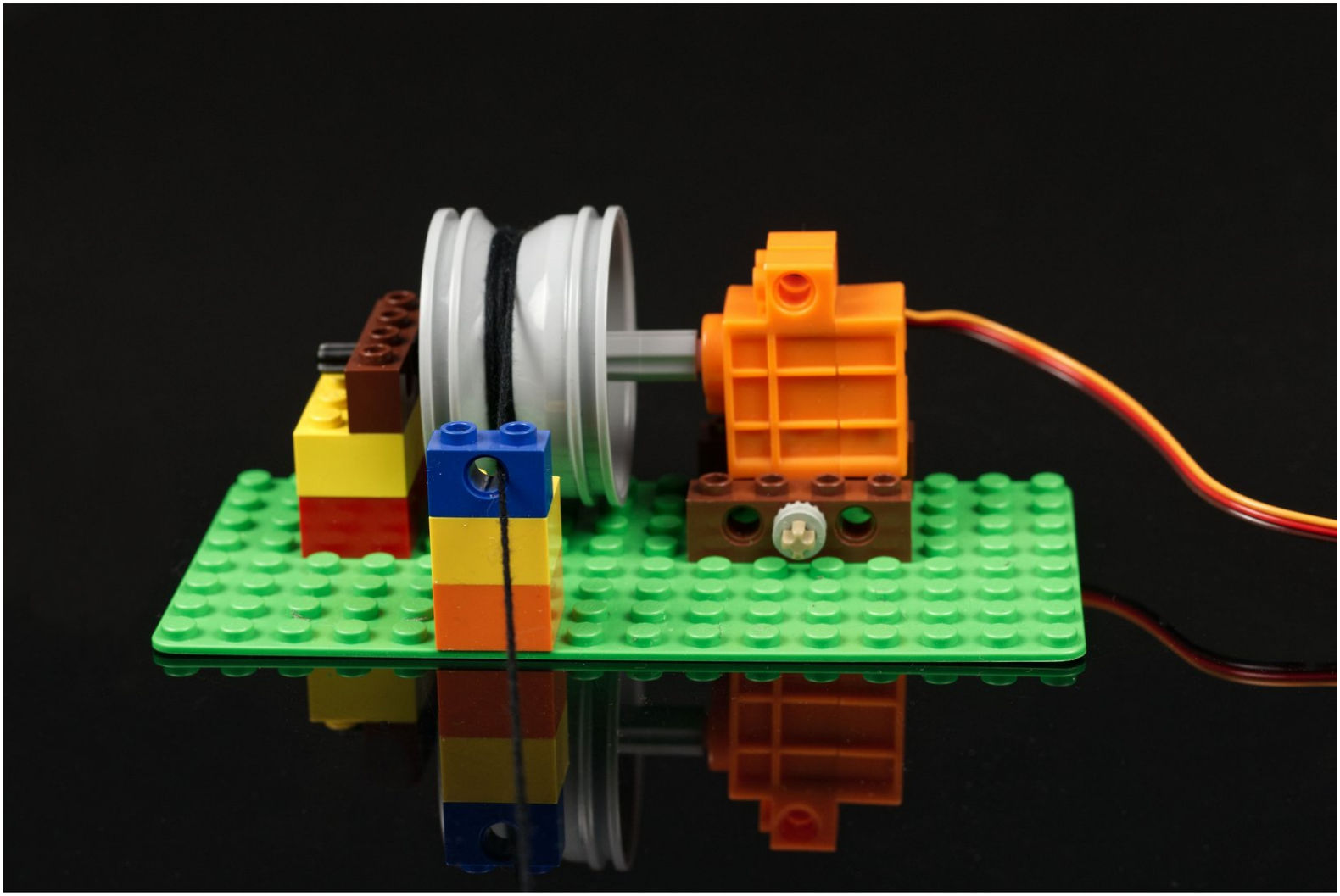
LEGO Winch Mechanism

We'll build a simple LEGO-based winch mechanism using a 360 degree continuous rotation servo that can be used with any microcontroller.

Written By: Pete Prodoehl



INTRODUCTION

We'll build a simple LEGO-based winch mechanism using a 360 degree continuous rotation servo that can be used with any microcontroller.

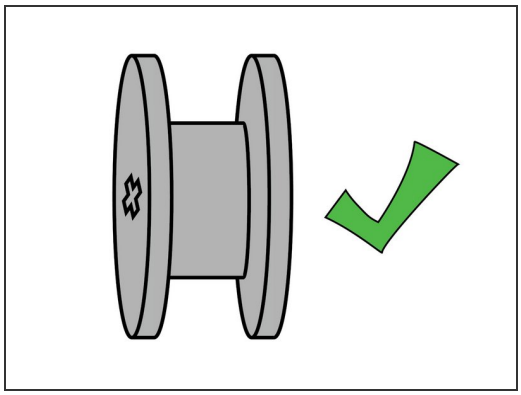
PARTS:

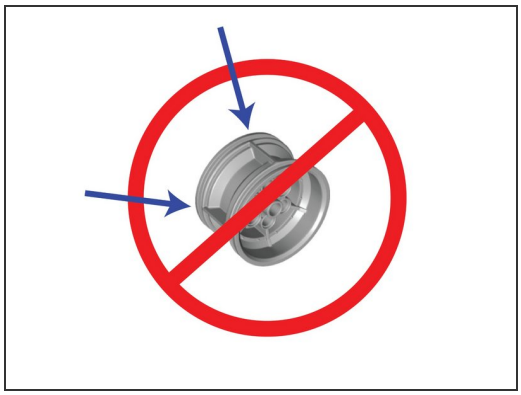
- Brick Compatible 360 Degree Servo (1)
- LEGO Wheel 43.2mm D. x 26mm Technic Racing Small with 3 Pinholes (41896) (1)
- LEGO Axle 6 (3706) (1)
- LEGO Axle Connector (Smooth with 'x' Hole) (59443) (1)
- LEGO Axle 4 with End Stop (87083) (1)
- LEGO Technic Brick 1 x 2 with Hole (3700) (1)
- LEGO Technic Brick 1 x 4 with Holes (3701) (3)
- LEGO Technic Bush 1/2 with Teeth Type 1 (4265) (1)
- String (1)

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Step 1 — Gather Parts

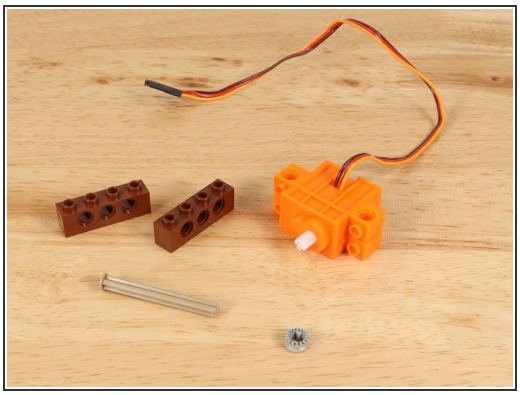
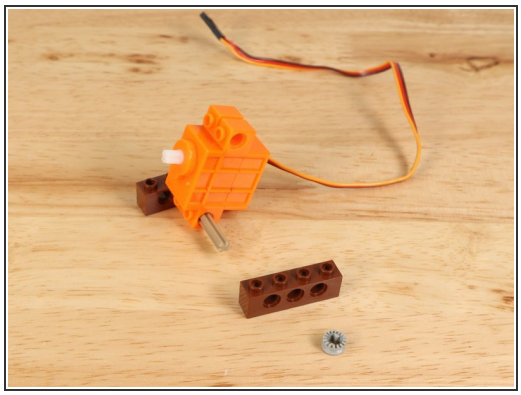
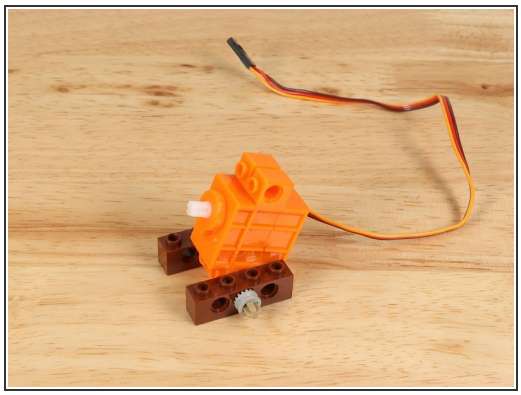






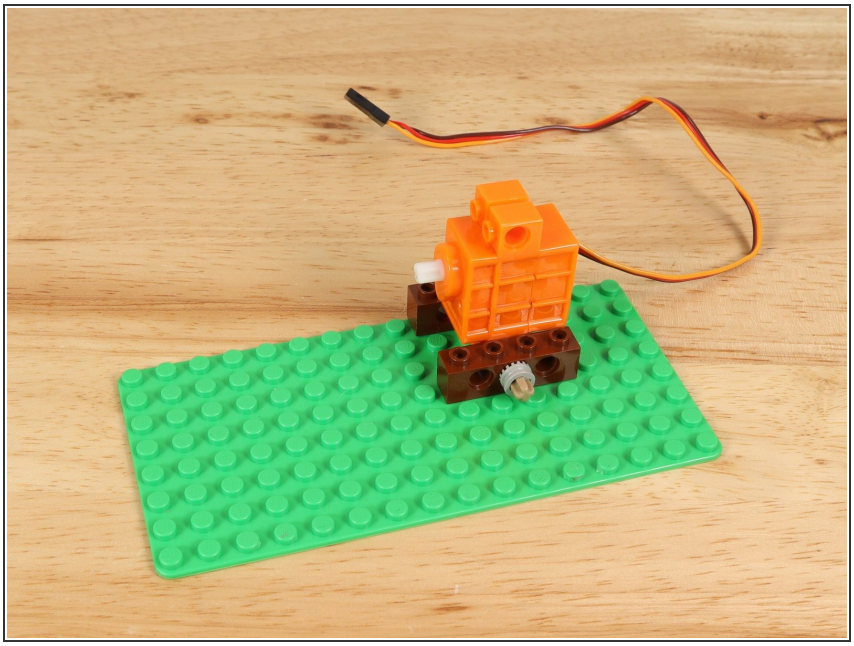
- As with all LEGO projects a variety of parts can be used. We've listed all the parts we chose but you should use what works, or what you already have on hand when possible.
- For instance, here are two alternative wheels/rims that could work.
  - LEGO Wheel 43.2 X 18 (86652)
  - LEGO Rim 56 X 34 with 3 Holes (15038 / 44772)
- Any wheel/rim with an "H" or "V" shaped groove should work. Avoid the ones with raised ribbing in the groove part.
- Besides the specified LEGO parts you'll need a LEGO baseplate, a few standard LEGO bricks, a 360 degree continuous rotation servo, and some string.

Step 2 — Attach Servo

- We'll start by adding some "feet" to the servo so we can attach it to the baseplate.
- Use the following parts:
  - LEGO Technic Brick 1 x 4 with Holes (3701) *You'll need two of them.*
  - LEGO Axle 4 with End Stop (87083)
  - LEGO Technic Bush 1/2 with Teeth Type 1 (4265)

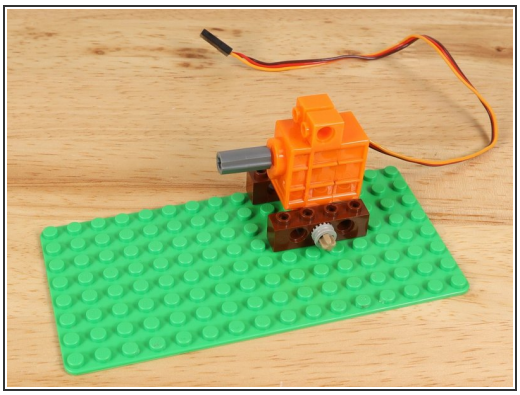
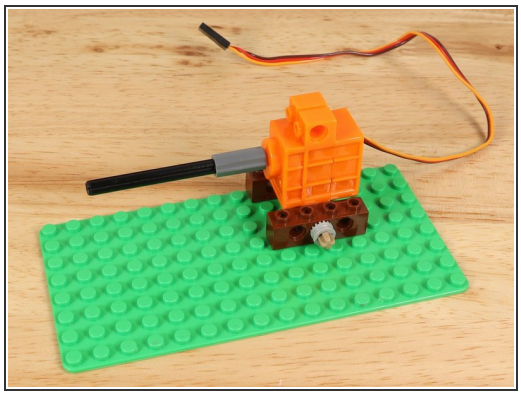
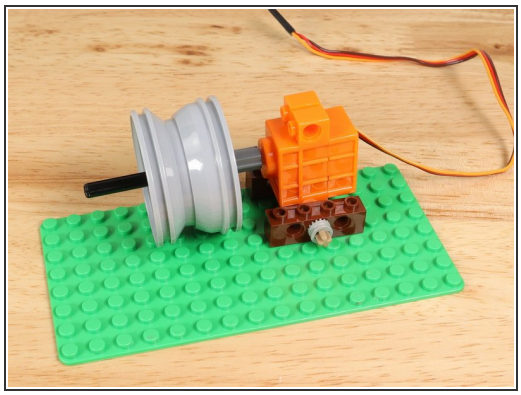
Step 3 — Place on Baseplate



- Once you have the "feet" for your servo you can attach it to a LEGO baseplate.

ⓘ Make note of the orientation of the servo. Since the shaft is not centered you want it higher up in the assembly.

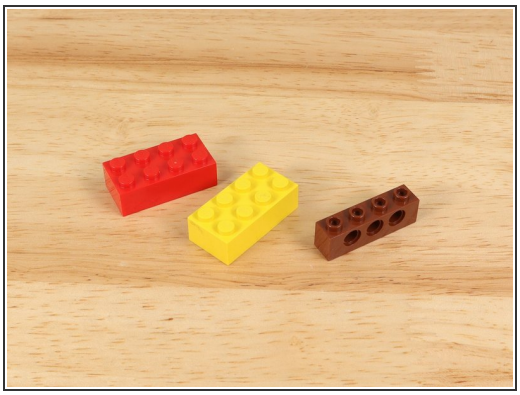
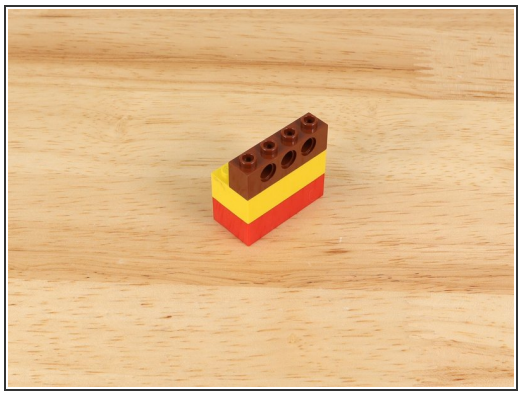
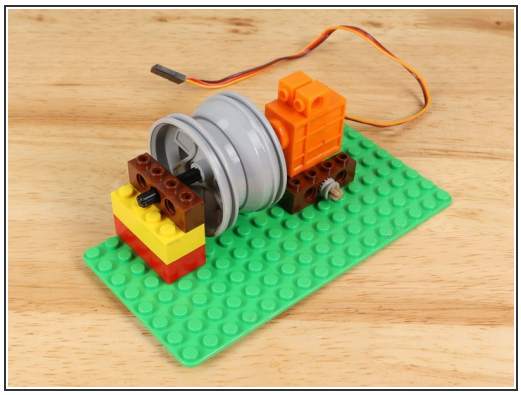
Step 4 — Attach Shaft & Wheel/Rim

- Next we'll attach the shaft and wheel/rim to the servo. You'll need an axle connector added to the servo shaft to start.
- Use the following parts:
  - LEGO Axle Connector (Smooth with 'x' Hole) (59443)
  - LEGO Axle 6 (3706)
  - LEGO Wheel 43.2mm D. x 26mm Technic Racing Small with 3 Pinholes (41896)

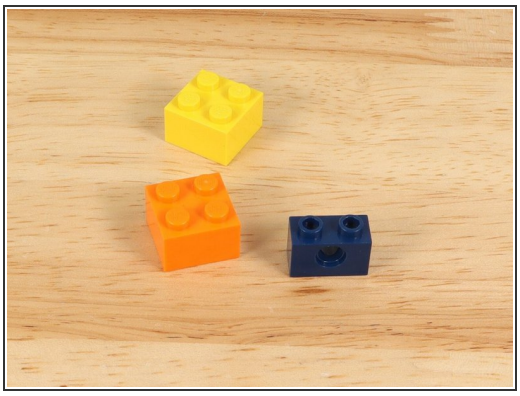
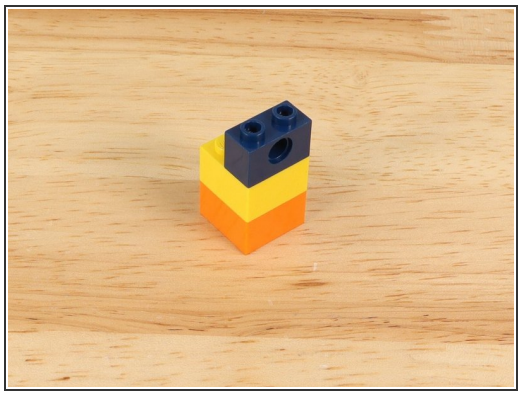
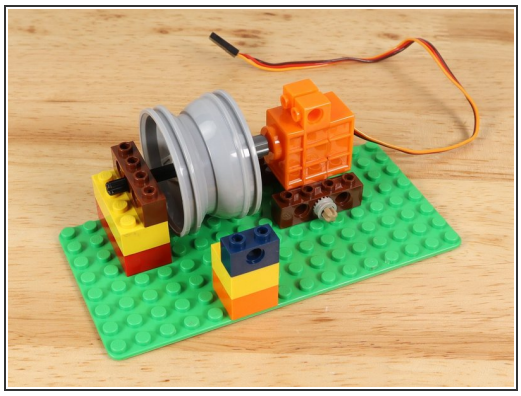
ⓘ Don't worry about the position of the wheel/rim on the shaft, since we can slide it into the correct position later.

Step 5 — Attach Axle Holder

- Next we'll add the parts to hold up the other side of the axle.
- Grab two standard LEGO bricks and another LEGO Technic Brick 1 x 4 with Holes (3701).
- Once assembled place it on the baseplate to hold the axle in place.

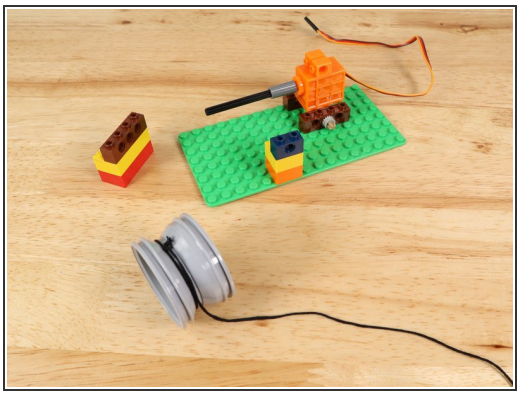
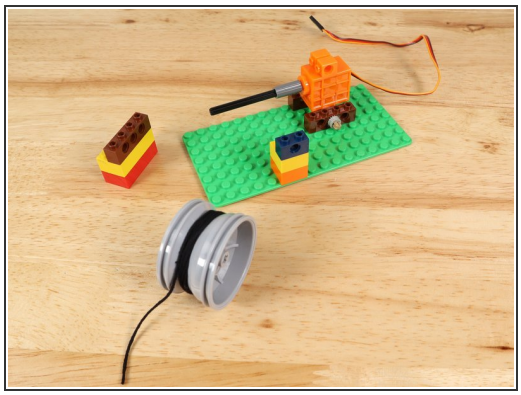
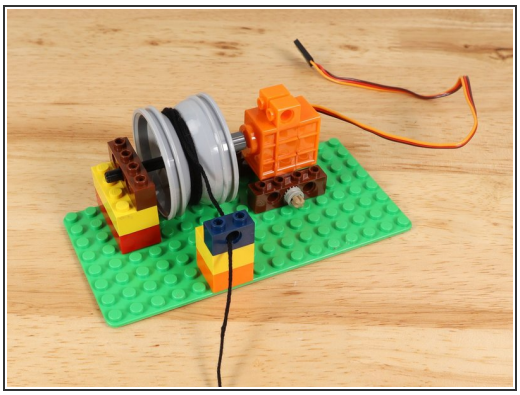
Step 6 — Attach String Guide

- Next we'll add a simple guide for the string to feed through so it doesn't get tangled.
- We used two small LEGO bricks and a LEGO Technic Brick 1 x 4 with Holes (3701).
- Line it up with the wheel/rim as close as you can, then slide the wheel/rim so it is centered to match the guide hole.

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Step 7 — Attach String

- If everything looks right you can pull the wheel/rim off to add on some string.
- Tie the string tight onto the wheel/rim and wind it around a few times.

⚠ If your string isn't wound enough times it may not wind up properly if you let too much of it out. You can also add a small piece of tape to hold the string in place if your knot is not tight enough.

- Place the wheel/rim back onto the axle and feed the string through the guide hole.
- **Your winch is ready to go!**

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