FIRST Robotics BC

Workshop for Teachers

How you can change how your students learn

August 28, 2020

Territorial Acknowledgement

"I would like to acknowledge that we are on the traditional, ancestral and unceded territory of the Coast Salish peoples."

Housekeeping

This session focusses on resources for the classroom. It will be recorded and available either through Youtube or our website.

There will be time at the end of the presentation for questions, or you can type them in the Q&A box.

The slides will be available on the *FIRST*RoboticsBC.org website in the Educators tab.

If you would like to learn more about our competition programs, please join us for the virtual season launch on Saturday August 29, from 11am to 12:30pm. Check EVENTS on the *FIRST*RoboticsBC.org website.

Presenters

Ian Koscielski
FIRST Robotics Competition

Uschi Leslie
FIRST LEGO League

Christine Nicholls
FIRST Tech Challenge

Agenda

- What is *FIRST* and *FIRST* BC   10 minutes

- Elementary and Middle School Resources   20 minutes
  ClassPacks, *FIRST*@Home, LEGO education

- High School Resources   15 minutes
  ClassPacks, Simulators, Curriculum

- Questions and Answers   15 minutes
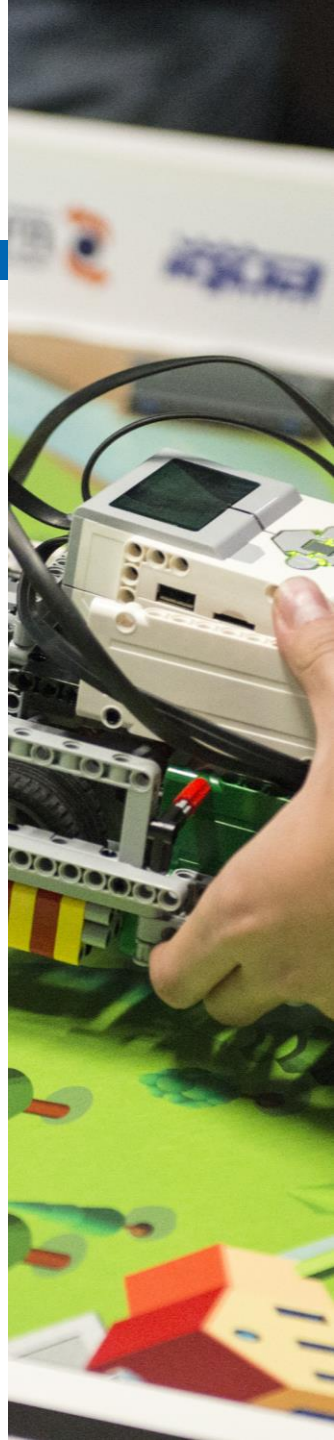
What is *FIRST*?

What is *FIRST* BC?

- We represent *FIRST* programs in British Columbia. Our aim is to promote *FIRST* ethos and values through engaging robotics programs for students from pre-K through Grade 12.

- Our charitable society seeks to support both competitive robotics programs and in-classroom activities that encourage youth to develop an interest in STEM.

- Students will have the opportunity to get involved in science and technology, while also learning about teamwork, collaboration, and other skills to become well-rounded contributors to society.

FIRST Class Packs

- Class Packs are purchasing option for schools wishing to implement STEM/robotics in the classroom through a project-based learning experience of *FIRST* programs ([detailed information for Educators](#)).

- Competitions/Festivals are hosted within the classroom or school. Start anytime, run it anytime during the school year.

- Includes flexible curriculum with [scope and sequence](#) options and guidance for student evaluation.

- Virtual [Professional Development](#) opportunities early this Fall.

- Specific COVID Guidance for Robotics in the Classroom

Agenda

- What is *FIRST* and *FIRST* BC   Ian K.

- **Elementary and Middle School Resources   Uschi L
  ClassPacks, *FIRST*@Home, LEGO education**

- High School Resources   Christine N
  ClassPacks, Simulators, Curriculum

- Questions and Answers   Ana G.

FIRST LEGO League
Elementary and Middle School

| FIRST LEGO LEAGUE DISCOVER | AGES 4-6 / GRADES PreK-1 | FIRST LEGO LEAGUE EXPLORE | AGES 6-10 / GRADES 2-4 | FIRST LEGO LEAGUE CHALLENGE | AGES 9-16* / GRADES 4-8 *Varies by Country |

FIRST LEGO League - Discover

FIRST
LEGO
LEAGUE

DISCOVER

AGES
4-6

GRADES
PreK-1

Harness young minds' natural curiosity and build habits of learning, confidence, and teamwork skills. This guided experience provides facilitators with the tools and resources to lead their learners as they explore STEM through play using the LEGO® Education STEAM Park.

PLAY MAKERS

FIRST LEGO League - Discover

FIRST LEGO League - Discover

What's included in the [Discover Class Pack](#)?

Class Pack
30
Students Served

1 team meeting guide

30 engineering notebooks

30 Discover More Parent Sets

7 Discover Sets

ThinkScape Learning Management System

Requires LEGO STEAM Park set, 1 per 8 students.

FIRST LEGO League - Discover

Class Pack

Total Startup Cost	Approx. $1,700 CAD
Total Ongoing Cost	Approx. $650 CAD
Professional Development	$250 USD per seat

FIRST LEGO League - Explore

FIRST LEGO LEAGUE EXPLORE

AGES
6-10

GRADES
2-4

In Explore, teams of students ages 6-10 focus on the fundamentals of engineering as they explore real-world problems, learn to design, and code and create unique solutions made with LEGO® bricks and powered by LEGO® Education WeDo 2.0.

PLAY MAKERS

FIRST LEGO League - Explore

FIRST LEGO League - Explore

- Framework for facilitators to guide their students through 12 sessions
- Students use their Engineering Notebooks to explore the fundamentals of engineering through a real-world problem,
- Participants learn to design and code, and create unique solutions made with LEGO® and powered by LEGO® WeDo 2.0.

FIRST LEGO League - Explore

	Class Pack 30 students	School Pack 144 students
Total Startup Cost	Approx. $3,875 CAD	Approx. $13,285 CAD
Total Ongoing Cost	Approx. $775 CAD	Approx. $1,484 CAD
Professional Development	$500 USD per seat	$500 USD per seat

FIRST LEGO League - Challenge

FIRST LEGO LEAGUE CHALLENGE

AGES
9-16*

GRADES
4-8

*Varies by Country

Engage your students in a range of relevant learning opportunities that will immerse them in research, problem-solving, coding, and engineering. Students will develop an innovative solution to a real-world problem, and design, build, and code a LEGO® robot to solve themed challenge missions.

RePLAY

FIRST LEGO League - Challenge

FIRST LEGO League - Challenge

Class Pack
30
Students Served

Includes:

- Digital Class Pack Guide
- 1 Team Meeting Guide
- 30 Engineering Notebooks
- 2 Challenge sets
- 4 robot game rule books
- 1 Year Access to Thinkscape Learning System

FIRST LEGO League - Challenge

Required Equipment:
(1 Per 4 Students)

SPIKE Prime Core Set
Or
Mindstorms EV3 Core Set
OR
Any other LEGO Mindstorms Set

Recommended Equipment:
SPIKE Prime Expansion Set
Mindstorms EV3 Expansion Set

LEGO SPIKE Prime Set

LEGO Mindstorms EV3 Set
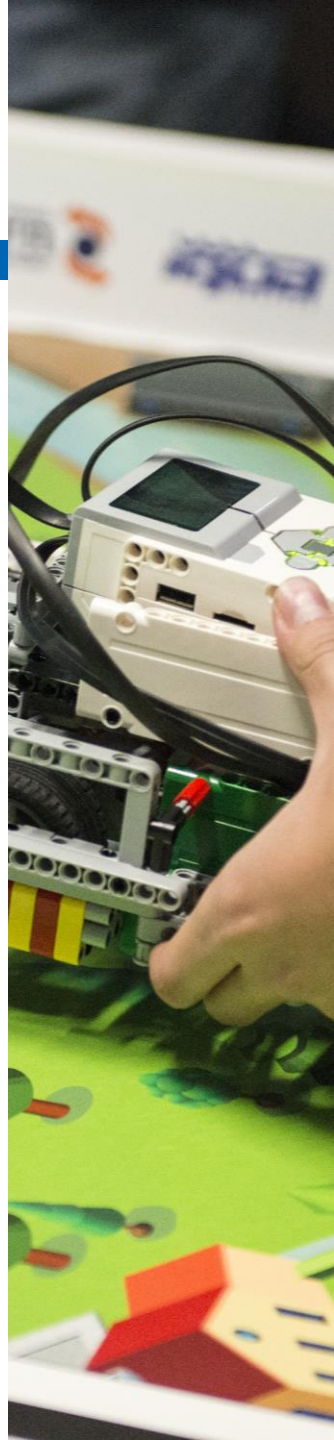
FIRST LEGO League - Challenge

	Mindstorms EV3 Platform	SPIKE Prime Platform
	+	
Total Startup Cost	Approx. $5,250 CAD*	Approx. $4,550 CAD*
Total Ongoing Cost	Approx. $920 CAD	Approx. $920 CAD
Professional Development	$500 USD per seat	$500 USD per seat

FIRST at Home -   FREE Resources

- Remote Learning Resources

- Free PreK – grade 12 STEM activity ideas

- Coding, programming and AI resources

- CAD resources

- Robot mechanics and Electronics Activities

firstinspires.org/community/home-learning
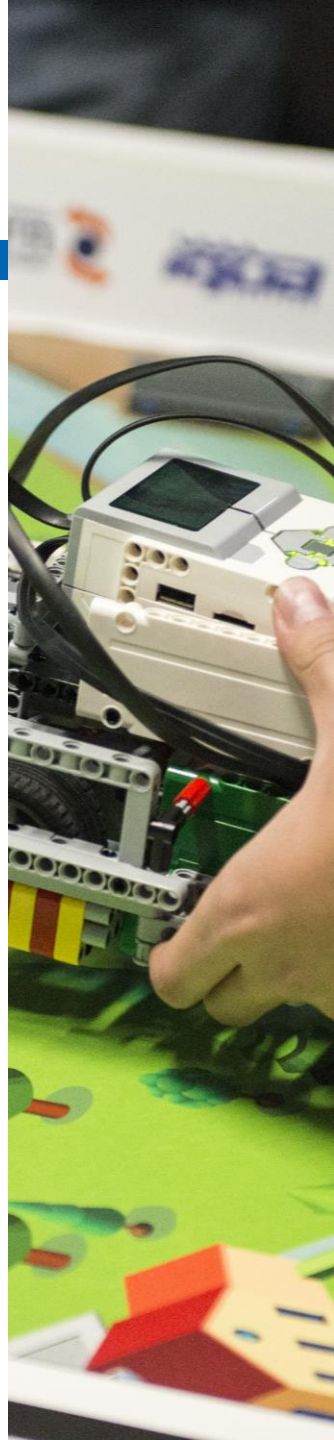
FIRST at Home -   FREE Resources

Some Digital Resources:

- Virtual Robotics Toolkit
  - [Virtual environment for *FIRST* LEGO League Robots](#)

- Online EV3 Tutorials
  - [FLL EV3 Tutorial](#)
  - [In Depth Tutorials created by FRC 4476](#)
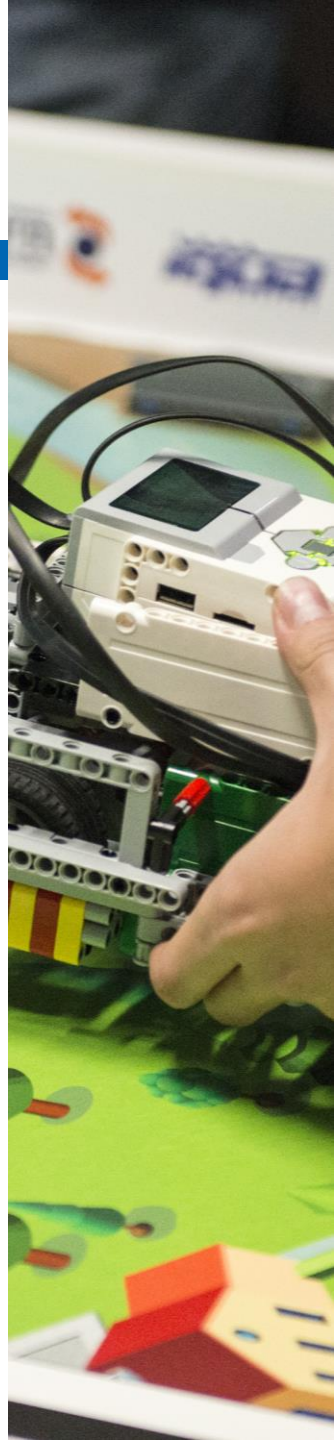
LEGO Education -   FREE Resources

- Getting started guides
  - https://education.lego.com/en-us/start

- Additional lesson plan resources
  - https://education.lego.com/en-us/lessons
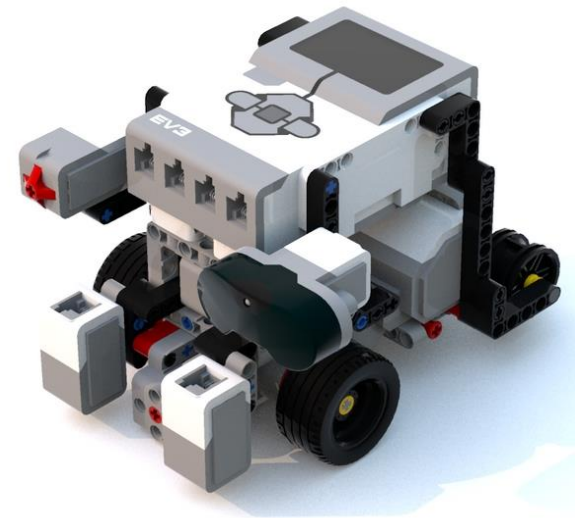
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- **High School Resources   Christine N**
  ClassPacks, Simulators, Curriculum

- Questions and Answers   Ana G.

FIRST Tech Challenge – Class Pack

FIRST TECH CHALLENGE

AGES
12-18

GRADES
7-12

Offer students connections to career pathways and collaborative STEM and holistic skill development with this year-long course. Students will focus on four core areas throughout the year including, community impact, performing essential engineering calculations, and applying teamwork, inclusion, and discovery while building a robot.
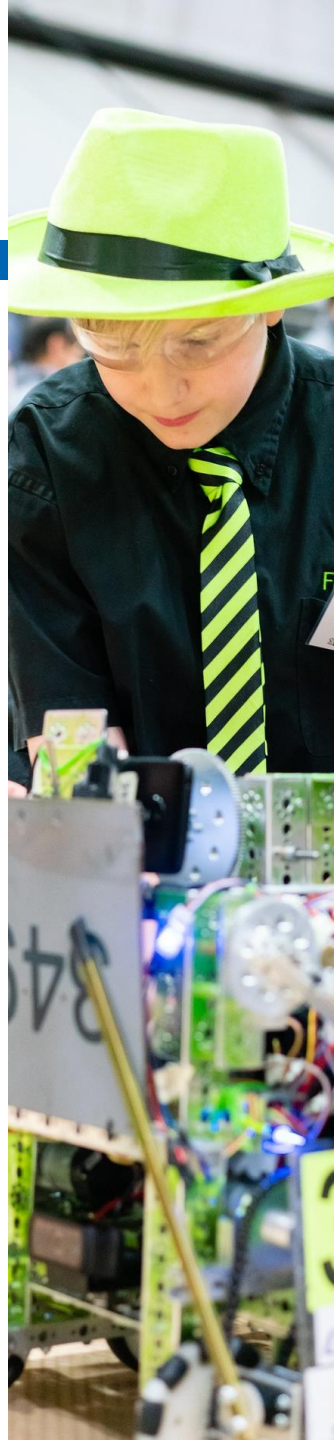
FIRST Tech Challenge – Class Pack

- Thinkscape Learning Management System for teachers and students, Access September 2020-September 2021

- Online Lesson Plans, Student Activities, and Engineering Notebooks

- 180 hours of flexible curriculum to keep students engaged

- Mini-game for use in the classroom

- Optional Professional Development $500 US per seat
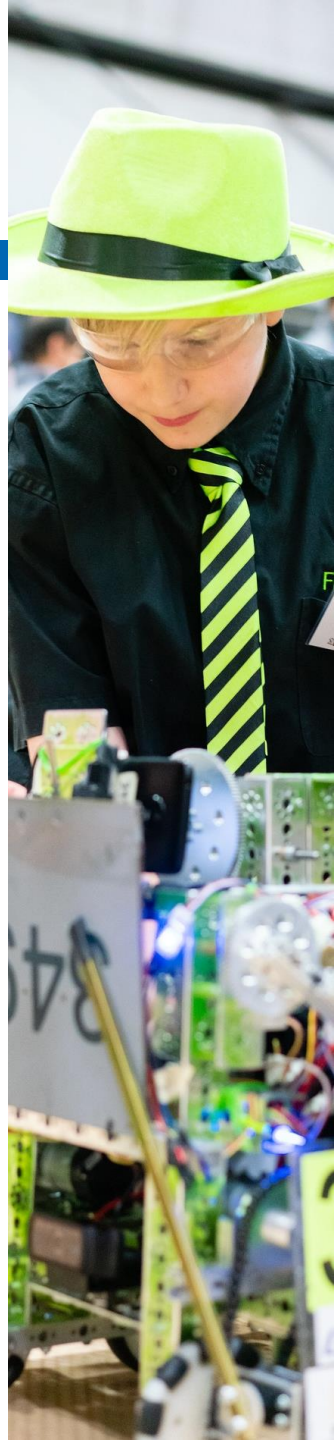
FIRST Tech Challenge – Class Pack

$695 USD for 30 students

Suggested Robot Kit
1 REV Robotics Edu Kit per 3 students $619 USD

Optional Upgrade Kit $289 USD
1-2 per classroom

Startup Cost $6,927 USD

Ongoing Cost $ 695 USD

FIRST Tech Challenge – Class Pack

Gear Option	FTC Class Pack
Class Pack	$695 USD (Approx. $915 CAD)
Shipping and Handling	$42 USD(Approx. $55 CAD)
Core Equipment (x10 sets)	$619 USD + Tax +Shipping[+]
Optional Expansion Packs	$289 USD + Tax + Shipping[+]
Total Startup Cost	Approx. $6,927 USD*
Total Ongoing Cost	Approx. $970 CAD
Professional Development	$500 USD per seat

*Does not include Expansion Pack option   [+]Reusable each year after initial investment
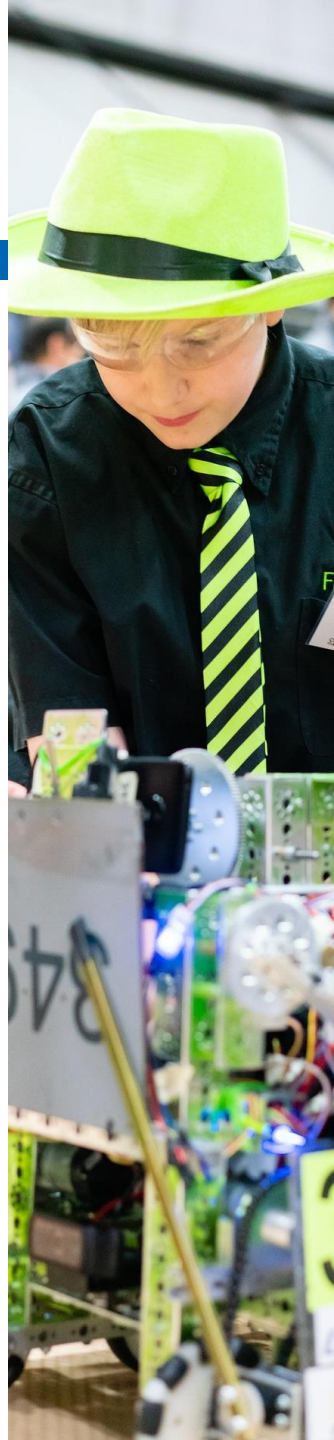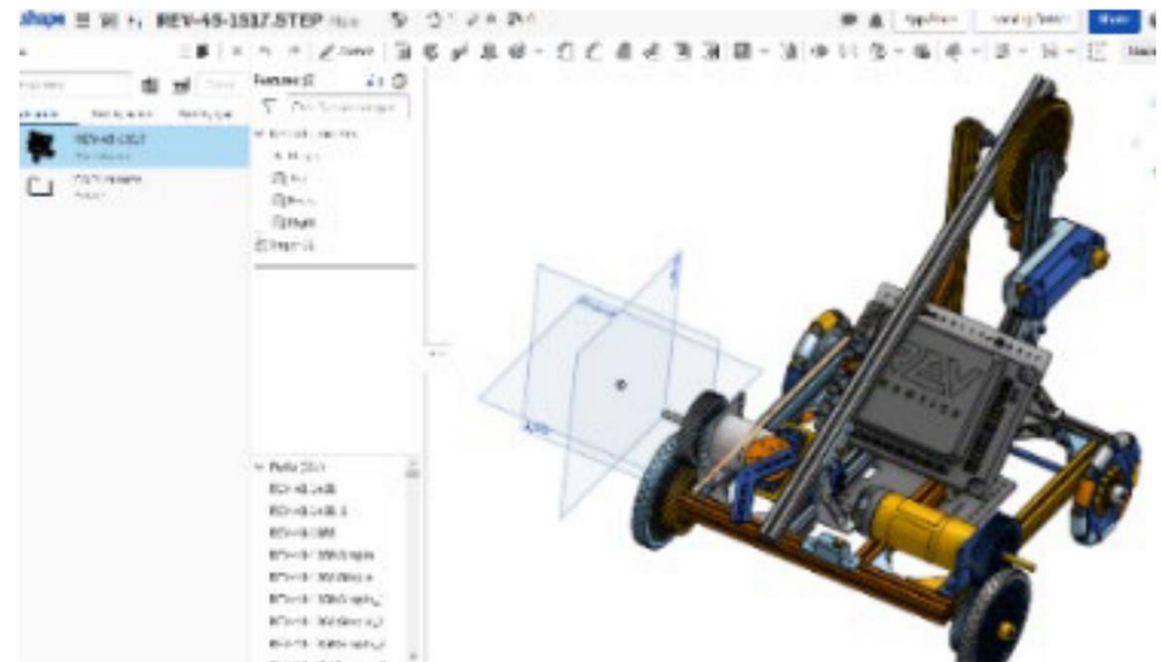
FIRST High School – CAD Resources

Students can use CAD software to design and test robots or mechanisms using free versions of online CAD software.

Fusion 360 -   autodesk.com/education/home

OnShape   -   onshape.com/education-plan

Other CAD software has free versions for students. Requires a fairly powerful computer to install and run.
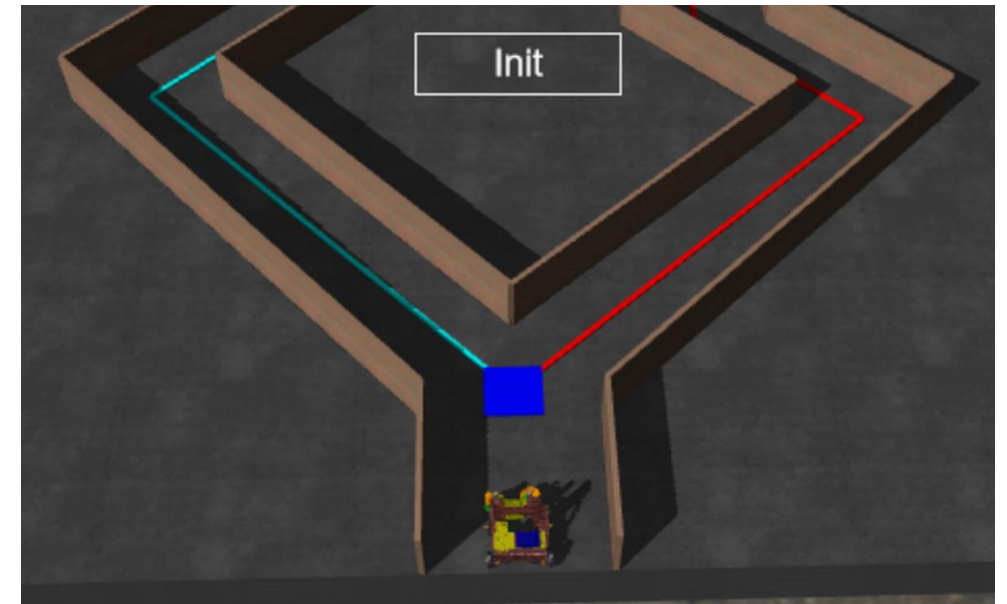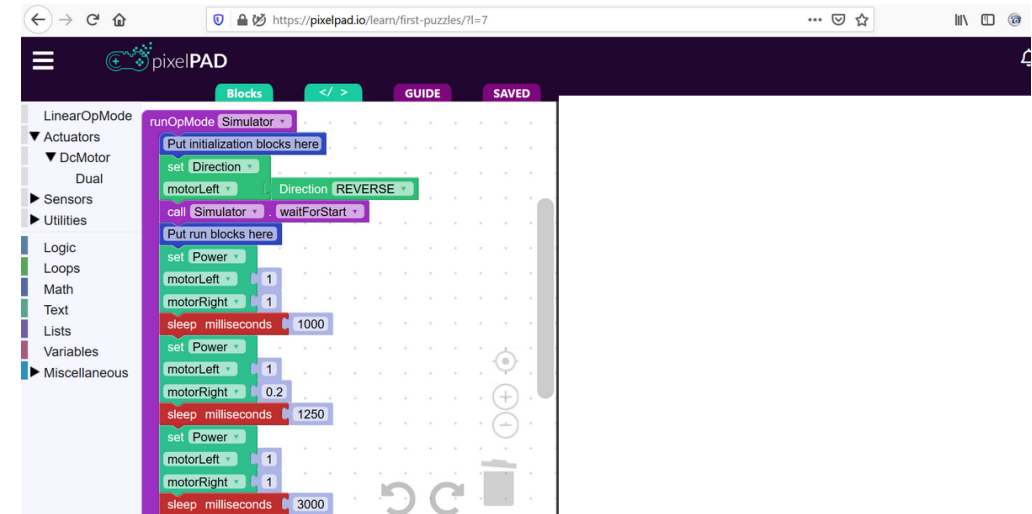
FIRST High School – Robot Simulators

[Blocks Programming Simulator](#)
web-based version for programing a
simulated robot, no hardware required!

[Synthesis](#) - open source robotics simulator for
FIRST Community
Students can export CAD robot from Fusion 360 or
Inventor into Synthesis to test autonomous
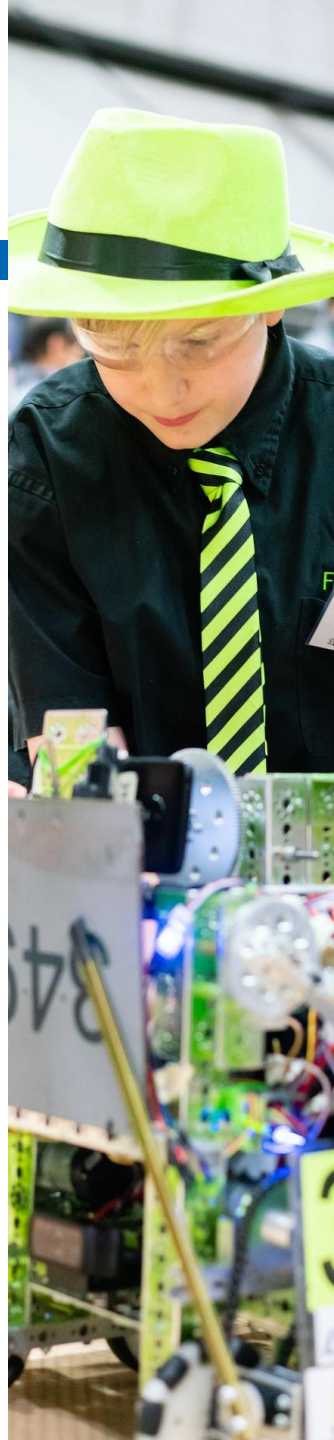programs or for tele-op driving.

FIRST High School – Free Curriculum

FIRST Tech Challenge Curriculum from 2018-19 Season

Topics covered include planning, design, mechanisms, programming, CAD, safety in the classroom, and evaluation guidance.

Includes ideas for Game Challenge

Next Steps

If you want to use a class pack:

1. Create your account and profile on firstinspires.org

2. From your dashboard, create a Class Pack account

    • Follow instructions found at firstinspires.org/class-pack

3. Order your Equipment

4. Review Class Pack Guidance for COVID-19 Interruptions

5. Have fun!!!!!!!

Questions?

Contact Info

Uschi Leslie, uleslie@firstpartners.org
FIRST LEGO League Programs

Christine Nicholls, cnicholls@firstpartners.org
FIRST Tech Challenge

Ian Koscielski, ikosielski@firstpartners.org
FIRST Robotics Competition

Thank You!

I thought I was building a robot... but what I didn't realize was the robot was **building me**.
- *FIRST* Student