LIGERBOTS

FIRST® Team 2877

FIRST Lego League

May 30th, 2017

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What is FLL?

https://www.youtube.com/watch?v=ydLJKFi0vHA

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These are the robots we are talking about:

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Not these:

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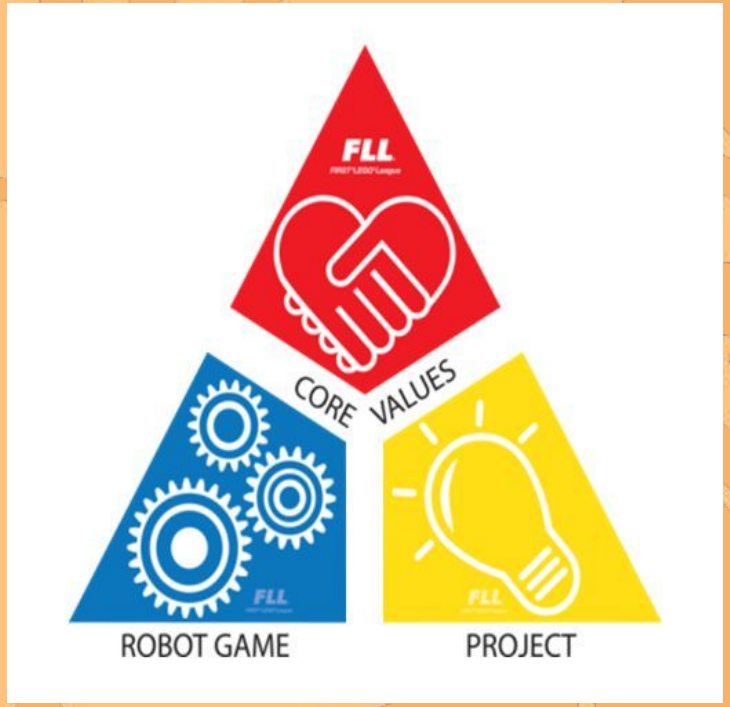
There are three parts to FLL:



The Project and Robot Game are what the children do. Core values are how they do it.

The Team

- FLL teams have:
  - Two adult coaches
  - 4 - 10 students grades 4 - 8
- Teams can be based in schools, organizations, or homes
- Students can only be on one team, but coaches and mentors can work with multiple teams
- Teams compete in both official and unofficial events

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The Challenge

- Each year has a robot game and a project that share a common theme
  - The robot is assembled from Lego parts
  - 4’x8’ field layout is new every year
  - Research project proposes solutions to real life problems
- The challenge is announced in late August, when a detailed manual and highlight video are released
- This year:

The Robot

- Start with Lego EV3 Kit
- Add parts to perform tasks
- Write software
- The robot must be completely autonomous

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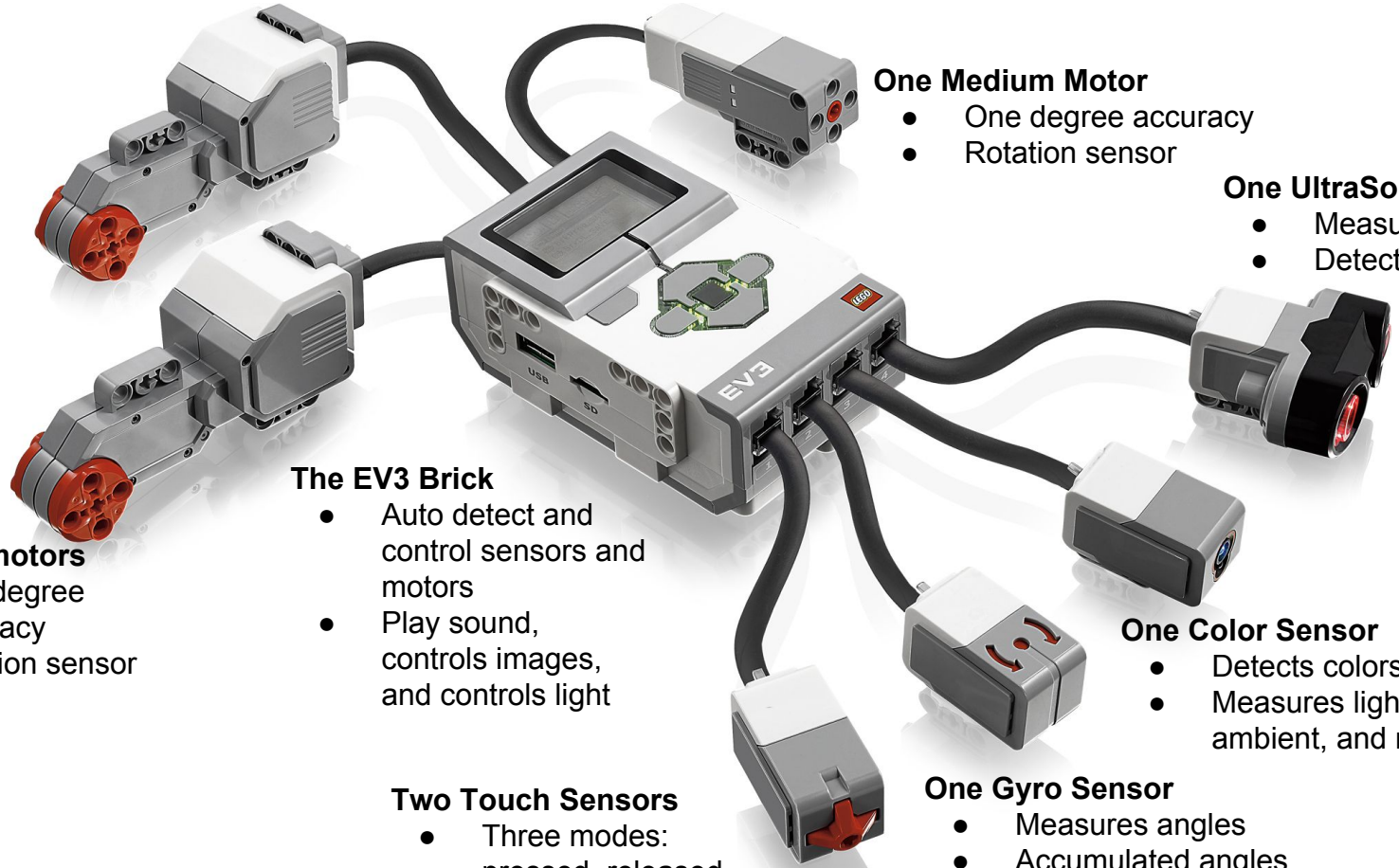

One Medium Motor
- One degree accuracy
- Rotation sensor

One UltraSonic sensor
- Measures distances
- Detects objects

Two large motors
- One degree accuracy
- Rotation sensor

The EV3 Brick
- Auto detect and control sensors and motors
- Play sound, controls images, and controls light

One Color Sensor
- Detects colors
- Measures light intensity, ambient, and reflected light

Two Touch Sensors
- Three modes: pressed, released, and count presses

One Gyro Sensor
- Measures angles
- Accumulated angles

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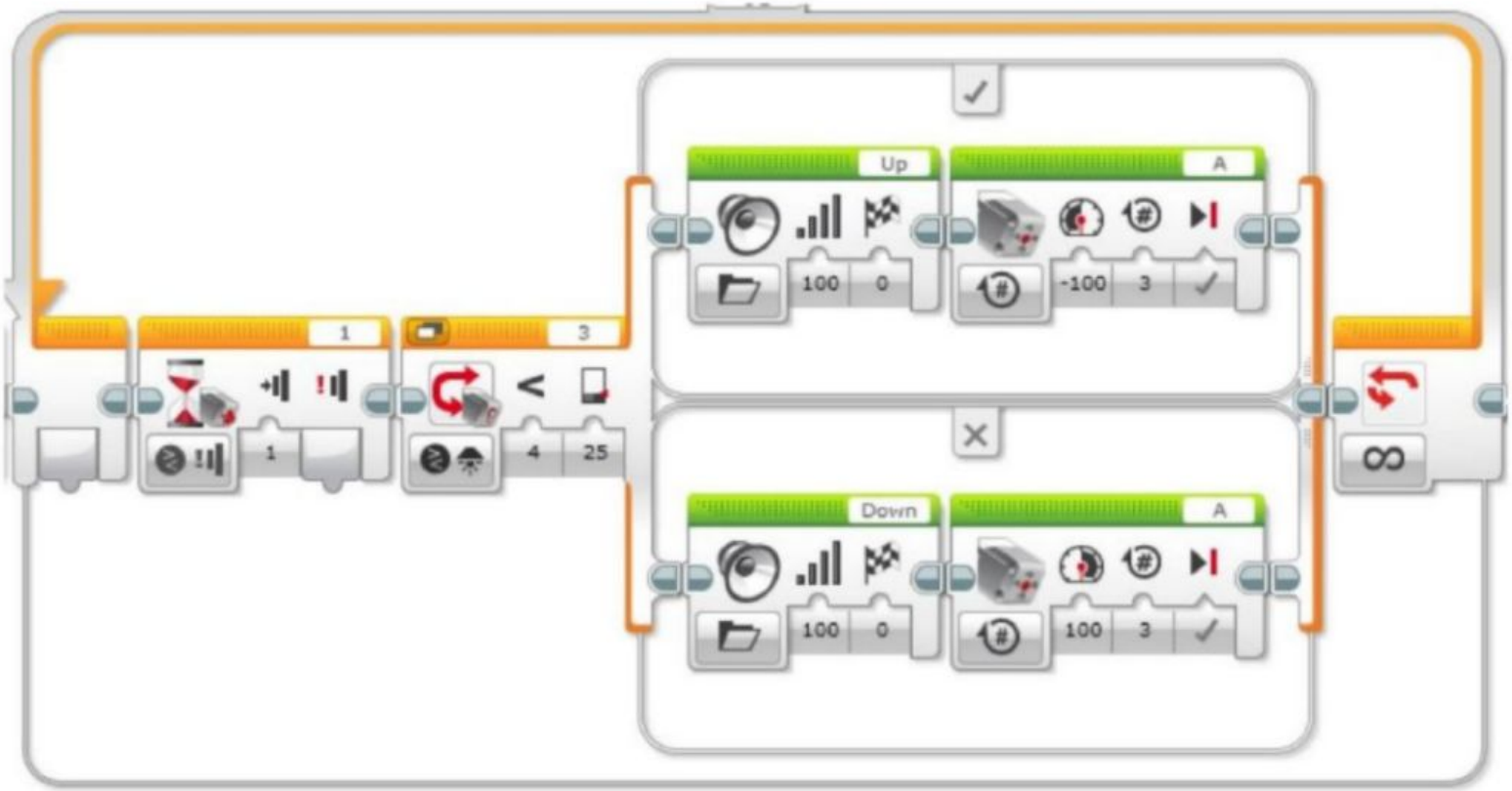

This is an example of a loop which uses the touch and color sensors to determine which sound file should be played and which direction to move the small motor. Notice the use of icons which look like the sensors and motors on the previous page, as well as dials and common symbols

The Project

- Related to the theme of the competition
- Research real-world problems
- Develop an innovative solution
- Come up with a creative presentation

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Season Schedule

- Start up over the summer
  - Registration is currently open
  - Registration closes when all slots are filled (typically in mid-September)
- The challenge is announced August 30th
- Build season is ten weeks
- Teams usually meet one to two times per week, but it is up to you to decide
- Cost depends on number of mentors and sponsorships

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2016 Animal Allies: Game Release

https://www.youtube.com/watch?v=Zj4IpvcHOrU

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2016 Animal Allies: Video of a Match

https://www.youtube.com/watch?v=J6TzD7Mz7hU

2016 Animal Allies: Project Vido

https://www.youtube.com/watch?v=ceCY2Xrnq5I

Hidden Agenda of FIRST

Working with robots and developing a real world solution are nice, but the real benefits of being on the team are:

- Learning how to work together
- Positively working through conflicts
- Building confidence even under scrutiny

Other benefits include:

- Applying engineering concepts
- Applying software development concepts
- Applying prioritization and time management
- Applying fun and achievement

Finding a Team

- There is a small number of existing teams in Newton
  - Many are school or home based
  - Some will recruit new members, but others are full
- Teams often change every few years
- The number of teams doesn't always meet the demand
- If you can't find a team, start one!

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Starting a team

- Find coaches and mentors
- Find students
- Costs are usually between $500 and $1,000
- Timeline:
  - Registration closes in September, but often fills up before then
- Registration process
  - Start on the FIRST website: www.firstinspires.org

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Coaching a Team

- You can coach a team!
- It does not require a STEM professional
- There is an abundance of resources for coaches
  - First website
  - Youtube
  - Google
- Other coaches will help, and so will we
- Every technical problem has already been solved (and captured on video!)

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Team Activities - Team Building

- Icebreakers
  - Name Bingo,
  - Pasta tower,
  - Low bar,
  - Name game,
  - Human robot,
  - Etc.
- Team name, logo, t-shirt design, banners, mascot, etc.
- “Yes, and...” exercises (practice agreeing, supporting, and building)
- Create a decision making process to resolve conflicts

Team Activities - Robot Game

- Build 96”x48” FLL table (detailed instructions are available online)
- Set up challenge field (August)
- Lego build challenges
  - Vague problems
  - Many solutions,
  - Compare approaches
- Programming tutorials
  - Navigate obstacles,
  - Push item,
  - Pick up,
  - Target,
  - Follow a line,
  - etc.

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Team Activities - Project

- Practice project using Animal Allies
  - Research,
  - Brainstorm,
  - Present,
  - Document,
  - Repeat!
- Watch other team's presentations

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Team Member Responsibilities

- Be positive toward everyone
- Be supportive of everyone
- Contribute to the team
- Respect coaches and others
- Do your share of the work and more
- Know your schedule and manage your time
- Make mistakes and share bad ideas (they might not be bad!)
- **HAVE FUN!**

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Parent Responsibilities

- Communicate scheduling conflicts
- Be supportive
- Drop off and pick up on time
- Be involved and motivate your child
- Get involved with the team!
  - Treasurer
  - Graphics
  - Administration (T-shirts, fundraising, snacks, videos, pit management, food, carpool, etc.)
- Help with fundraising or attaining sponsorship

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Coach Responsibilities

- Encourage and structure the process but let the team develop the content
- Ask questions to encourage the team's thinking and problem solving
- Keep kids aware of the schedule
- Help learn skills in basic building and programming
- Read and understand the rules
- Keep parents informed
- Balance fun and competition!

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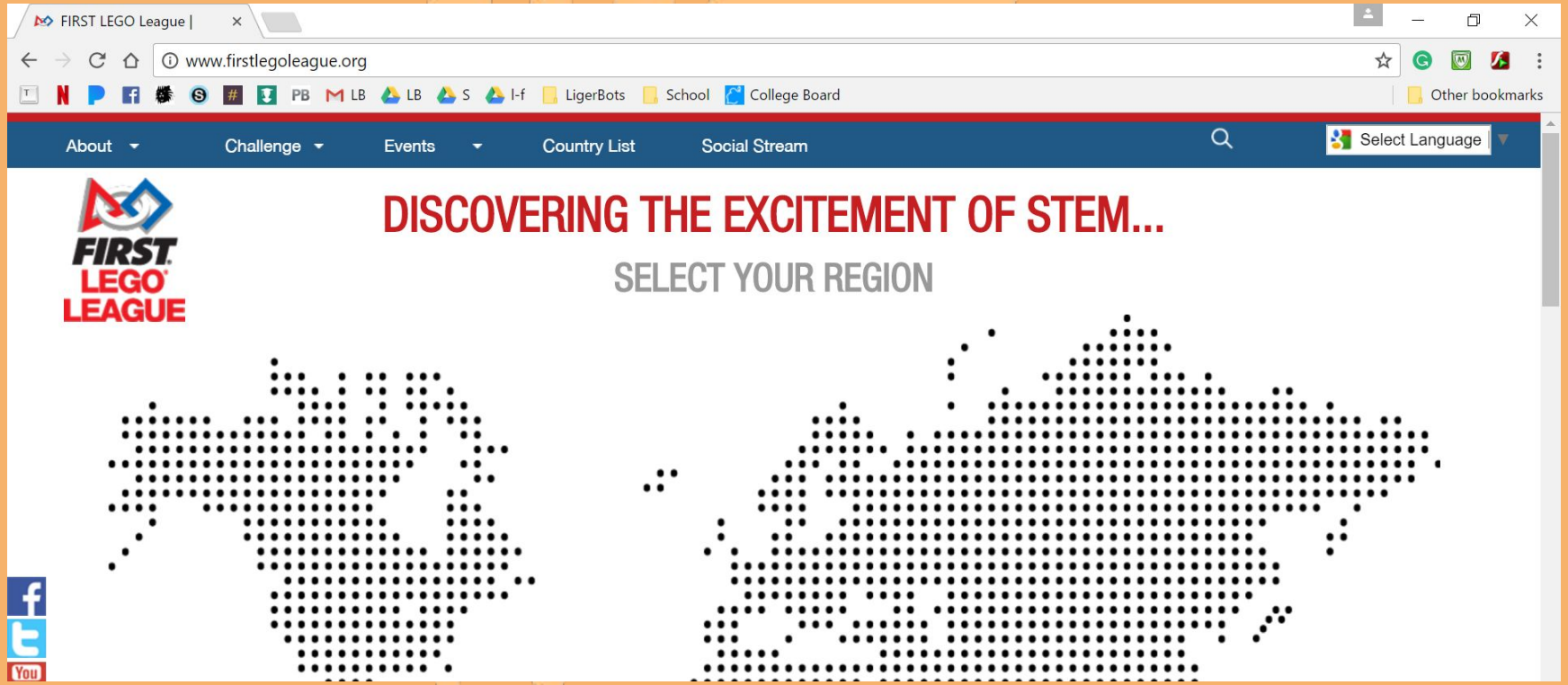
NOT Coach’s responsibilities

- Build and program the robot
- Do research and design project solutions
- Make important decisions
- You are **not** a football coach
  - Don’t call the plas
  - Winning isn’t everything!

Official FIRST® online resources



www.firstlegoleague.org

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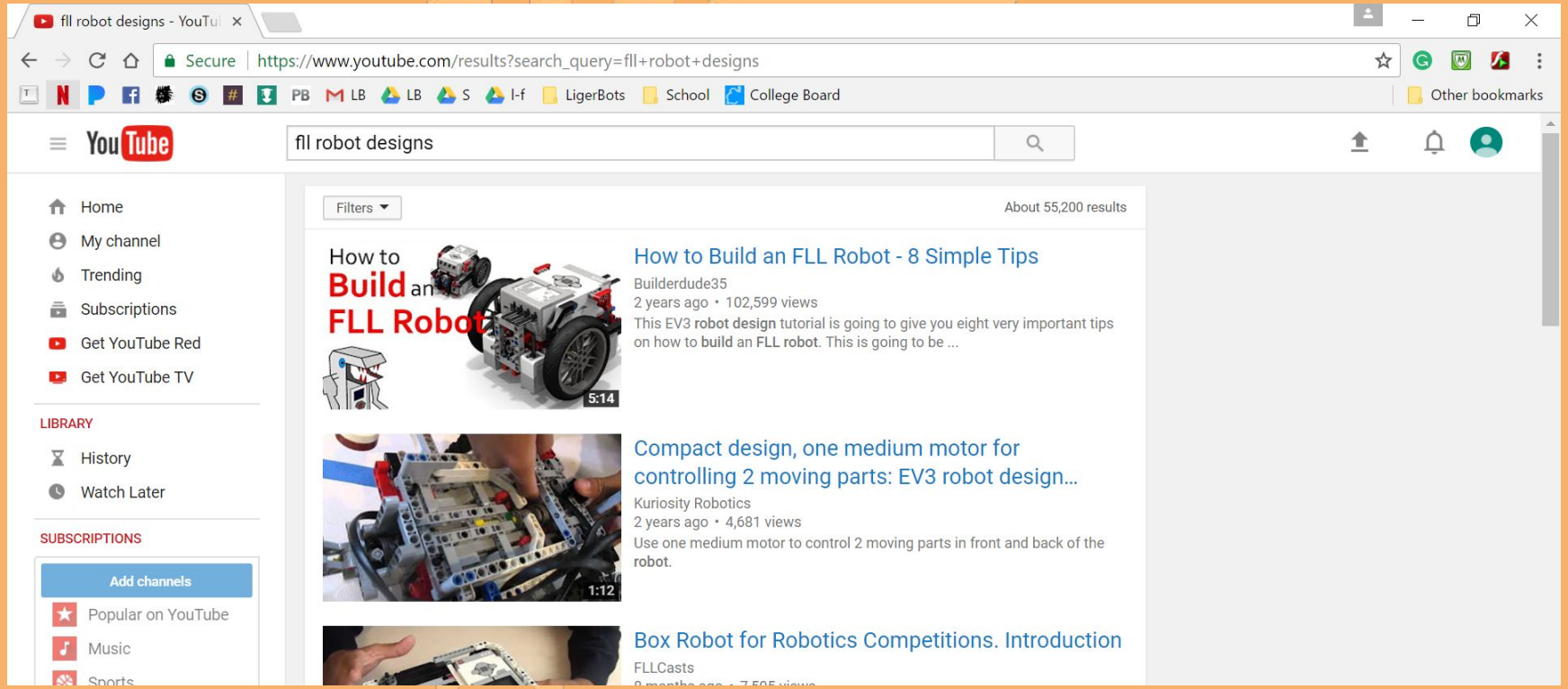
Youtube



"fll robot designs"

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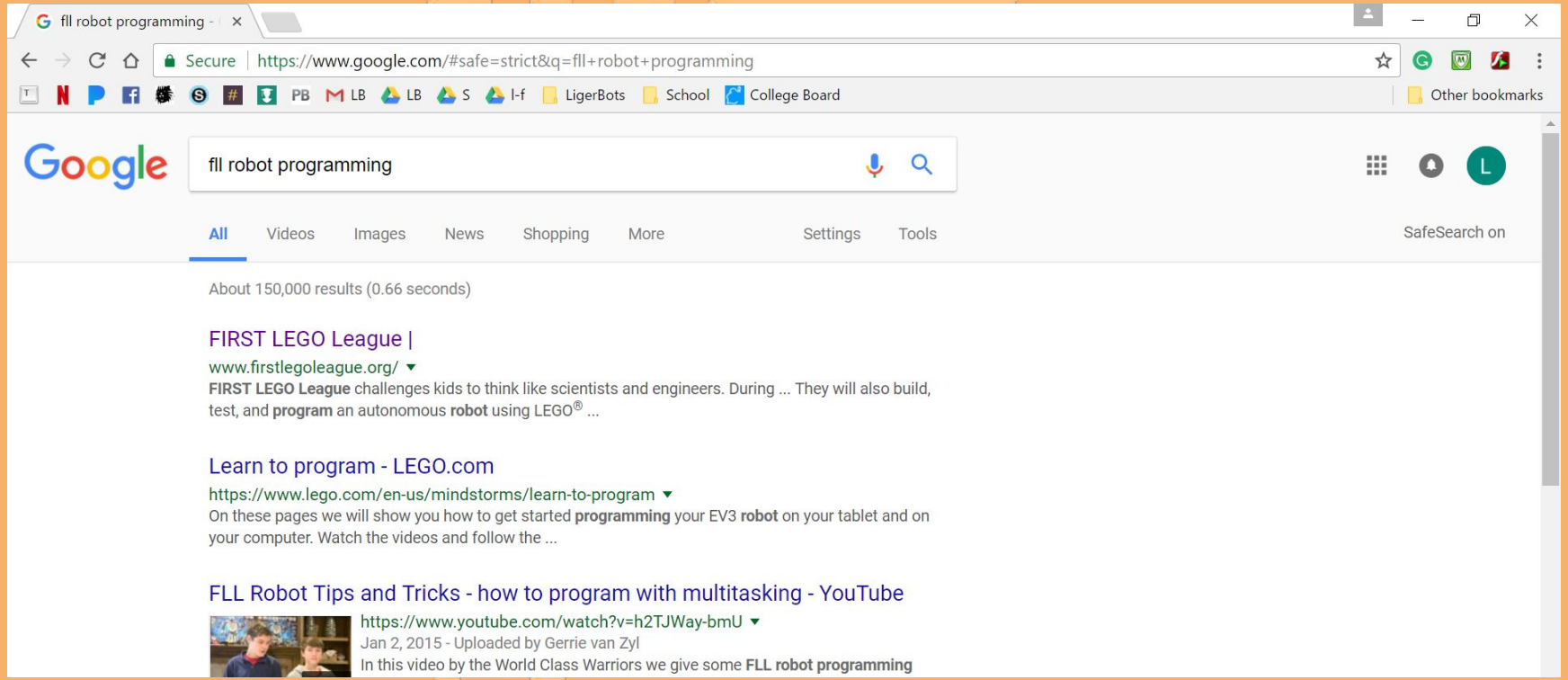
Google



"fll robot programming"

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Panel Q & A