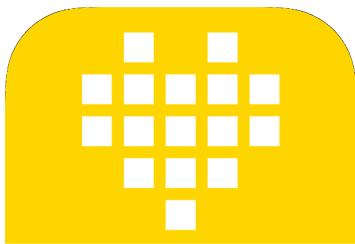


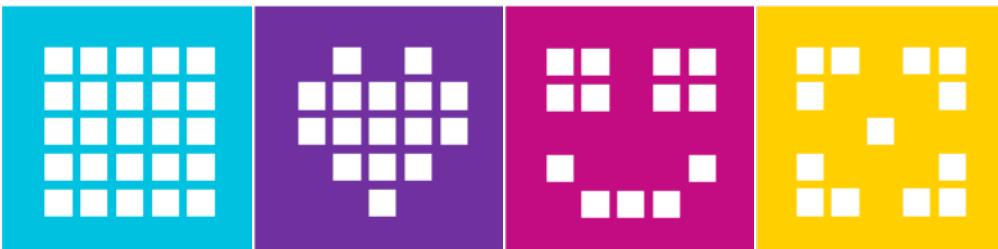
# SPIKE PRIME LESSONS

By the Creators of EV3Lessons



## INTRODUCTION TO HUB & SOFTWARE

BY ARVIND SESHAN



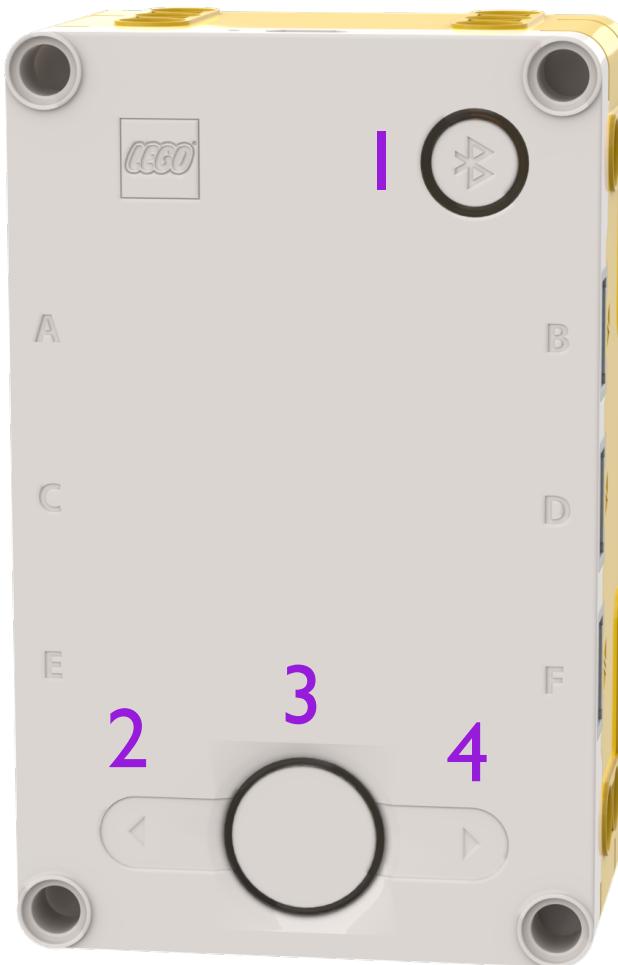
# LESSON OBJECTIVES

- Learn how the SPIKE Prime Hub operates
- Learn about the main components of the SPIKE Prime Software
- Learn how to connect your Hub



# THE HUB BUTTONS

1. Put Hub in Bluetooth pairing mode
2. Left button for program navigation in home menu
3. Select program or exit program when running. Hold down for 5 seconds to power off. Turns on Hub.
4. Right button for program navigation



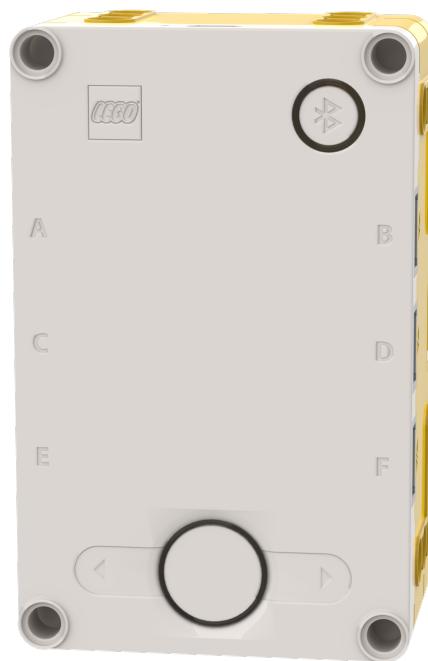
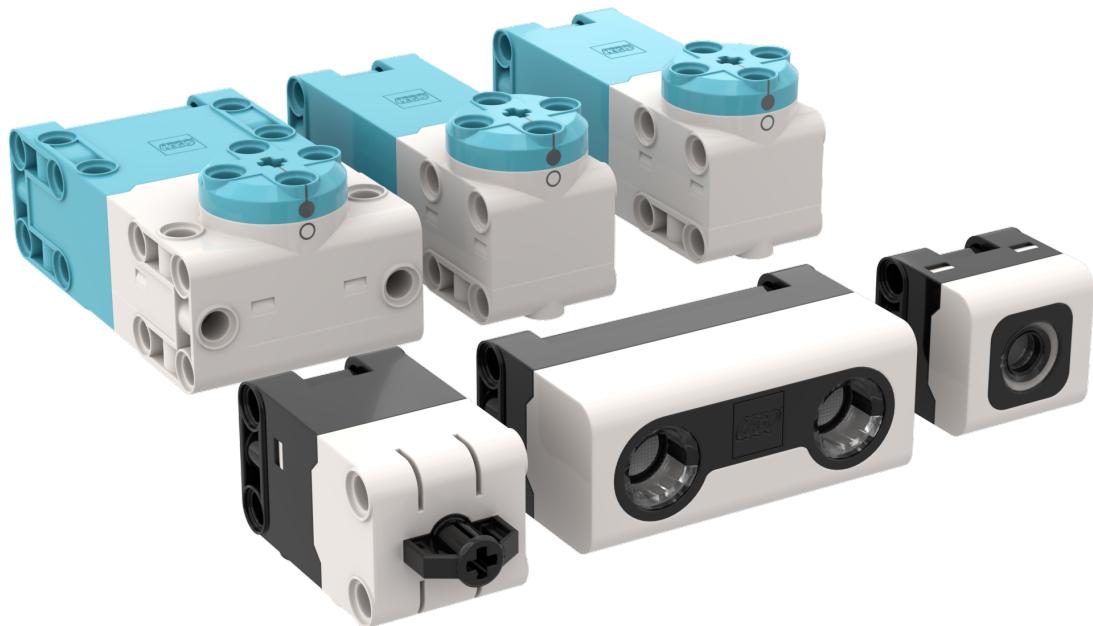
# THE HUB SCREEN

- 5x5 LED pixel matrix can be used to make designs, but also pick programs
- Patterns onscreen represent different programs
- Use the arrows and center button to navigate/launch programs
- You can have a maximum of 20 programs

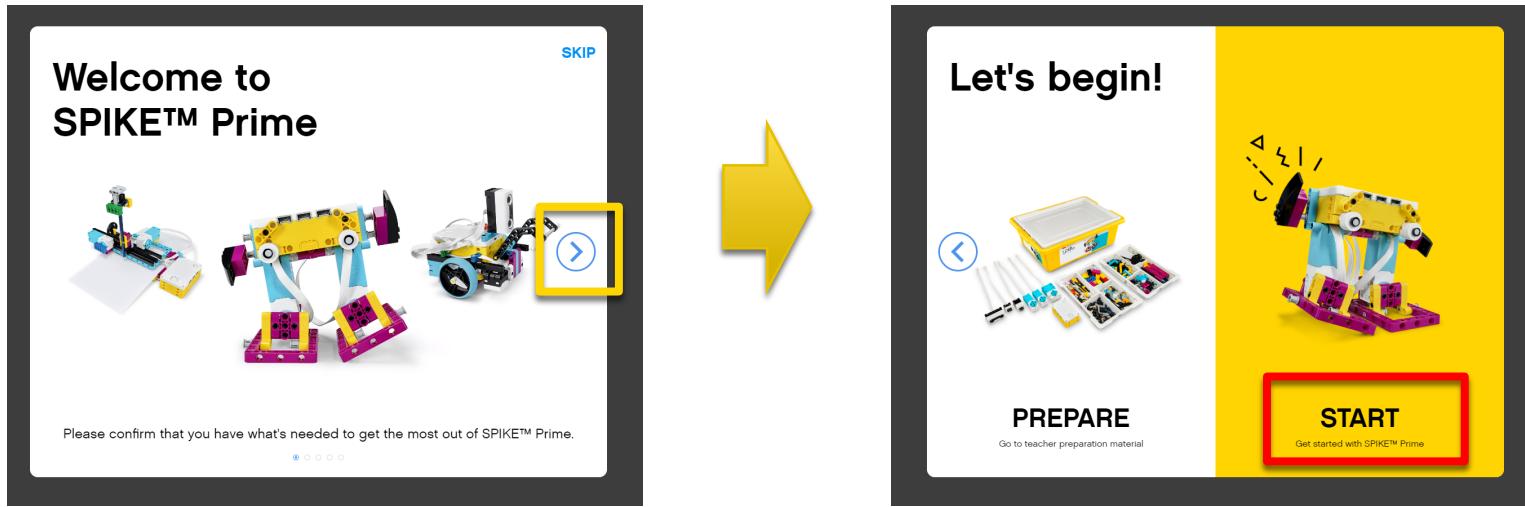


# PORTS, MOTORS AND SENSORS

- The hub has 6 built-in ports (A-F)
- Any port can be used for any motor or sensor
- The basic SPIKE PRIME set comes with 1 Large Motor and 2 Medium Motors, 1 Force Sensor, 1 Distance Sensor, 1 Color Sensor, and a built-in 6-axis IMU (3-axis accelerometer + 3-axis gyro)

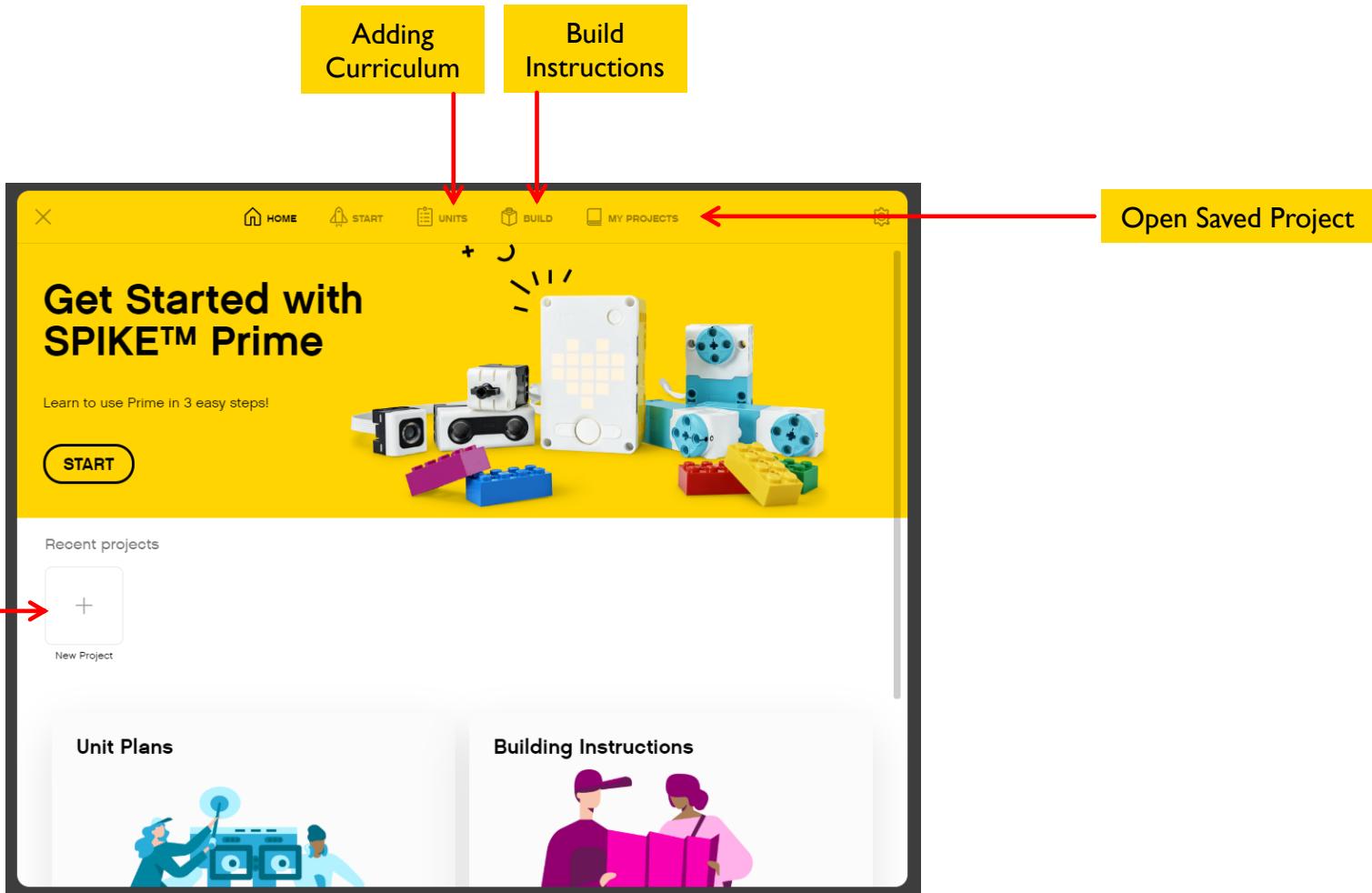


# GETTING STARTED



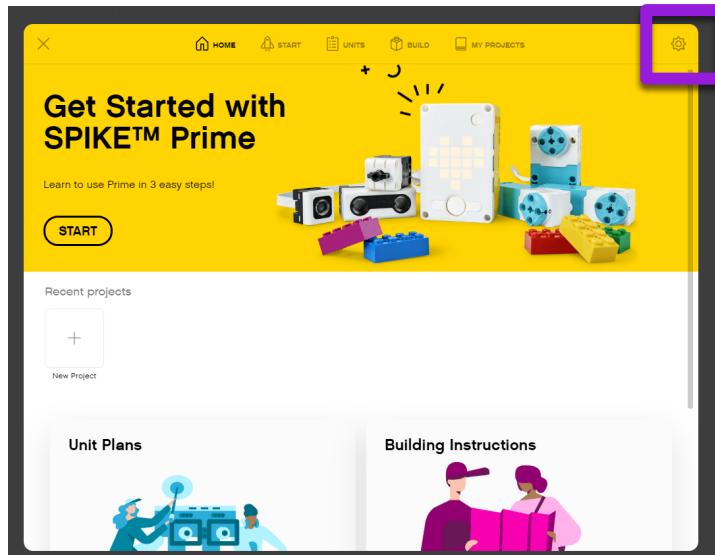
Follow the onscreen steps and then click “START” to access the programming environment

# HOME MENU



# ACCESSING THE HELP MENU

1. Click the Settings icon in the Home screen
2. Navigate to Help on the left hand column



A screenshot of the SPIKE Prime app's Help menu. The title "Help" is at the top. Below it is a "Help Files" section with a sub-section "Interacting with the App". This section contains information about pairing with a Hub, including a bulleted list: "Pairing, or connecting, your Hub to your device is an essential part of the LEGO® Education SPIKE™ Prime experience. This can be done using a direct connection through a micro USB cable or by pairing over Bluetooth. From the Programming Canvas, press the Hub Connection icon. This will guide you through setting up your connection." There are also sections for "Hub Pairing", "Micro USB", and other help topics like "General" and "Language".

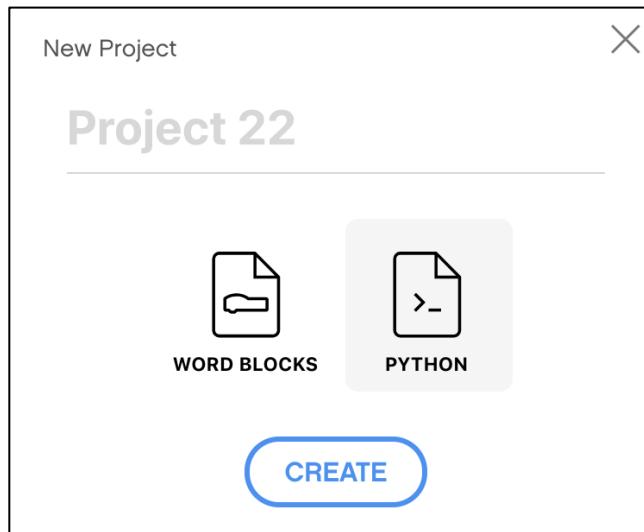
# ADDING CURRICULUM - UNITS

- Lesson Plans can be found in the Units Section from the Home Menu.
- Section which unit you want to add and hit Download
- The FIRST LEGO League Curriculum is called “Competition Ready”

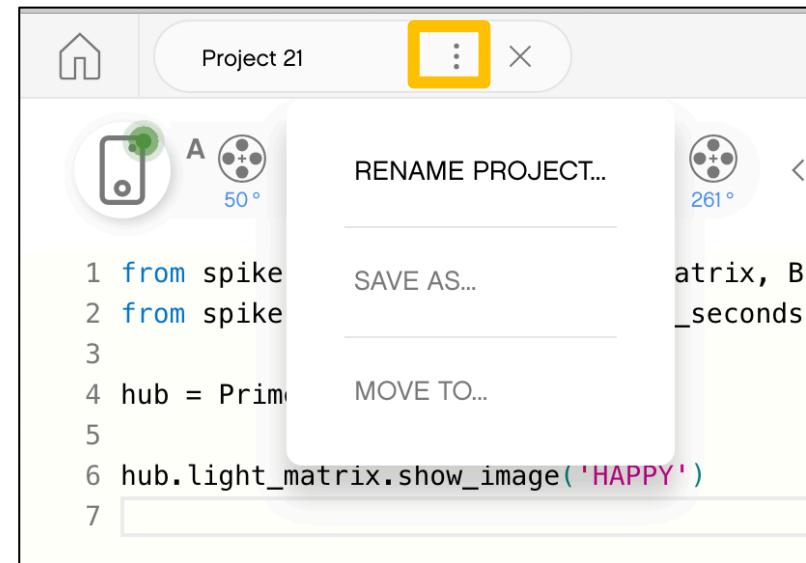
The image displays two side-by-side screenshots of the SPIKE Prime Lessons website. Both screenshots show the 'Unit Plans' section under the 'UNITS' tab in the top navigation bar. The left screenshot shows three unit cards: 'Invention Squad' (STEAM, Engineering), 'Kickstart a Business' (Computer Science, STEAM), and 'Life Hacks' (STEAM, Computer Science). Each card has a large 'DOWNLOAD' button with a downward arrow. The right screenshot shows a similar layout but includes a download progress bar for the 'Competition Ready' unit, which is at 80% completion. This unit is described as 'Ready to expand your robotics skills? This unit also includes a guided FIRST LEGO League mission!'. Both screenshots also feature a 'FIRST LEGO LEAGUE' logo in the bottom left corner of their respective sections.

# CREATING A PYTHON PROJECT

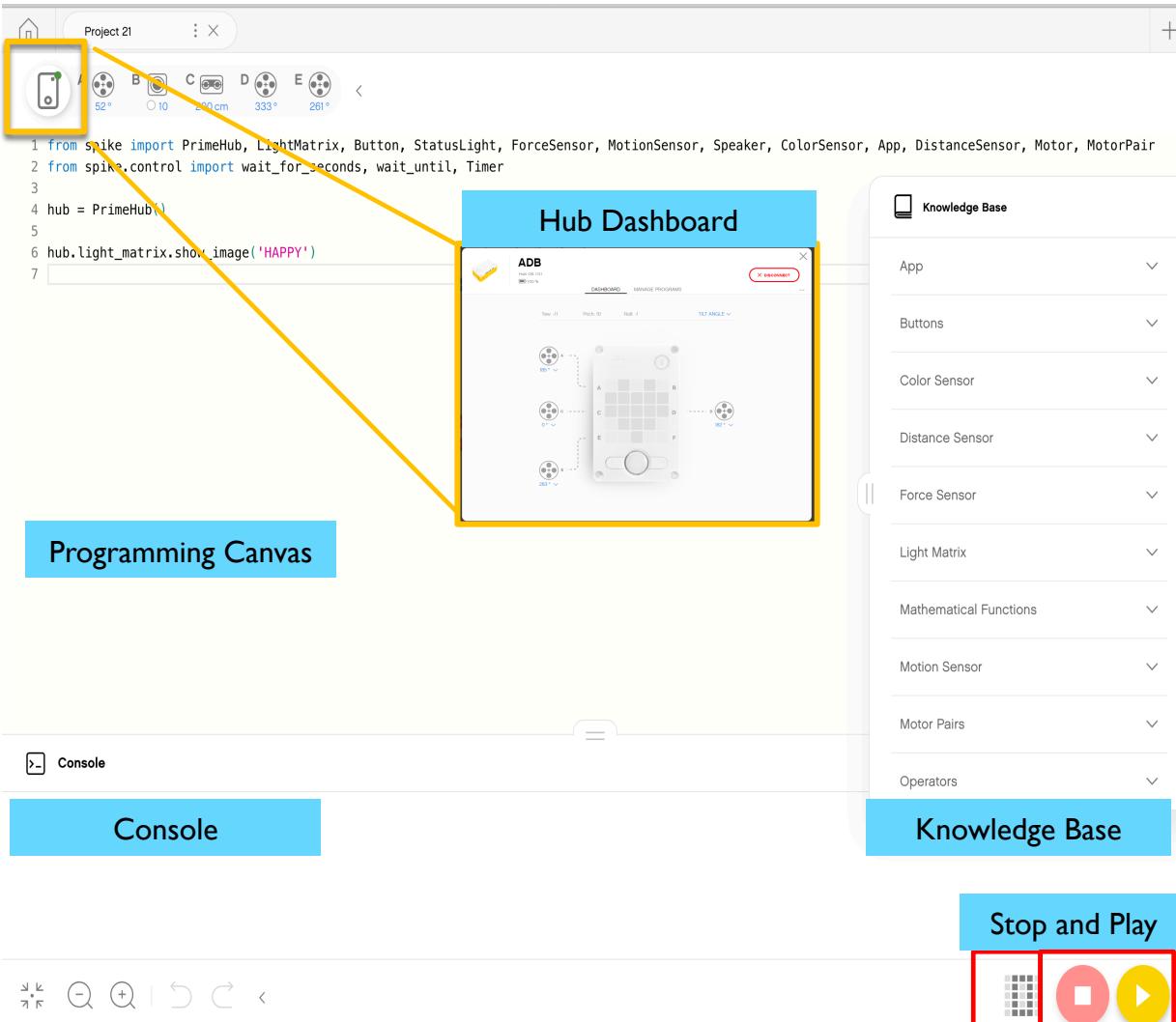
- Select Python from the pop-up



- Click on the three dots to change the file name



# PROGRAMMING CANVAS

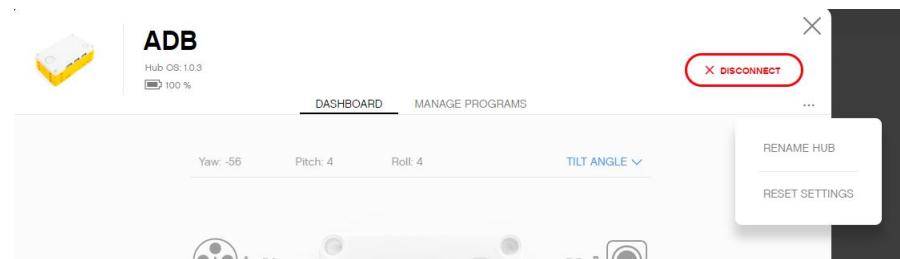
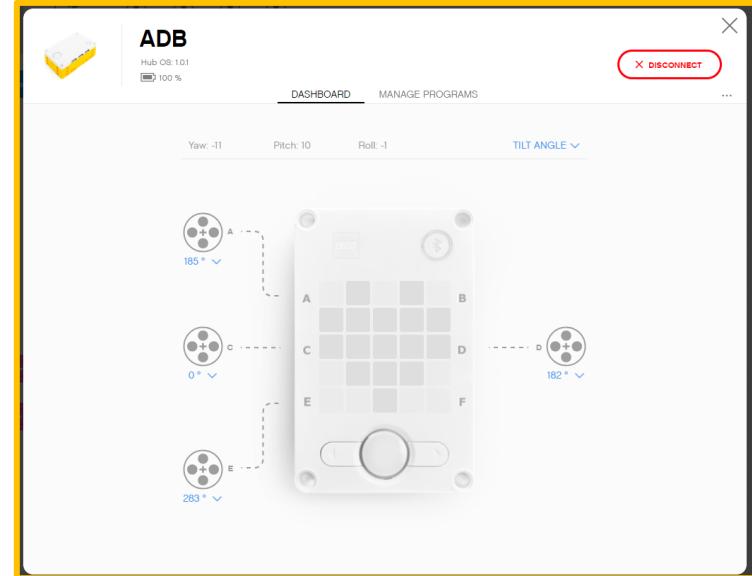


- **Knowledge Base: MicroPython Tips**
- **Programming Canvas:** The main programming canvas is where you will create each program (called 'Project')
- The Connect Icon lets you access the Hub Dashboard
- Stop/Play Icon lets you pick which slot to download the code to and run your code
- Console; Anything you print as well as errors will show up here

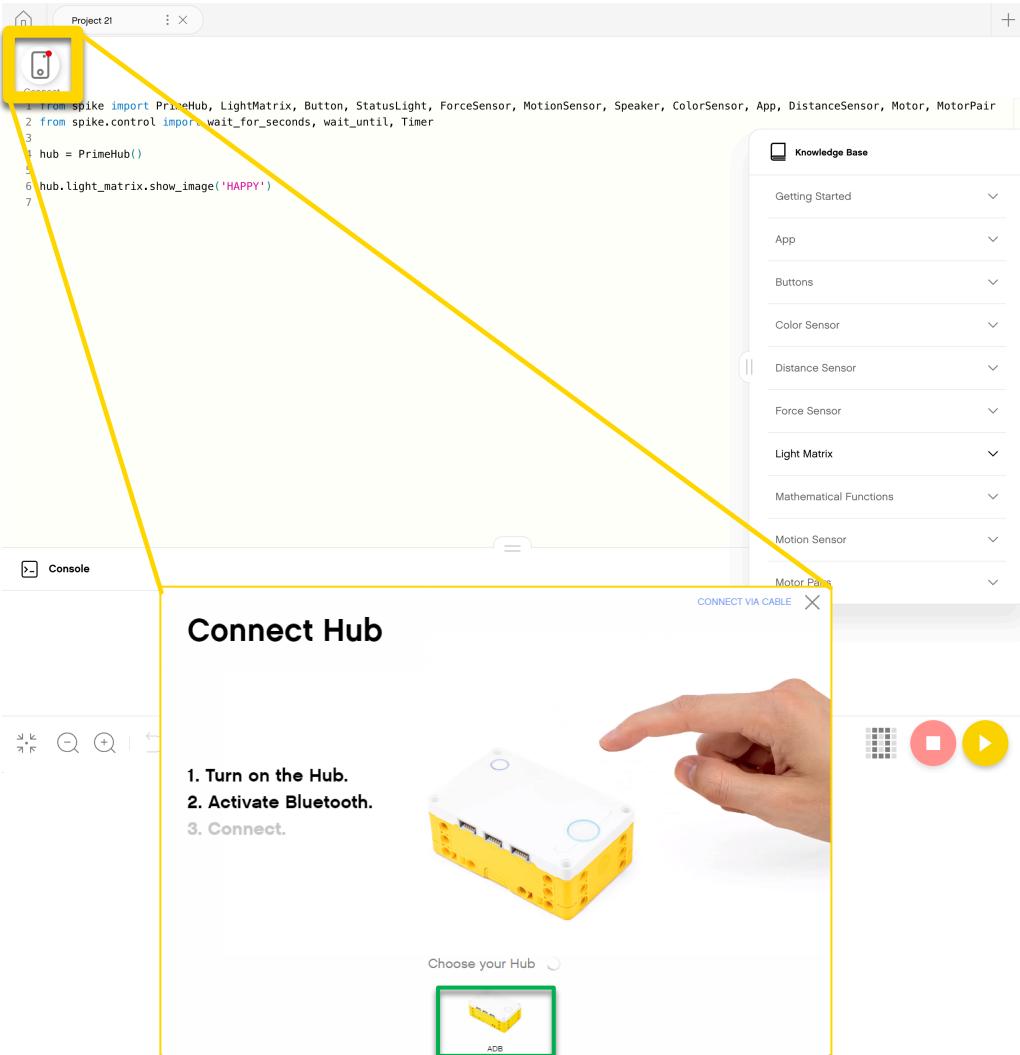
# HUB DASHBOARD



- You must connect your Hub to access this section
- This section is very useful for:
  - Checking battery level
  - Hub OS version
  - Gyro Sensor Values
  - See which motors and sensors are connected
  - Get real time values from the motors and sensors
- You can also rename your Hub in this panel by clicking on the three dots (...)
- The Manage Programs has a list of all programs on the Hub (maximum of 20). Use this section to change the order of the programs.



# CONNECTING TO BRICK



- The software will auto-connect to the brick if you are using USB
- To connect over Bluetooth, click the connect icon in the software.
- Enable Bluetooth by pressing the Bluetooth button on the brick.
- Your brick will show up in the list at the bottom. Click connect on your hub

# DEFAULT PYTHON CODE

- All Python programs will begin with the following code by default.
- You should keep this code in all projects you create except for the following:  
`hub.light_matrix.show_image('HAPPY')`



```
1 from spike import PrimeHub, LightMatrix, Button, StatusLight, ForceSensor, MotionSensor, Speaker, ColorSensor, App, DistanceSensor, Motor, MotorPair
2 from spike.control import wait_for_seconds, wait_until, Timer
3
4 hub = PrimeHub()
5
6 hub.light_matrix.show_image('HAPPY')
7
```

# CREDITS

- This lesson was created by Arvind Seshan for SPIKE Prime Lessons
- More lessons are available at [www.primelessons.org](http://www.primelessons.org)



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