

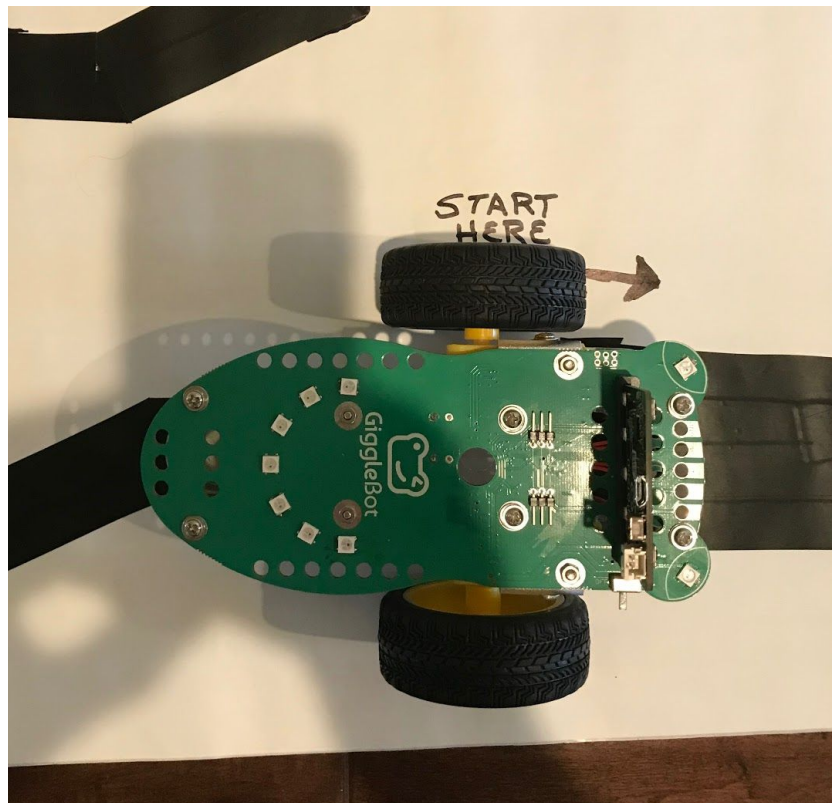
## GSOC Gigglebot table activity instructions - Imaginology event April 13 / 14th 2019

There are two “gigglebots” involved with this activity, and two separate “mats” (shelf liner) for each.

The gigglebot with the “2” tag (masking tape tag on the chip on top of the gigglebot) is the LINE FOLLOWER and the other gigglebot is an interactive “VISITOR DRIVES” activity.

### LINE FOLLOWER SETUP:

- 1) Roll the shelf liner mat containing black lines like a race track onto the table and tape it down with blue tape if required (or weights). I was assuming we'd have 2x6' tables.
- 2) Place gigglebot #2 at the START point as shown in the picture below:



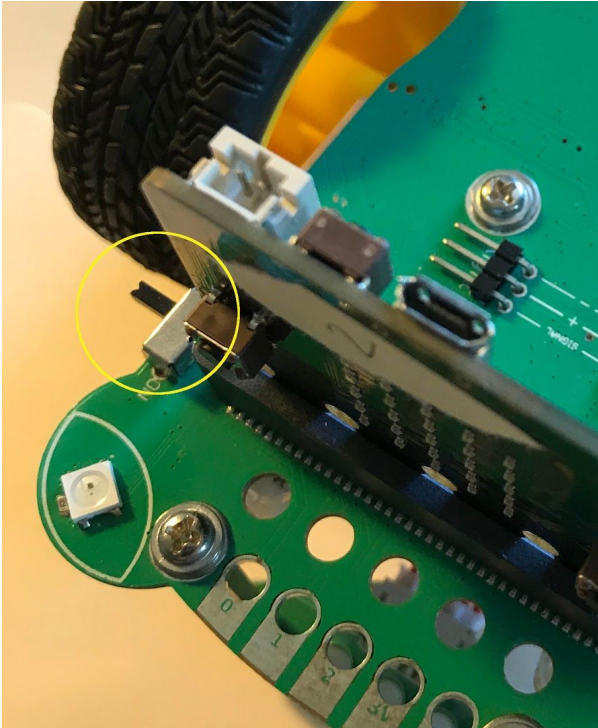
- 3) Switch the on/off switch on the front right (facing the direction of travel) side of the gigglebot. Blue eyes should light up and a check mark will appear on the front of the micro:bit chip on top of the gigglebot. Press the A button on the front of the micro:bit and the gigglebot will start moving forward following the line. That's it!

When the gigglebot gets to the break in the line (right before the start) the “smile” at the back of the gigglebot will light up and the gigglebot will do a little back and forth shuffle (aka “smile shuffle”). After 5 shuffles the gigglebot will move forward and rediscover the line past the start point.

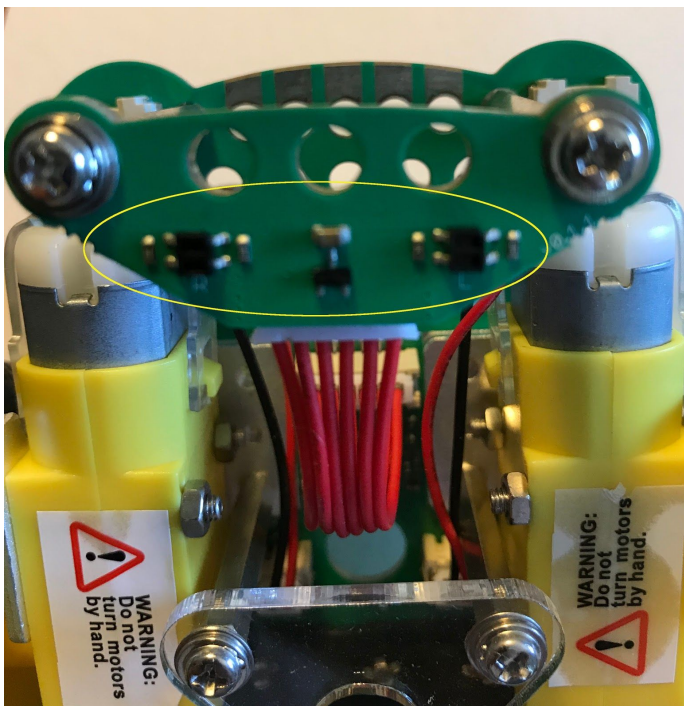
- ***Sometimes the gigglebot will stop with just one of the two green “smile” lights on. Give the front of the gigglebot a TINY tap towards the line and it should continue moving forward.***

- ***Sometimes the gigglebot will come off the line all together and start into it's "shuffle". If this happens, just pick it up and put it back at the gap in the line just before the Start point. Alternatively, turn off the gigglebot and restart it at the Start line.***
- If the front blue "eyes" turn red, that means the batteries in the gigglebot have worn down. Turn the gigglebot off, then replace the batteries beneath the gigglebot. There are batteries in a tupperware container within the blue "Program in a box" tub.

On-off switch:

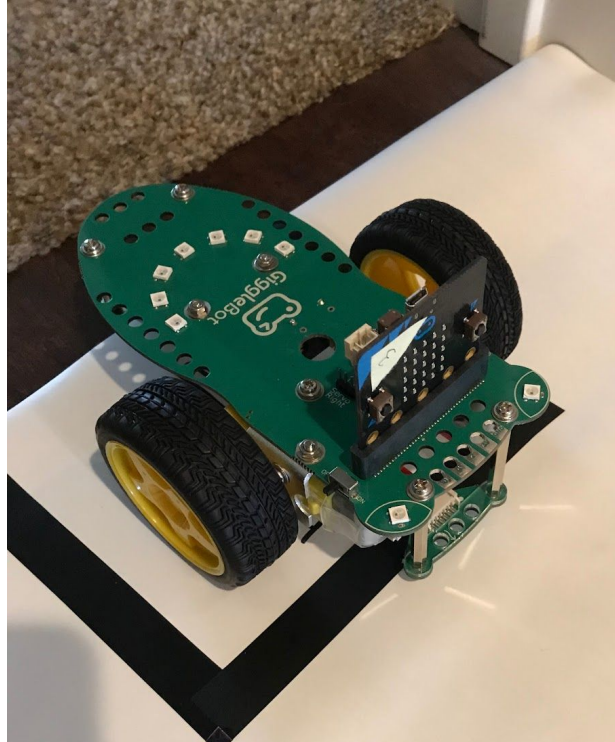


The line following sensors are at the bottom of the gigglebot:



## VISITOR DRIVES activity setup:

- 1) Roll out the shelf liner mat with the “Park Here” box, tape down the mat if required with the blue tape found in the blue “Program-in-a-box” tub. Place the #3 tagged gigglebot in the starting point area as shown in the picture below. Turn the gigglebot on (on/off switch on the right front of the gigglebot facing in the direction of travel). A “heartbeat” graphic should appear on the micro:bit chip that is placed on top of the gigglebot.



- 2) Locate the “glove”. Plug the battery wire into the white receiving plug at the top of the micro:bit as shown in the picture below. The micro:bit will display a checkmark when the battery is attached correctly.



- 3) Keep the glove flat (parallel to the ground). Tilting the glove forward (palm perpendicular to the floor, fingers pointing at the floor) will move the gigglebot forward for 1 second. The glove's

microbit display will scroll the message “down”. Similarly, tilting the glove up will move the gigglebot backward for 1 second, right and left will turn the gigglebot for the same amount of time. You need to move slowly with a pause between movements -- some practice is required! Have guests take turns trying to operate and to park the robot, be careful they don't drive it off the table.

Batteries are available in a tupperware container within the blue “Program-in-a-box” tub if needed. If you have problems, simply try to turn the gigglebot off and then on, and similarly, pull and replug the white plug from the glove's battery connection.

### **HOW THIS WORKS (for visitor discussion):**

#### **Line follower activity:**

The gigglebot and the attached micro:bit have several built in sensors, including light sensing, temperature, accelerometer, and light reflective sensing. In the case of our line follower, we are using the light reflective sensors (shown in the picture above) beneath the robot to “sense” when the sensors are over a black line (the reflection is nearly zero) or over a white area (highly reflective). The micro:bit attached to the gigglebot contains a program that determines when the left, right or both sensors are over the black line, and “steers” the gigglebot accordingly to stay over the line. When we get to the gap in the line, the program recognizes that both reflective sensors are off of the line, and the gigglebot begins it's “smile shuffle”, also specified in the program on its micro:bit controller.

#### **Visitor Drives activity:**

Micro:bits can “speak” to each other over a radio channel. The glove uses the micro:bit's accelerometer to determine if the glove was moved in a direction other than parallel to the ground. If a move (up, down, left or right) is detected, the glove radios an “up”, “down”, “right” or “left” command to the gigglebot. The gigglebot remains listening for a radio transmission, otherwise the gigglebot's micro:bit display a heartbeat. Once a radio transmission is received, if it is one of the four commands listed above, it will move the gigglebot in that direction for one second.

If a visitor is interested in the code running on the Raspberry Pi, please direct them to the URL:

<https://github.com/bhontz/imaginologygigglebot>