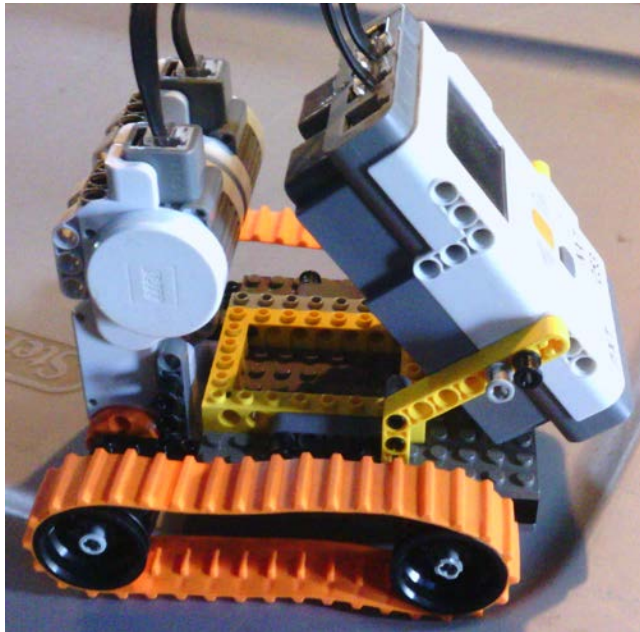


Building a Simple NXT Treaded Robot

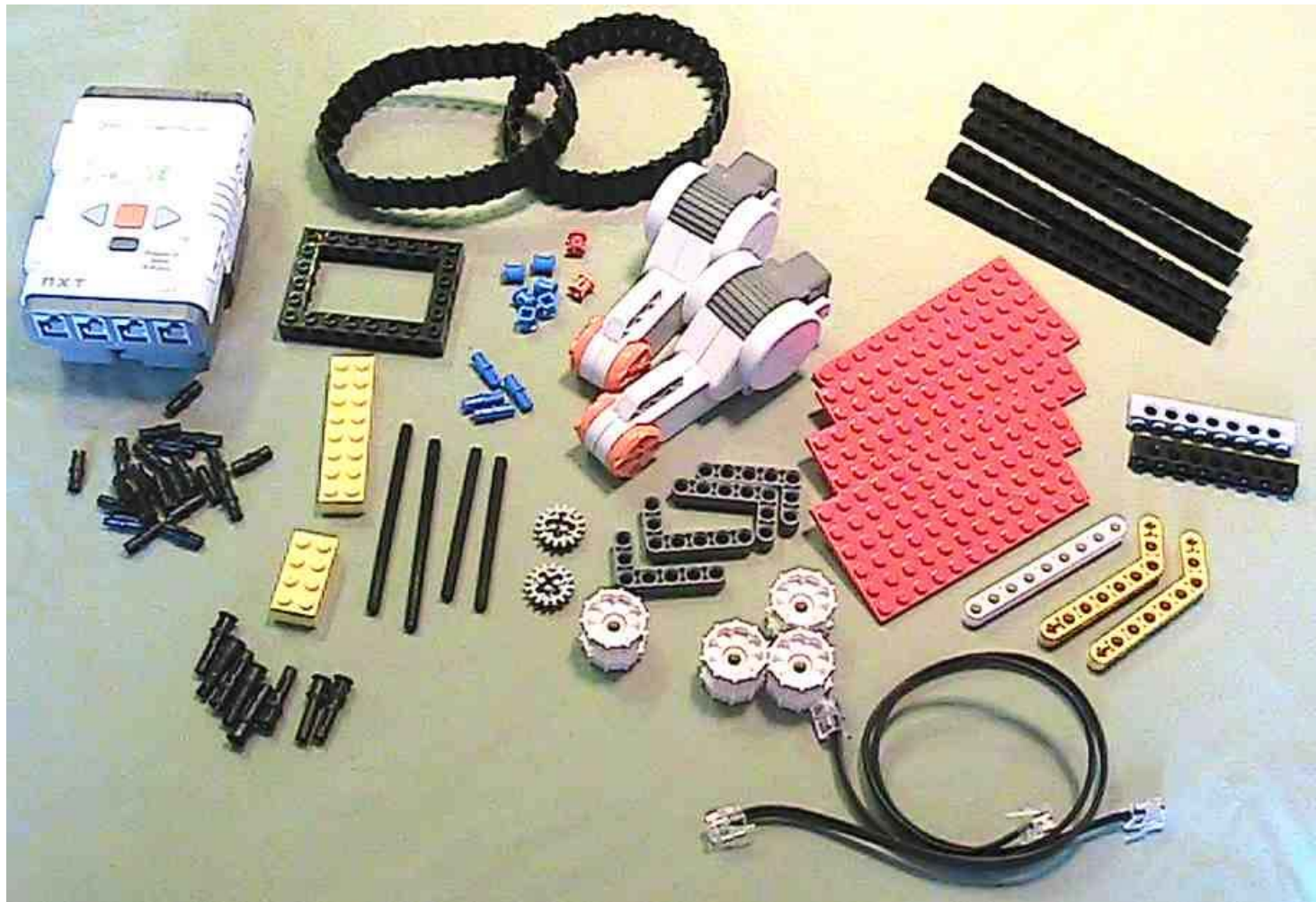


by Tom Bickford
Maine Robotics

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Total of 79 pieces



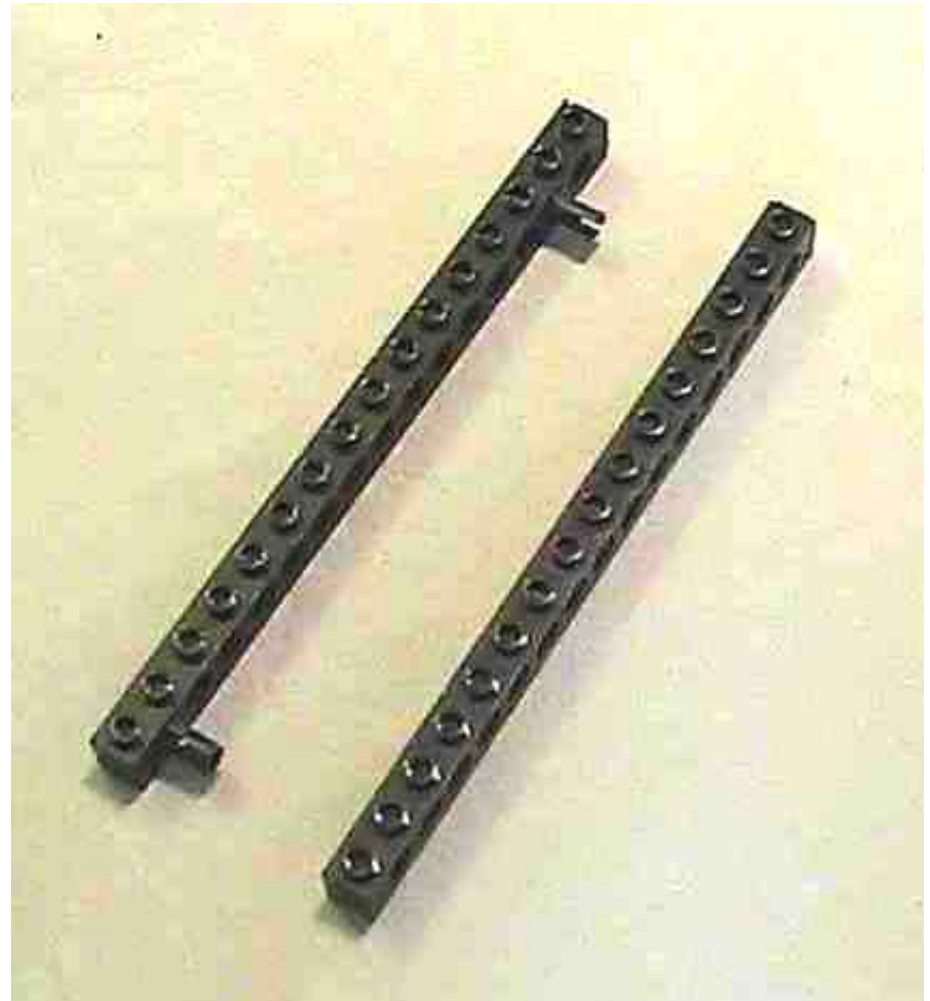
Parts List (79 pieces total)

- (1) NXT
- (2) motors
- (2) wires
- (4) 6x12 plates
 - Or (12) 2x12 plates
- (4) 1x16 Technic bricks
- (2) 1x8 Technic bricks
- (1) 6x8 Technic brick (square)
- (1) 2x4 brick
- (1) 2x8 brick
- (2) #10 axles
- (2) #8 axles
- (1) 9-hole technic lift arm
- (2) 9-hole bent technic lift arm
- (4) 3x5 Technic “L” lift arm
- (22) Technic short friction pins (black)
- (4) Technic axle-pins
- (8) Full bushings
- (8) Technic long friction pins with full bushing (black)
- TREADS, older type:
 - (2) Older, black treads
 - (4) Sprockets, with center round hole (need 16 tooth gears to attach to the drive axle)
 - (2) 16 tooth gears
- TREADS, newer type:
 - (2) Newer, orange treads
 - (4) black wheels with center axle hole
 - No gears needed

Start the Chassis

Make two:

- Connect two 1x16 Technic Bricks using two black Technic friction pins
- Use the first hole in on one end and the second hole in on the other end



Start Motor Mounts

Make two (mirrored):

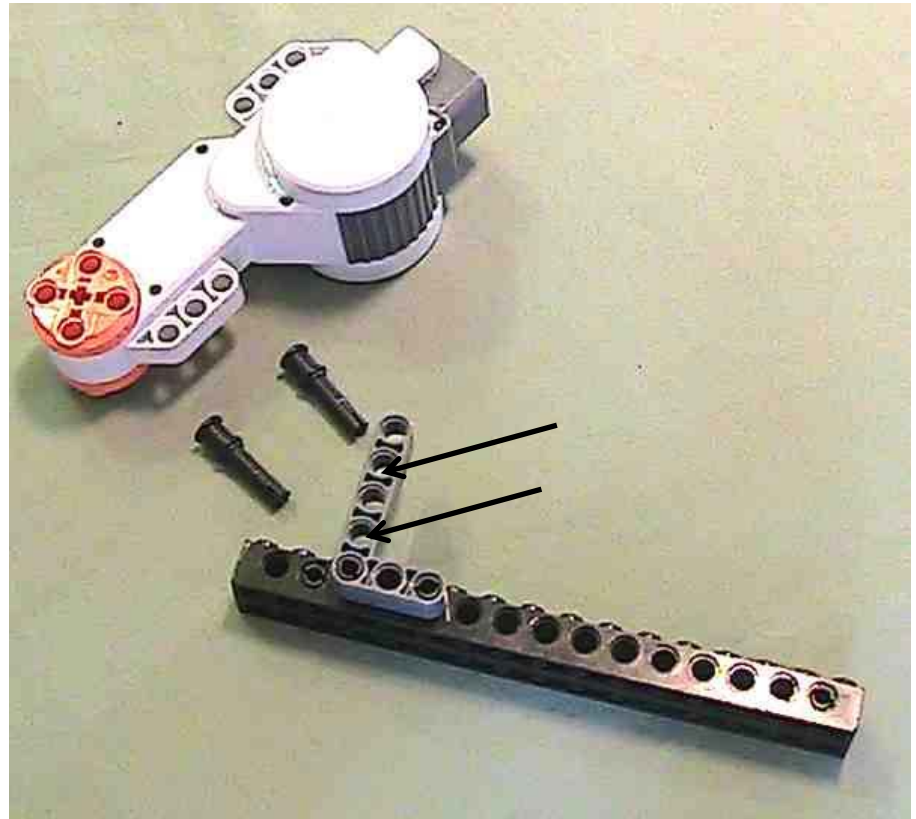
- Connect a 3x5 “L” Technic lift arm to the chassis piece
- Mirror the two sides
- The “L” piece should connect to **holes 3 and 5** and be on the end that had a pin in hole #2



Connect the Motors

Make two (mirrored):

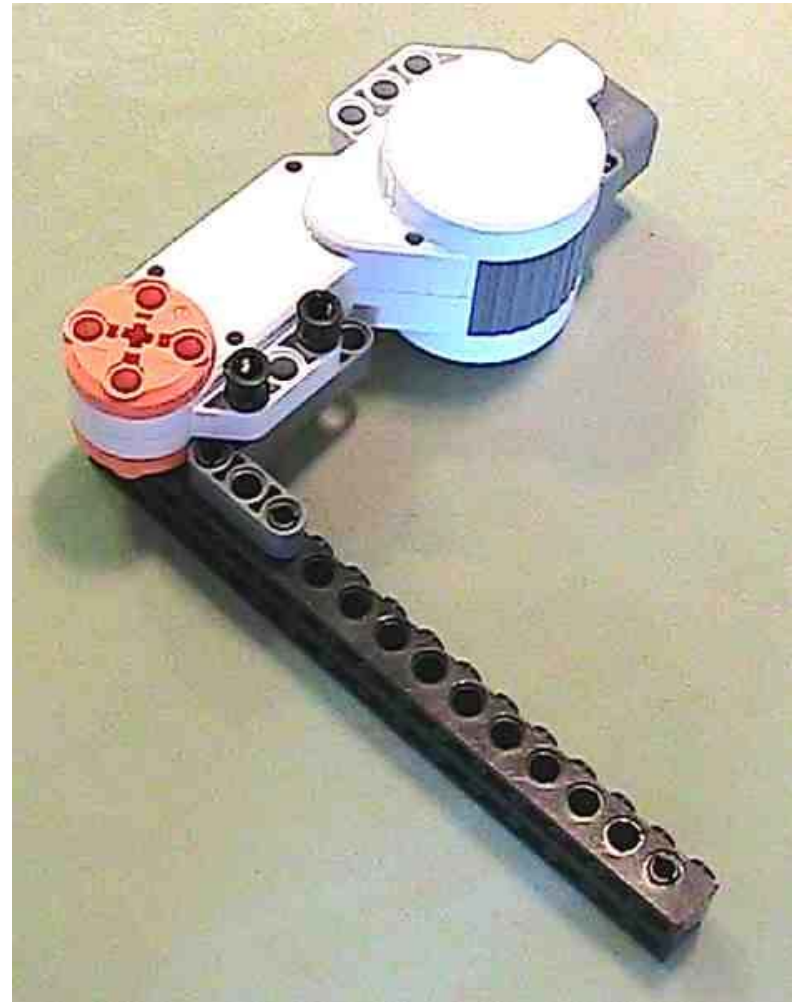
- Connect the two motors using two long Technic friction pins with end bushing
- Mirror the two sides
- The “L” piece will connect using the **2nd and 4th holes** on the long side



Motor Mount complete

Make two (mirrored):

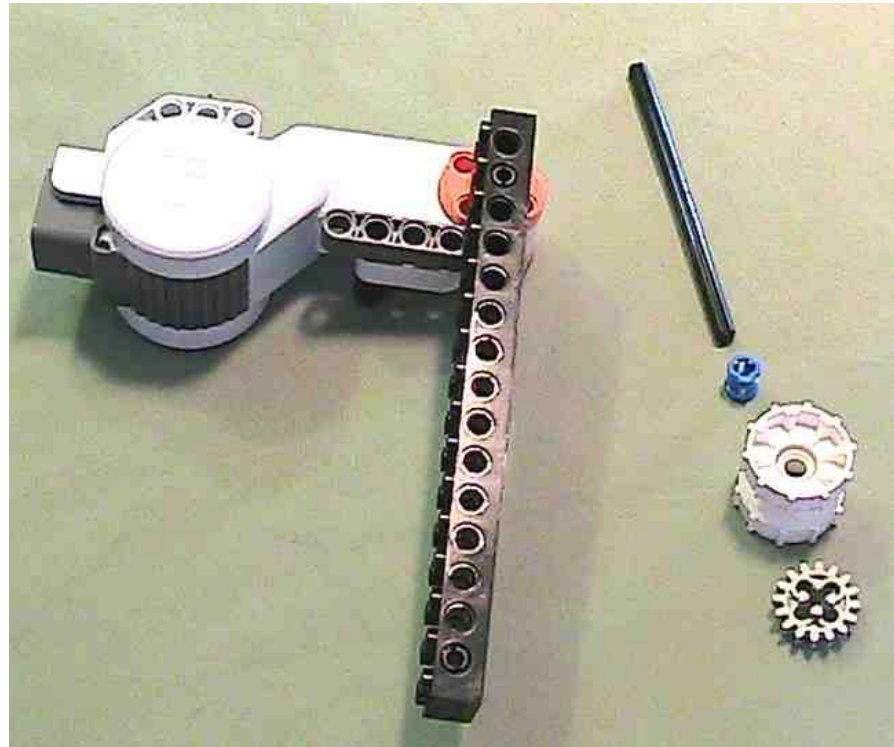
- Note that the order goes:
 - 1x16 chassis section
 - 3x5 Technic Lift arm
 - Motor



Add the Drive Axle and Sprocket

Make two (mirrored):

- NOTE: The axle hole on the motor should line up with the first hole on the 1x16 technic blocks.
- Put a #10 axle through the hole and through the motor
- Place the bushing on the axle
- Place the sprocket on the axle
- Finish with the 16 tooth gear on the axle, and it should nestle into the sprocket

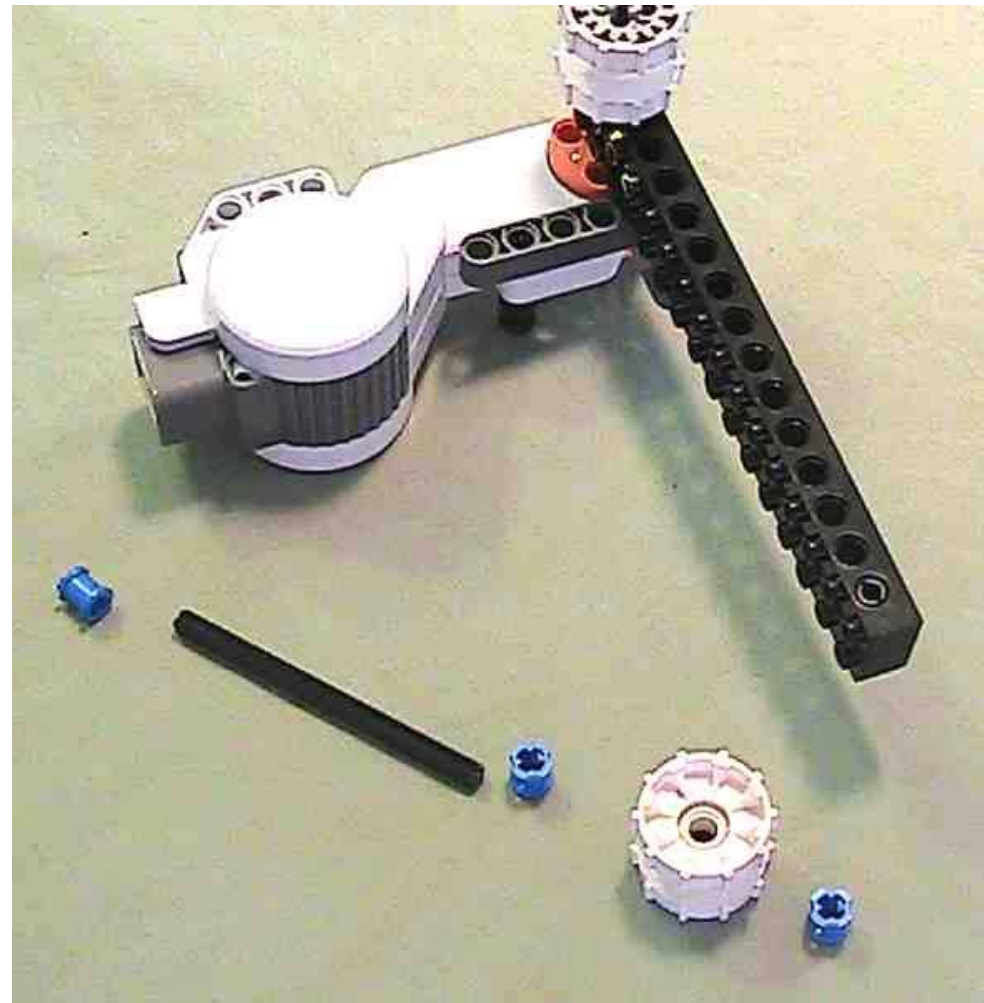


If you are using the newer treads just substitute the black wheels for the white sprockets and don't use a gear to hold it on, hold it on with a bushing.

Finished drive axle and adding the support axle and sprocket

Make two (mirrored):

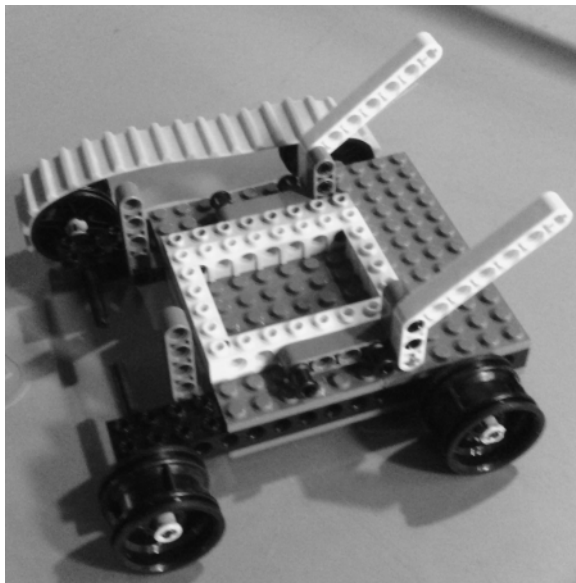
- NOTE: The second axle must go through the 3rd hole on the other end of the 1x16 technic brick. Treads must always be 13 holes apart (11 holes between the axles)
- Put a #8 axle through the hole
- Place a bushing on each side of the chassis blocks with most of the axle on the side away from the motor side
- Place the sprocket on the axle
- Finish with a last bushing on the axle, and it should nestle into the sprocket



Chassis Side Assembly

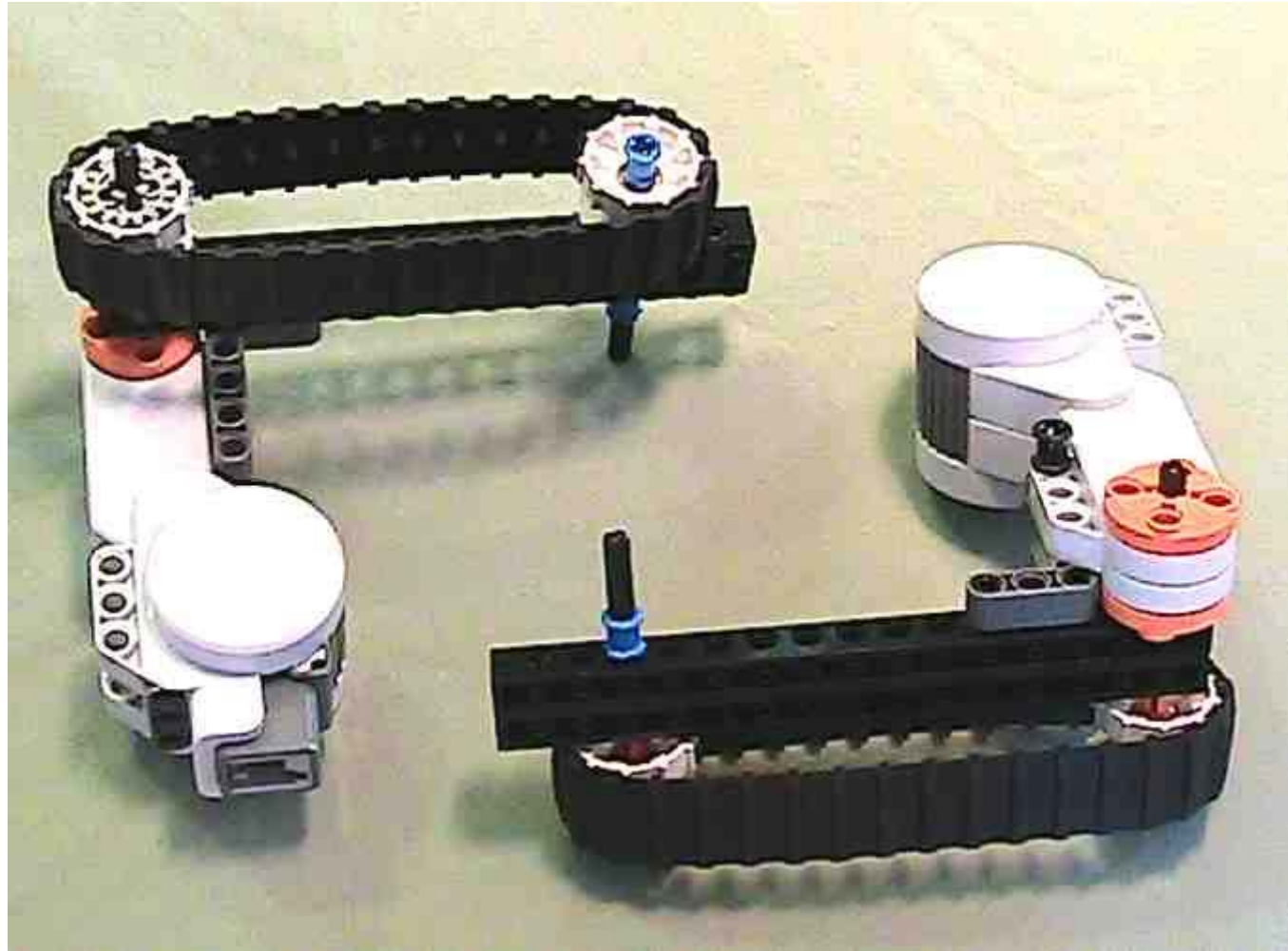
Make two (mirrored):

- Completed side assembly, ready for tread
- NOTE: If you have the newer treads (Orange with black hubs) the axle spacing is the same, but no 16 tooth gear is needed, just keep on with a bushing.



Pair of Sides Assembled

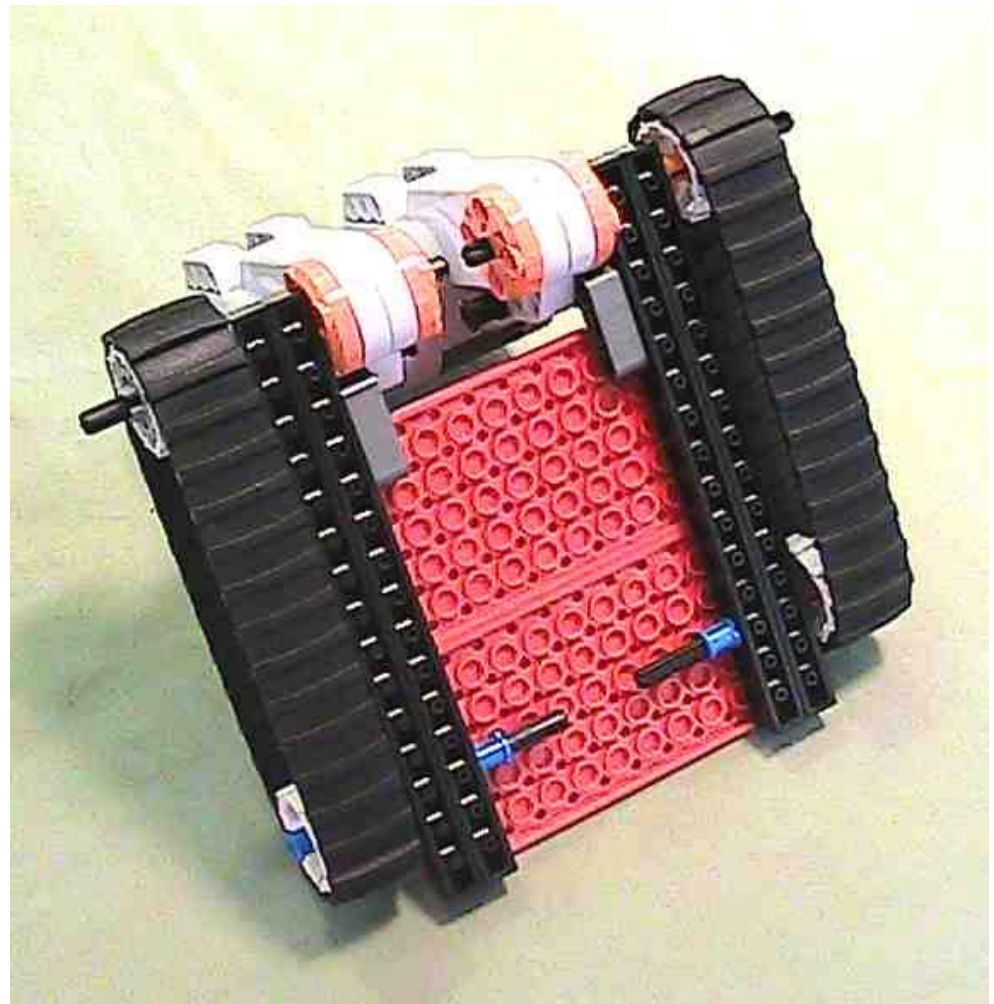
NOTE: Extra axle length can be pushed to the inside, (and adjust the inside bushings) before putting plates on.



Add Decking

Complete Chassis:

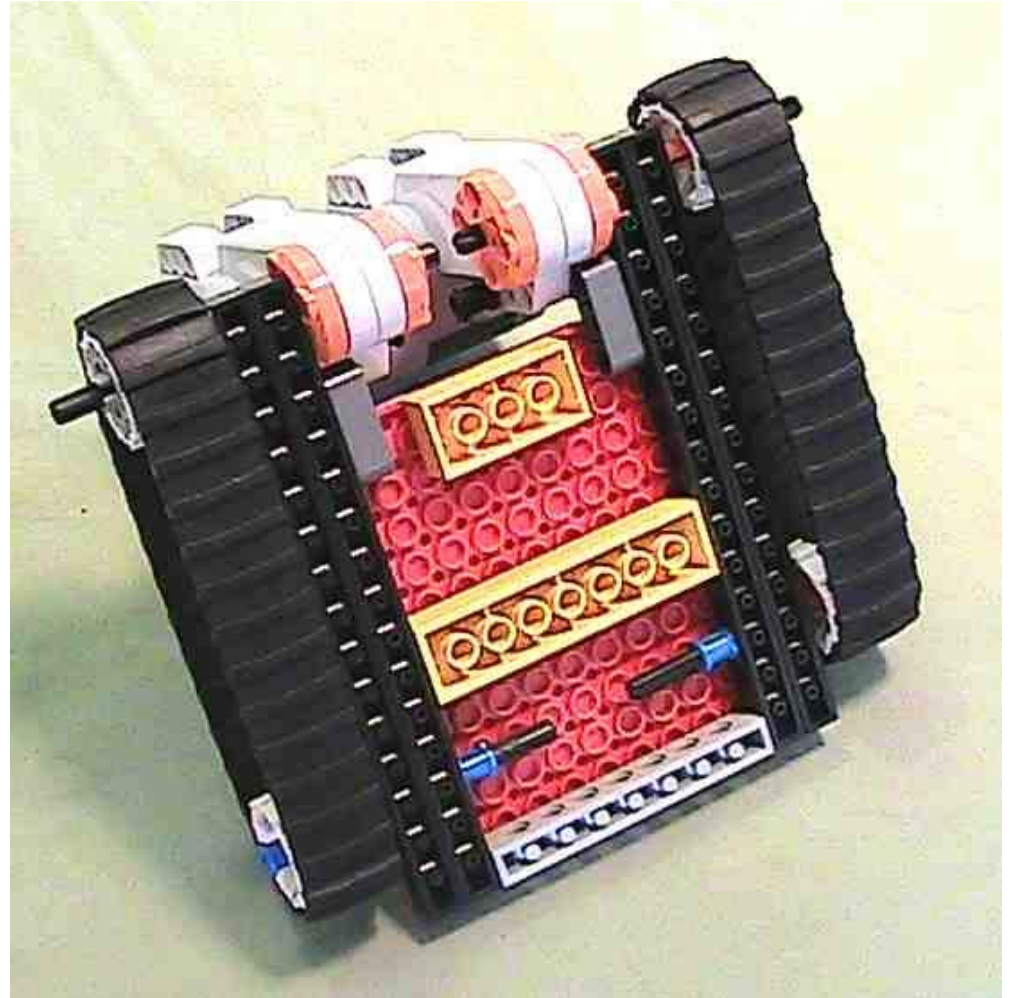
- Place 6x12 plates on top of deck, starting at the front, leaving no deck at the back (motor) end of the chassis.



Add spacers to Chassis

Add Spacers:

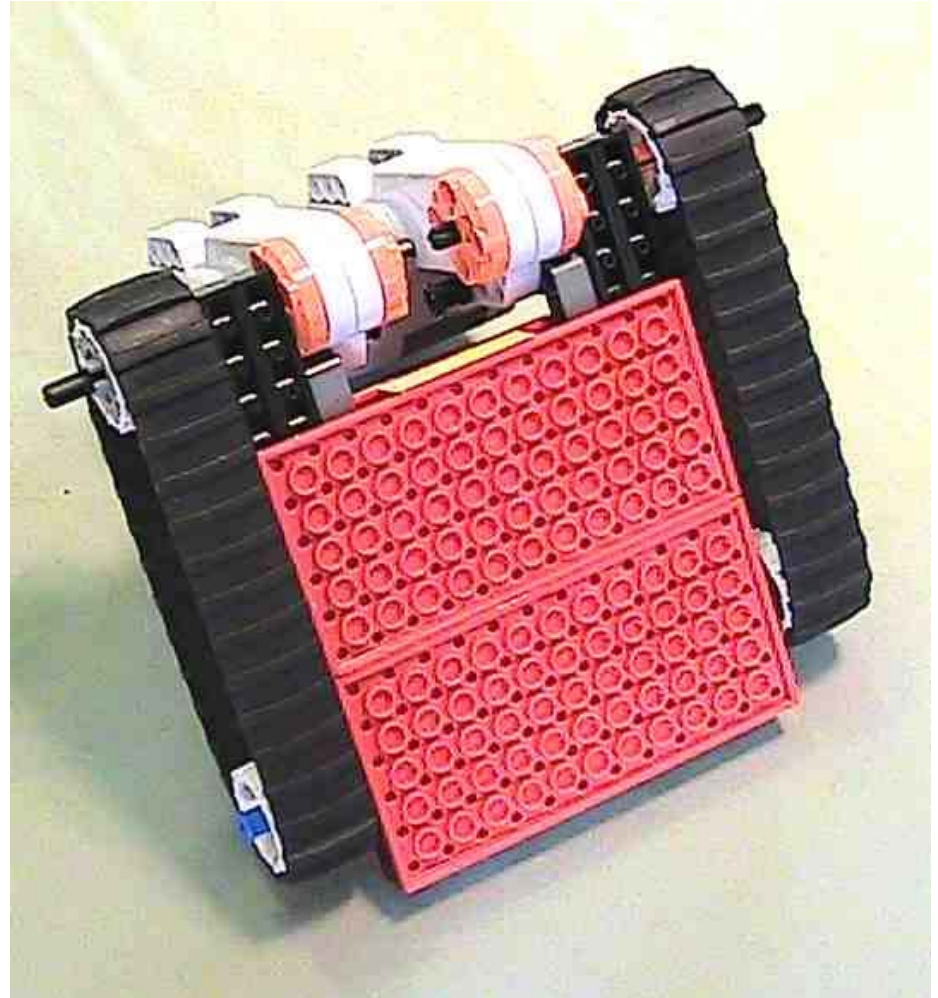
- Using a 1x8 Technic Brick, a 2x8 brick and a 2x4 brick as shown, add spacers onto the bottom of the 6x12 plates.
- These spacers will serve three purposes.
 - They will add strength between the top and bottom of the chassis
 - The Technic brick at the front will give you technic holes to attach to if needed.
 - The middle 2x8 brick will also support the seam between the two plates.



Finish the Chassis

Finish the Chassis:

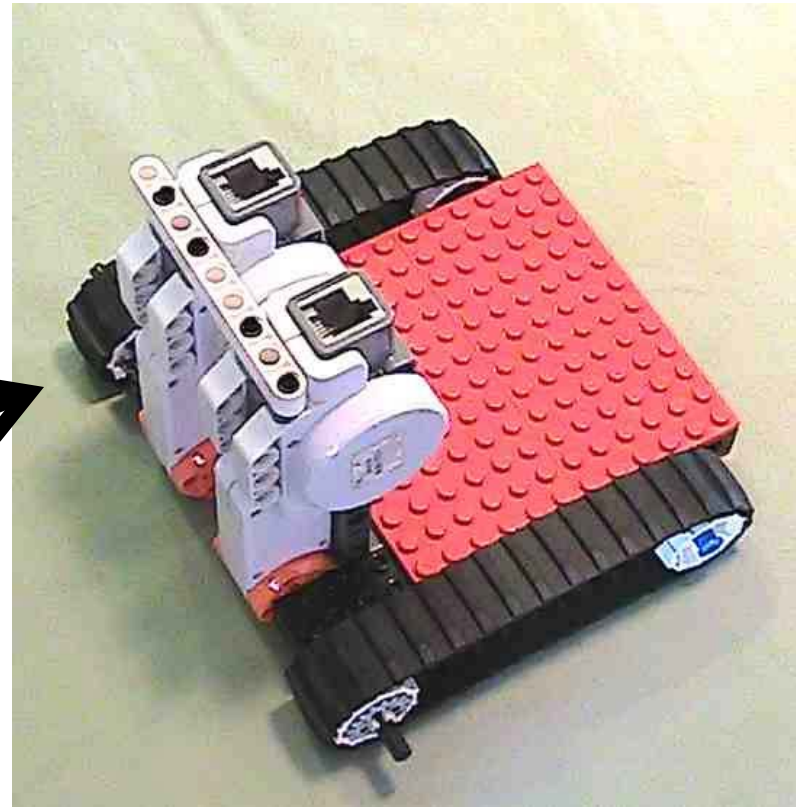
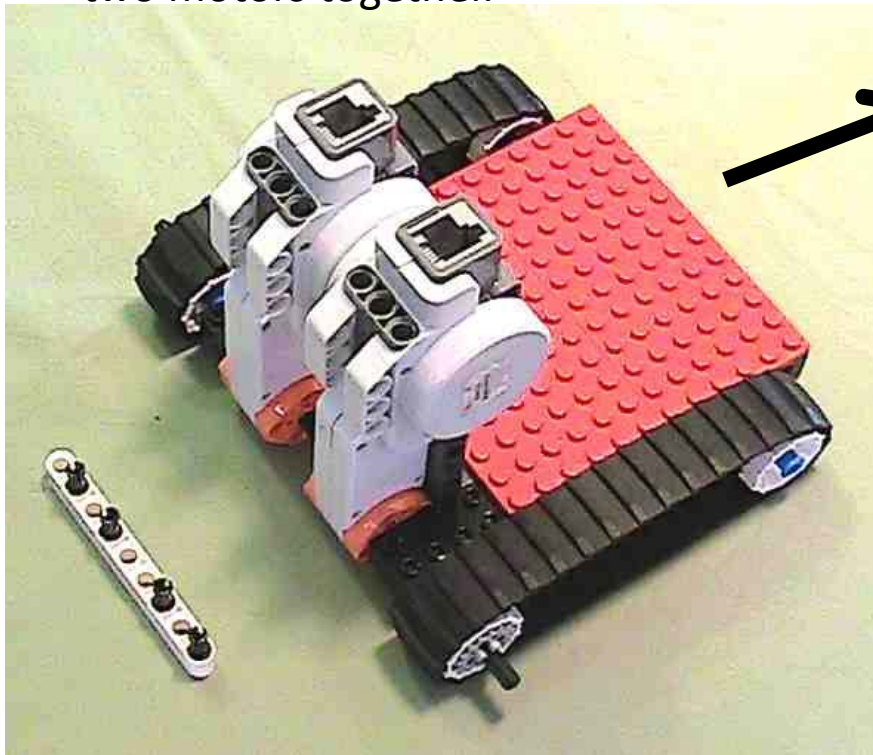
- Add the last two 6x12 plates to the bottom of the chassis and make sure the plates and bricks are securely fastened.



Add Motor Cross Support

Cross Support:

- Using a 1x9 Technic Lift arm and 4 short Technic friction pins, secure the two motors together.



NXT Attachment

NXT Attachment:

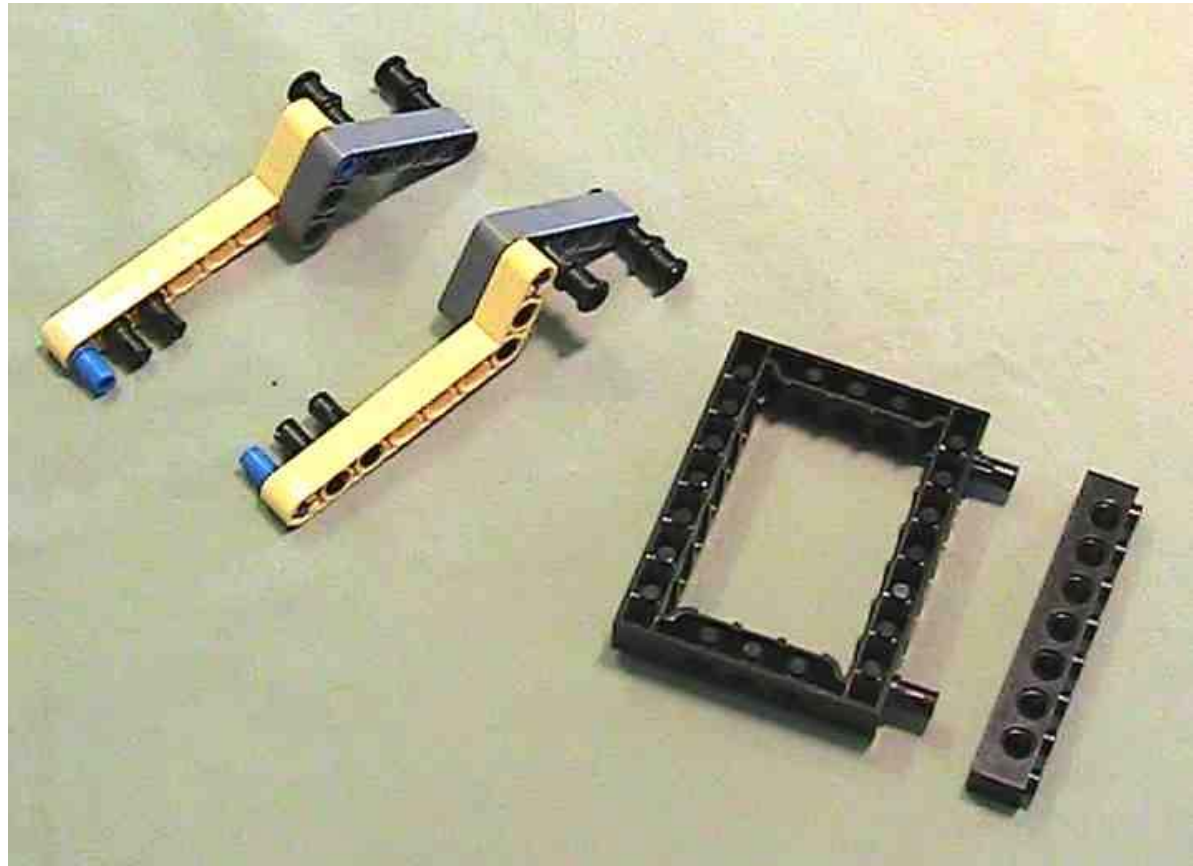
- Assemble the parts as show:
 - (2) 3x5 “L” Technic Lift arms with 2 long friction pins with stop bushing on each as shown.
 - Two #9 bent Technic Lift arms with 4 black friction Technic pins and 2 Technic axle-pins on each as shown.
 - NOTE: Each is a mirror of the other



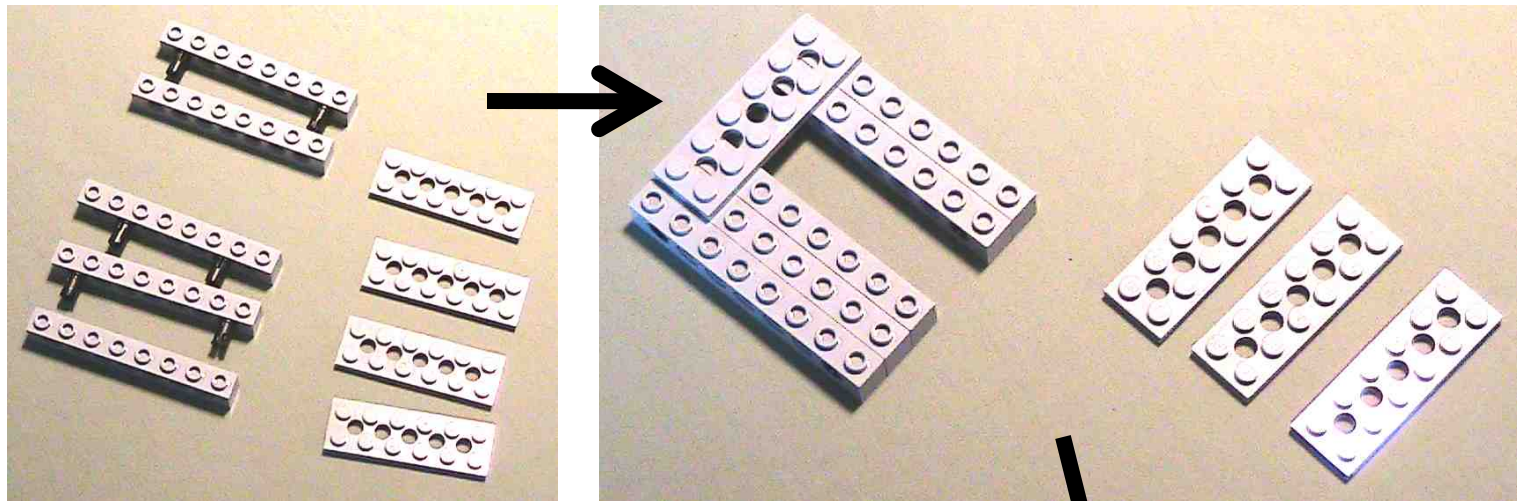
Assemble the NXT Holder

NXT Attachment:

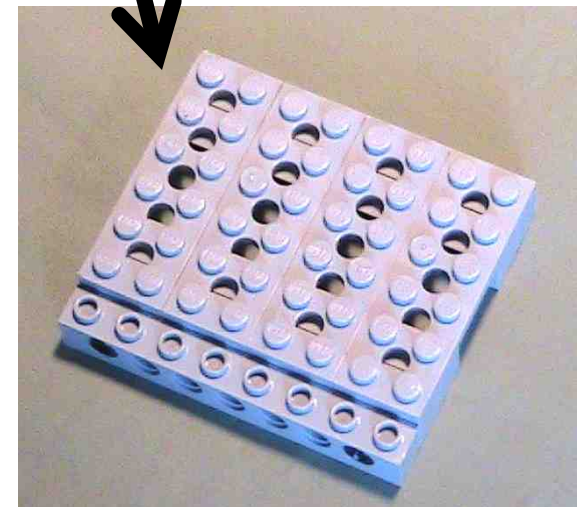
- Assemble the parts as show:
 - Connect the 3x5 and #9 bent Technic Lift arms together as shown.
 - Attach a 1x8 Technic brick to the long side of a 6x8 Technic square using 2 Technic friction pins (black)



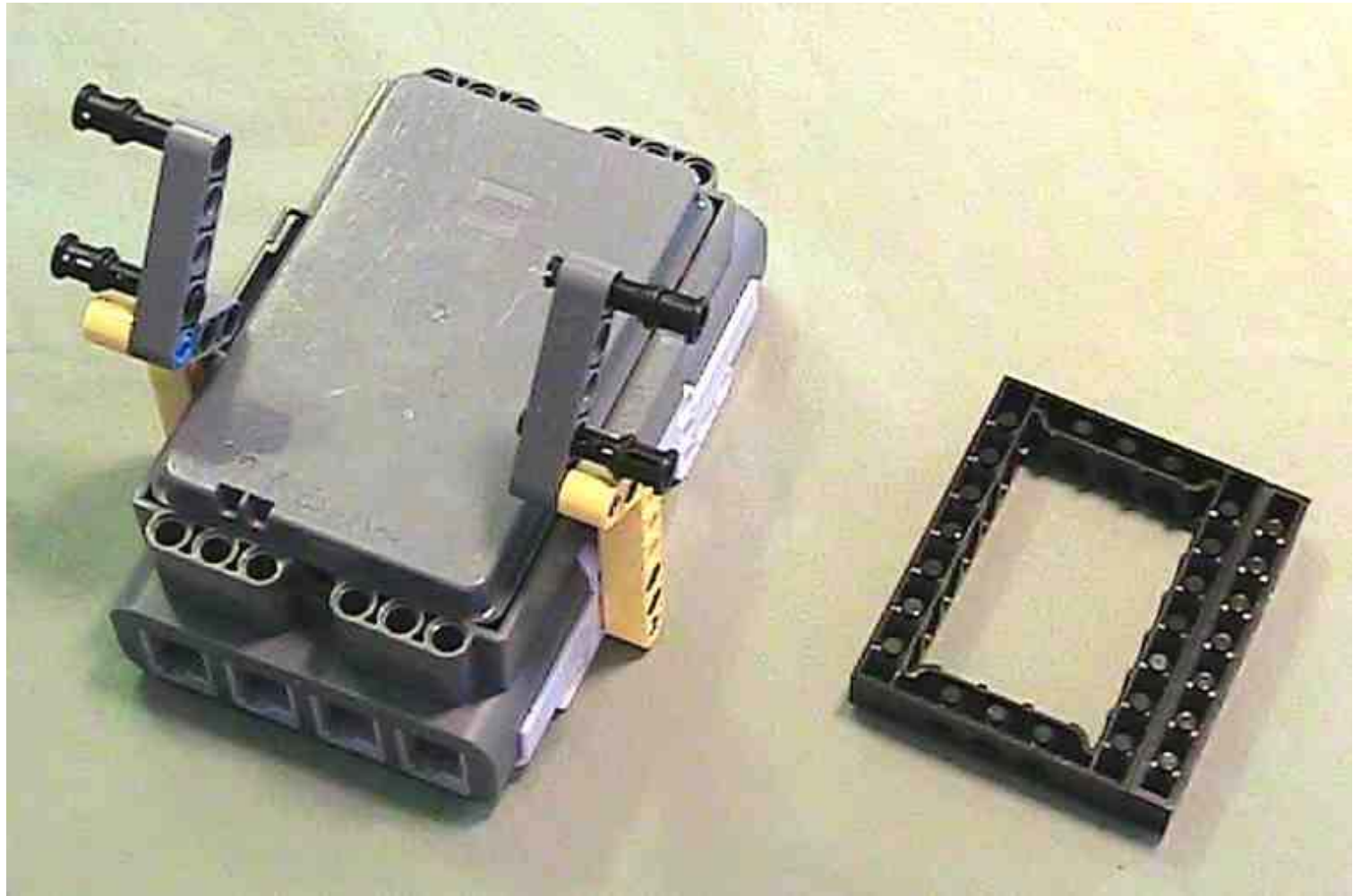
Alternate NXT Attachment Base



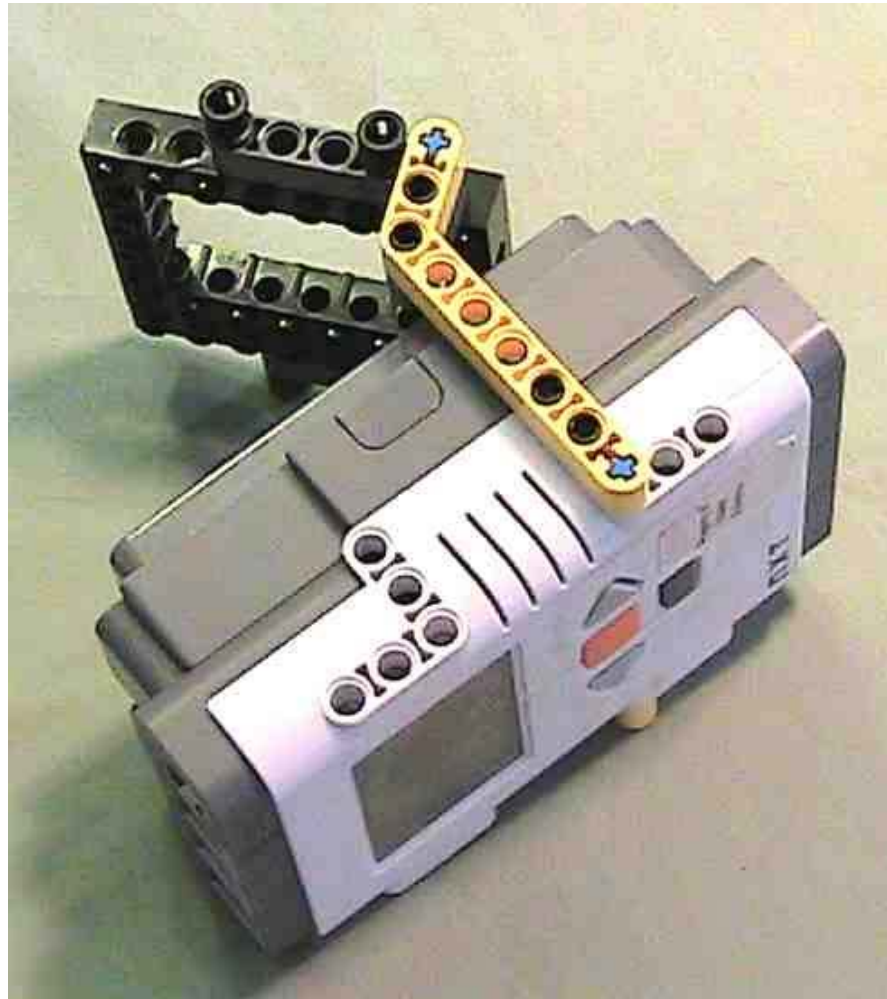
If you don't have a 6x8 Technic Square, you can build the equivalent using five 1x8 Technic bricks, 6 friction pins, and four 2x6 plates as shown.



Attach the Side pieces to the NXT



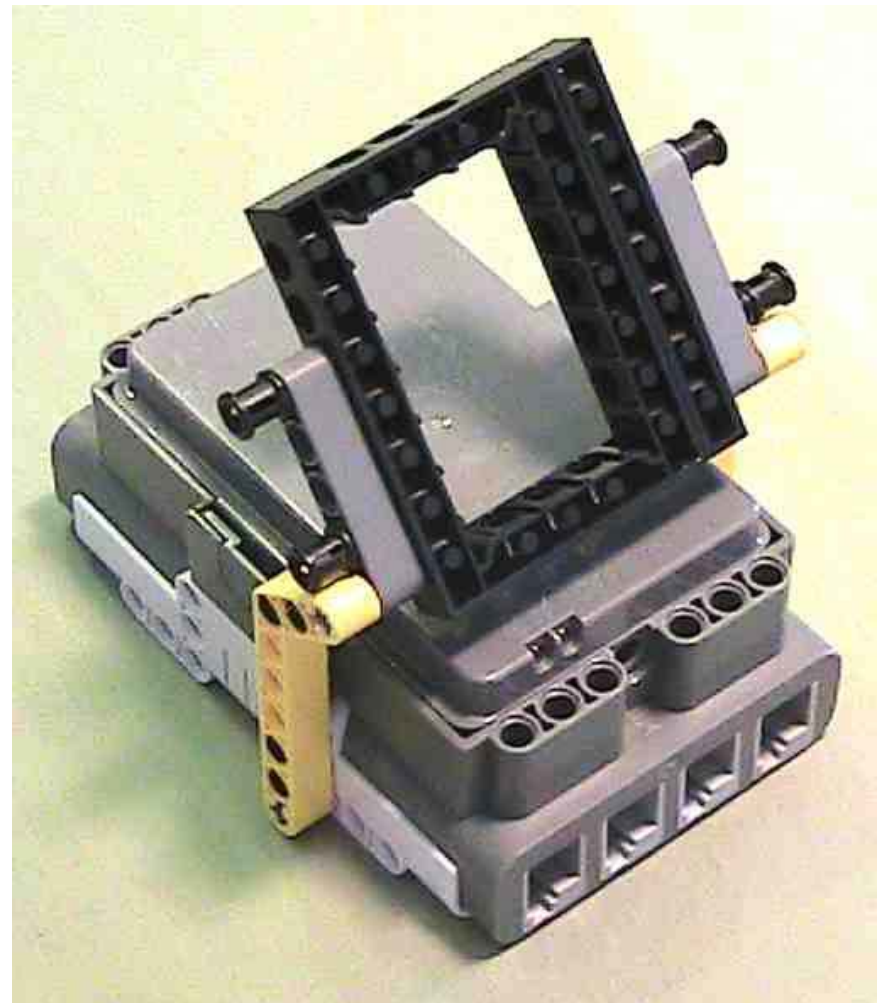
Attach the Side pieces to the Base using
4 long friction pins with full bushings



Finished assembly

NXT Attachment:

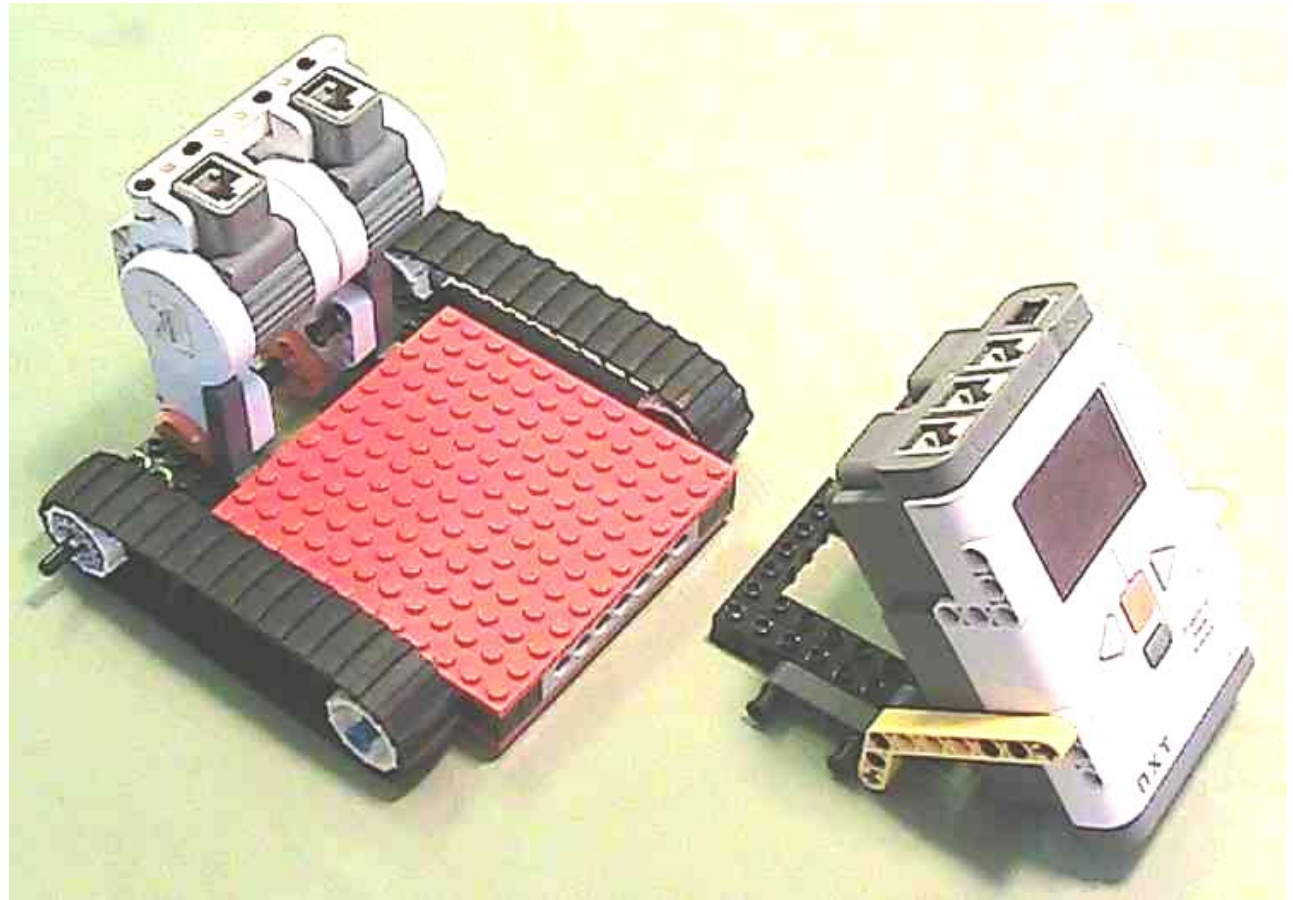
- NOTE:
 - The NXT is 9 knobs wide, so you will always have an odd number to build if you want to attach it to your robot.
 - This is usually done (as is here) by adding an extra brick, beam, or lift arm to widen your assembly.



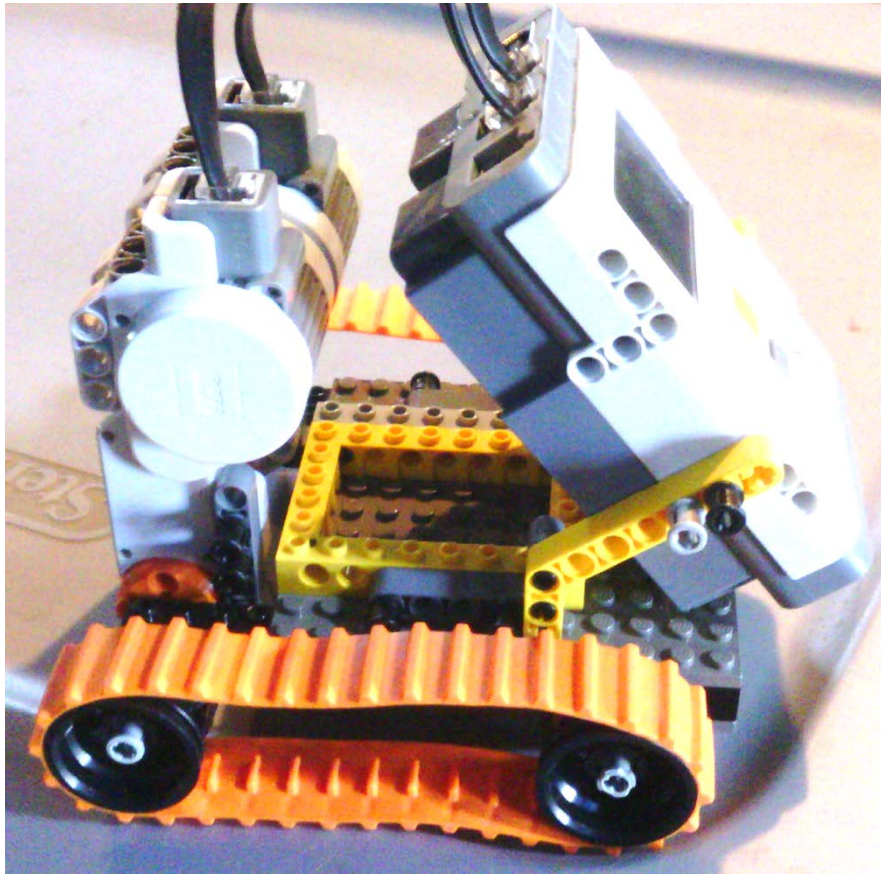
Adding the NXT to the Base

NXT Attachment:

- The NXT base is ready to attach directly to the Chassis base.
- Place it as far back (to the motors) as possible to keep the weight well balanced.
- NOTE: The NXT is an odd number of knobs wide, but the Chassis is an even number, so it will be off center by one knob.



Assembled - Complete with Wires



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