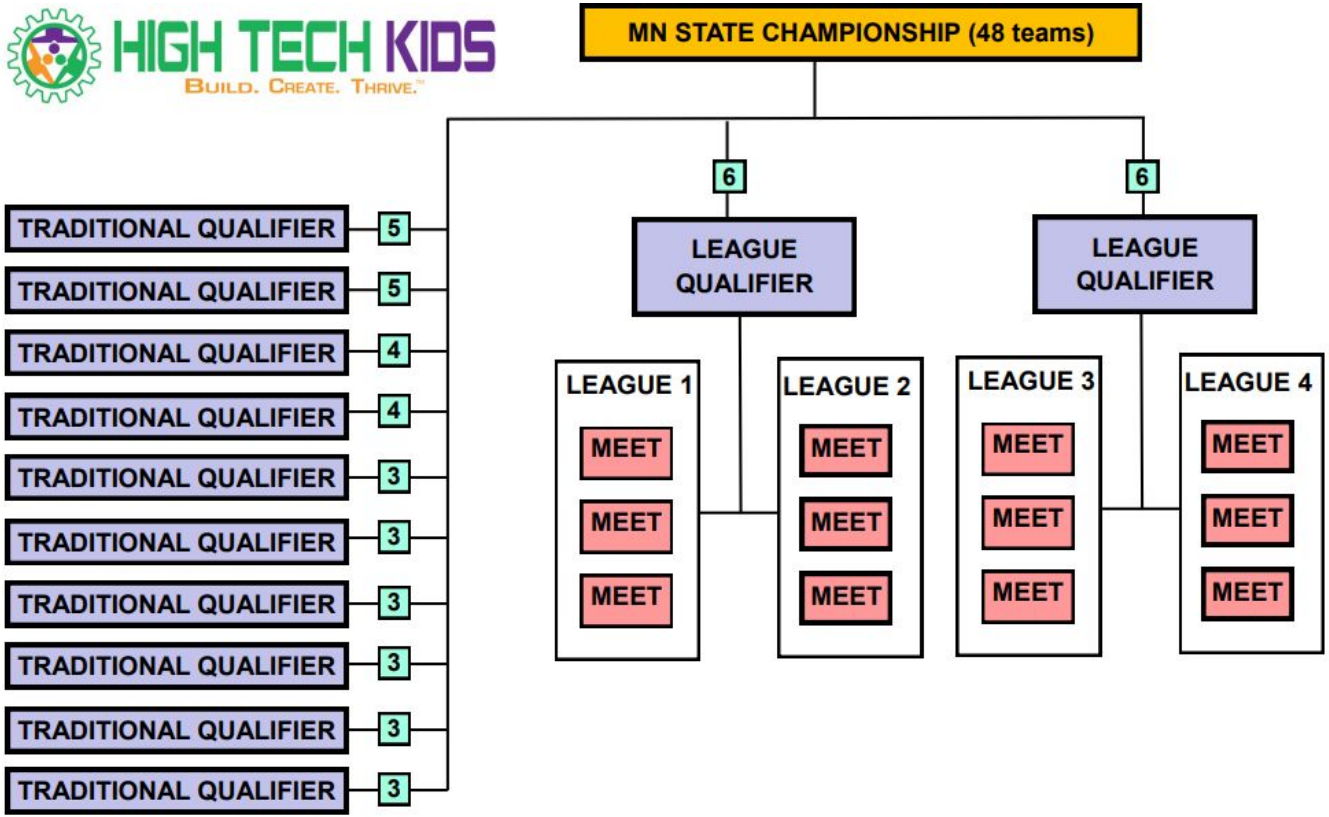
- Watch the judge's interview? **YES**
- Watch the robot inspections? **YES**
- Watch the robot matches as spectators? **YES**
- Help their team stay on schedule? **YES**
- Scout for the team? **YES**
- **Talk to other teams about their robots/outreach? YES**

What does competition day look like?

Miscellaneous tips:

- **<u>Safety glasses are REQUIRED for every team member</u>**
- No Wi-Fi hotspots (you will be DISQUALIFIED)
- Judges are always observing the team’s actions
- Talk to other teams

How do teams advance to other competitions?



How is the FTC community different from the FLL community?

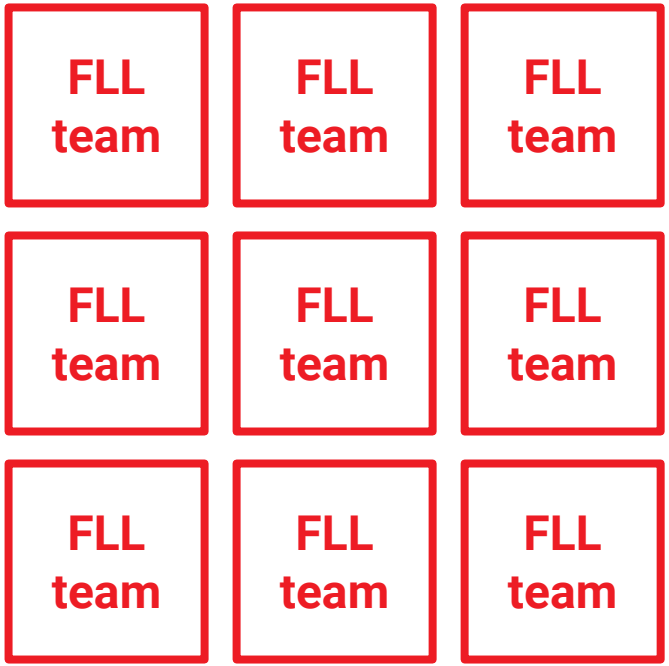
- Websites
- Social media
- Giveaways

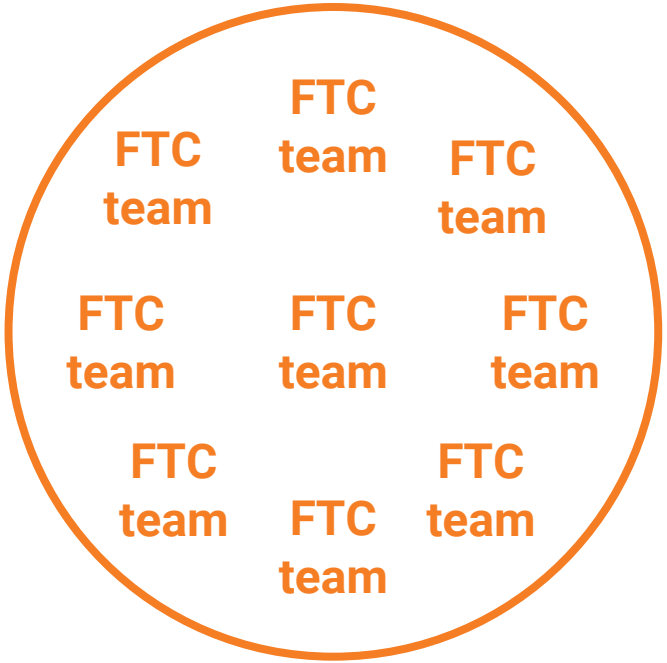
teams

friends/teams

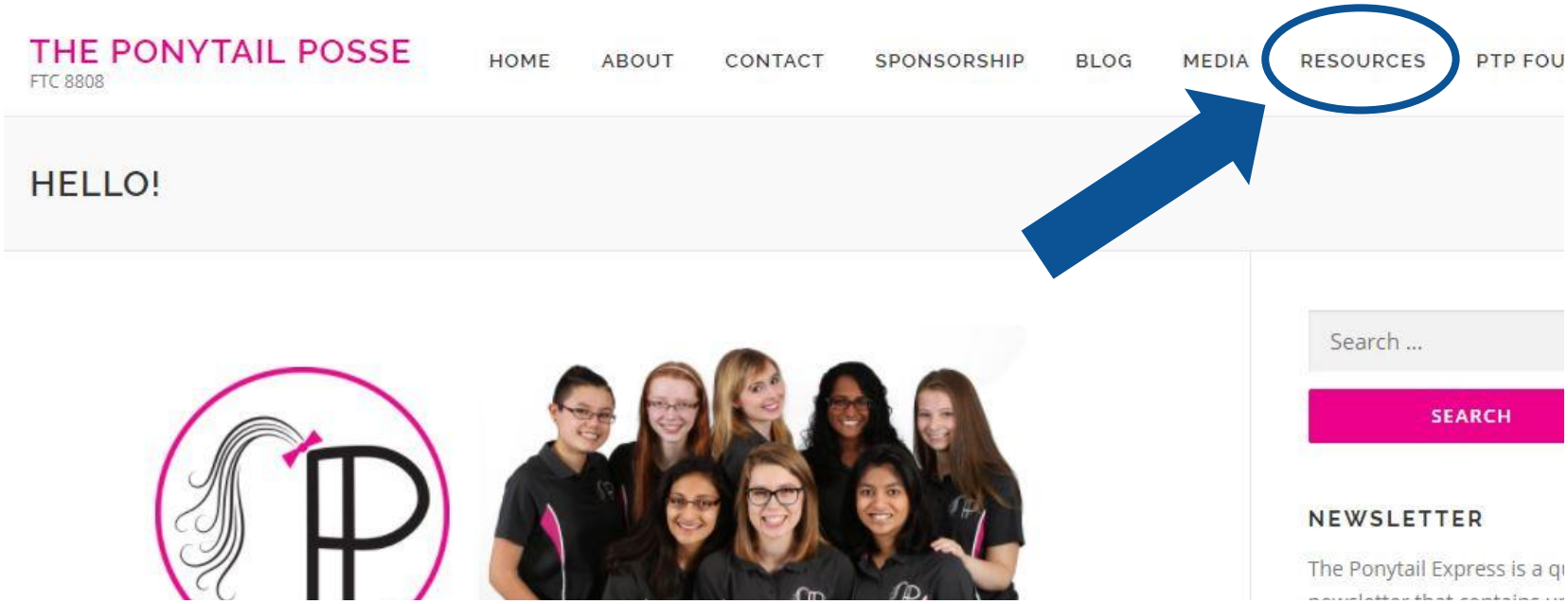
family

How is the FTC community different from the FLL community?





FTC is a COLLABORATIVE program!



www.theponytailposse.com/resources

THE PONYTAIL POSSE
FTC 8808

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RESOURCES FOR FTC (*FIRST* TECH CHALLENGE) TEAMS

Abridged 2016-17 Ponytail Posse Engineering Notebook

Videography presentation **with speaker notes** (from FTC Kickoff 9/9/17)

- Videography presentation **PDF version**

Engineering Notebook presentation **with speaker notes** (from FTC Kickoff 9/9/17)

- Engineering Notebook presentation **PDF version**

CAD and 3D Printing presentation (from FTC Kickoff 9/9/17)

FTC night-before-tournament checklist

FTC info & tips (from FTC Info Night 9/3/15)

www.theponytailposse.com/resources

RESOURCES:

www.theponytailposse.com/resources

Find this presentation, past presentations, Engineering Notebook examples, etc.

www.firstinspires.org/robotics/ftc

International organization that runs *FIRST* robotics programs

www.hightechkids.org

Local organization that runs FTC in Minnesota

www.firstinspires.org/sites/default/files/uploads/resource_library/ftc/2018-2019/game-manual-part-1.pdf

Game Manual Part I (Part II comes out on Sept. 8)

www.ftc-tricks.com

Mostly robot-related tips