

Catapult

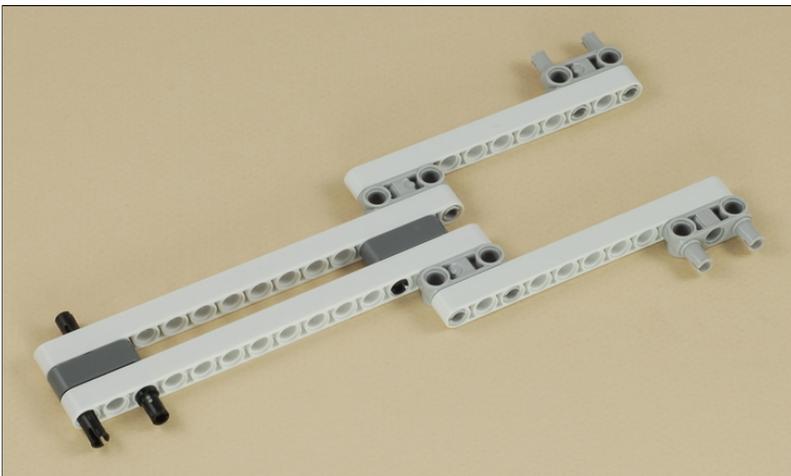
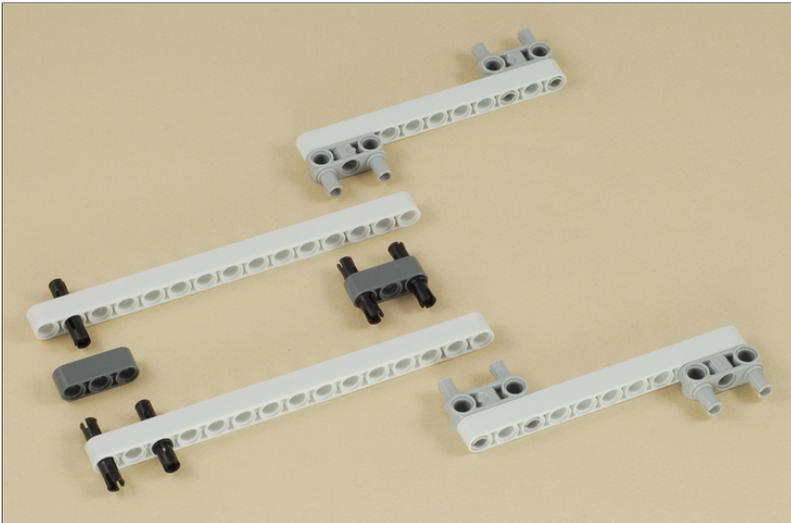
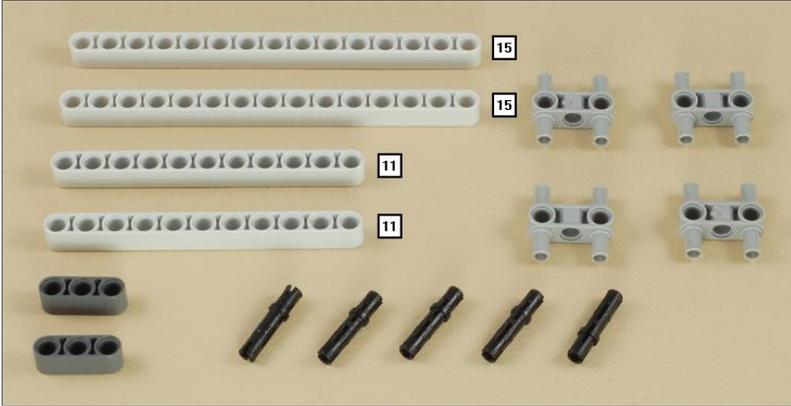
Building: ■ ■ ■ ■

Program: ■

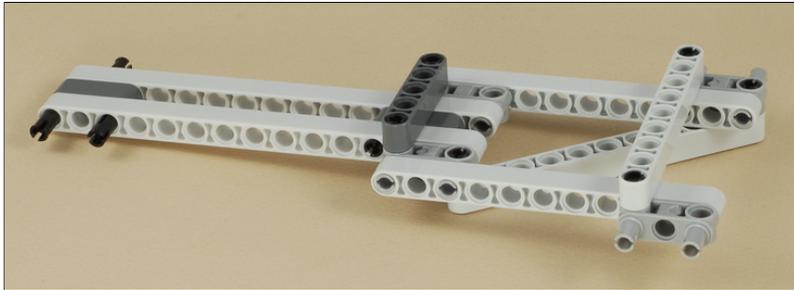
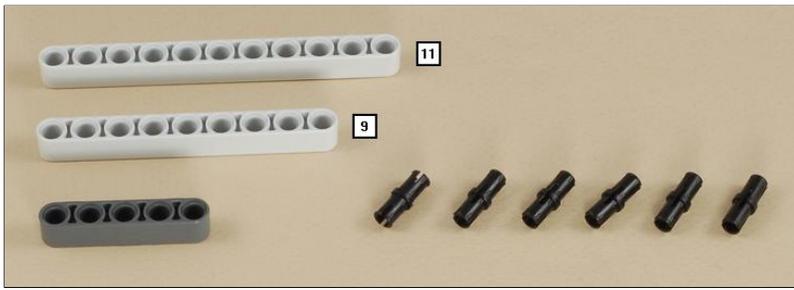
Designed for **NXT 1.0** (8527, or 9797 + 9695/9648)

Building Instructions

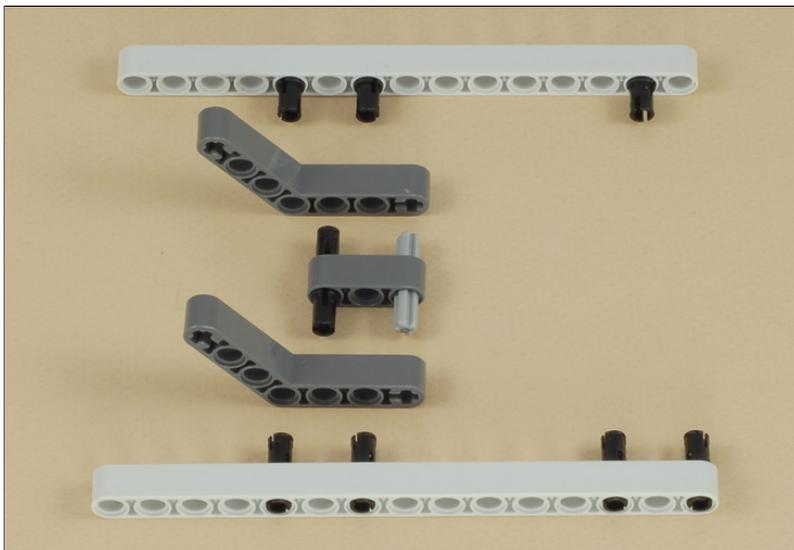
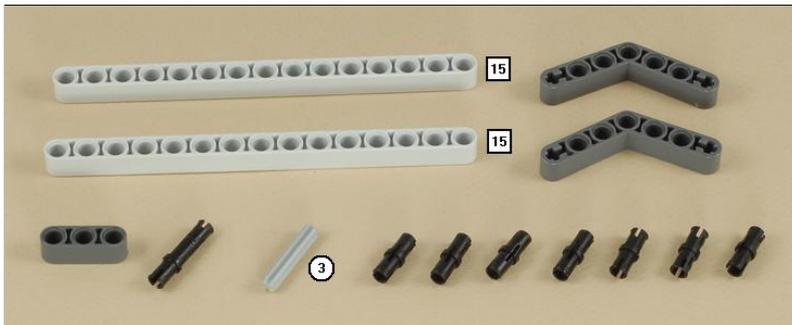
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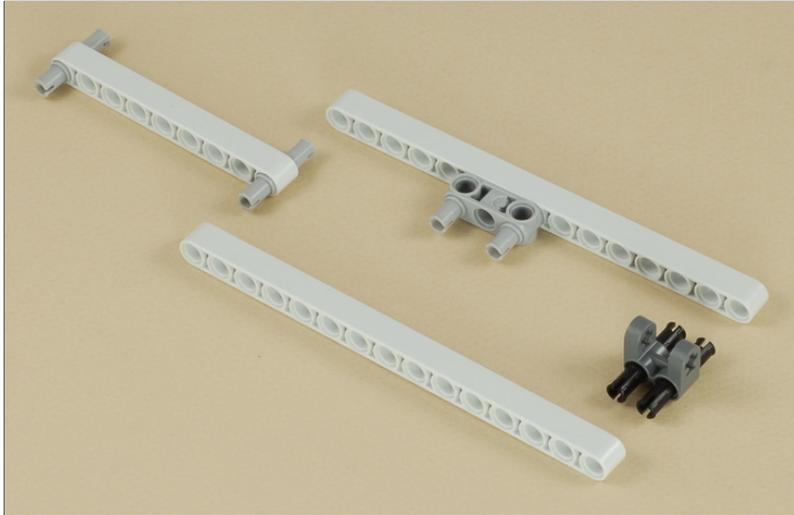
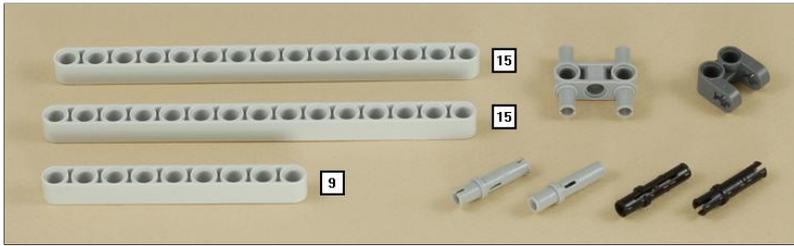
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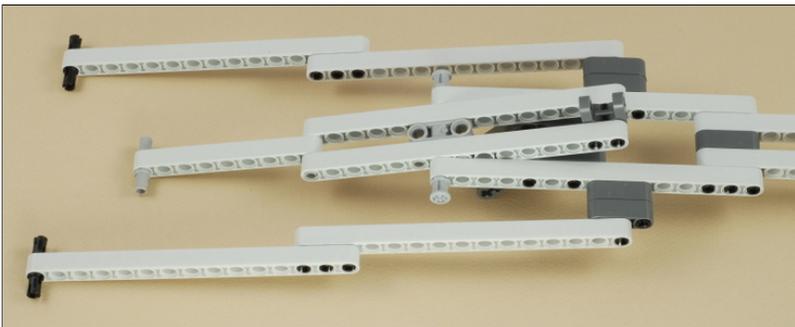
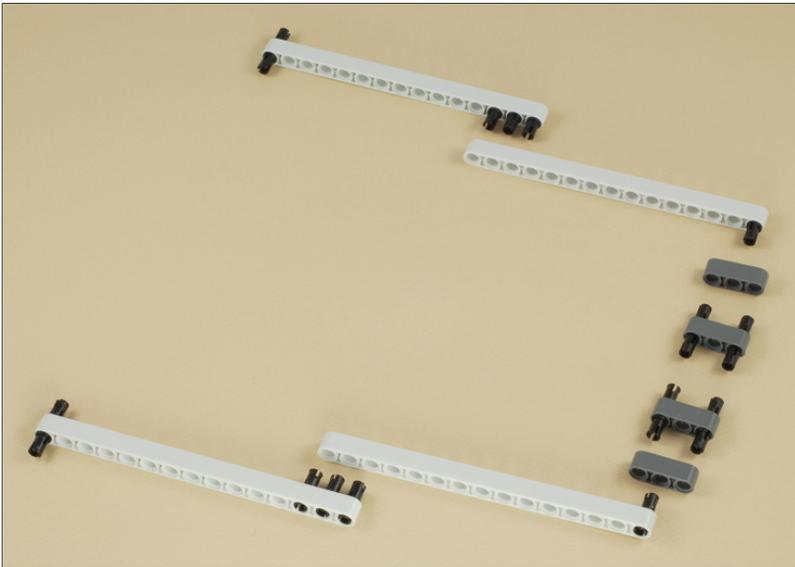
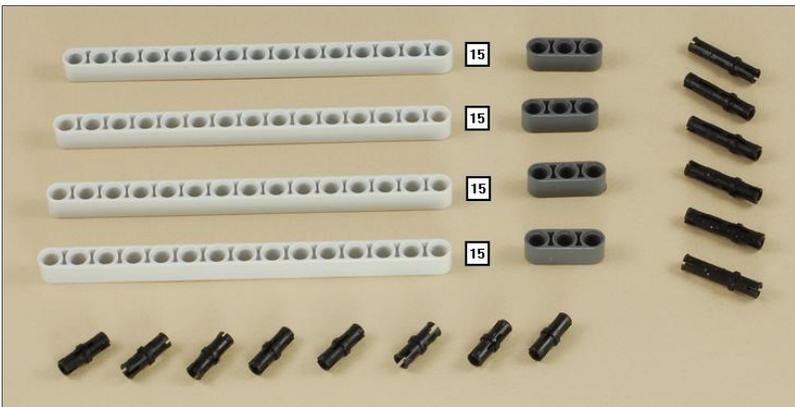
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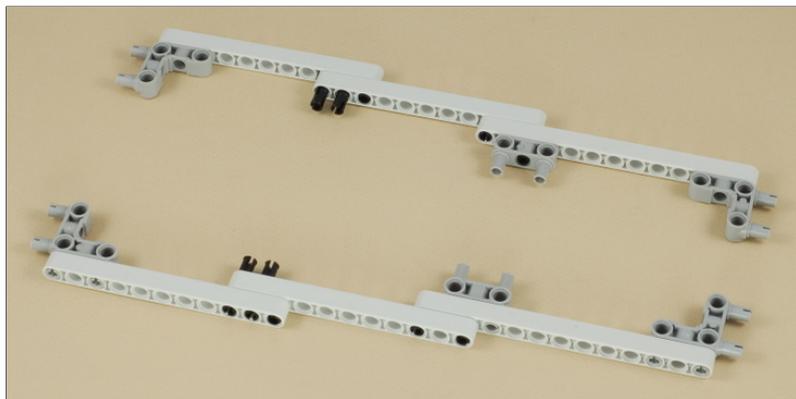
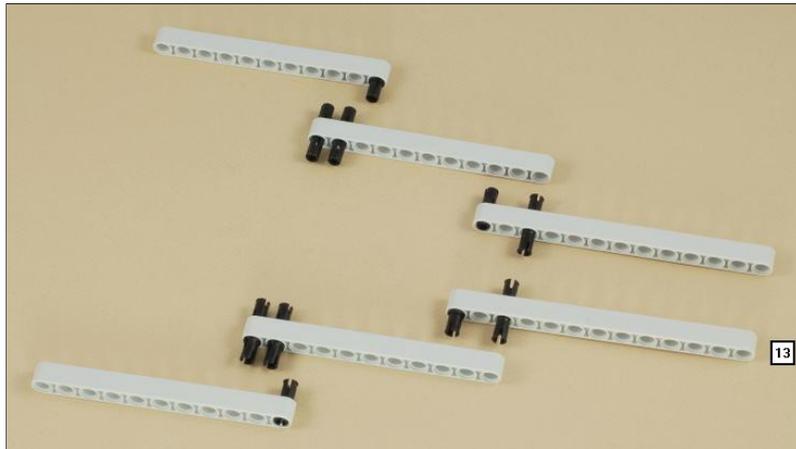
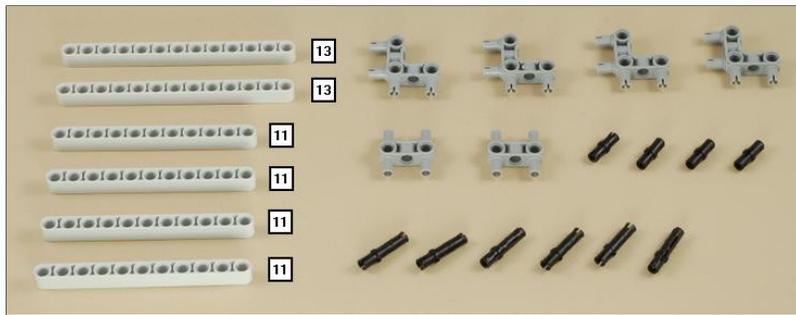
Note: Make sure the lever is not upside down. Look at the ends carefully.



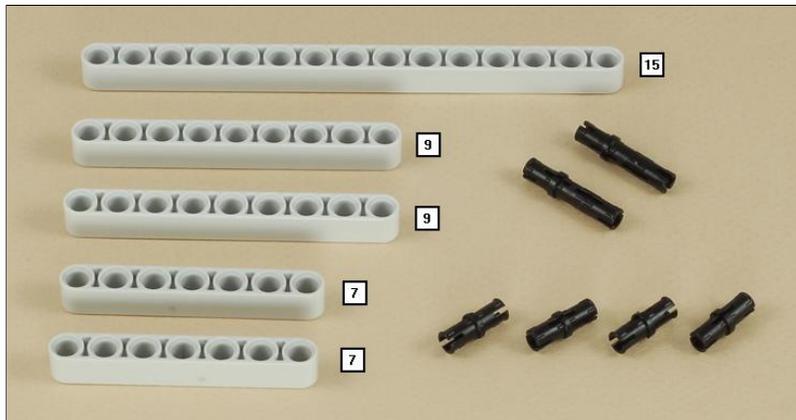
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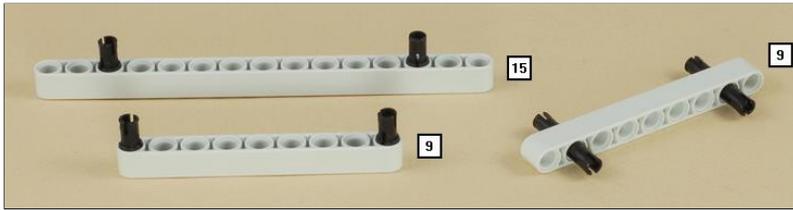


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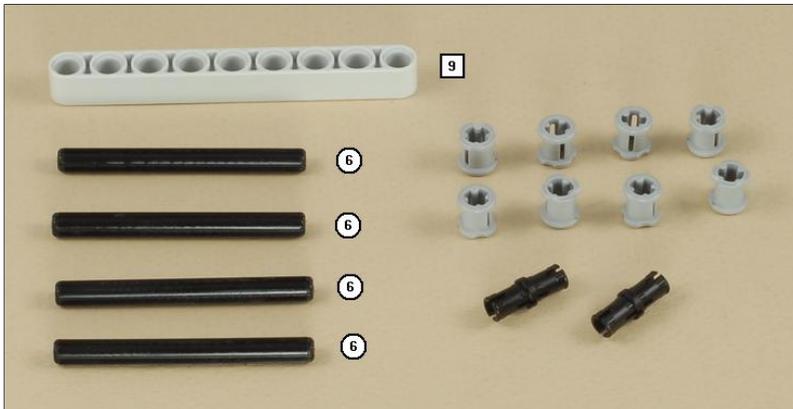


This step is a little tricky. Try it like this:

1. Hold the pivoting A-frame/lever assembly in the correct direction so that the dark gray angled beams near the top are pointing down and the long legs are hanging down.
2. Peg the four legs of the A-frame into the corners of the two base halves.
3. Attach the inner support beams to the two legs on the left.
4. Attach the three cross beams to connect the two base halves together.
5. Check the result against the picture carefully to make sure everything is right-side up and facing the right direction.

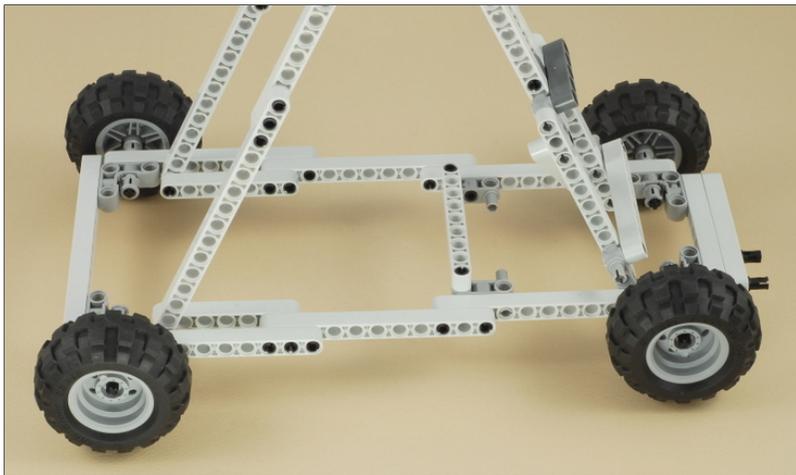


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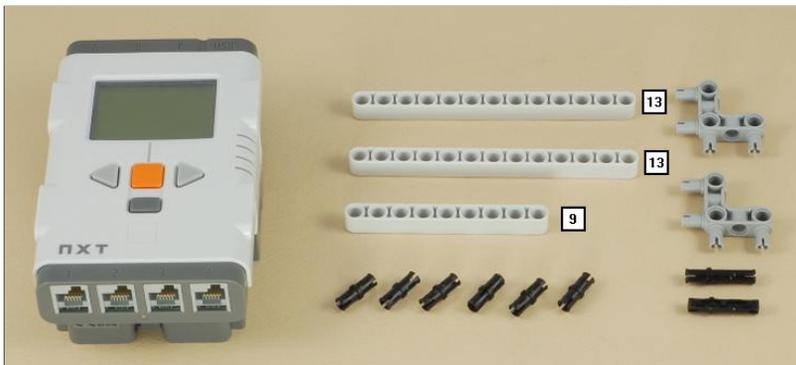




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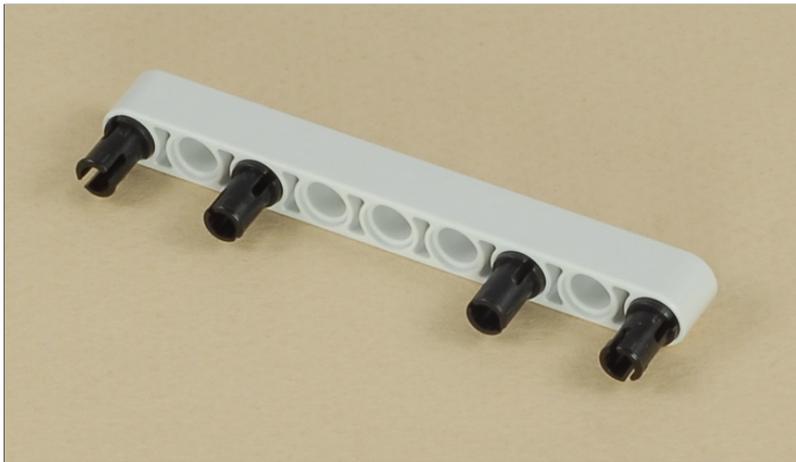
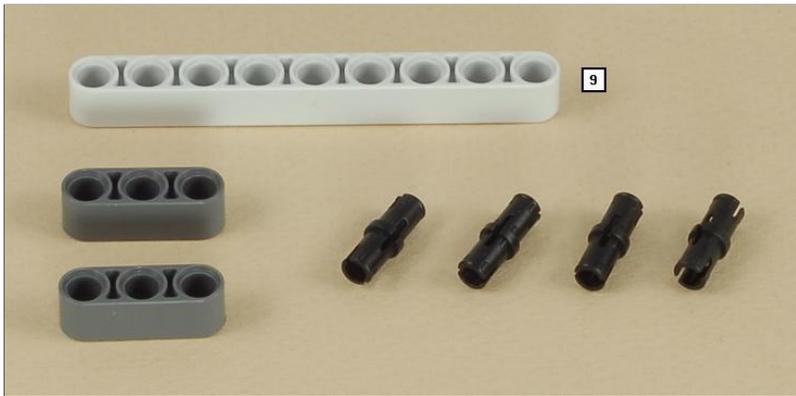


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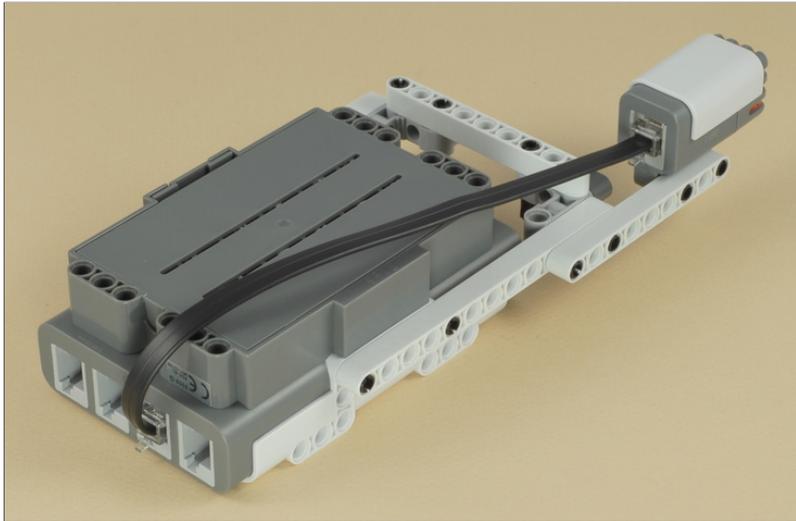
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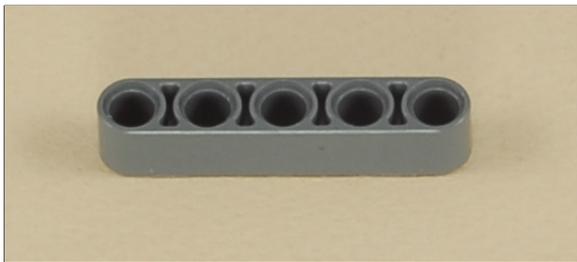


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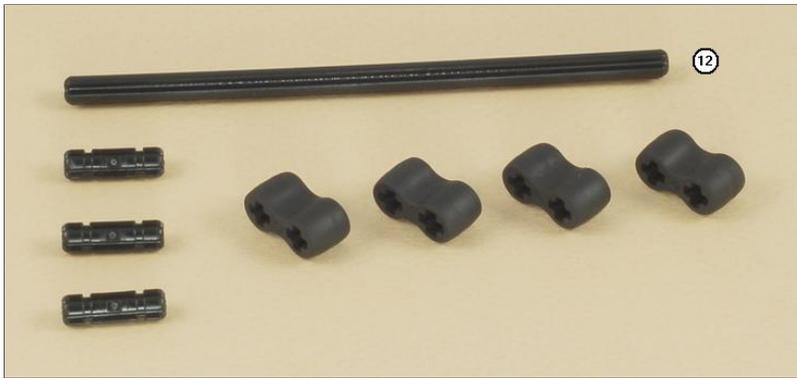
Use the shortest wire for this step and connect it to port 2 on the NXT.



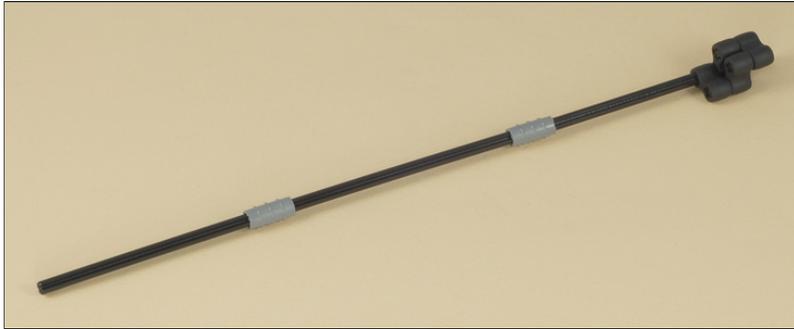
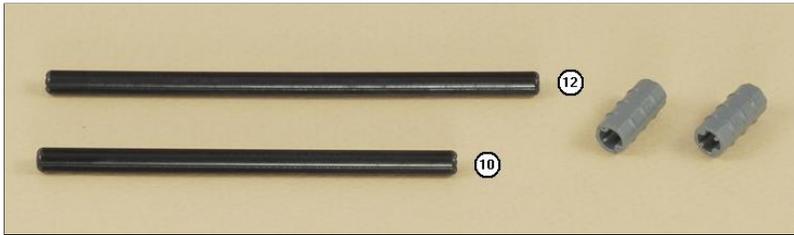
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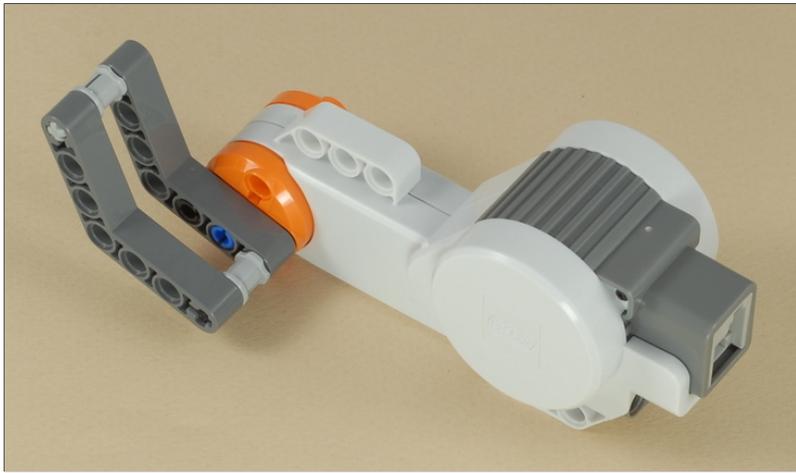


Note: Make sure the tip of the throwing arm has the tip of the axle below the rubber parts, as shown below.



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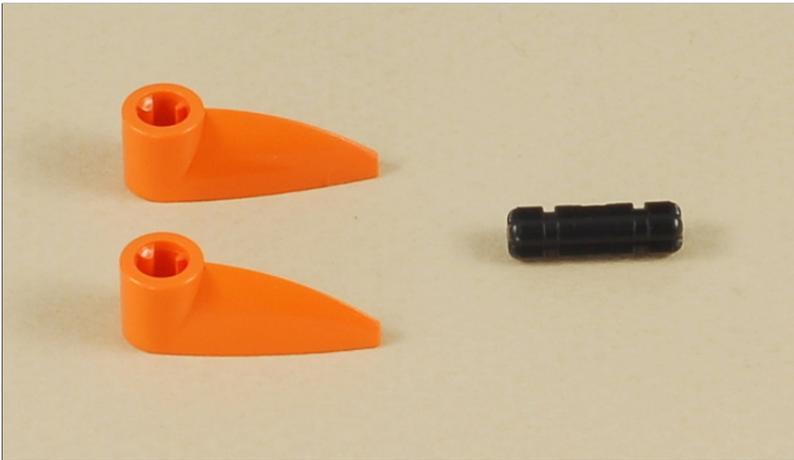
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Connect a wire from the motor to port C on the NXT. Make sure that the wire allows the NXT to hang mostly straight and does not interfere with the path of the NXT brick when it falls down.



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You can experiment with different small projectiles for the catapult to fling. Here is one design.





Catapult Programming

Use the program [Catapult](#) for the catapult. This is a simple program and would be easy to modify if you want to change the triggering sequence. As provided, the trigger is sound activated. Clap your hands or yell "Fire!" to activate the trigger.

Using the Catapult

1. Cock the catapult by pulling the throwing arm down, then move the trigger on the motor into position so that it hooks on the black axle under the rubber platform (not on the rubber).

2. Carefully place a projectile on the rubber platform. The orange projectiles seem to fly well when they are placed as shown on the right.

Important: Keep your face out of the path of the throwing arm when loading the catapult, in case it goes off by accident!

3. Run the [Catapult](#) program, then stand back and clap your hands or yell "Fire!" to trigger the sound sensor. The program will automatically reset the sound trigger after 1 second and be ready to fire again, so you can carefully (and quietly!) cock and load it again.



Challenges

- Several parts of the catapult can be adjusted to produce different throwing angles and distances. By changing the position of the two dark gray angled beams near the top of the frame, you can force the throwing arm to stop in a different position, which will change the angle of the throw. You can also adjust the length of the throwing arm, the position of the pivot point on the lever, and other things. Can you make any adjustments that make it throw any farther?
- The way that the rubber platform at the end of the throwing arm holds the projectile is an important part of a good throw. The platform must hold the projectile securely during the swing so that it doesn't slip off, but release it easily at the end. Can you design better projectiles or a better platform/bucket to throw farther?

