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Automation Engineers



Do you know how airplanes fly?



It has to do with the forces applied to the plane.

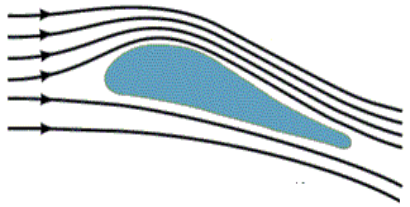
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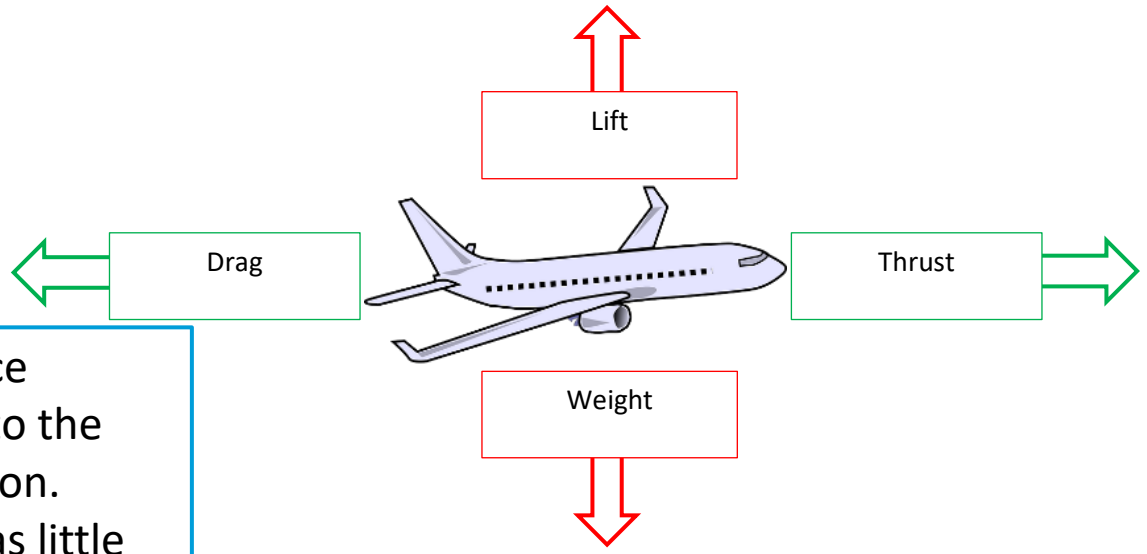
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Airplane

Upward force.
The shape of the wings directs air downwards, so, this pushes the airplane up.





Drag is a force facing opposite to the moving direction.
This needs to be as little as possible.

Force toward the moving direction, coming from motors with propellers or tubines

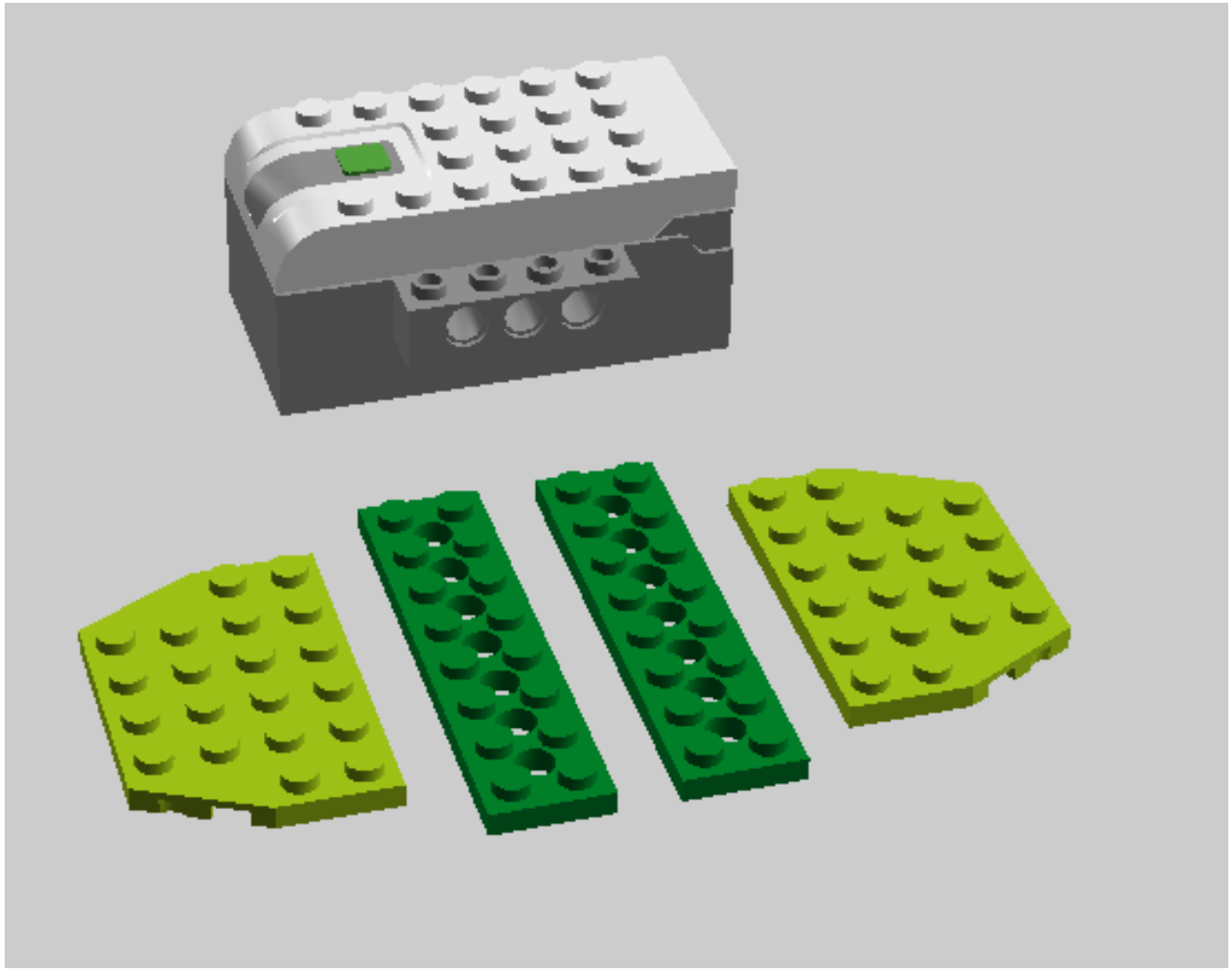
The force that the Earth attracts every object, facing downwards

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Airplane

1

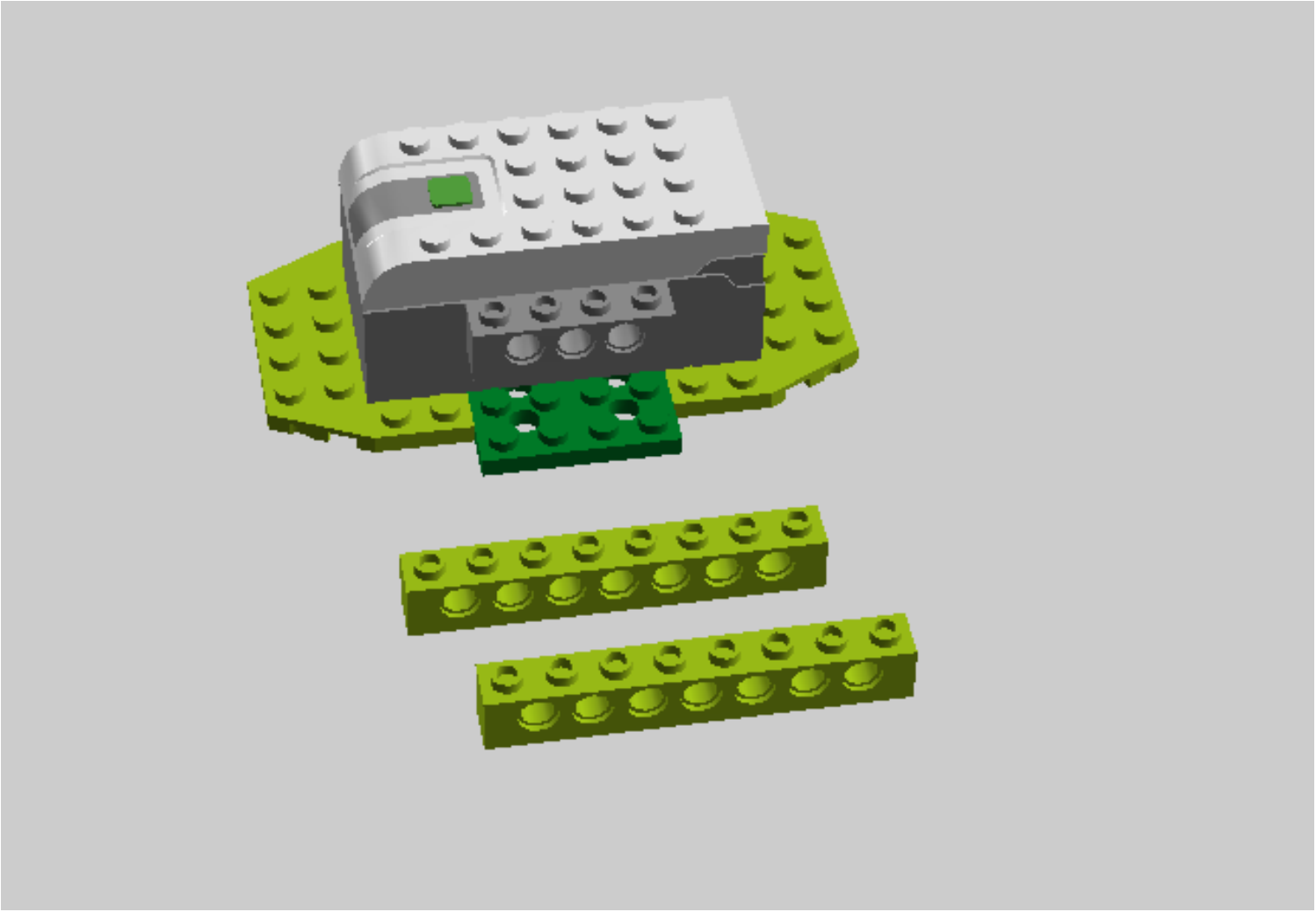


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2

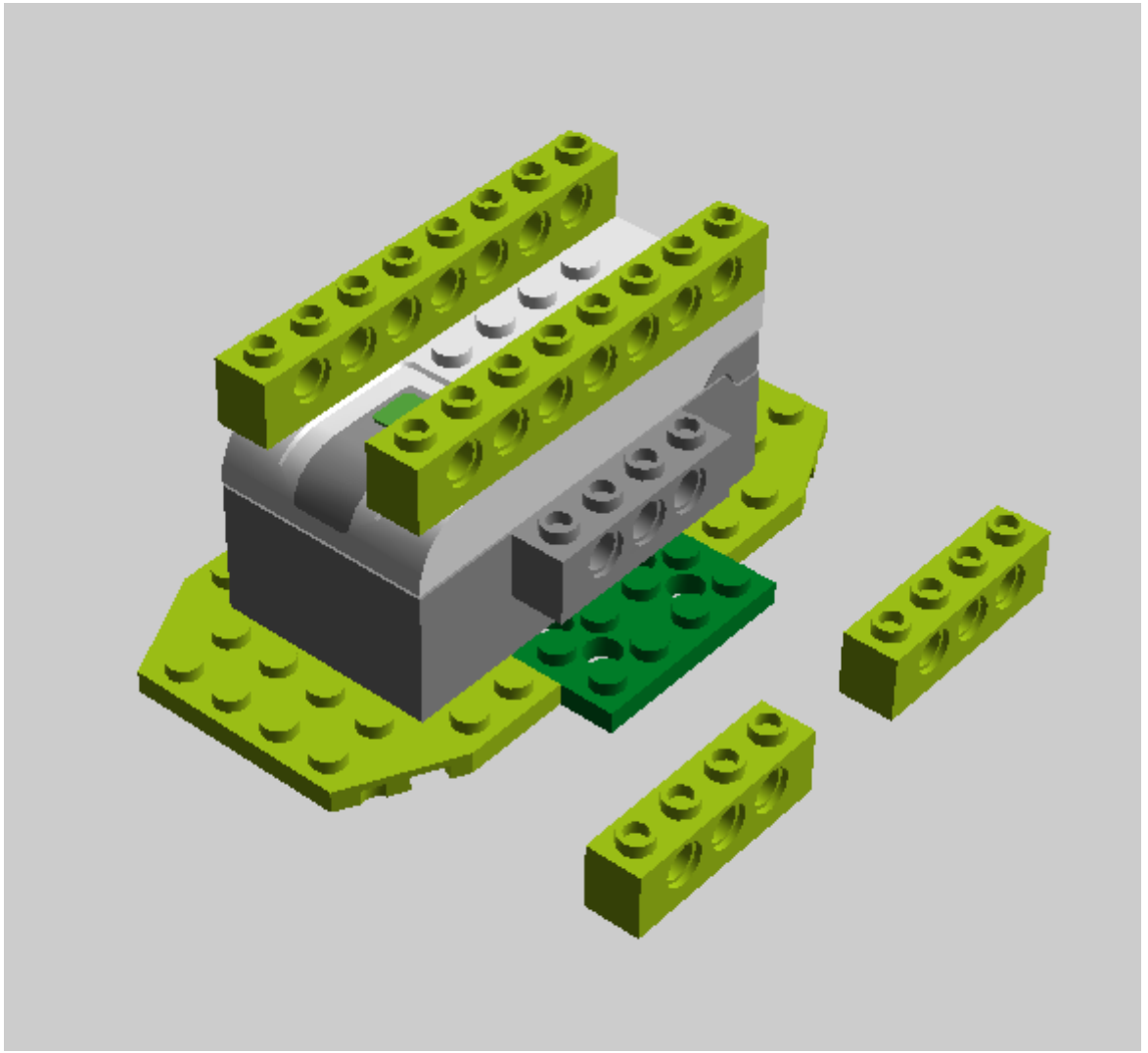


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3

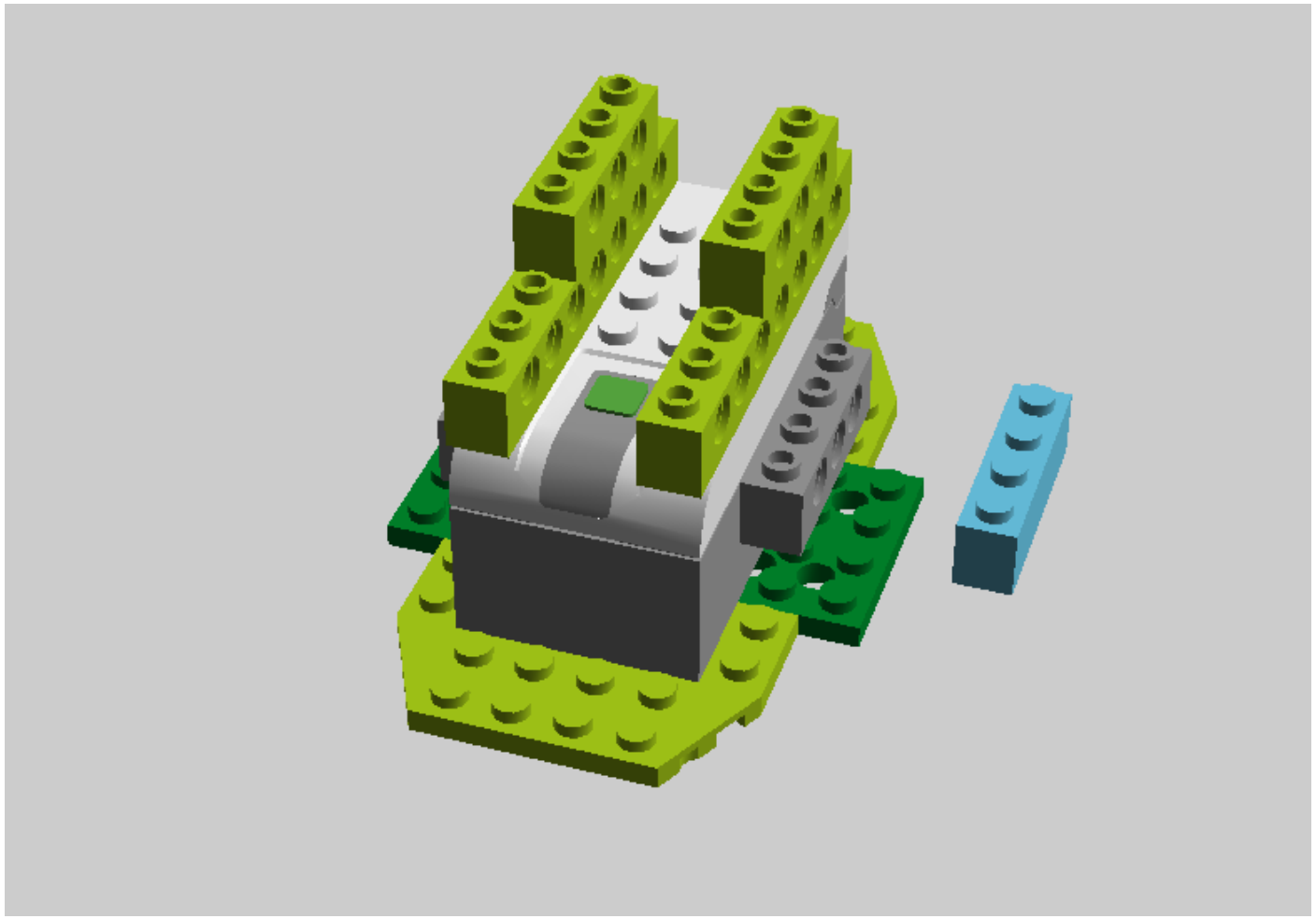


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4

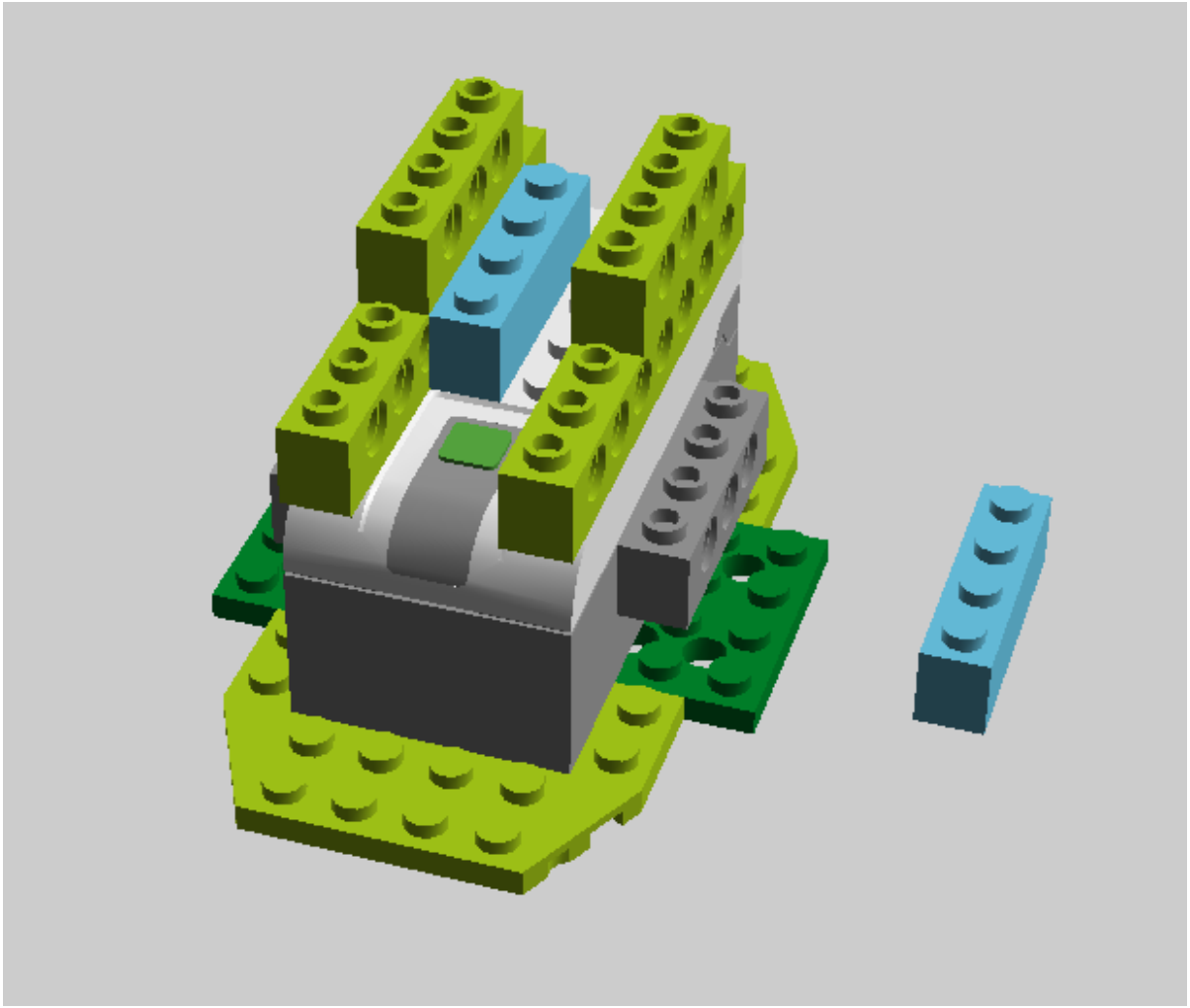


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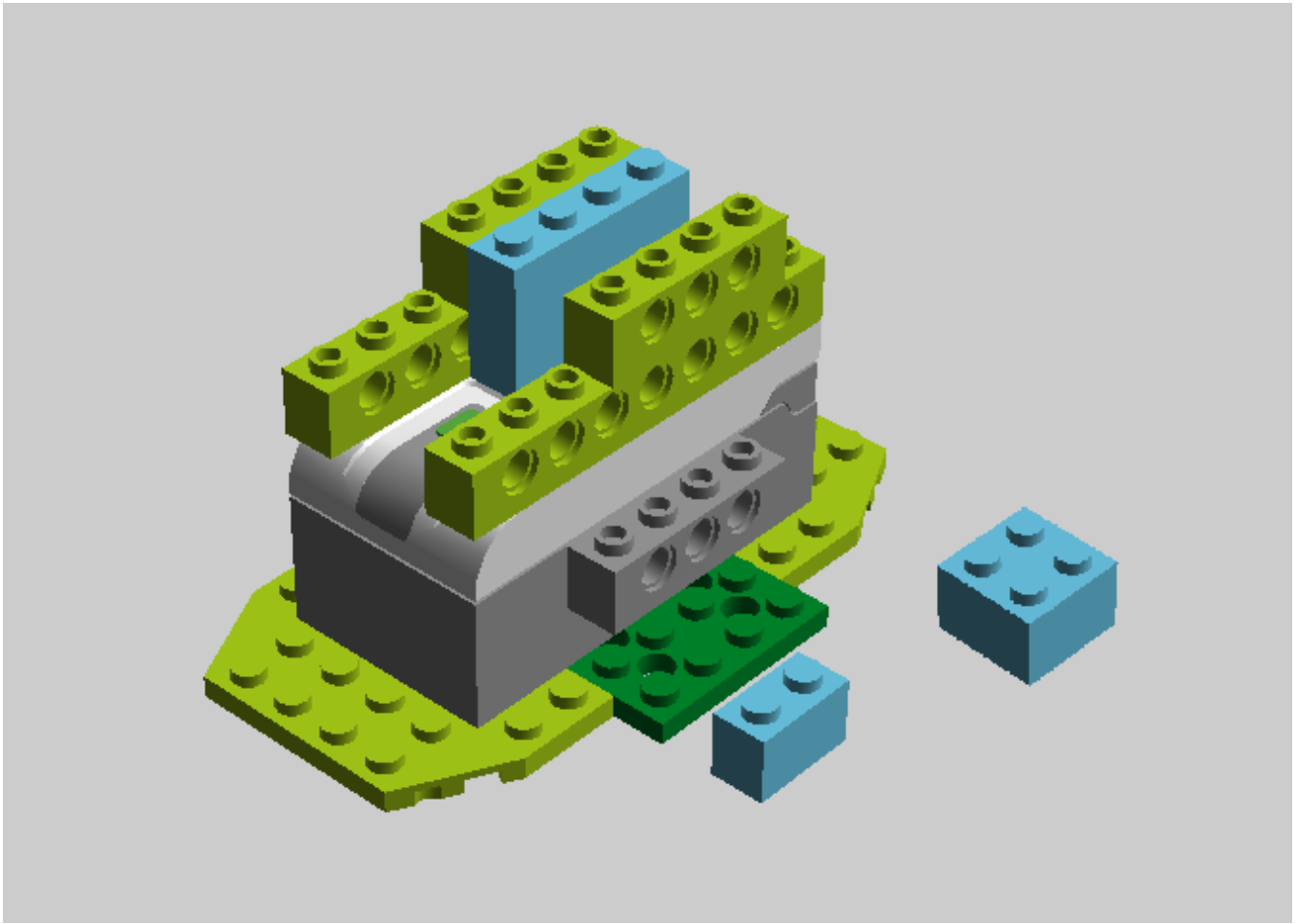


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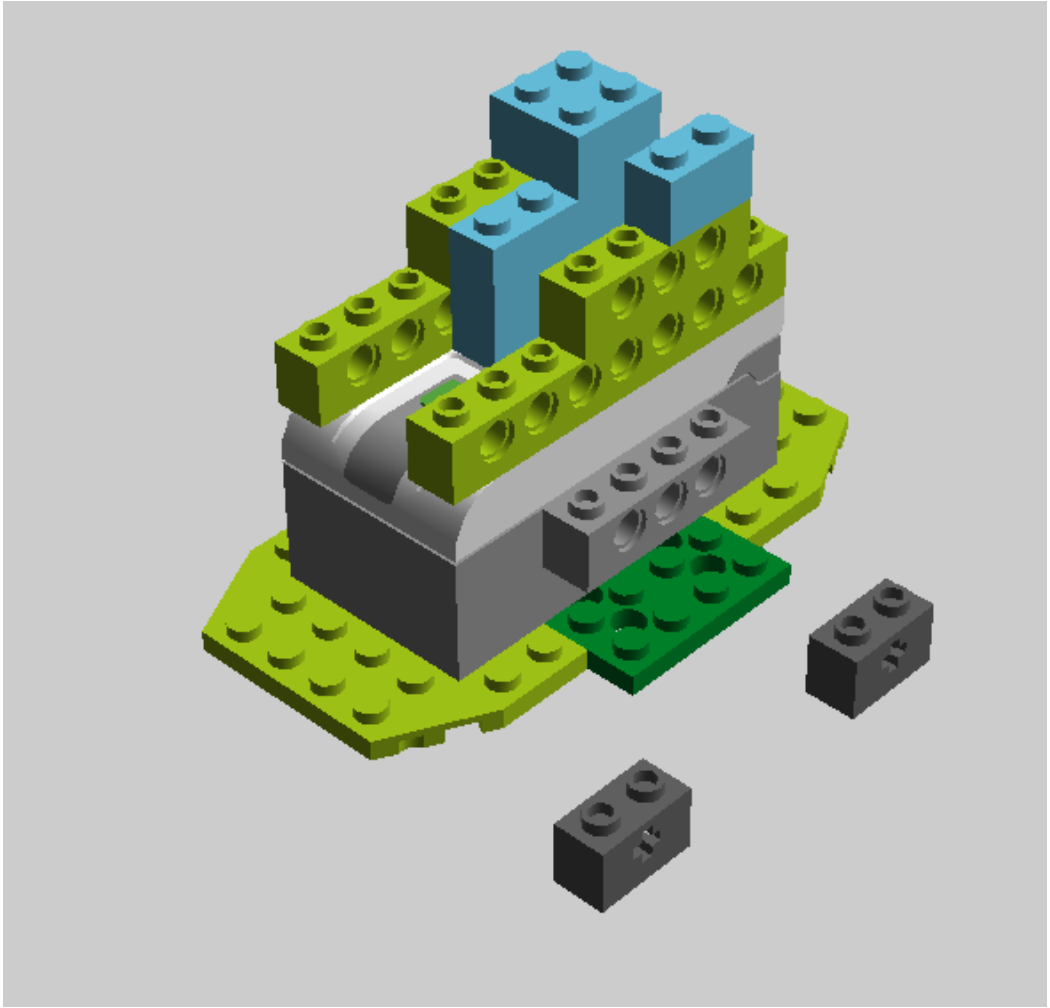


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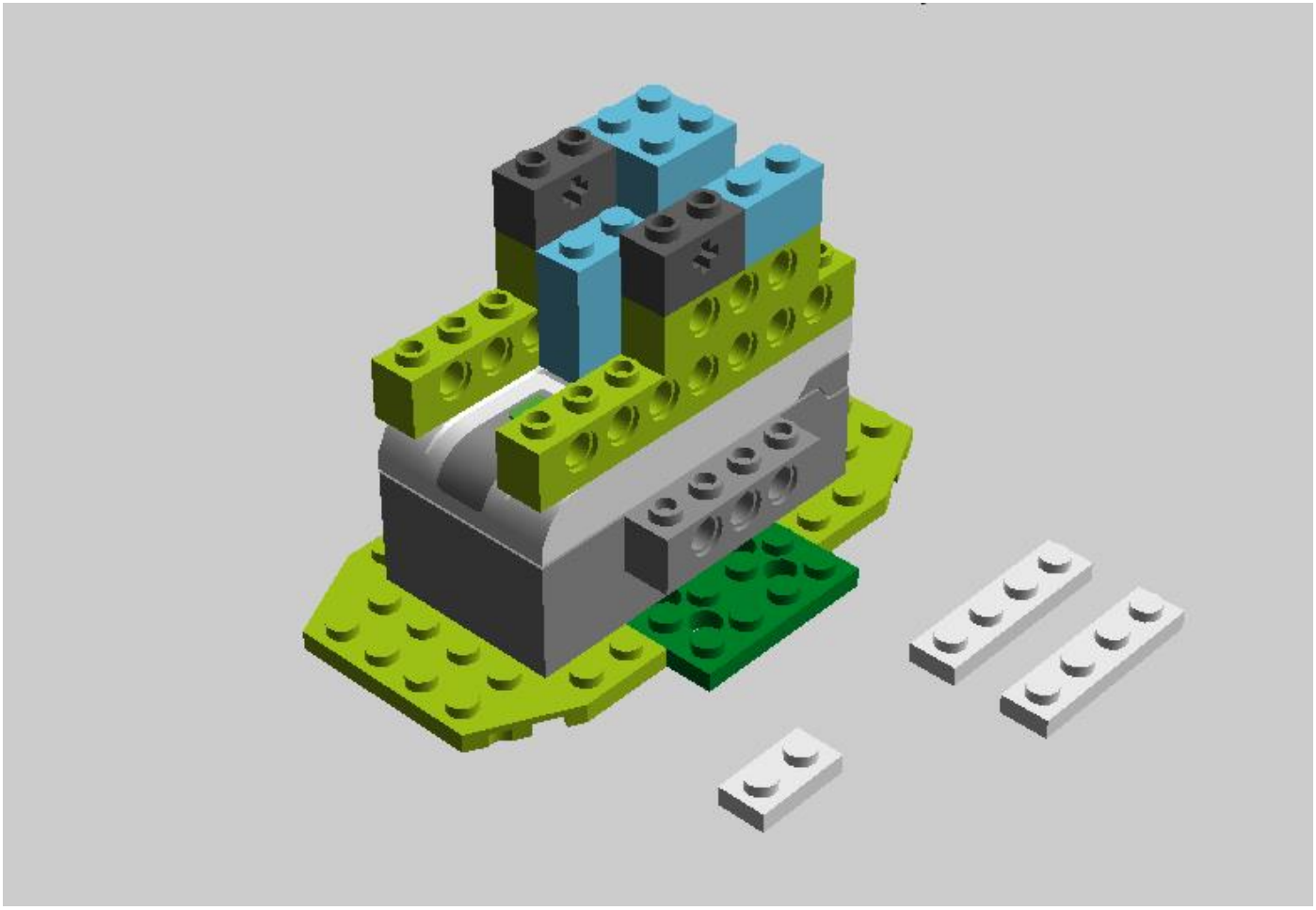


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8

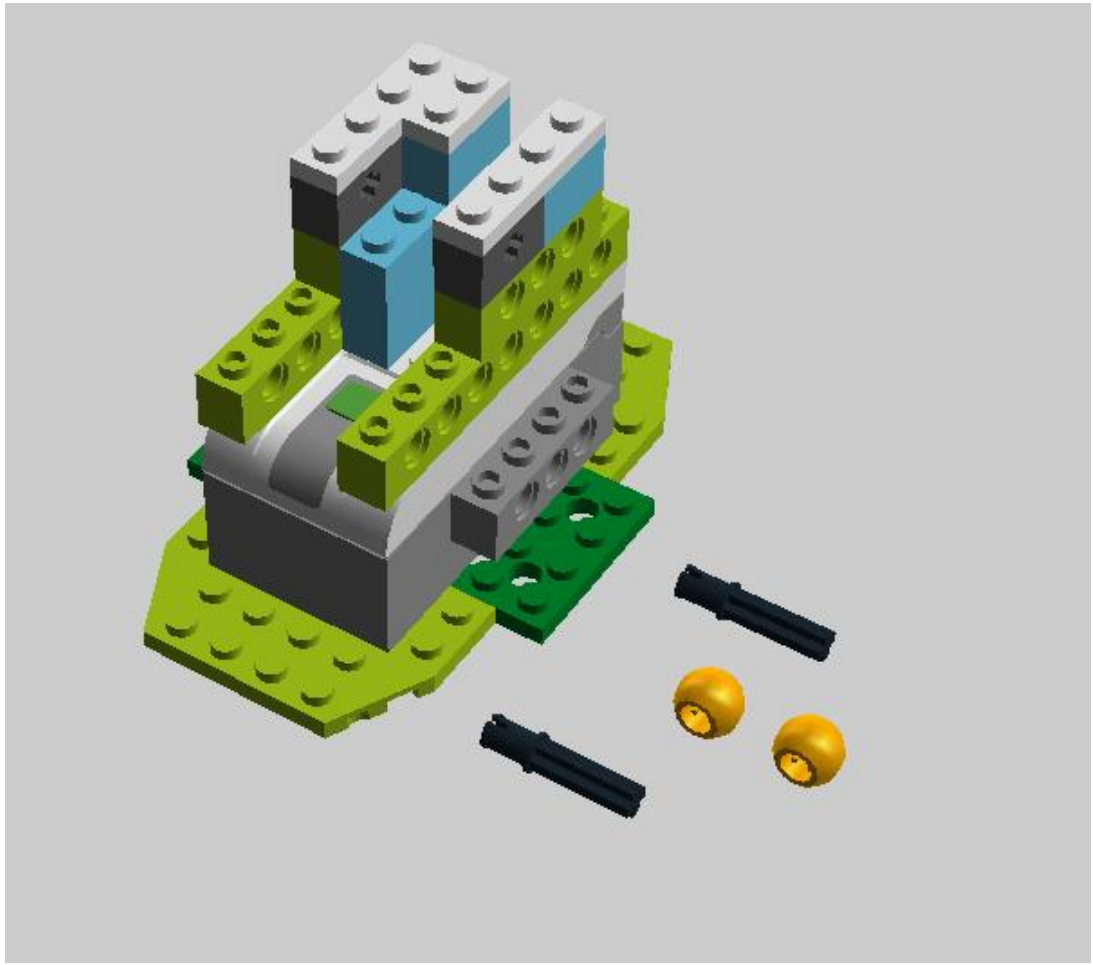


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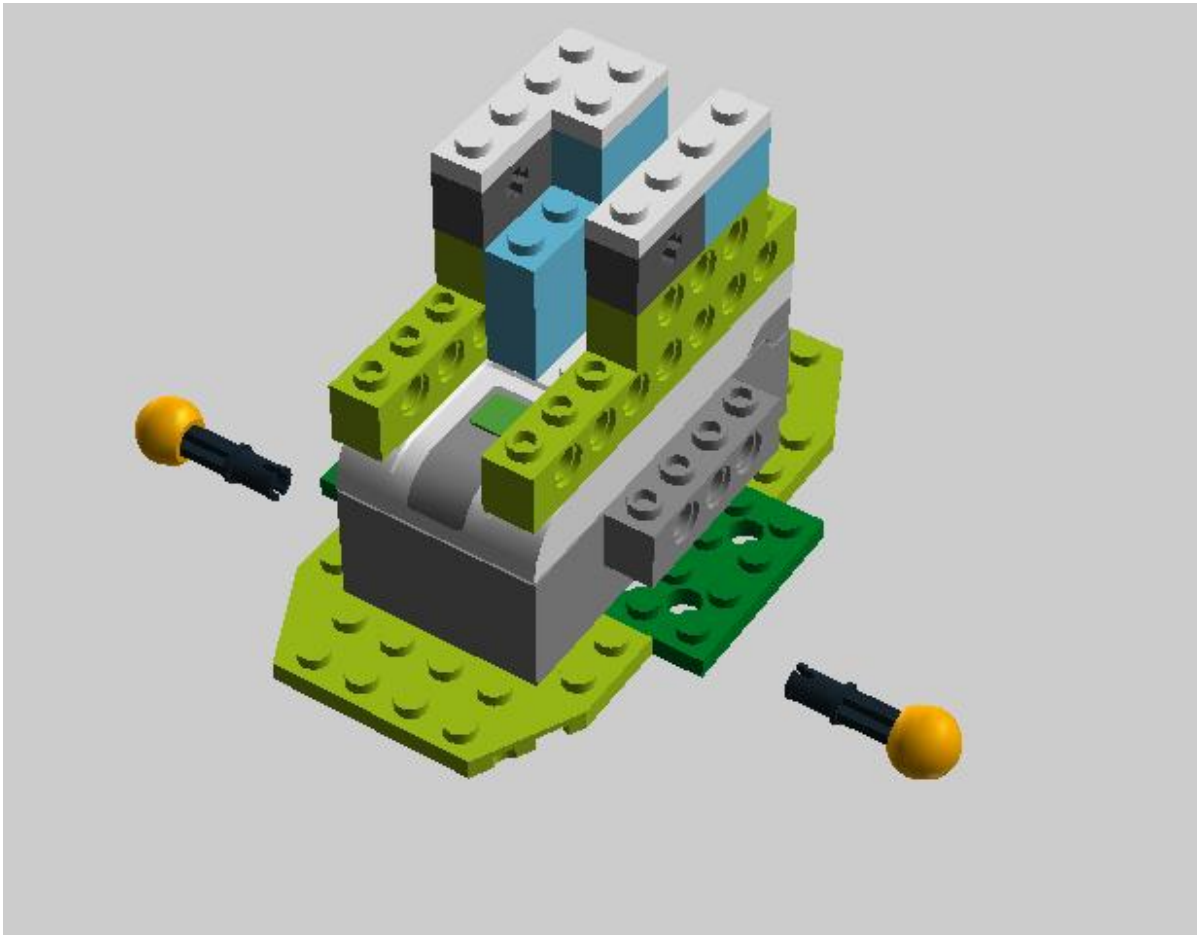
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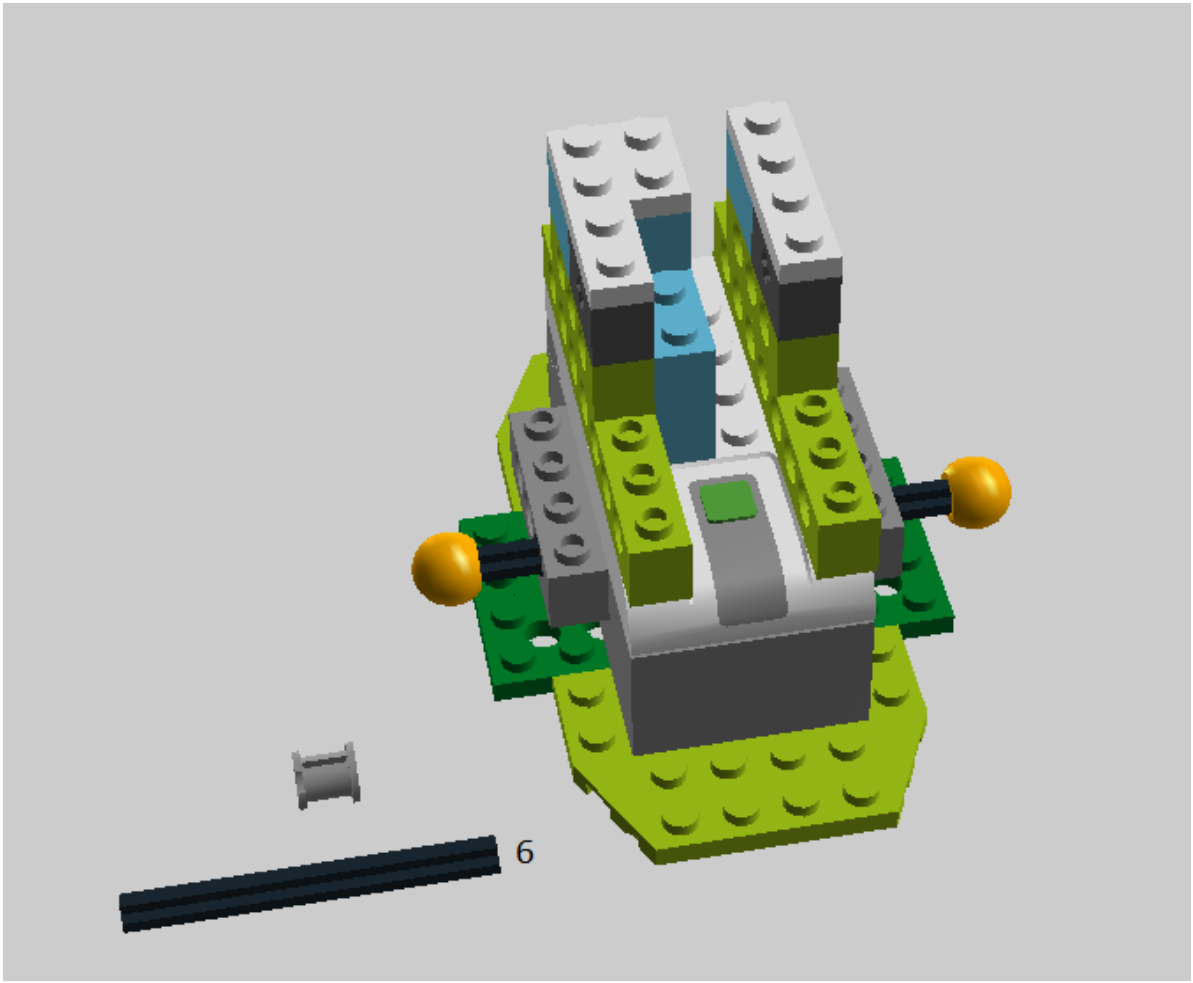
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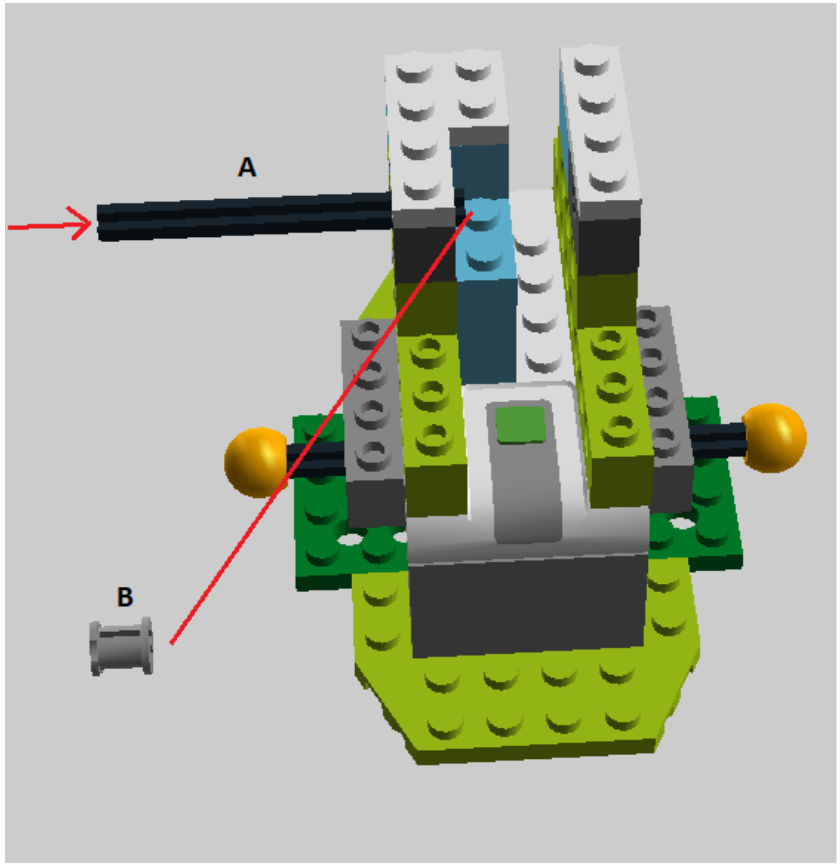
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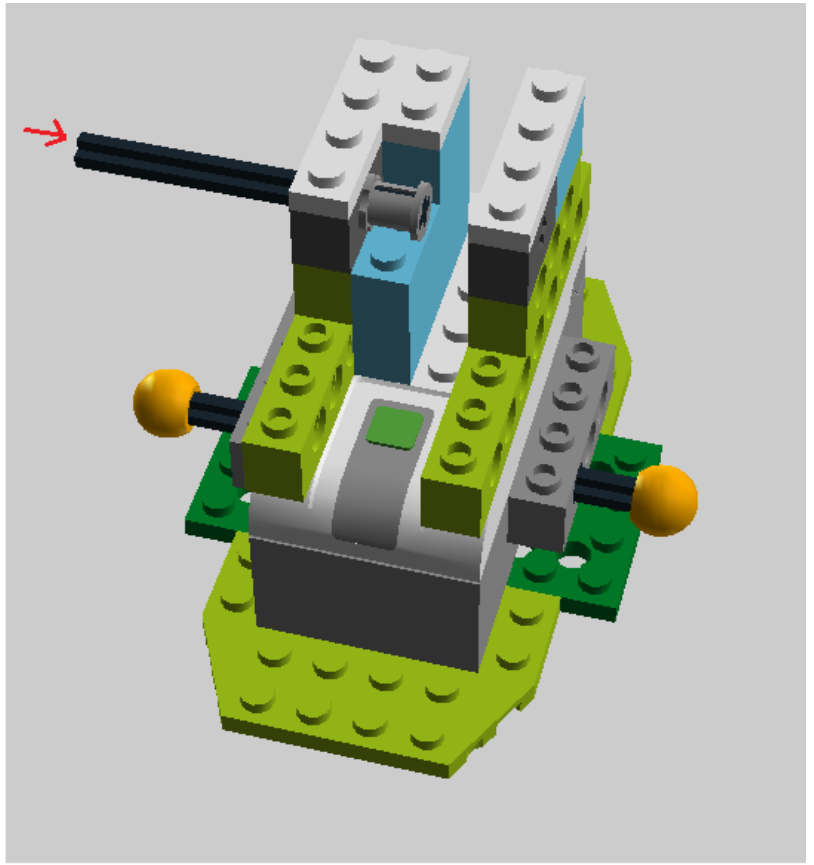


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Place axle A to the point you see in the left picture. Place the ring B for safety, keep it and press the axle until it gets through it. Be careful about the axle not getting over the ring, as you see in the right picture.

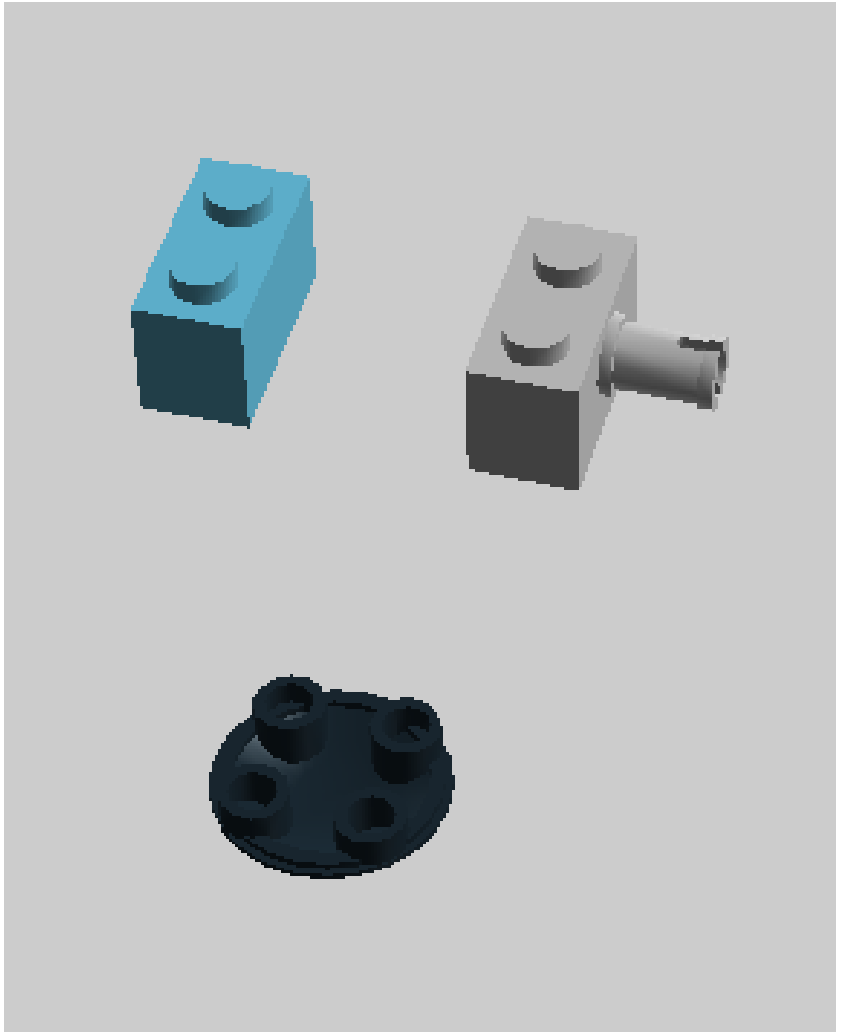
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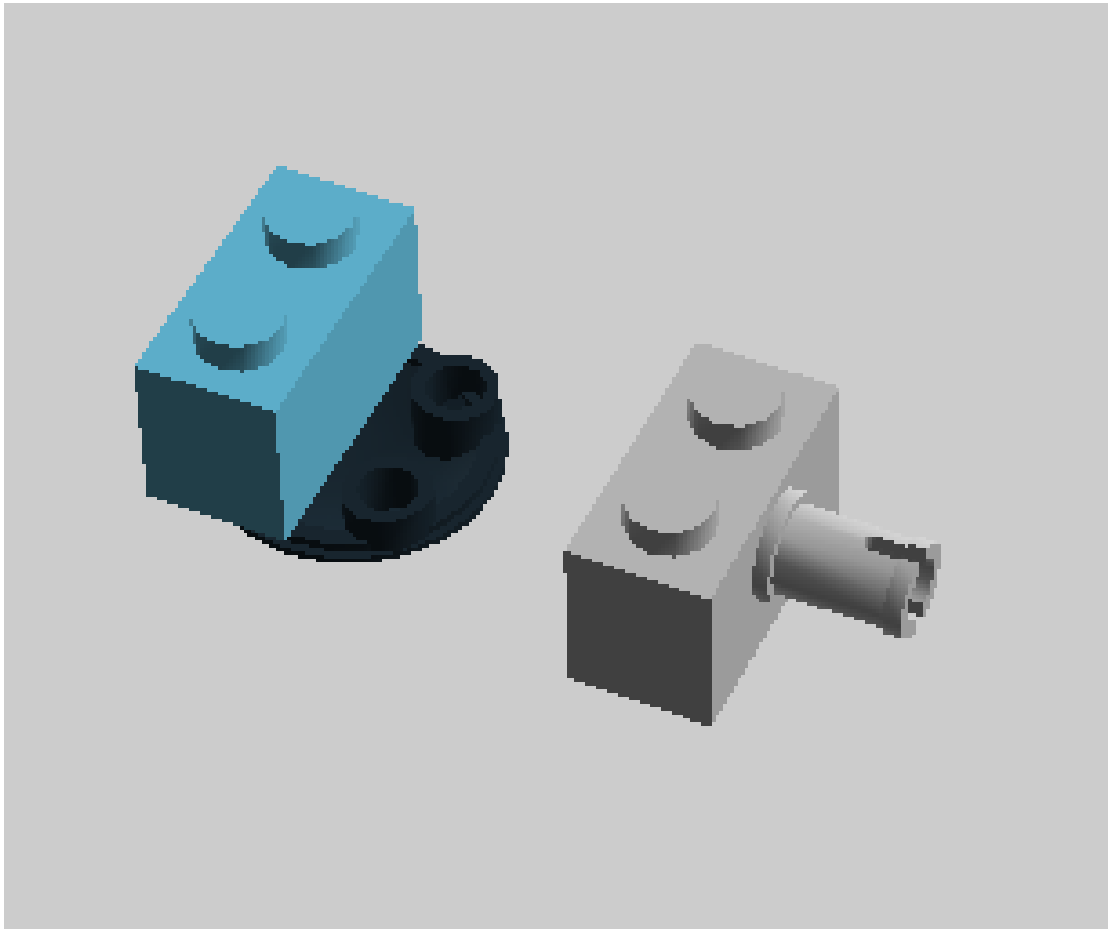
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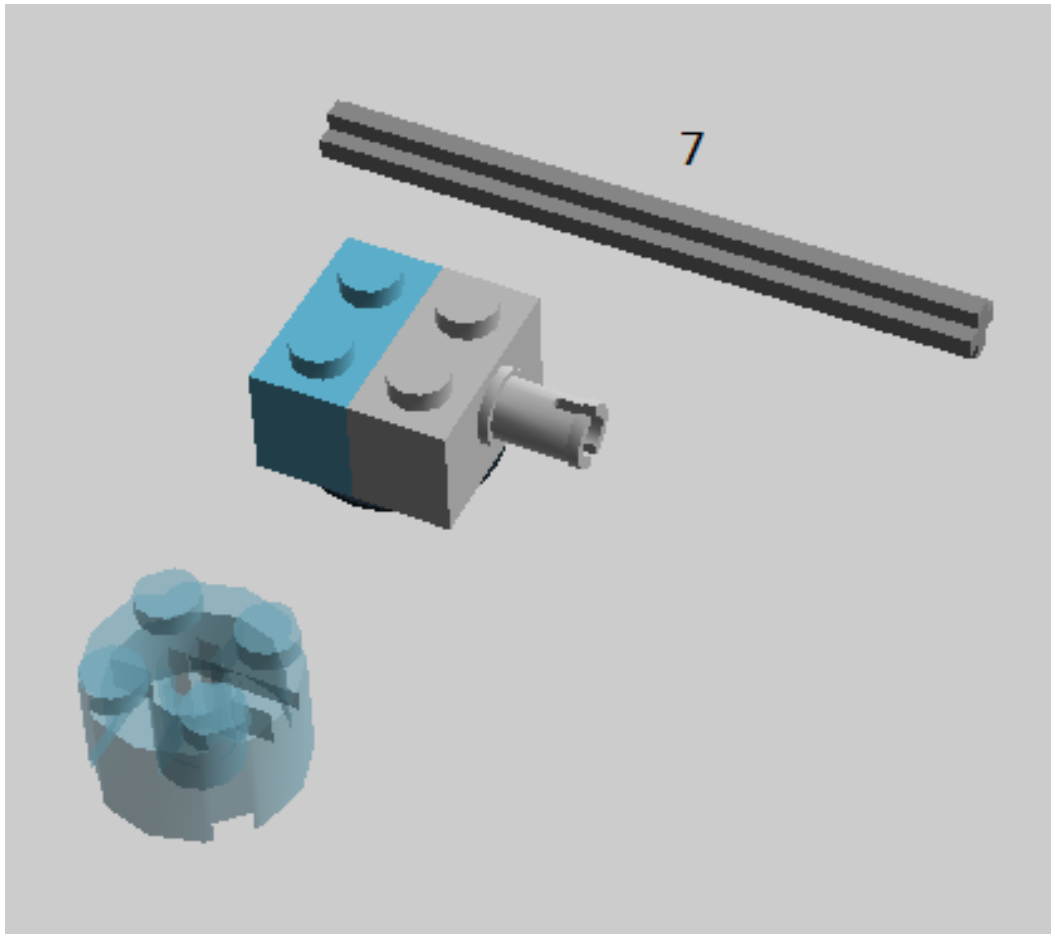
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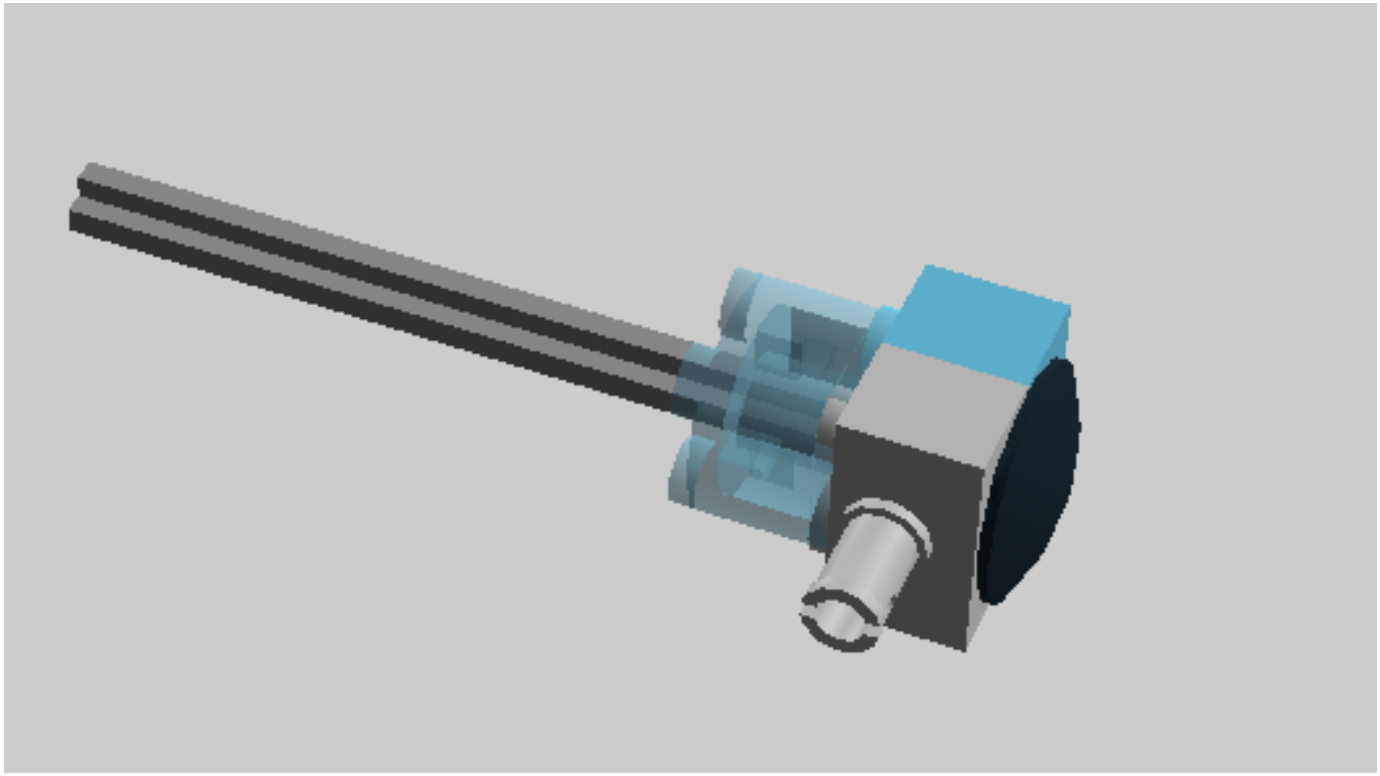
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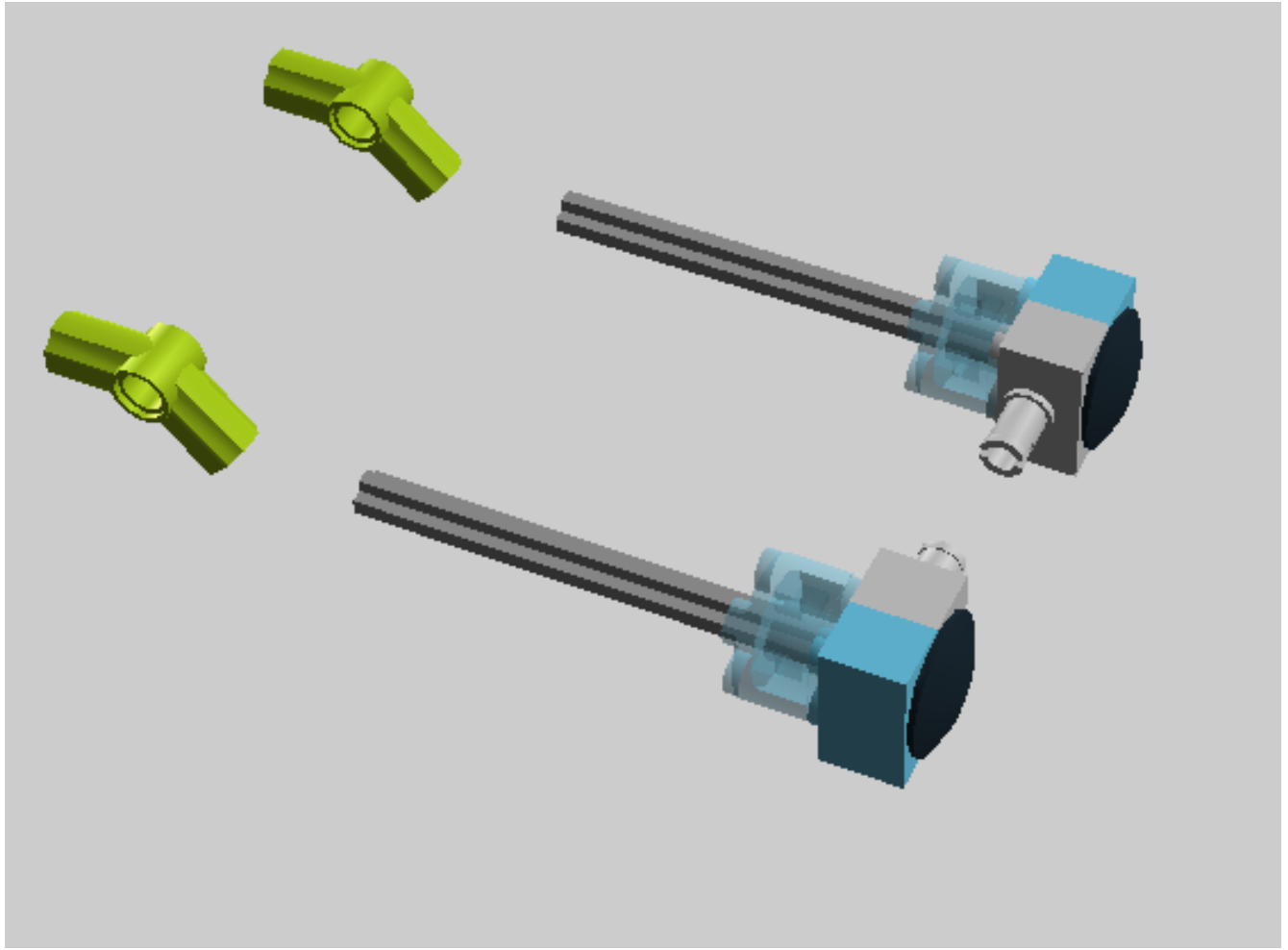


Repeat steps 13-16 once more, to build another similar part

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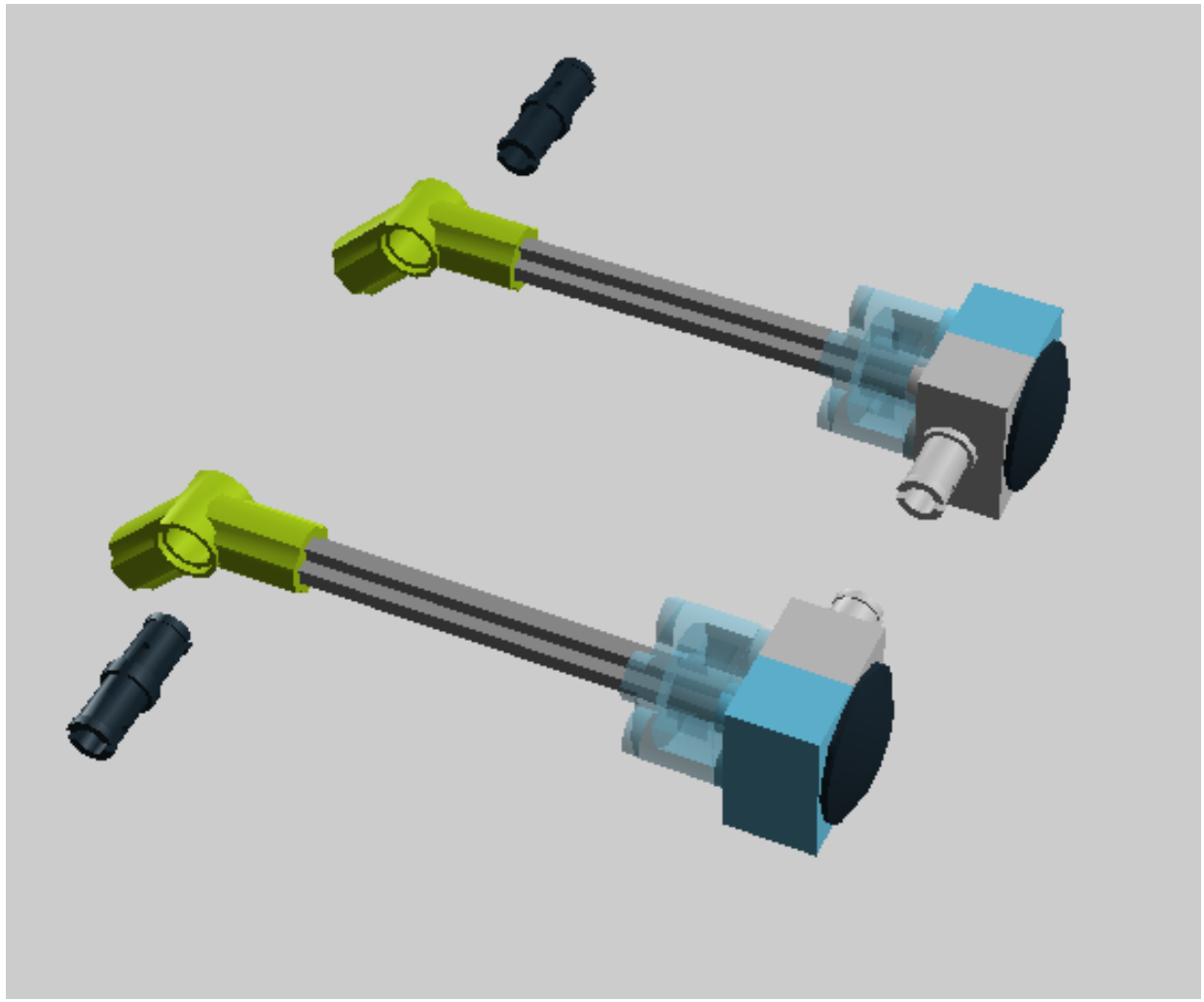
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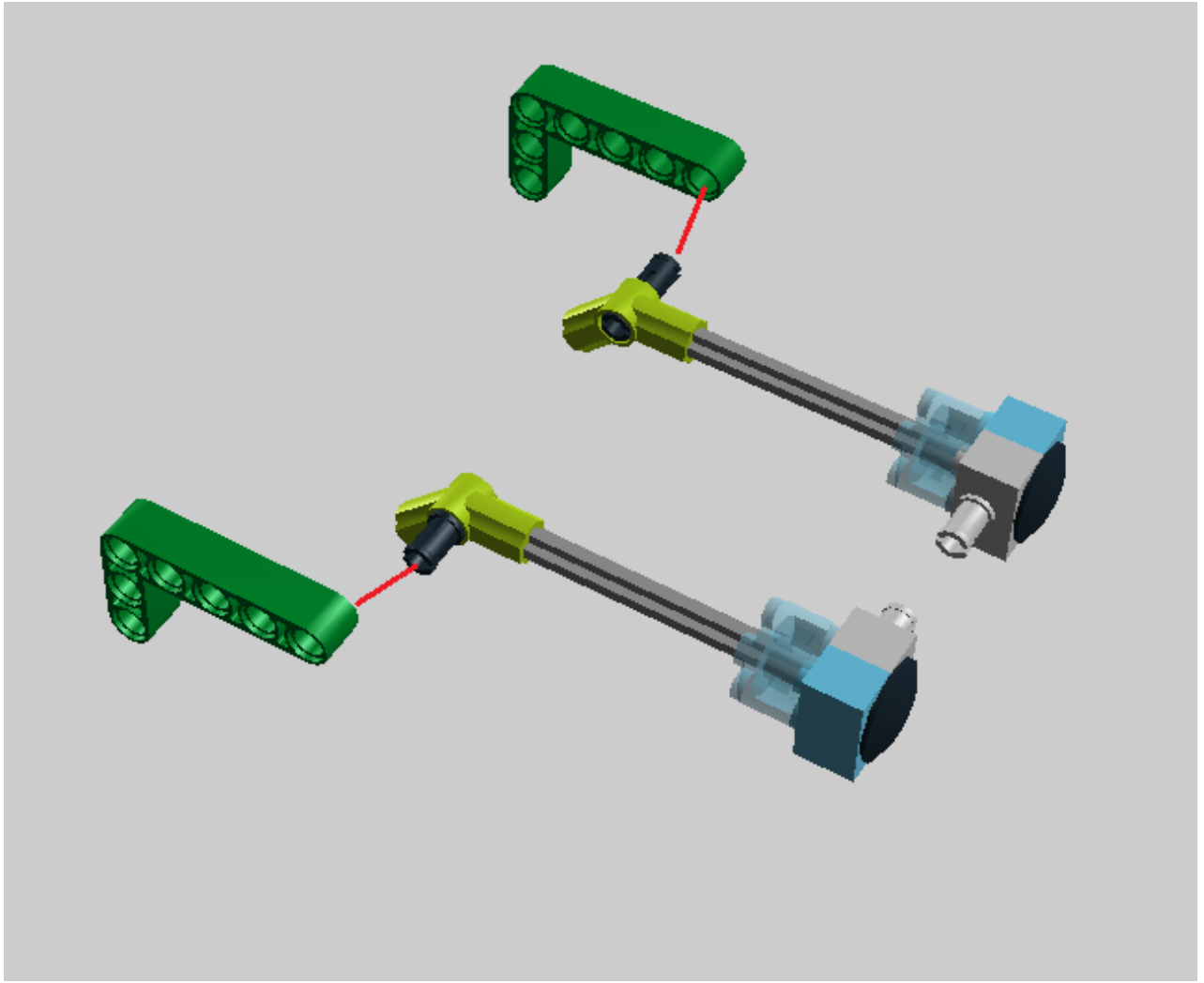
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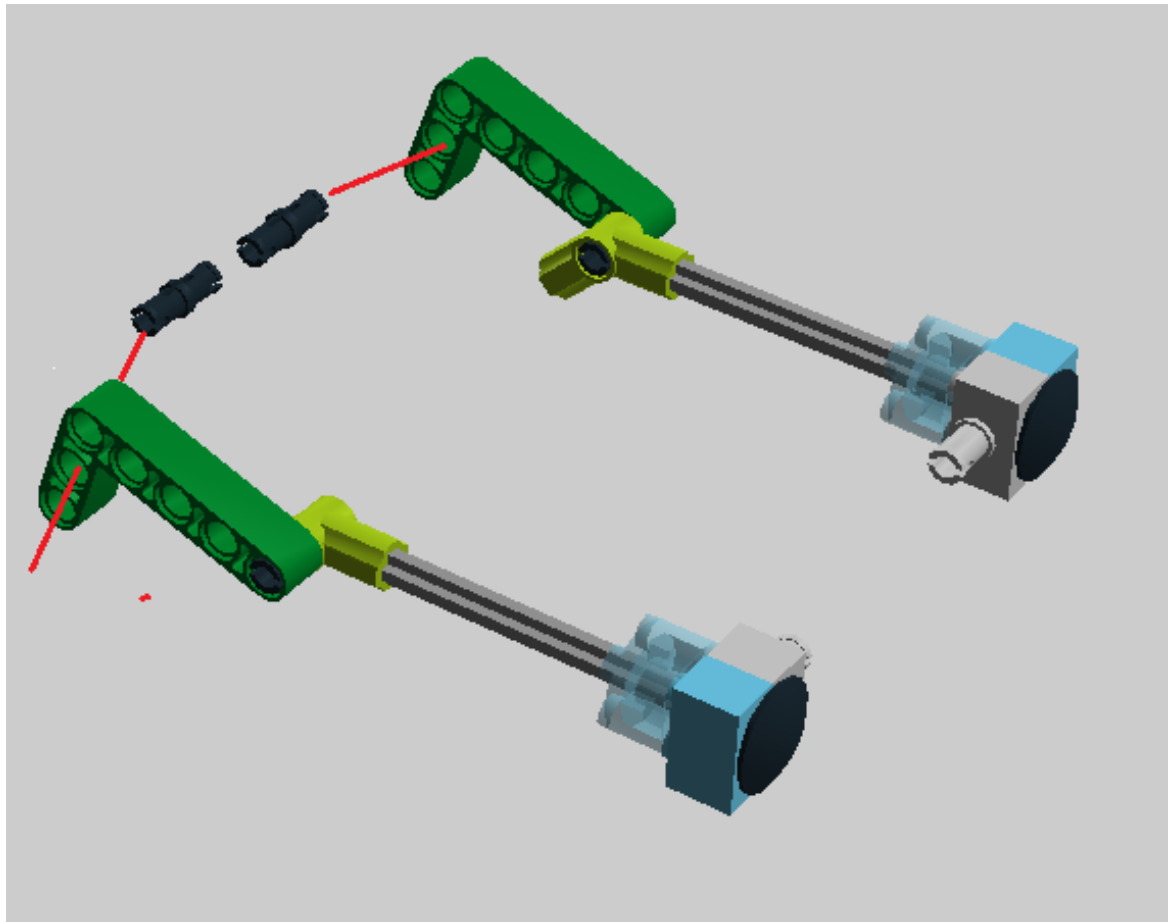
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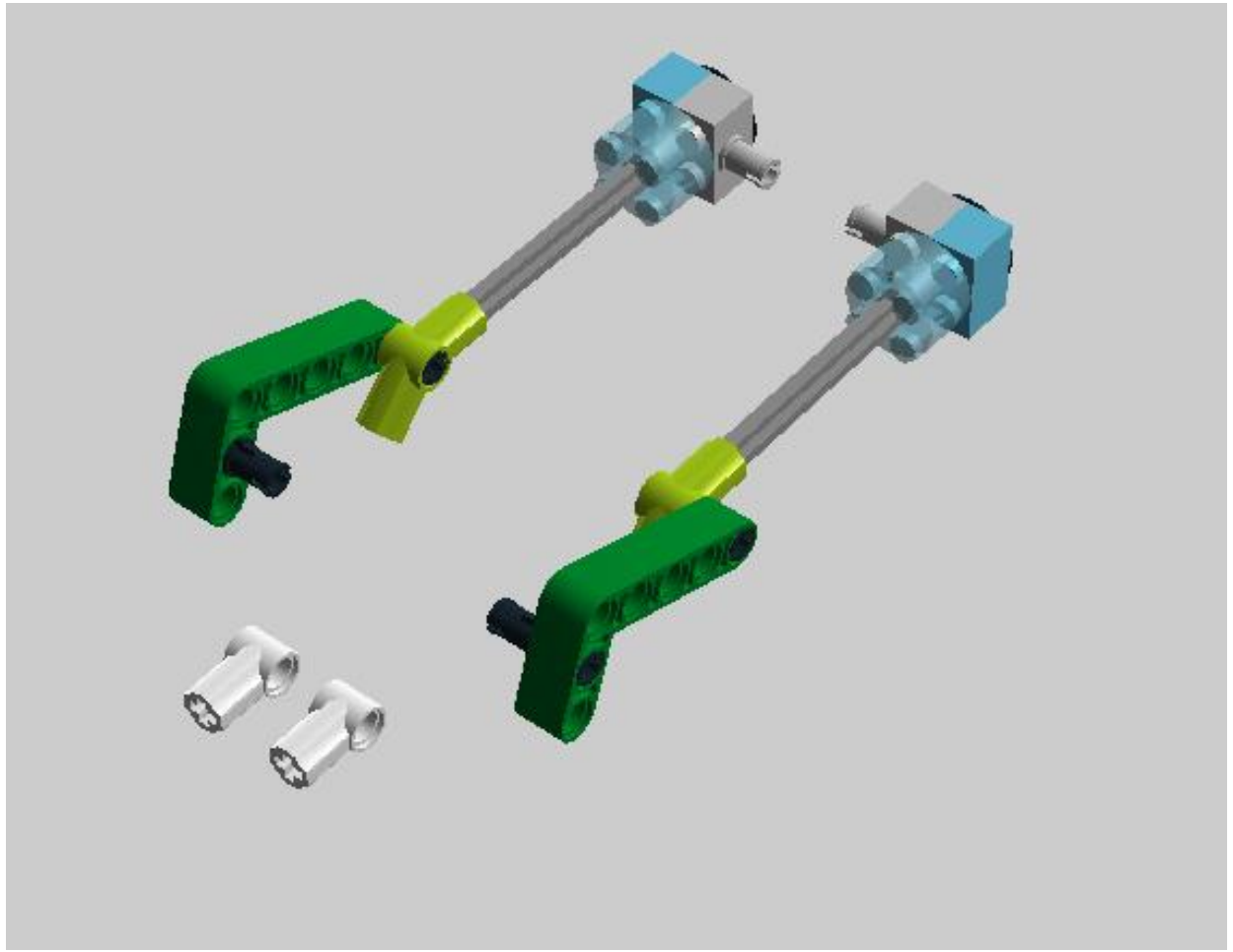
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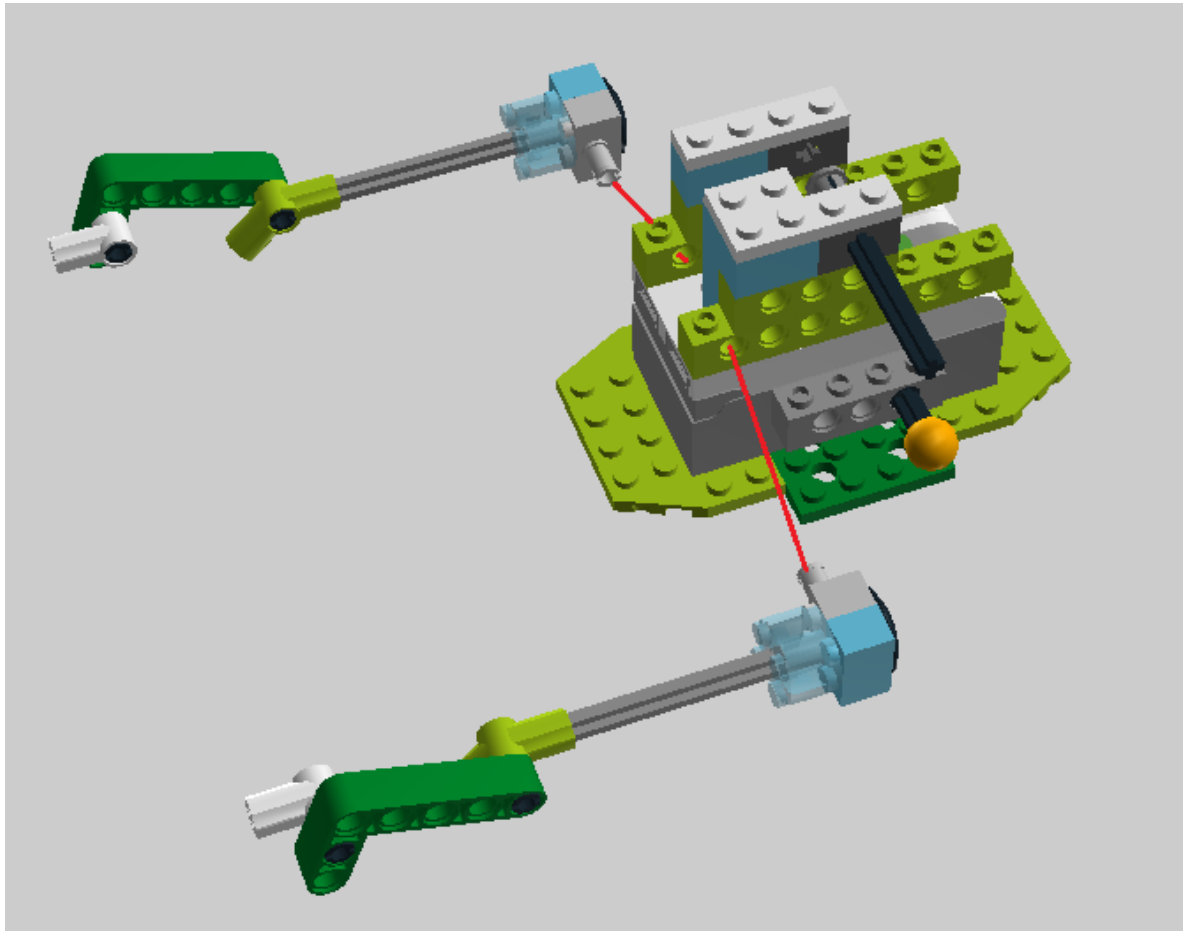
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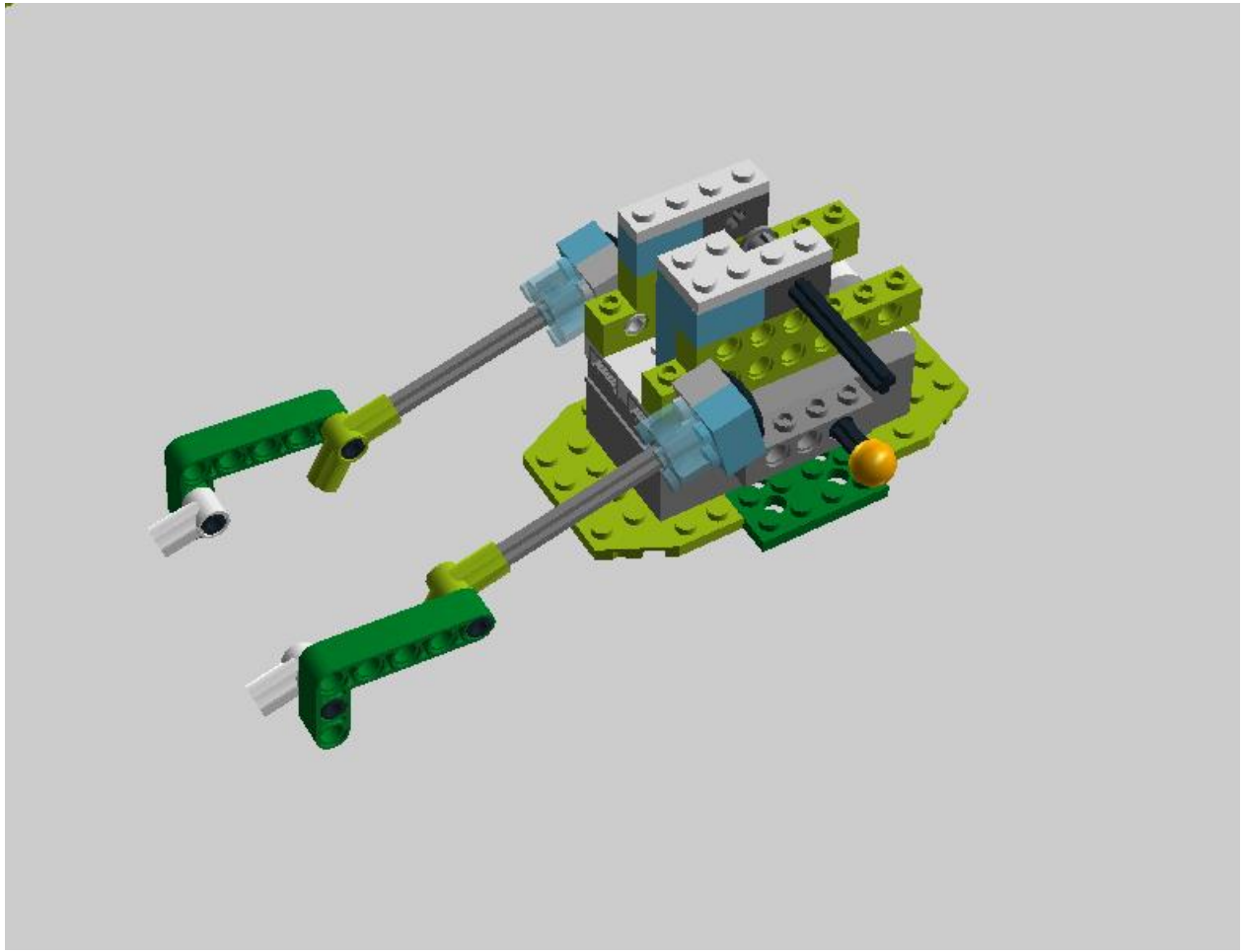
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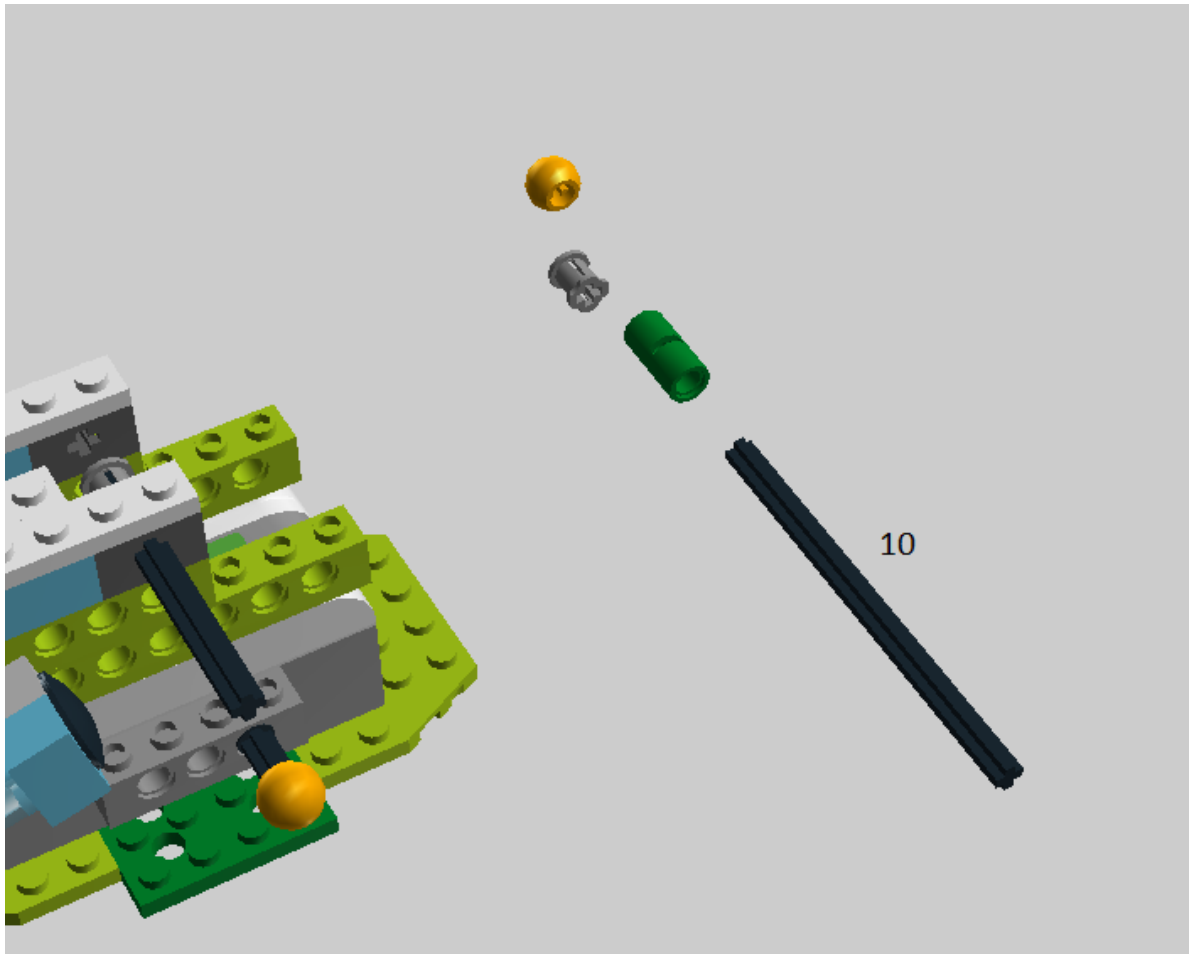
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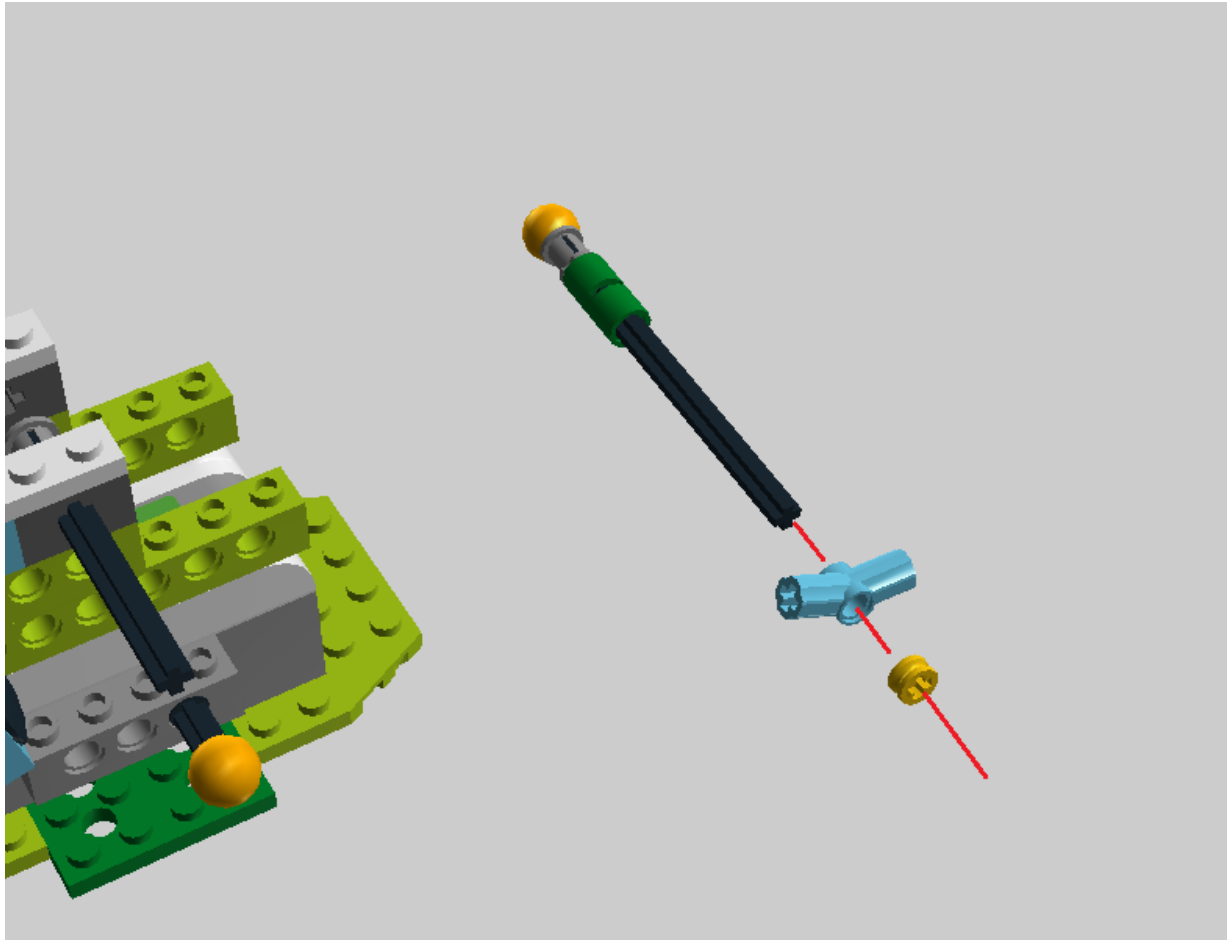
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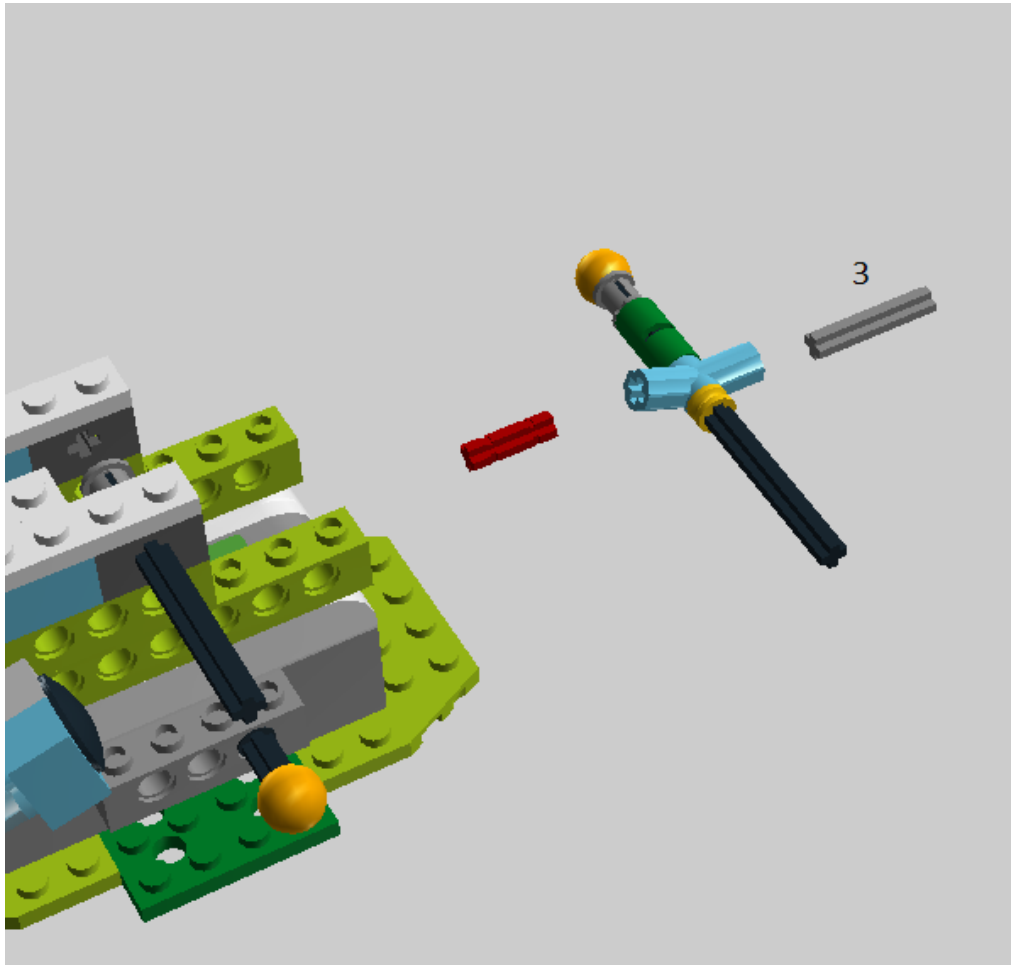
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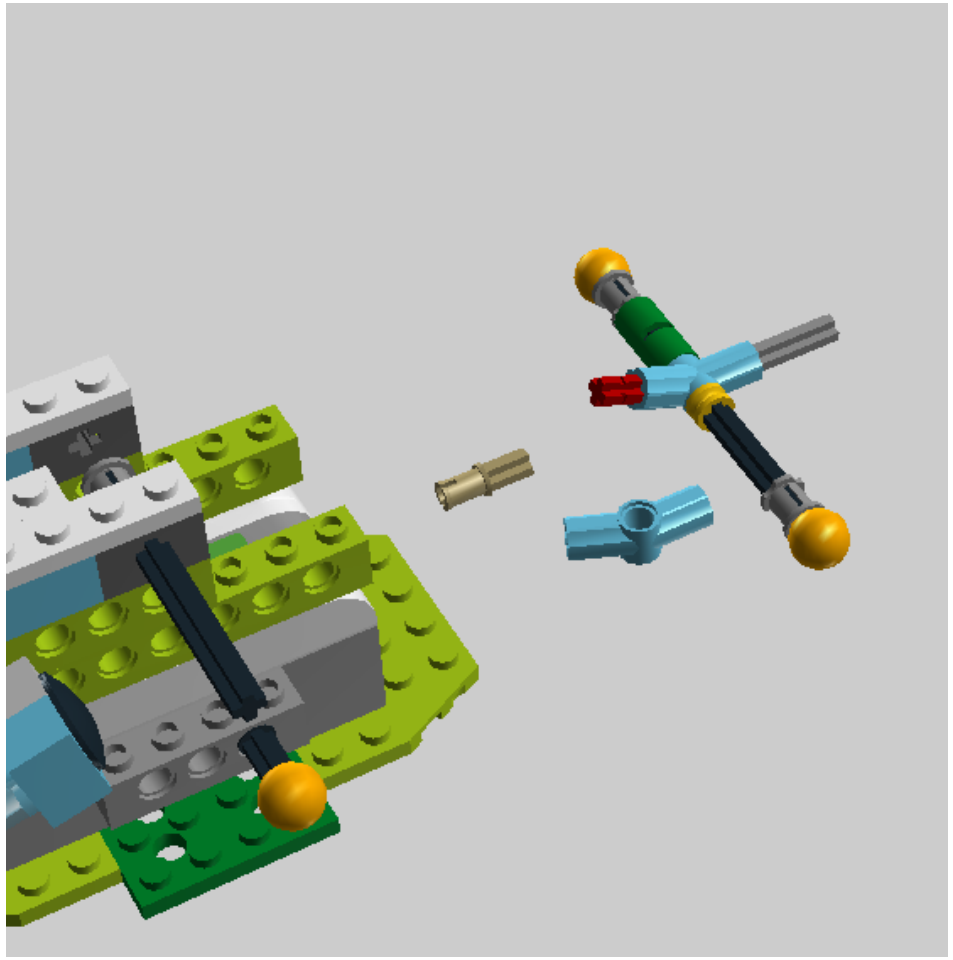
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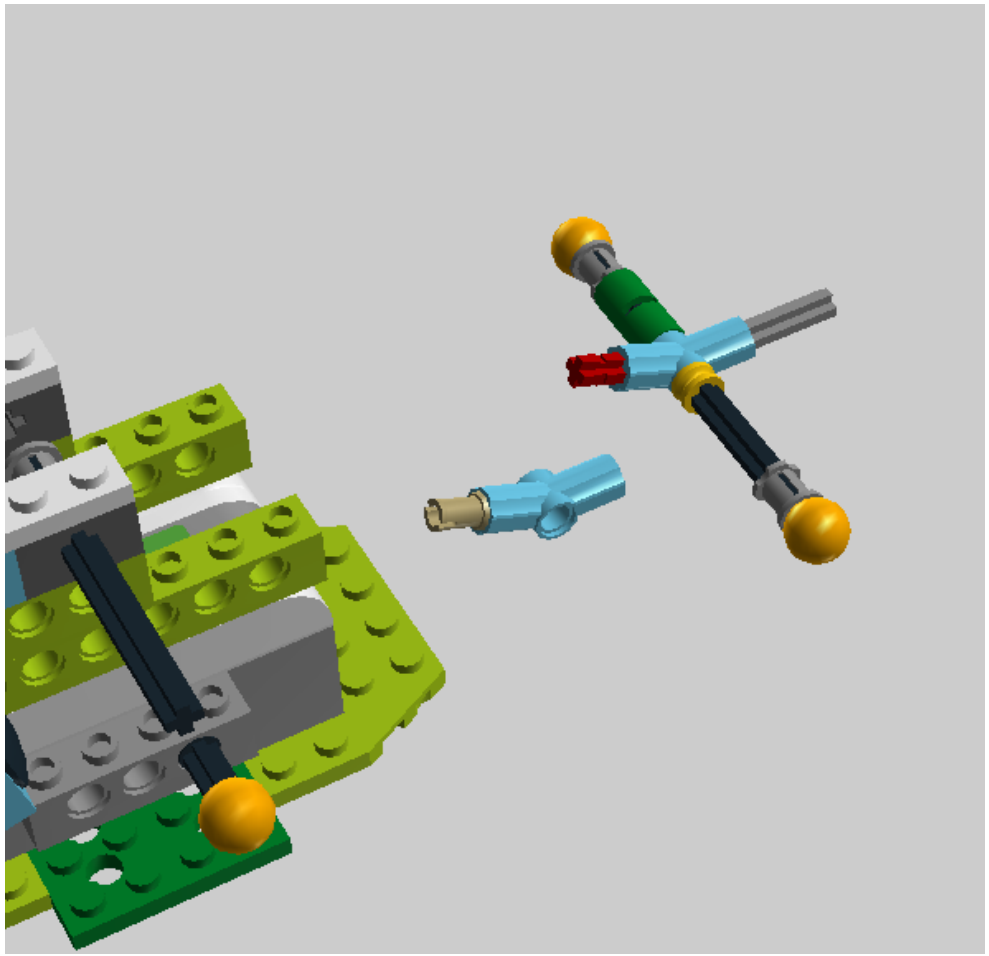
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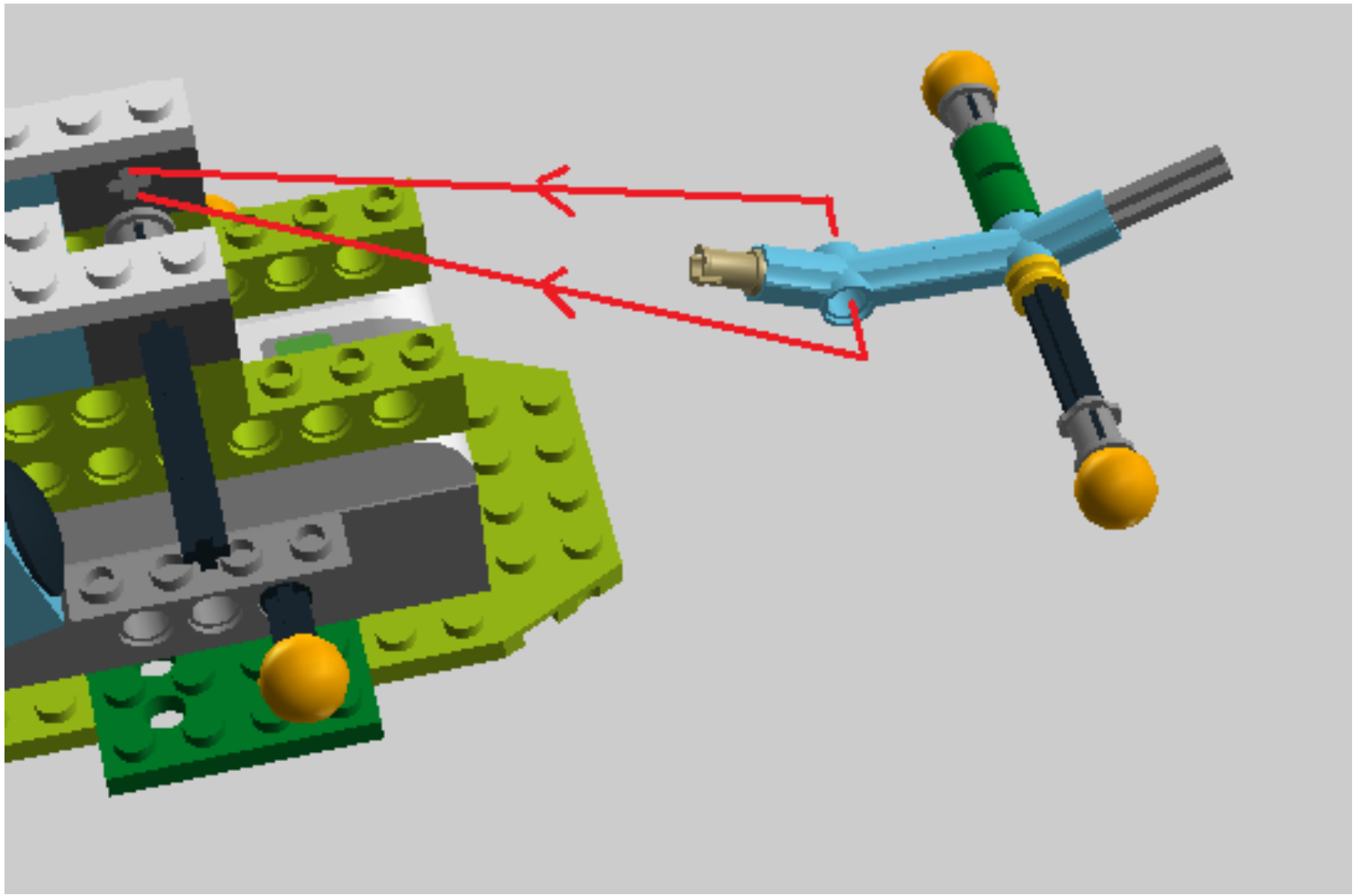
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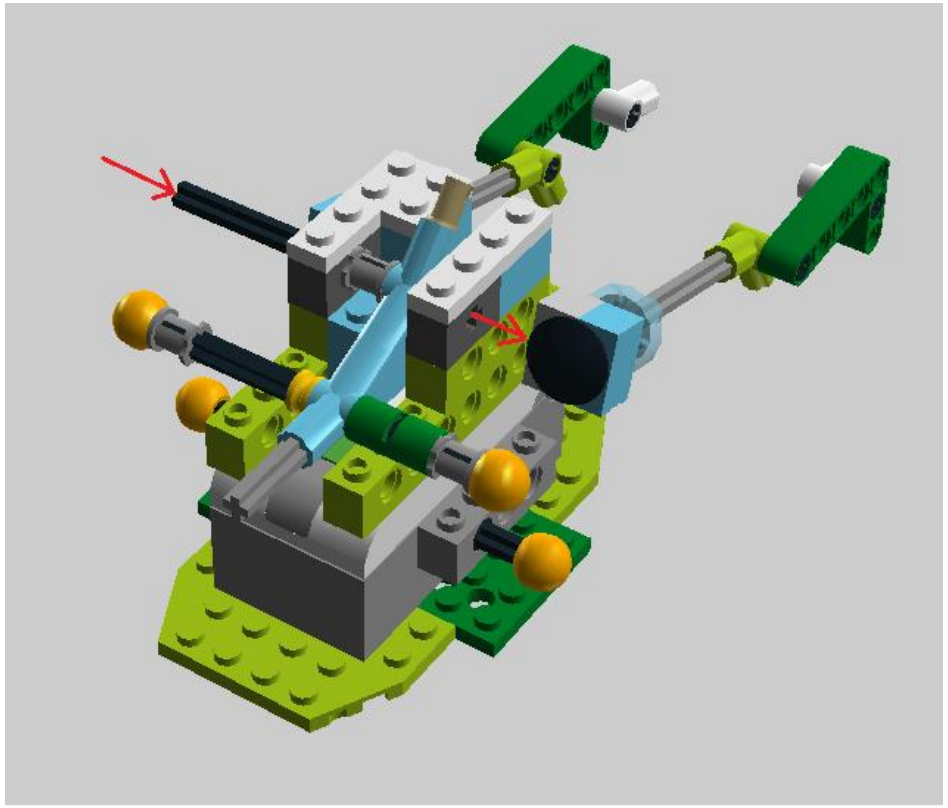
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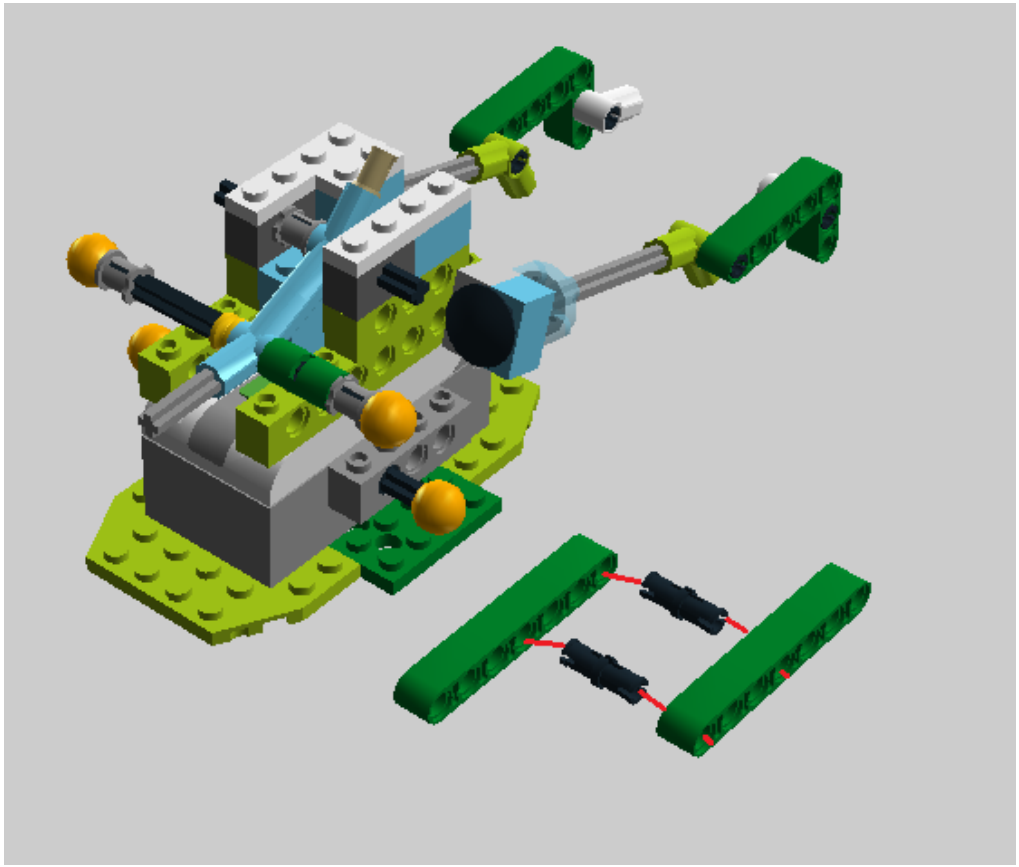


Press the axle to come through the other side, to secure the part you built.

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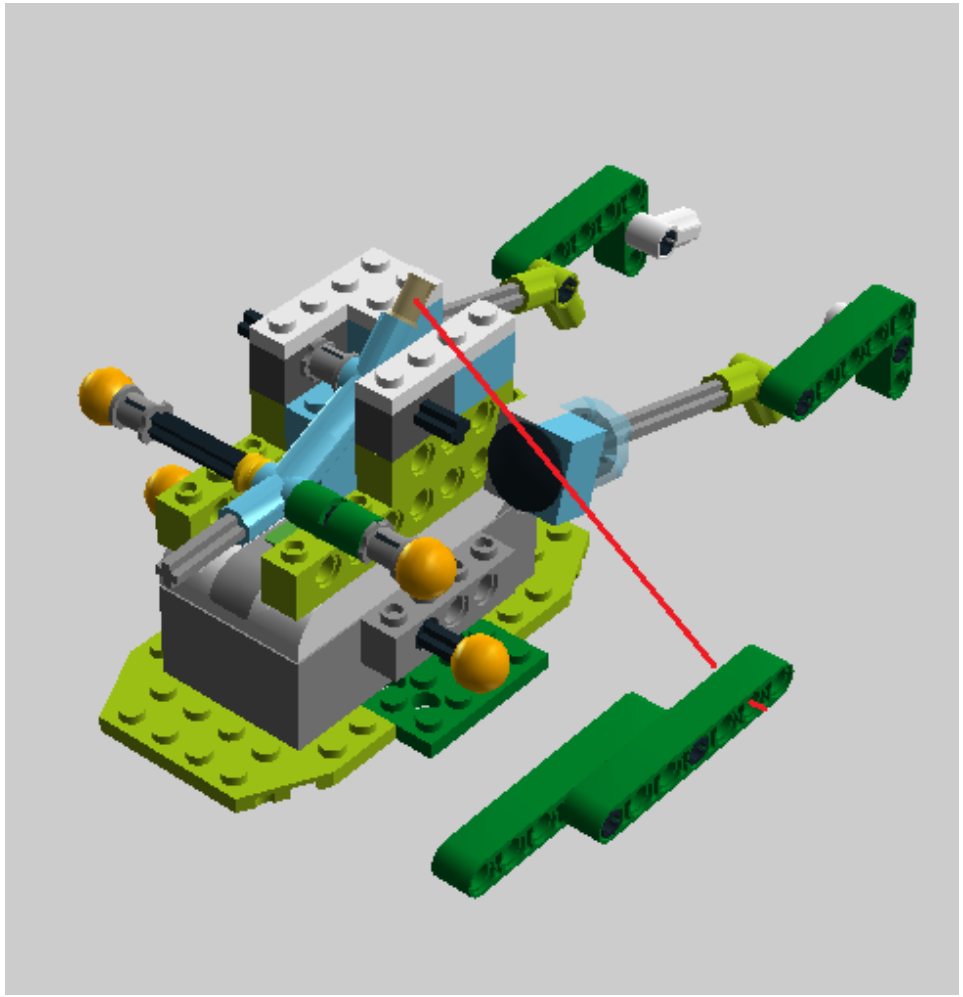
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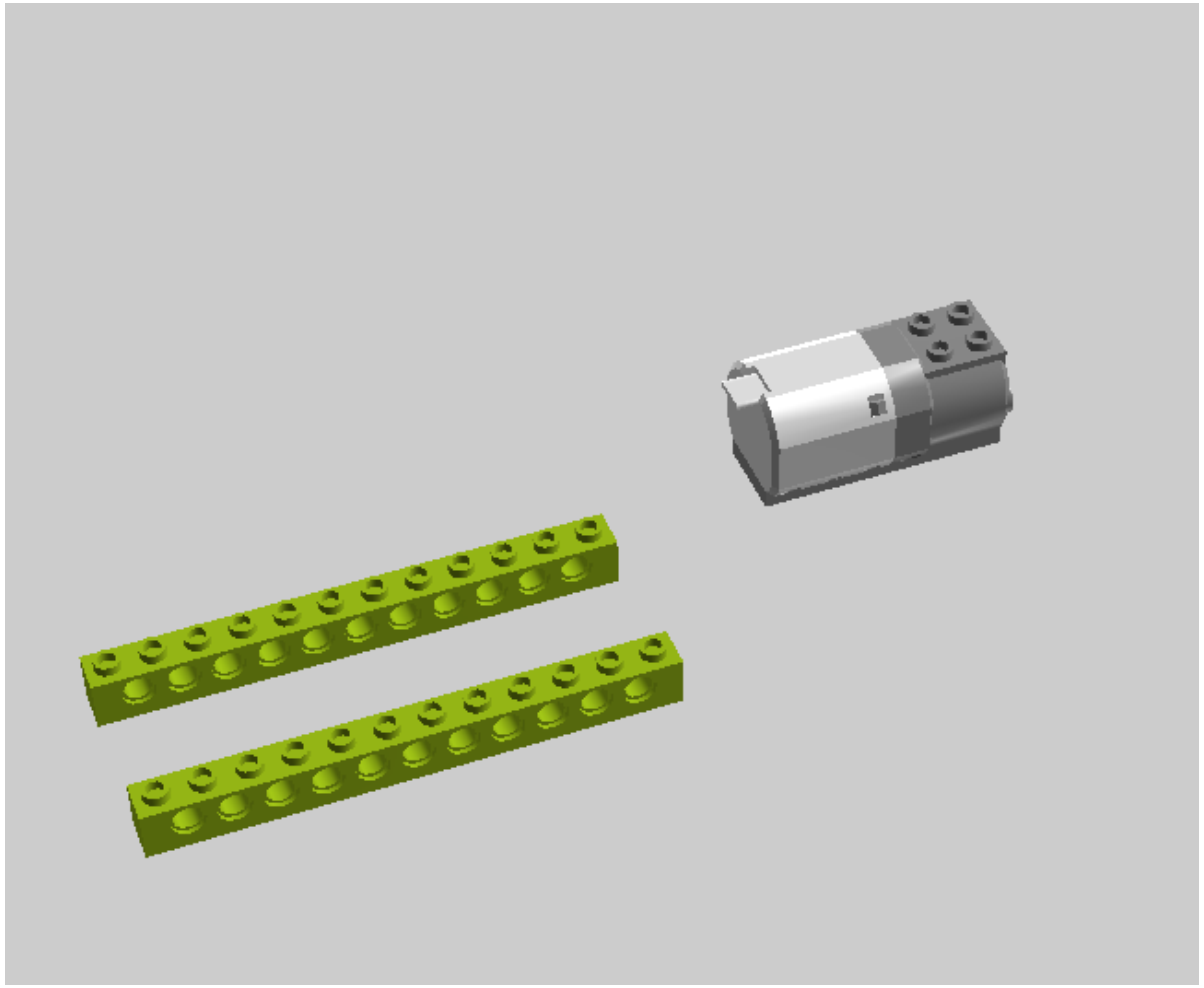
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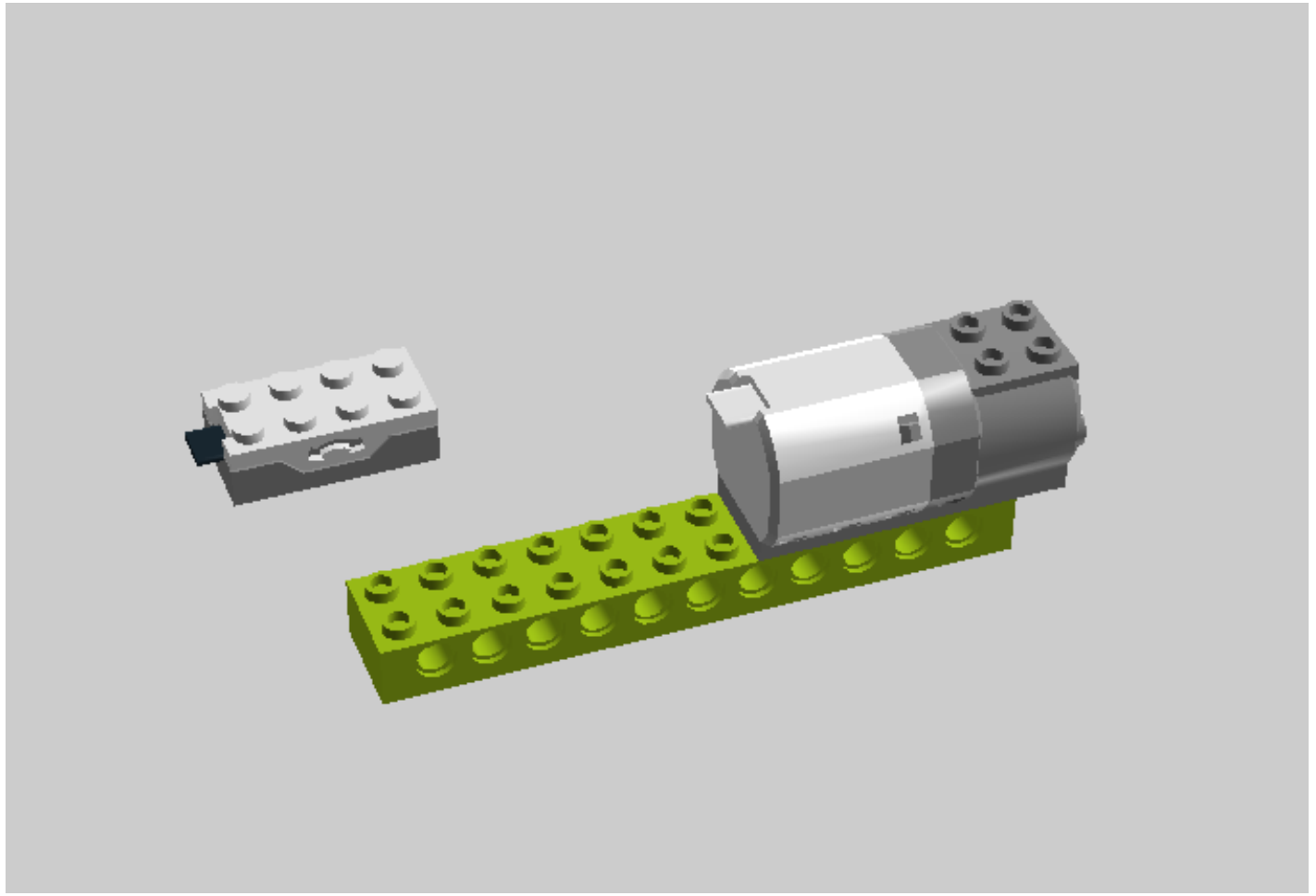
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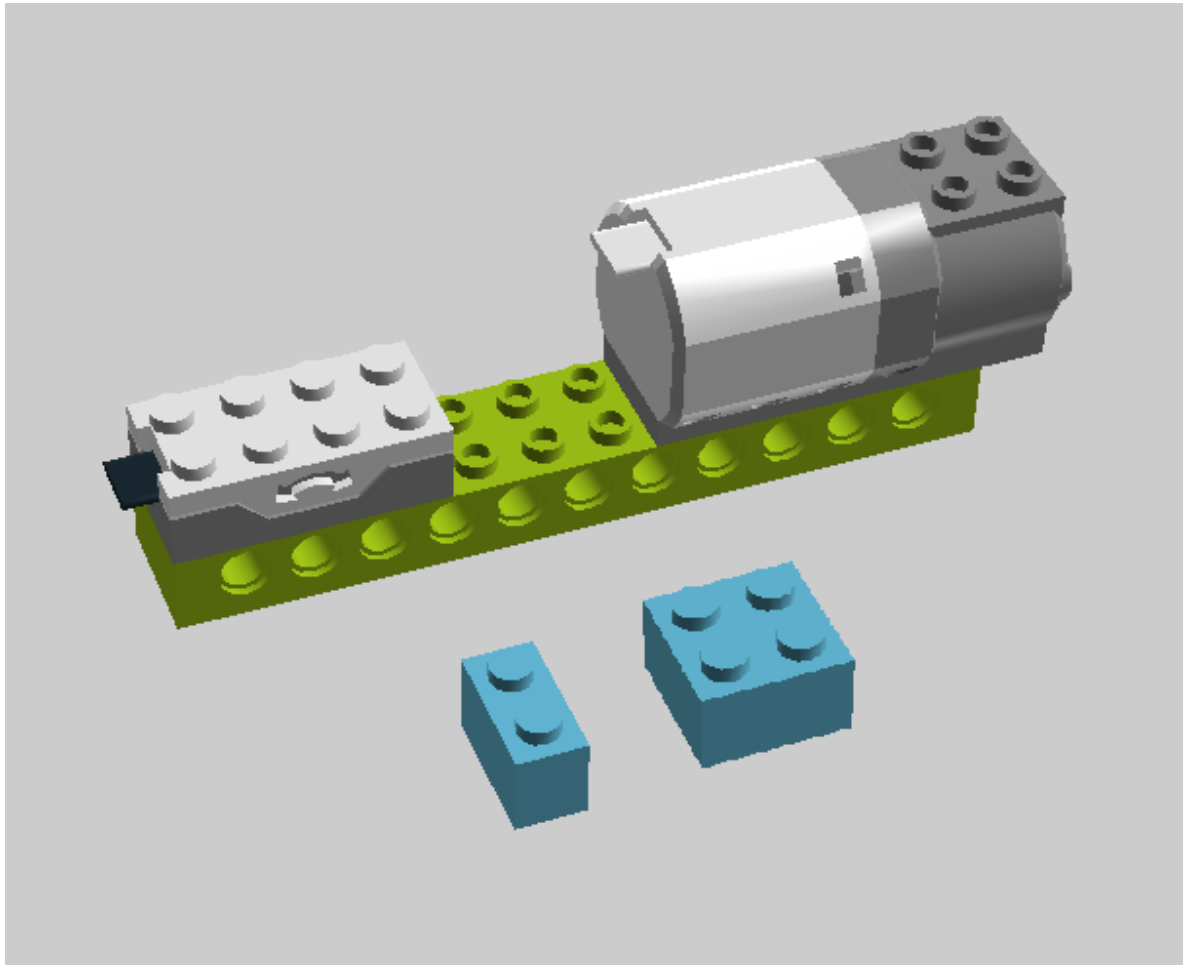
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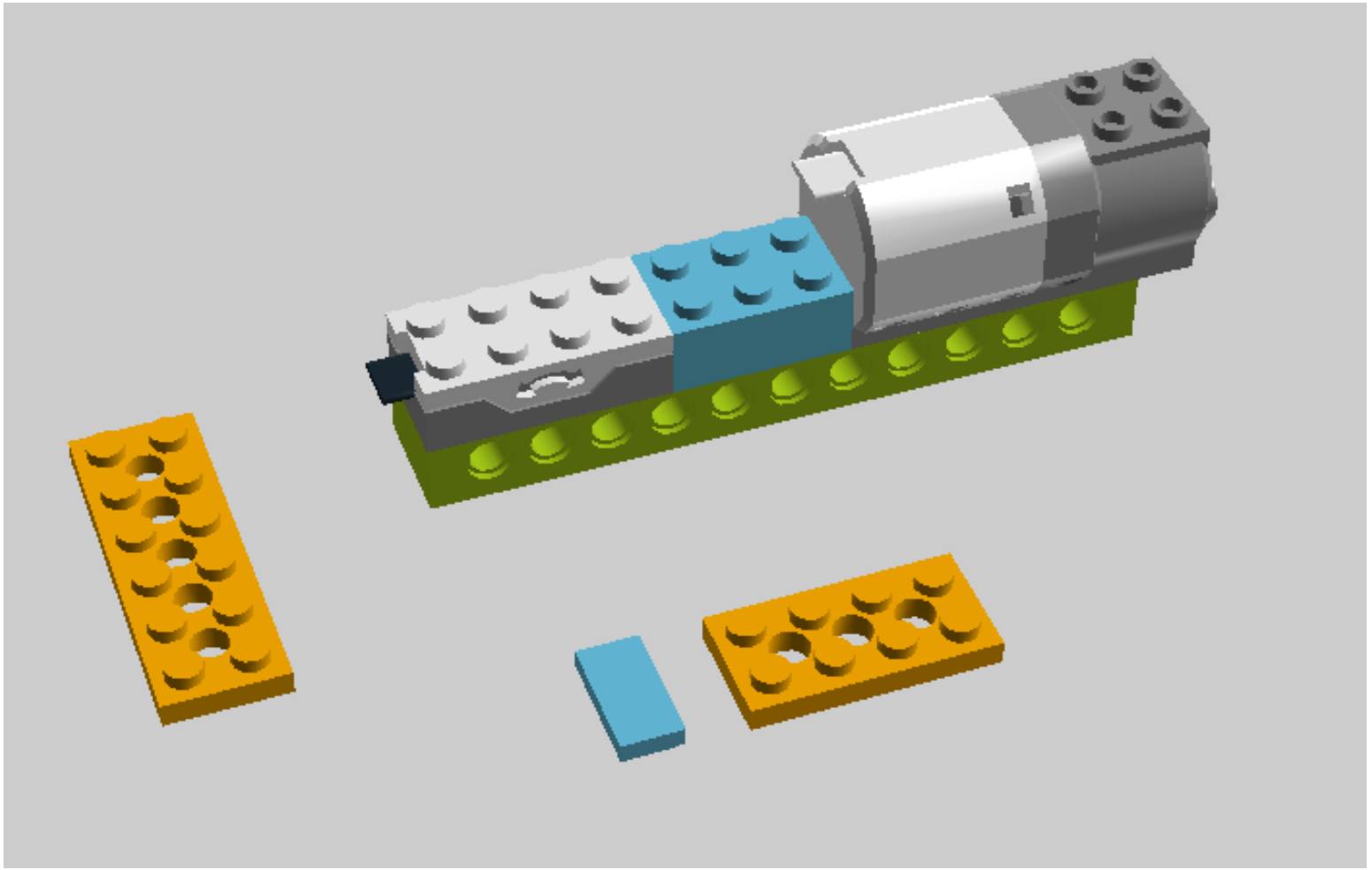
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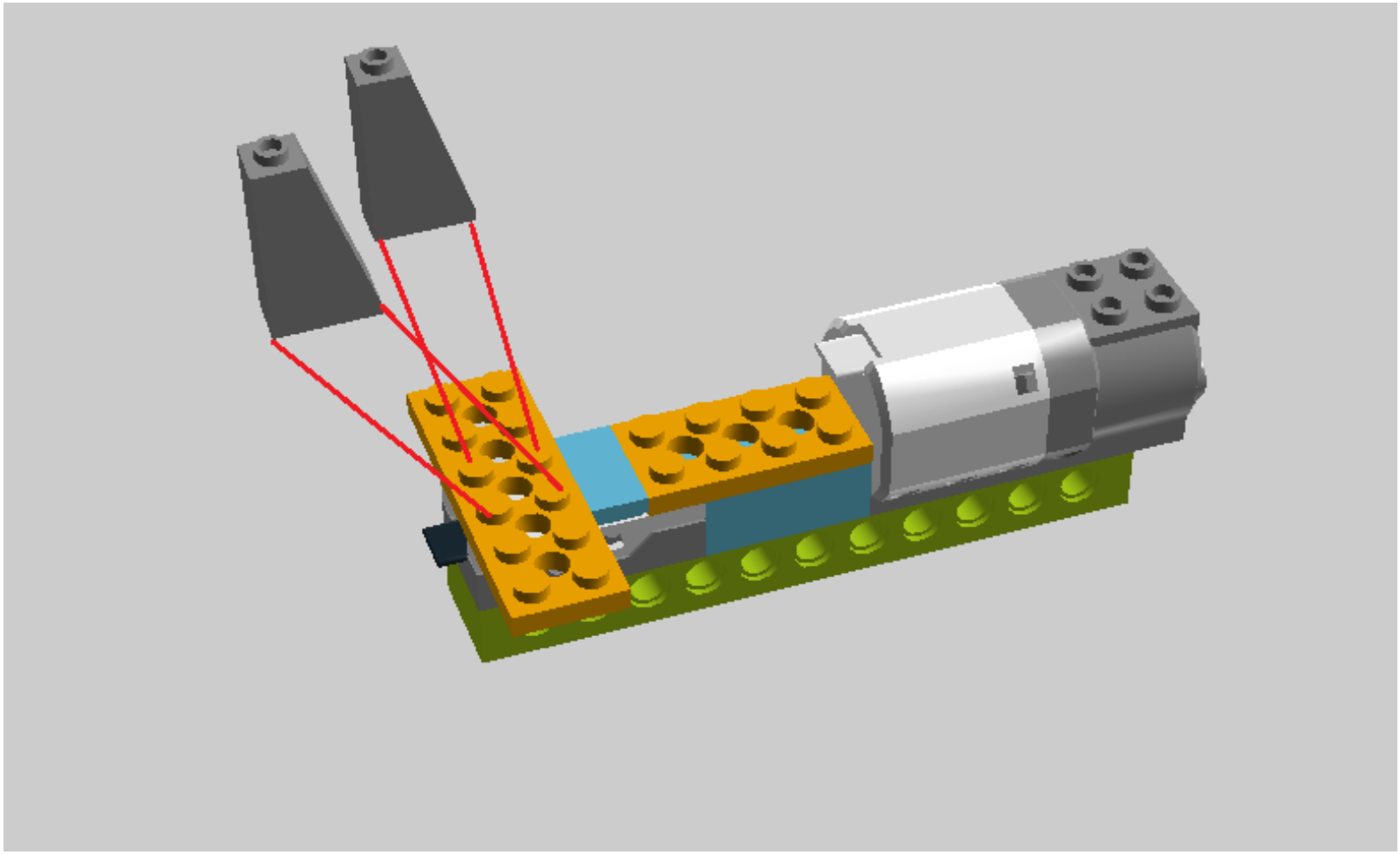
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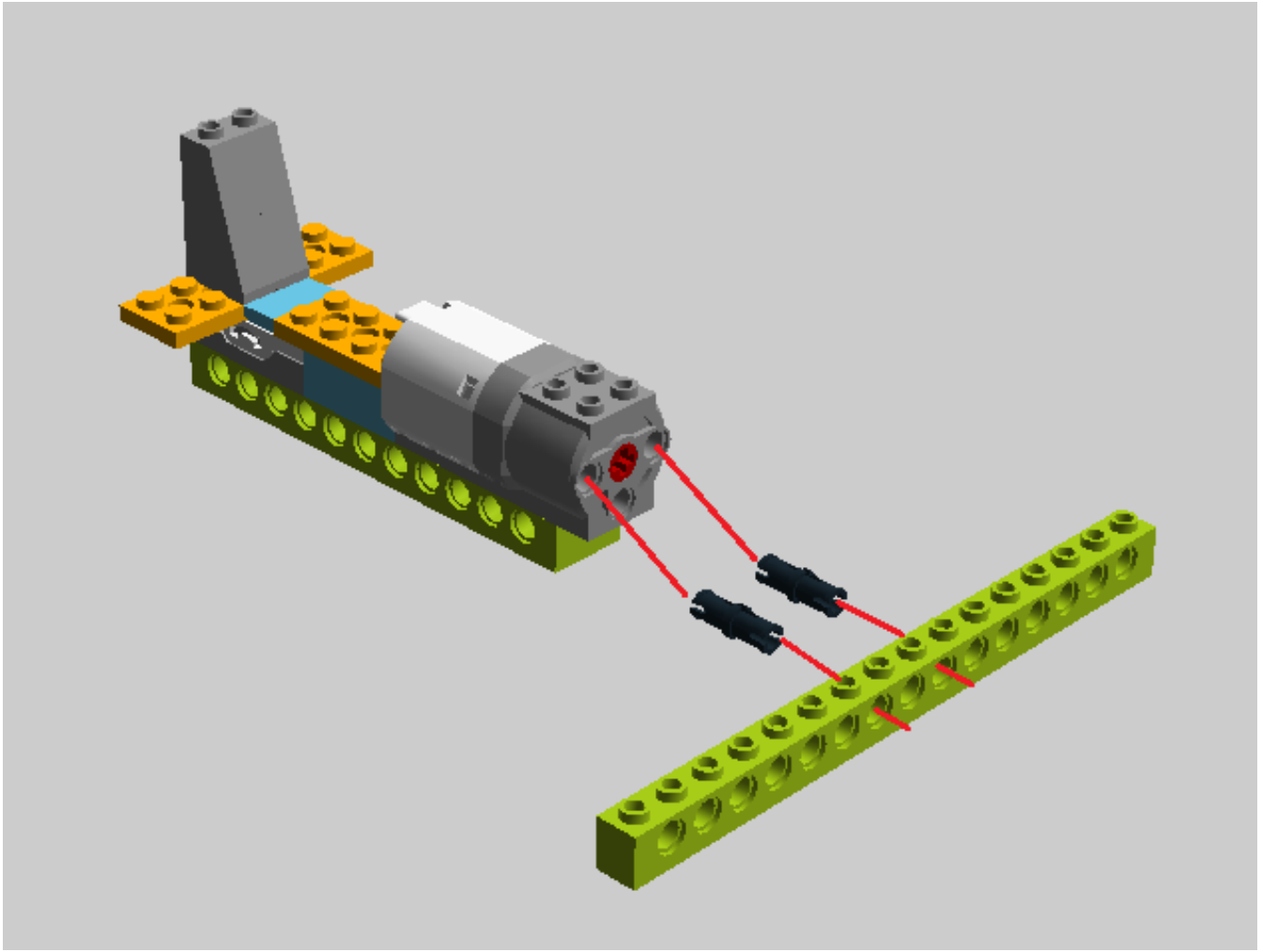
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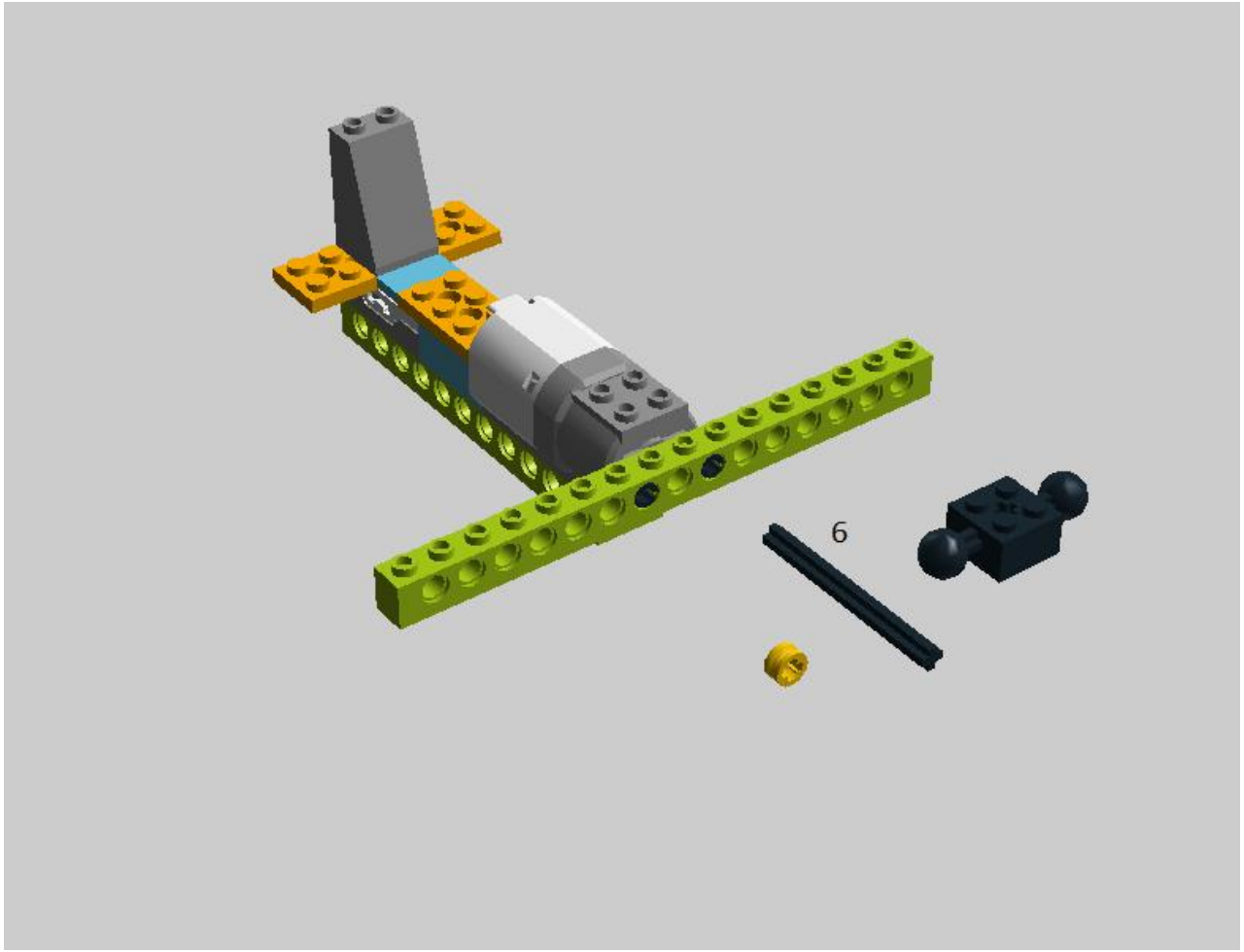
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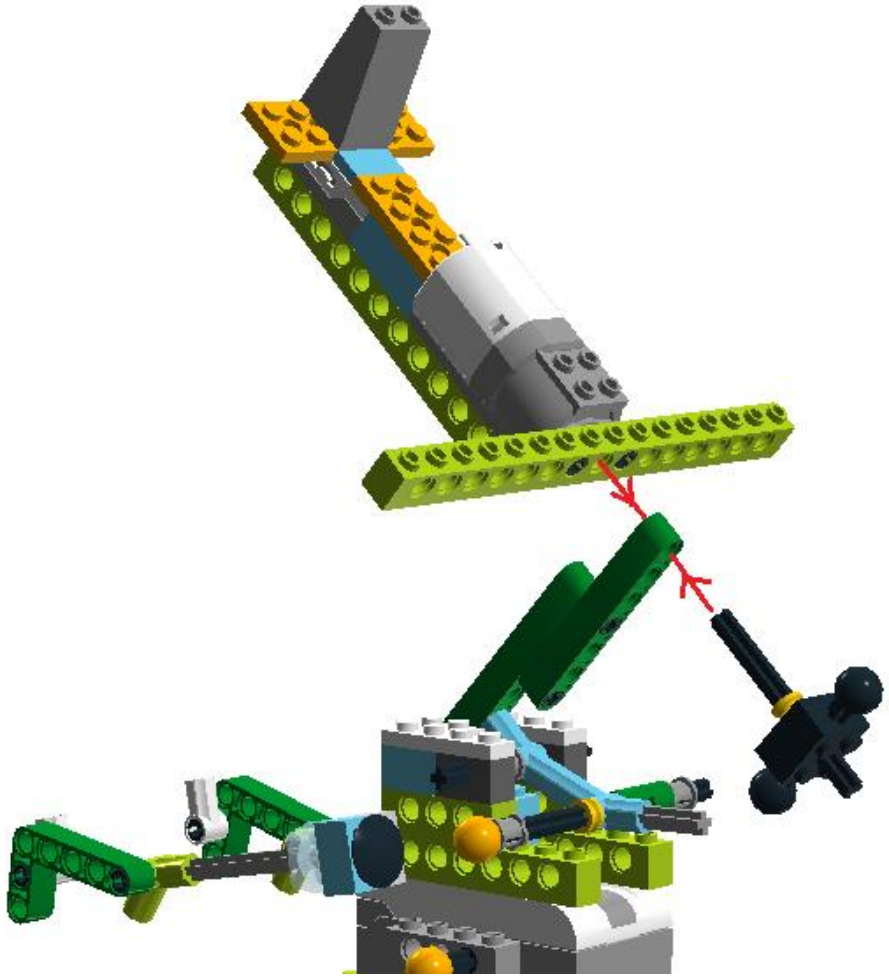
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Automation Engineers

Airplane

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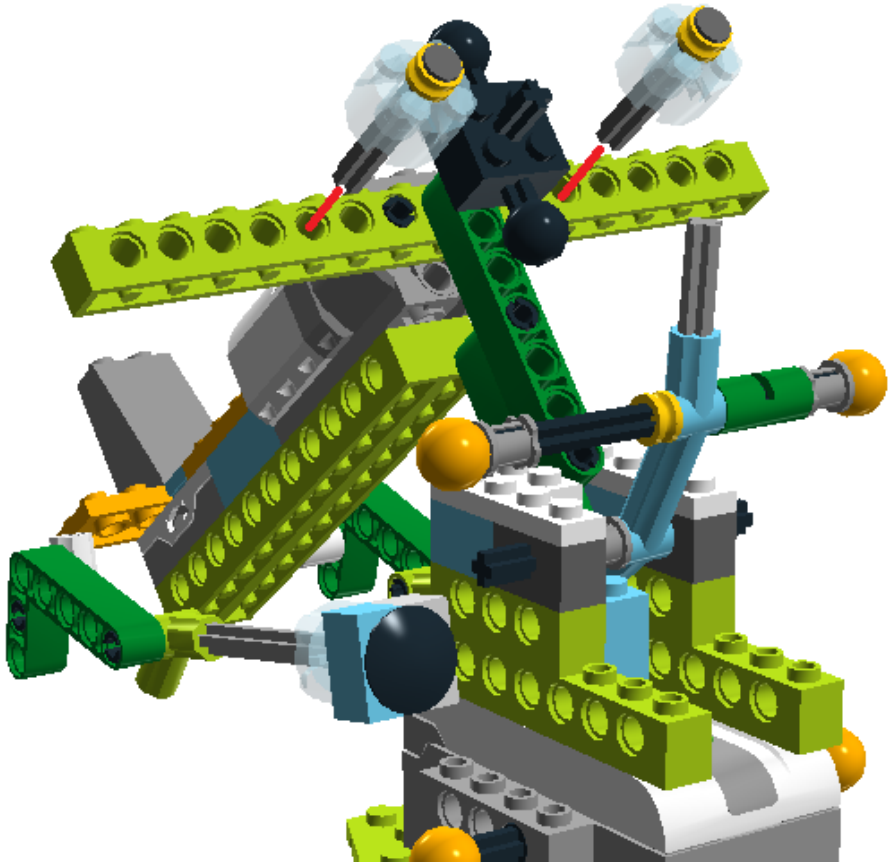
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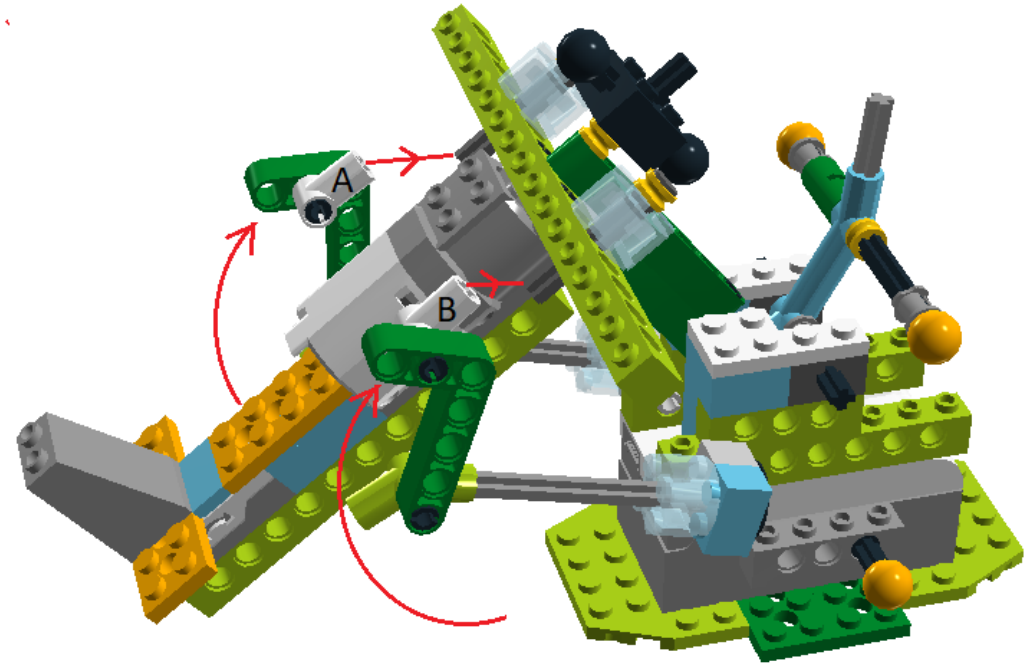
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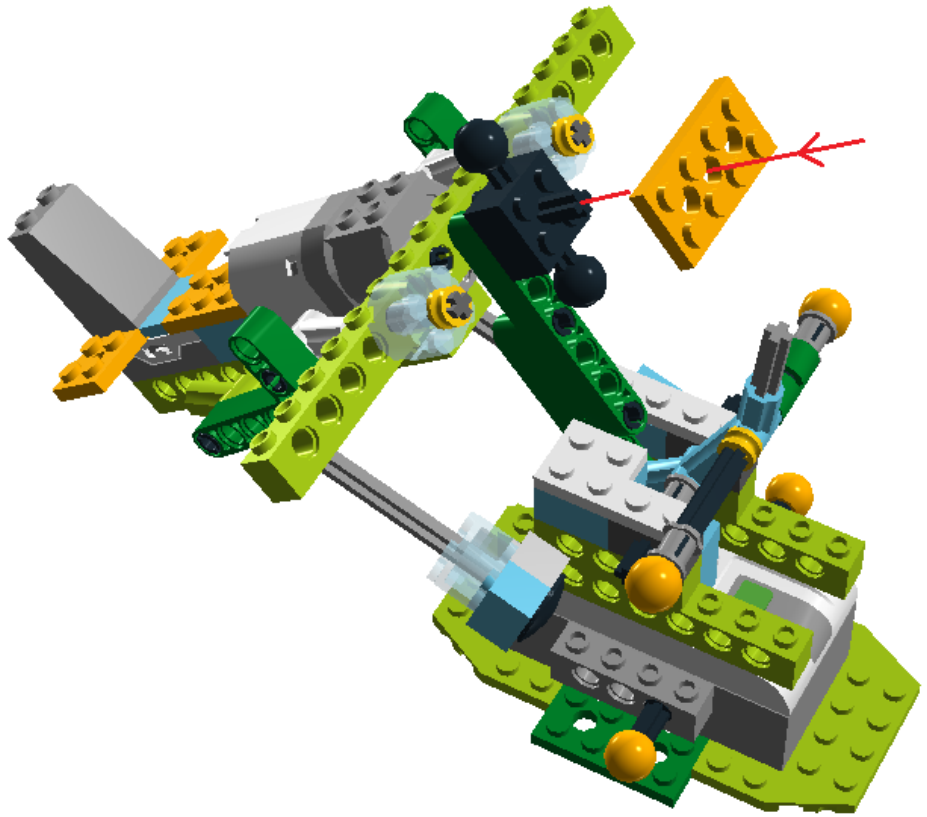
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Lift and turn the part you see in the picture, until A and B are connected to the grey axles.

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Place the wings. The parts you connected in a previous step will seem separated, but don’t worry, this is a system error!

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Finally, place the rubbers, that assist the controller to remain in a horizontal position

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Open Scratch, where you can see that most stuff is ready.
You will only program the plane and try to direct it.

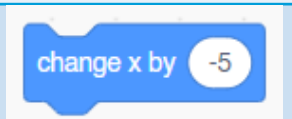
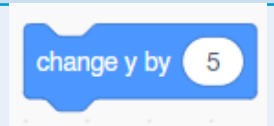
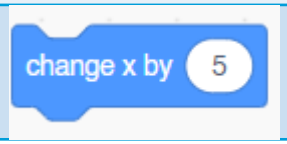


When the green flag is clicked
-The plane-sprite moves to x: 0, y: -143
-The motor is activated (you don't need to define direction, power and time)
Add costumes 1 to 4, you can find in the file "Plane_Stages", regarding the values of the tilt sensor.

Use the controller to change the direction of the plane. Is the program synchronized?

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After you synchronize the commands to the program, place them in the correct points, to change the position of the plane in the screen, regarding its tilt!

	Moving upwards
	Moving downwards
	Moving left
	Moving right

When you finish your worksheet,

disassemble your built,

placing everything in the right place



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