

Simple EV3 Wheelbot

67 Pieces!



by Benjamin Goff
Copyright Maine Robotics 2014
Version 1.0 Beta

Parts List Pt 1

Electronics



(1) EV3 Robot Controller



(2) Mindstorm Wires, any size



(2) Large EV3 Motors

Wheels



(2) Large Wheels



(2) Small Pulley Wheels

*Note: the exact type of wheel does not matter, but the two wheels must be identical!
The instructions will be using the bottom left wheels, but feel free to experiment with different wheels*



OR

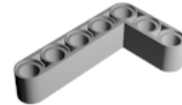


Parts List Pt 2

Beams / Technic Lift Arms



(5) 5-Hole Technic Lift Arms



(2) 3x5-Hole L Shaped Bent Technic Lift Arms



(2) 7-Hole Technic Lift Arms



(2) 11-Hole Technic Lift Arms



(2) 2x4-Hole L Shaped Bent Technic Lift Arms

Axle Connectors



(1) Hole-Hole-Axle Connector, Perpendicular



(1) Axle-Hole-Axle Connector, Perpendicular

Parts List Pt 3

Axles



(1) #3 Axle



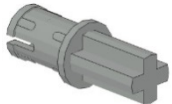
(3) #7 Axles

Note: Axles are measured by the number of studs long they are. So a #7 Axle is 7 studs long if it is held next to a regular Lego brick.

Pins and Connectors



(4) Long Pins w/ Bushings
(any color)



(2) Axle Pins



(1) Half Bushing



(7) Black or Blue Long Pins



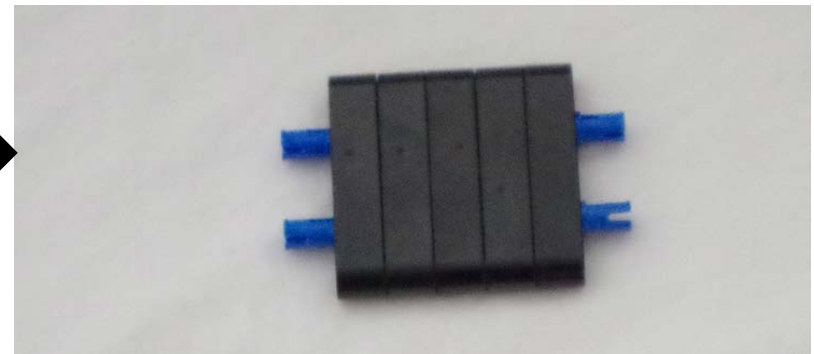
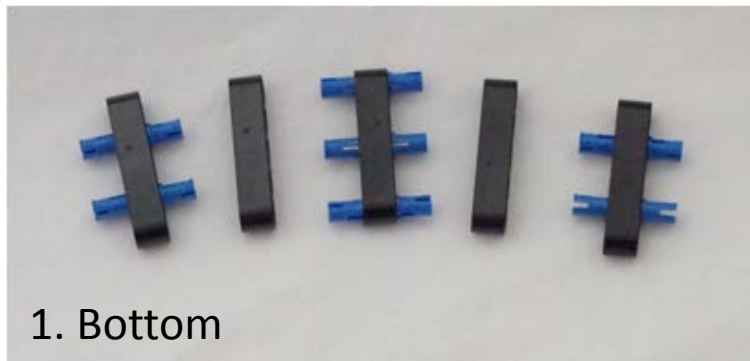
(18+) Black Friction Pins



(5+) Bushings

Parts Laid Out





Lay out pieces as shown and push together, lining up holes on the Lift Arms

Build Base Pt1

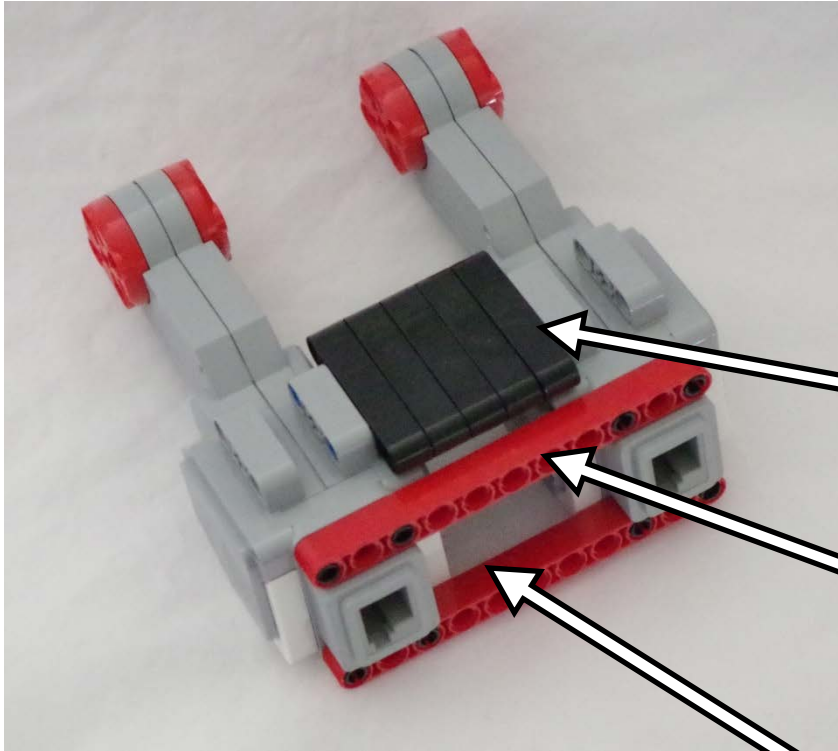
- 1. Build Bottom:** Connect the (5) *5-hole Technic Lift Arms* using the *Long Pins*.
- 2. Build Back Horizontal Reinforcers:** Connect *Friction Pins* to (2) *11-hole Technic Lift Arms* as shown in the lower right hand figure.



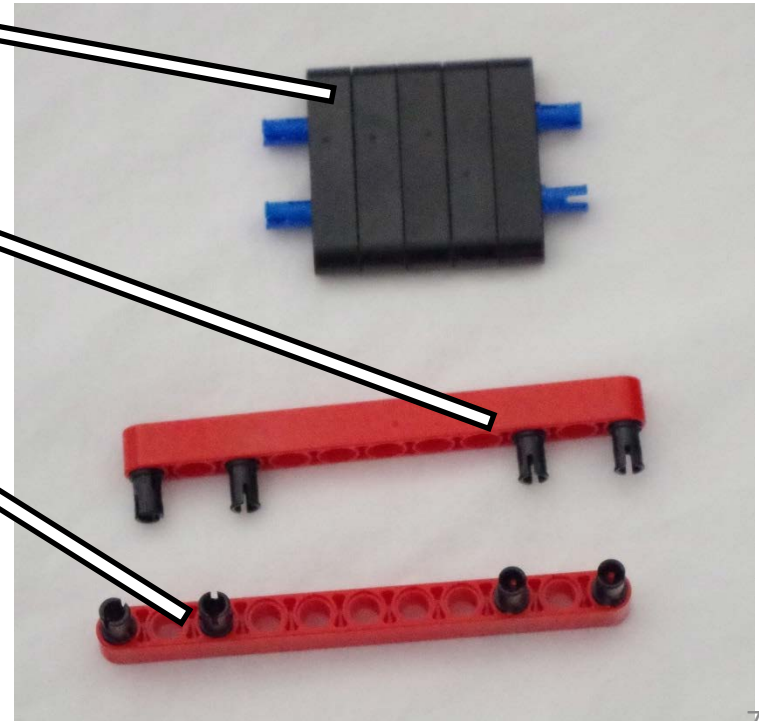
2. Back Horizontal Reinforcers

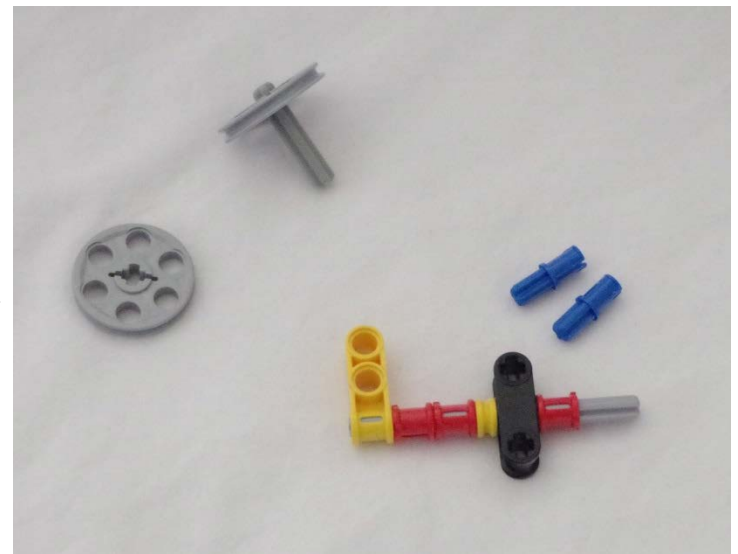
Build Base Pt2

3. Attach **Bottom** pieces and **Back Horizontal Reinforcers** to *Motors*.
4. *Note: the Motors have been placed upside down in the picture!*



The bottoms of the Motors are a light gray, if you see white on top then flip the Motors over.





Step 2 Order: Hole-Hole-Axle Connector, Bushing, Bushing, Half-Bushing, Axle-Hole-Axle Connector, Bushing

Build Pivot Wheel

1. Layout Pieces:

#7 Axle

Axle-Hole-Axle Connector

Bushing

(2) Axle-Pins

#3 Axle

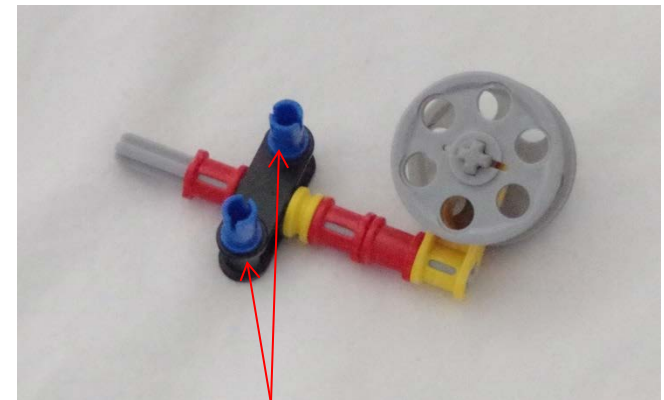
Hole-Hole-Axle Connector Half-

(3) Full Bushings

(2) Pulley Wheels

2. Slide *Full Bushings, Half-Bushing, Hole-Hole-Axle Connector, and Axle-Hole-Axle Connector* onto *#7 Axle*. See upper right picture

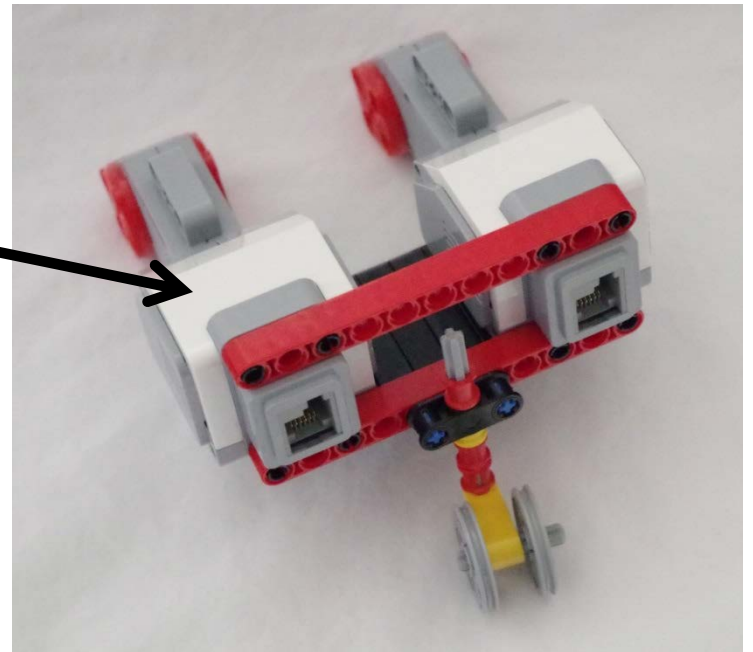
3. Attach *Pulley Wheels and #3 Axle* to *Hole-Hole-Axle Connector (to the end hole)* and push *Axle-Pins* into *Axle-Hole-Axle Connector*.



Axle-Pins

Attach Pivot Wheel to Base

Flip the Base over so that the white tops of the Motor are showing!



The Pivot Wheel should attach to the bottom Back Horizontal Reinforcer

Upper wheel shows deeper impression.

Lower wheel shows the shallower impression.

This side should face the motors



Attach Large Wheels (Drive Wheels)

1. Build **Wheel and Axle Assemblies**: Put #7 Axle through *Large Wheel* and then slide on bushing. Repeat for the other wheel.
2. Put the **Wheel and Axle Assemblies** through the center hole of the *Motors*.

*Note: some wheels have a deeper impression on one side than the other. The Shallower side should face **TOWARDS** the motors.*

Older wheels may need a bushing on both sides to hold the wheel on.

Build Side Assemblies Pt 1

1. Lay out Pieces:

- (2) 2x4 L Shaped Bent Lift Arms
- (2) 7-Hole Lift Arms
- (2) 3x5 L Shaped Bent Lift Arms
- (4) Long Pins w/ Bushings
- (2) Axle-pins and (6) Black Friction Pins.

Note: The pieces change color in between pictures, this is to make them easier to see.



2. Connect pins as shown in image on right.

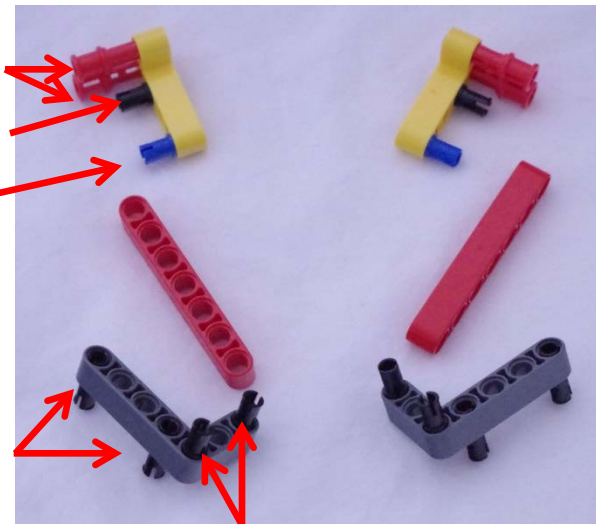
Note: the two side pieces are mirrored not identical.

Long Pins w/ Bushings

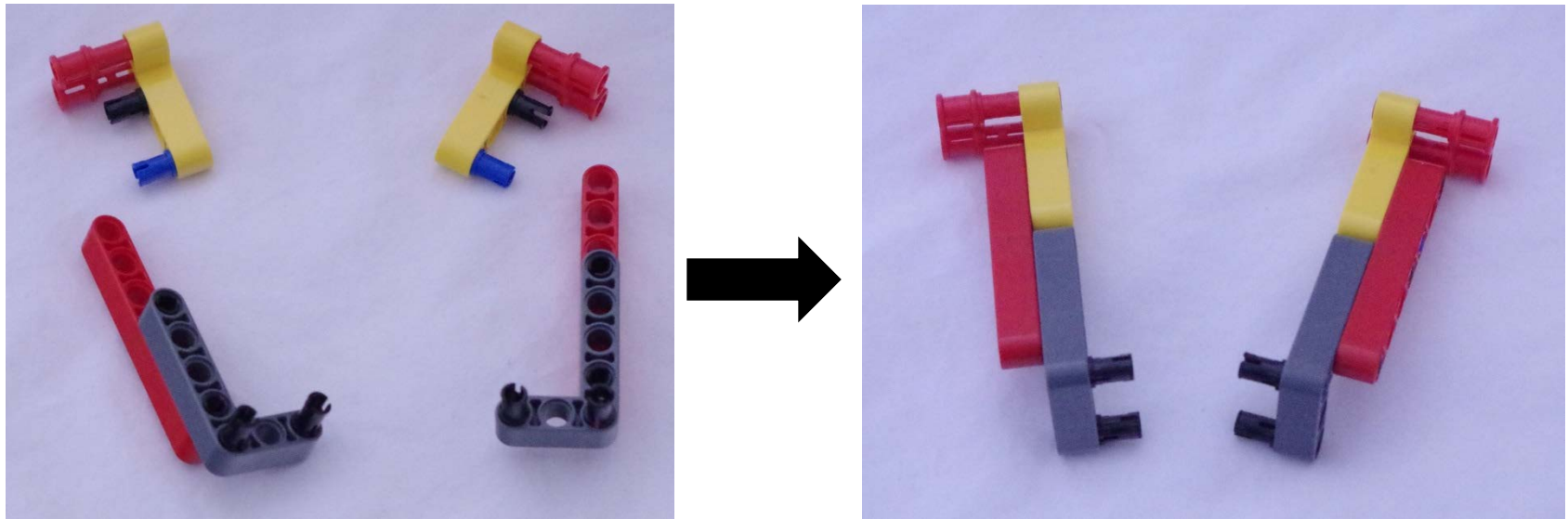
Black Friction Pin

Axle-pin

Black Friction Pins



Black Friction Pins



Build Side Assemblies Pt 2

3. Attach *7-Hole Lift Arms* to *3x5 L Shaped Bent Lift Arms*. The *7-Hole Lift Arms* should cover 4 holes of the 5-hole arm of the *L Shaped Lift Arms*. See upper left image.
4. Connect the *2x4 L Shaped Bent Lift Arms* to the exposed ends of the *7-Hole Lift Arms*. The *7-Hole Lift Arm* should cover 3 holes of the 4-hole arm of the *L Shaped Lift Arm*.

Note: The completed Side Assemblies should be mirrored and form an “S” shape when viewed from the side. A backwards “S” may also work.



Attach Side Assemblies and EV3

1. Attach Side Assemblies to the “Necks” of the *Motors*, as seen in the picture on the left. *Note: Do not push Long Pins w/ Bushings fully in yet.*
2. Connect EV3 by lining up top most forward side holes with the top of the Side Assemblies and pushing in the *Long Pins w/ Bushings*.



Note: The screen of the EV3 should be over the back of the Motors and the ports labeled 1 through 4 should be facing the same direction as the Large Drive Wheels.



Attach Wires to Motors and EV3

1. Rotate the EV3 so you are looking at it from the back and can see ports A, B, C, and D
2. Connect a wire to Port C of the EV3 and the left side motor.
3. Connect a wire to Port B of the EV3 and the right side motor.



Complete!

Note: The Long Pins w/ Bushings are used because they are easier to grab with fingers. This makes taking the EV3 off to replace batteries slightly easier.