

# CONSTRUCTOPEDIA

NXT Kit 9797

**Beta Version 2.1**  
**June 2008**



The Tufts University Center for  
**Engineering Educational Outreach**

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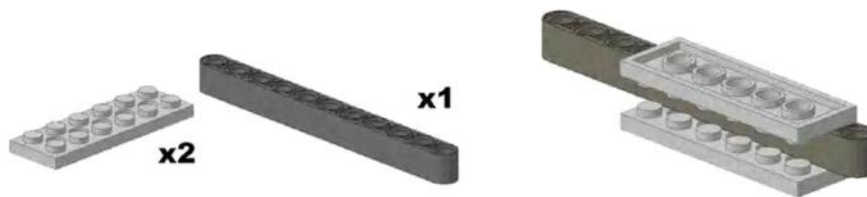
## I. Simple Shapes and Structures

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### 1. Square



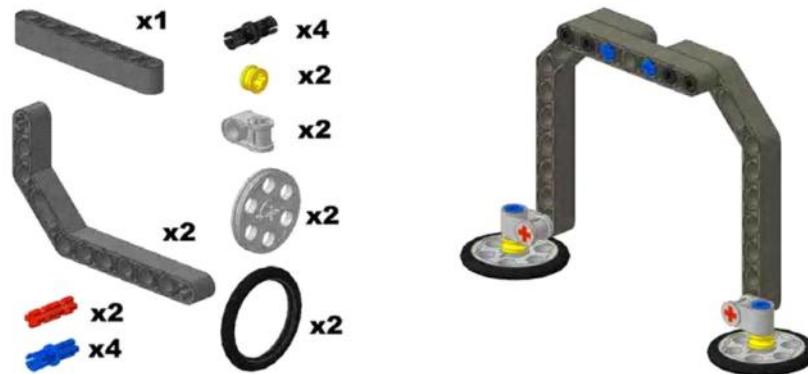
### 2. Reversing Trick



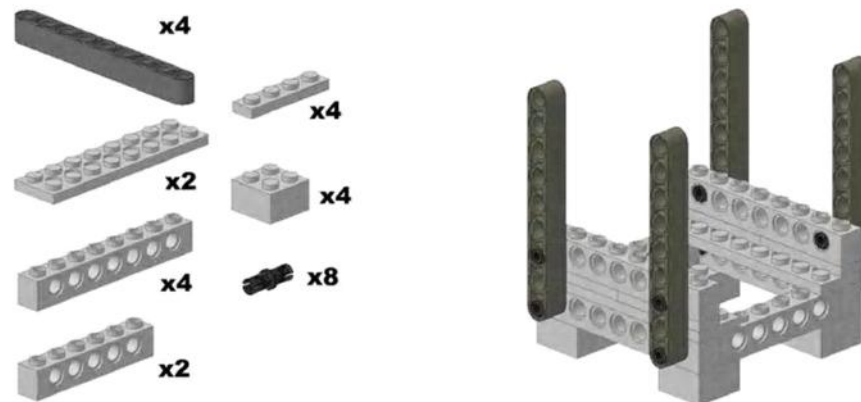
### 3. Cube



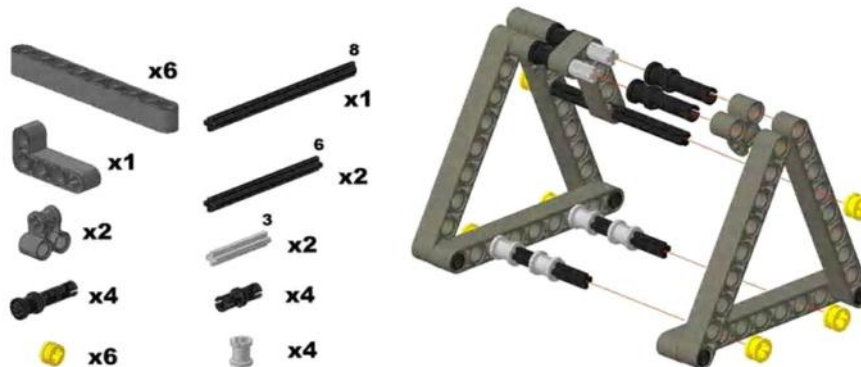
#### 4. Arch



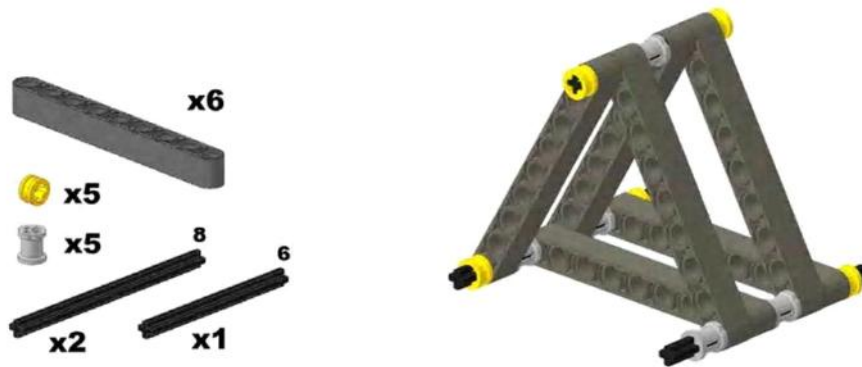
#### 5. Beams



## 6. Triangles - Option 1



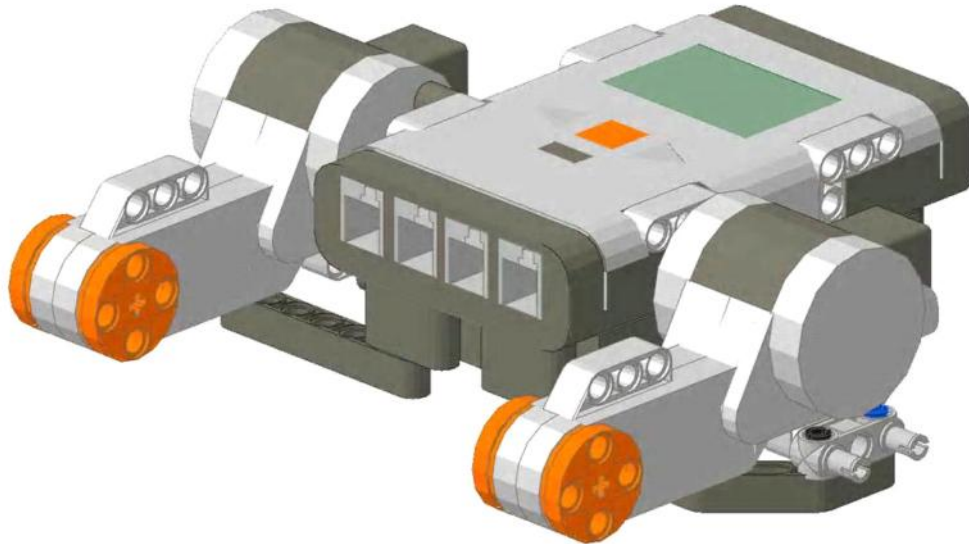
## Option 2



## II. Ways to Attach NXT Motors

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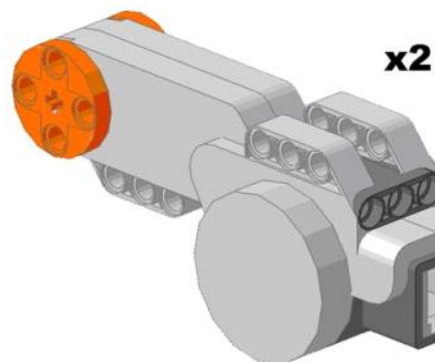
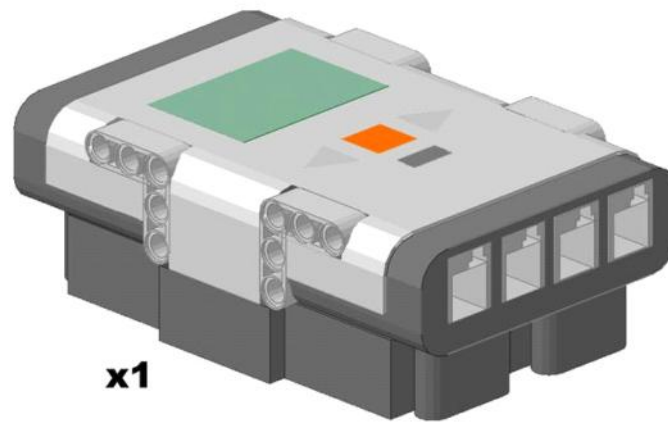
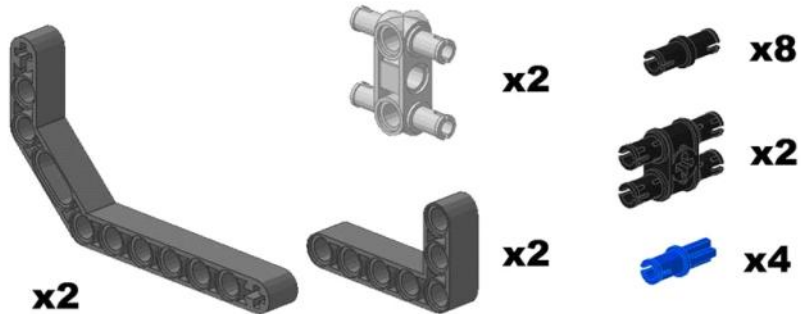
### 1. Simple Side Attachment



#### Model Description:

This is a motor attachment option in which the motors attach closely to the sides of the NXT.

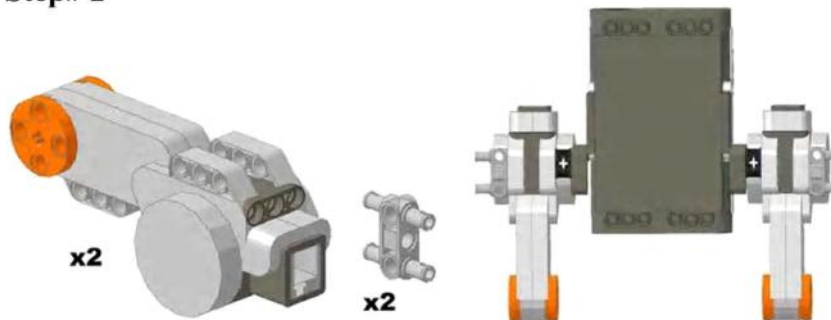
These are the parts that you will need:



**Step# 1**

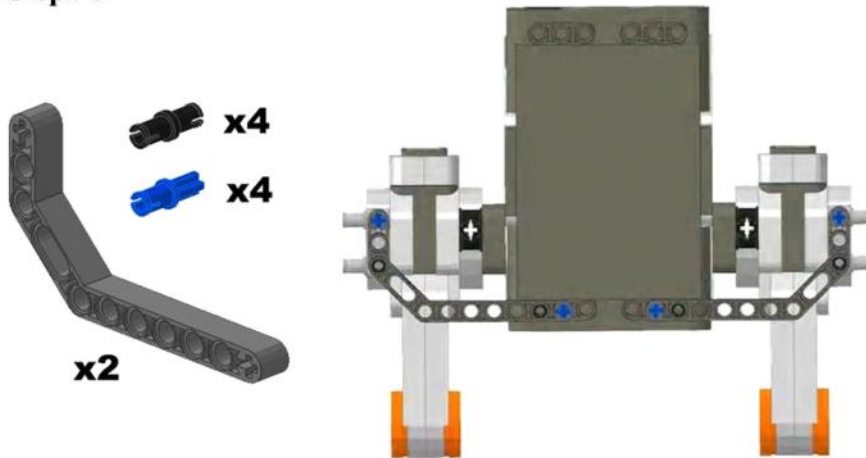
Attach 2 bent beams to the NXT using friction pins. The shorter portion of the beam should be sticking out from the NXT. Insert a double pin connector into this portion.

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**Step# 2**

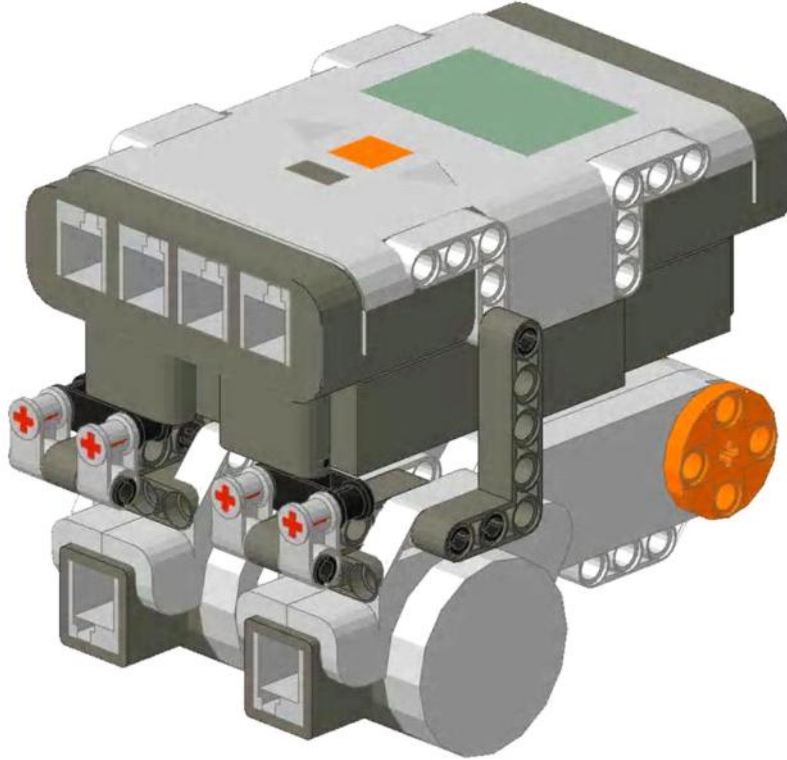
Fasten the motors to the double pin connectors on the bent beams. Then fit a 4 pin connector into the outside mounting beam on the NXT.

### Step# 3



Attach the double bent beam to the 4 pin connector and the NXT using the axle pins and friction pins.

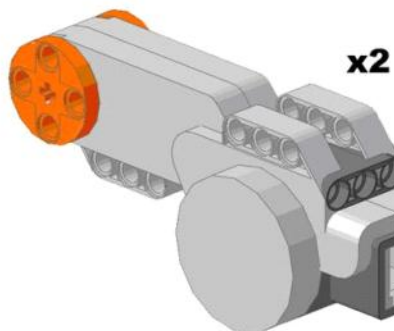
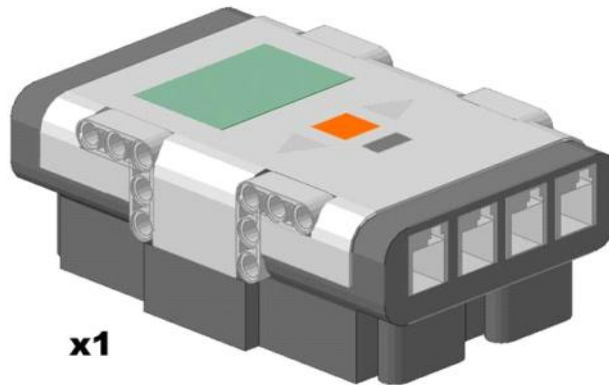
## 2. Underside Motor Attachment

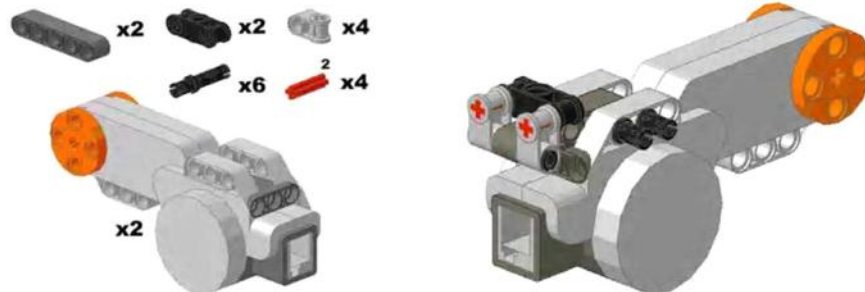


### Model Description:

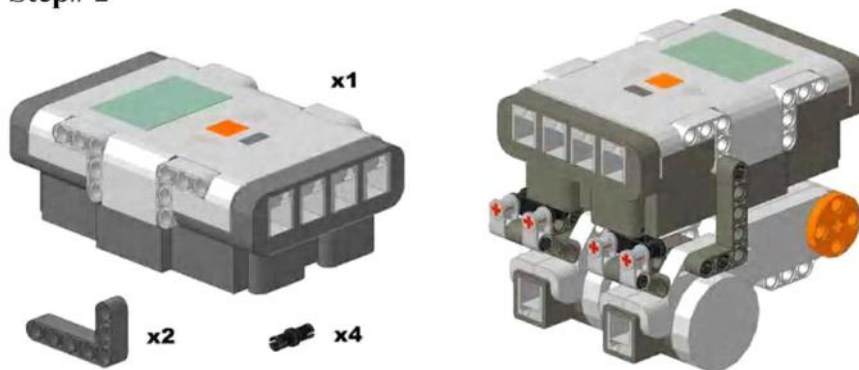
This is a simple, stable way to attach two motors under the NXT.

 **x2**  
 **x2**  
 **x6**  
 **x2**  
 **x4**  
 **x2**  
 **x4**  
 **x4**



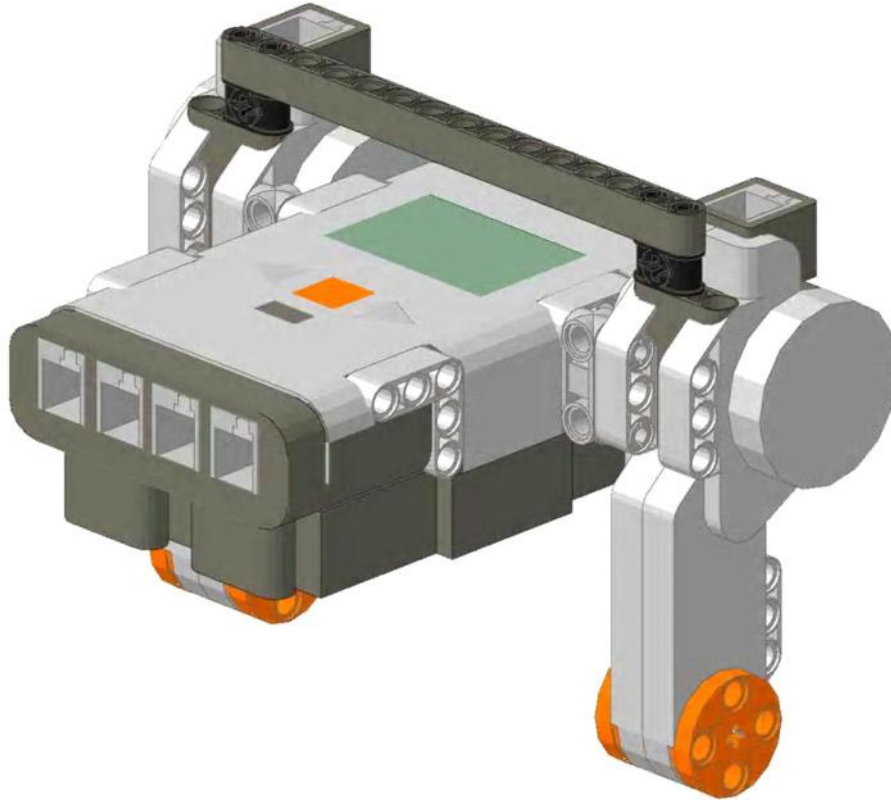
**Step# 1**

Connect 2 gray axle joiners to the black axle joiner using two 2 stud axles. Connect the 5 hole beam to the gray axle joiners using a long friction pin. Then connect the beam to the motor using 2 more long friction pins. Repeat this process for the 2nd motor.

**Step# 2**

Attach each motor assembly to the bottom of the NXT by the black axle joiner, using a friction pin. Then secure each motor using the bent beam.

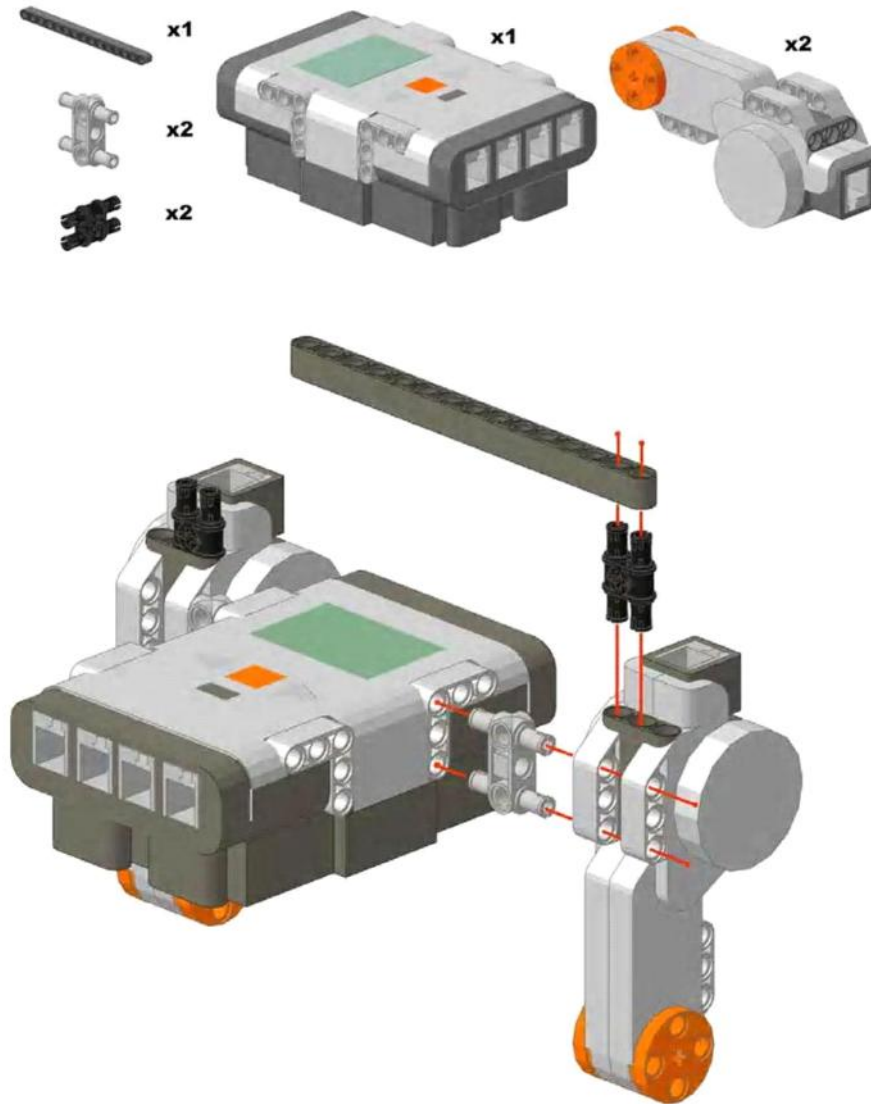
### 3. One Step Motor Attachment



**Model Description:**

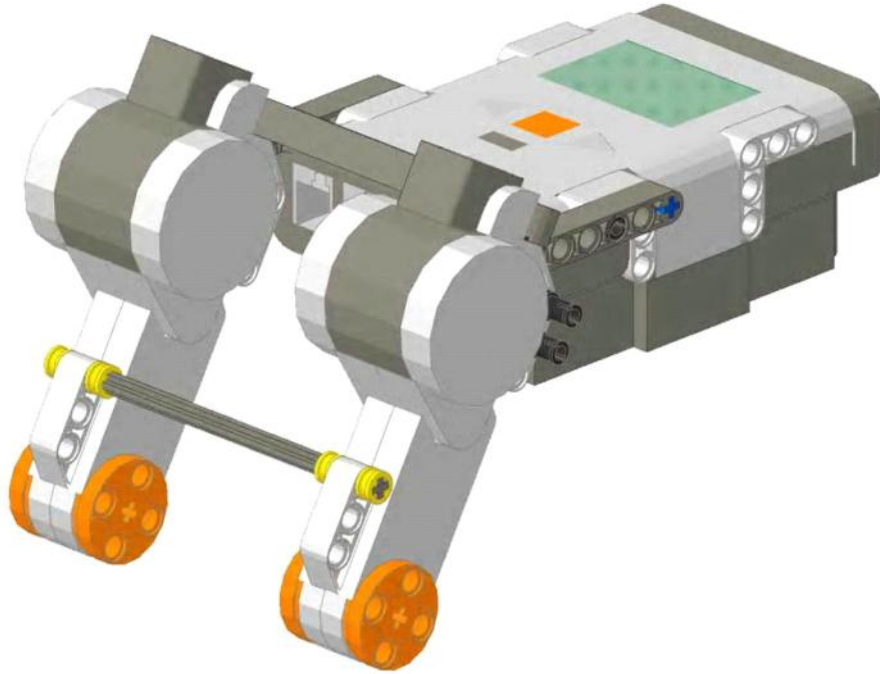
This is a very simple way, using few pieces, to attach motors.

### Step# 1 (and only)



Using 1 beam and 4 connector pegs, attach each motor to the NXT. The left and right sides are symmetrical.

#### 4. Angled Back Attachment

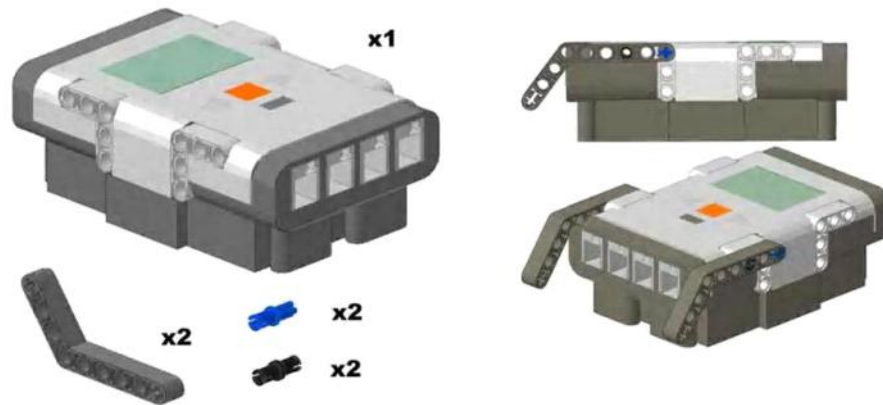


**Model Description:**

This is a motor attachment option in which the motors angle downward from the NXT.

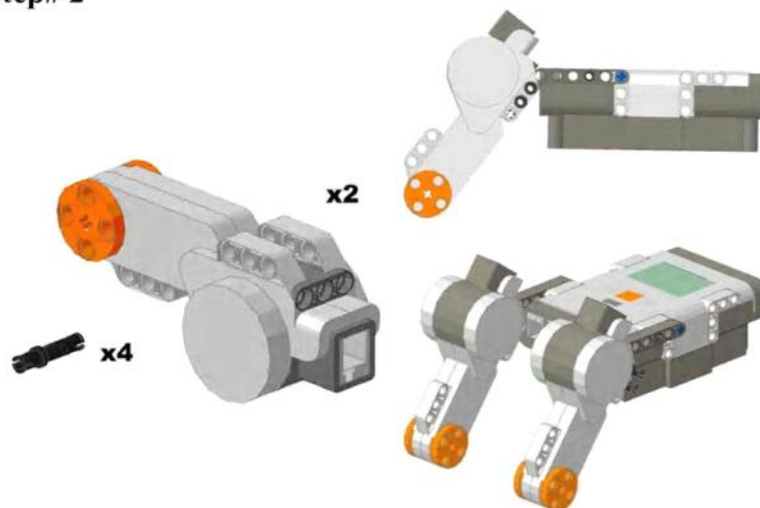
These are the parts that you will need:



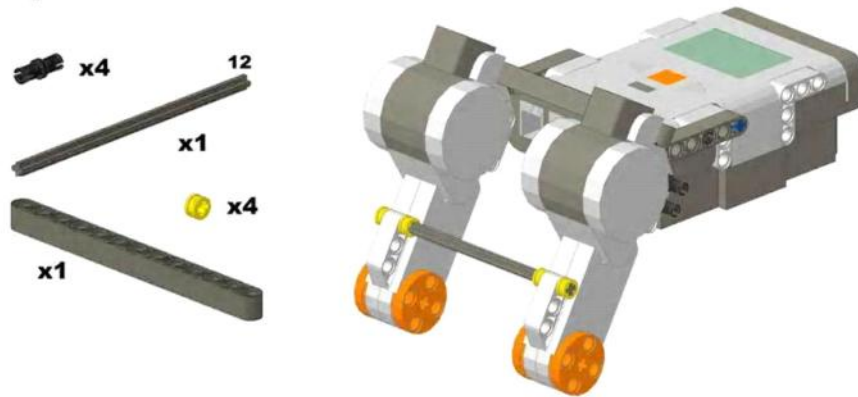
**Step# 1**

Attach the 2 bent beams to the NXT using a friction pin and an axle pin on each. The shorter portion of the beam should be sticking out from the NXT.

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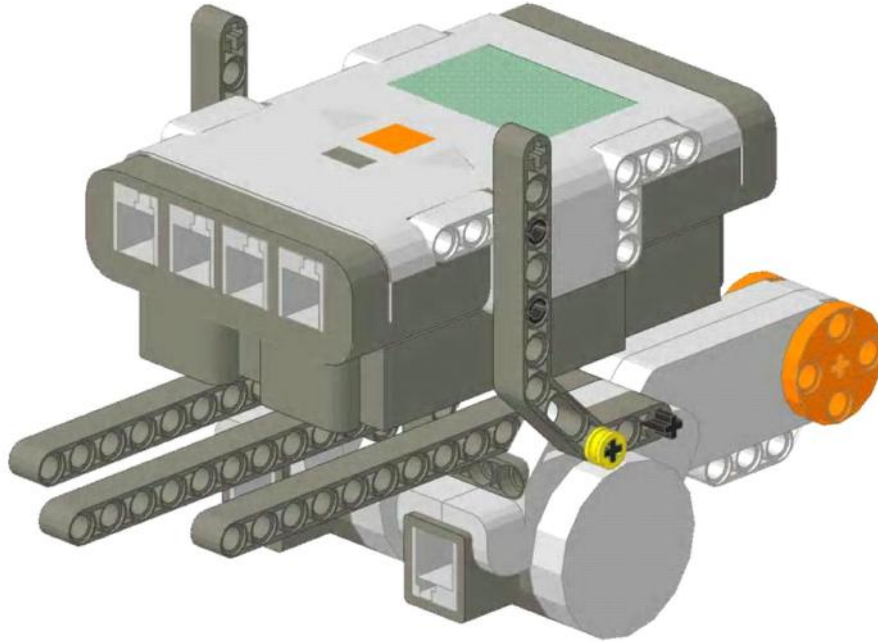
**Step# 2**

Fasten the motors to the bent beams using the extended pins. Make sure the bent beams are placed in between the 2 mounting beams on the NXT.

**Step# 3**

Slide the 12 stud axle through the mounting beams of the motor and secure it in place with  $\frac{1}{2}$  bushings. Use the friction pins to attach the 13 hole beam across the tops of the motors.

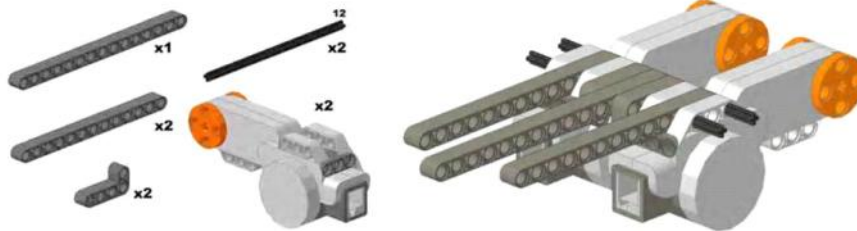
## 5. Sturdy Motor Attachment



### Model Description:

This model is a compact, sturdy, way to attach NXT motors.

[illegible]

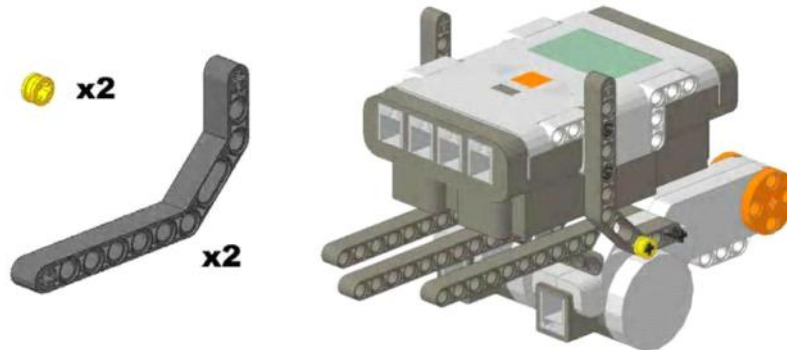
**Step# 1**

Thread the two 12 stud axles through the NXT motors, beams, and bent beams.

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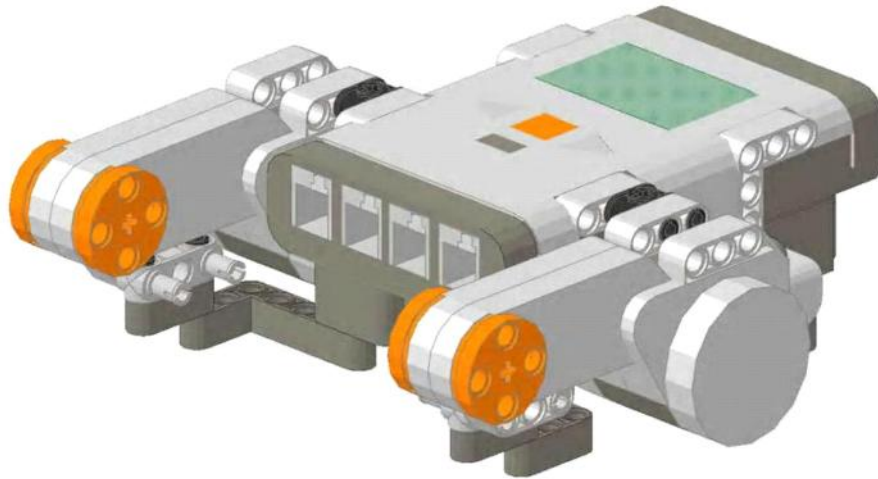
**Step# 2**

Attach 6 friction pins into the NXT. (3 per side)

**Step# 3**

Combine the parts from Steps #1 and #2. Attach the bent beams to the friction pins in the NXT and to the axles from step #1. Use a  $\frac{1}{2}$  bushings to hold the 3-5 bent beam to the axle. Both sides are symmetrical.

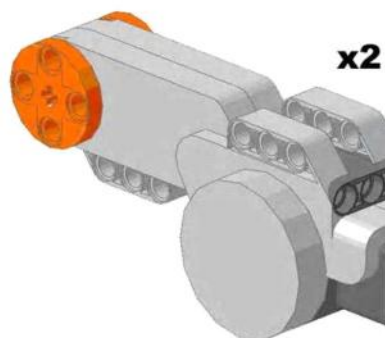
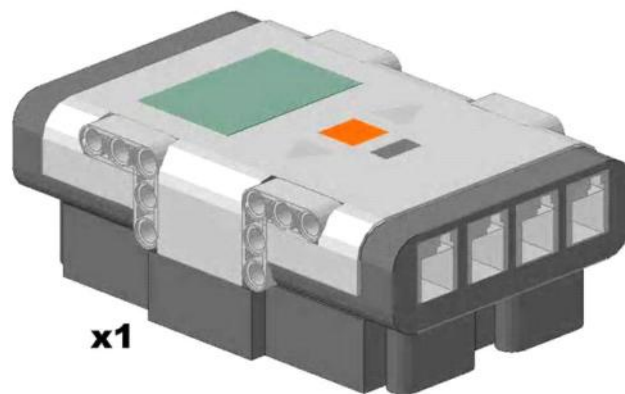
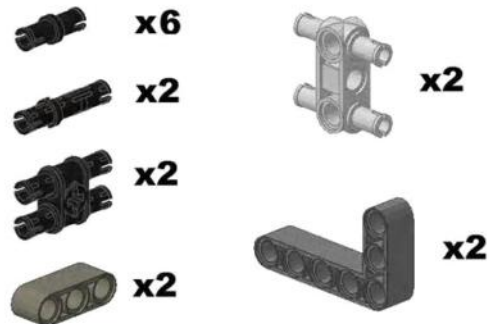
## 6. Wide Back Attachment

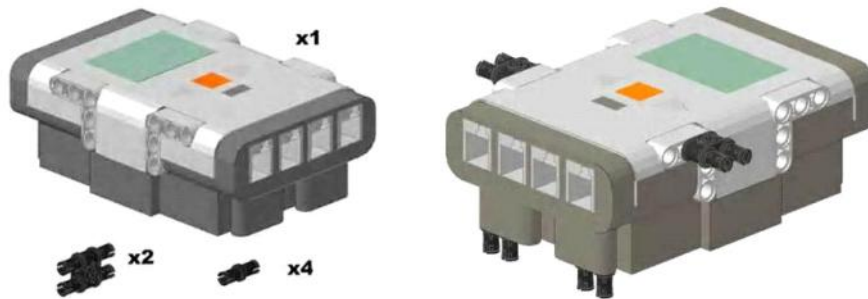


### Model Description:

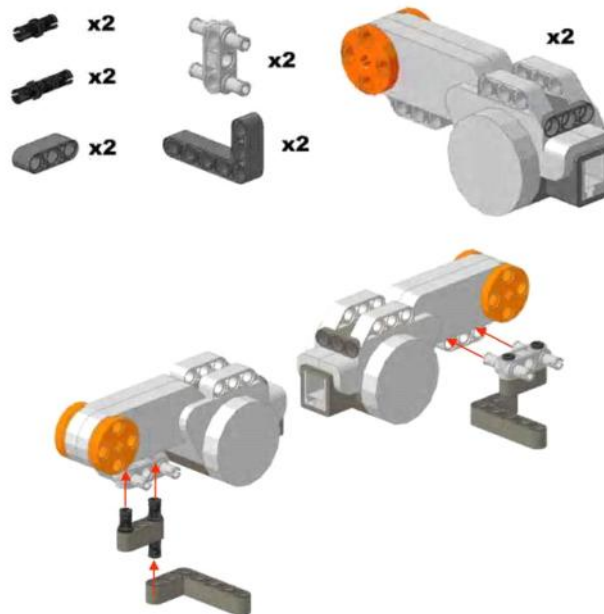
This is a motor attachment option in which the motors are mounted far apart in the back of the NXT.

These are the parts that you will need:



**Step# 1**

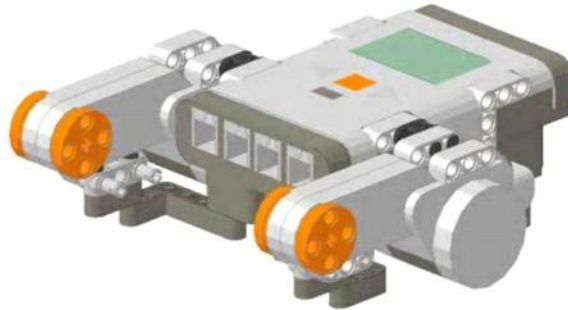
Attach a double pin connector to each side of the NXT. Place 4 pins to the bottom of the NXT in the outside most holes.

**Step#2**

Attach a four pin axle joiner to each of the NXT motors. In 1 hole of the 4 pin connector attach a pin and in the other hole attach an extended pin. Attach the short beam to both pins and the bent beam to the extended pin.

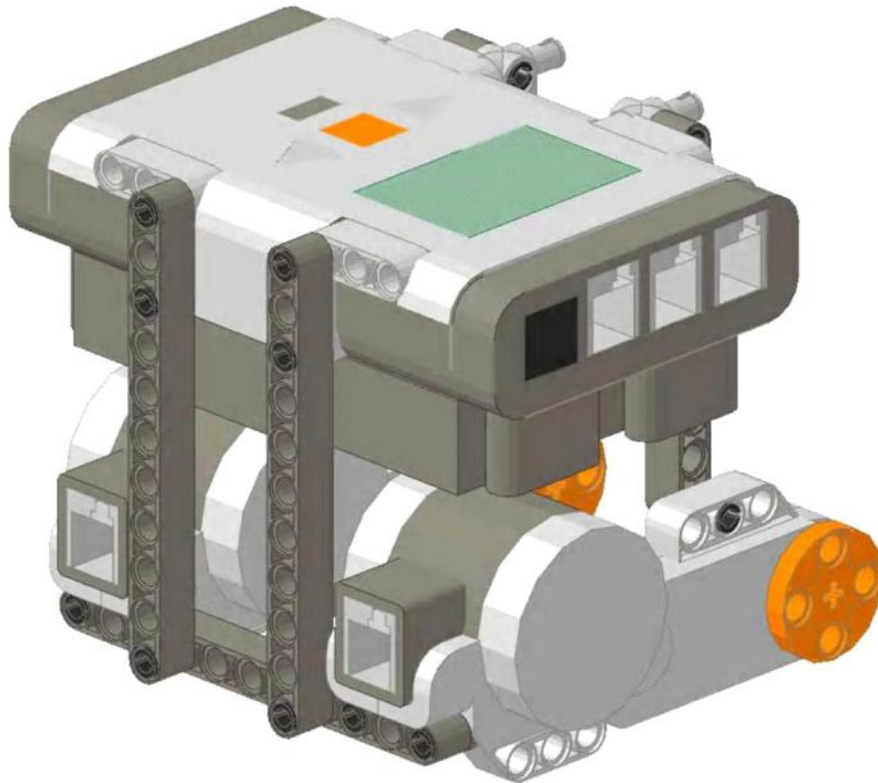
Note: Each motor assembly should be a mirror image of the other.

### Step# 3



**Combine the assemblies from Steps #1 and #2. Attach the bent beams to the bottom of the NXT and the motors to the double pin connectors.**

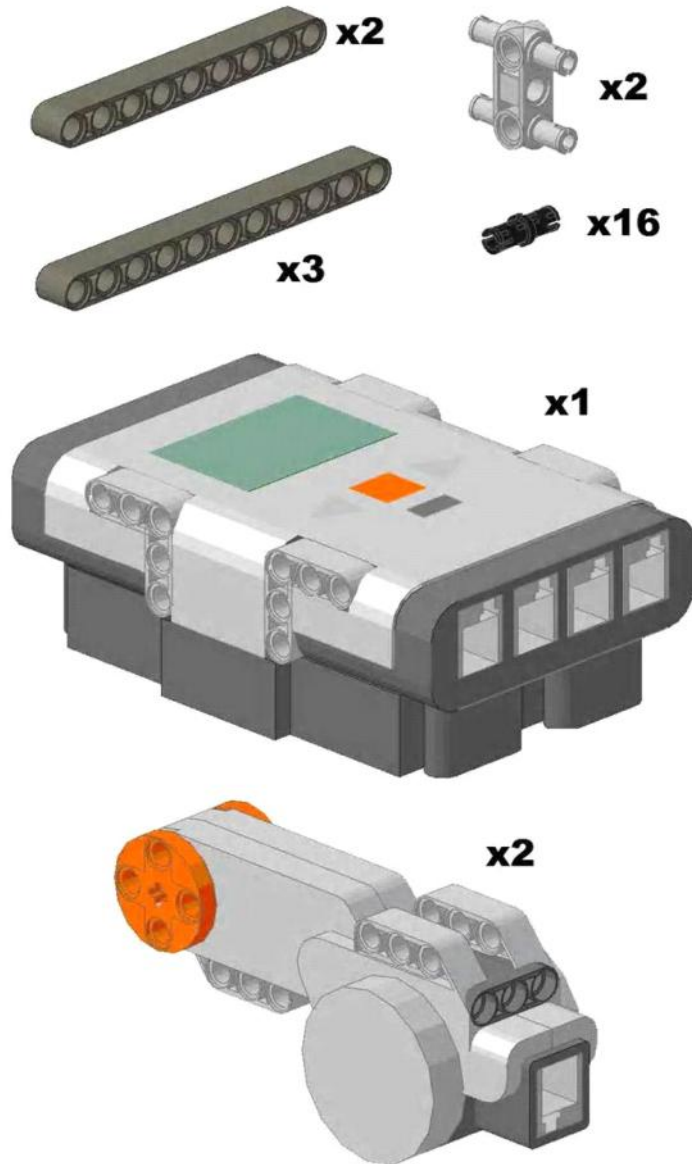
## 7. Compact Motor Attachment

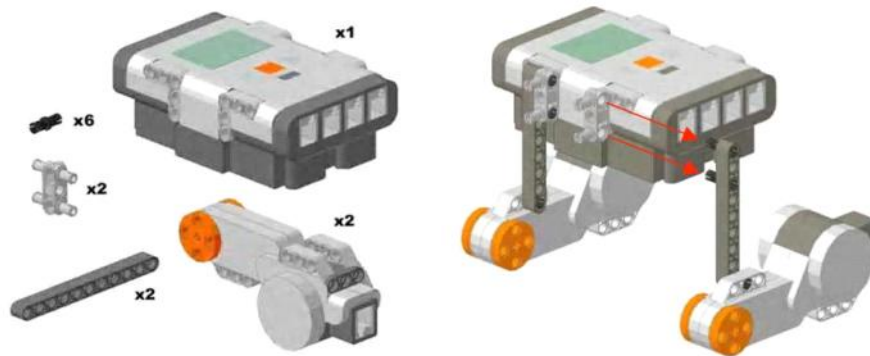


### Model Description:

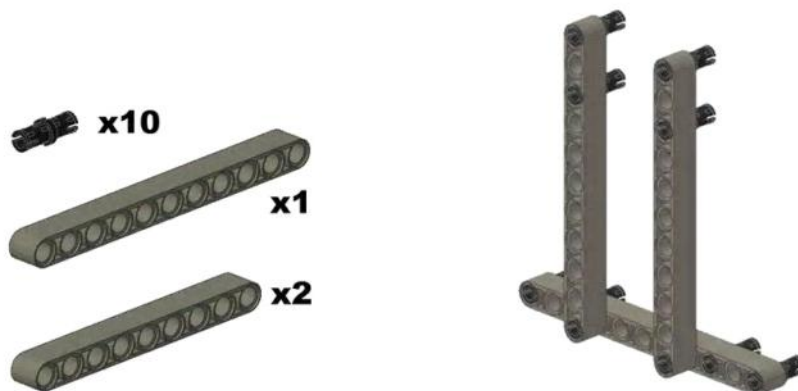
This is a simple, compact way of attaching motors to the NXT.

These are the parts that you will need:



**Step# 1**

Attach 2 motors to the NXT using beams and various pegs.

**Step# 2**

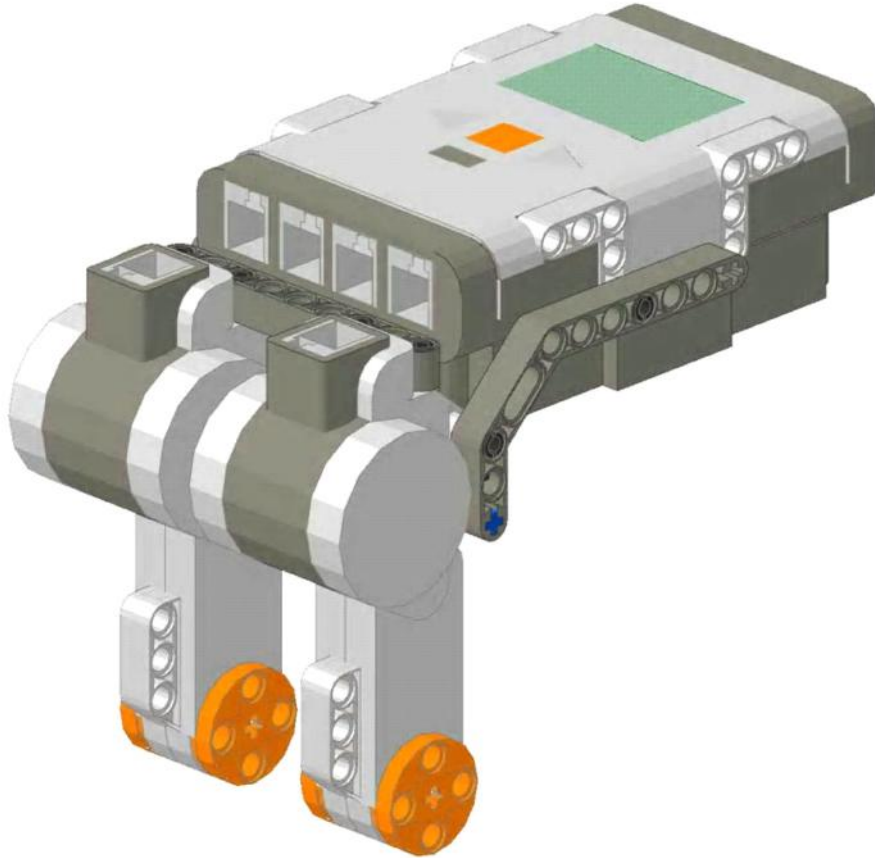
Separately build a motor support using beams and pegs.

### Step# 3



Attach the part from Step #1 to the part from Step #2 so that the beams from the first step connect to the back of the motors.

## 8. Vertical Motor Attachment

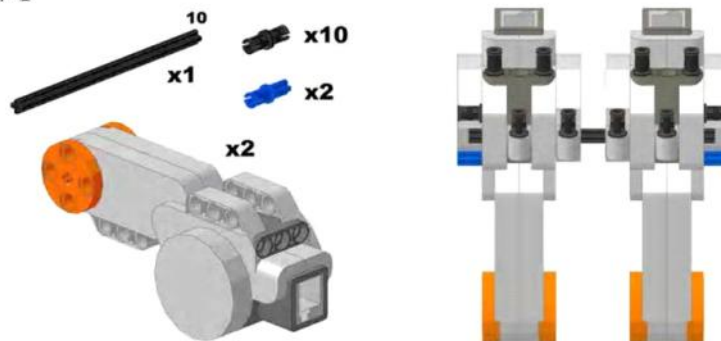


### Model Description:

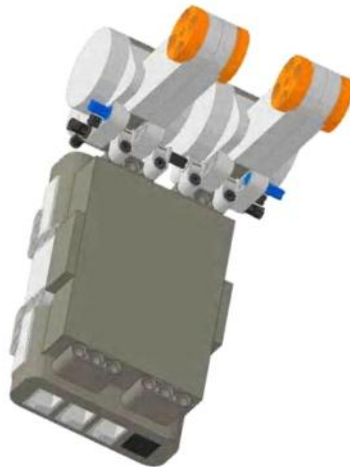
This is a motor attachment option in which two motors are held vertically

These are the parts that you will need:



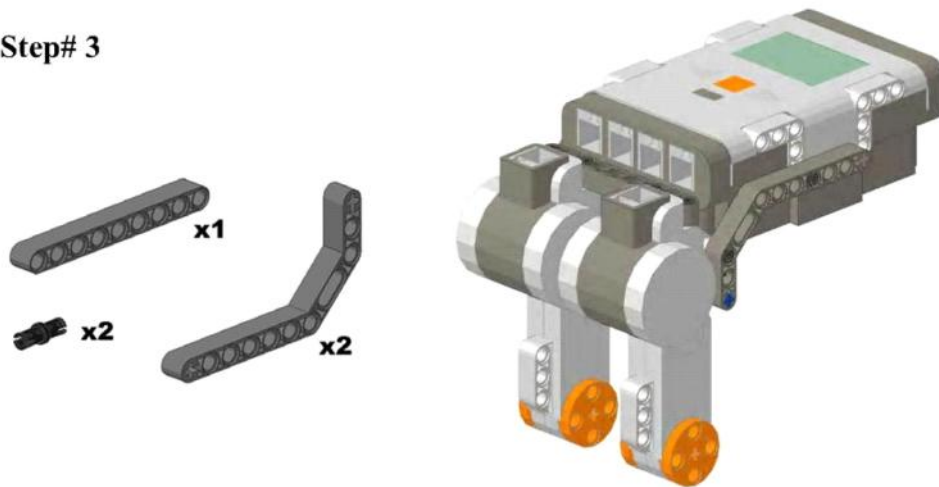
**Step# 1**

Attach 4 pins to the back of 2 motors. Also attach a pin and an axle pin to the side of each motor. Take 4 pins and attach each to a perpendicular axle joiner. Thread an axle through each motor lining up the 4 perpendicular axle joiners.

**Step# 2**

Attach the 4 pins from the perpendicular axle joiners to the bottom of an NXT.

### Step# 3



Attach 2 pins to the side of the NXT. Secure Step #2 by attaching a bent beam on both sides of the NXT and a straight beam on top of each motor.