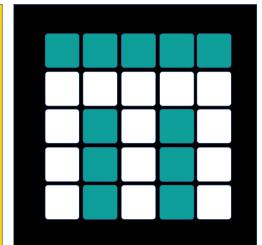
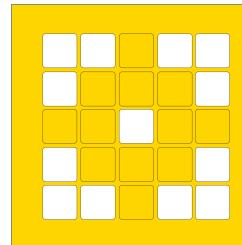


PRIME LESSONS

By the Makers of EV3Lessons



HOW TO USE THESE LESSONS

BY SANJAY AND ARVIND SESAN

WHO ARE THE AUTHORS & FOUNDERS?

- 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 850,000 users worldwide. FLLTutorials.com has an additional 150,000 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.
- We have also been working with MINDSTORMS Robot Inventor.
- In short, we have a strong background in teaching, writing lessons, and competing in LEGO robotics.



Arvind



Sanjay



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. There are also projects available in Robot Inventor.
- Prime Lessons offer a different perspective. We focus on developing programming skills by using a basic training robot with two drive wheels
- 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

PRIME LESSONS ORGANIZATION

- **UNIT 1 – Getting Started**
 - How to use these Lessons
 - Building a Robot
 - Easier Building with SPIKE Prime and Robot Inventor
 - 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/Loops
 - Using Sound Blocks/Speaker Functions
 - Using Light Blocks/Light Functions
 - Using If-Then Blocks/If-Else Statements
- **UNIT 7: Putting it all Together**
 - Moving an Object with Stall Detection
 - Basic Line Follower
 - Challenges

PRIME LESSONS ORGANIZATION

■ 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
- Importing Custom Libraries

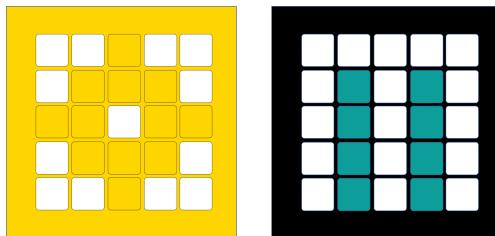
TYPES OF LESSONS

- Lessons are available for Word Blocks and Python

Using Repeat Blocks/Loops

Word Block Slides: [PPTX](#), [PDF](#)
Python Slides: [PPTX](#), [PDF](#)

- SPIKE Prime and MINDSTORMS Robot Inventor are very similar. Our lessons are compatible with either. If there are differences, we point these out in the lessons.



CREDITS

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



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