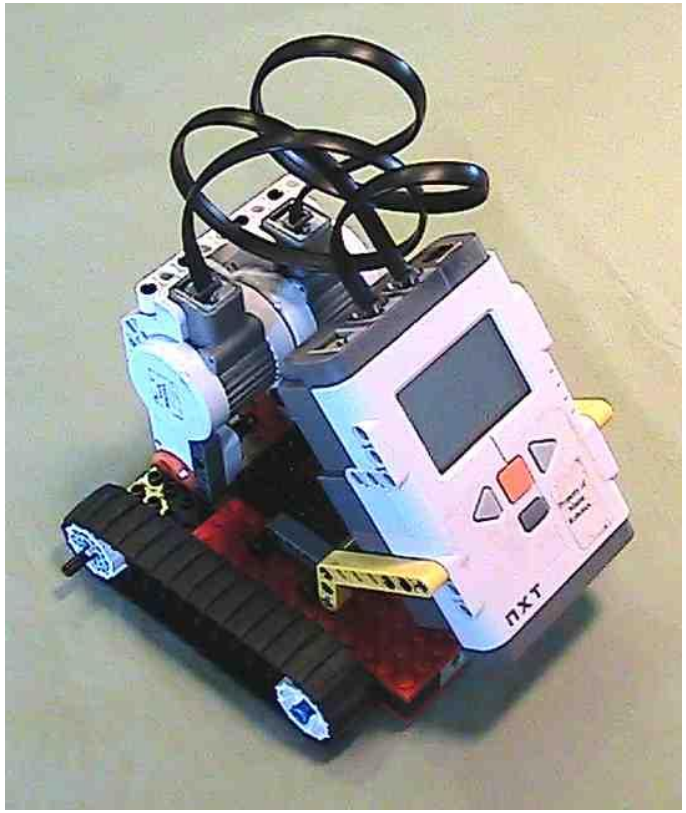
Building a Simple NXT Treaded Robot

by Tom Bickford
Maine Robotics



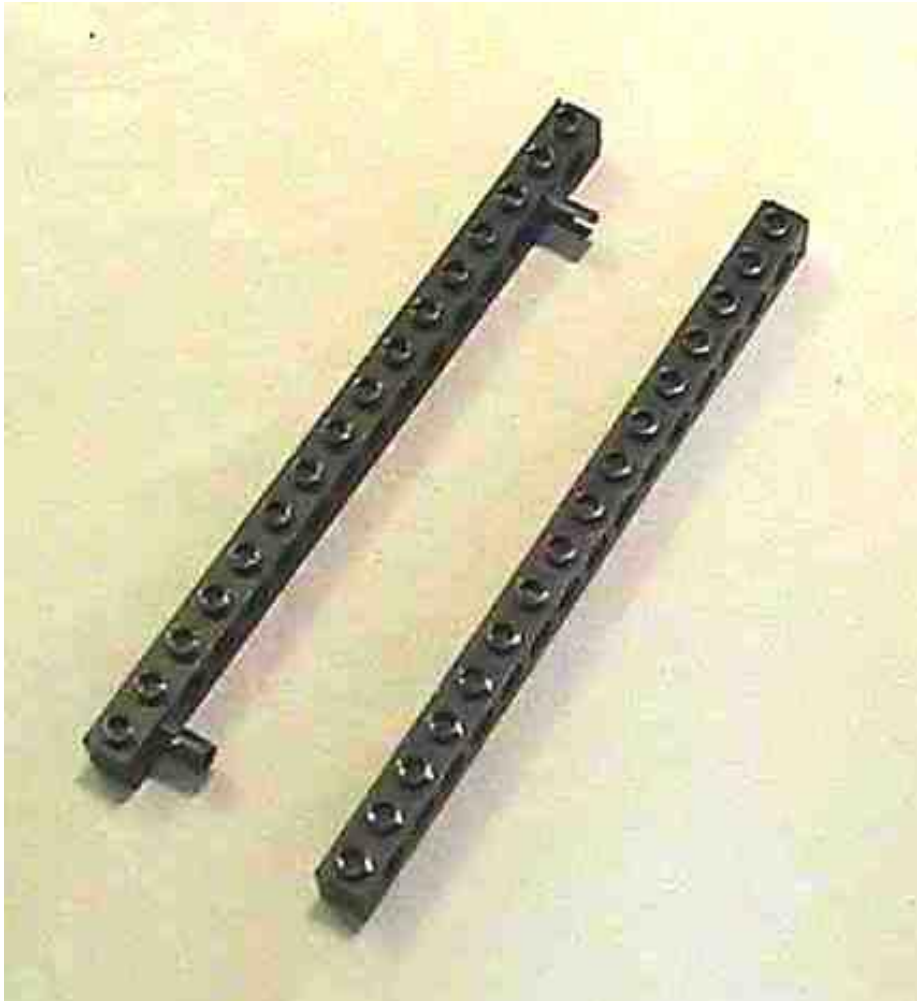
Parts List (79 pieces total)

- (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) treads
- (4) sprockets
- (2) 16 tooth gears
- (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)

Start the Chasis

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

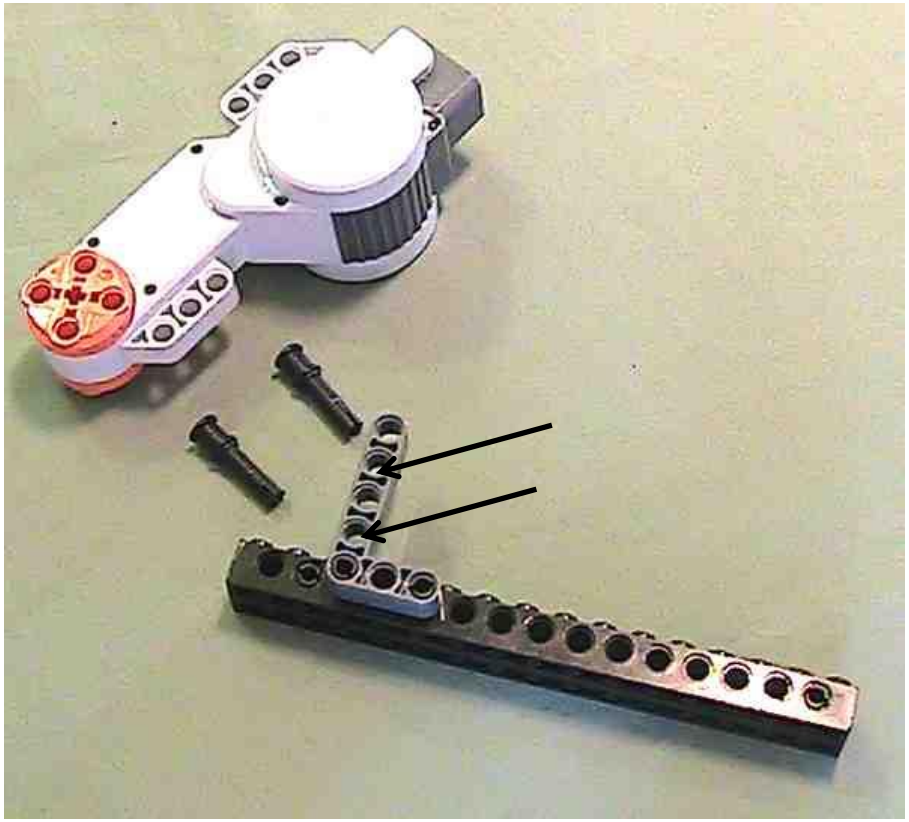
Make two (mirrored):

- 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):

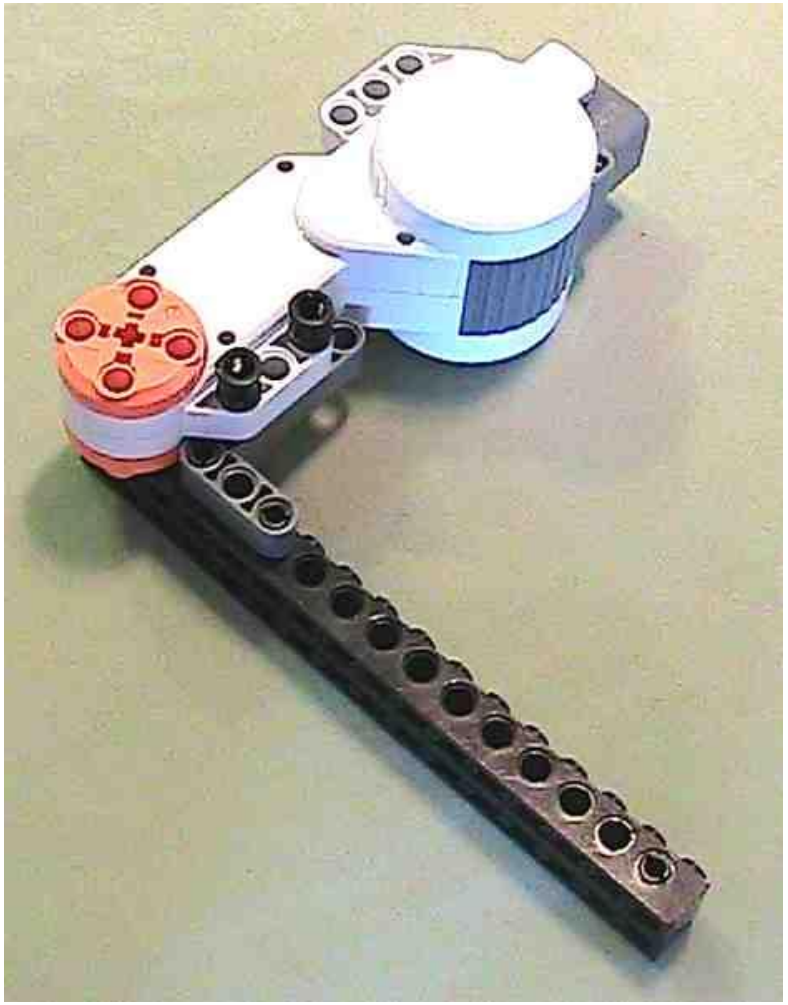
- Connect the two motors using two long Technic friction pins with end bushing
- Mirror the two sides
- The “L” piece will connect using the **2nd and 4th holes** on the long side



Motor Mount complete

Make two (mirrored):

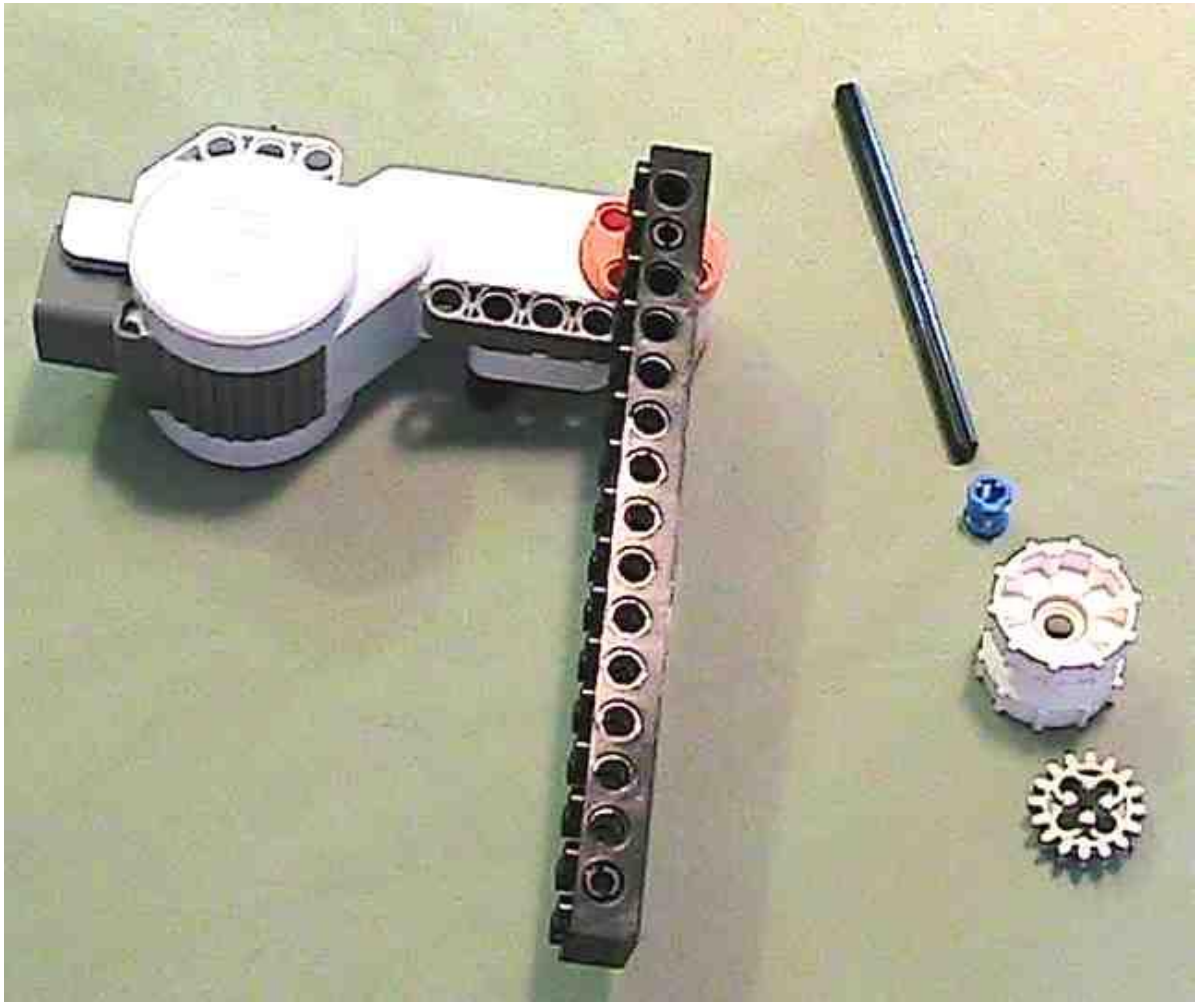
- Note that the order goes:
  - 1x16 chassis section
  - 3x5 Technic Lift arm
  - Motor



Add the Drive Axle and Sprocket

Make two (mirrored):

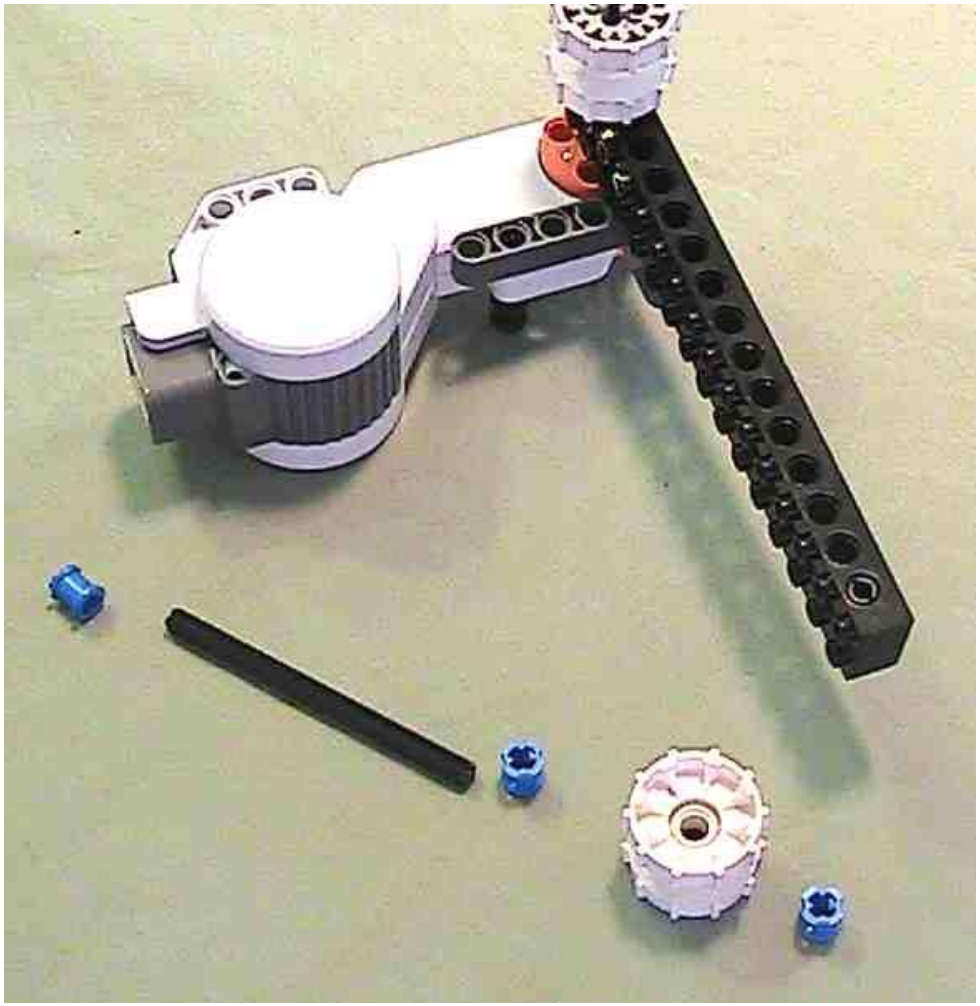
- NOTE: The axle hole on the motor should line up with the first hole on the 1x16 technic blocks.
- Put a #10 axle through the hole and through the motor
- Place the bushing on the axle
- Place the sprocket on the axle
- Finish with the 16 tooth gear on the axle, and it should nestle into the sprocket



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



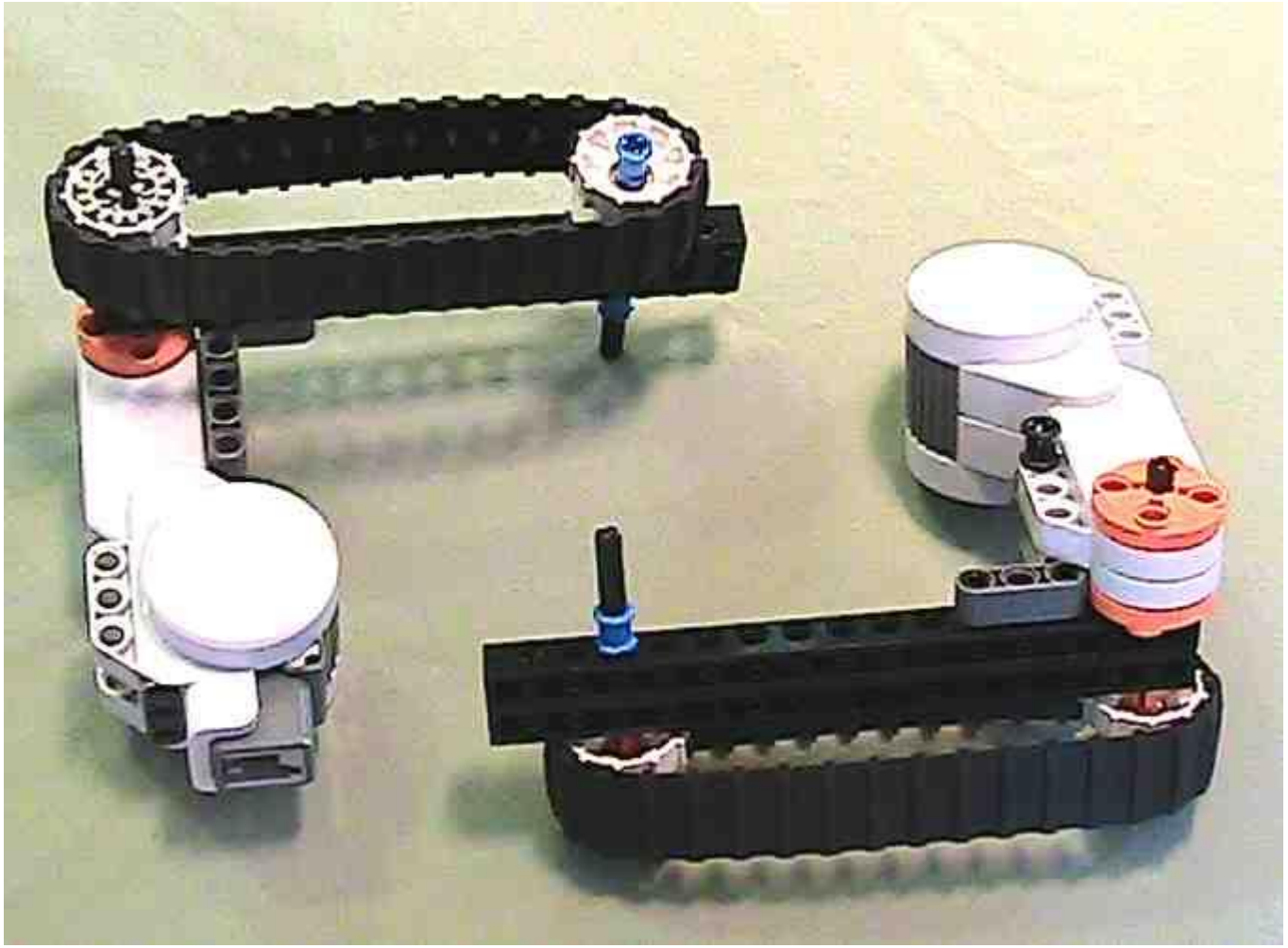
Chassis Side Assembly

Make two (mirrored):

- Completed side assembly, ready for tread

Pair of Sides Assembled

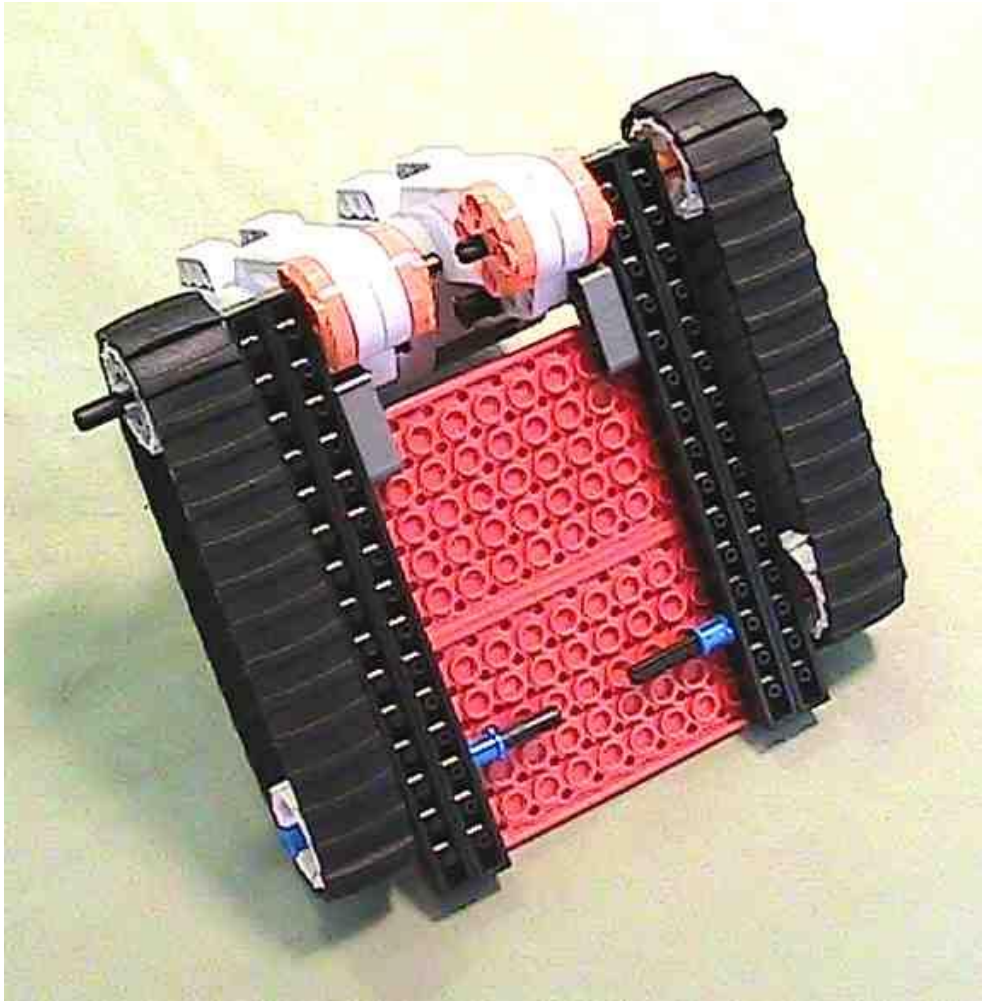
NOTE: Extra axle length can be pushed to the inside, (and adjust the inside bushings) before putting plates on.



Add Decking

Complete Chassis:

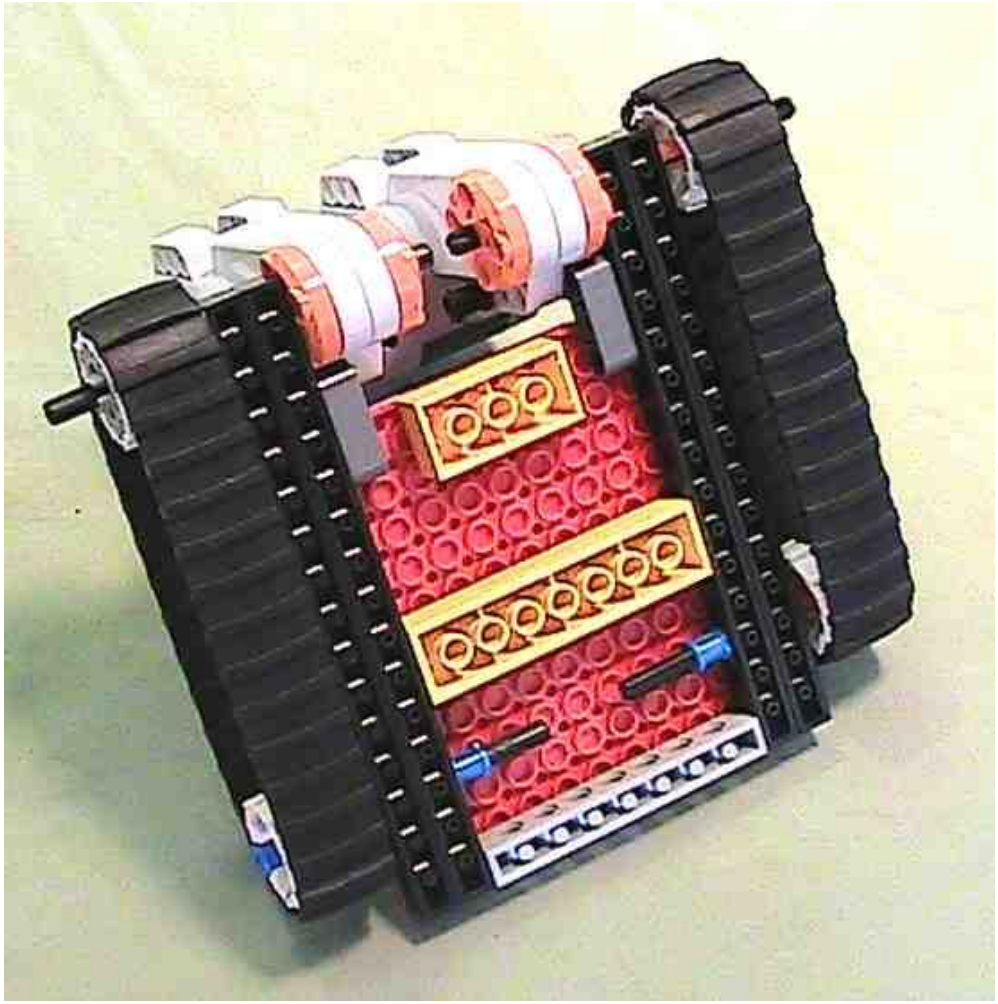
- Place 6x12 plates on top of deck, starting at the front, leaving no deck at the back (motor) end of the chassis.



Add spacers to Chassis

Add Spacers:

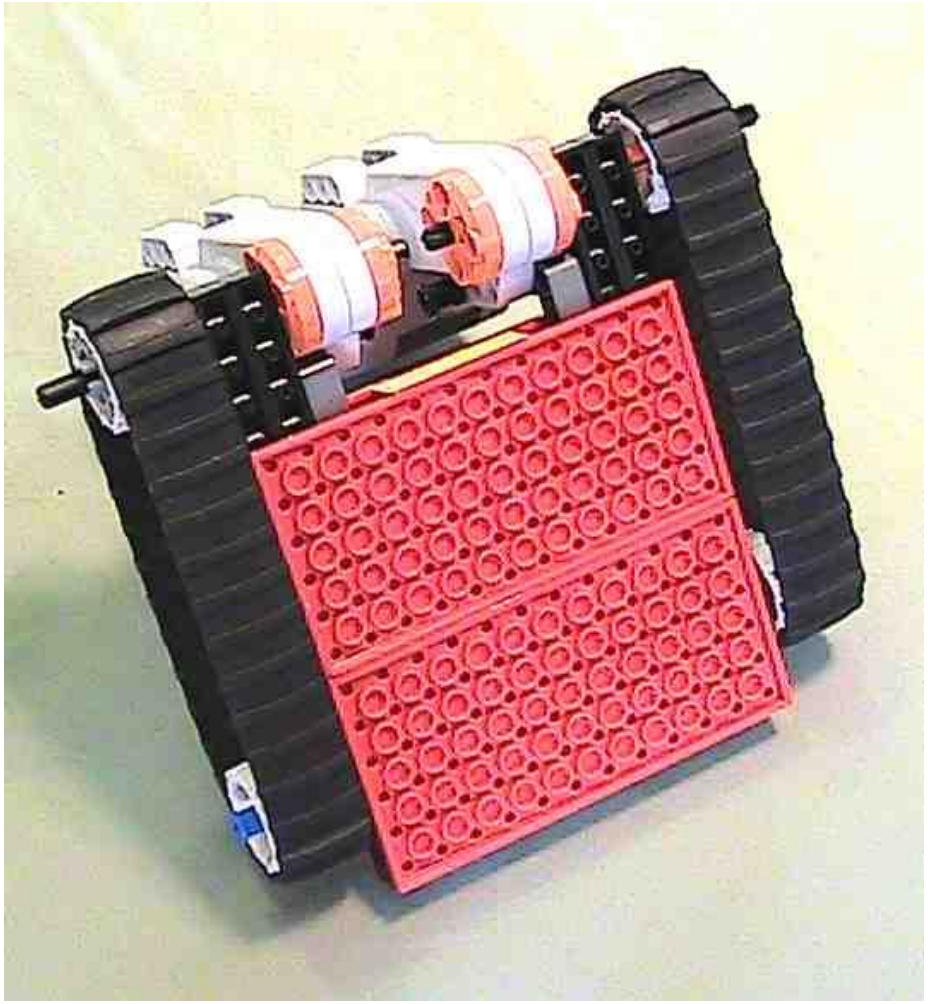
- Using a 1x8 Technic Brick, a 2x8 brick and a 2x4 brick as shown, add spacers onto the bottom of the 6x12 plates.
- These spacers will serve three purposes.
  - They will add strength between the top and bottom of the chassis
  - The Technic brick at the front will give you technic holes to attach to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



Finish the Chassis

Finish the Chassis:

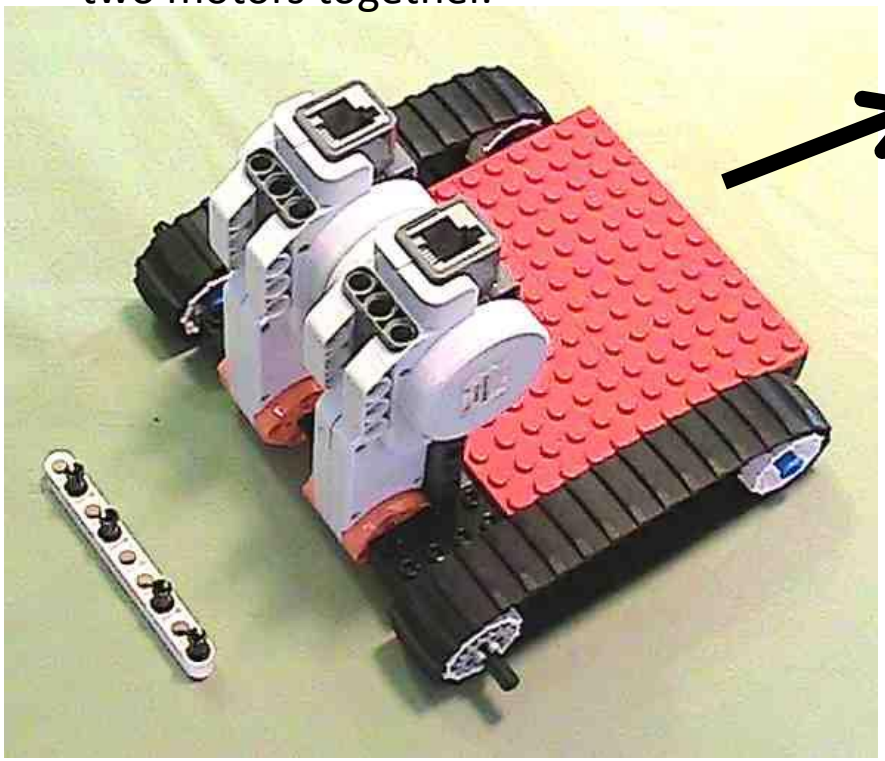
- Add the last two 6x12 plates to the bottom of the chassis and make sure the plates and bricks are securely fastened.

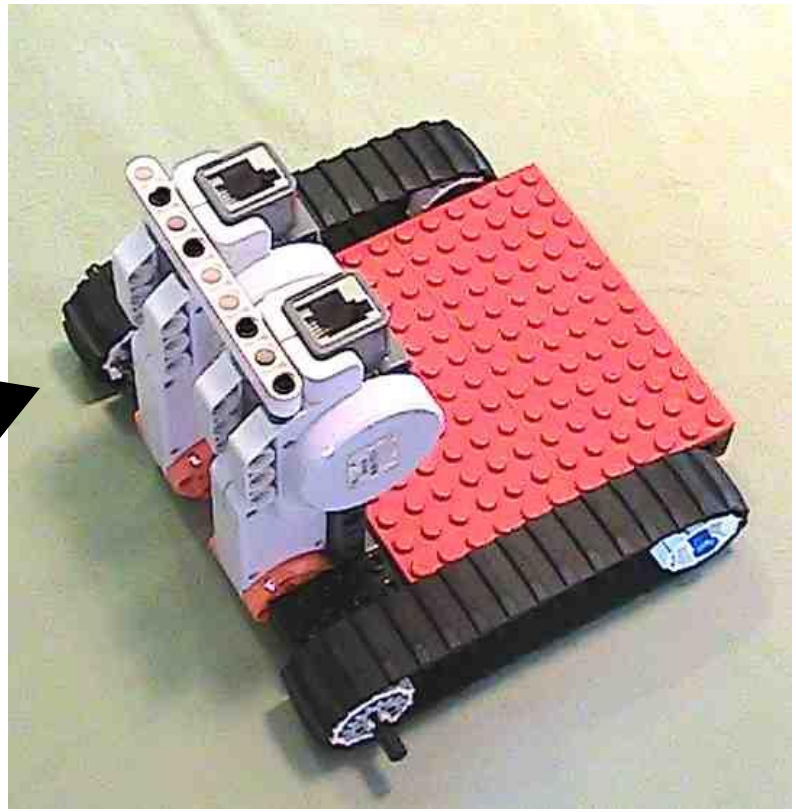


Add Motor Cross Support

Cross Support:

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

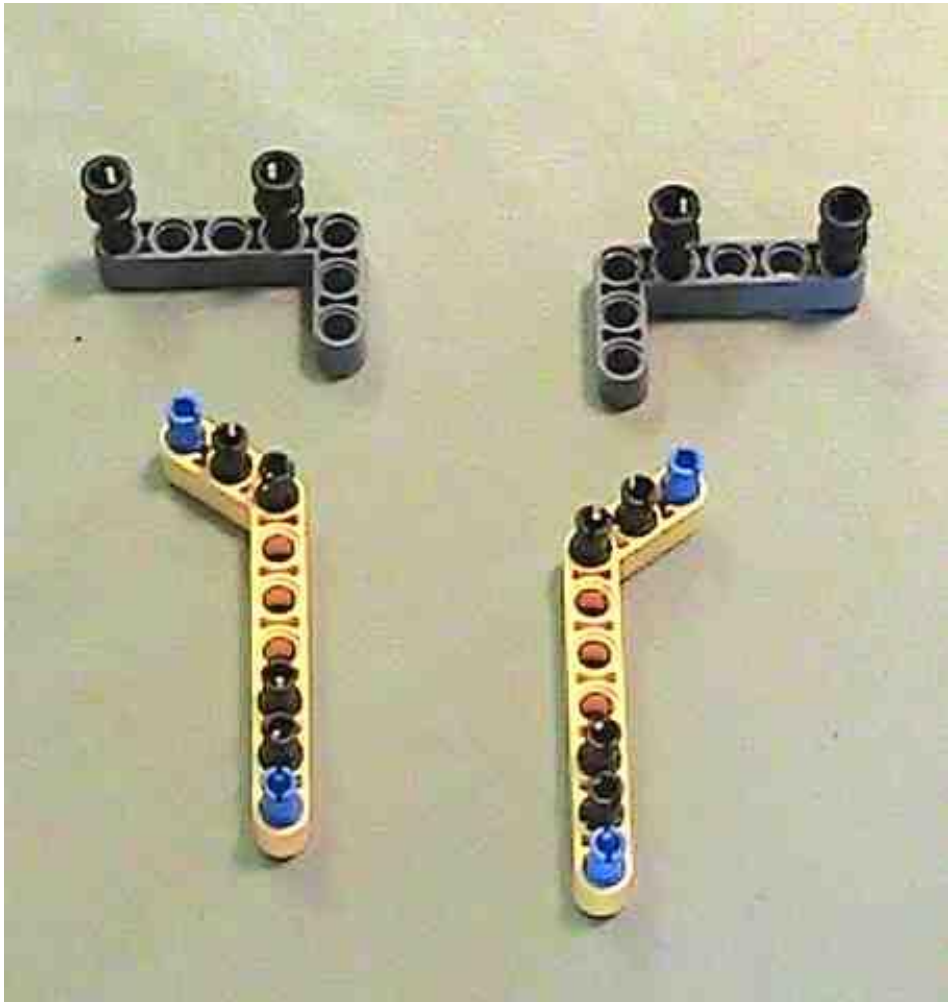




NXT Attachment

NXT Attachment:

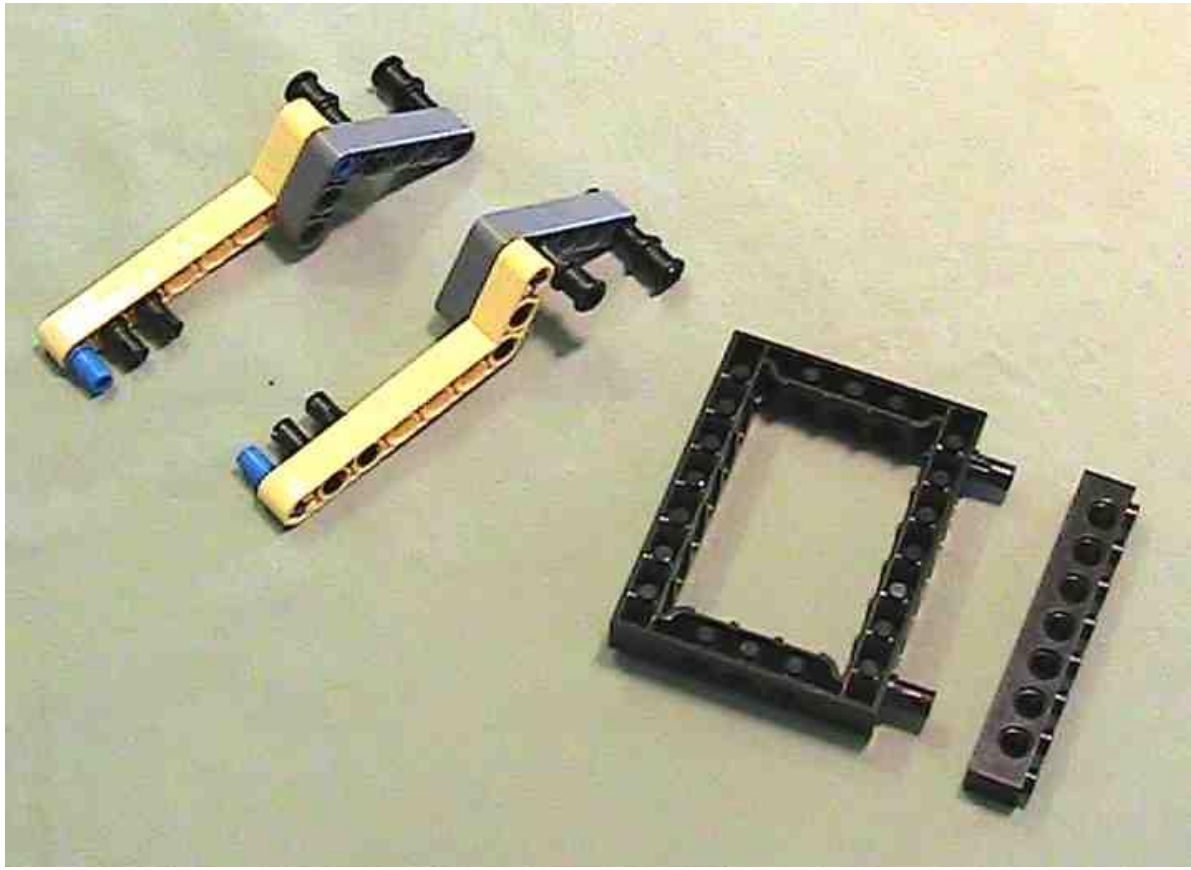
- Assemble the parts as show:
  - (2) 3x5 “L” Technic Lift arms with 2 long friction pins with stop bushing on each as shown.
  - Two #9 bent Technic Lift arms with 4 black friction Technic pins and 2 Technic axle-pins on each as shown.
  - NOTE: Each is a mirror of the other



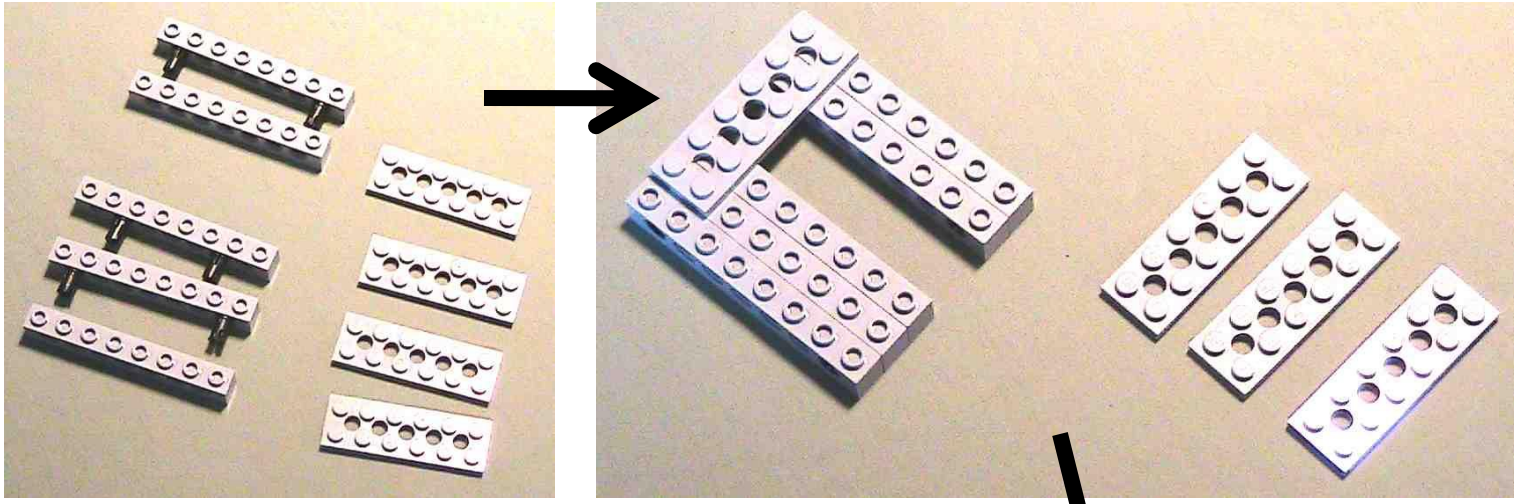
Assemble the NXT Holder

NXT Attachment:

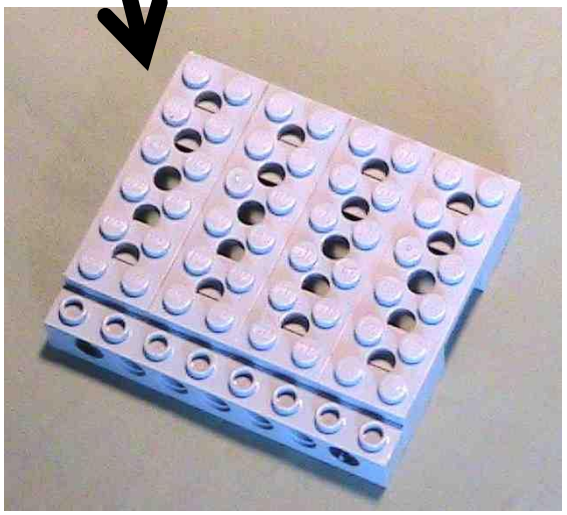
- Assemble the parts as show:
  - Connect the 3x5 and #9 bent Technic Lift arms together as shown.
  - Attach a 1x8 Technic brick to the long side of a 6x8 Technic square using 2 Technic friction pins (black)



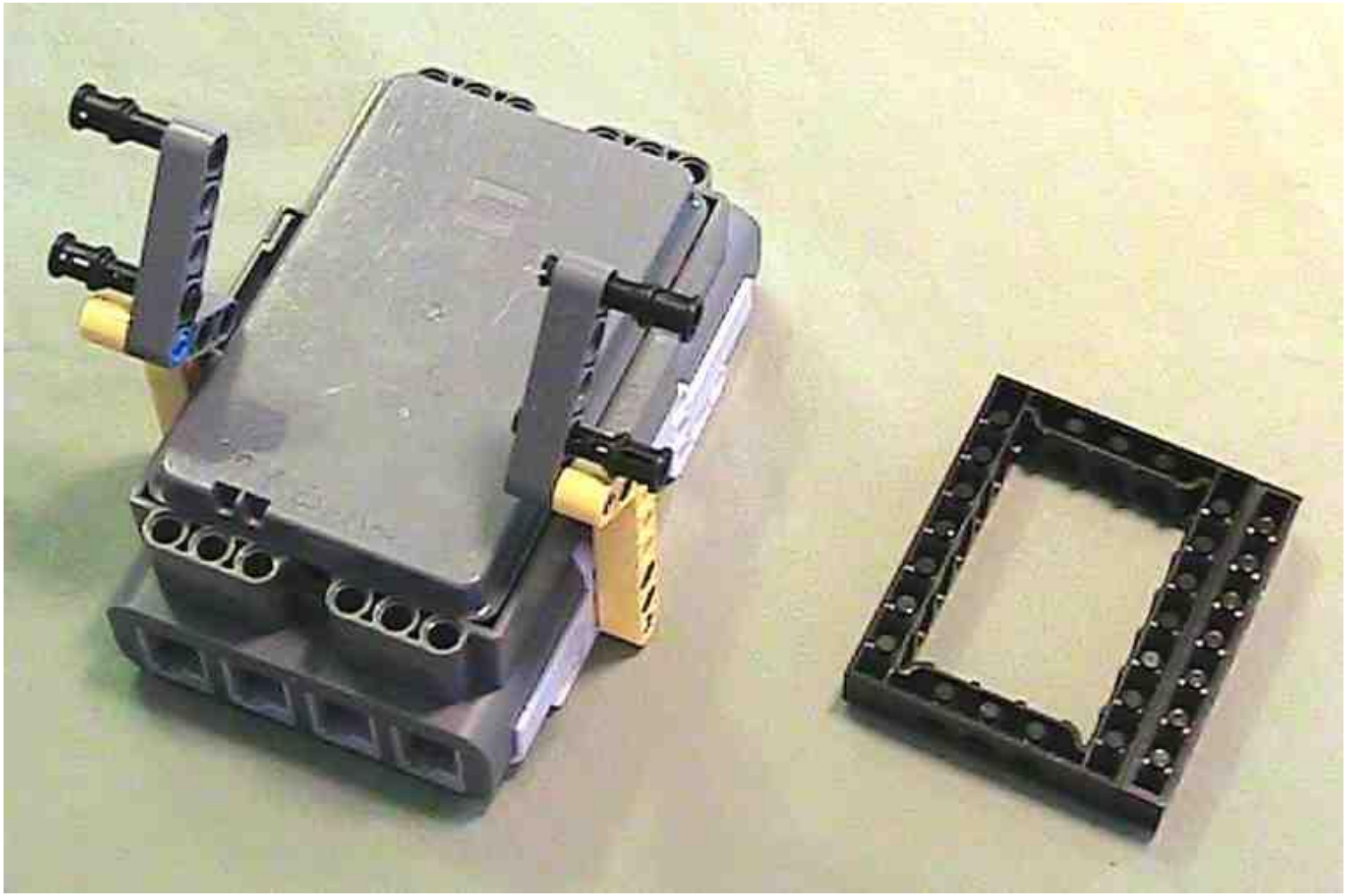
Alternate NXT Attachment Base



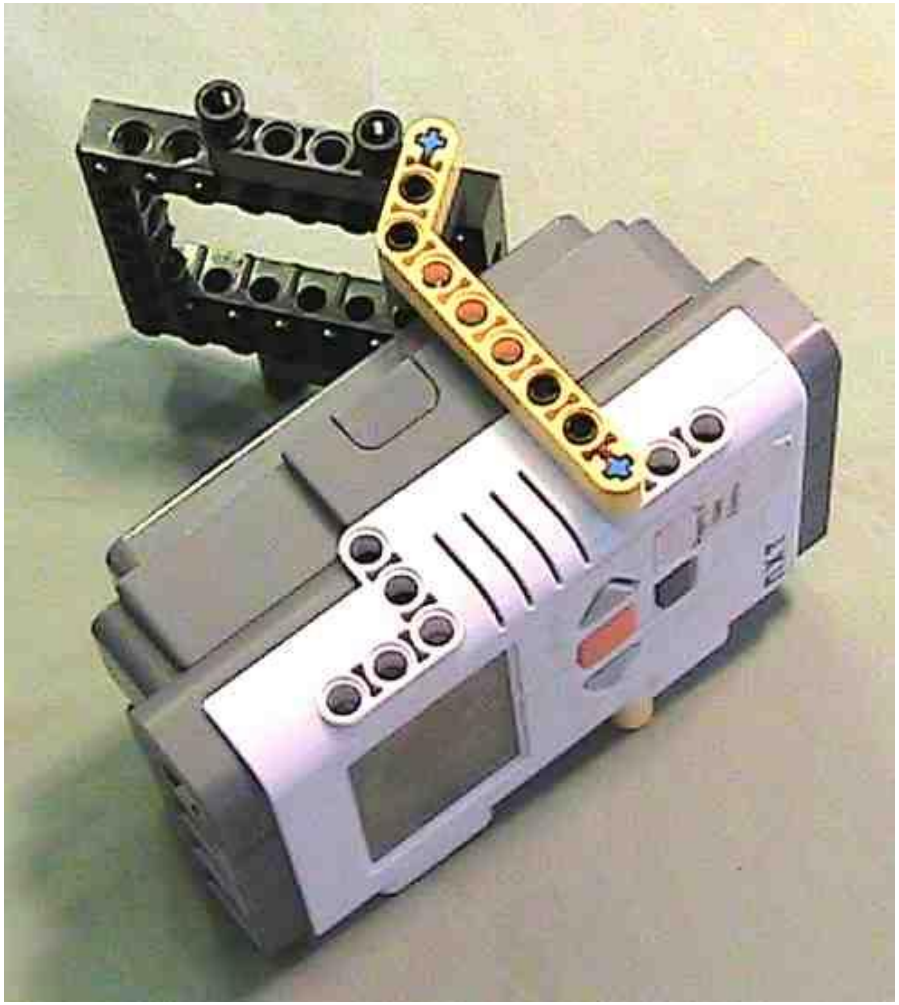
If you don't have a 6x8 Technic Square, you can build the equivalent using five 1x8 Technic bricks, 6 friction pins, and four 2x6 plates as shown.



Attach the Side pieces to the NXT



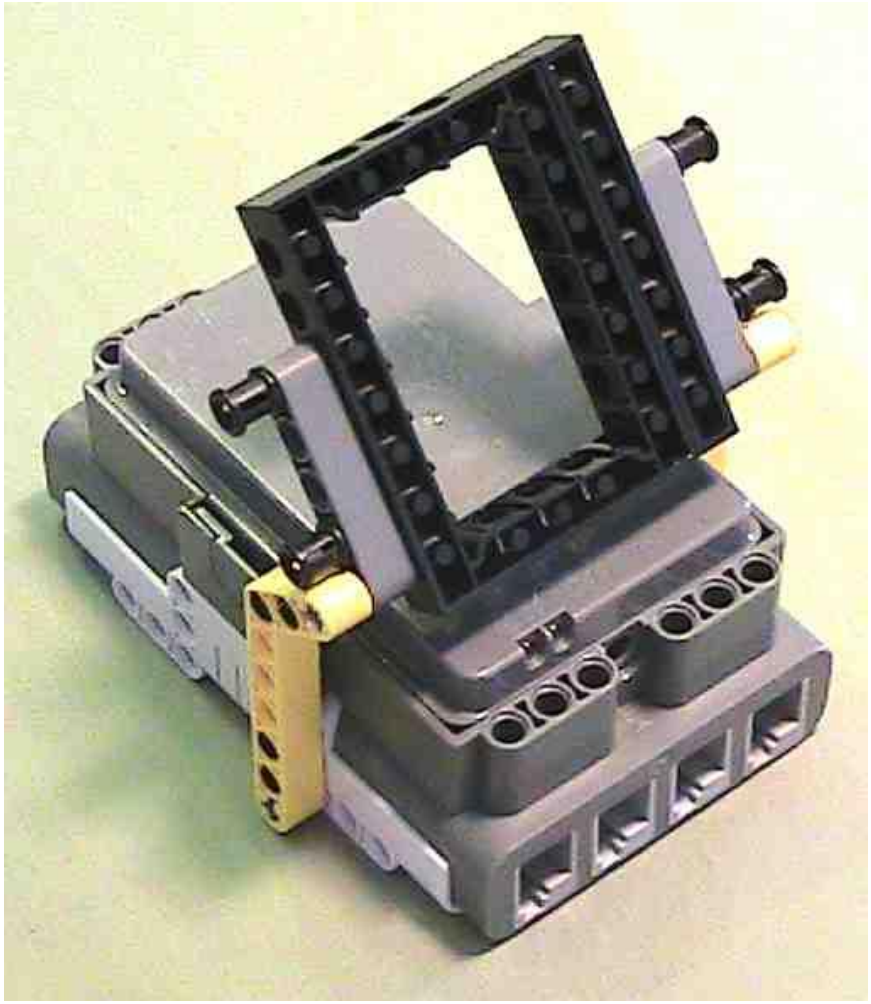
Attach the Side pieces to the Base using 4 long friction pins with full bushings



Finished assembly

NXT Attachment:

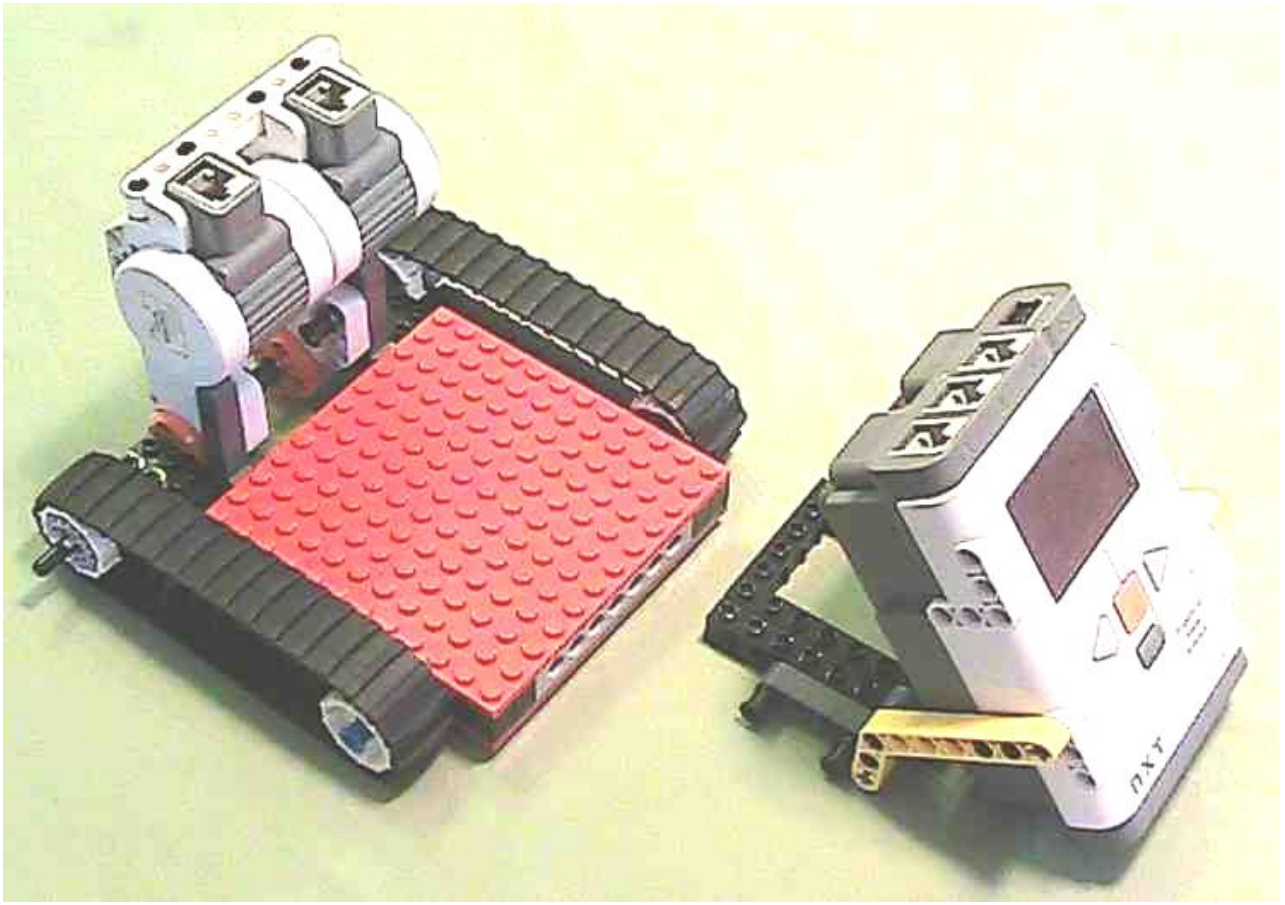
- NOTE:
  - The NXT is 9 knobs wide, so you will always have an odd number to build if you want to attach it to your robot.
  - This is usually done (as is here) by adding an extra brick, beam, or lift arm to widen your assembly.



Adding the NXT to the Base

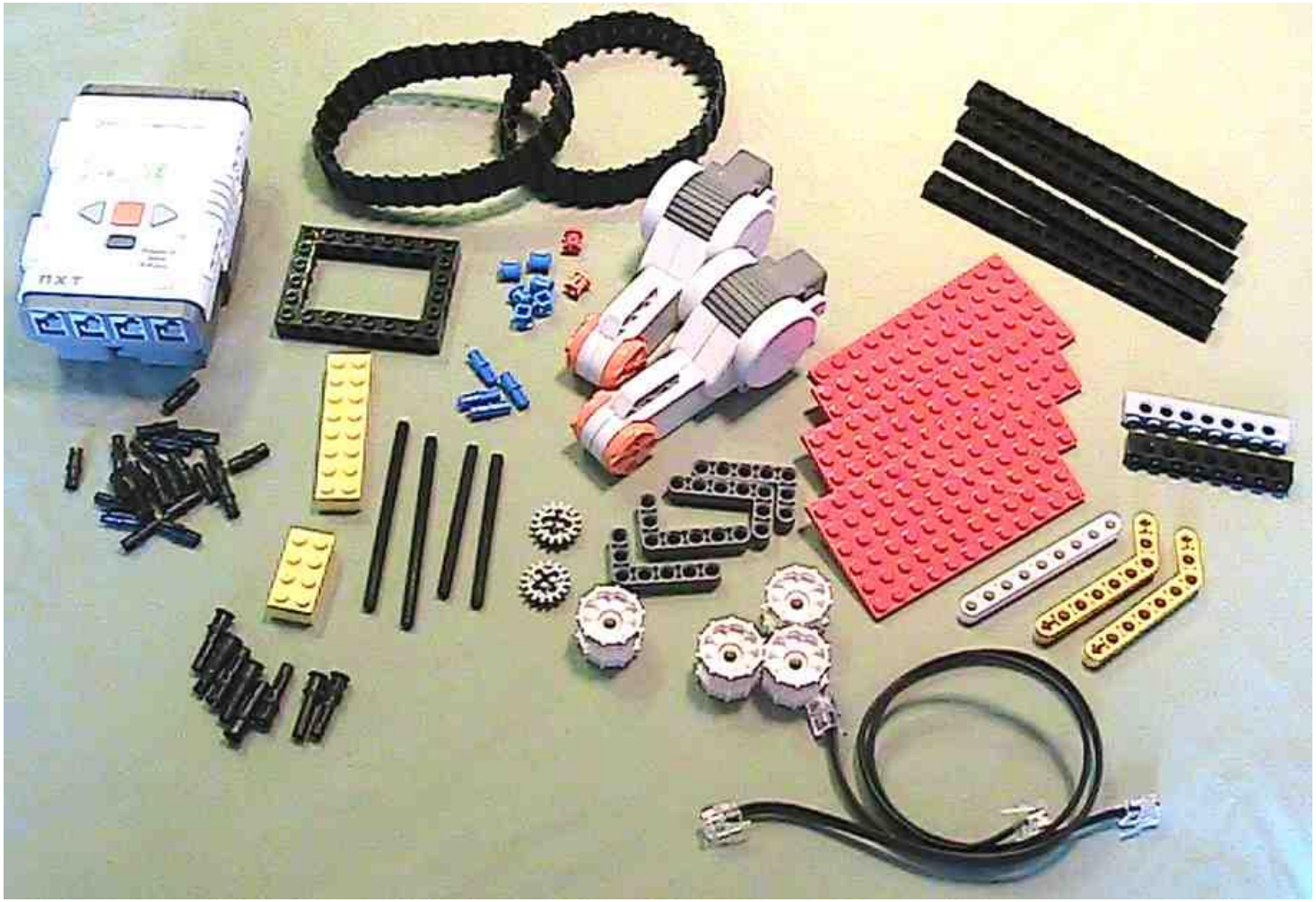
NXT Attachment:

- 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

Total of 79 pieces



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