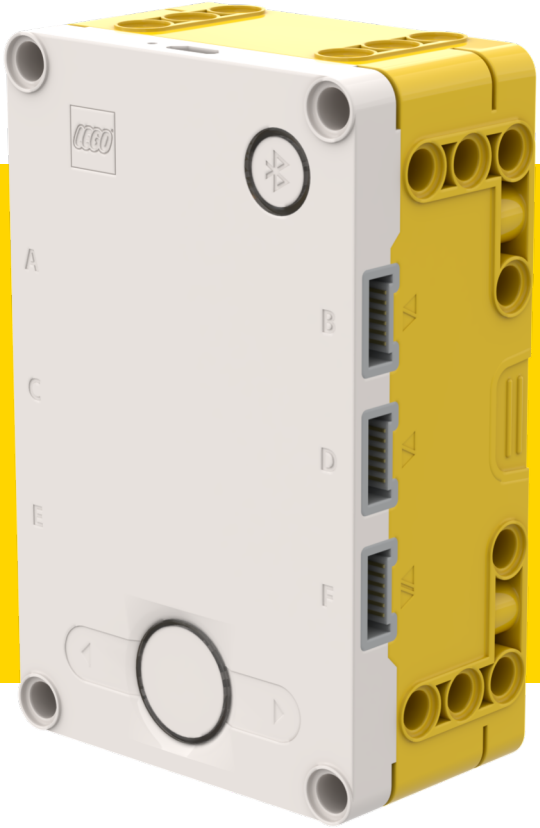
SPIKE PRIME LESSONS

By the Makers of EV3Lessons

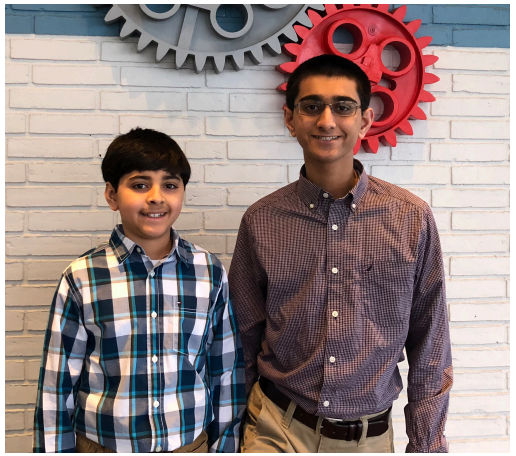


HOW TO USE THESE LESSONS

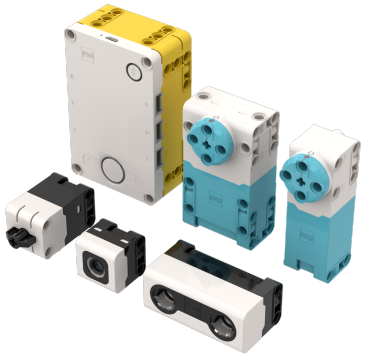
BY SANJAY AND ARVIND SESHAN

WHO ARE THE AUTHORS?

- We are high school students from Pittsburgh, PA, USA
- We have won First Place Programming and First Place Champion's at World Festival. Our robots have consistently scored top 6 in the world every year.
- We also authored all the lessons on EV3Lessons.com which are used by more than 550,000 users worldwide. FLLTutorials.com has an additional 100,000 users.
- We were also selected to be the "First 5" – Two of the first five community members selected by LEGO to give feedback on SPIKE Prime as it was being developed
- In short, we have a strong background in teaching, writing lessons, and competing in LEGO robotics.



Arvind and Sanjay Seshan in Billund, Denmark in 2017



MISSION AND FOCUS

- There are programming lessons available inside the SPIKE Prime software. Those lessons are short, project-based lessons. There is a competition unit included.
- Our SPIKE Prime lessons offer a different perspective. We focus on one build – a basic training robot with two drive wheels, and concentrate on developing programming skills
- The skills we teach can be applied to any project or competition
- We believe strongly in the need for discovery. At no time will we provide direct solutions to a competition. It is expected that you learn the concept and apply it situations you need in competition
- We believe strongly that sensor usage is a valuable tool to increase robot reliability, and so you will find majority of our lessons talk about sensors in some way
- Our lessons are designed to be completed in order so that you will have the correct prerequisites for each lesson. They are organized into handy units that build upon each other.

LESSON FORMAT

- Our lesson content and format are based on seven years of writing and teaching programming lessons.
- We try to keep our lessons short (10-12 slides) on purpose.
- Our lessons are not YouTube videos on purpose. However, we will provide a supplemental video to demonstrate robot movement when needed.
- Every lesson includes the following components:
  - Objectives, Main Blocks, Challenge, Solution
- Lessons are grouped together into units

SPIKE PRIME LESSONS

- UNIT 1 – Getting Started
  - How to use these Lessons
  - Building a Robot
  - Easier Building with SPIKE Prime
  - Installing Software and Firmware
- UNIT 2 – Navigating the Software
  - Introduction to Hub and Software
  - Managing Projects
  - Viewing Sensor Values
- UNIT 3 – Moving and Turning
  - Configuring Robot Movement
  - Moving Straight
  - Turning with Gyro
  - More Accurate Turns
- UNIT 4 – Good Programming Practices
  - Pseudocode
  - Commenting Code
- UNIT 5 – Using Sensors
  - Introduction to Force Sensor
  - Introduction to Color Sensor
  - Introduction to Distance Sensor
- UNIT 6: Better Programming Techniques
  - Using Repeat Blocks
  - Using Sound Blocks
  - Using Light Blocks
  - Using If-Then Blocks
- UNIT 7: Putting it all Together
  - Moving an Object with Stall Detection
  - Basic Line Follower
  - Challenges

SPIKE PRIME LESSONS

- UNIT 8 – Advanced Programming Techniques
  - Introduction to Events
  - Event Synchronization
  - Variables
  - My Blocks
- UNIT 9 – Advanced Sensor Use
  - Squaring on a Line
  - Proportional Line Follower
  - Gyro Move Straight
  - PID Line Follower
- UNIT 10 – Techniques for FIRST LEGO League
  - Acceleration
  - Debugging Techniques
  - Reliability Techniques
- UNIT 11 – MicroPython
  - Introduction to MicroPython

More lessons planned and coming soon

CREDITS

- This lesson was created by Sanjay Seshan and Arvind Seshan for SPIKE Prime Lessons
- More lessons are available at www.primelessons.org