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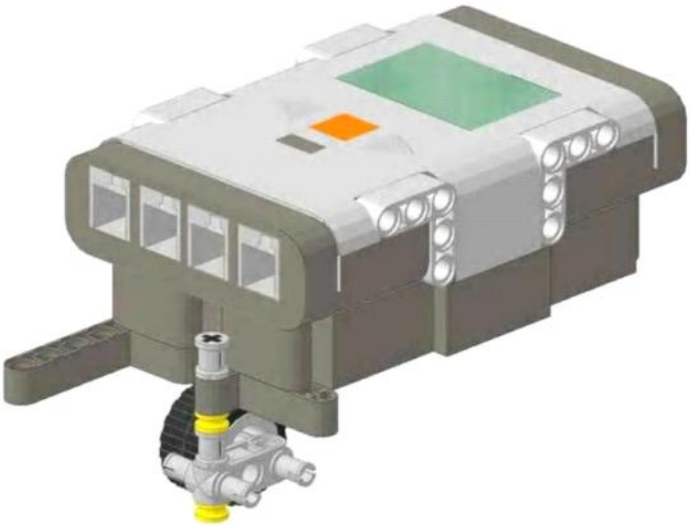
III. Front End Setups

1. Swiveling Front Attachment



Model Description:

This is a front wheel attachment option in which one small wheel has the ability to swivel. This allows the car to turn easily.

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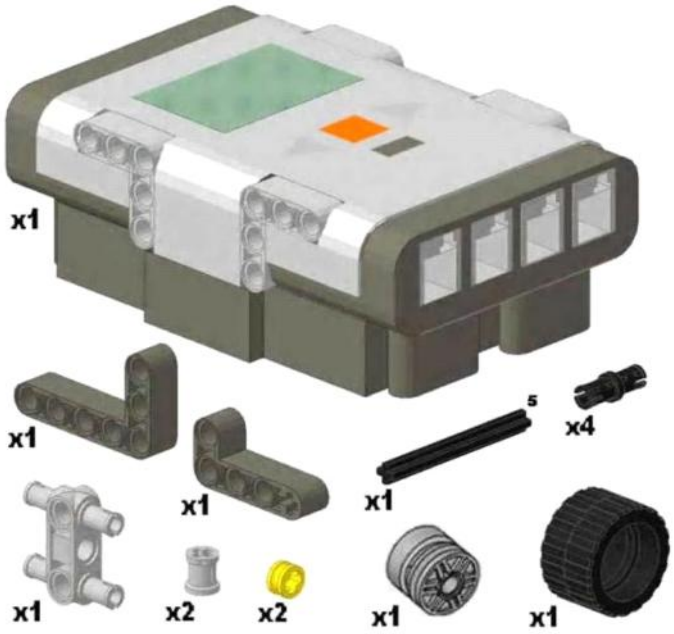
These are the parts that you will need:



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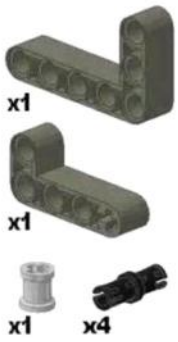
Step# 1

Take a 5 stud beam and slide on a half bushings, a 4-connector peg, a bushing and another half bushing. Attach the wheel to the 4-conector peg.

Step# 2



Take a small L-beam and attach 2 black friction pins to the 2nd hole and the 2nd hole from the top. Attach that to the parts from Step# 1 with a bushing. Take an L-beam and attach 2 black friction pins to the 2nd and 3rd holes.

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Step# 3

Attach the parts from Step# 2 to the NXT at the protruding connector pegs.

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2. Long Front Attachment

Model Description:

This is a front end setup that can slide or hold another wheel.

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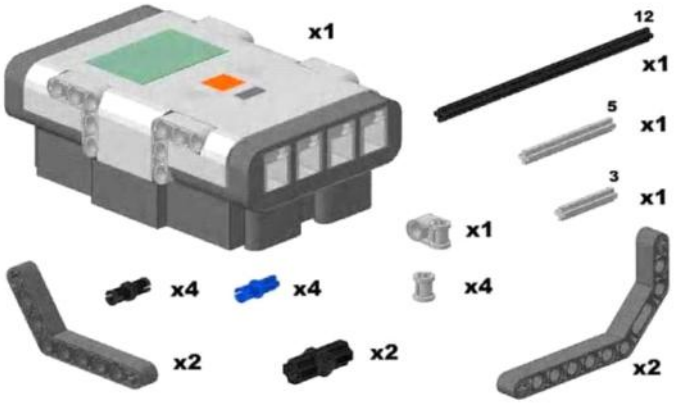
These are the parts that you will need:



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Step# 1

Attach to the side of each angle connector an axle pin. To the top of each, connect a pin. Thread a medium axle between the angle connector placing 2 bent beams and a bushinging in between. At the bend of the beams, thread a long axle with bushingings inside and outside of the beams. At the end of the beams, thread a small axle with a perpendicular axle joiner.

Step# 2

Attach Step #1 to the bottom of the NXT.

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Step# 3

Secure the assembly by attaching a bent beam to each side of the NXT threading the long axle and the axle pin to the bent beam.

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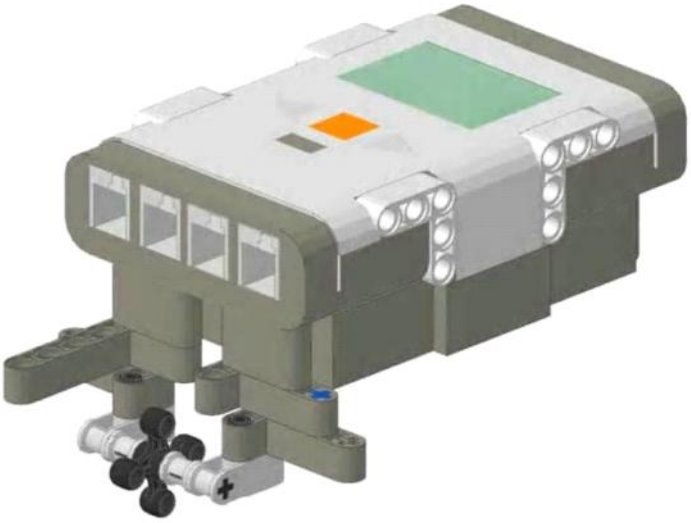
3. Sliding Front Attachment



Model Description:

This is a front wheel attachment option with skids to slide around on. This gives an NXT car the ability to turn without the use of a wheel.

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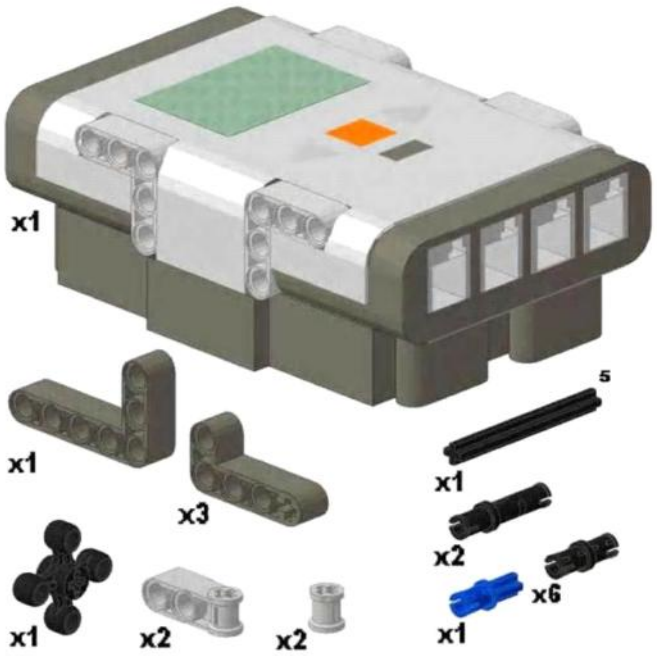
These are the parts that you will need:



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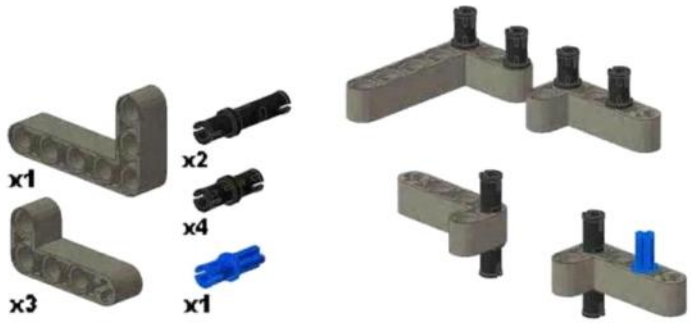
Step# 1

Slide a 5 stud axle through the skid. Side on 2 half bushings to keep the skid centered followed by 2 axle joiners on each end. Place a friction pin into the middle hole of the axle joiners.

Step# 2



Take 2 small L-beams and place an extended black friction pin through the 2nd hole. On one of these small L-beams place a blue axle pin in the 2nd hole from the top. Take another small L-beam and insert 2 black friction pins in the 2nd hole and the 2nd hole from the top. Take an L-beam and insert 2 black friction pins into the 1st and 3rd holes.

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Step# 3

Attach the parts from Step# 1 and Step# 2 together like this.

Step# 4

Attach the parts from Step# 3 to the NXT at the protruding connector pegs.

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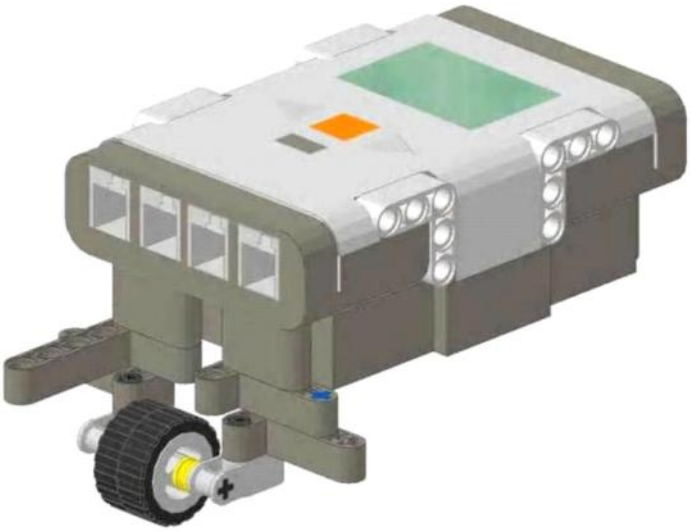
4. Single Wheel Attachment



Model Description:

This is a front wheel attachment that allows attachment of various sensors.

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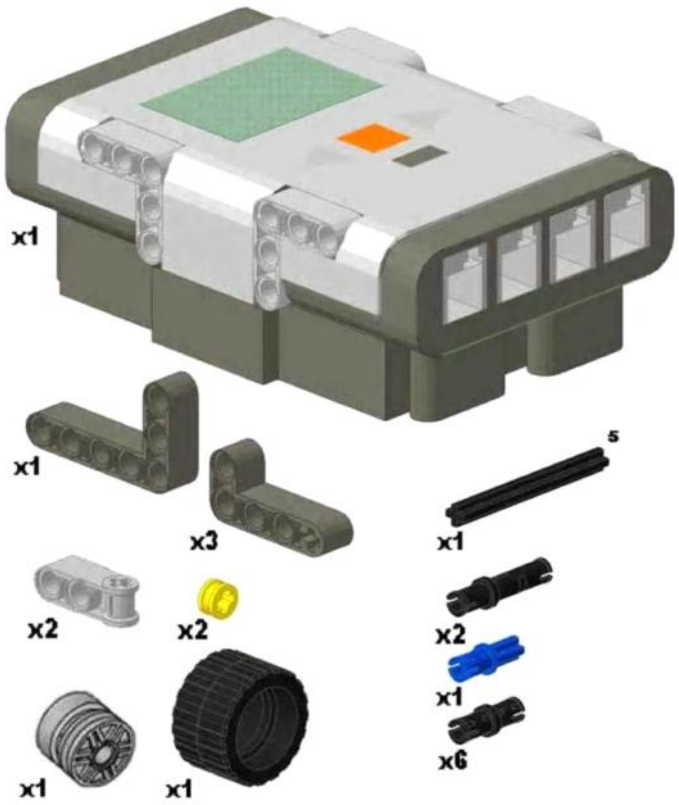
These are the parts that you will need:



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Step# 1

Slide a 5 stud axle through the wheel. Side on two half bushings to keep the wheel centered followed by two axle joiners on each end. Place a friction pin into the middle hole of the axle joiners.

Step# 2

Take 2 small L-beams and place an extended black friction pin through the 2nd hole. On one of these small L-beams place a blue axle pin in the 2nd hole from the top. Take another small L-beam and insert 2 black friction pins in the 2nd hole and the 2nd hole from the top. Take an L-beam and insert 2 black friction pins into the 1st and 3rd holes.

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Step# 3

Attach the parts from Step# 1 and Step# 2 together like this.

Step# 4

Attach the parts from Step# 3 to the NXT at the protruding connector pegs.

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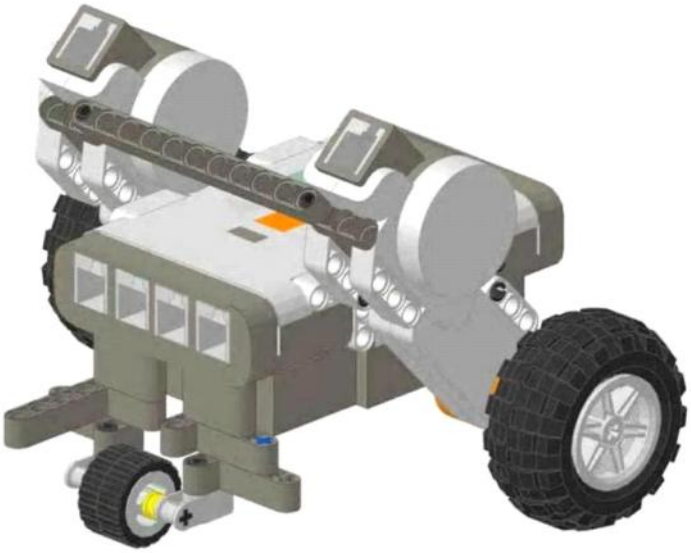
IV. Full Car Model



Model Description:

This is a simple, 2 motor car that can be built in less than 15 minutes using the NXT kit. Additionally, all front end setups (Section III) and sensor types can easily be added to this model. The following model displays the single front wheel front assembly.

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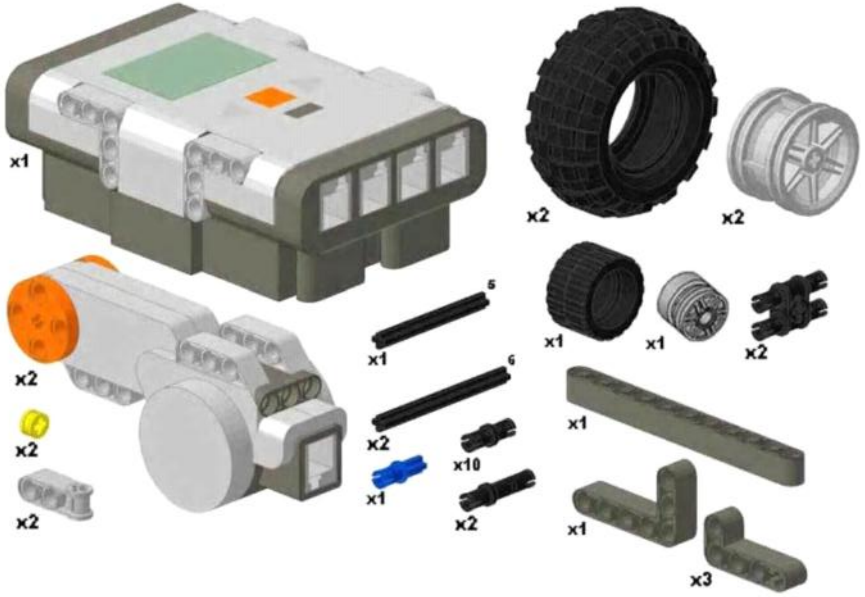
These are the parts that you will need:



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Step# 1

Side Views

Attach a double black connector peg and a single black connector peg to both sides of the NXT. Connect the double peg vertically in the top most holes. The single peg should be connected in the middle horizontal hole. Your NXT should look like the below picture before moving on to the next step.

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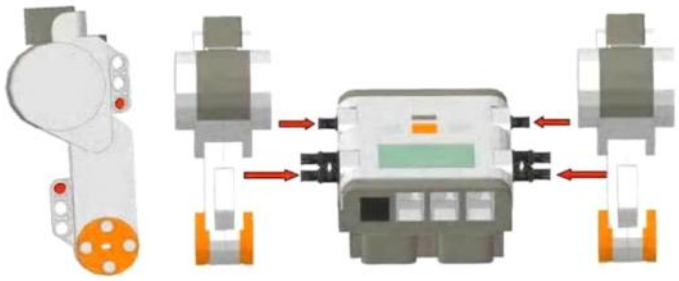
Step# 2



Side View Top View

Attach the motors (one per side) to the NXT using the double black connector pegs and the short black connector pegs attached to the NXT. The red dots in the side view identify which holes on the motor attach to the pegs. Your NXT should look like the below picture before moving on to the next step.
Note: The top connection of the double black connector peg is not connected to anything.

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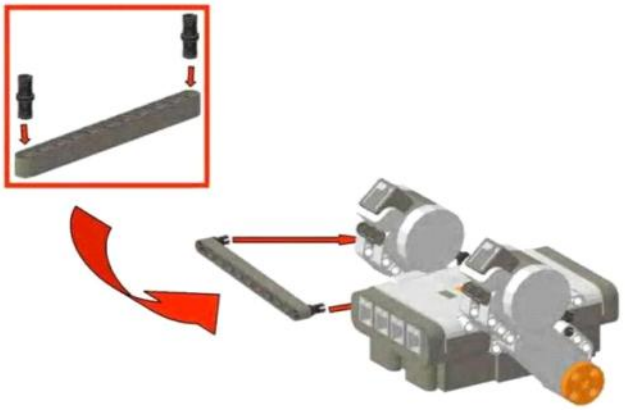
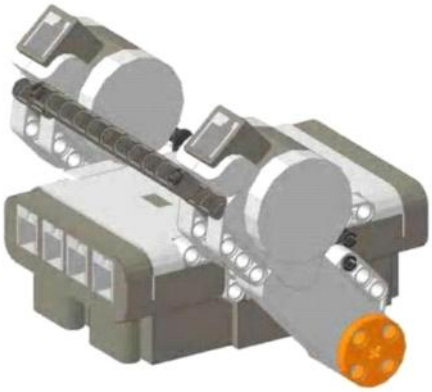
Step# 3



Take an 11-holed rounded beam and attach two short black connector pegs to the outside holes as seen in the red square. Connect the pegs to the back of each motor (as identified by the red dots) to further support the motors to the NXT. Your NXT should look like the below picture before moving on to the next step.



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Step# 4

Assemble 2 rear wheel assemblies using a 6 stud axle, a wheel, and a hub. Attach one to each motor as seen below.

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Step# 5

Take an L-beam and attach a black connector peg to the first and third hole on the smaller part of the L. Take a small L-beam and attach a black connector peg to the 1st and 3rd hole on the larger part of the L. In the 2nd hole between the 2 connector pegs on each L-beam, attach an extended black connector peg. Also attach a friction axle to the fourth hole on the small L-beam. Now attach 2 small L-beams to the protruding pins below the other L-beams. Attach a black connector peg to the second hole on the small part of the L. Now attach an axle joiner on each of the protruding connector pegs below the small L-beams. Then, align the wheel between 2 half bushings and slide the 5-axle through the axle joiners. Connect the front wheel assembly to the bottom of the NXT at the protruding connector pegs.

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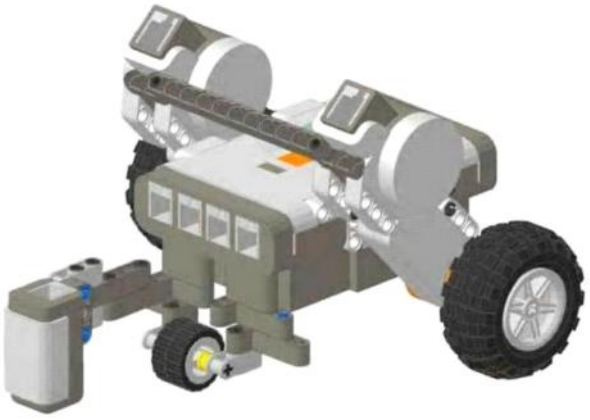
Step# 6 (Optional)

Insert a black connector peg into the 1st and 3rd holes of the 5-hole beam and an extended black connector peg into the 4th and 5th holes. Attach an axle joiner to the extended black connector pegs. Insert a friction axle into each hole of the axle joiners and attach the light sensor to the friction axles. Attach the light sensor to the car from Step #5. The 5-hole beam should connect to the top of the L-beam on the front wheel assembly.



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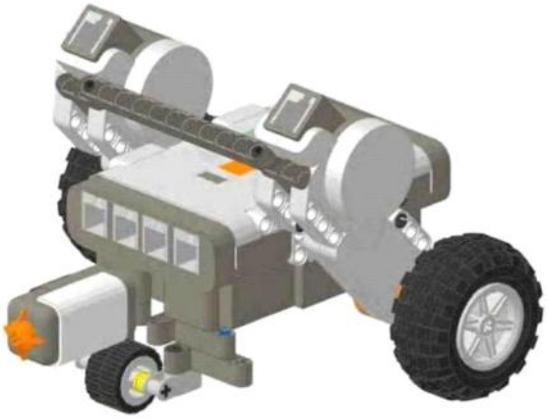
Step# 7 (Optional)

Attach the two black connector pegs to the first and third holes of the touch sensor. Attach the touch sensor assembly to the car from Step #5. The sensor should attach to the top of the L-beam on the front wheel assembly.



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IV. 15 Minute Building Projects

1. Swing Set

Model Description:

This is a swing set that can be programmed to move back and forth.

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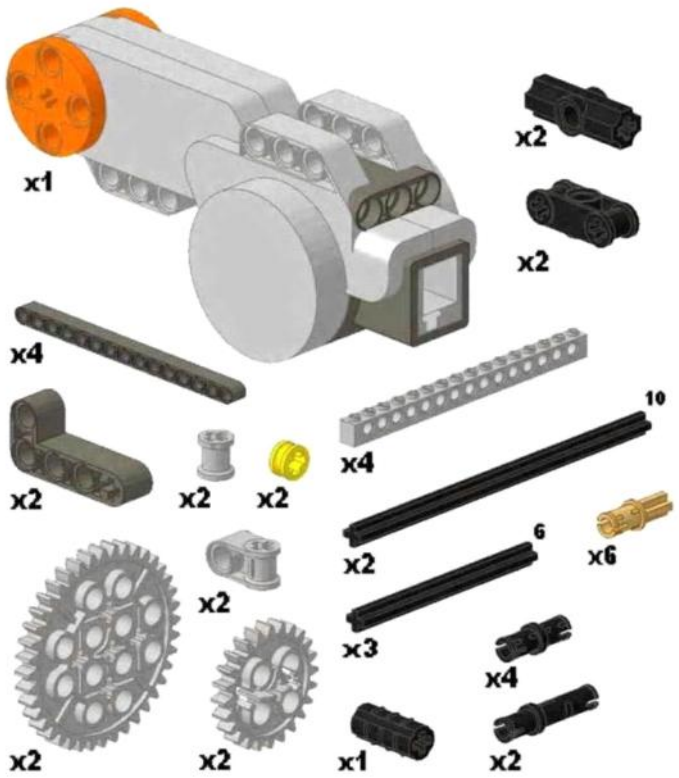
These are the parts that you will need:



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Step# 1

Connect the 2 lift arms using 2 axle pins. Place an axle pin with friction into the top holes of the lift arms. Connect these pins to the gray axle joiners. Insert a 6 stud axle into each axle joiner. Place a gray connector on each axle. Connect the black axle joiners using the 2 stud axles.

Step# 2

Slide the 10 stud axles through the gray axle joiners from the previous step, and connect them using the axle connector. Create the base by connecting the beams to the 1st and 15th hole of the studded beams using a pin and a long pin. Reinforce the base by connecting 2 more studded beams to the bottom of the frame. Slide the 10 stud axles through the ends of the beams and secure in place with one bushing and two ½ bushings.

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Step# 3

Place 1 of the 24-tooth gears on the exposed 10-stud axle at the top of the assembly. Connect the other 24-tooth gear using the axle pin to the 4th hole from the top of the beam. Connect one of the 40-tooth gears to the 8th hole from the bottom of the beam. Connect the other 40-tooth gear to the 2nd hole from the bottom of the beam using the 6-stud axle to the motor. Secure the motor in place with a bushing.

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NXT Merry-Go-Round!

Model Description:

This medium building difficulty merry-go-round can rotate forever!! Wires will never get tangled up since the NXT spins with the motors.

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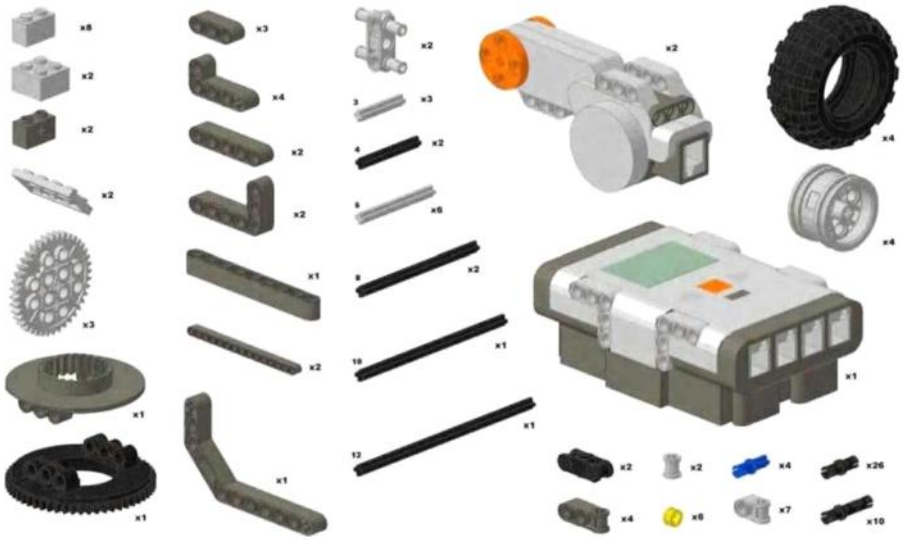
These are the parts that you will need:



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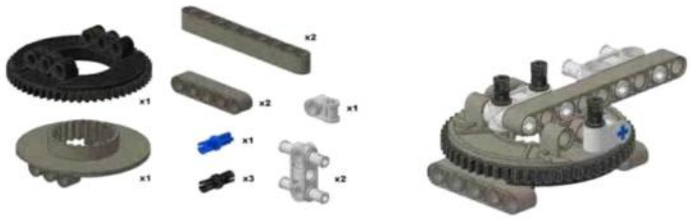
Step# 1 (repeat step twice)

Construct supports for the base of the merry-go-round. Use wheels for the bottom, axles as attachments, an assembly of beams and pegs as the supports. You will need 2 of these assemblies to create a sturdy base.

Step# 2



To connect the base supports, a center console is needed. Use a turret, beams and a variety of pegs to assemble the center console.

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Step# 3

Use the assemblies from Steps #1 and #2 to assemble the complete base. For added support, take a 12-beam and connect it between the 2 sides of the base.

Step# 4

Build the base motor assembly. Attach to the motor a series of beams and pegs. Also thread an axle through the motor and attach a 40-tooth gear.

Note: The gear will need to be removed in the next step to attach to the base.

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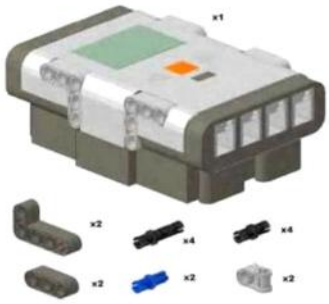
Step# 5

Attach the base motor assembly to the base. Remove the 40-tooth gear and thread the axle through the 4 pin connector.

Step# 6



Build the NXT assembly. Attach a series of beams and pegs that will allow you to attach the top portion of the merry-go-round.

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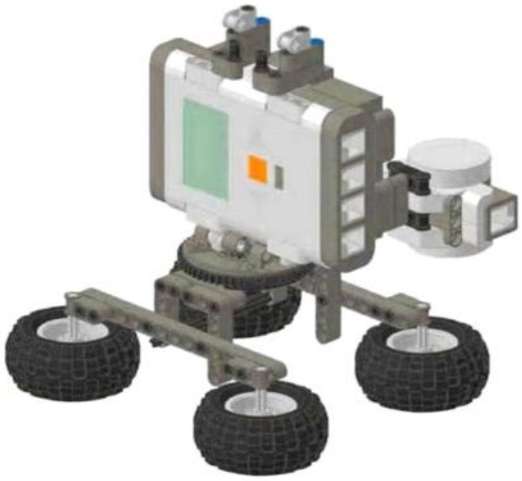
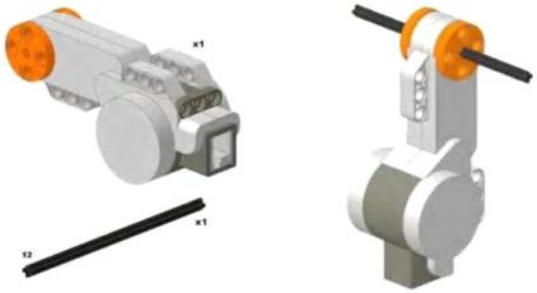
Step #7



Attach the NXT assembly to the base and base motor. The NXT should attach in 3 places on the base and 4 places on the motor.

Step# 8



Assemble the top motor assembly. Thread a 12-axle through the motor.

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Step #9

Attach the top motor assembly to the NXT.

Step #10 (repeat step twice)

Construct 2 horses for the merry-go-round.

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Step# 11

Attach the 2 horses to the 12-axle of the top motor assembly. Wire the motors to the NXT outputs and your merry-go-round is complete.

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