Image-guided therapy and medical robotics tutorial using a LEGO Mindstorms NXT robot and 3D Slicer

Assembly Instructions: Robot

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Surgical Planning Laboratory,

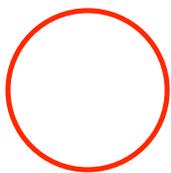**Brigham and Women's Hospital and Harvard Medical School**
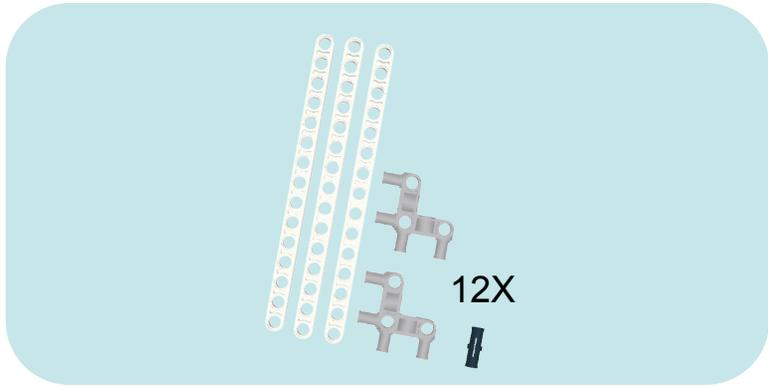
Before you start:

5 Gives the length for axels (see the back cover of the LEGO Mindstorms NXT User Guide)

12X Tells you how many pieces to use (12 in this case)

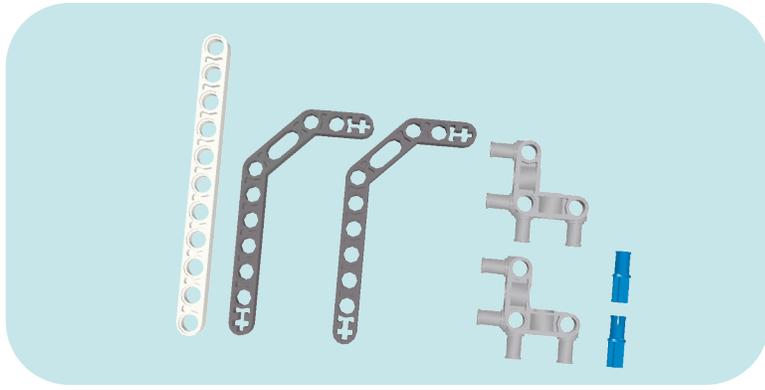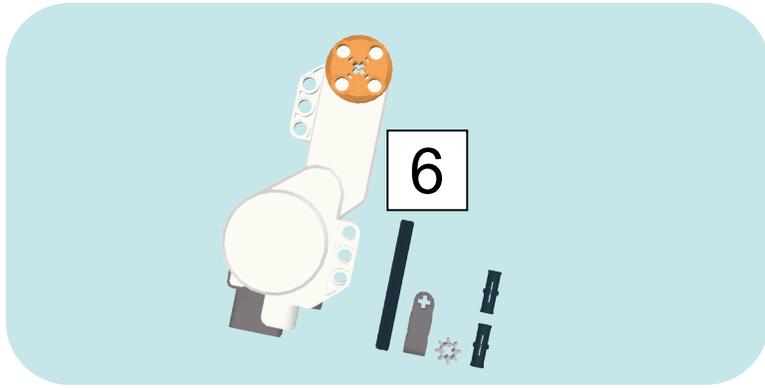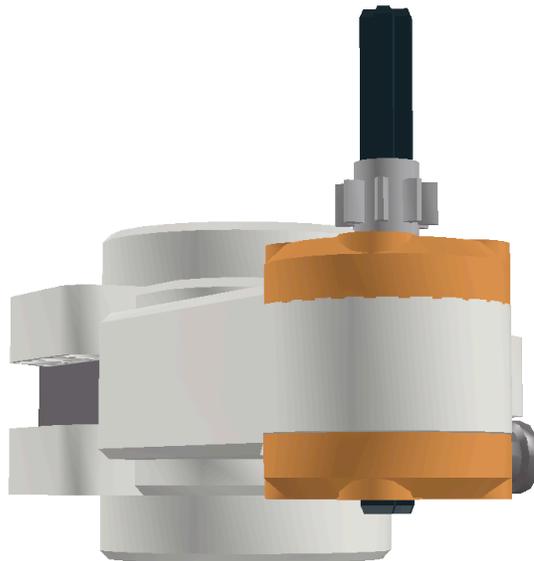Shows where two constructions snap together or areas to pay special attention to

1

12X

2

3

Alternate
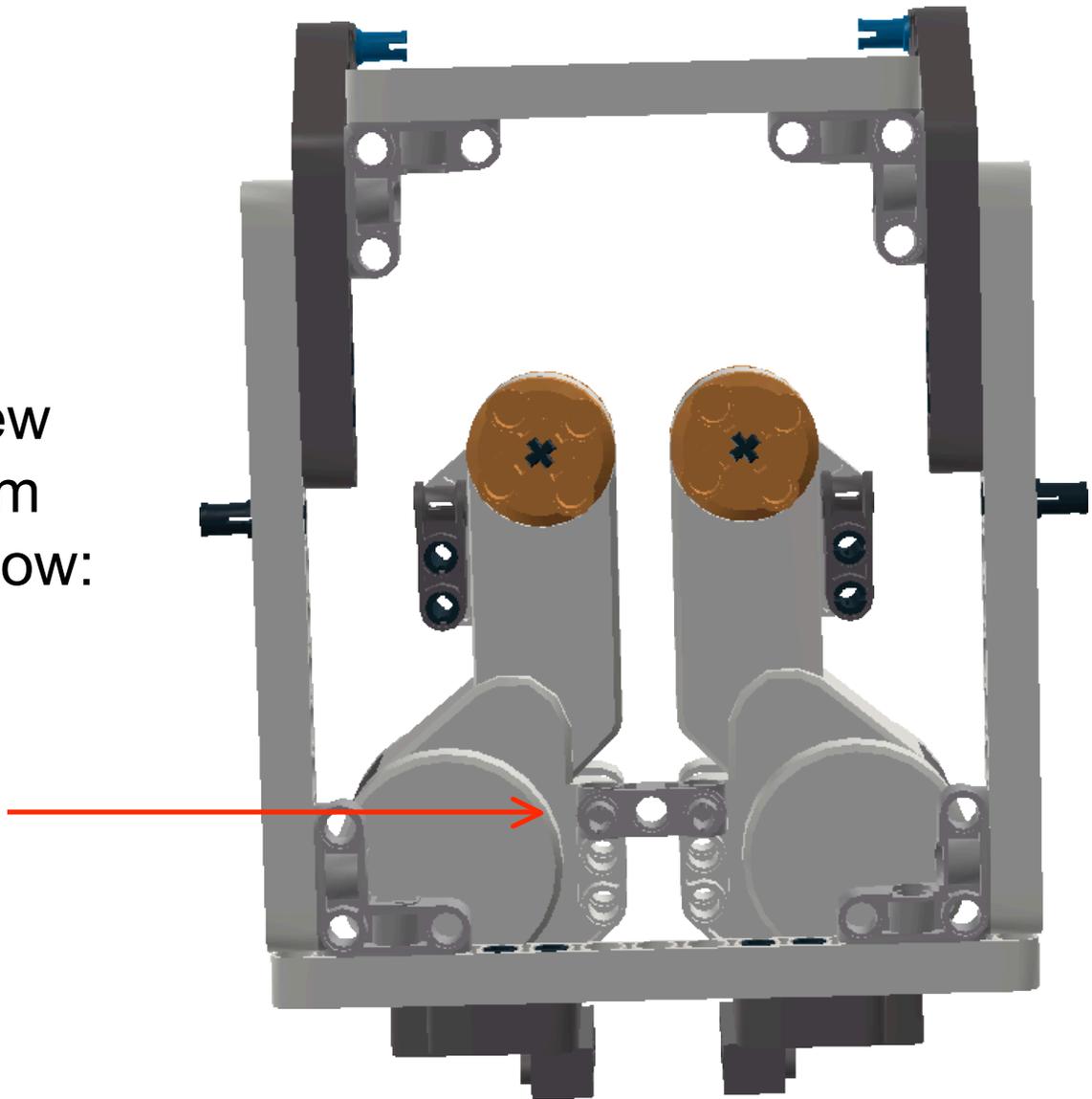view:

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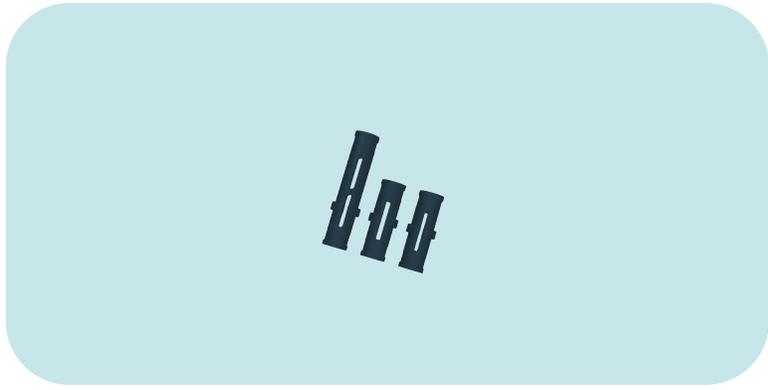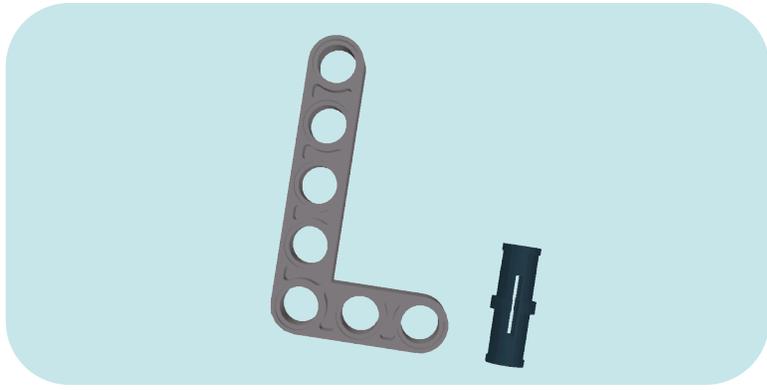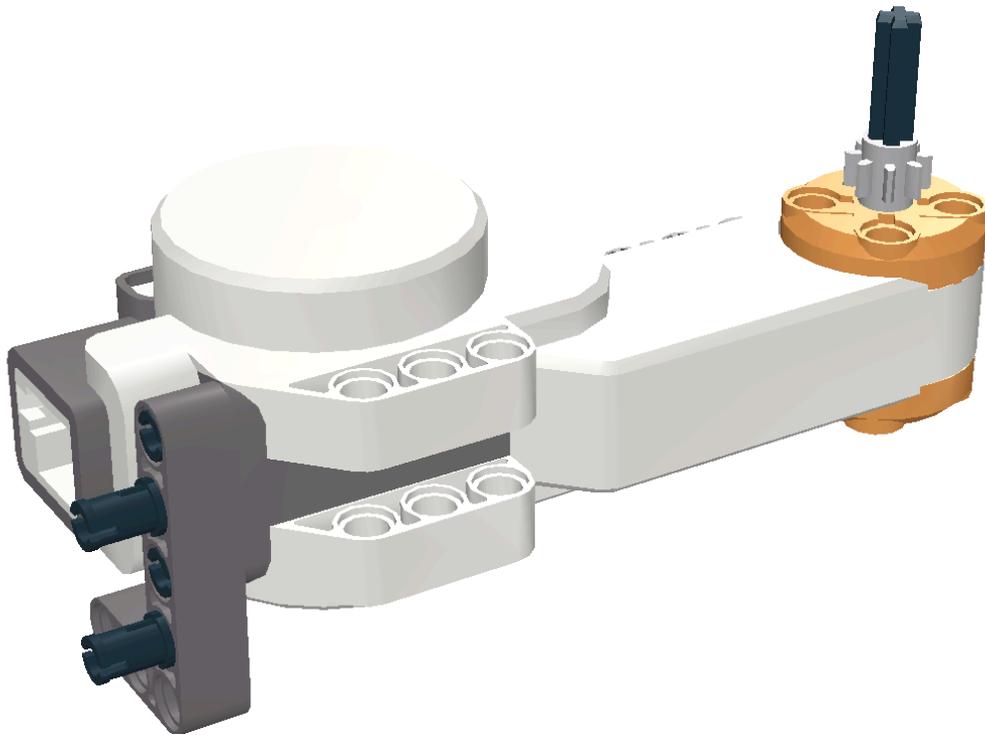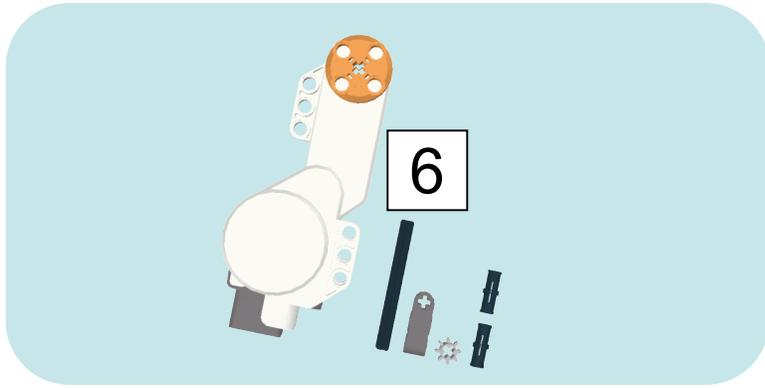
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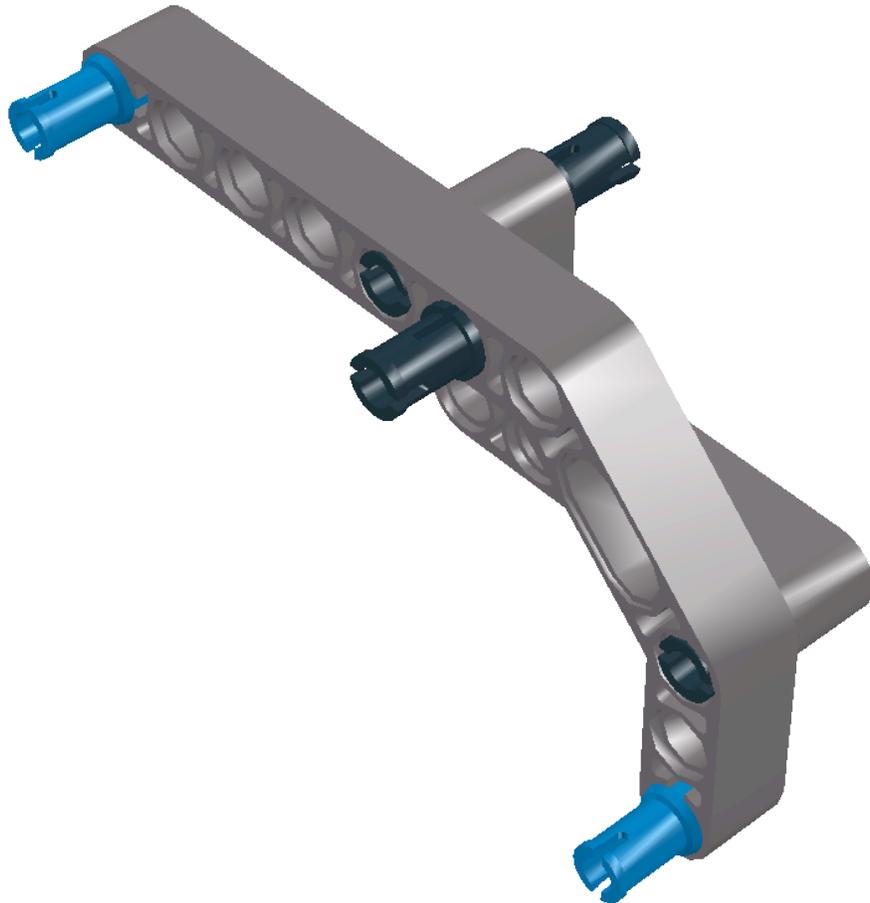Alternate
view:

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9

10
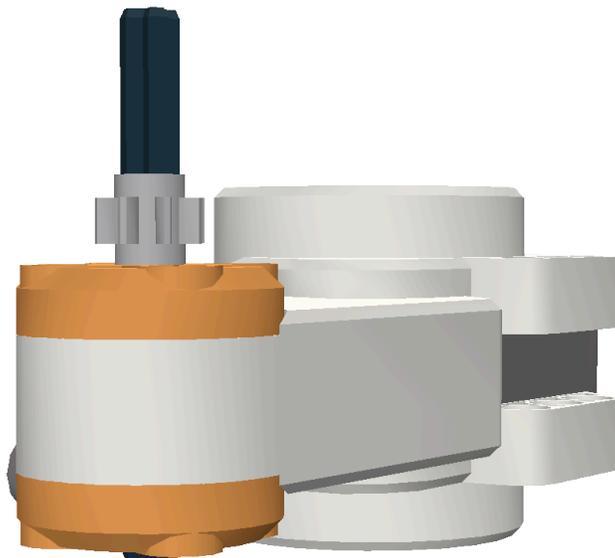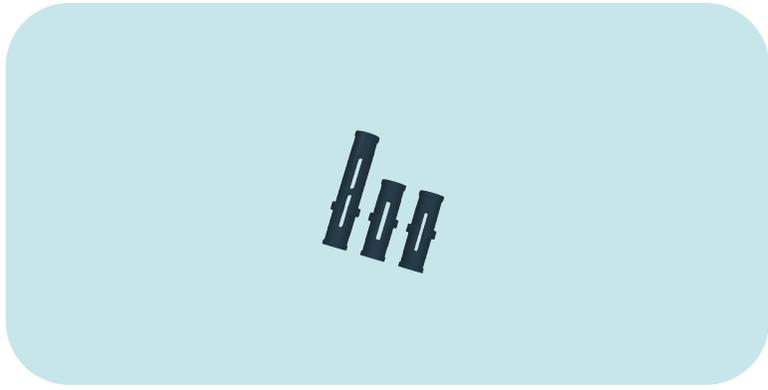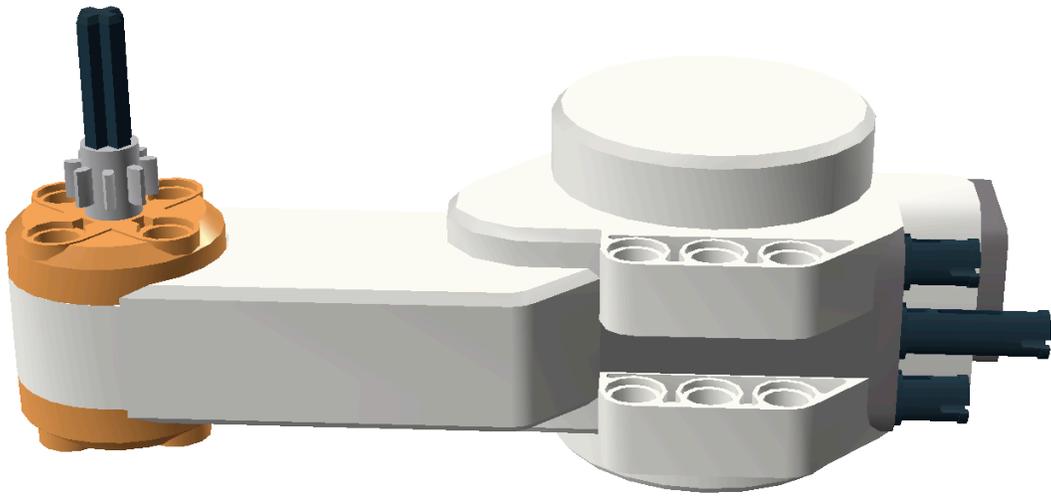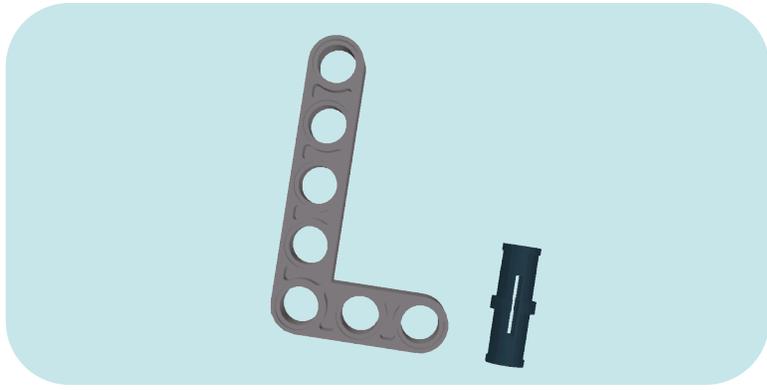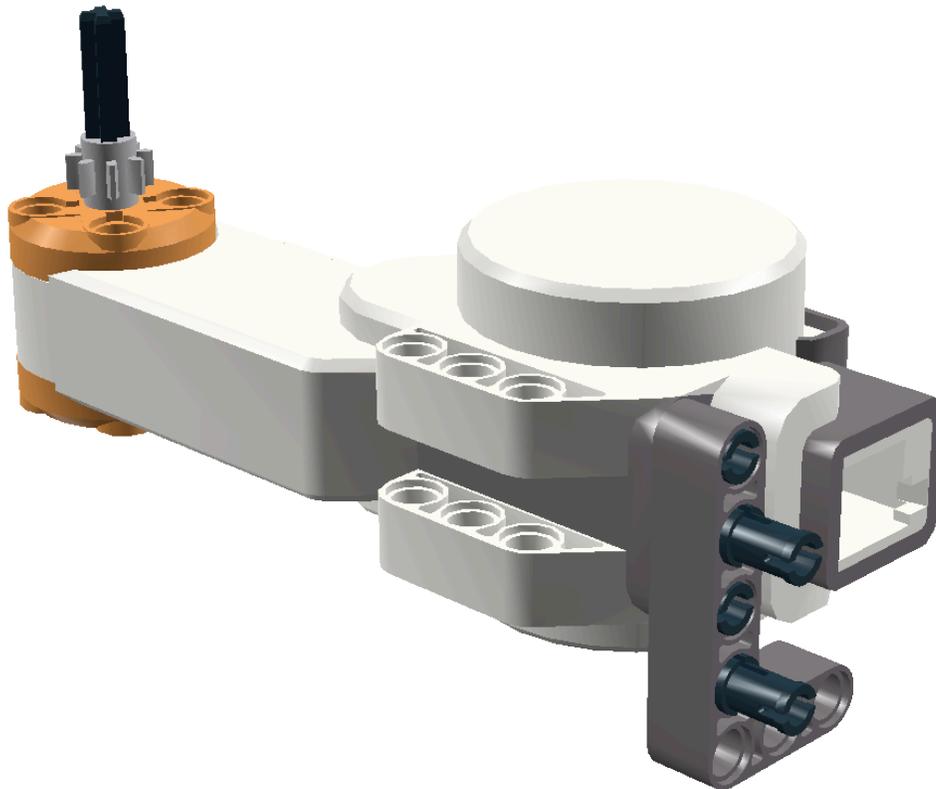
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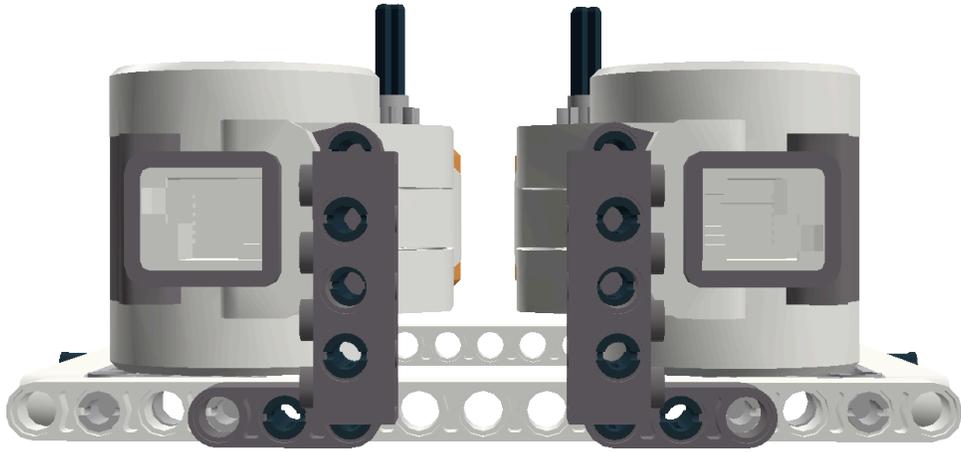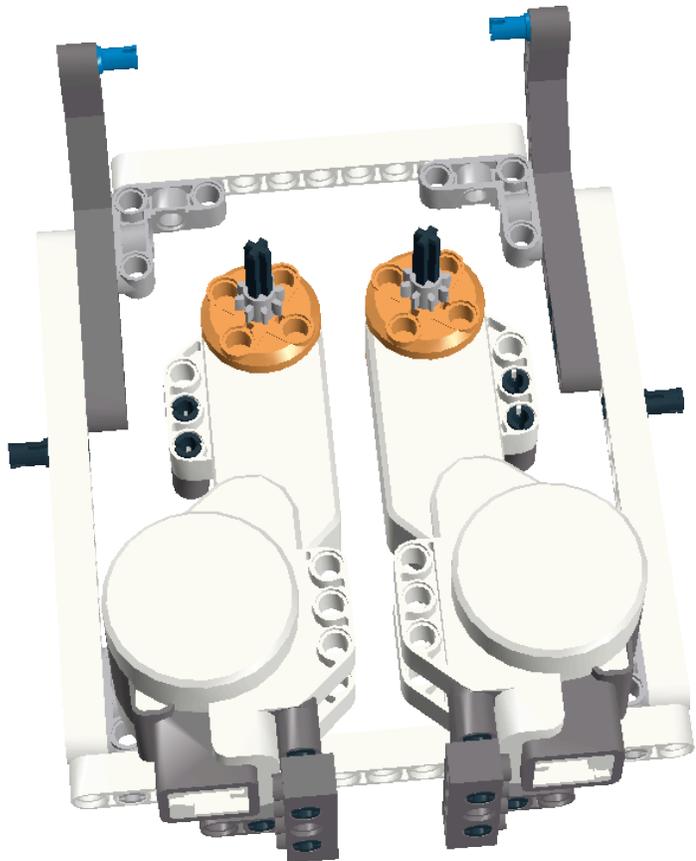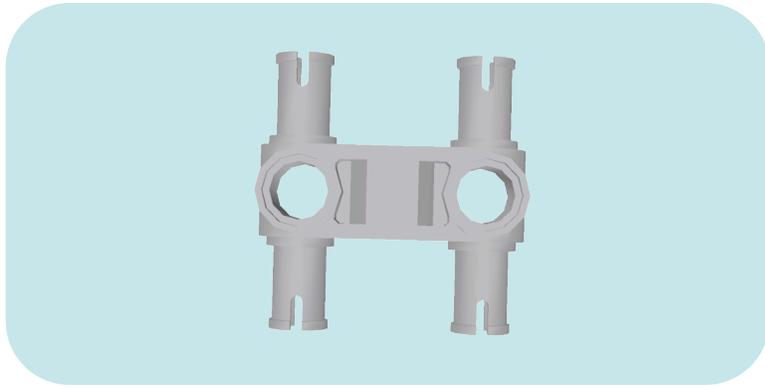
Alternate
view:

12

View
from
below:
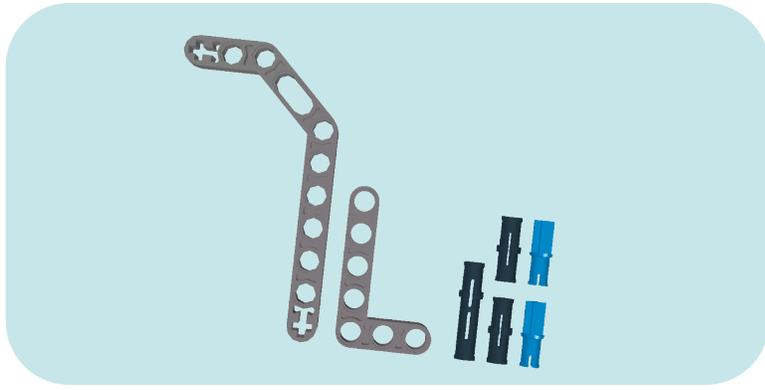
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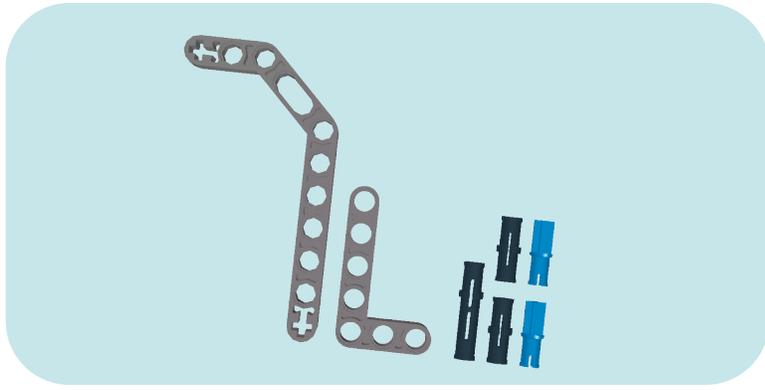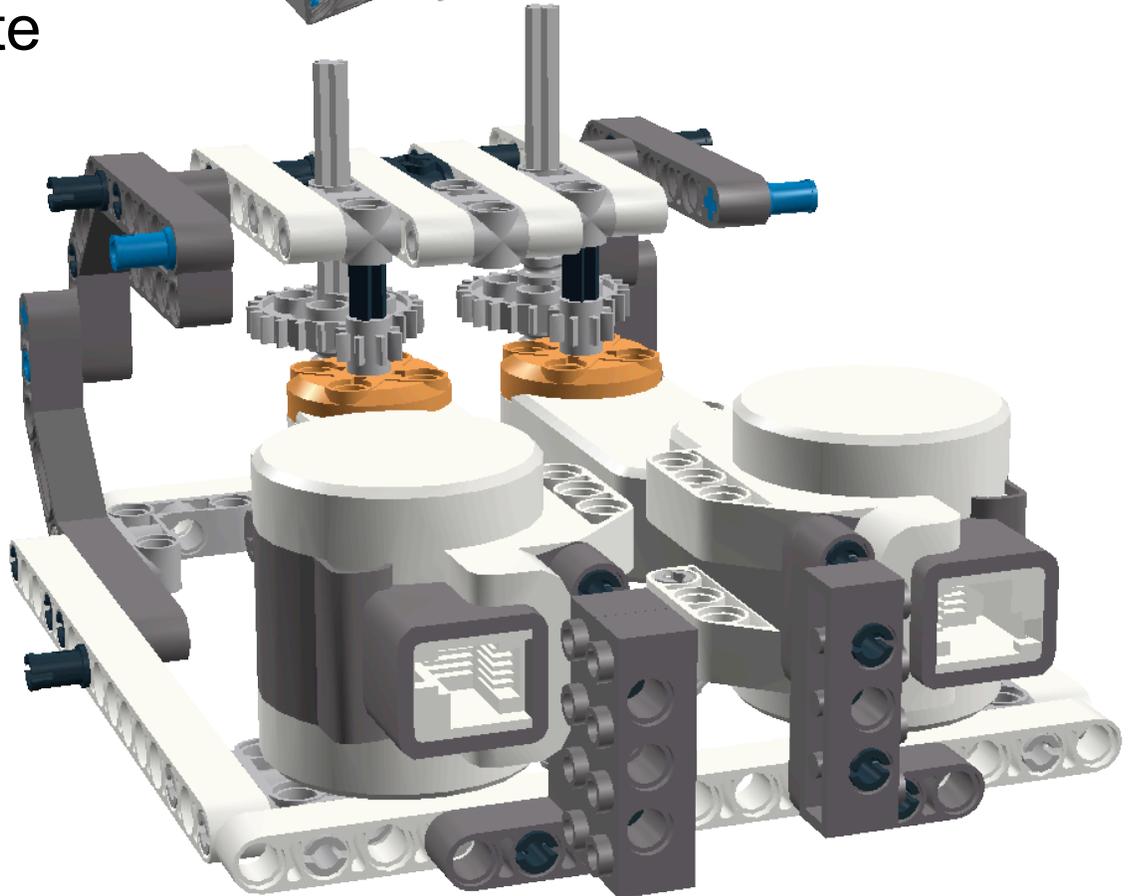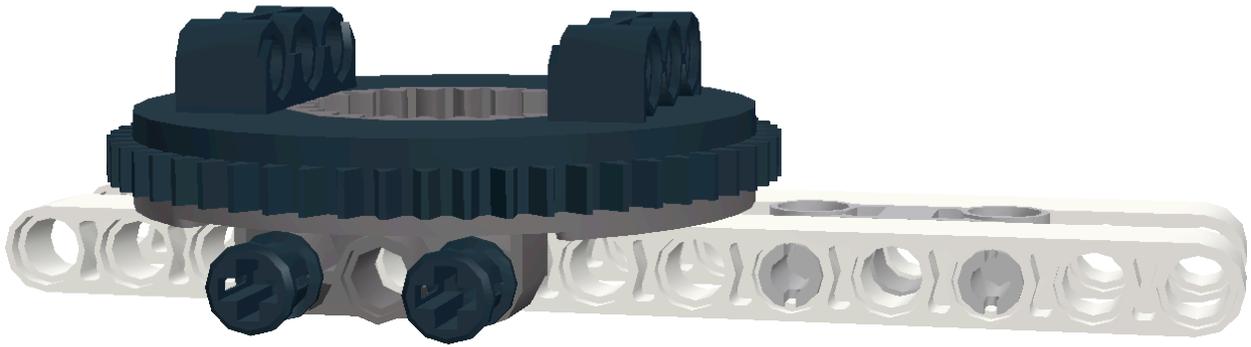
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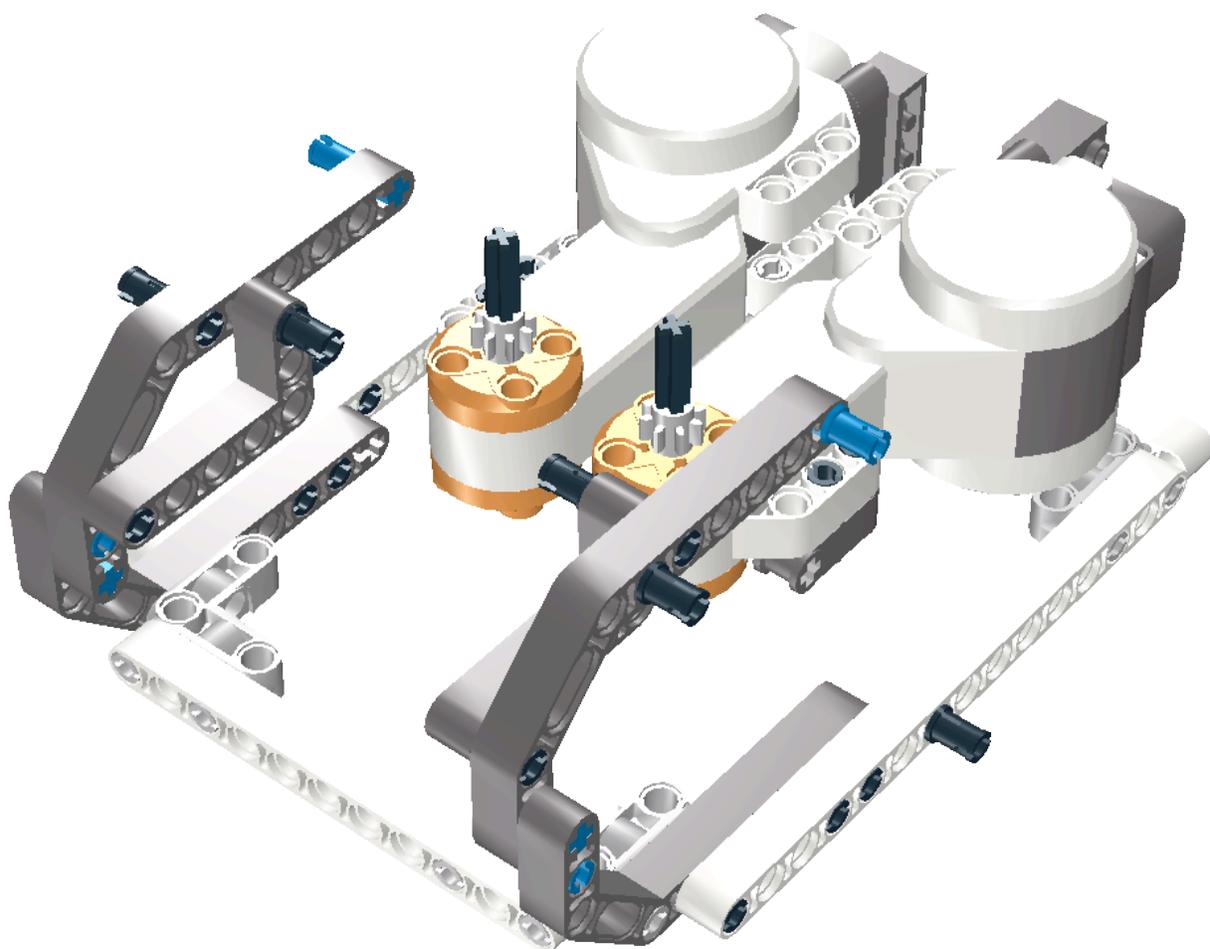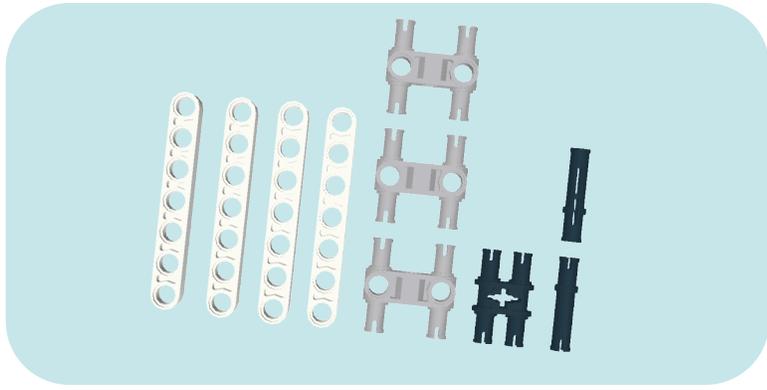
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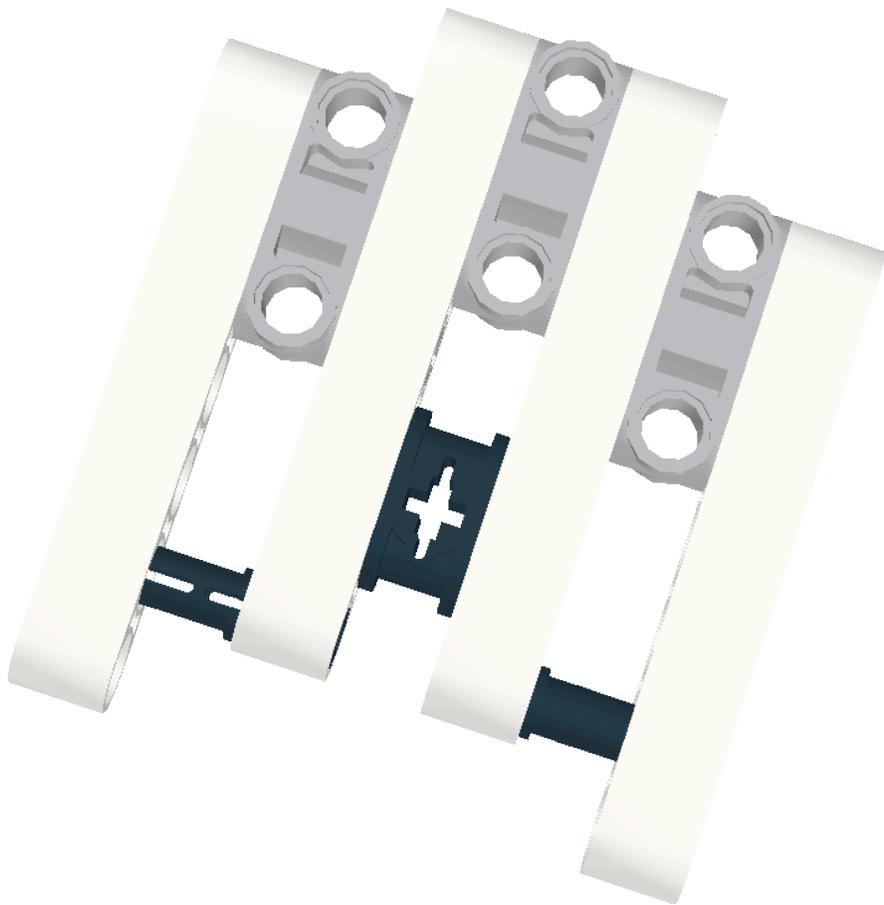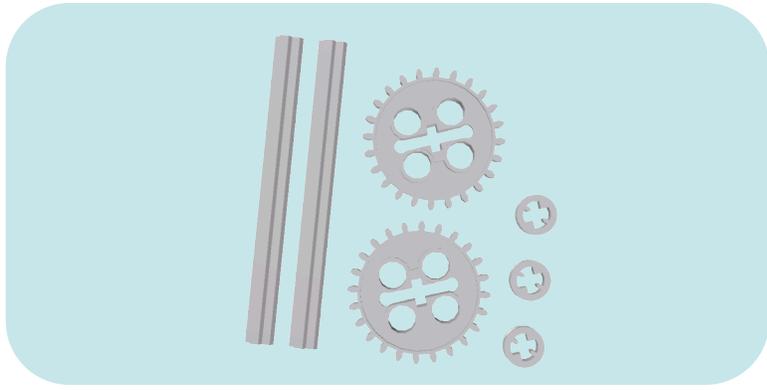
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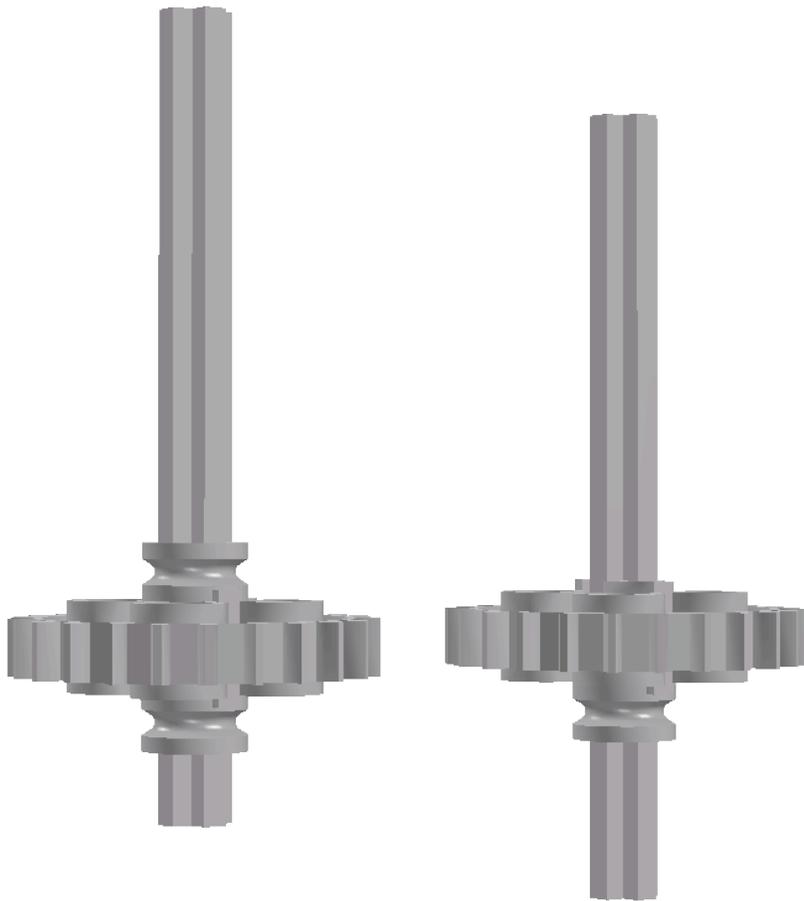
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Alternate
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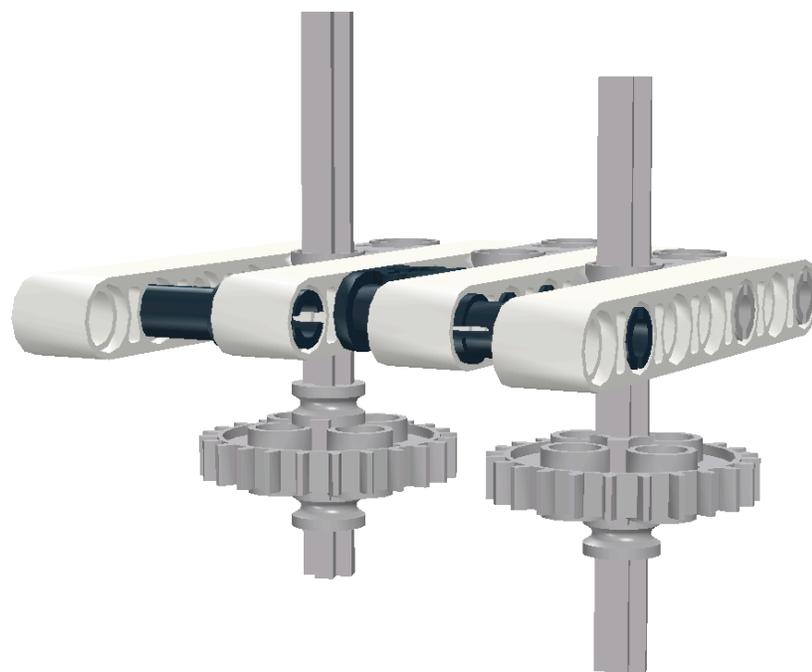
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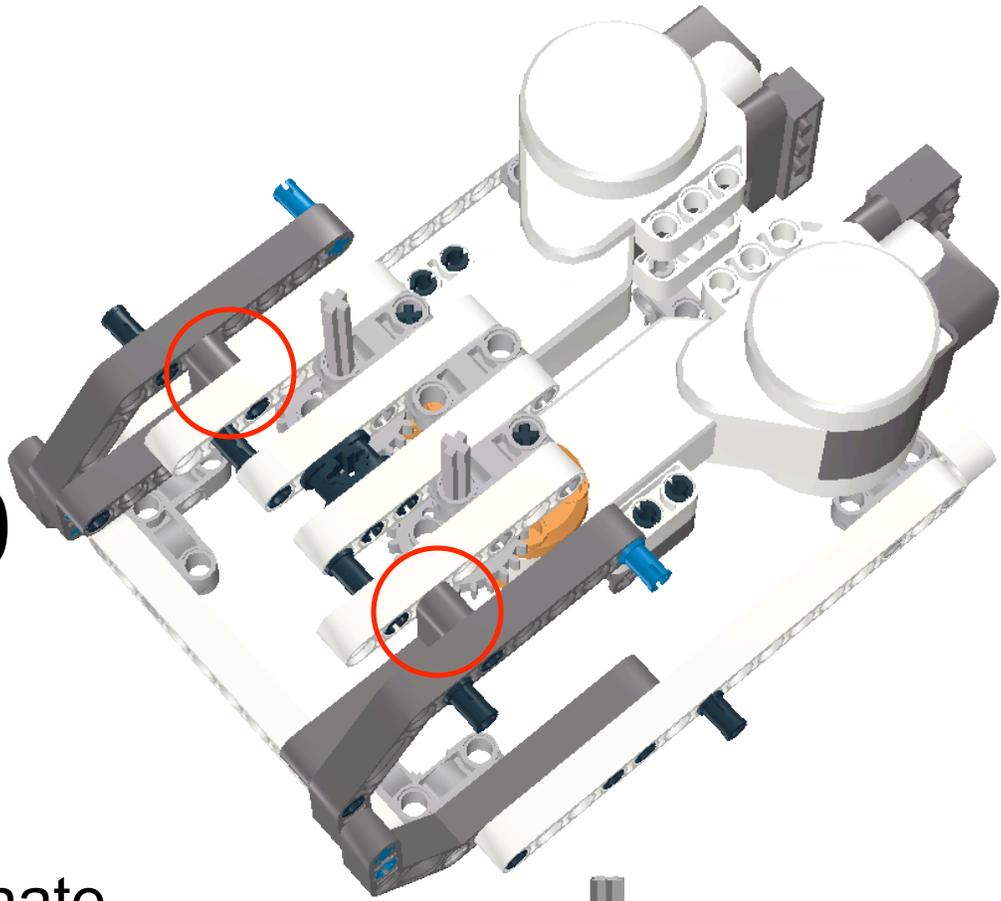
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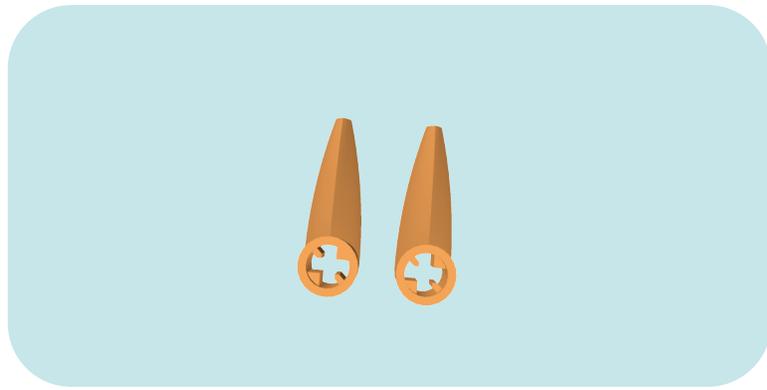view:
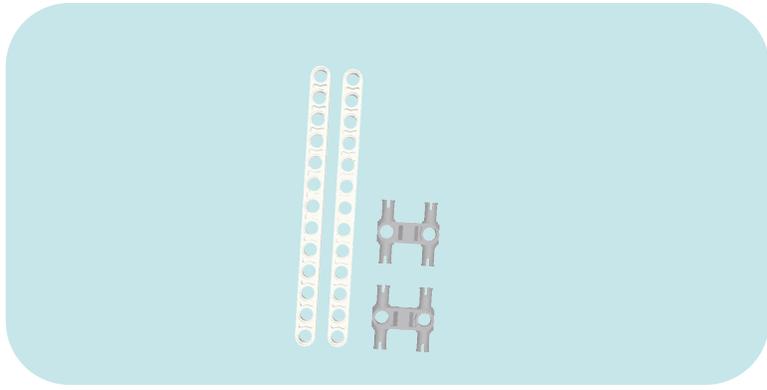
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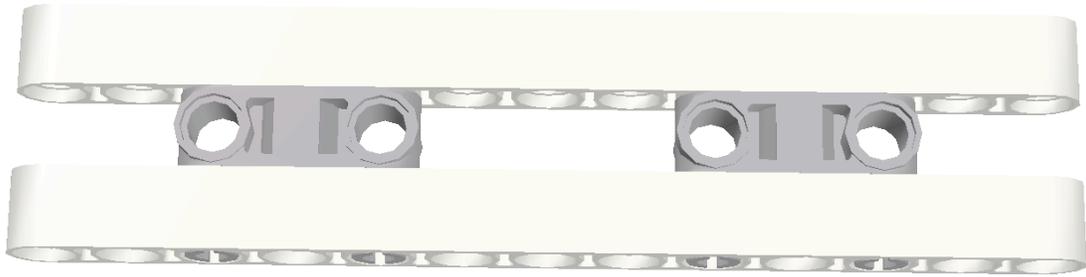
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Back view:
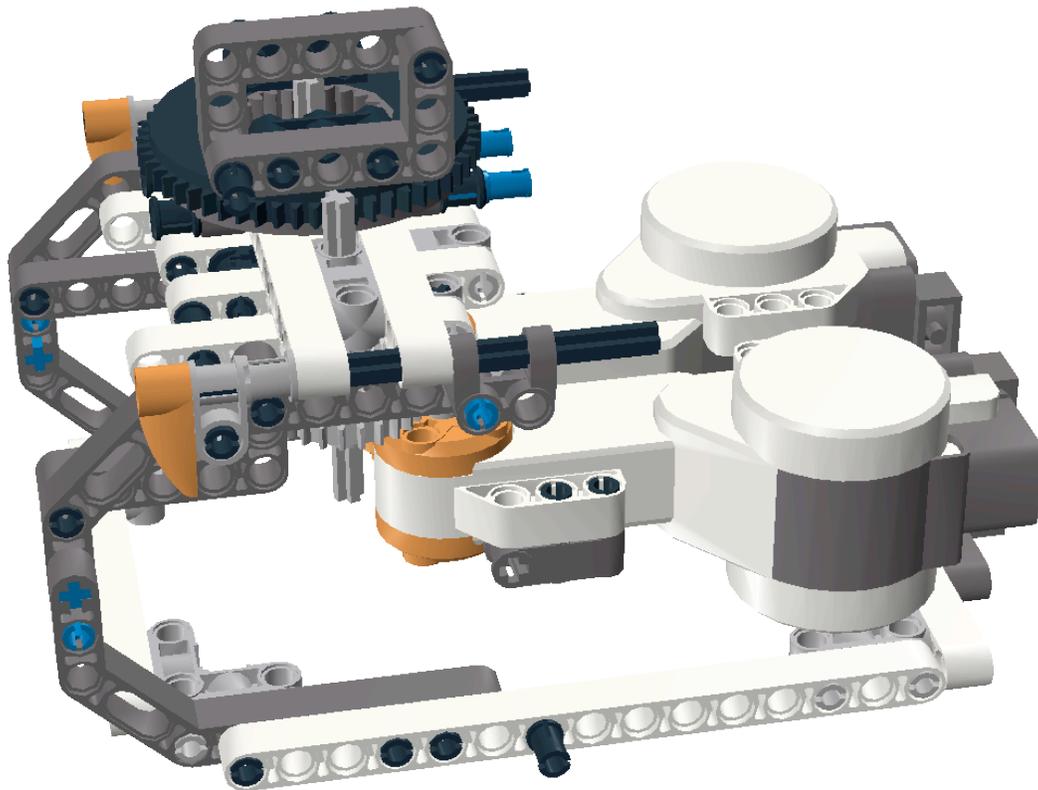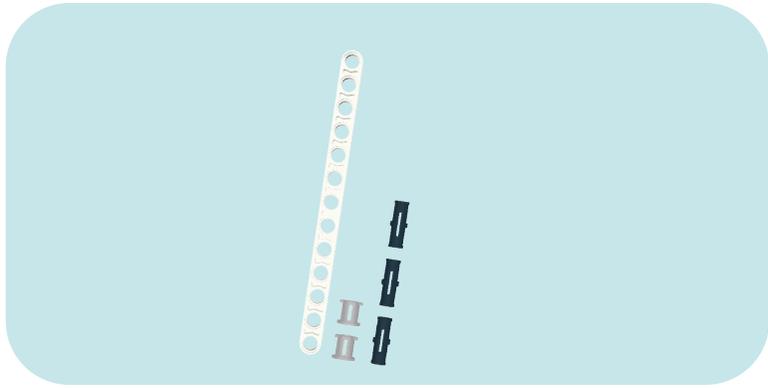
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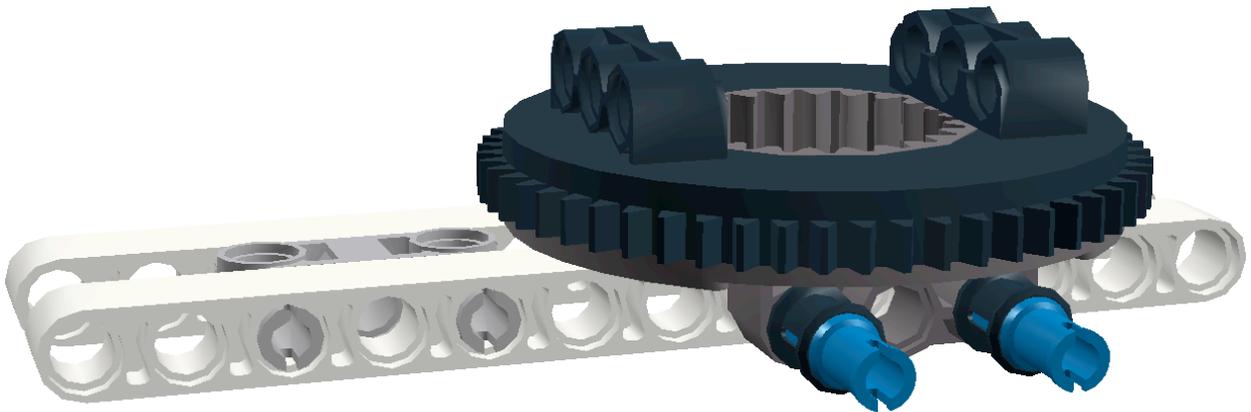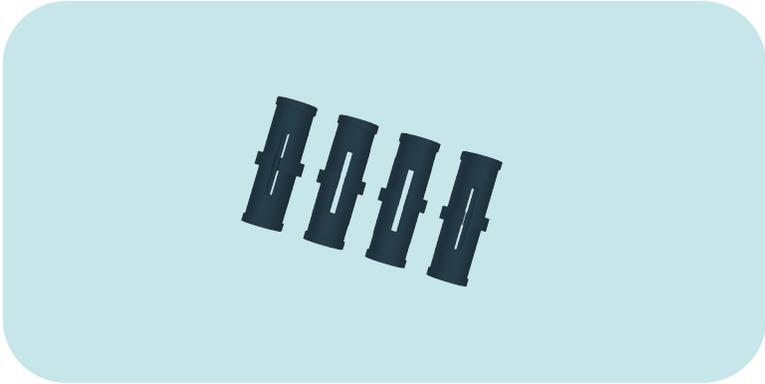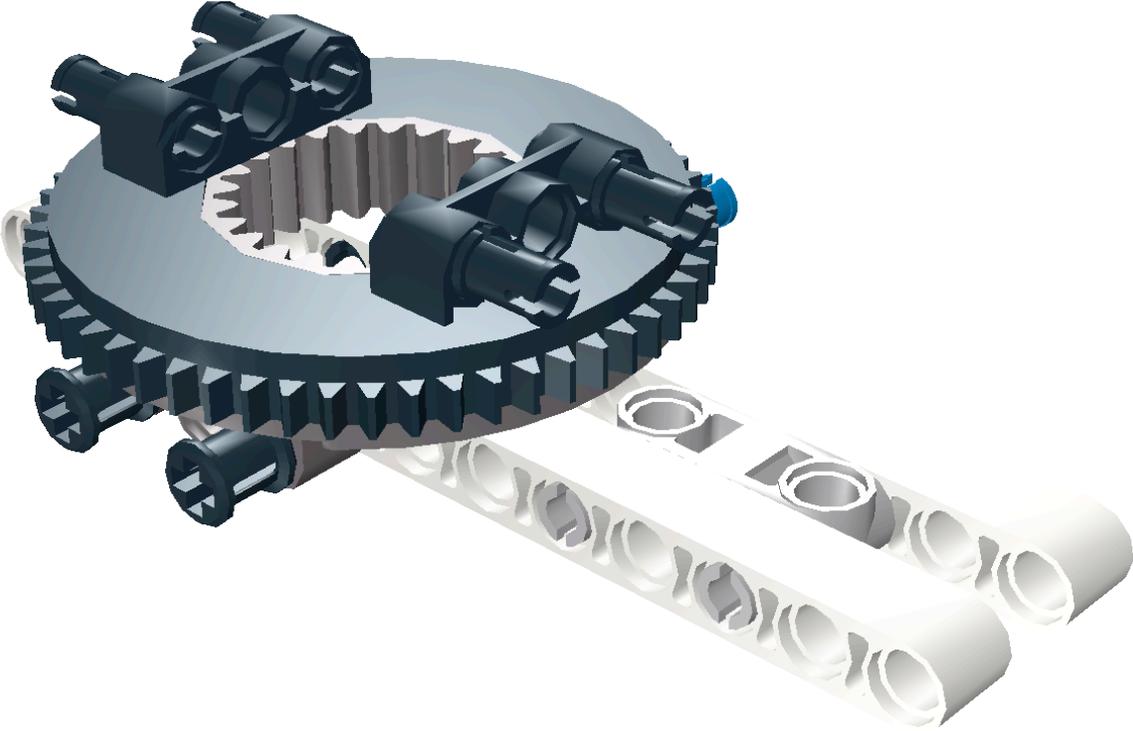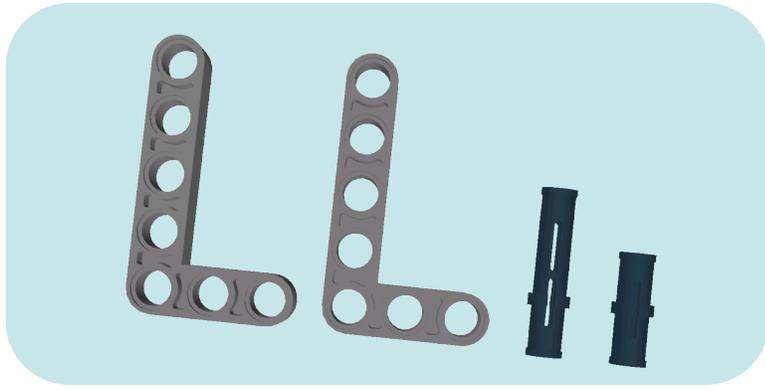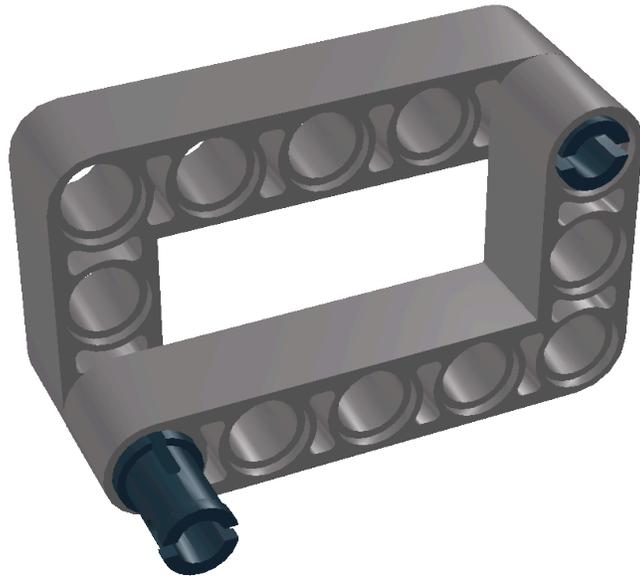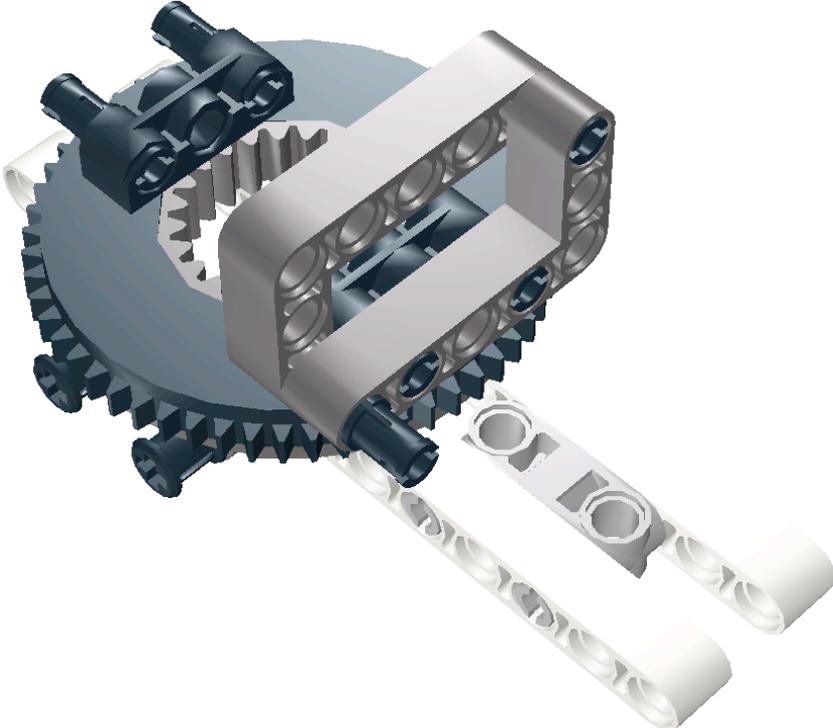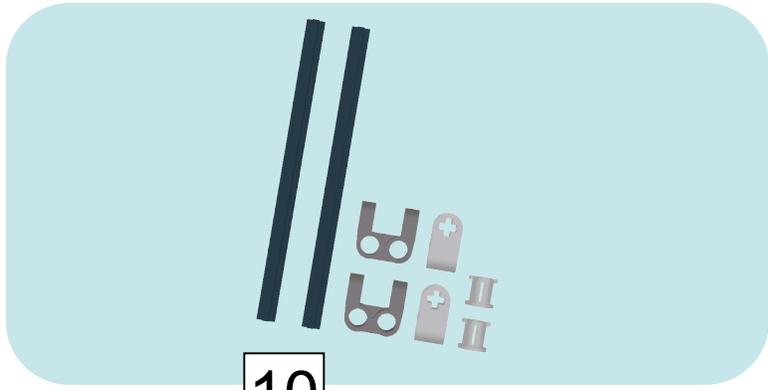
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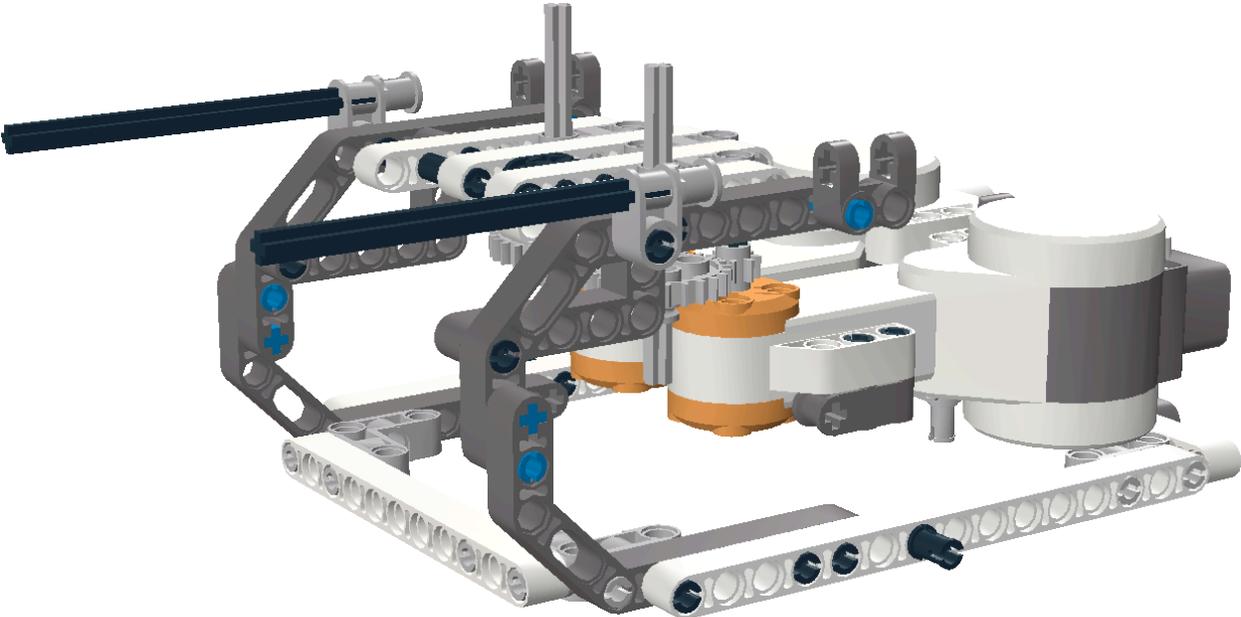
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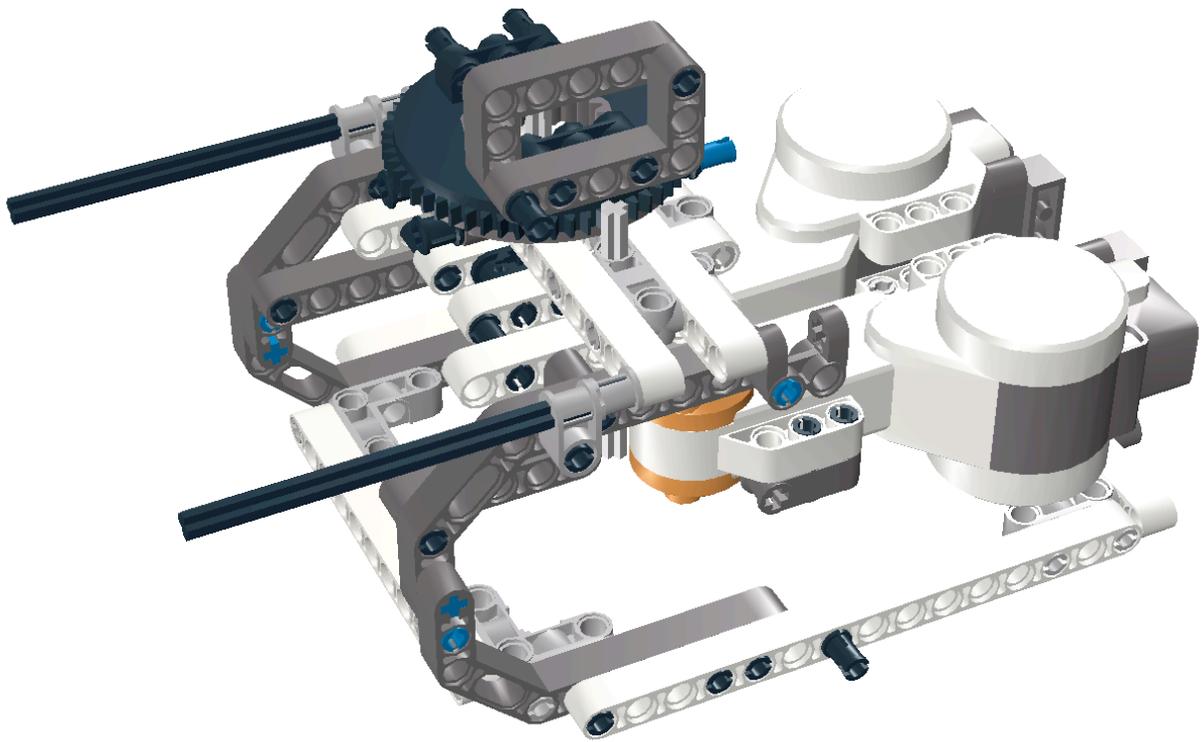
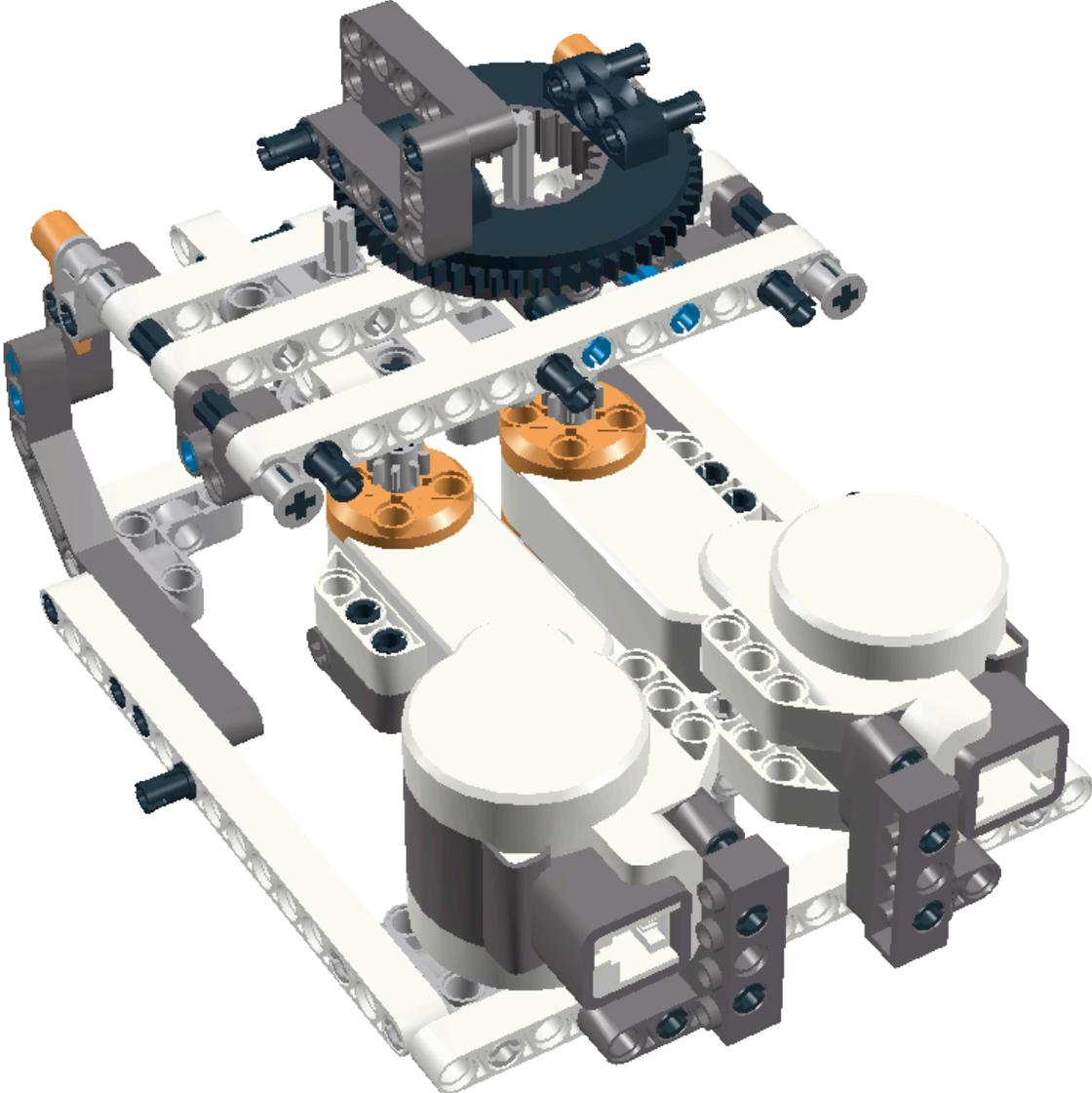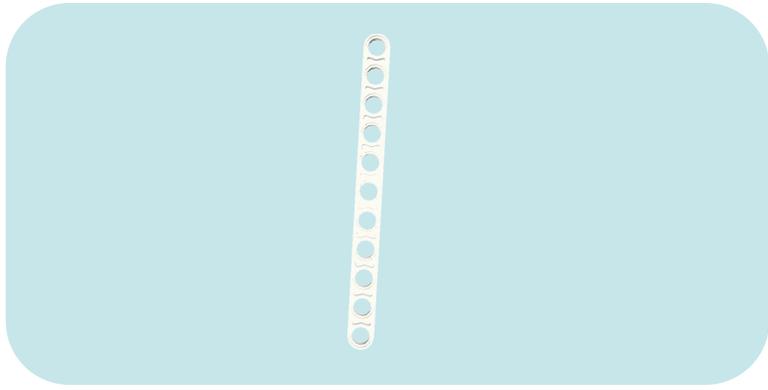* Don't snap any pieces together - simply rest the top portion onto the two vertical gray axels

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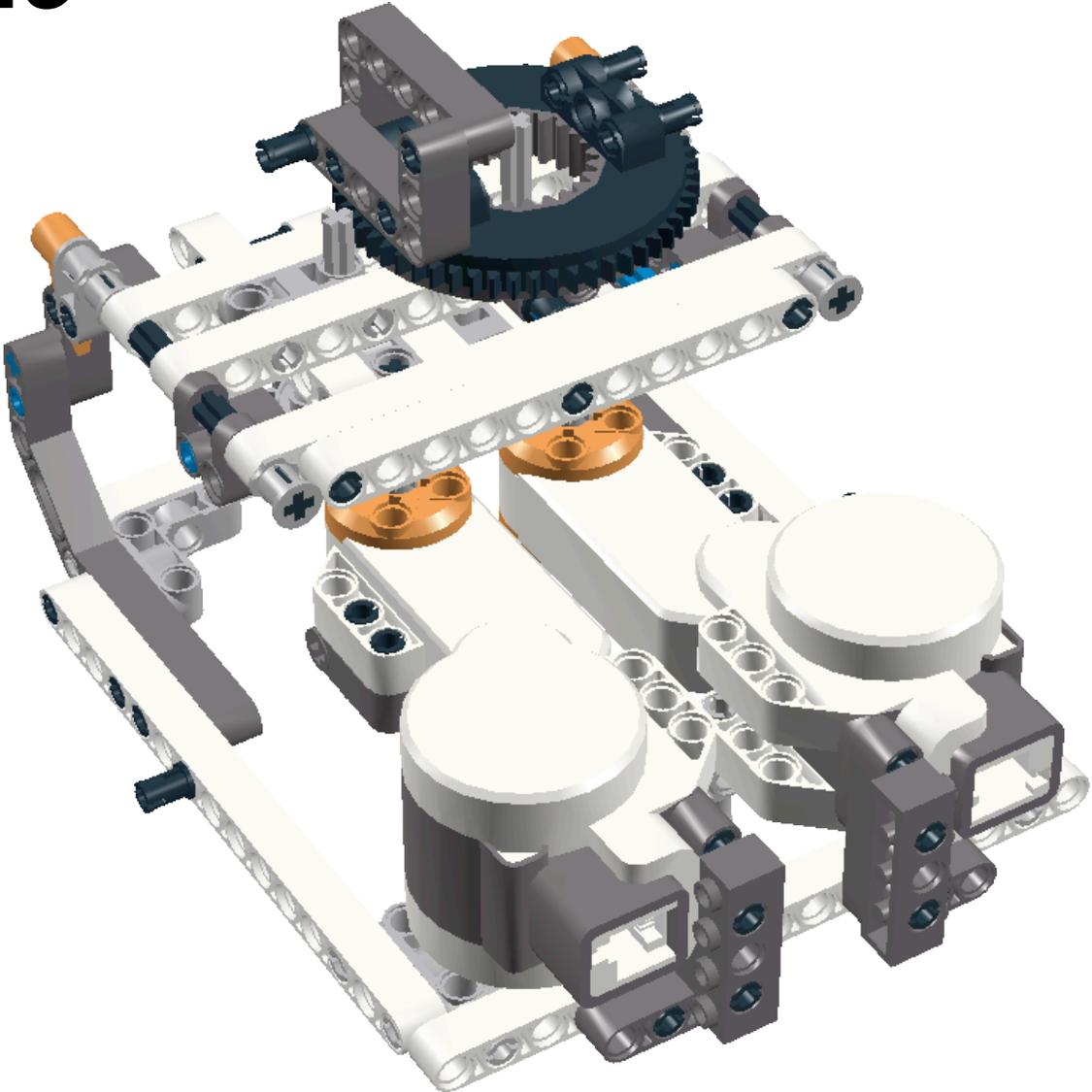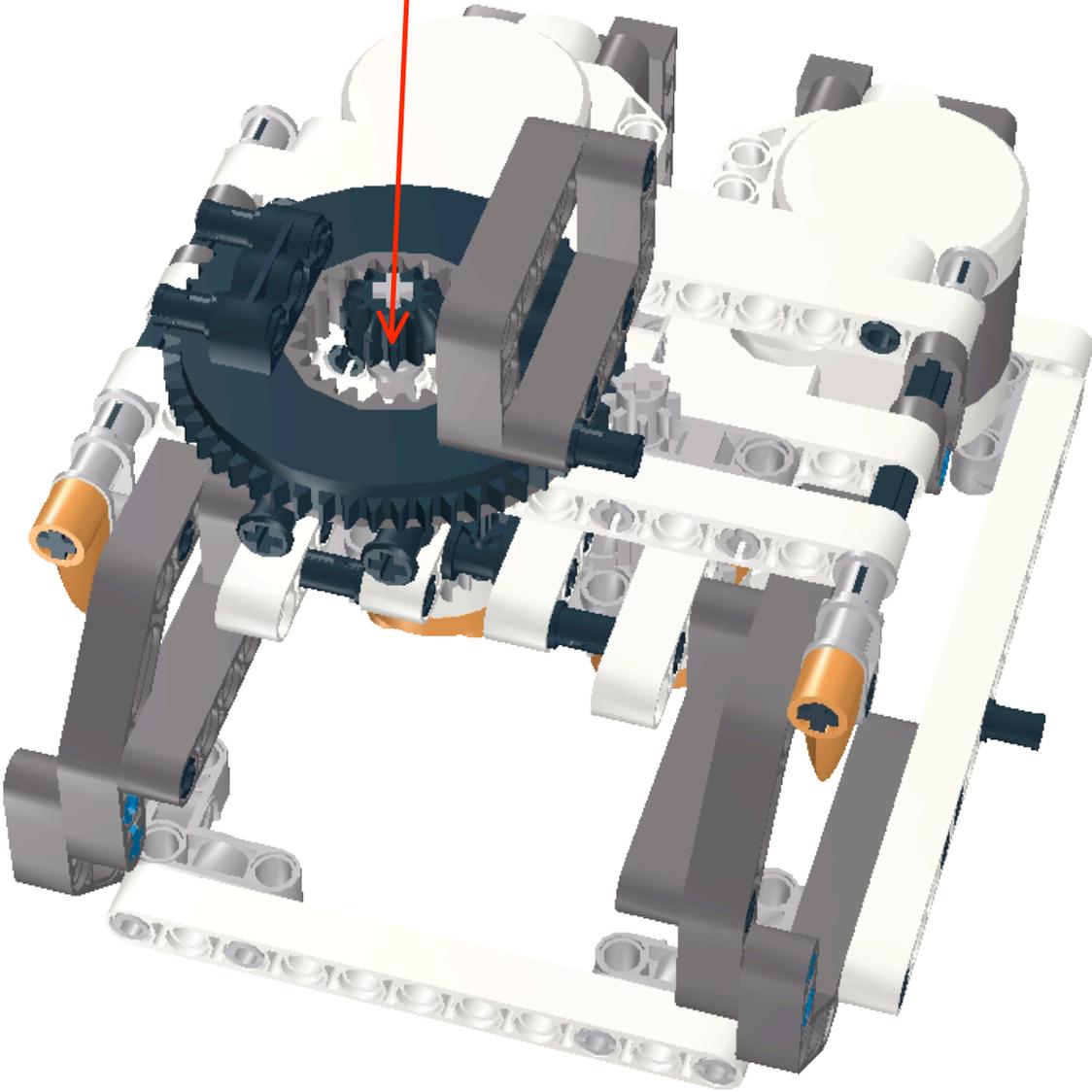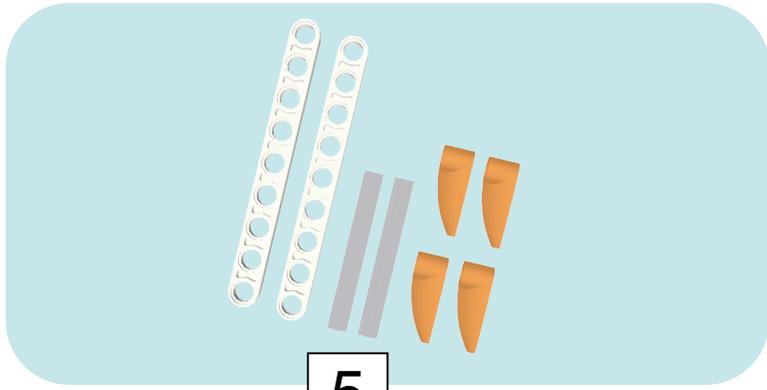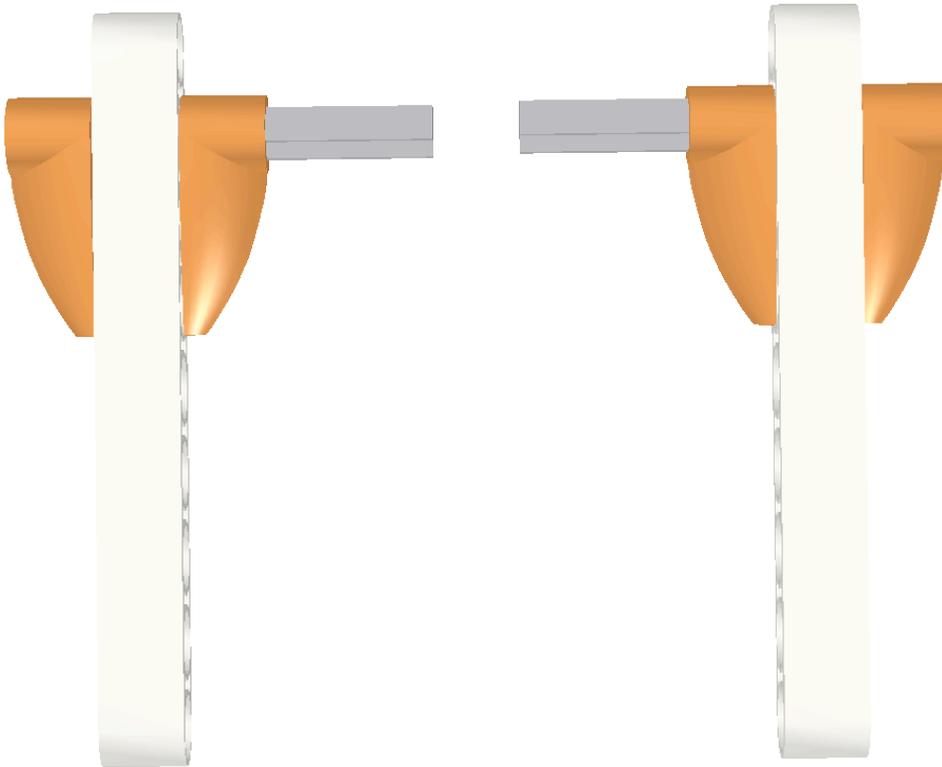* Push the two horizontal black axels through, then add the orange pieces

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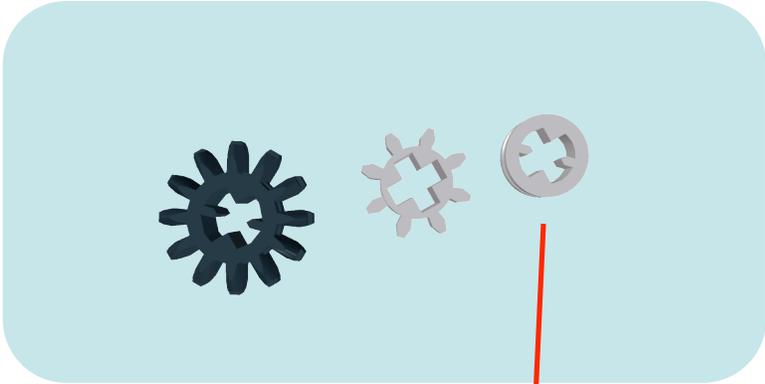
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* This piece goes under the black gear

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32

Alternate view:

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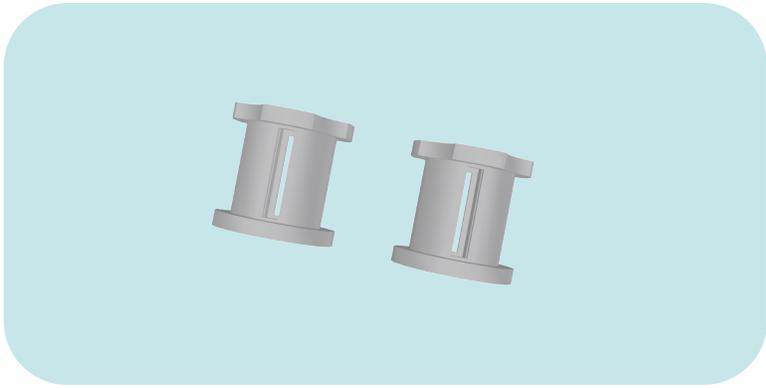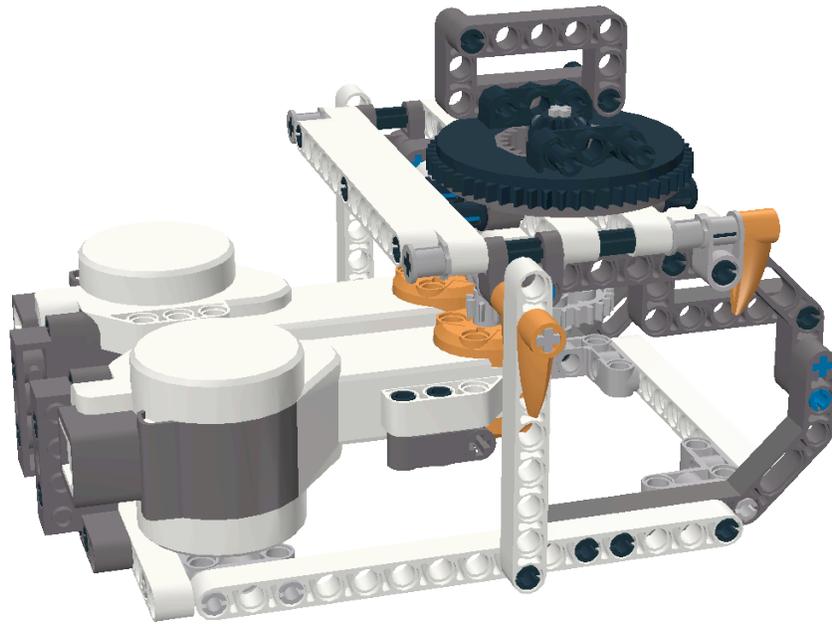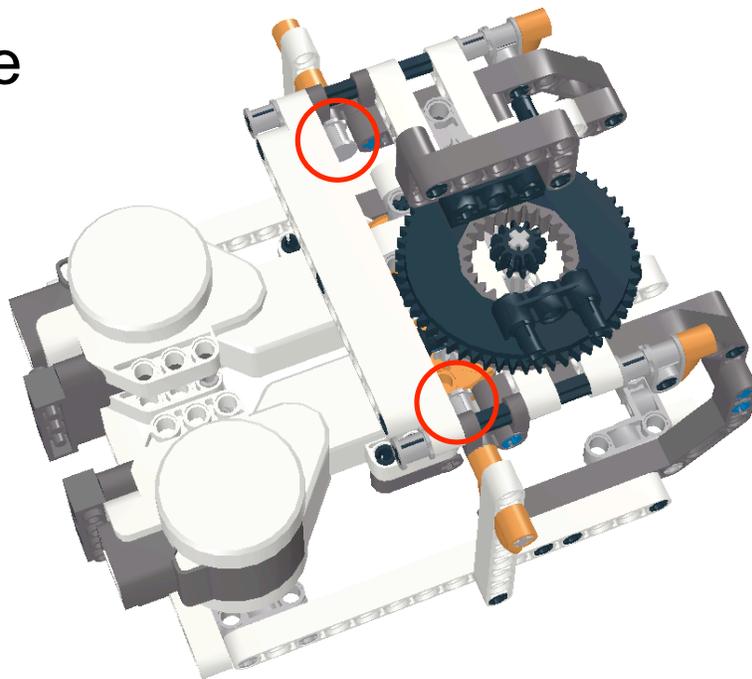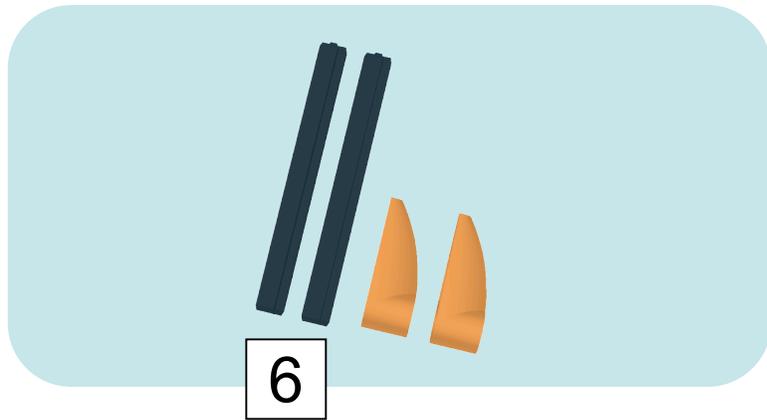
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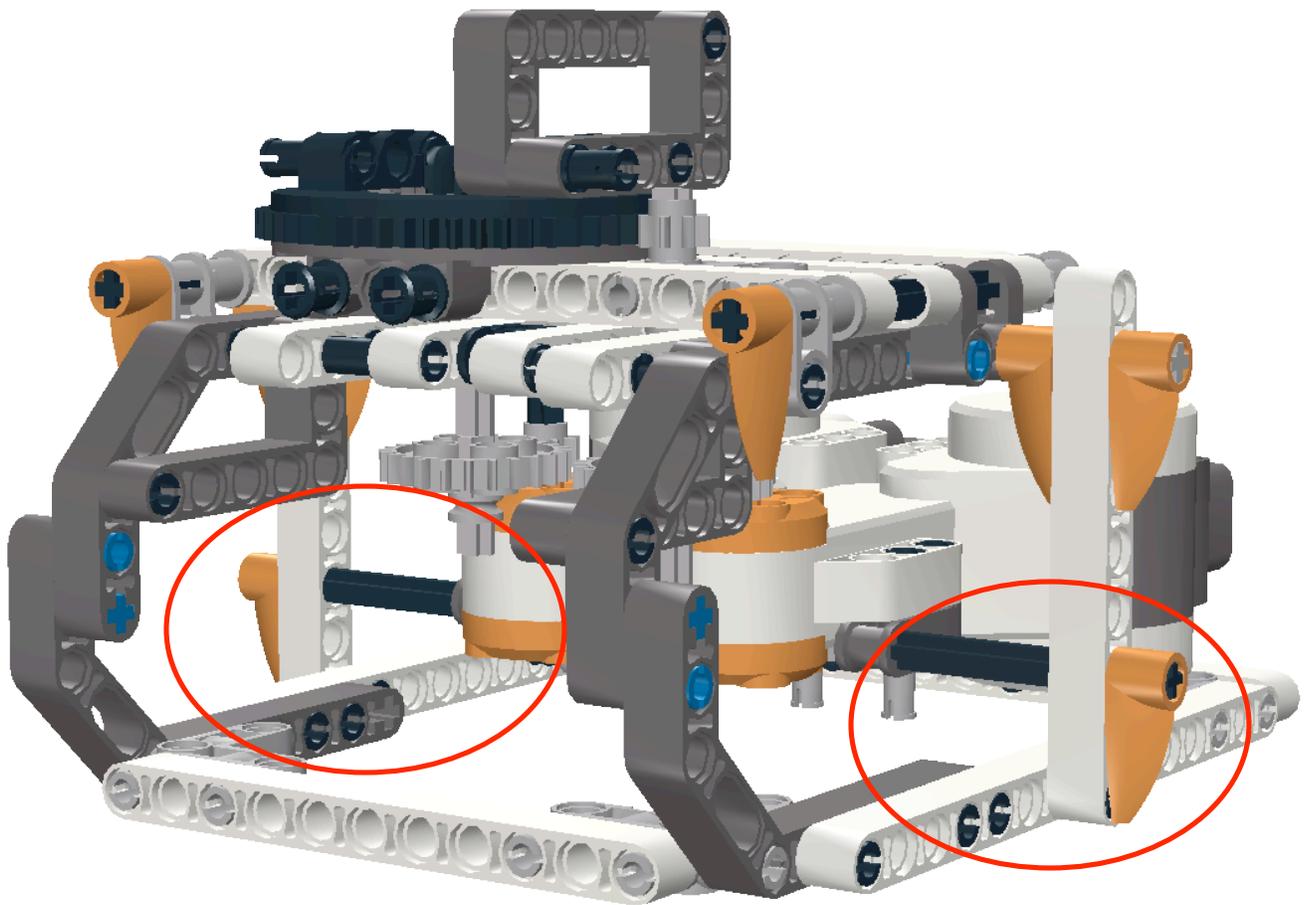
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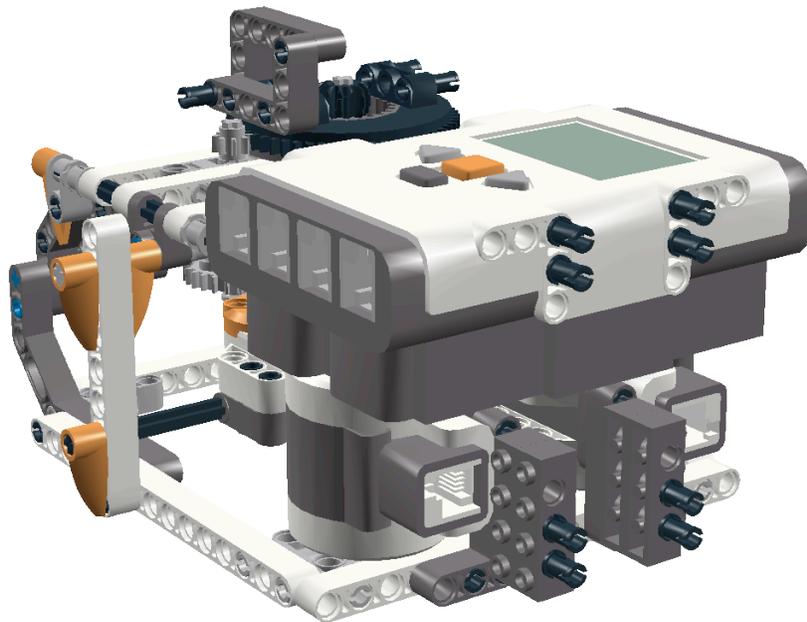
Alternate
view:

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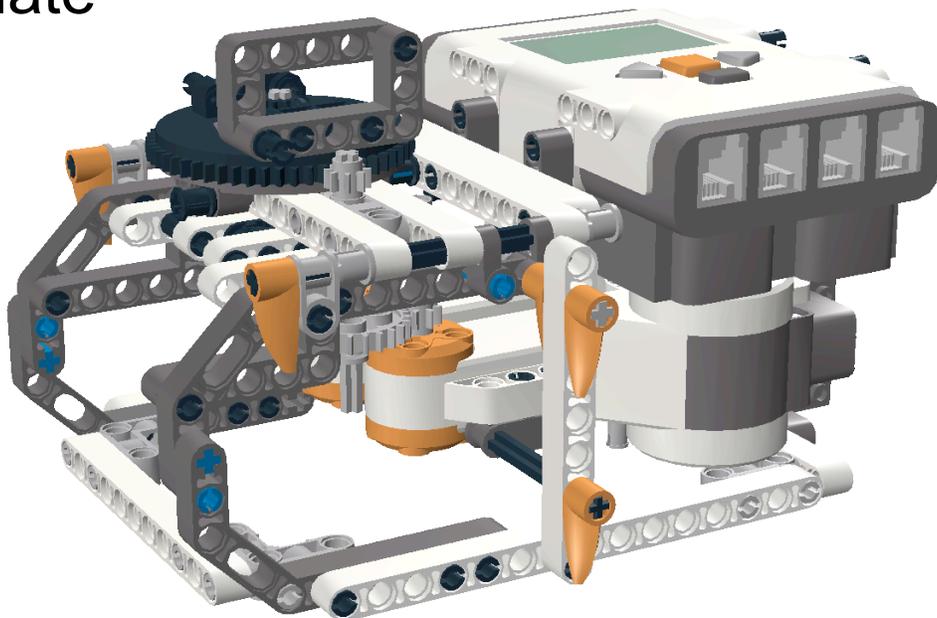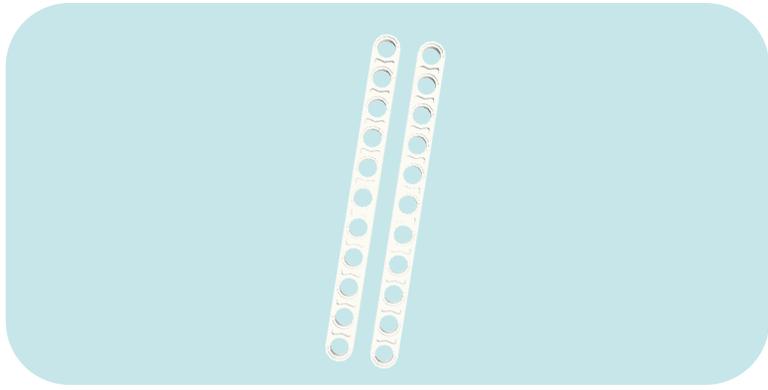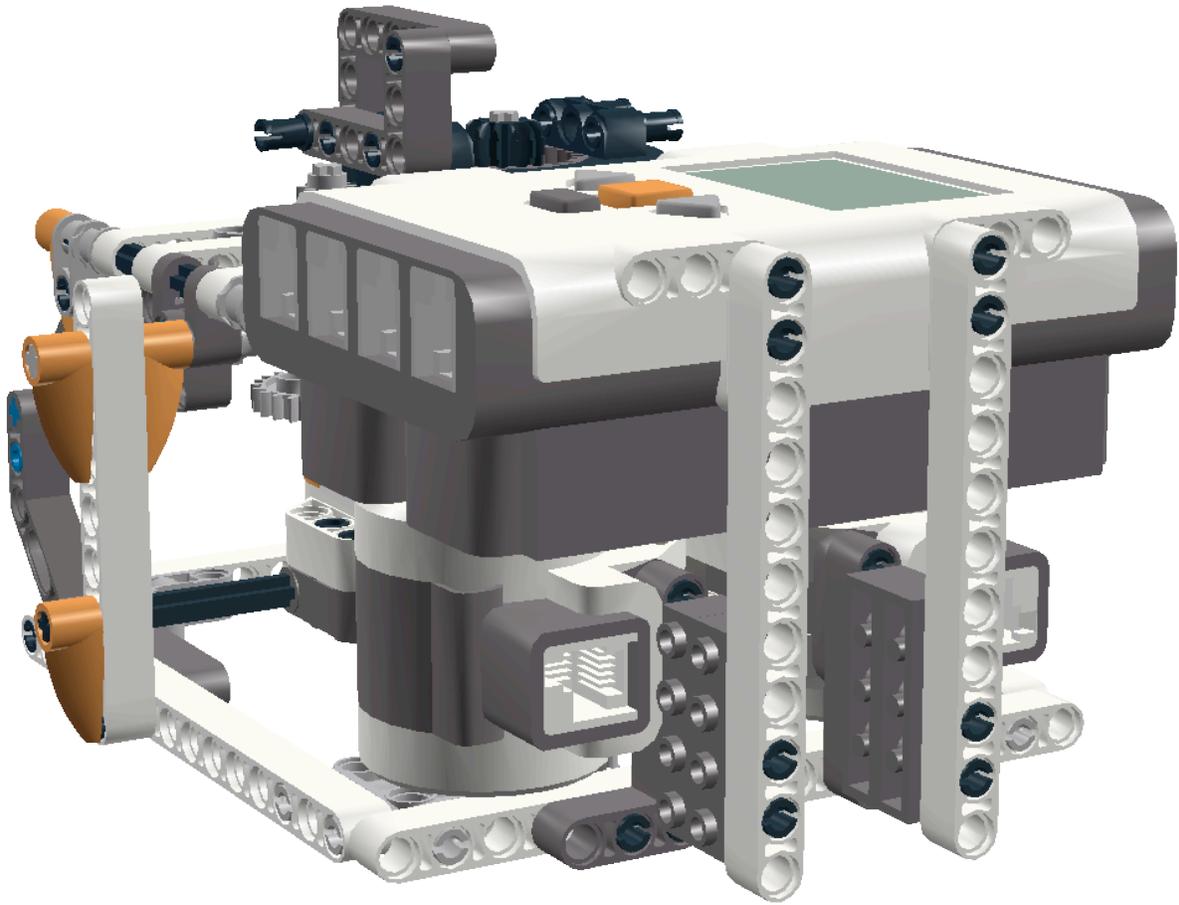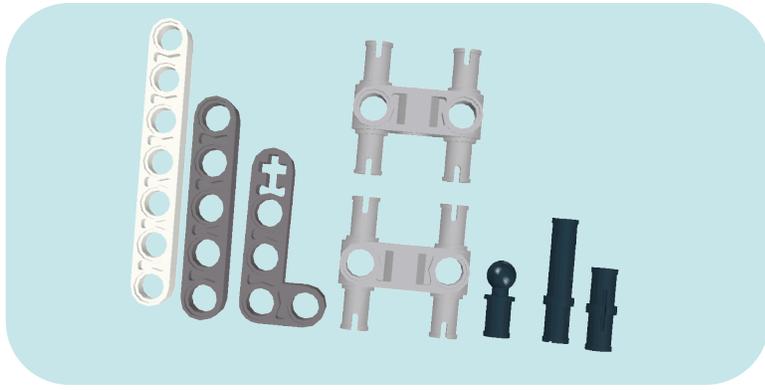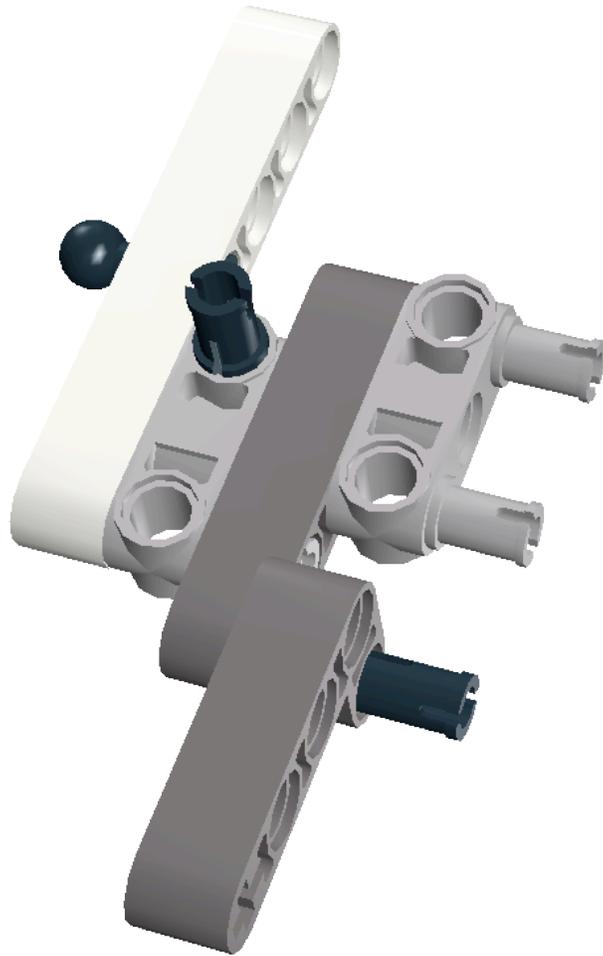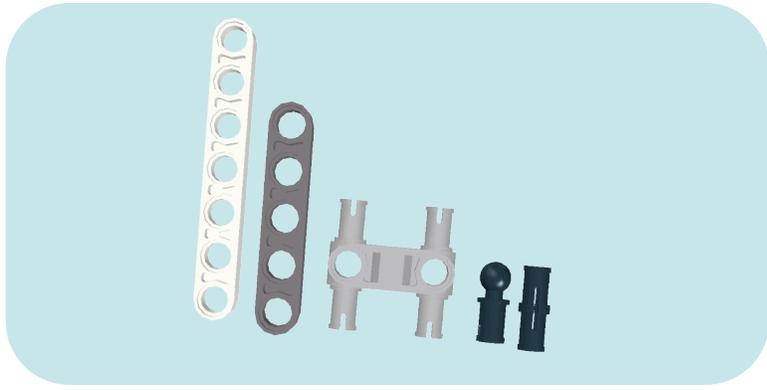
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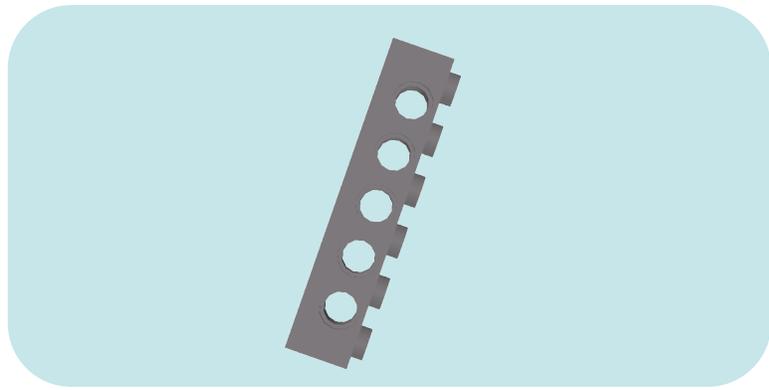
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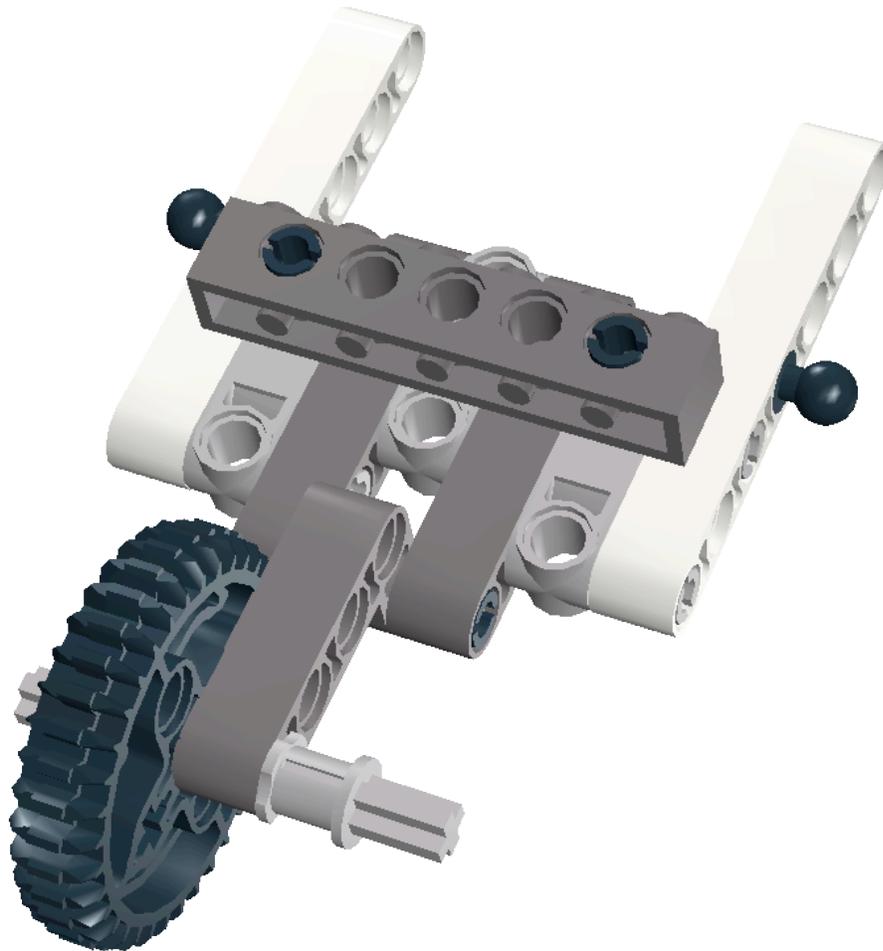
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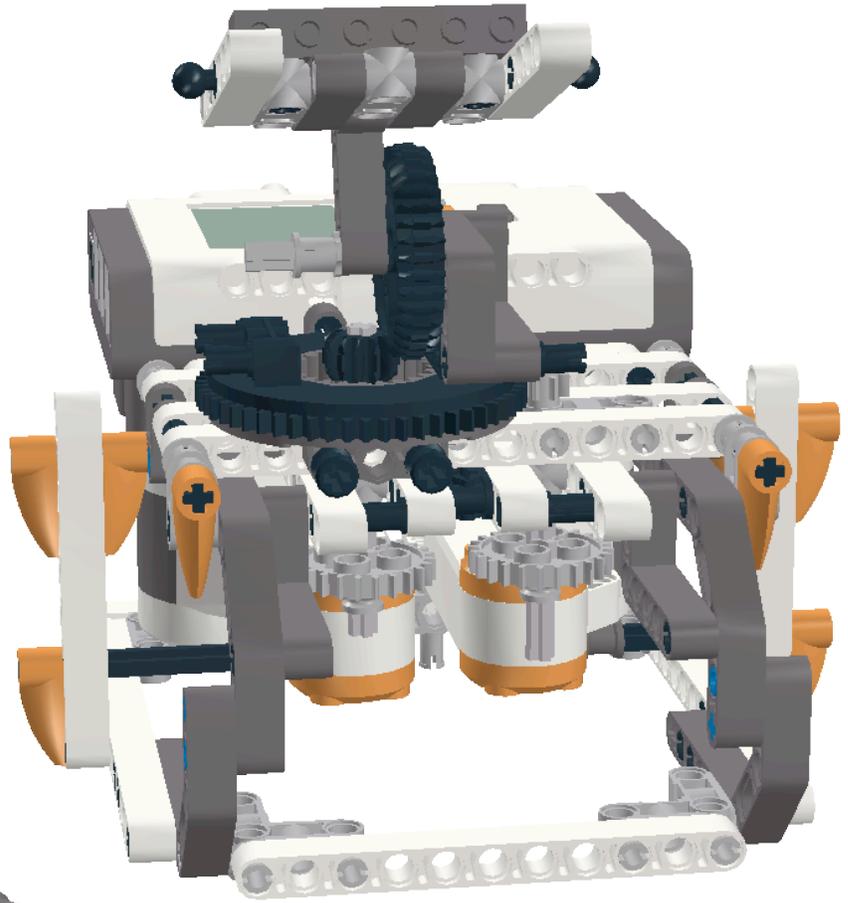
Alternate
view:
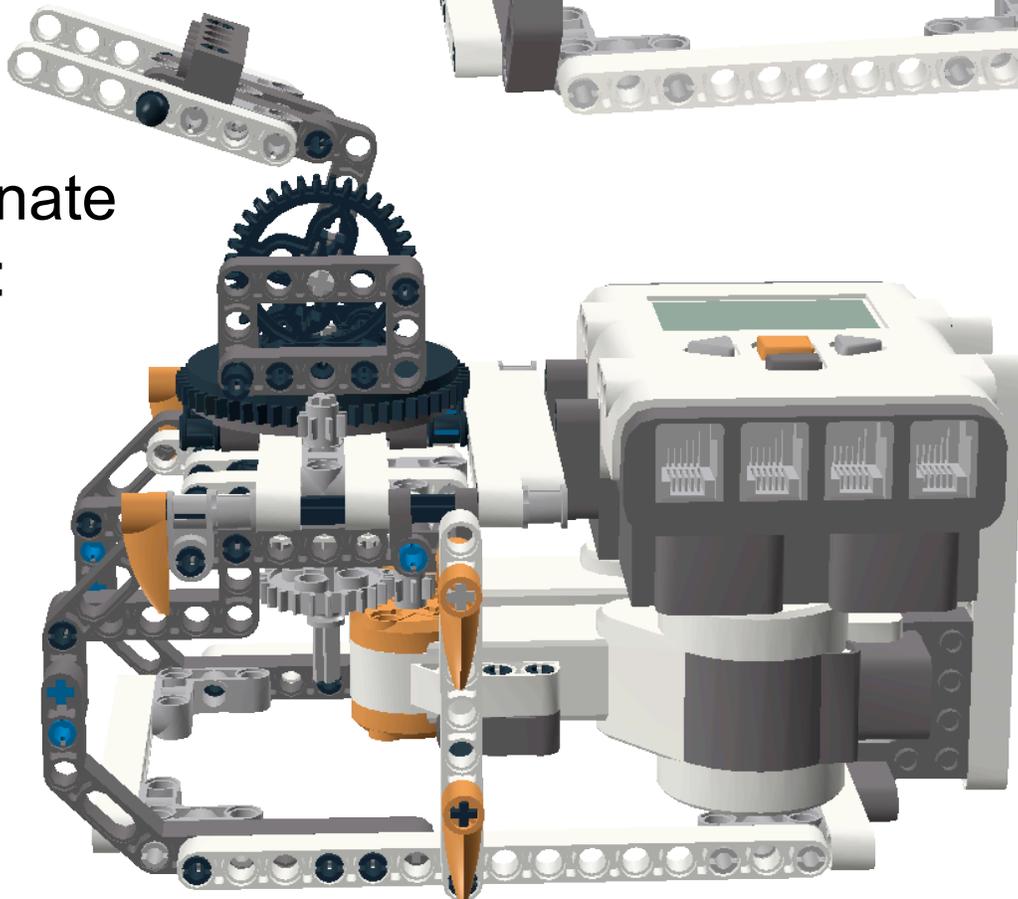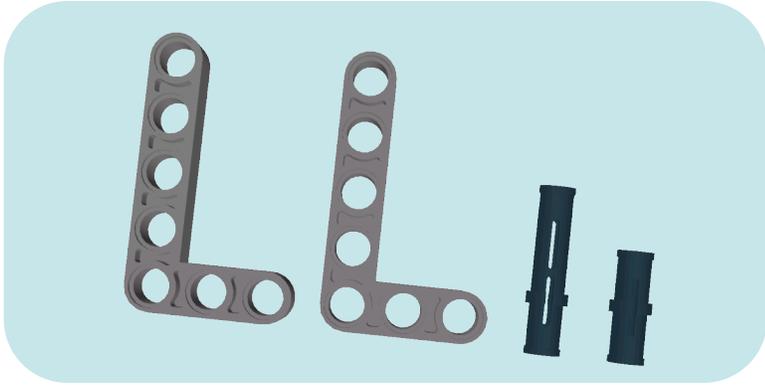
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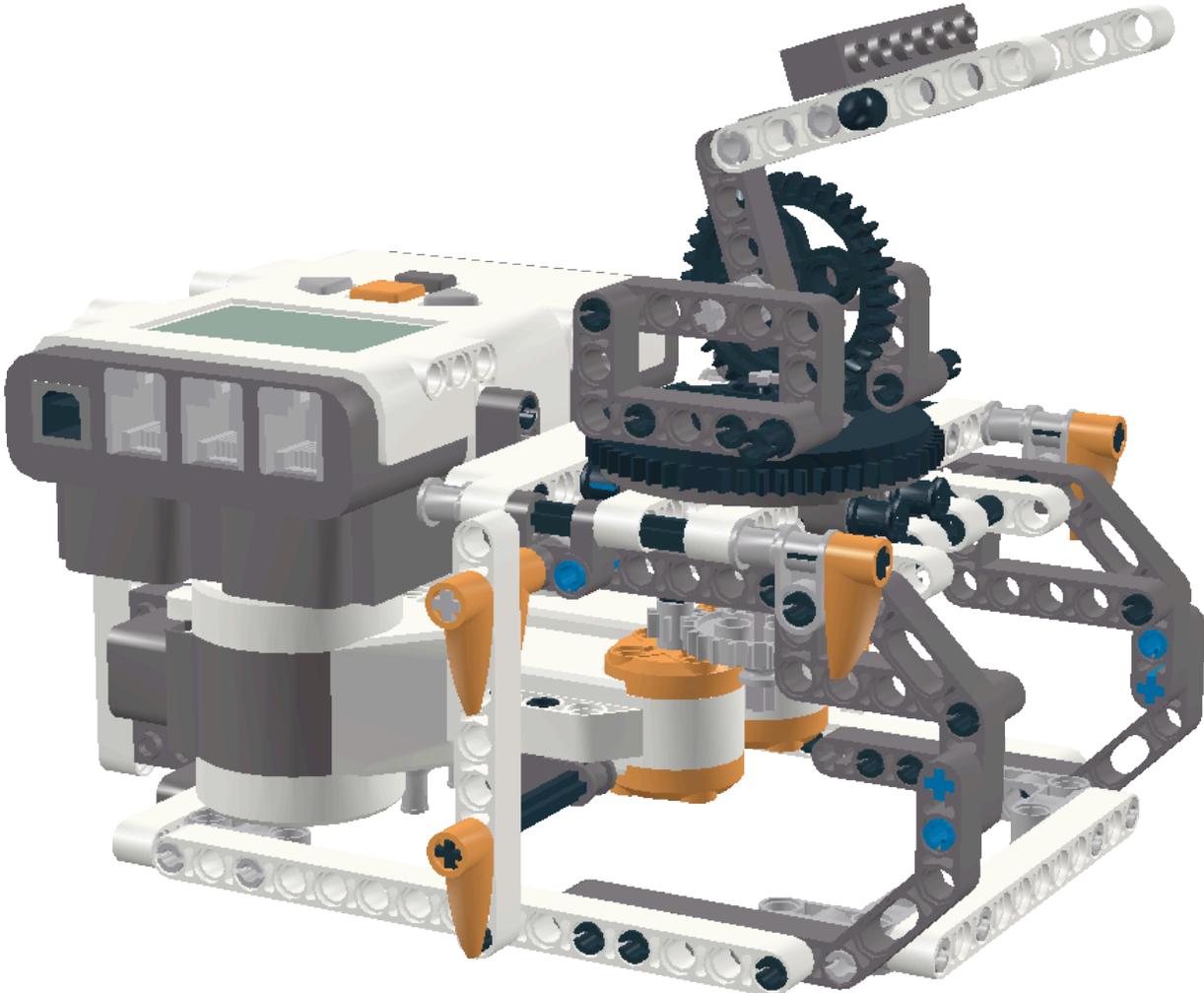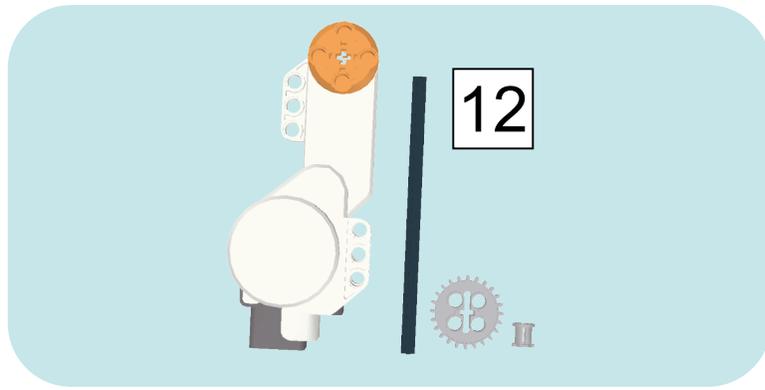
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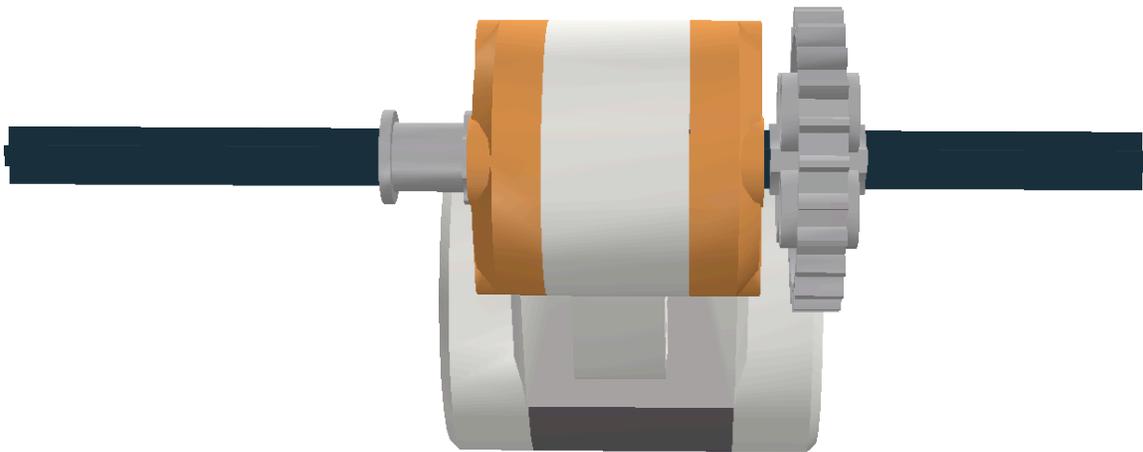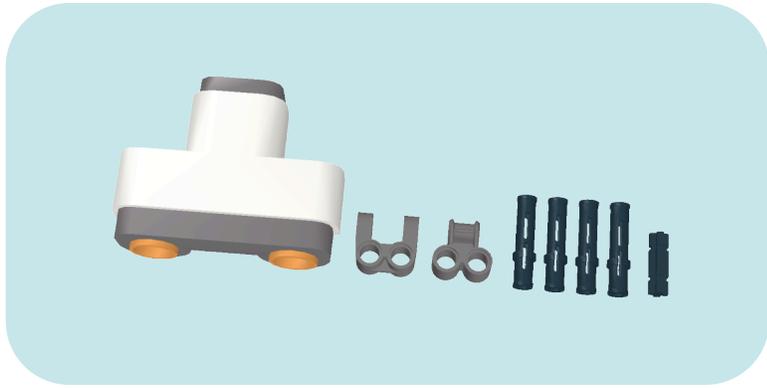
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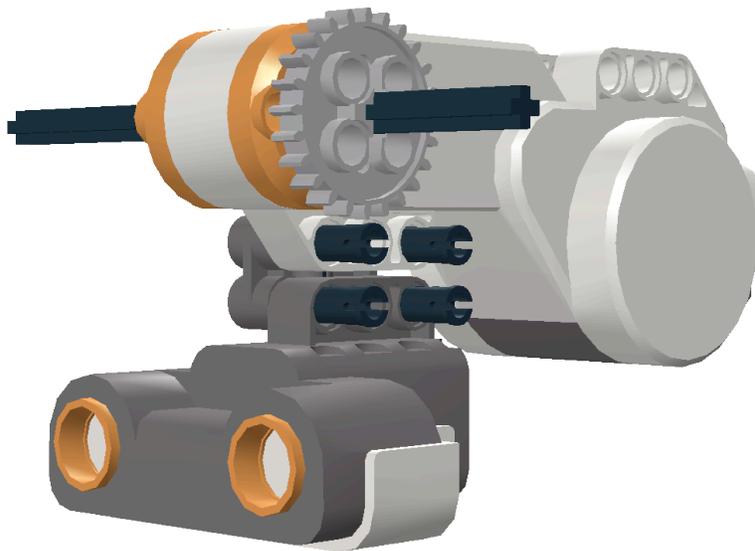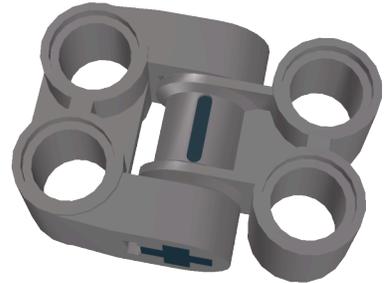
Alternate view:

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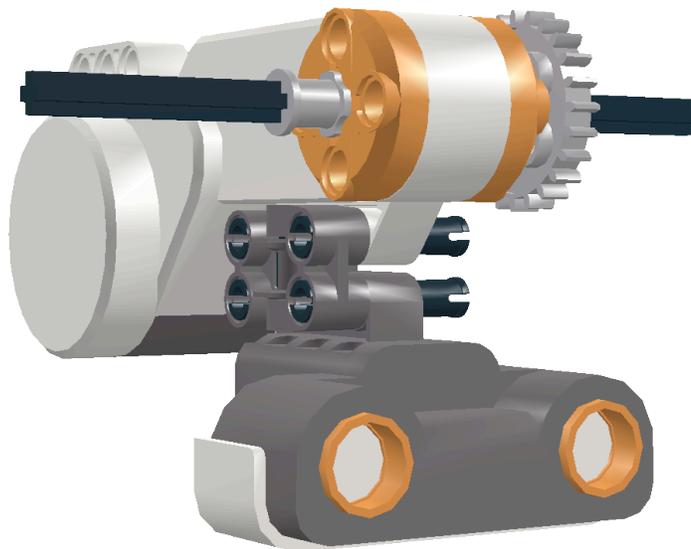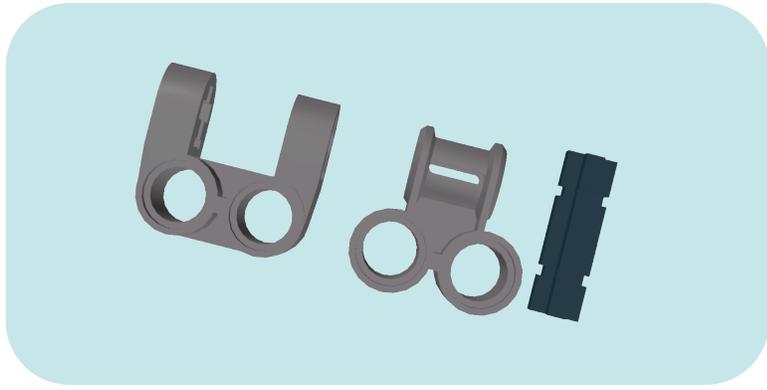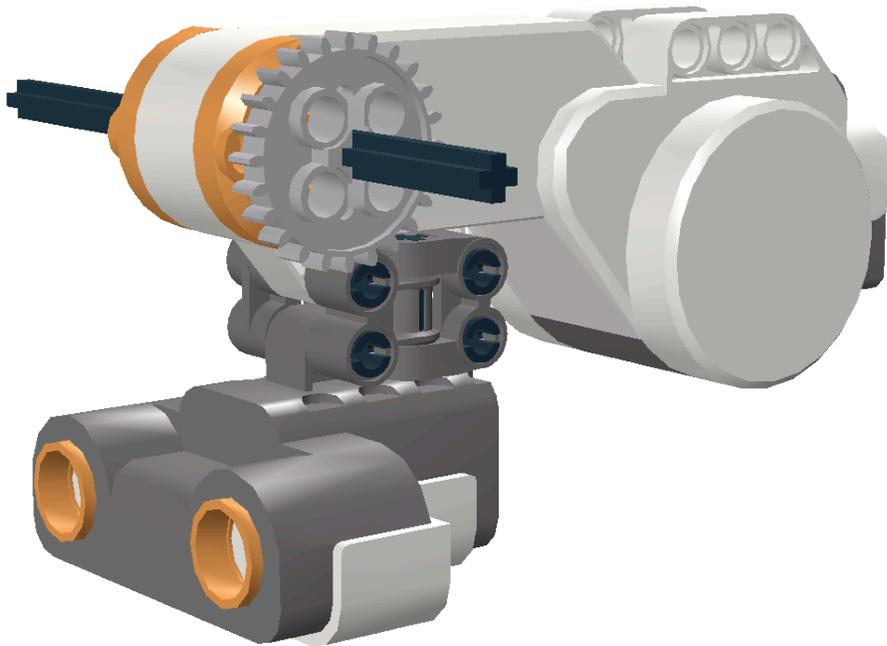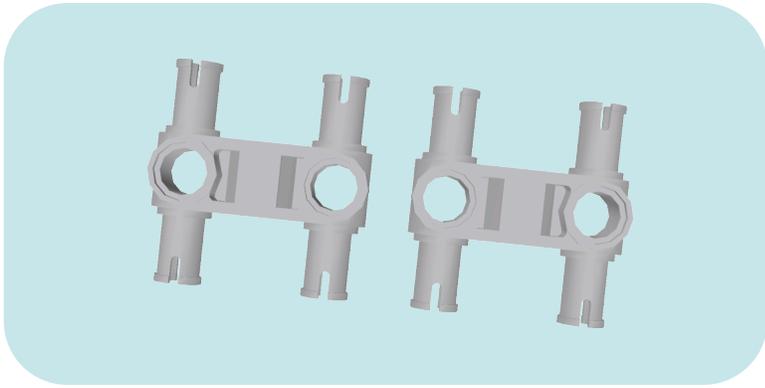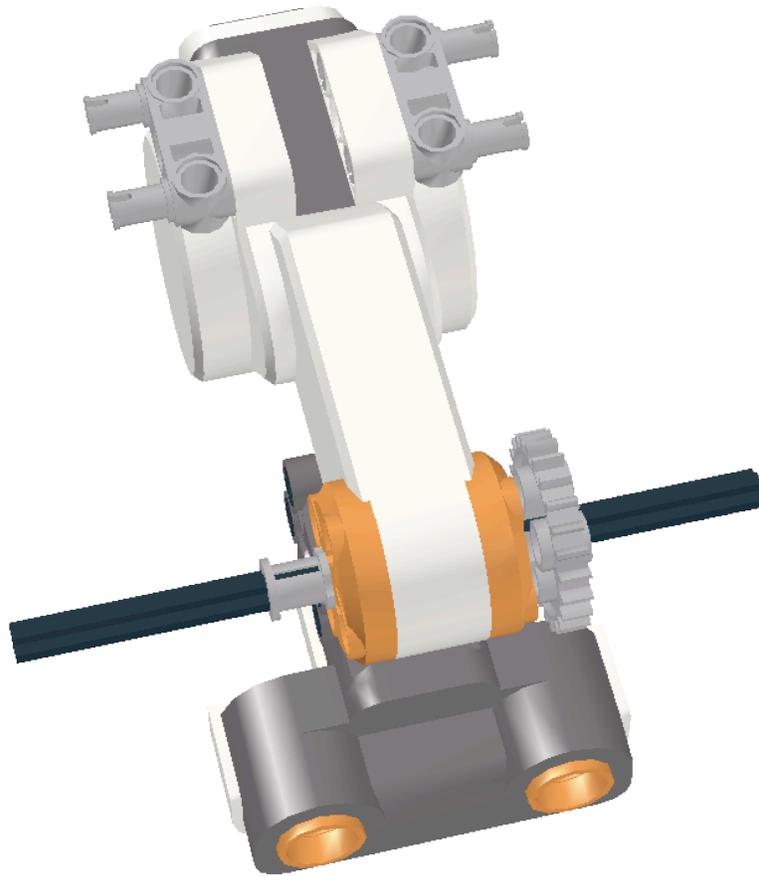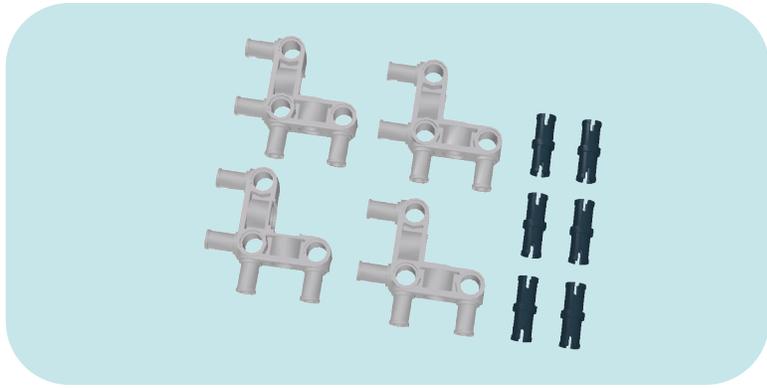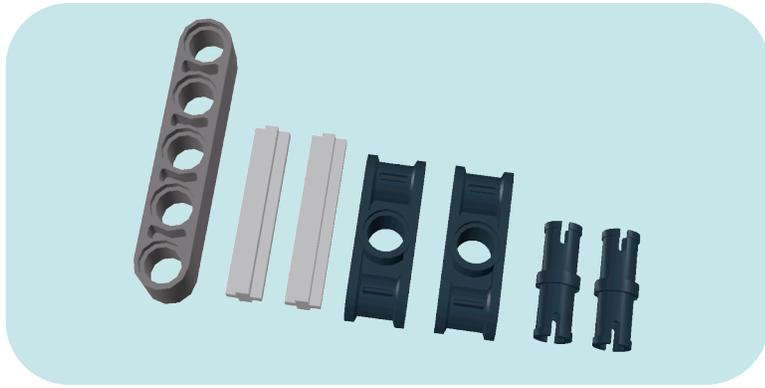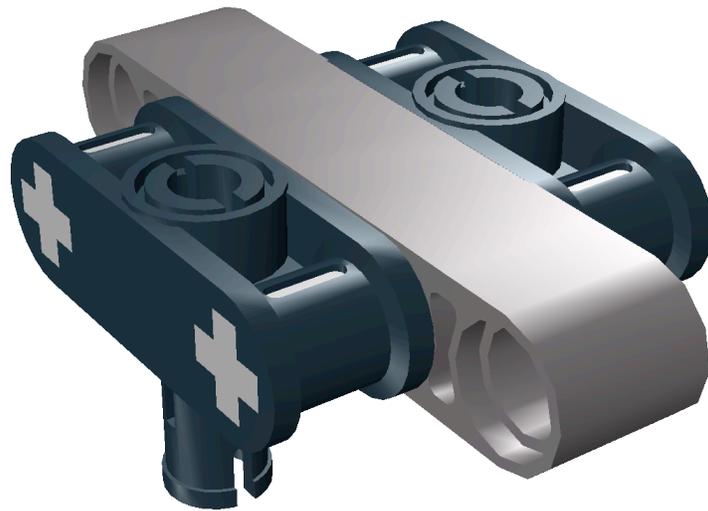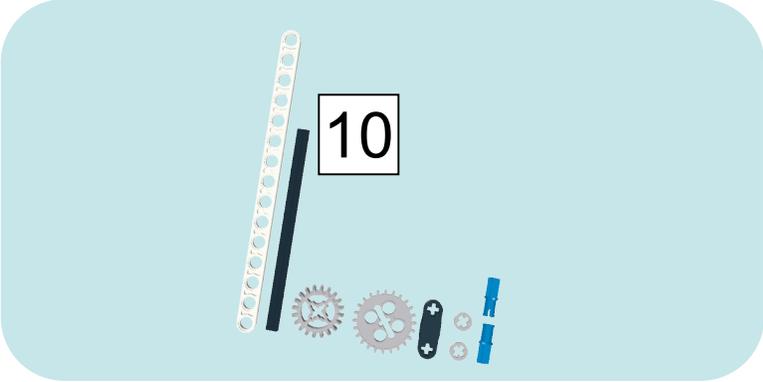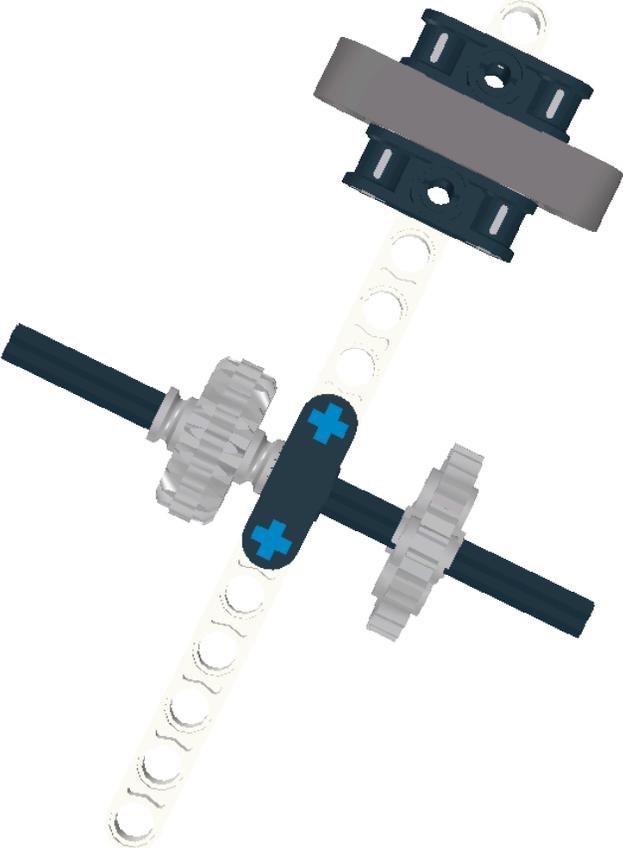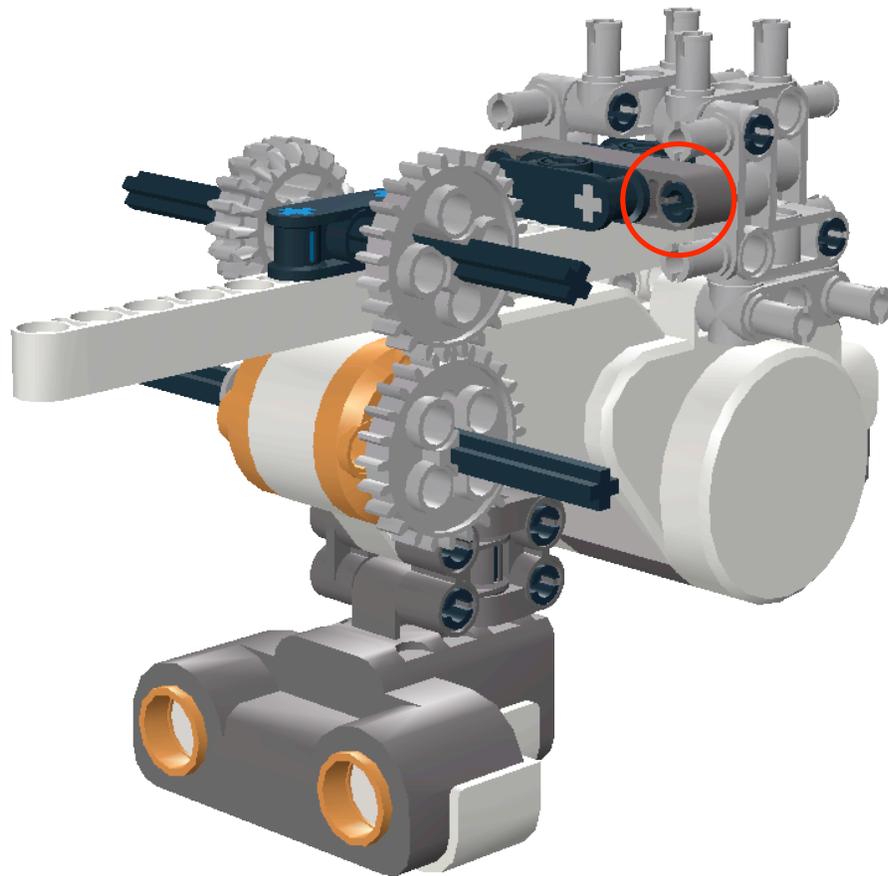
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Alternate
view:
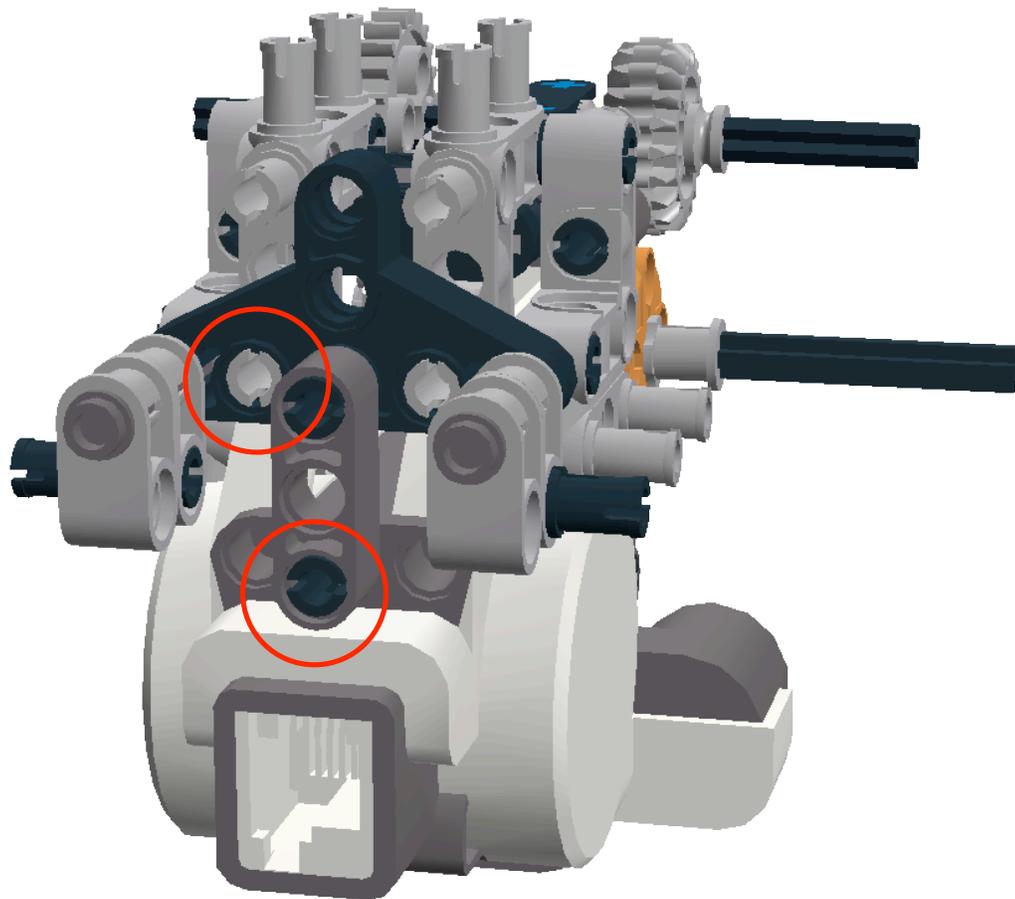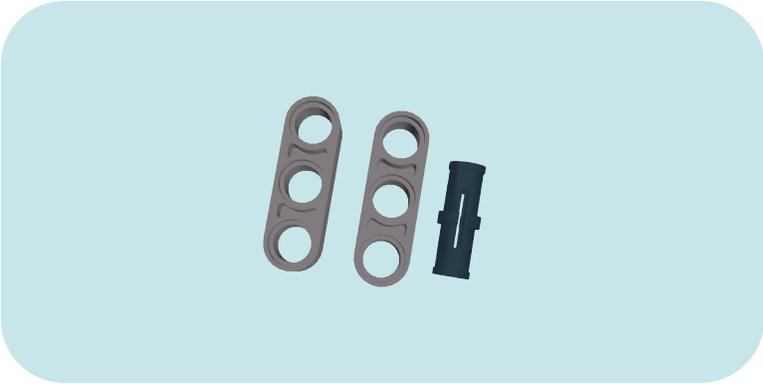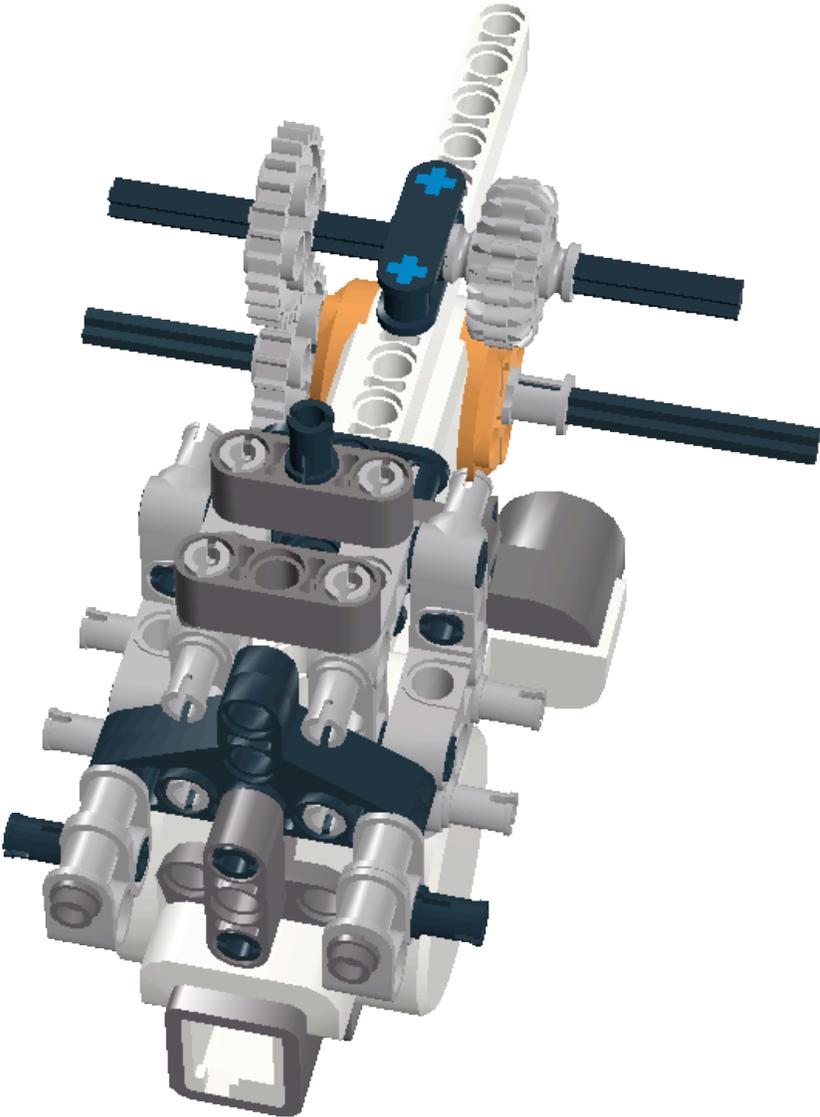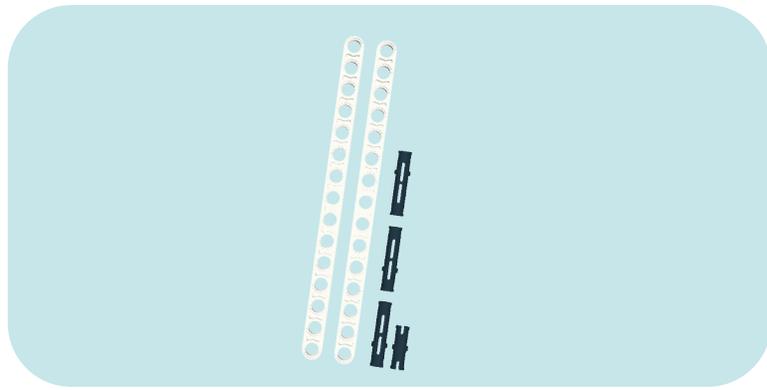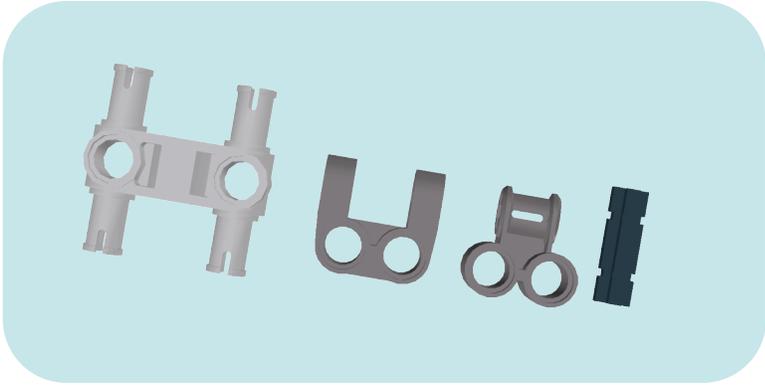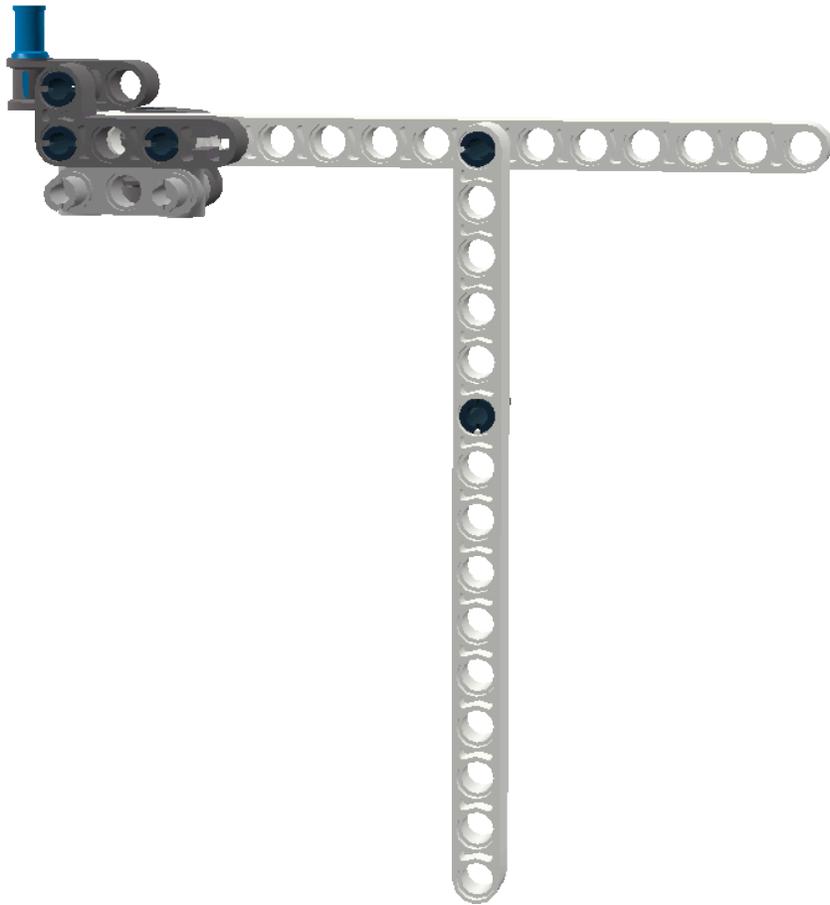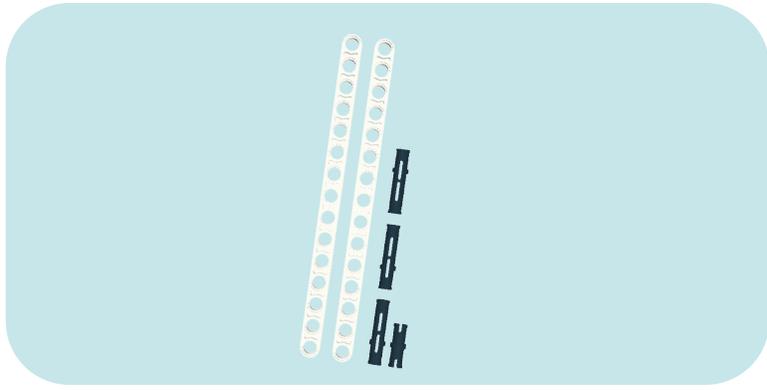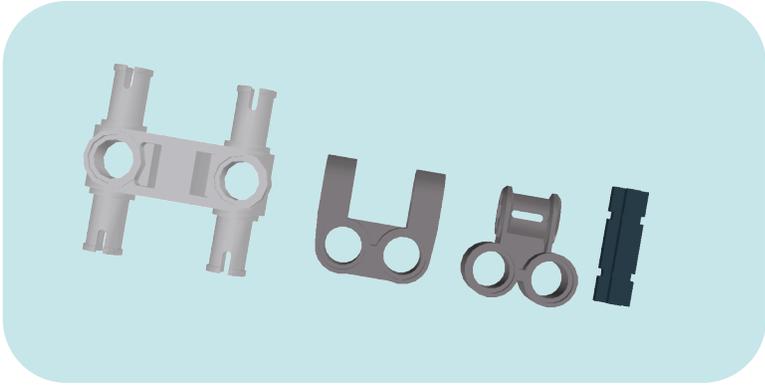
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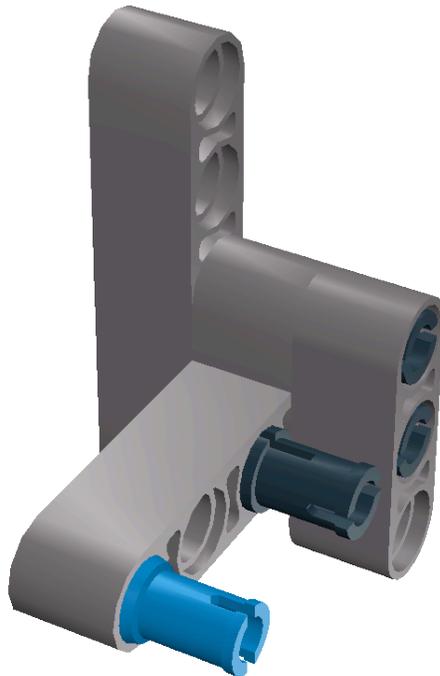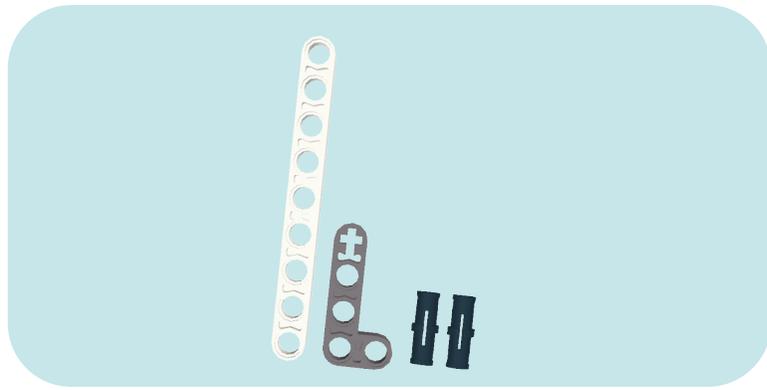
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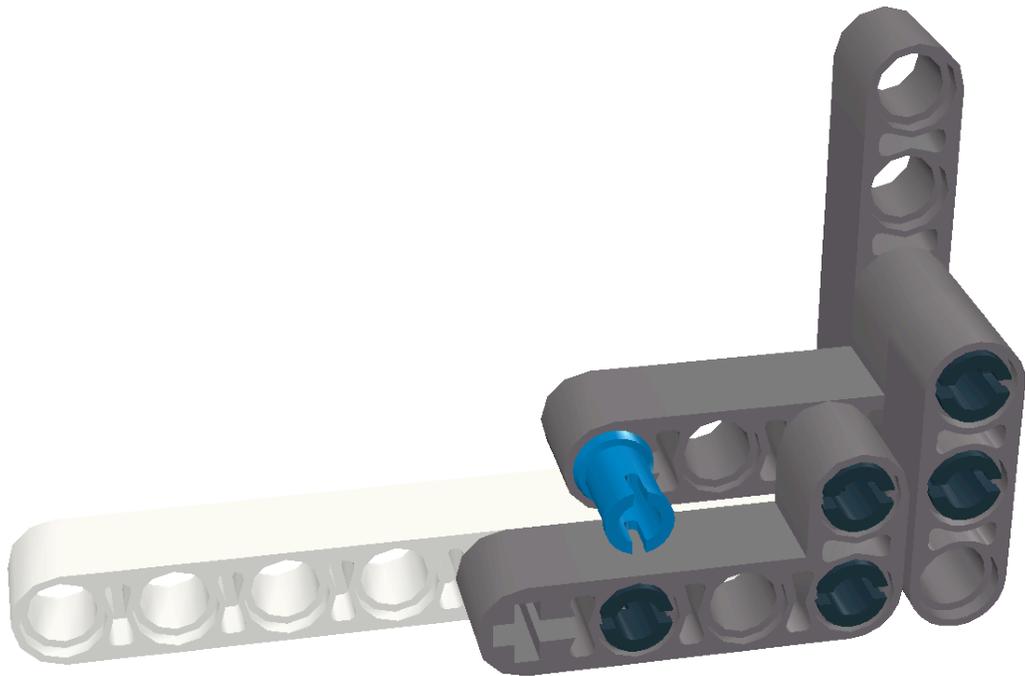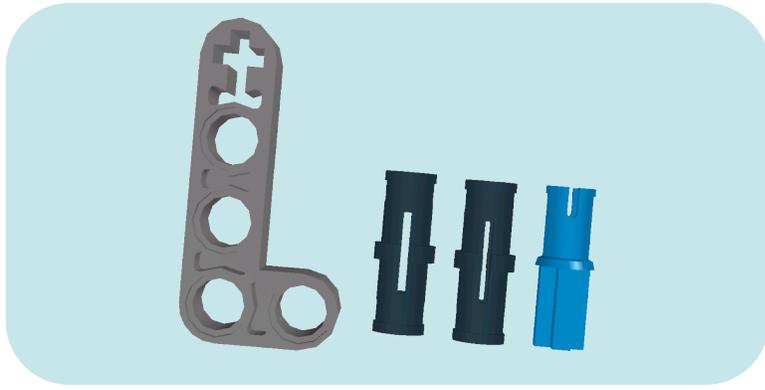
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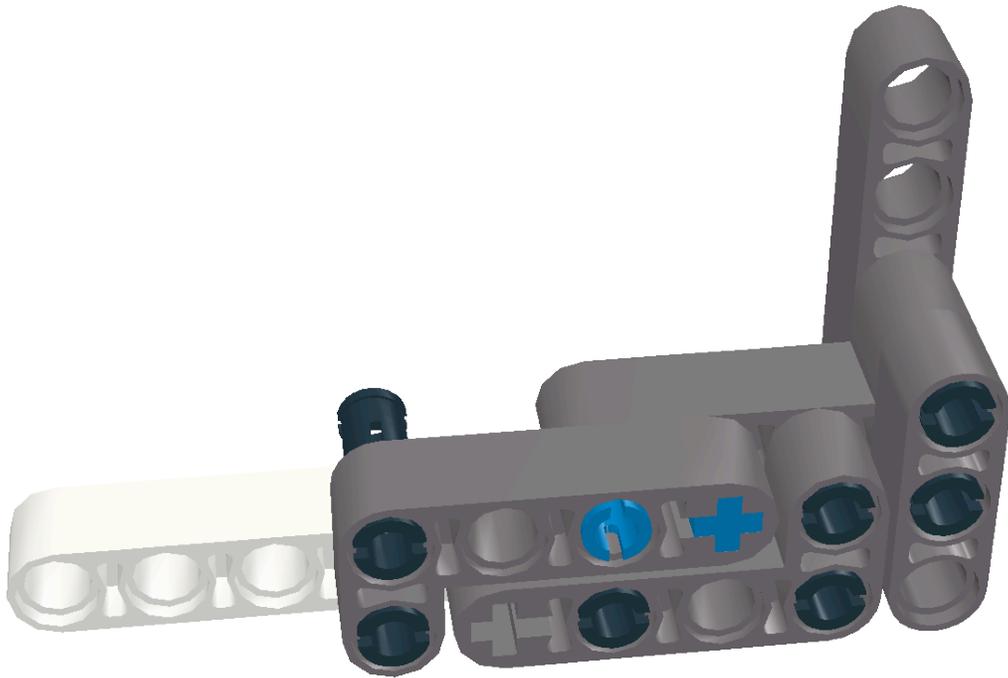
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View from below:
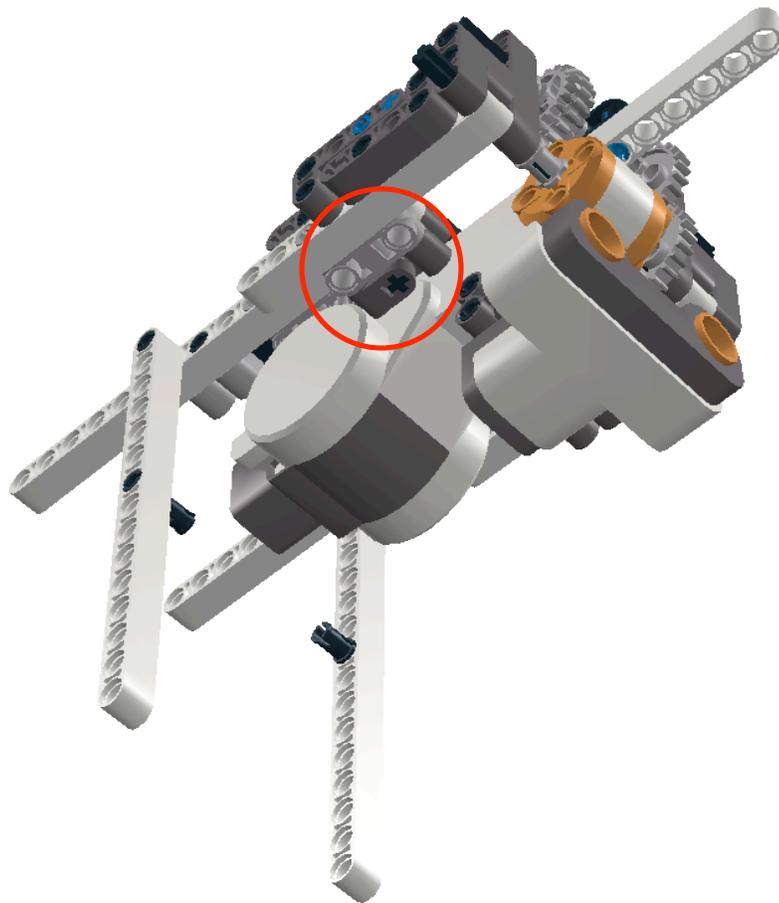
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Ultrasonic sensor

Motor C

84

Motor A
(Motor B is the corresponding motor on the other side)
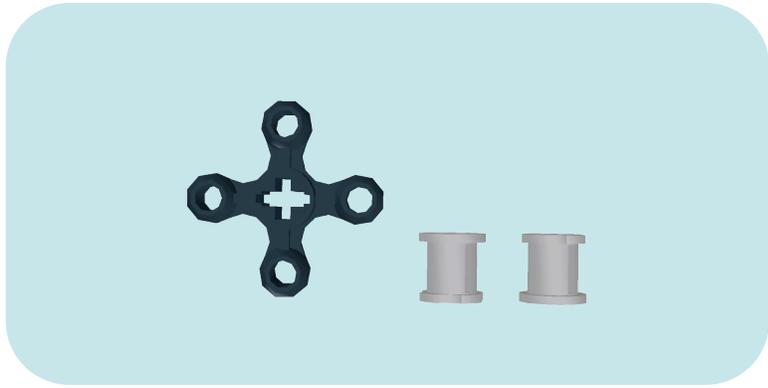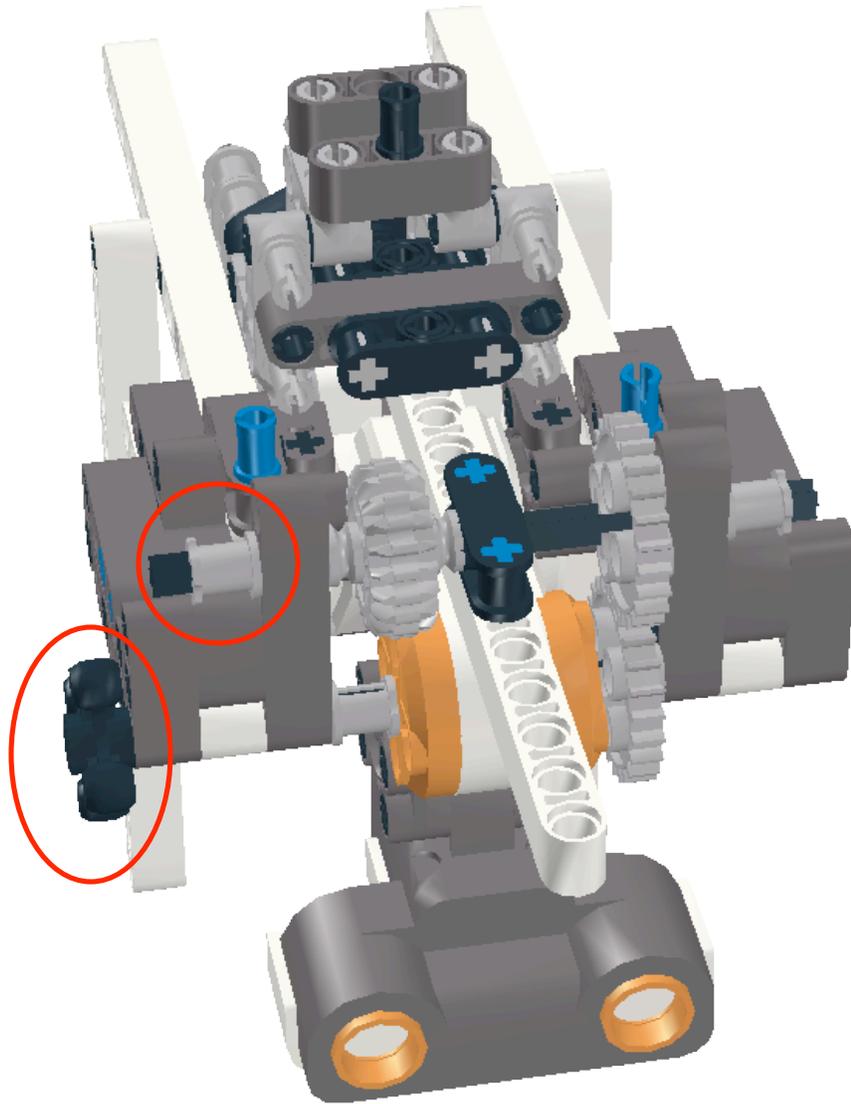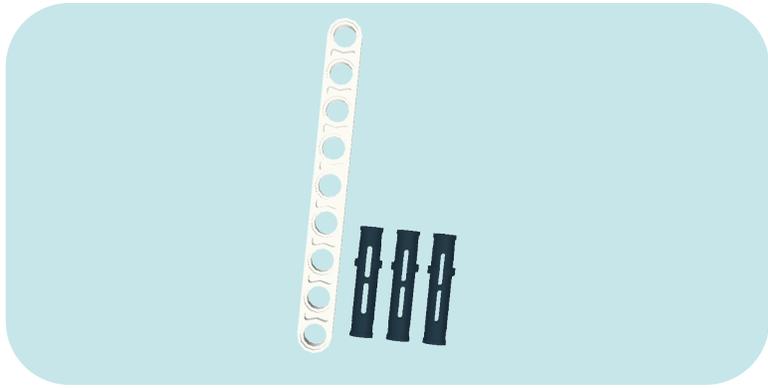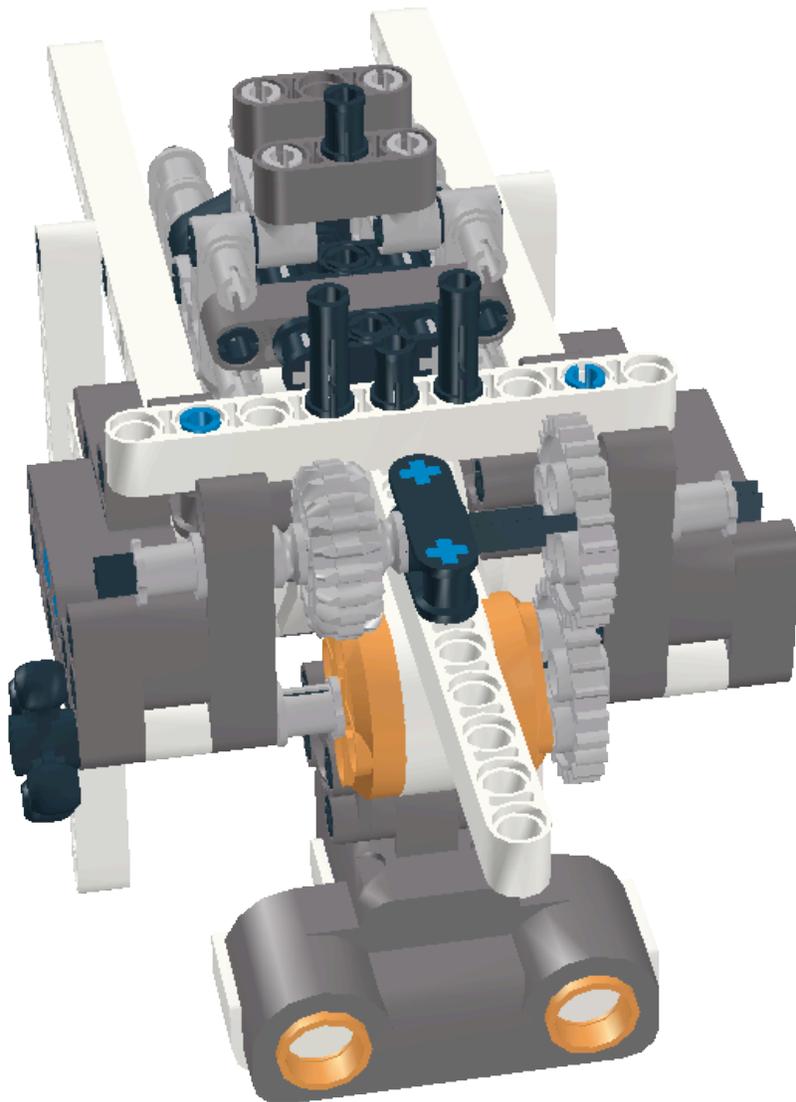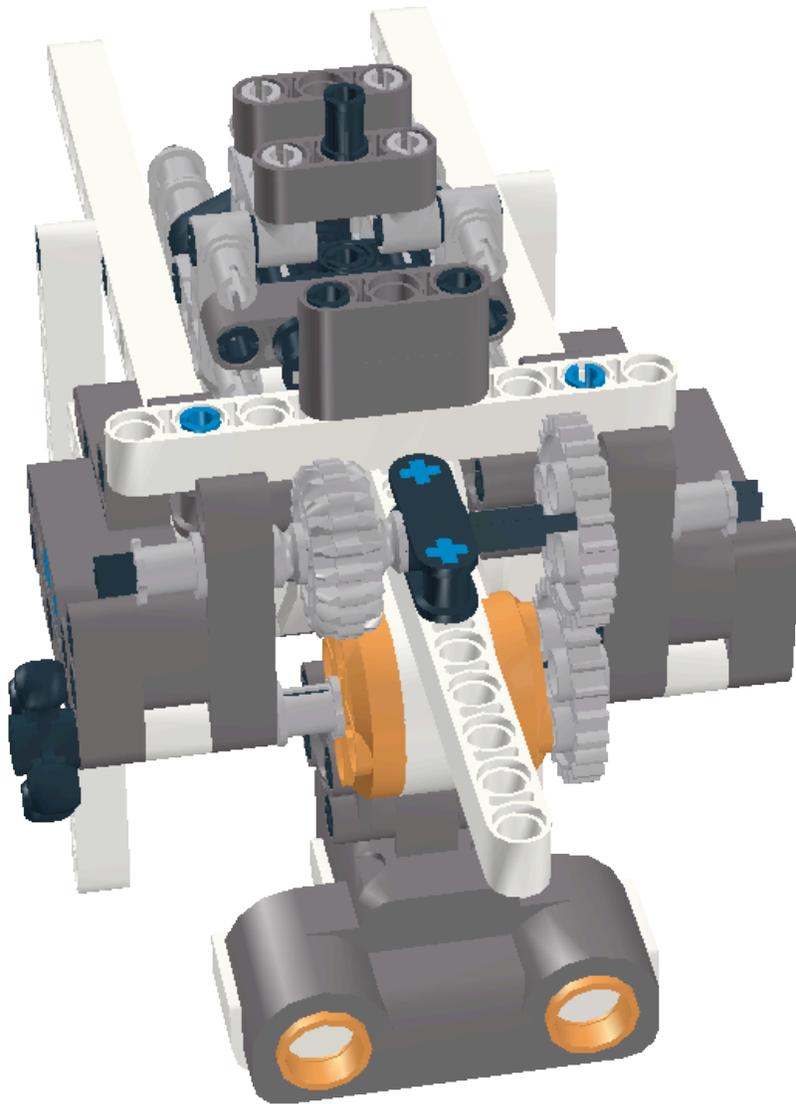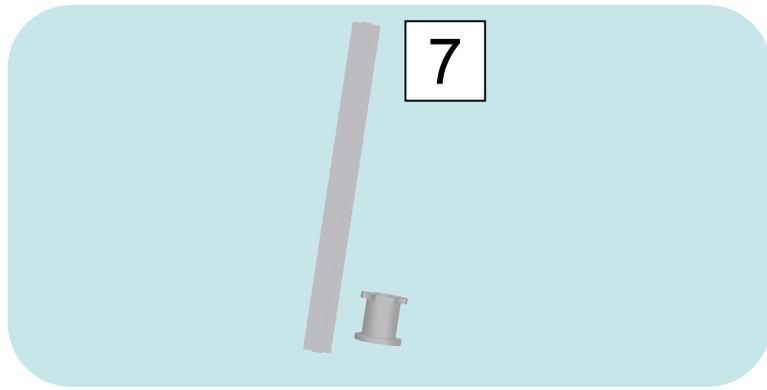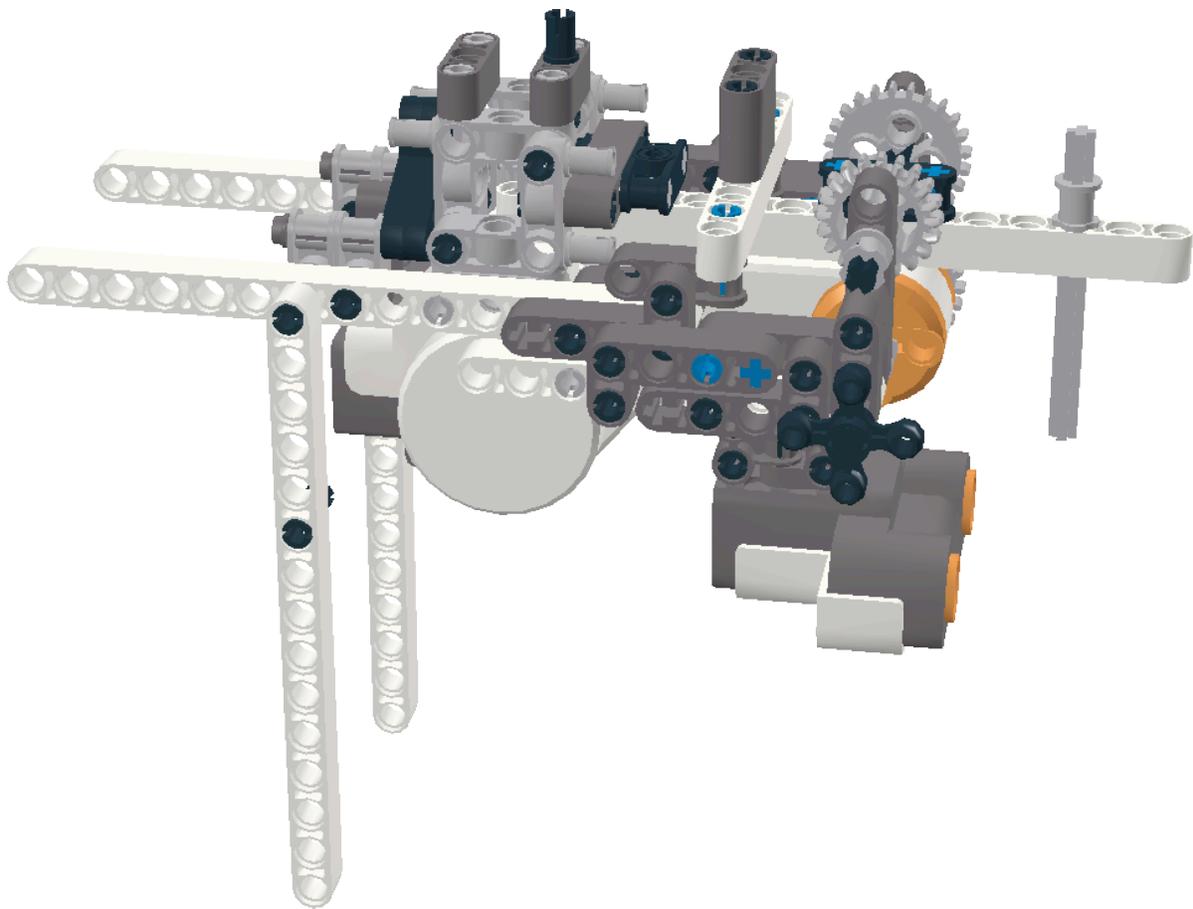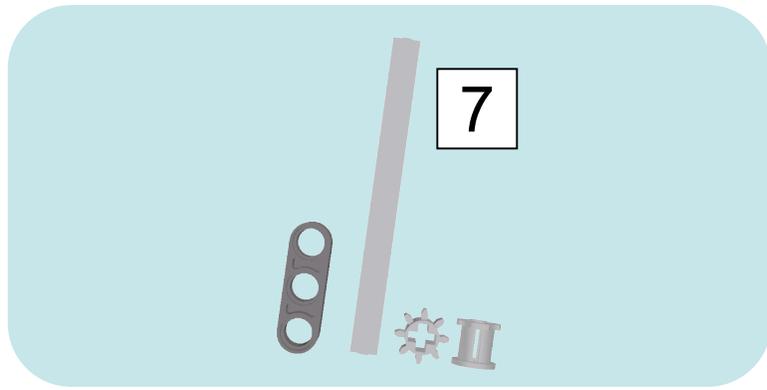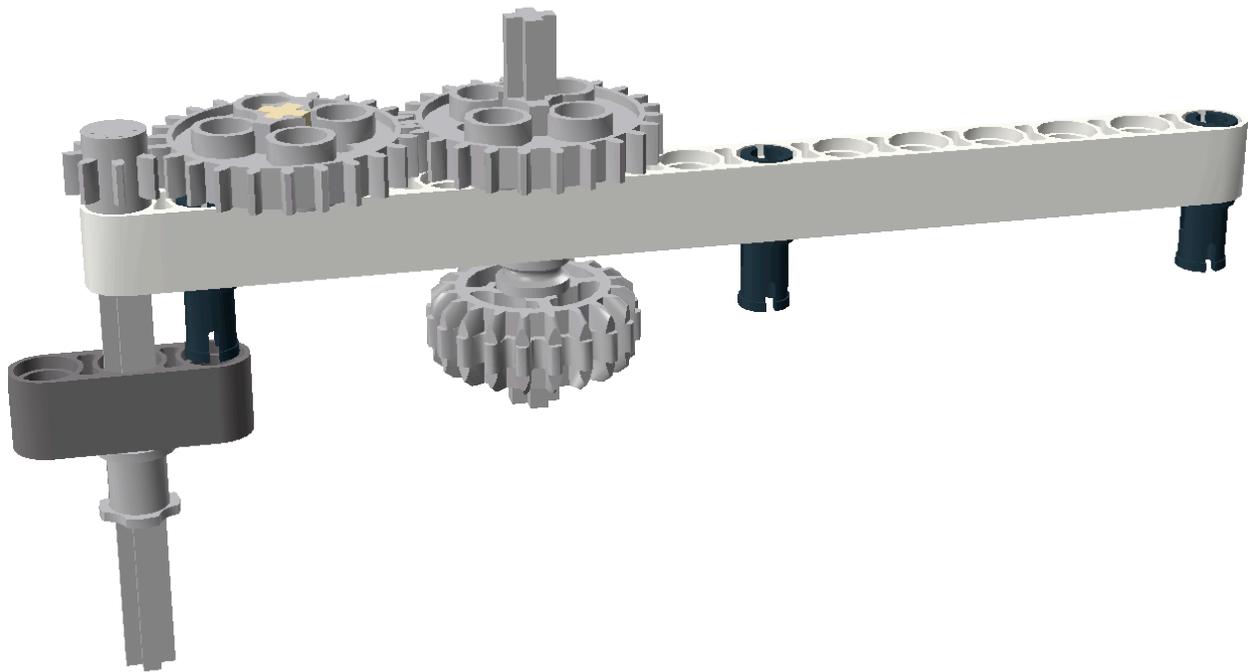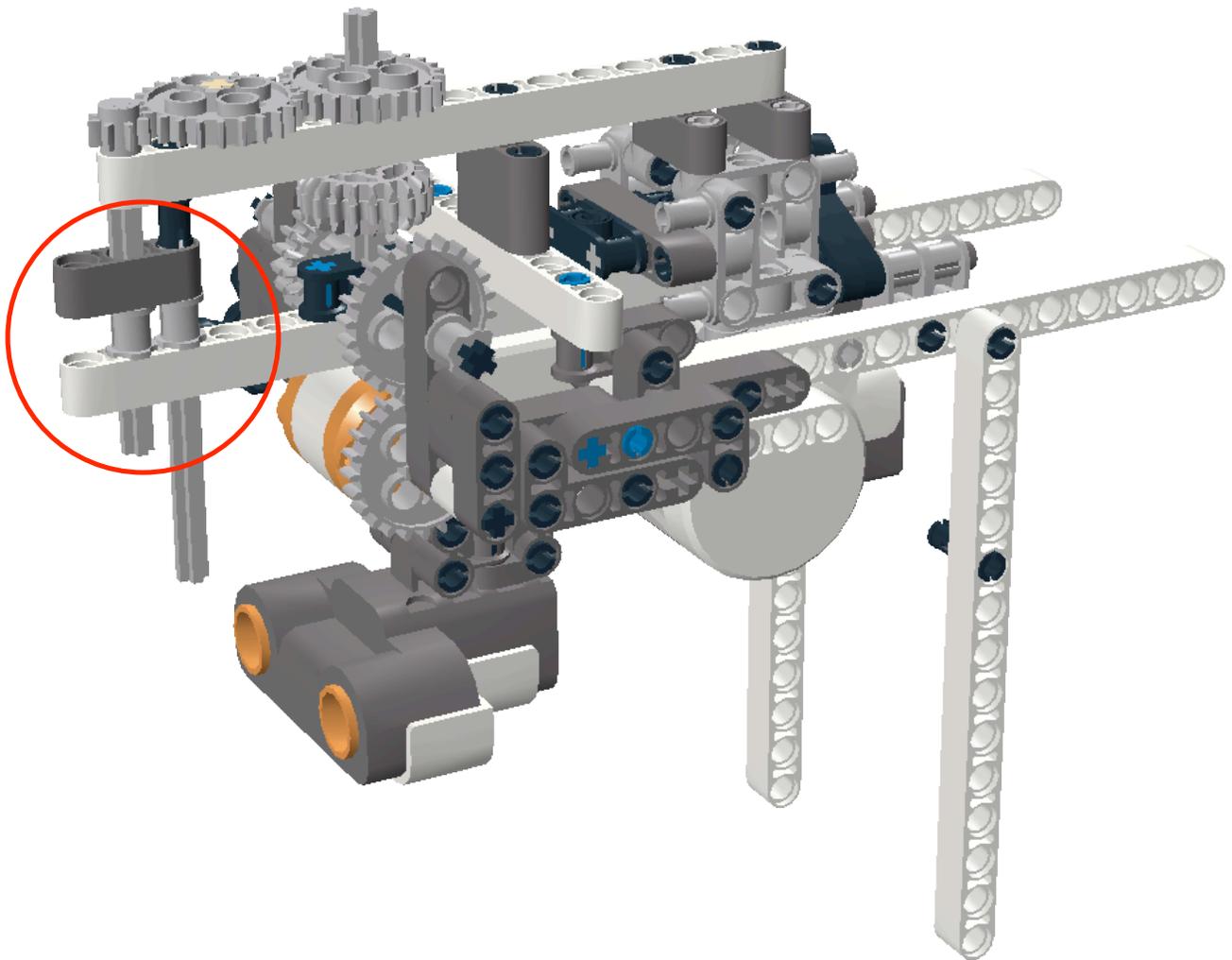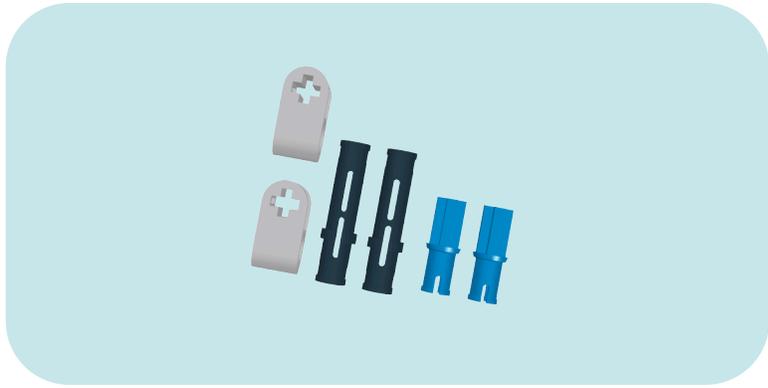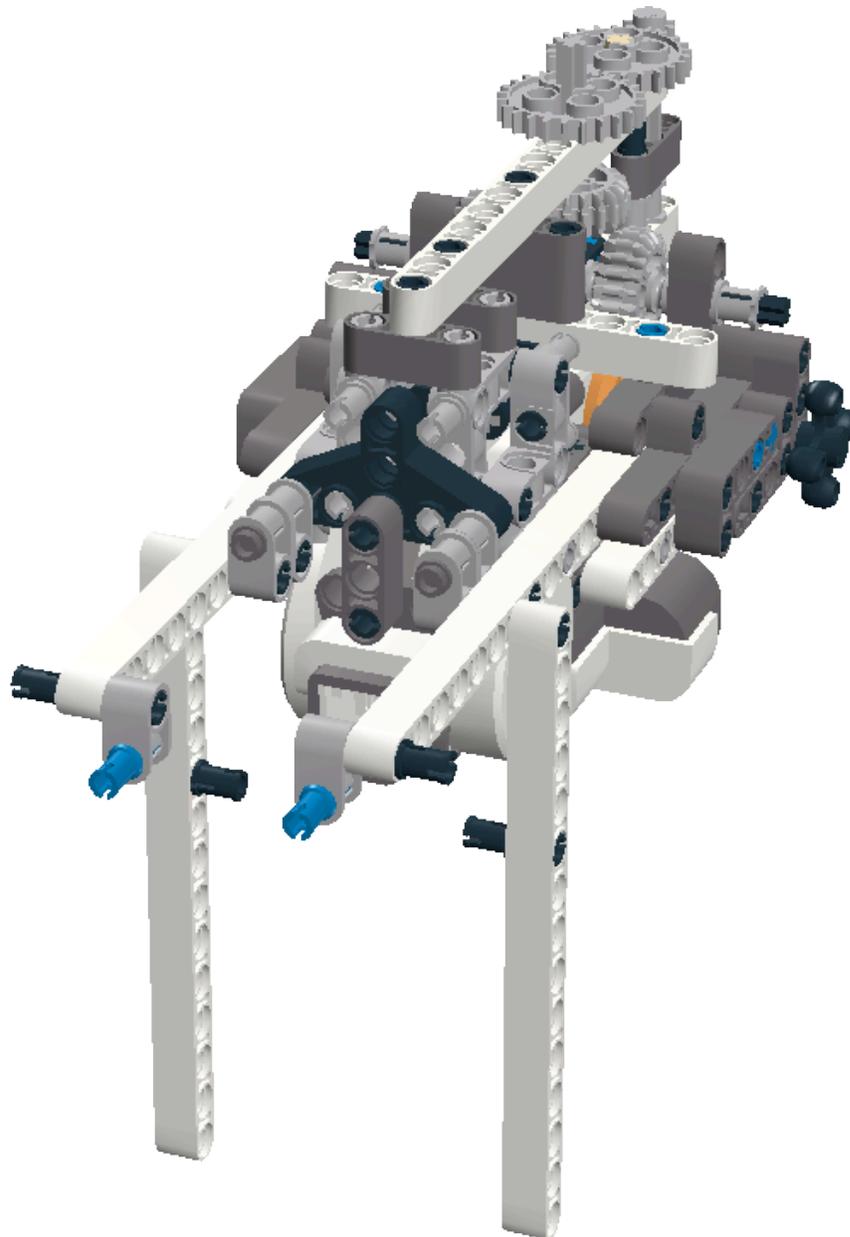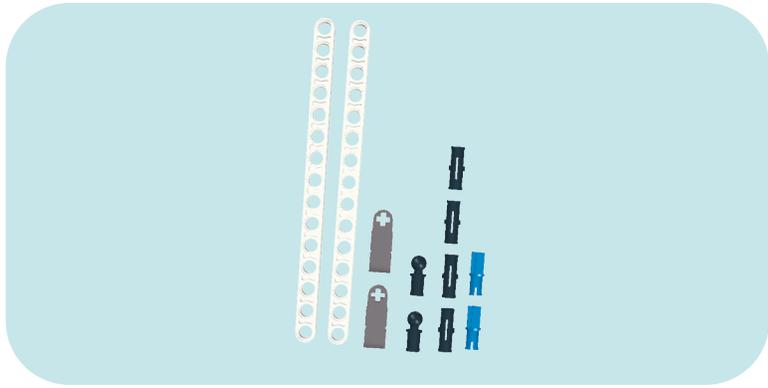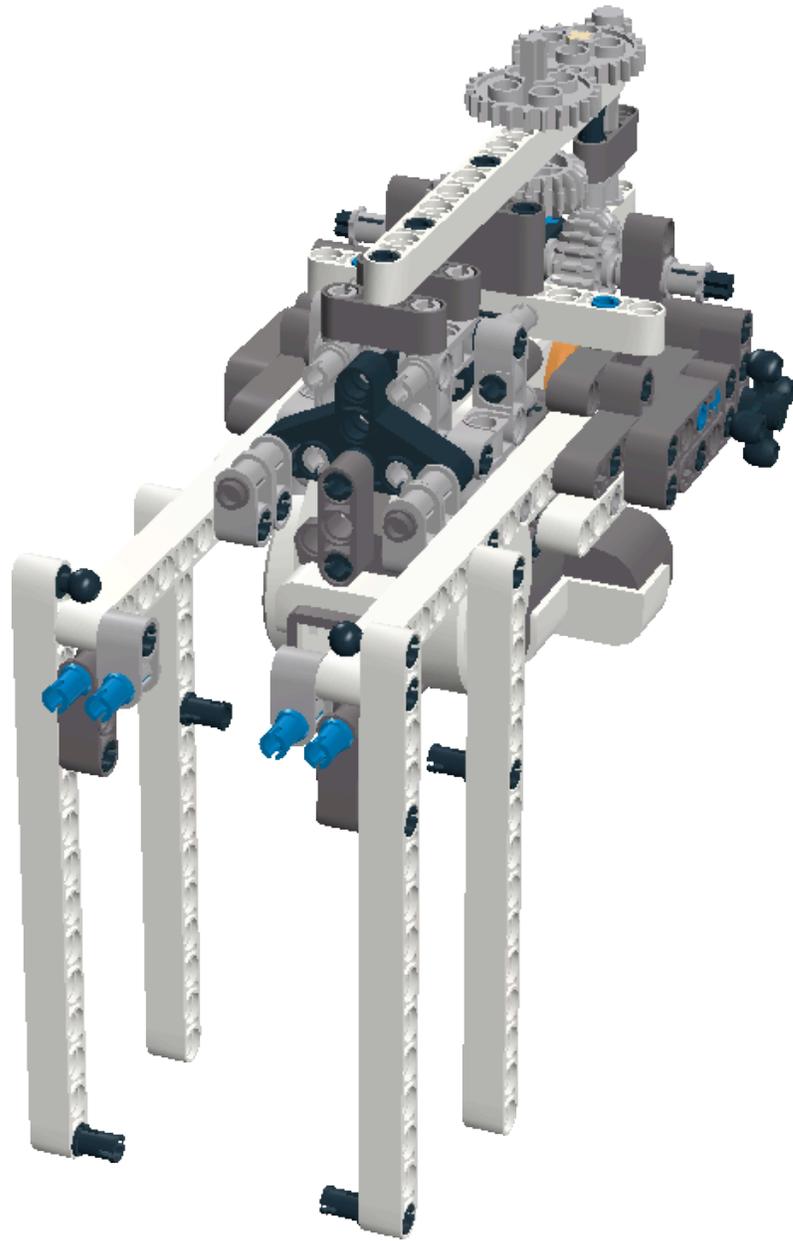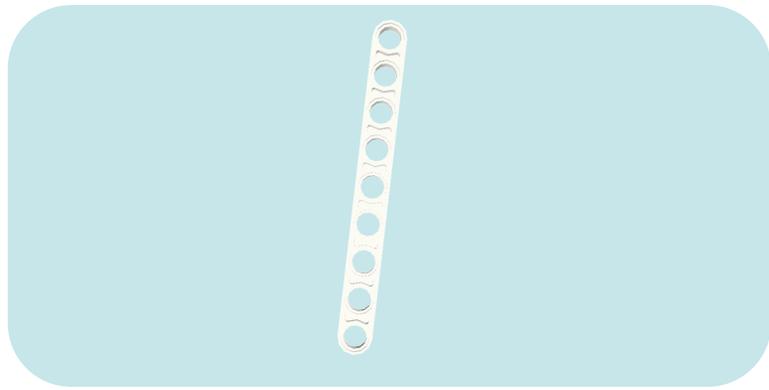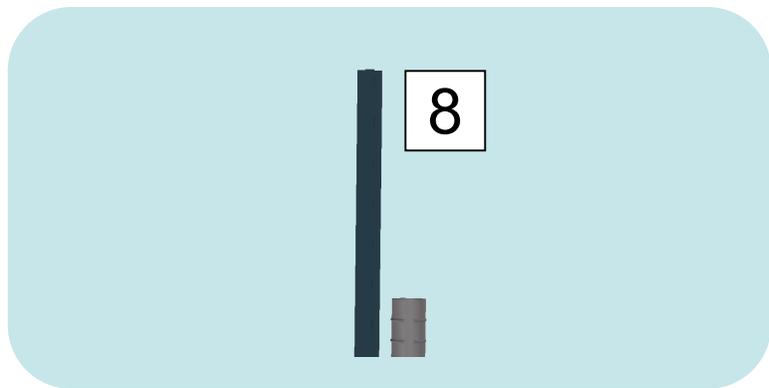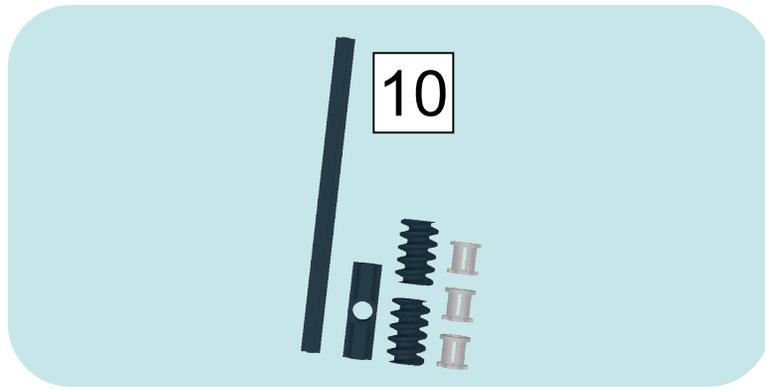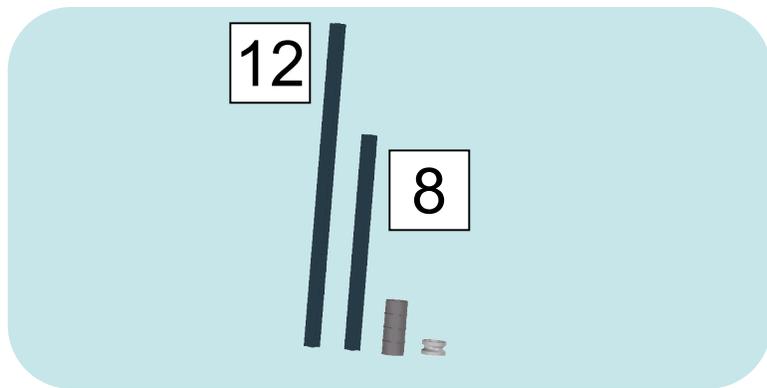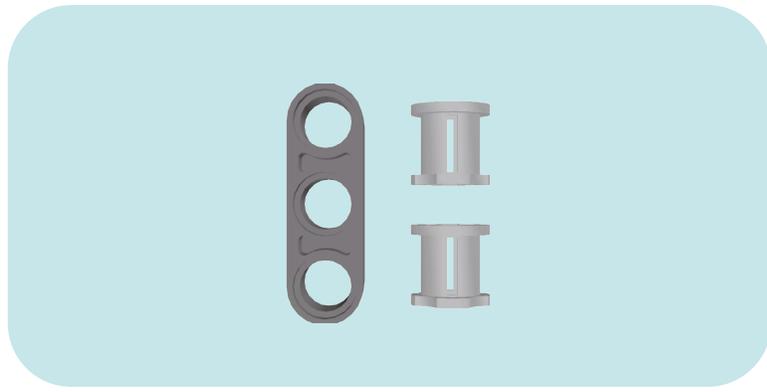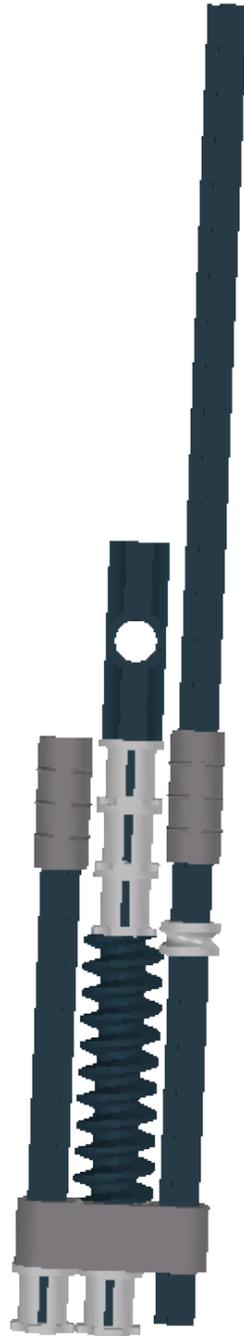
1. Use two of the large (495 mm) black 6-wire cables to connect:

    - The ultrasonic sensor and input port 4

    - Motor C and output port C

2. Use two of the medium (368 mm) black 6-wire cables to connect:

    - Motor A and output port A

    - Motor B and output port B

3. Try not to tangle the cables so that the robot can move freely

Before you use the robot:

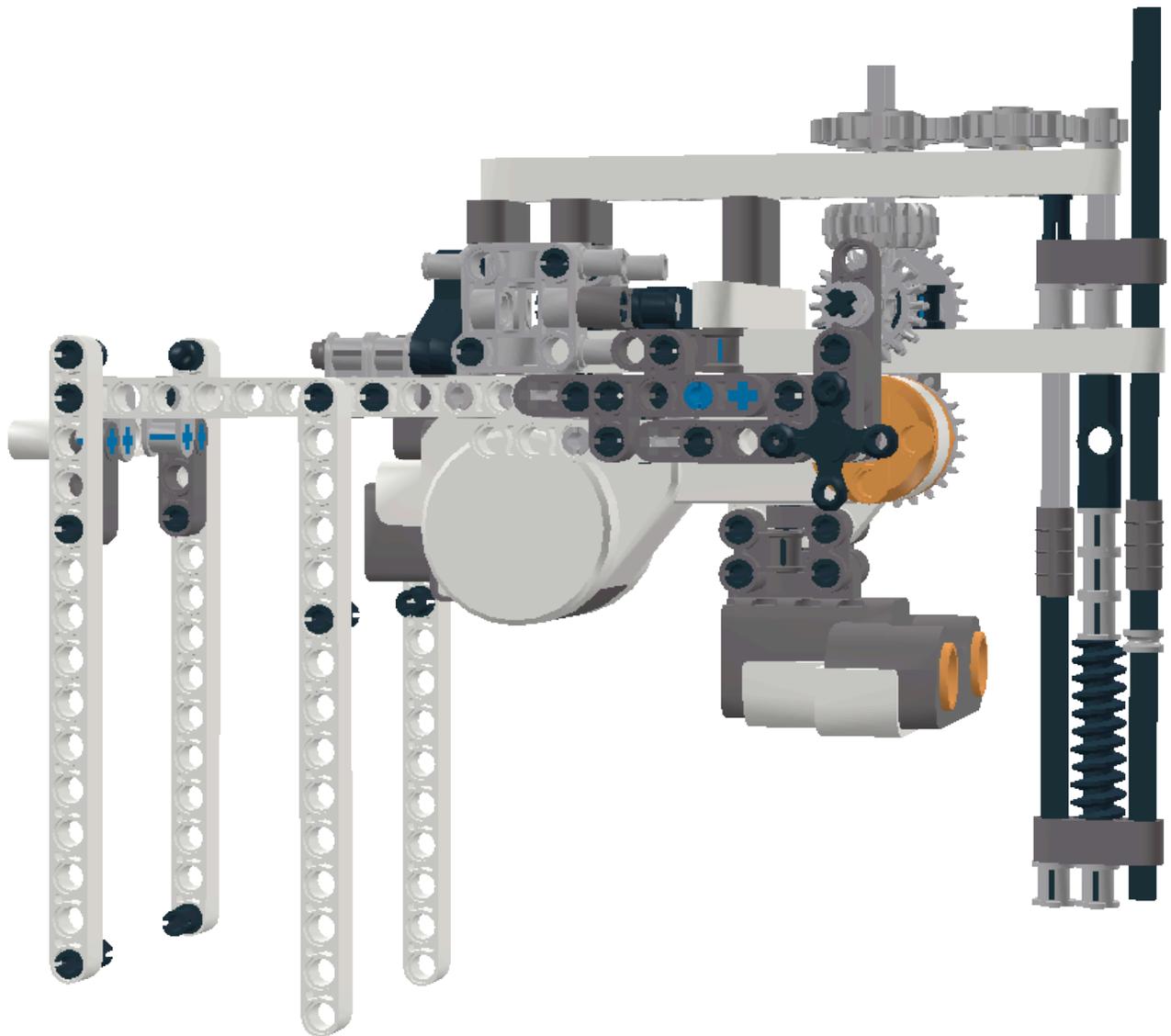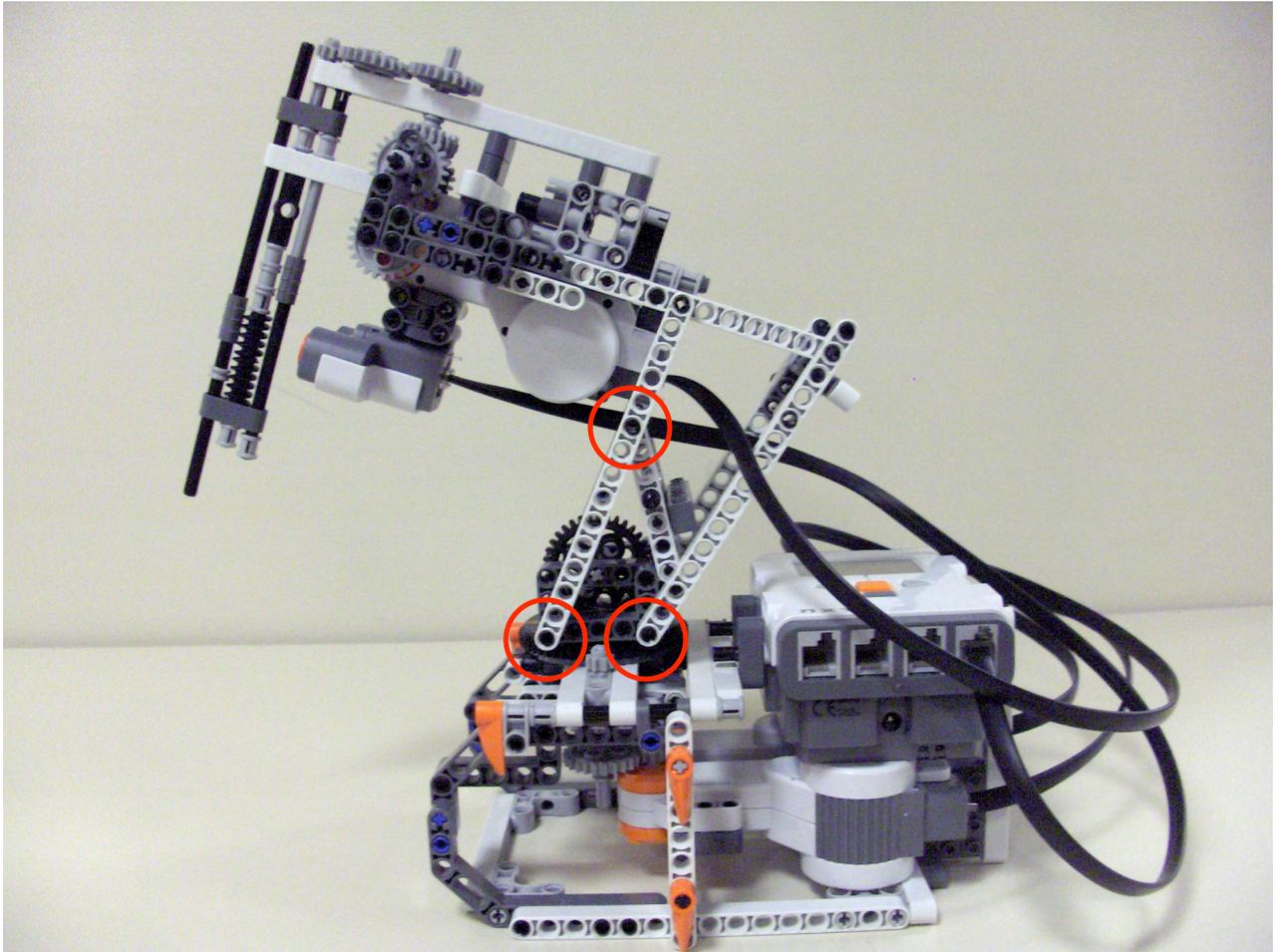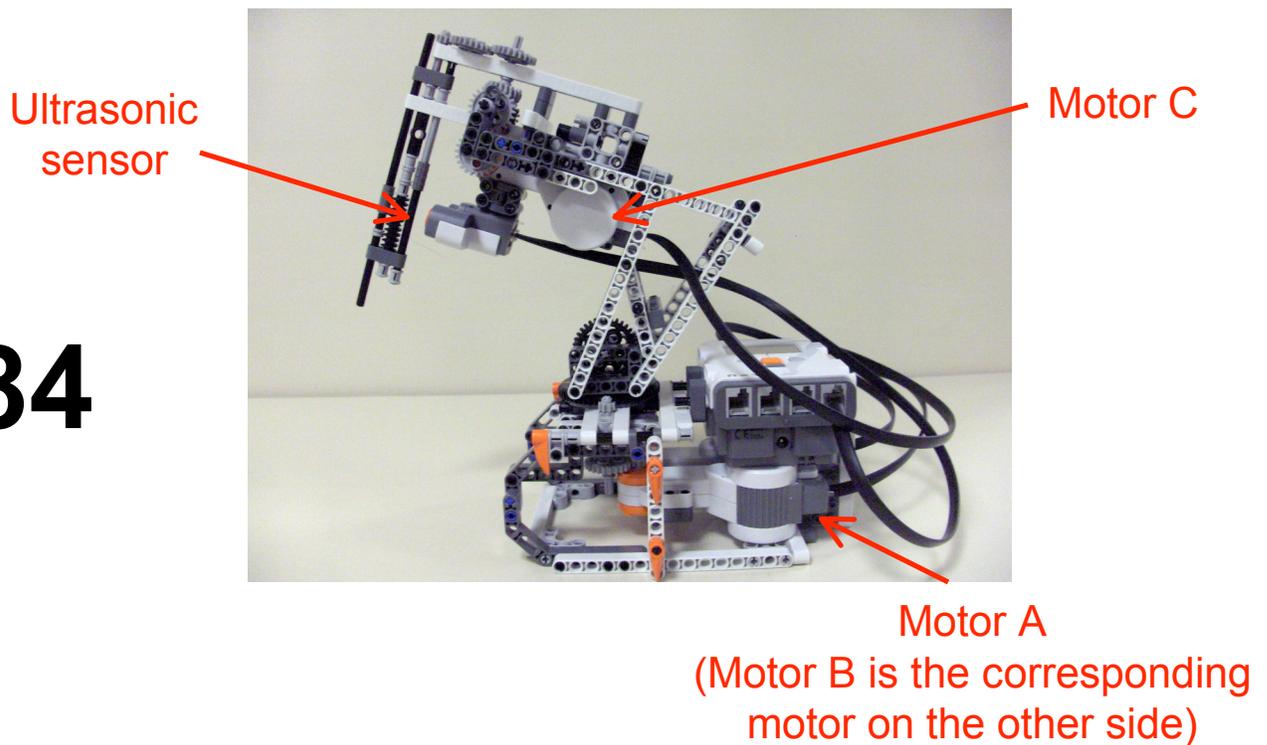- Check that all of the joints are securely fastened

- Check that all of the gears line up with each other