**Supplies:** robots

Welcome, so I am going to conduct this session as if you have never seen an EV3 robot. Please let me know if I am going to slow/fast and interrupt with questions.

**Intro to robot**

 Brick = brain

 How to turn on

 Back key, how to turn off

 Work through keys, specifying port view and settings

 Go to tools, sleep

**Intro to EV3 programming** – can program with buttons on robot but not very easy to view/edit/etc

 Open program

 Look at Lobby and Lessons

 Open a new project

 Explain file structure of projects and programs, how to name projects and programs

 Canvas

 How to Save – need to remind kids to do, also keep old versions for awhile, asterick shows that latest version has not been saved

 Green Action Blocks

 Go through Move straight block, how to make go forwards and backwards

How do we know how far our robot will go?

The robots can drive for a set number of seconds, rotations or degrees. We need to figure out how to compare that to distances we use, like centimeters or meters. How long in cm is one rotation? How many rotations in a meter?

The circumference of these wheels is about 18 cm.

**Turns with move steering and tank**.

* Pivot turn you set the curvature to 50 (for 50%) this has just one motor turn on.
* Spin turn, you set the curvature to 100 and both motors turn on. You will need to calibrate how many rotations = a turn of 90 deg (and this will depend on power.) (The degrees option that they can pick instead of rotations is how many degrees the wheels turn, not the robot turns).
* Tank block
* Program the robot to go in a square and return to exactly where it started. Talk about running out of space, curser and wires.

I need to show you how to get programs from the computer onto your robot.

Show download (make sure robot on) and talk about firmware update which someone should get.

Show how to find program on brick.

**Lift Attachment**

* Medium motor
* Jams? Too many rotations? Hit back key

Program robot to go forward, lower its attachment (-.5), turn around and drag something back to starting point.

**Mention Pseudo Code as helpful hint**

So, what do you think I mean by pseudo code?

Pseudo code helps us break down complicated tasks into many small simple tasks.

* Robots follow directions that people give them. They need detailed, step-by-step instructions to complete a task.
* It is a set of detailed notes that the programmer can use to write the code when they are ready.
* It is not written in any particular programming language. Pseudocode can be in part English and part code.
* Pseudocode allows the programmer to communicate his/her plan with others
* Pseudocode is detailed enough to create the actual code

**Sensors**

* Touch Sensor 0 = released, 1= pressed, 2 = bumped
* Light Sensor = can detect color, can be confused by ambient light, shield?
* Ultrasonic Sensor = measures distance to an object using sound waves – thus can be confused by ambient sound
* Gyrosensor – not very useful yet, Lego Ed guy stays away from.

**Flow Control Blocks – if time**

* Wait
* Loop
* Switch