Tips and Tricks for FLL Coaches – Robot

Aditya Jain and Rohan Suri:
Presidents of LCSRC
(Ladue Community STEM and Robotics Club)

Who are we?

- Members of FIRST for 10+ years
  - JFLL to FLLC to FRC.
- Organize robotics programs year-round.
- Provide mentorship to FLLC Teams
- Entirely operated by high school students.

The MASTERPIECE Board

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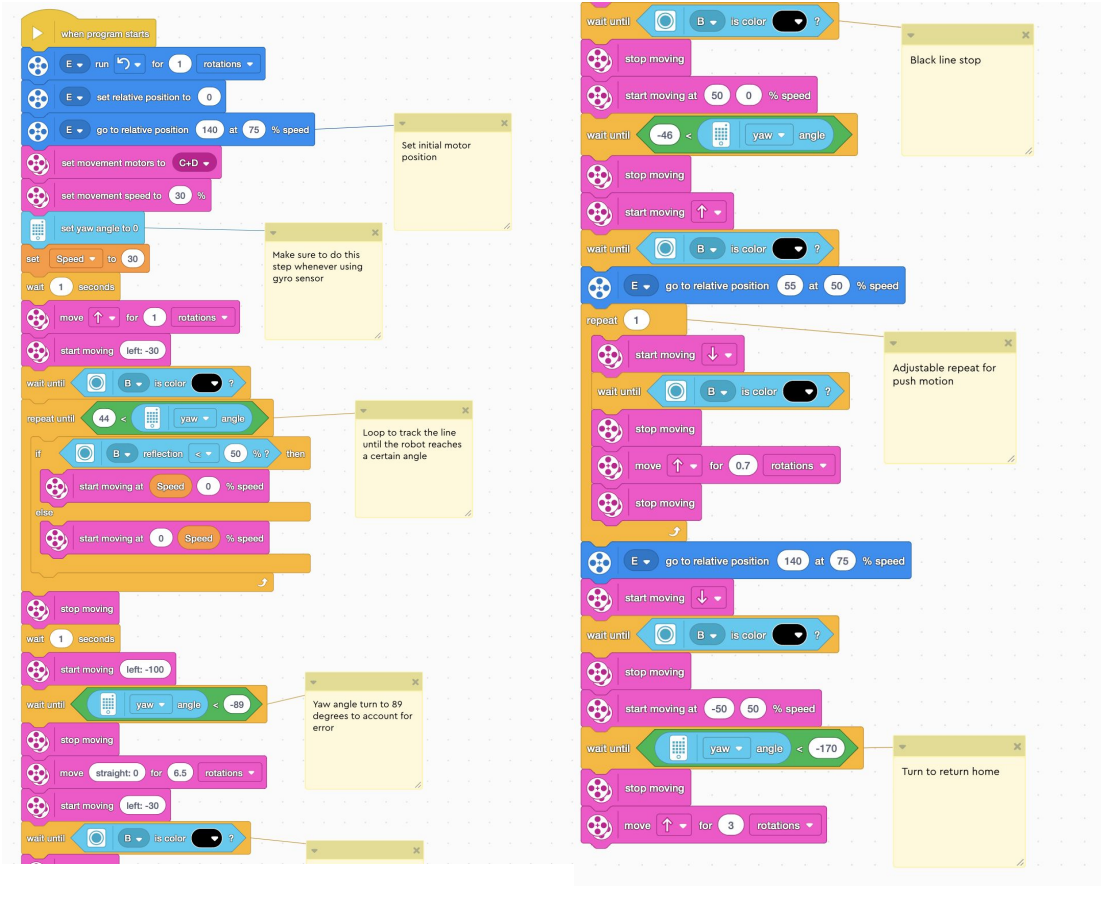
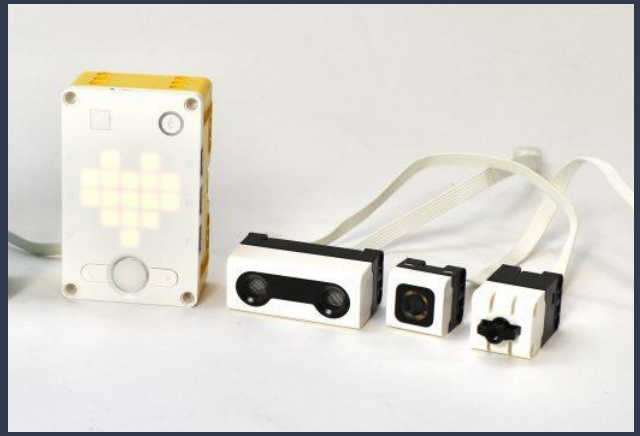
Guided Mission M02: Theater Scene Change



Lego SPIKE Prime

- About the Brick
  - Battery Life
  - Startup time
  - Consistency
- Units on SPIKE Prime App
  - “Competition Ready” - great for new teams
- Motors/Sensors
  - Embedded gyro sensor
- Programming interface
  - Word blocks or python

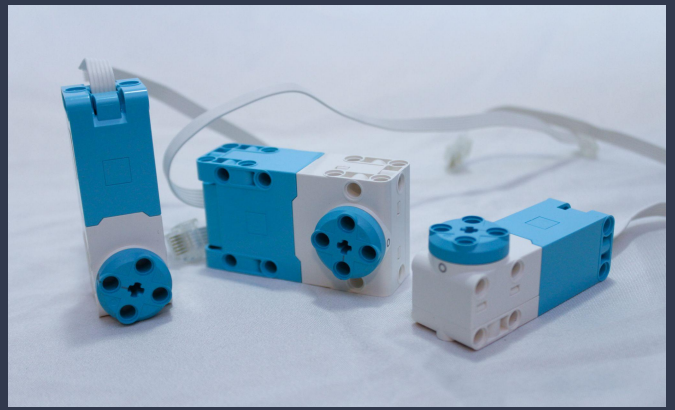
Sensors



Types of Sensors

- Ultrasonic Sensor
  - Track Distance
- Color Sensor
  - 1 vs 2 Color Sensors
- Force Sensor
  - Tracks force instead of only touch
- Embedded Gyro Sensor
  - Driving perfectly straight
  - Perfect turns

Motors/Wiring

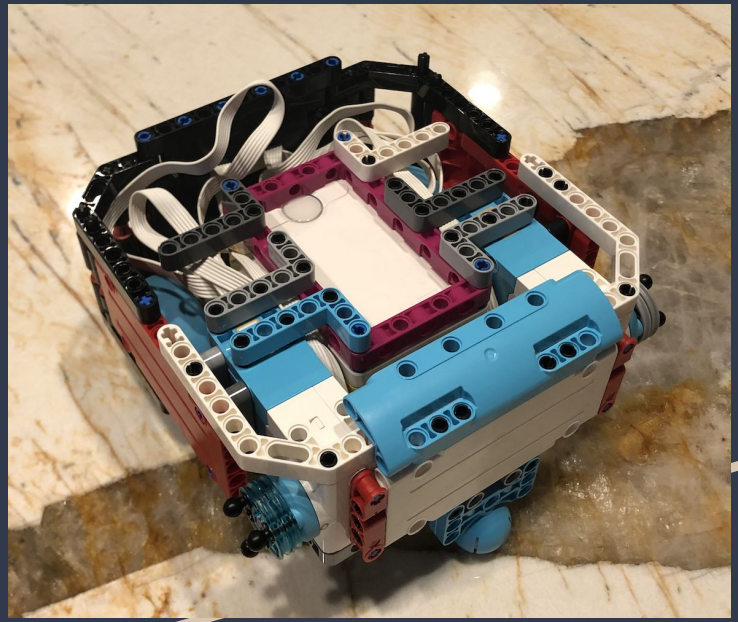


Two Types of Motors:

- Large Motors
  - Great for Attachments
  - New Shape
- Medium Motors
  - Great for Driving Base
- Wiring Changes
  - Wire Clips!

SPIKE Demonstration!

Building Tips



Robot Design Tips

- Base Robot
  - Driving Base 1
  - Flat Edges
- Driving Base
  - What type of motors?
  - Typical Types
- Easy to attach attachments
  - Attaching straight to the motor
  - Drop On Attachments

Mission Planning

Picking out Missions

- Type of Motion
  - Are motors required?
- Location
  - Close to base?
  - Close to other missions?
- Points
  - Is it worth the time/effort?
- Grouping
  - Create mission runs based off of the previous criteria

Season Planning

General Process

- Base Robot
  - Finished before end of August
- Mission Planning
  - Create spreadsheet group missions
  - Decide on final plan by mid/end September
- Coding
  - Begin at season start
  - Develop movement plan
  - Iterate

Coding Walkthrough

Select your SPIKE™ solution

SPIKE
Essential

SPIKE
Prime

LEGO education

Select your SPIKE™ solution

SPIKE
Essential

SPIKE
Prime

LEGO education

HOME

Explore learning materials

NEW PROJECT

Create new Programming Canvas

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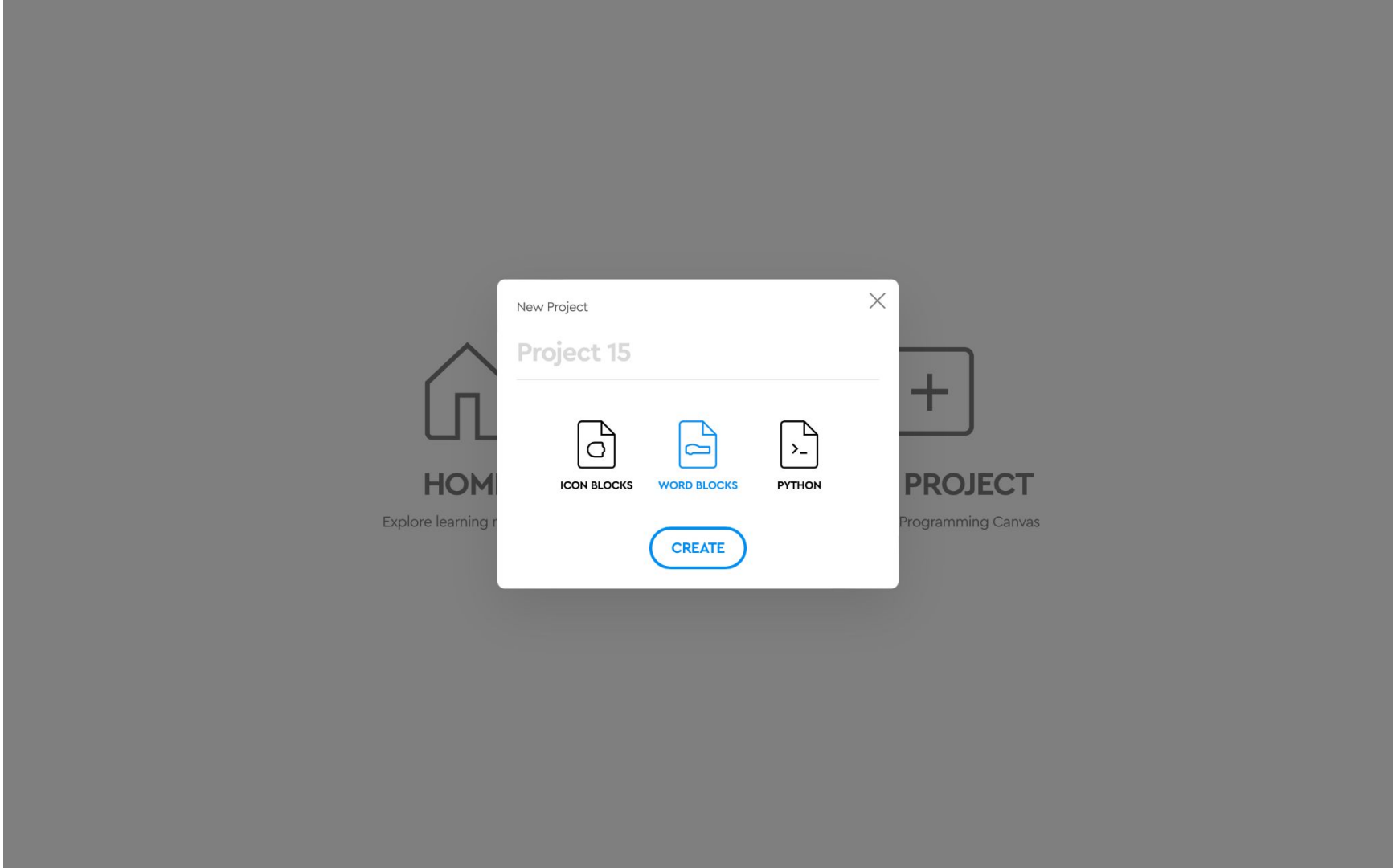
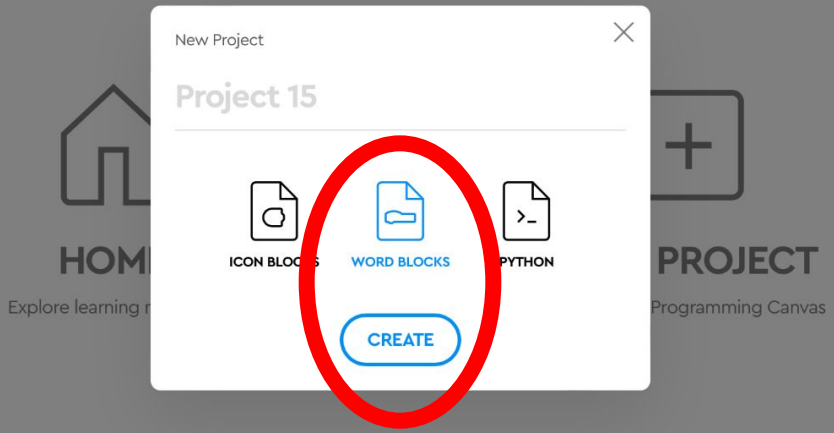
Create new Programming Canvas


New Project
Project 15
ICON BLOCKS
WORD BLOCKS
PYTHON
CREATE
HOM
Explore learning
PROJECT
Programming Canvas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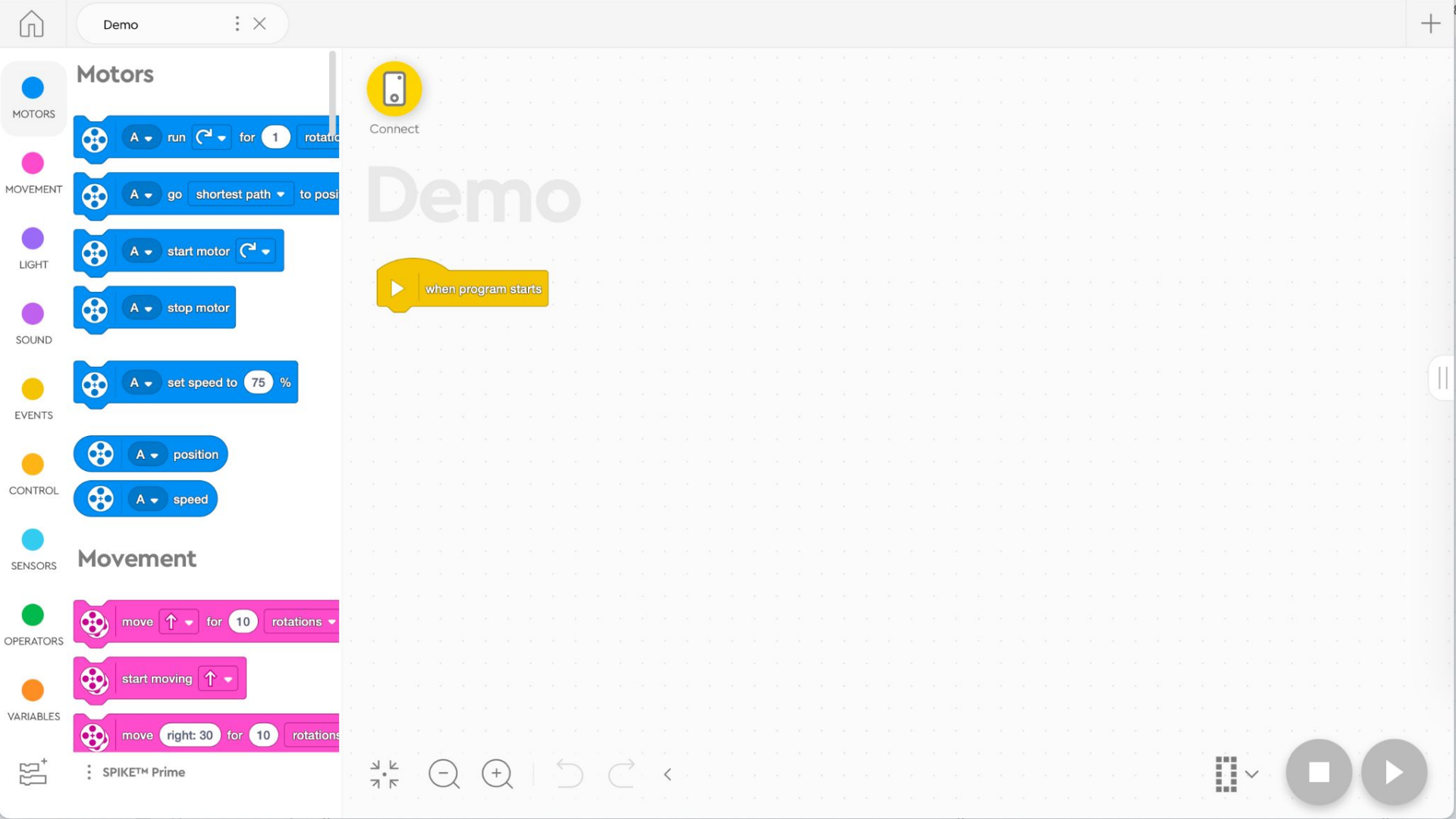
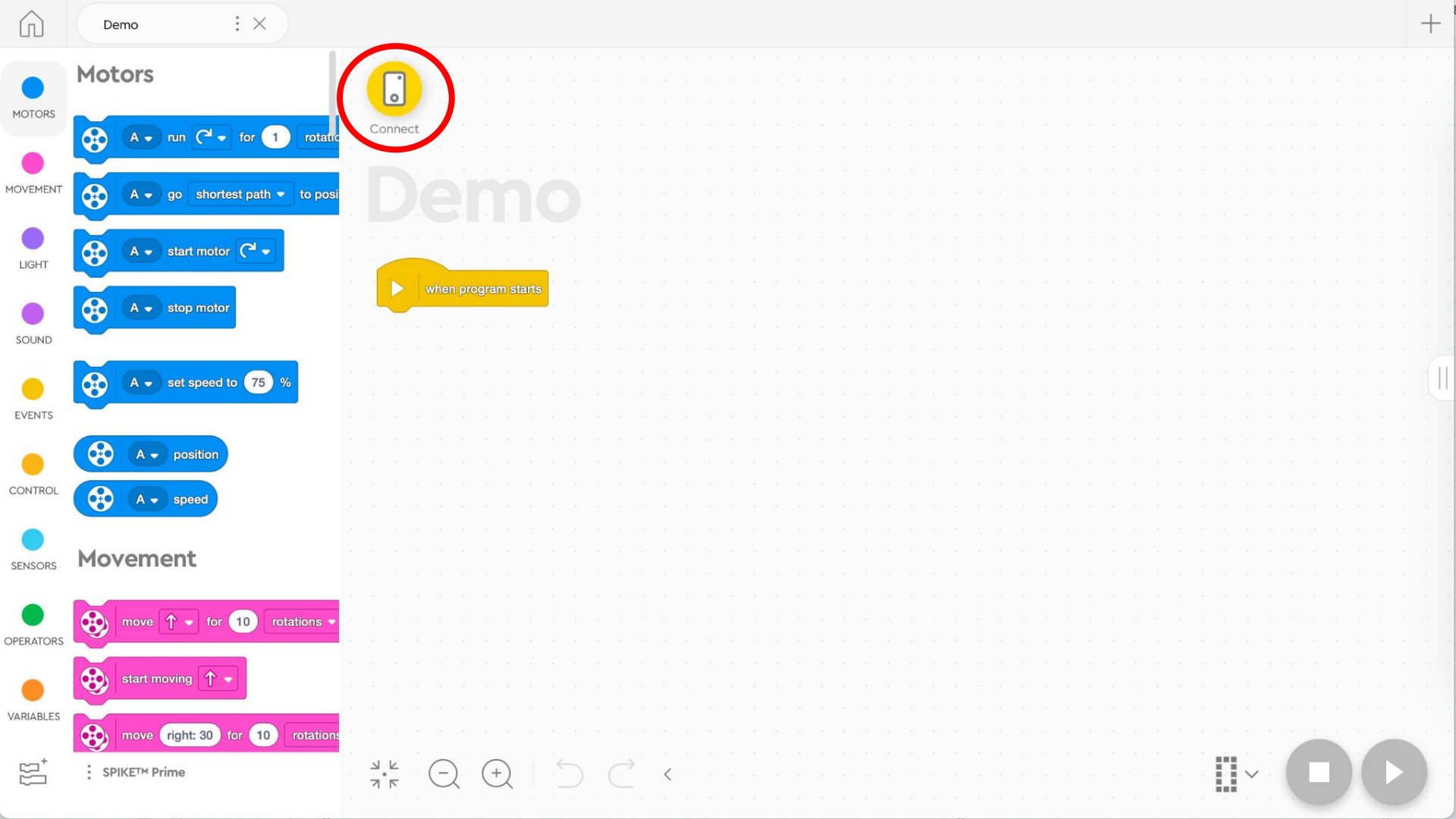

Demo
MOTORS
MOVEMENT
LIGHT
SOUND
EVENTS
CONTROL
SENSORS
OPERATORS
VARIABLES
Motors
A run for 1 rotatio
A go shortest path to posi
A start motor
A stop motor
A set speed to 75 %
A position
A speed
Movement
move for 10 rotations
start moving
move right: 30 for 10 rotations
SPIKE™ Prime
Connect
Demo
when program starts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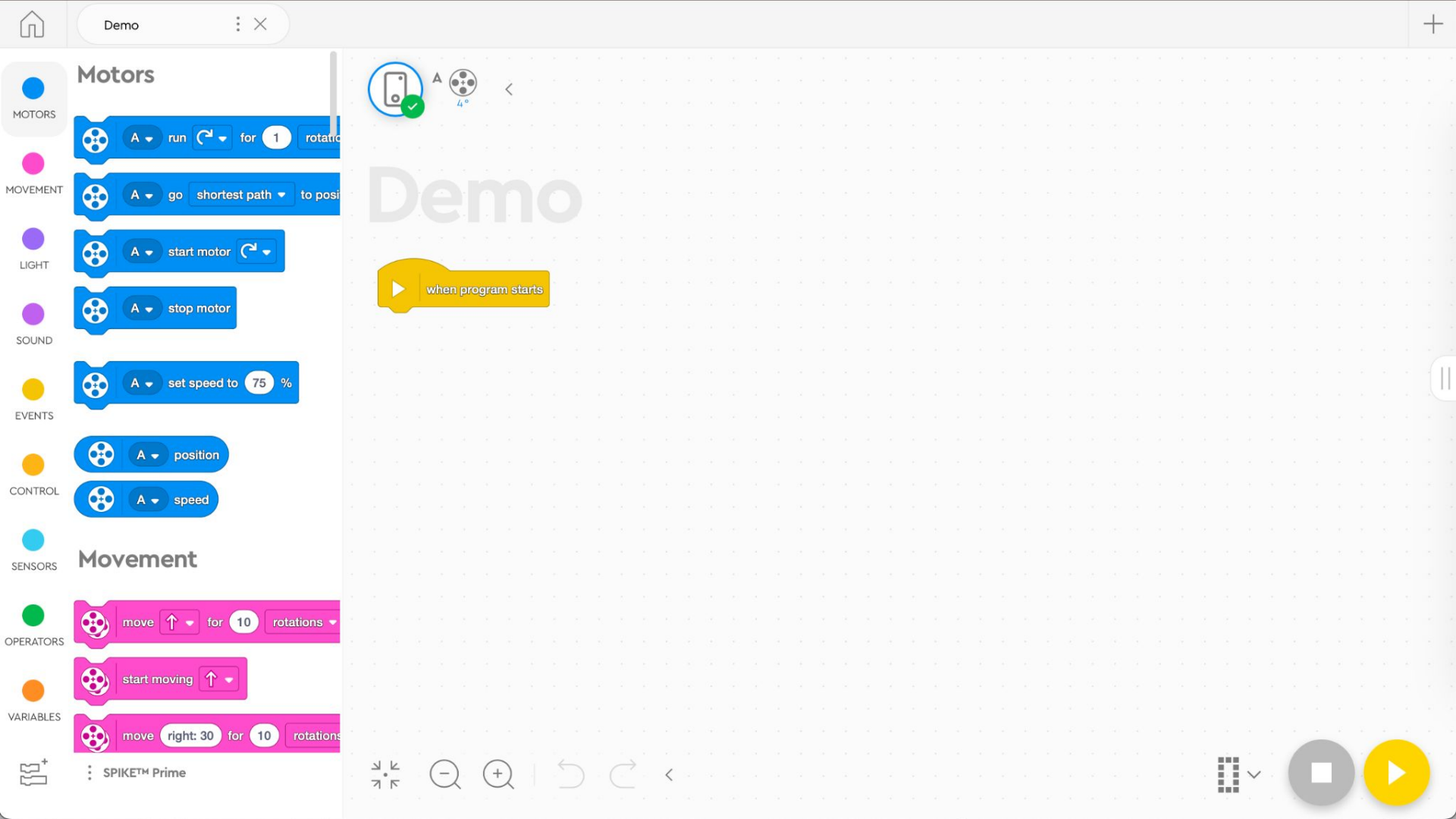
SPIKE Prime
CHANGE

You might need to update your Hub OS

What color is your Power Button?

Green
Already updated

White
Update now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4°
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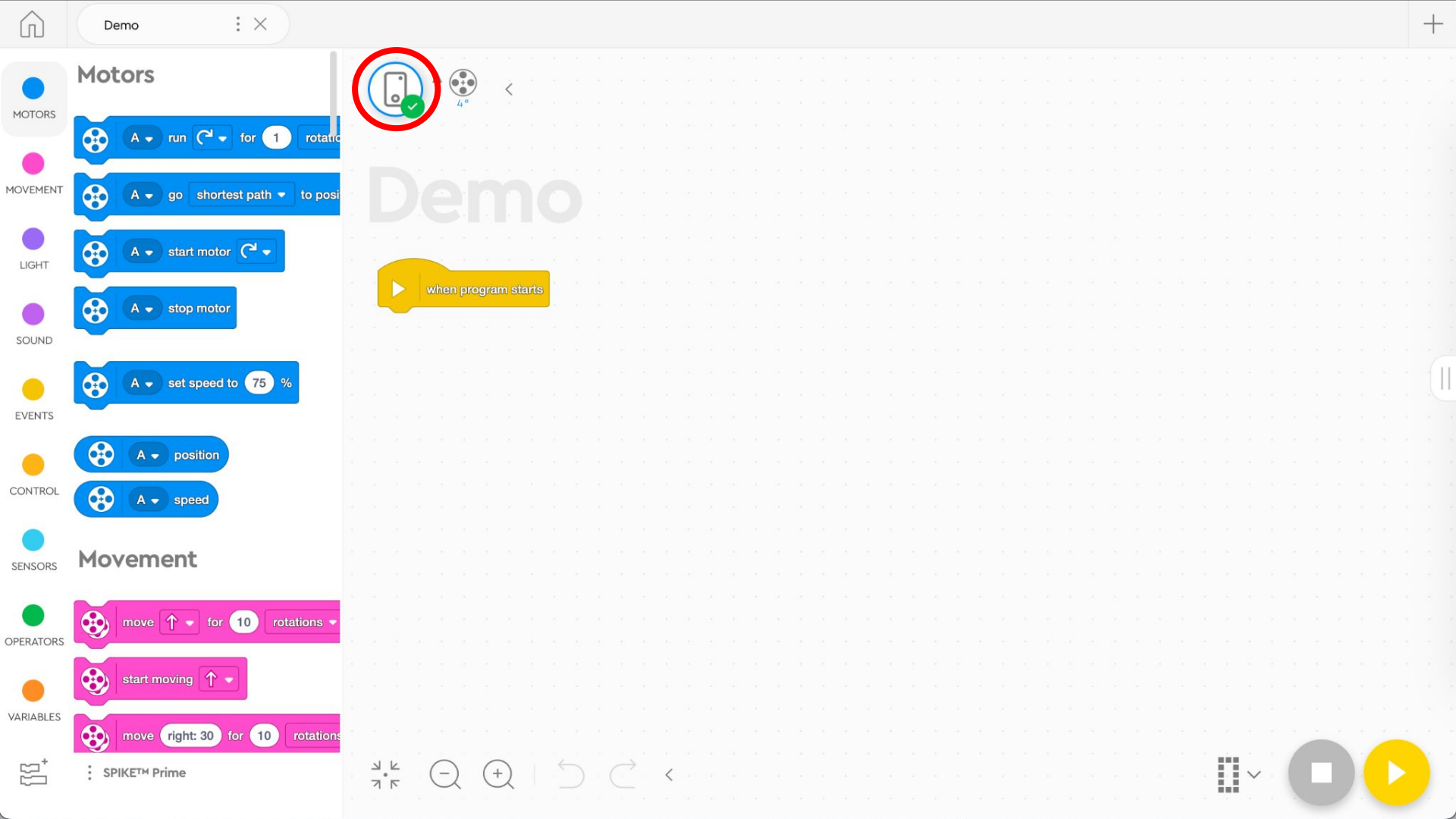
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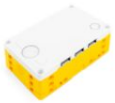


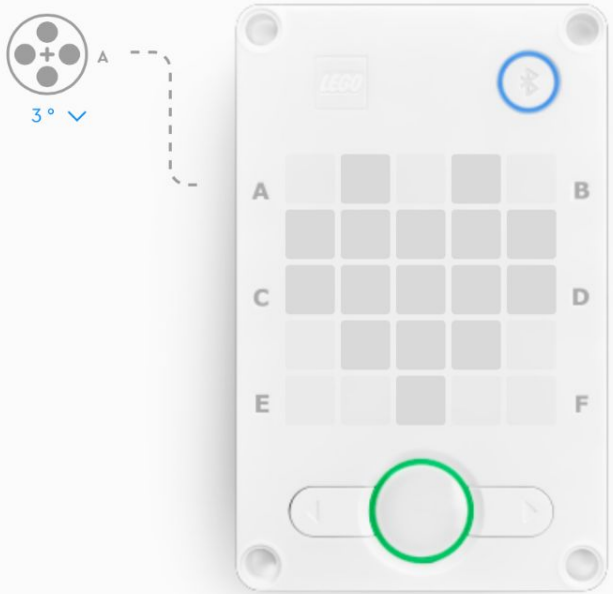
LCSRC1

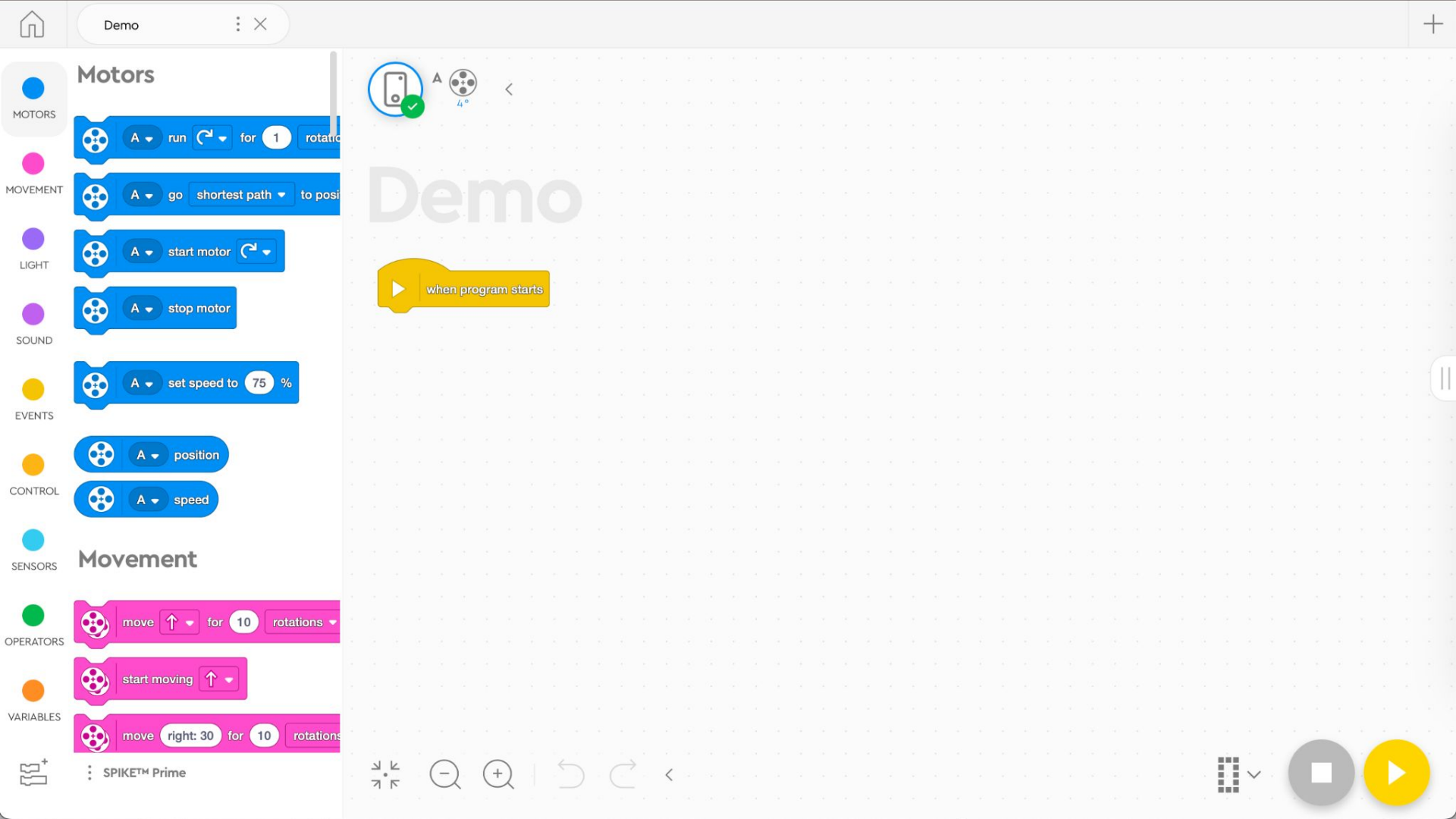
Hub OS: 1.3.26 RENAME

100 %

DISCONNECT

Yaw: -3 Pitch: 1 Roll: 0 TILT ANGLE

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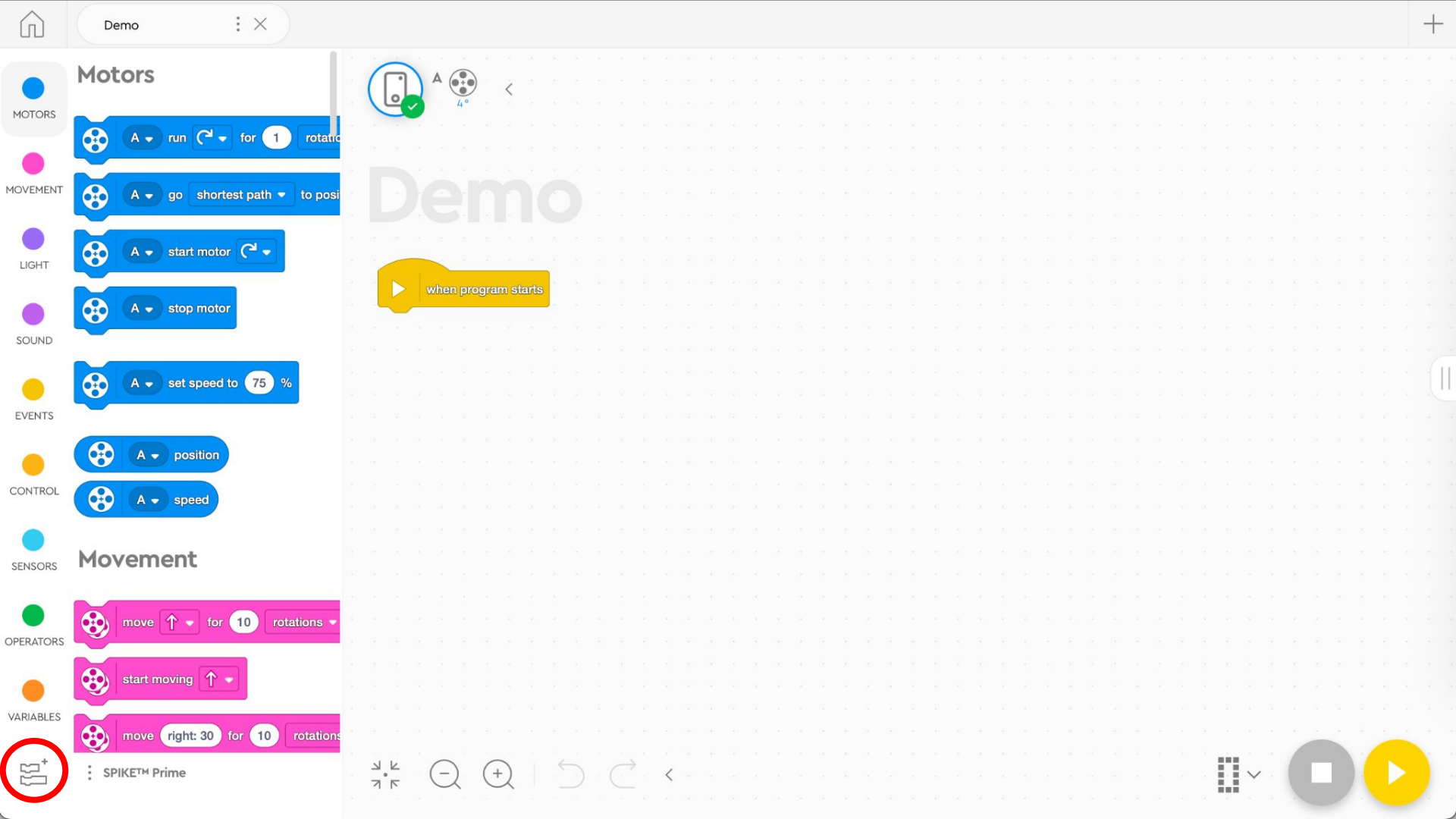
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Extensions

Weather Manager

Get this week's weather forecast. Your computer needs to be connected to the internet. Weather forecast from Yr,...

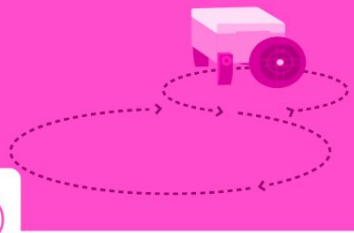
> LEARN MORE

More Motors

Make motors hold their position or run motors with unregulated power.

> LEARN MORE

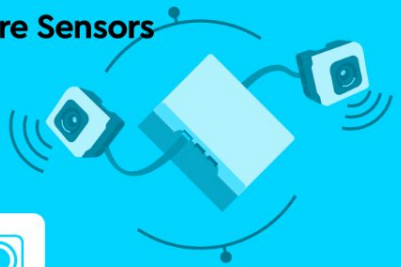
More Movement



Set the individual motor speed on a Driving Base or make it hold its position.

> LEARN MORE

More Sensors



This extension provides additional sensor data, such as acceleration and raw color readings.

> LEARN MORE

Music

Play instruments and drums. Music will play from your computer or tablet.

> LEARN MORE

Line Graph

This extension allows you to display and experiment with line graphs.

> LEARN MORE

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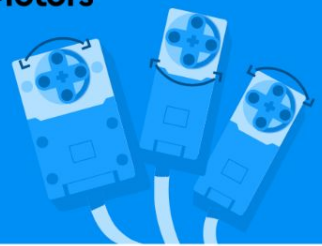

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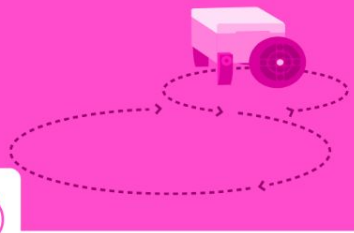

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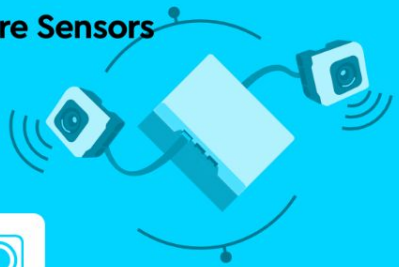

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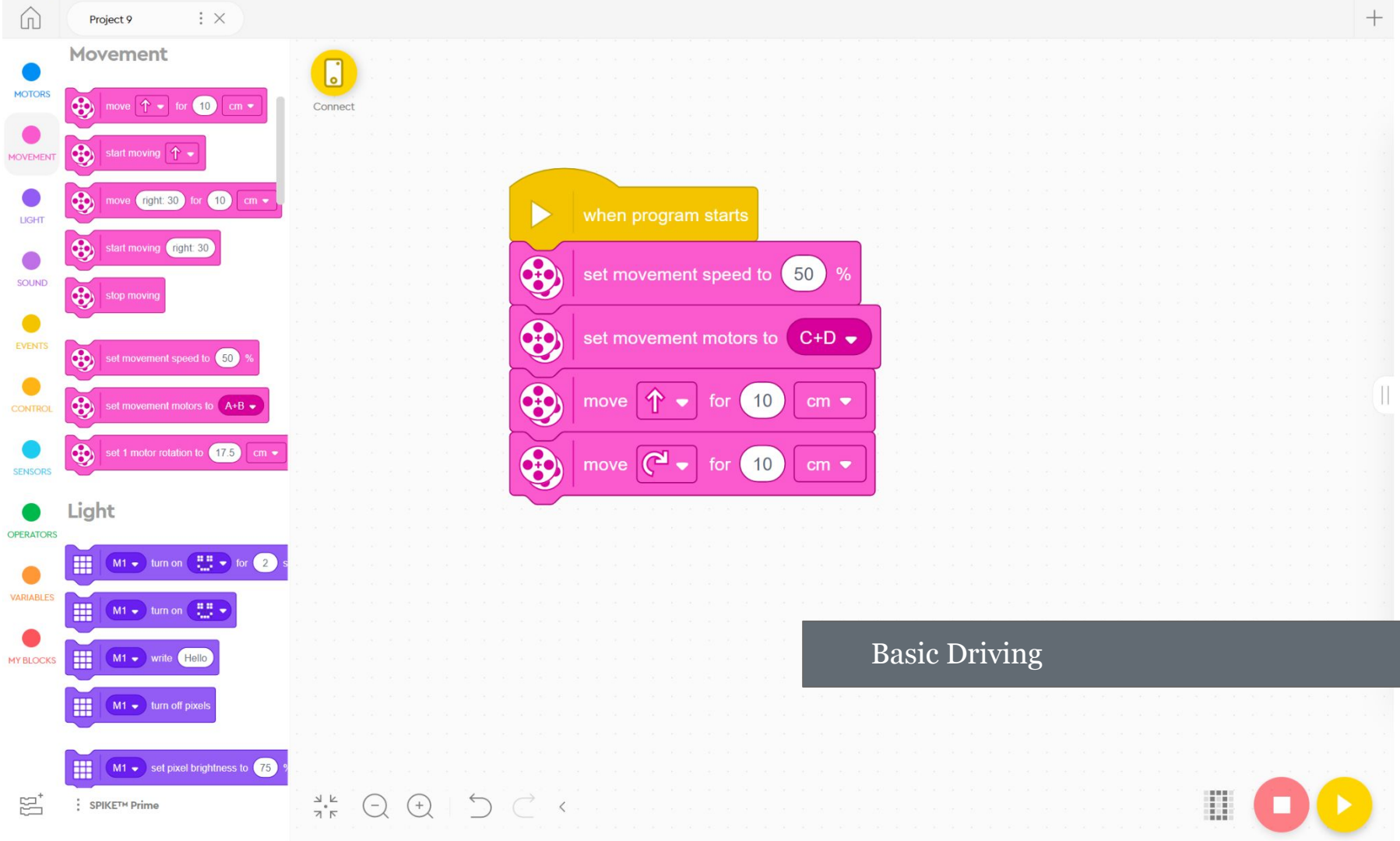
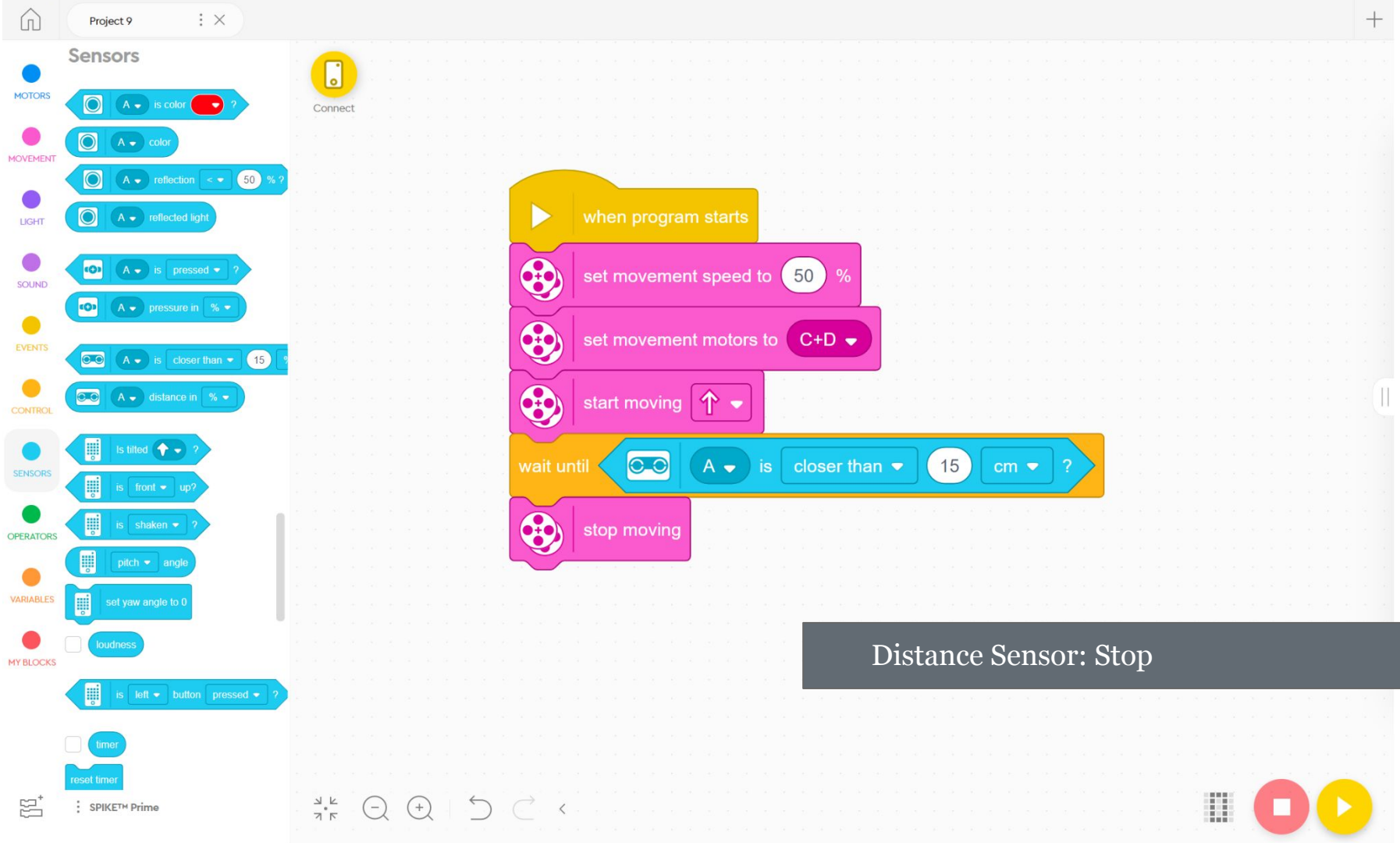
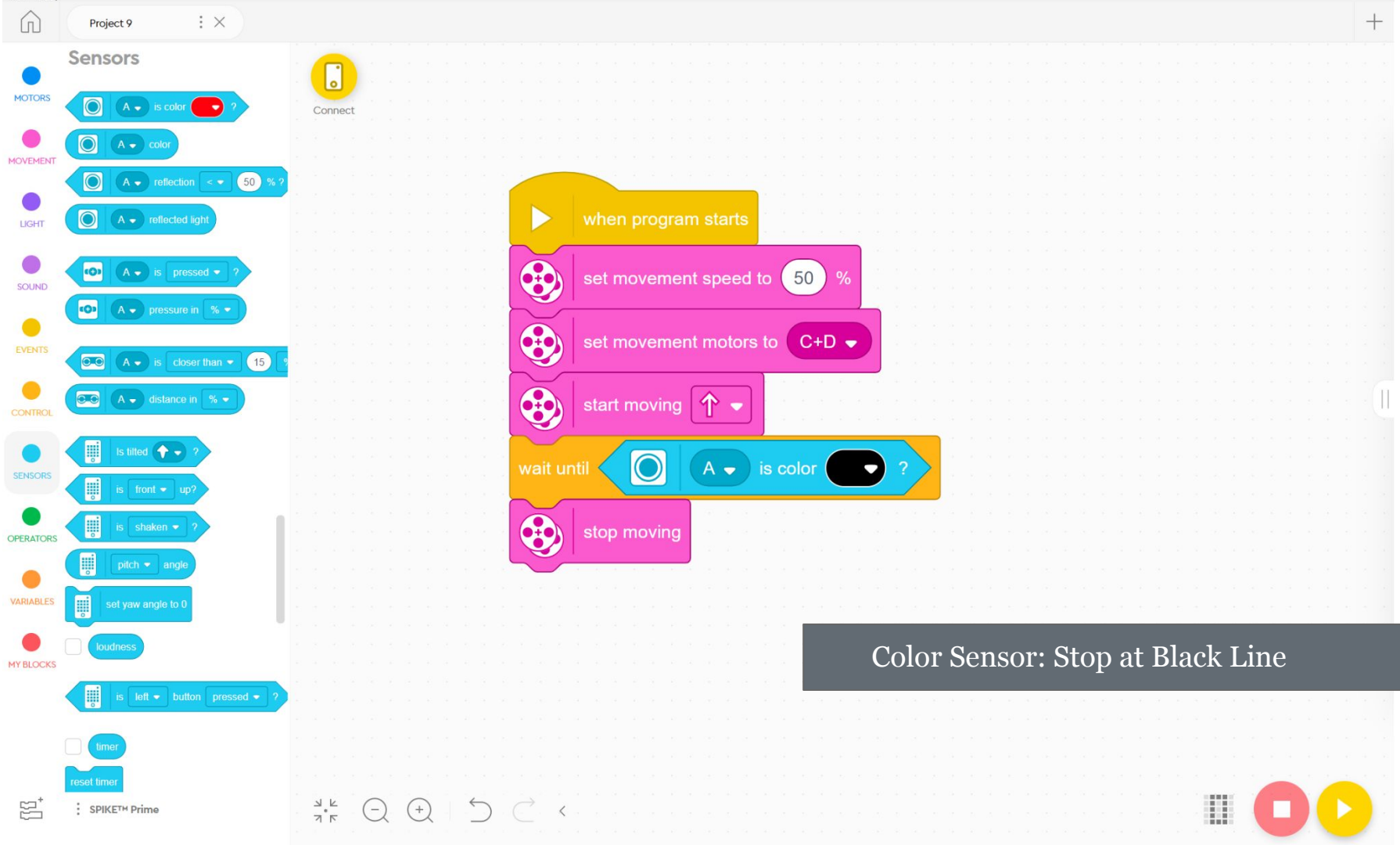
Coding Examples



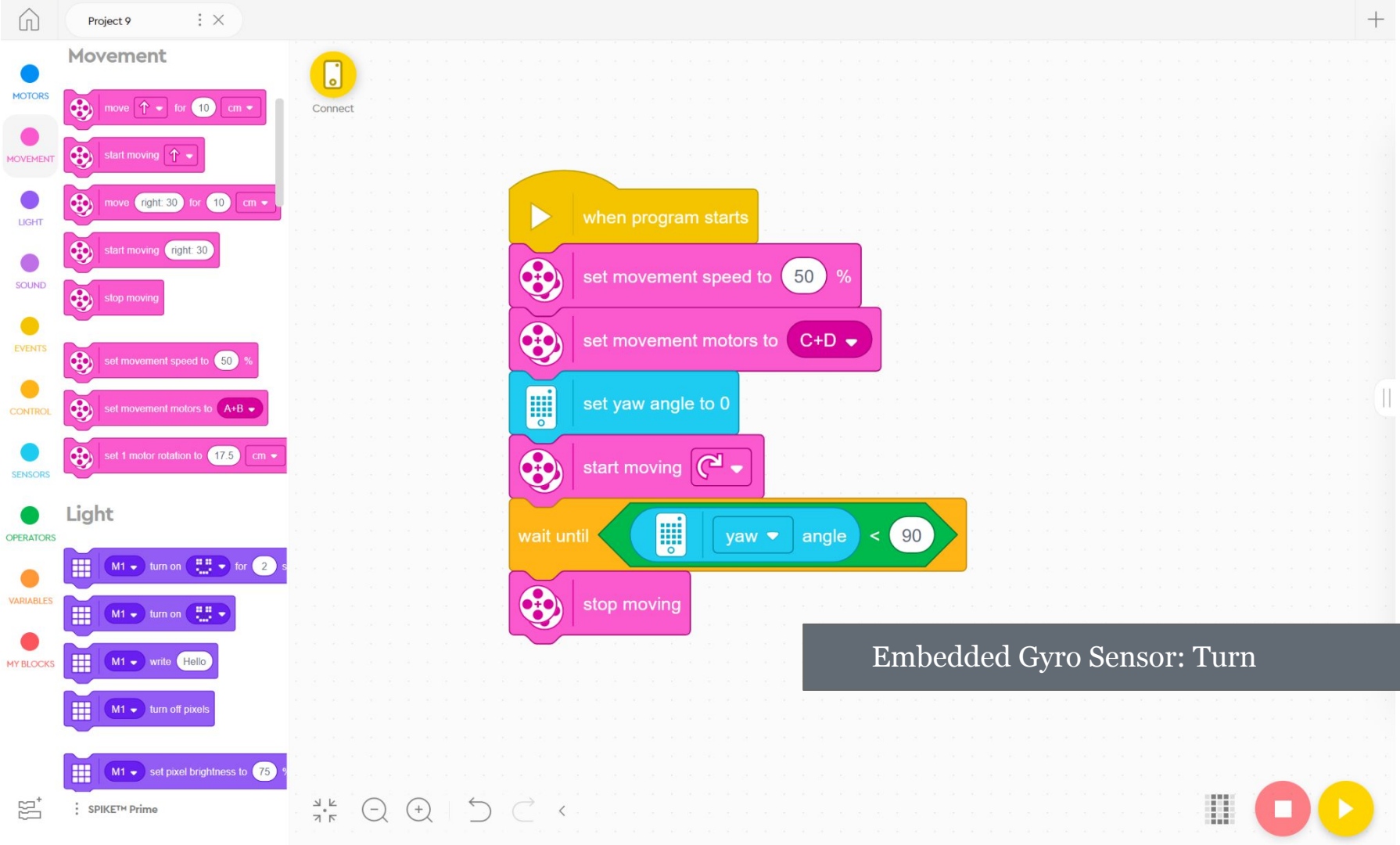
Basic Driving



Distance Sensor: Stop

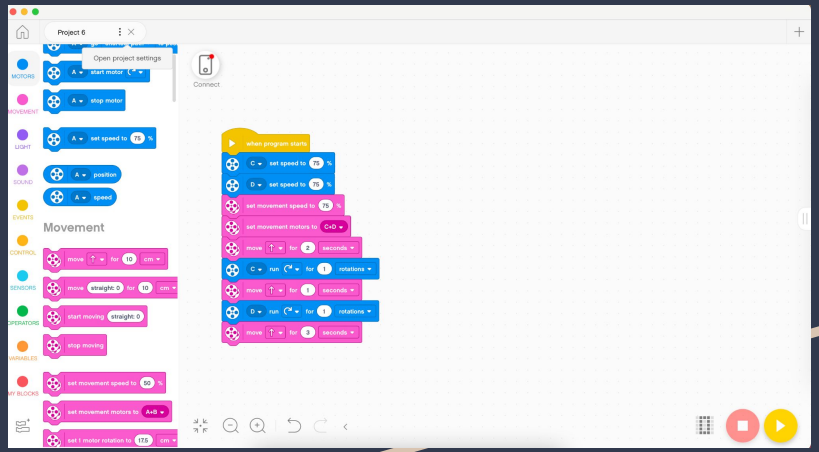


Color Sensor: Stop at Black Line



Embedded Gyro Sensor: Turn

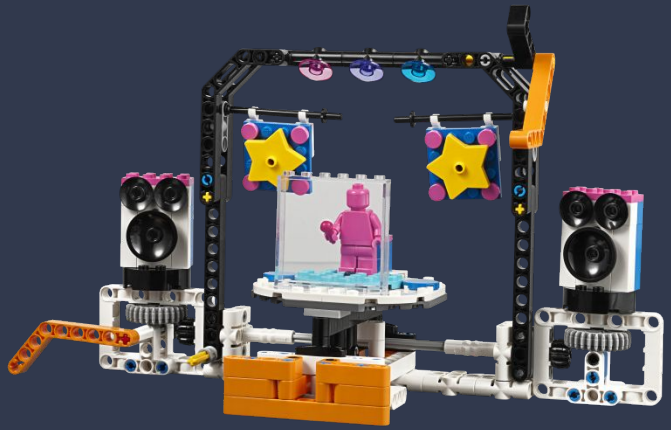
Coding Tips



Coding Tips

- Don’t Overcomplicate!
  - Make sure the kids can explain each step of their code
- Print out code
  - The judges love to see a printout of the code
- Word Blocks vs Python
  - SPIKE offers both
- Kids do the work!

Competition Day!



What to do on Competition day

- Have a clear plan of who is bringing what
  - Make sure to have a backup of the code
- Have the kids hold EVERYTHING
- If you can, bring spare parts
- Things will go wrong, and that is ok!
- It’s a stressful day, don’t forget to have fun!

Scrimmage!

Competition Preparation

- Relaxed game environment
  - Tables set up, official FIRST referees
  - No leaderboard
- Information
  - October 29th, 9:00 AM
  - Ladue Fifth Grade Center
- Flyers!
  - Take a picture of our flyer for more information

Any questions?

Website: laduestem.org
Email: laduestem@gmail.com
Phone: (314) 325-4017

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COMMUNITY