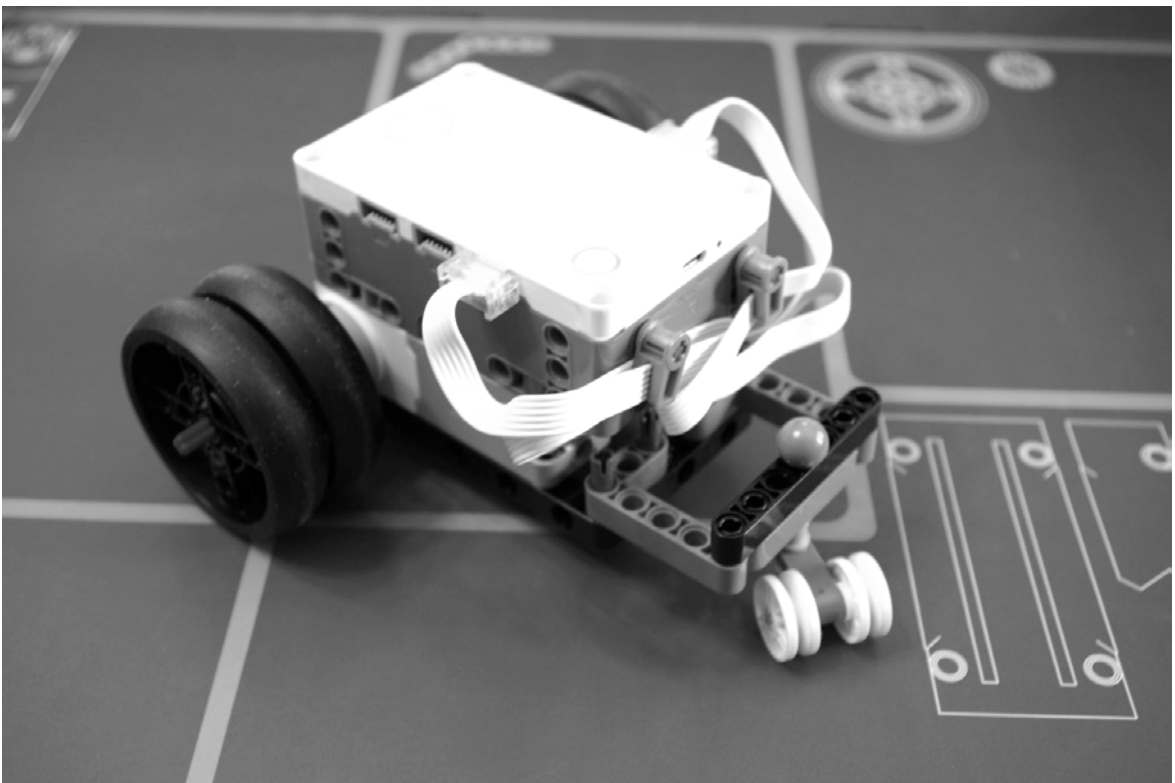


# A Simple Spike Prime Robot

56 pieces

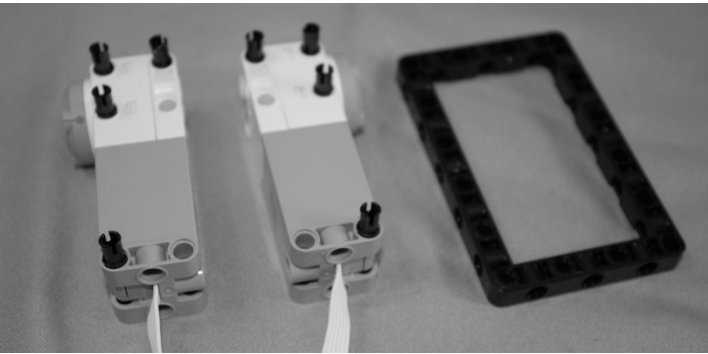


by Thomas Bickford

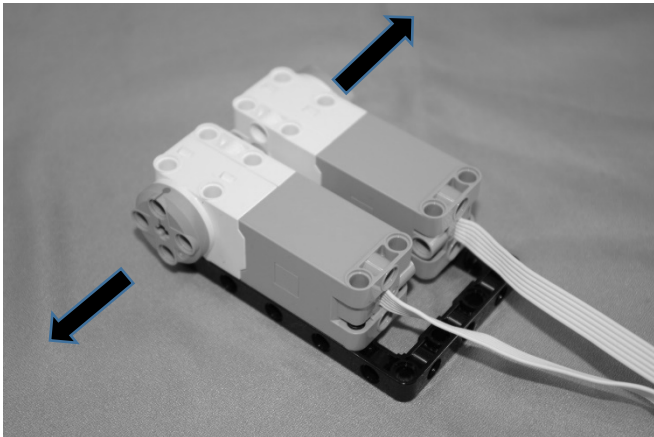
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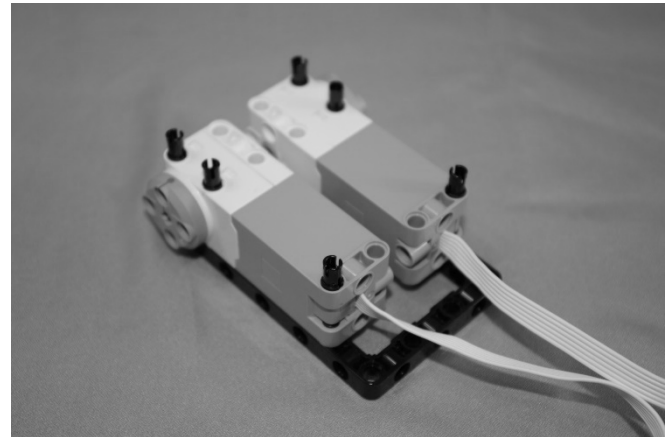
# Motor-Spike base assembly



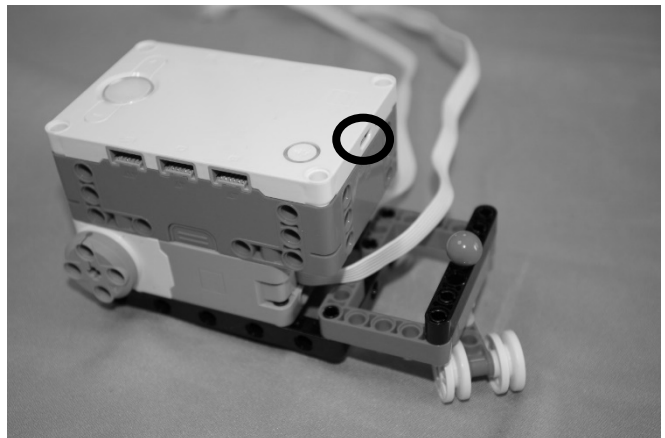
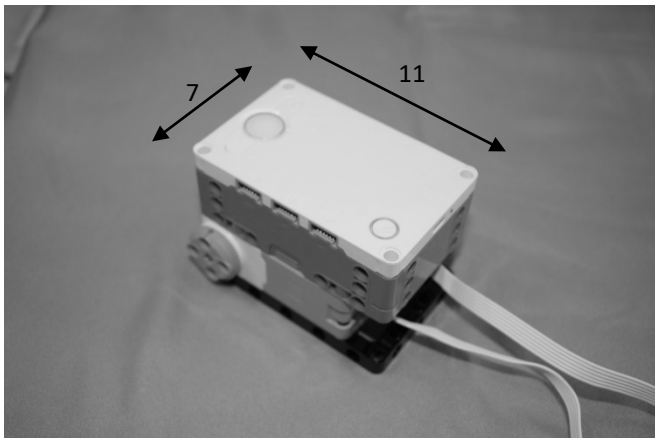
- Insert 8 short black friction pins into the two motors as shown. NOTE, they are mirrored of each other. One motor has the motor hub facing the right, and one facing the left.
- Now connect the 7 x 11 open technic beam frame. Note that the beam frame extends back from the motors on the wire end.



- Flip the assembly over.
- Are the gray motor hubs on the outside?
- Insert 6 short black friction pins into the motors as shown.



The Spike Prime controller is 7 knobs wide, 11 knobs long, and 4 blocks tall, the same width and length as the 7 x 11 technic open base.



- Attach the Spike Prime controller to the motor base. Note it also sticks out over the end with the wires.
- **Note.** The controller doesn't care which direction it is attached, but we have it shown with the power button to the "front" or "drive wheel" end of the robot. We do this so that the charger port (circled) is at the back as we want to leave the front free for attaching a sensor later. Also shows the pivot wheel assembly attached.

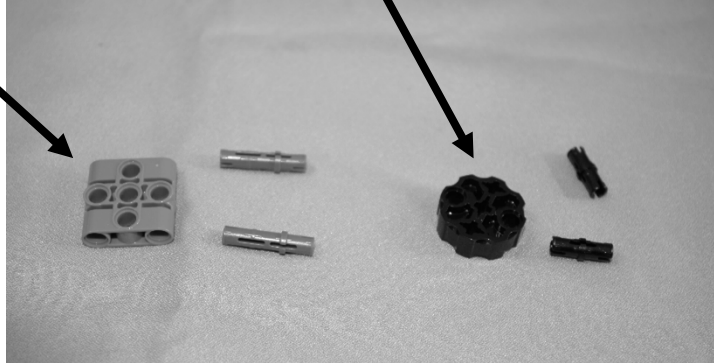
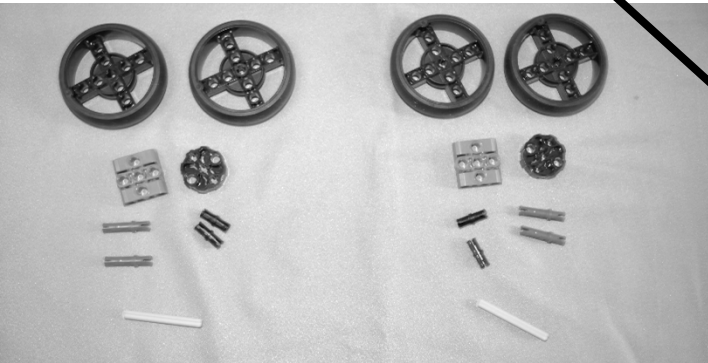
# Wheel Assembly

“Technic, pin connector block, liftarm 1 x 3 x 3” (part #39793)

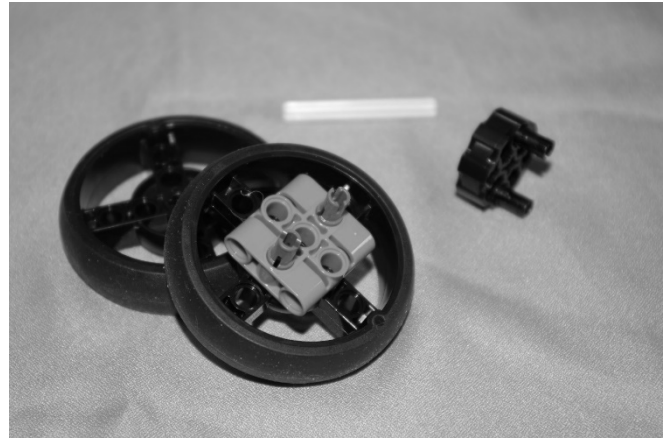
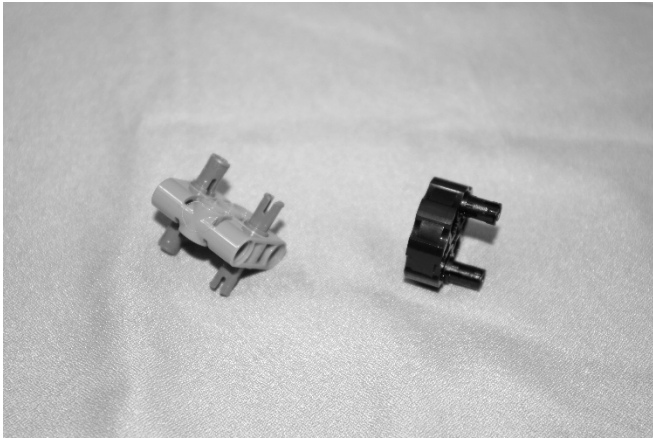
We’ll call them **Technic 3x3 block** from here on out.

“Technic, axle connector block round with 2 pin holes and 3 axle holes” (part #98585 or 31311 or 31520)

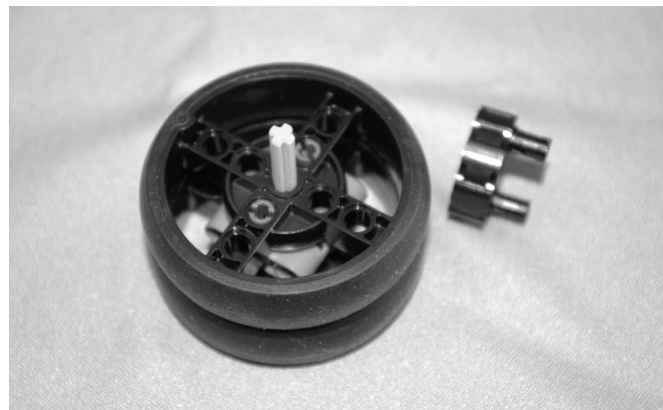
We don’t make up these names, that’s what LEGO calls them. We’ll call them **ROUND BLOCKS** from here on out.



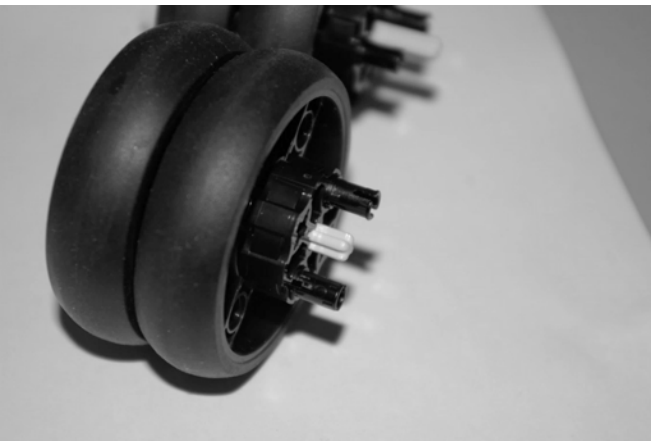
- You need a right and left wheel assembly. One for each side.
- Note: You can simplify this to ½ the parts if you only want one wheel on each side.
- Or add a few parts and make it stronger.



- Put the two #3 long blue friction pins through the technic 3x3 block.
- Insert the two short black friction pins in the round blocks.
- Attach the 3x3 to the wheel with the blue pins.



- Attach the other wheel to the other side of the technic 3x3 block, connecting to the other end of the blue pins.
- Insert the #5 axle through the center.

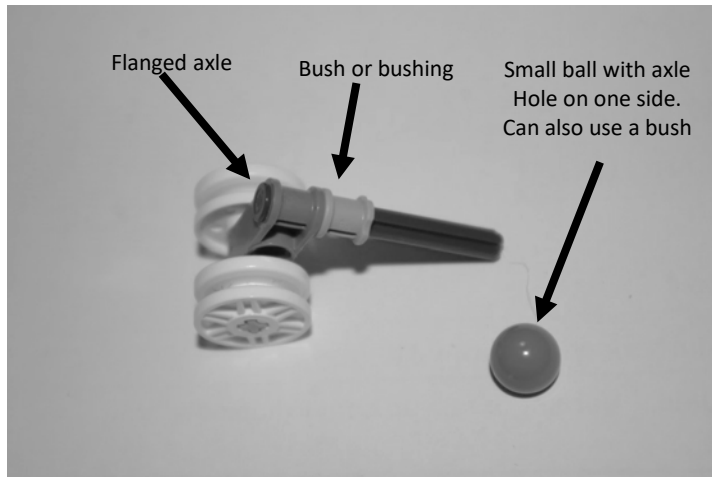
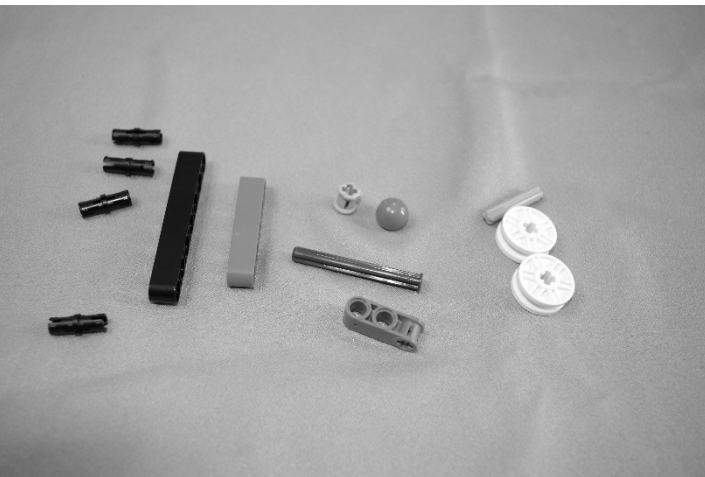


You can increase the strength of the assembly if you replace the two black friction pins with two #3 blue friction pins and have them connect from the inner wheel, through the round block, and into the motor hub.

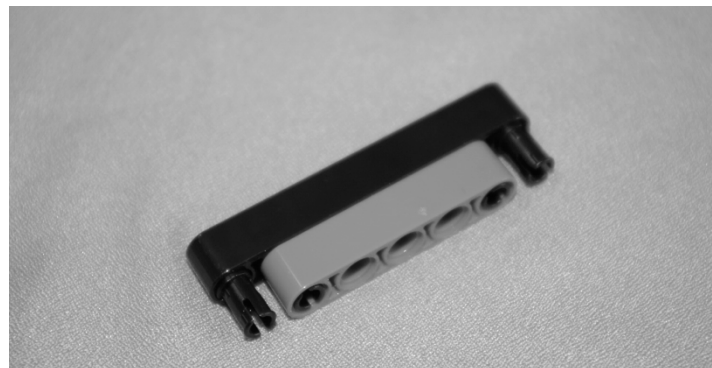
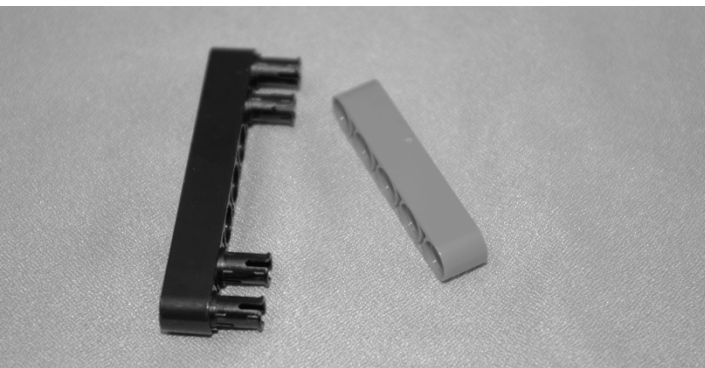
You can also increase the connection to the motor hub by placing two axle-pins into the two remaining holes on the round block and into the motor hub. BUT, be forewarned, you may need pliers to pull the axle-pins out of the motor hub when you go to disassemble.

- Attach the round block so that the two black pins are sticking out on the same side as the axle.
- Complete for both wheel assemblies

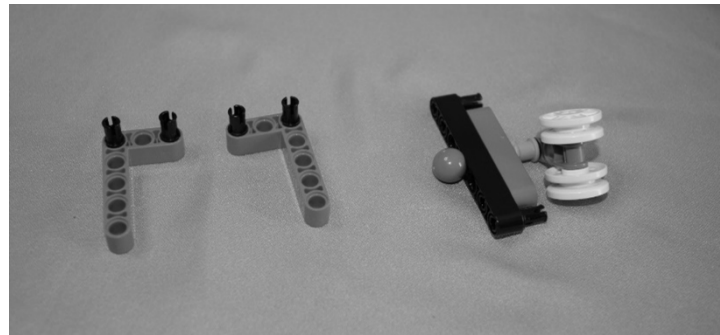
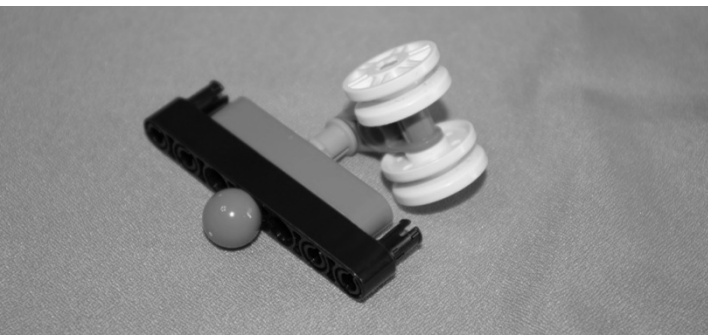
## Pivot wheel assembly (rear wheel)



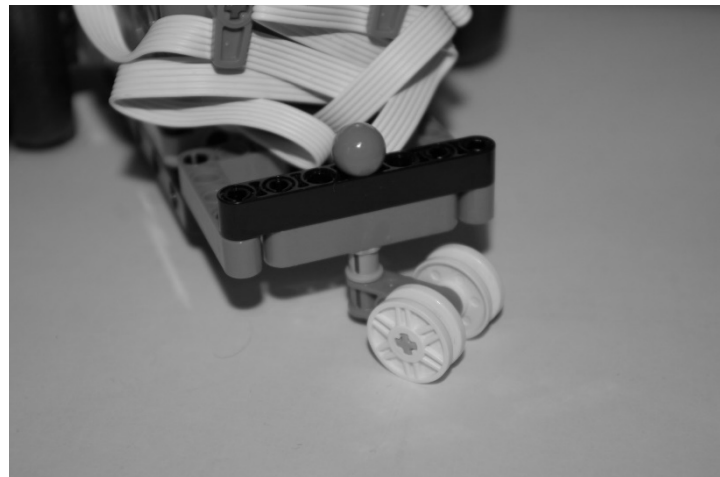
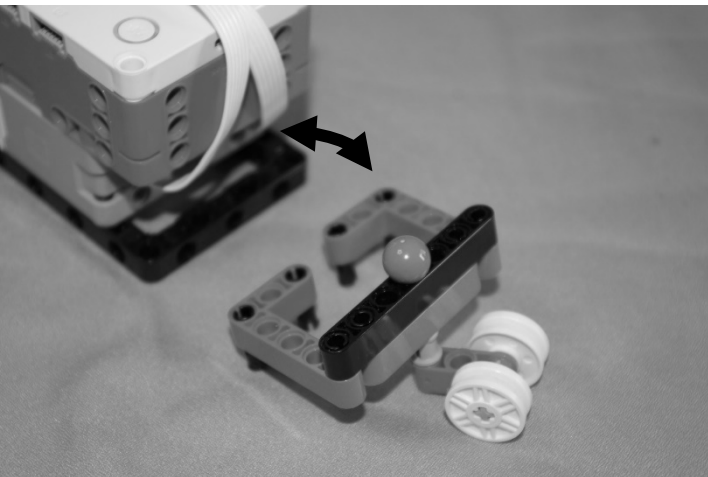
- Attach the two white wheels (without tires) to the #3 gray axle and through the end hole of the #3 Technic connector (hole-hole-axle).
- Insert the #5 axle so that the stop flange is at the bottom. Then add a full size bushing to the axle from the other side to hold it all together.



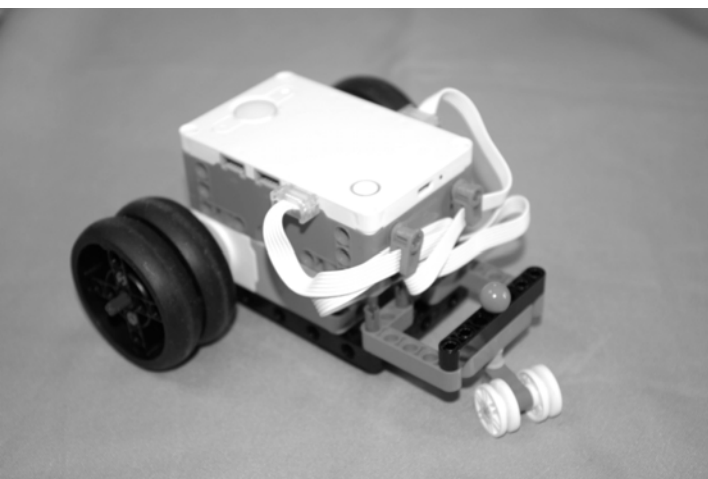
- Insert 4 short black friction pins into the 4 end holes on a #7 technic lift arm.
- Attach the #5 technic lift arm to the inner two pins as shown.



- Attach the pivot wheel by putting the axle through the middle hole and securing with either a bushing or the round axle ball. Short black friction pins pointing towards wheels.
- Insert 4 short black friction pins into the 2 3x5 “L” technic lift arms as shown.



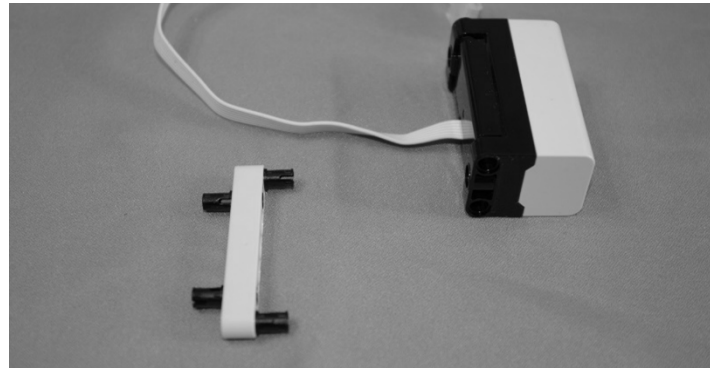
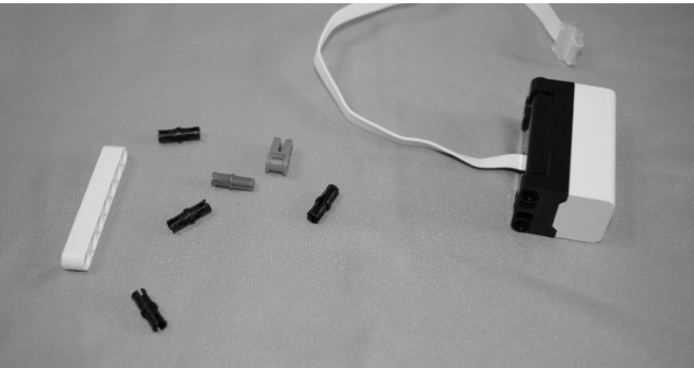
- Connect the two “L” lift arms as shown, with the pins facing down. The end of the lift arms connect to the unused pins on the pivot wheel assembly.
- Attach the assembly to the back of the motor/spike assembly. The four black friction pins fit into the top of the 7x11 open technic beam frame.



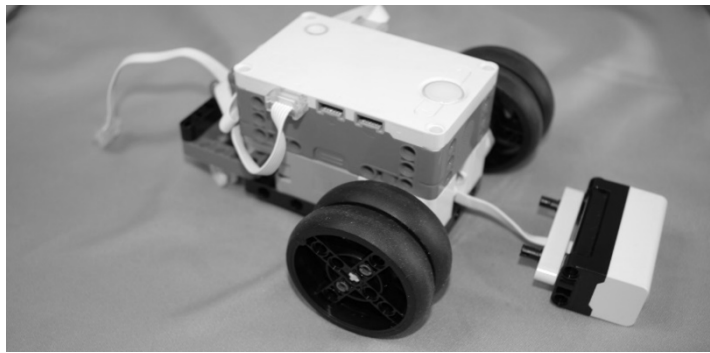
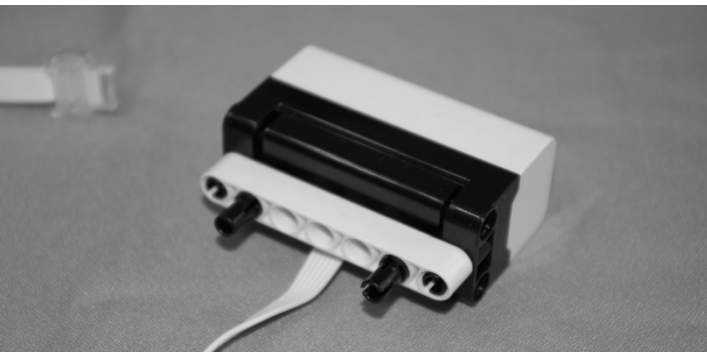
- Connect the motor wires to any of the available controller ports.
- Attach the wheel assemblies to the motor hubs on the motors.
- Use the wire clips along with blue axle-pins to do some wire-management as shown.

# Optional: Attach a Distance Sensor

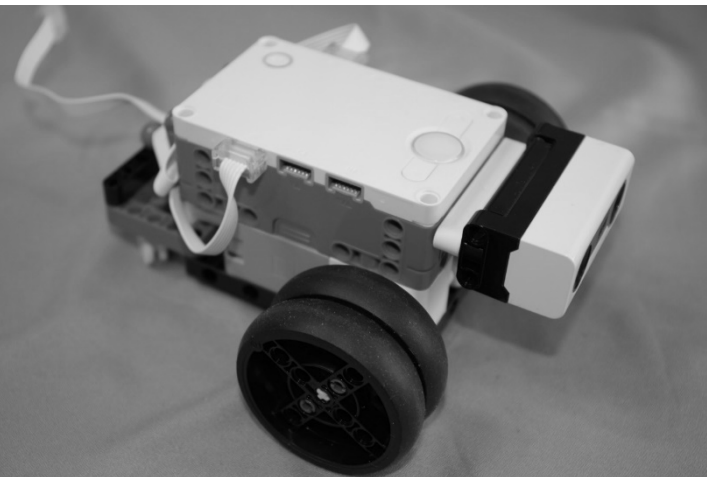
(8 more pieces)



- Insert the 4 short black friction pins into the #7 technic lift arm as shown



- Attach the lift arm to the back of the sensor.
- Feed the wire under the controller and between the motors and out the back of the assembly.



- Attach the sensor to the front of the robot.
- Plug the sensor wire into any available port on the controller.
- Use a cable clamp and blue axle-pin to better manage the cable.

## A few other notes:

- If your robot turns left when you want it to turn right, just swap out which ports the motors are plugged into.
- The wheels for this kit aren't as "sticky" as with the NXT or EV3 which is why we have them doubled up to give better traction.
- You can increase the stability of the pivot wheel assembly by making it 3 thick (top to bottom) and pin it to both the bottom 7x11 technic base AND to the bottom of the controller.
- For the educational kit, you can use the special bearing wheel as the rear wheel assembly rather than building a pivot wheel.