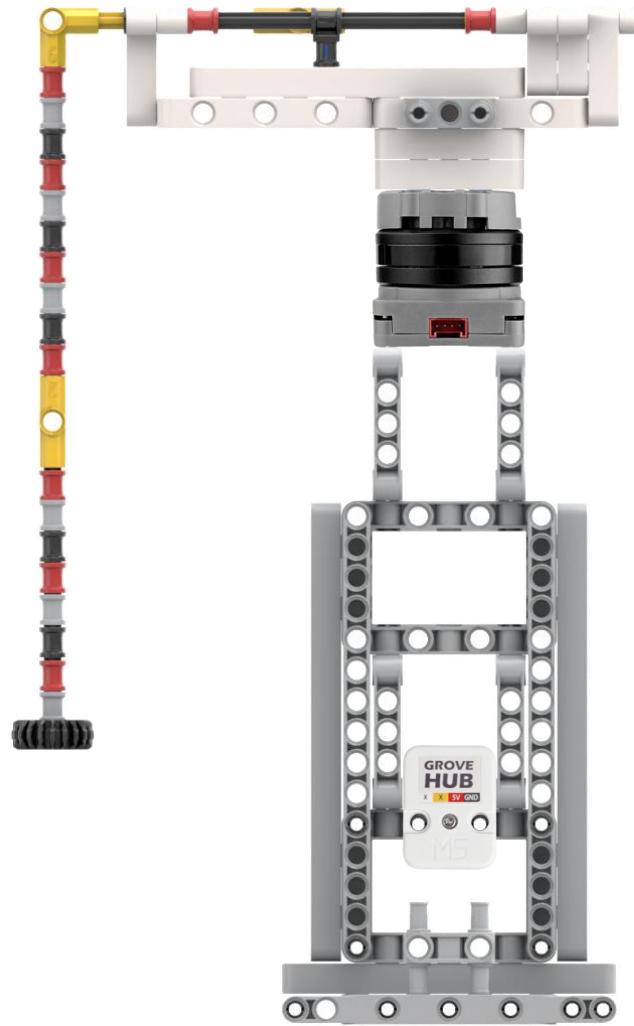


回転型倒立振子の組み立て



部品リストと購入先

3万円を超えるくらい
(Arduino 含む)

LEGO 部品

2026/02/01 確認

部品番号	部品名	色	個数	単価	価格	購入先
43093	Technic, Axle 1L with Pin with Friction Ridges	Blue	6	6	36	https://brickers.jp/products/43093-023
44294	Technic, Axle 7L	Yellow	1	23	23	https://brickers.jp/products/44294-024
60485	Technic, Axle 9L	Yellow	1	43	43	https://brickers.jp/products/60485-024
3737	Technic, Axle 10L	Black	3	113	339	https://brickers.jp/products/3737-026
3708	Technic, Axle 12L	Black	1	148	148	https://brickers.jp/products/3708-026
32034	Technic, Axle and Pin Connector Angled #2 - 180 degrees	Yellow	2	78	156	https://brickers.jp/products/32034-024
32014	Technic, Axle and Pin Connector Angled #6 - 90 degrees	Yellow	1	48	48	https://brickers.jp/products/32014-024
32039	Technic, Axle Connector with Axle Hole	Black	2	28	56	https://brickers.jp/products/32039-026
3713	Technic, Bush	Black	8	38	304	https://brickers.jp/products/3713-026
3713	Technic, Bush	Red	7	10	70	https://brickers.jp/products/3713-021
3713	Technic, Bush	Light Bluish Gray	6	13	78	https://brickers.jp/products/3713-194
32269	Technic, Gear 20 Tooth Double Bevel	Black	1	123	123	https://brickers.jp/products/32269-026
32525	Technic, Liftarm Thick 1 x 11	Light Bluish Gray	2	128	256	https://brickers.jp/products/32525-194
32525	Technic, Liftarm Thick 1 x 11	White	2	68	136	https://brickers.jp/products/32525-001
32278	Technic, Liftarm Thick 1 x 15	Light Bluish Gray	8	173	1,384	https://brickers.jp/products/32278-194
32316	Technic, Liftarm Thick 1 x 5	White	7	28	196	https://brickers.jp/products/32316-001
32140	Technic, Liftarm, Modified Bent Thick L-Shape 2 x 4	White	4	28	112	https://brickers.jp/products/32140-001
64178	Technic, Liftarm, Modified Frame Thick 5 x 11 Open Center	Light Bluish Gray	3	488	1,464	https://brickers.jp/products/64178-194
64179	Technic, Liftarm, Modified Frame Thick 5 x 7 Open Center	White	2	638	1,276	https://brickers.jp/products/64179-001
64179	Technic, Liftarm, Modified Frame Thick 5 x 7 Open Center	Light Bluish Gray	8	398	3,184	https://brickers.jp/products/64179-194
60484	Technic, Liftarm, Modified T-Shape Thick 3 x 3	White	4	108	432	https://brickers.jp/products/60484-001
6558	Technic, Pin 3L with Friction Ridges	Blue	16	10	160	https://brickers.jp/products/6558-023
32054	Technic, Pin 3L with Friction Ridges and Stop Bush	Red	4	12	48	https://brickers.jp/products/32054-021
48989	Technic, Pin Connector Perpendicular 3L with 4 Pins	Light Bluish Gray	2	28	56	https://brickers.jp/products/48989-194
2780	Technic, Pin with Short Friction Ridges	Black	79	6	474	https://brickers.jp/products/2780-026
					合計	10,602

電子部品

2026/02/01 確認

	個数	単価	合計	購入先
Unit Roller485 (スリップリング付き)	1	8,316	8,316	https://www.switch-science.com/products/9924
12bit磁気式エンコーダAS5601	1	1,700	1,700	https://www.switch-science.com/products/3494
ACアダプタ 9V/1.3A	1	1,463	1,463	https://www.switch-science.com/products/1795
Grove Hub (M5Stack用拡張ハブユニット)	1	649	649	https://www.switch-science.com/products/5696
手元スイッチ	1	1,698	1,698	https://www.monotaro.com/p/4103/8103/
DCジャック付ケーブル (2.1Φ)	1	449	449	https://www.monotaro.com/p/6991/8795/
Arduino Mega2560 Rev3	1	7,980	7,980	https://akizukidenshi.com/catalog/g/g107381/
ピンヘッダ	1	35	35	https://akizukidenshi.com/catalog/g/g100167/
		合計	22,290	

その他

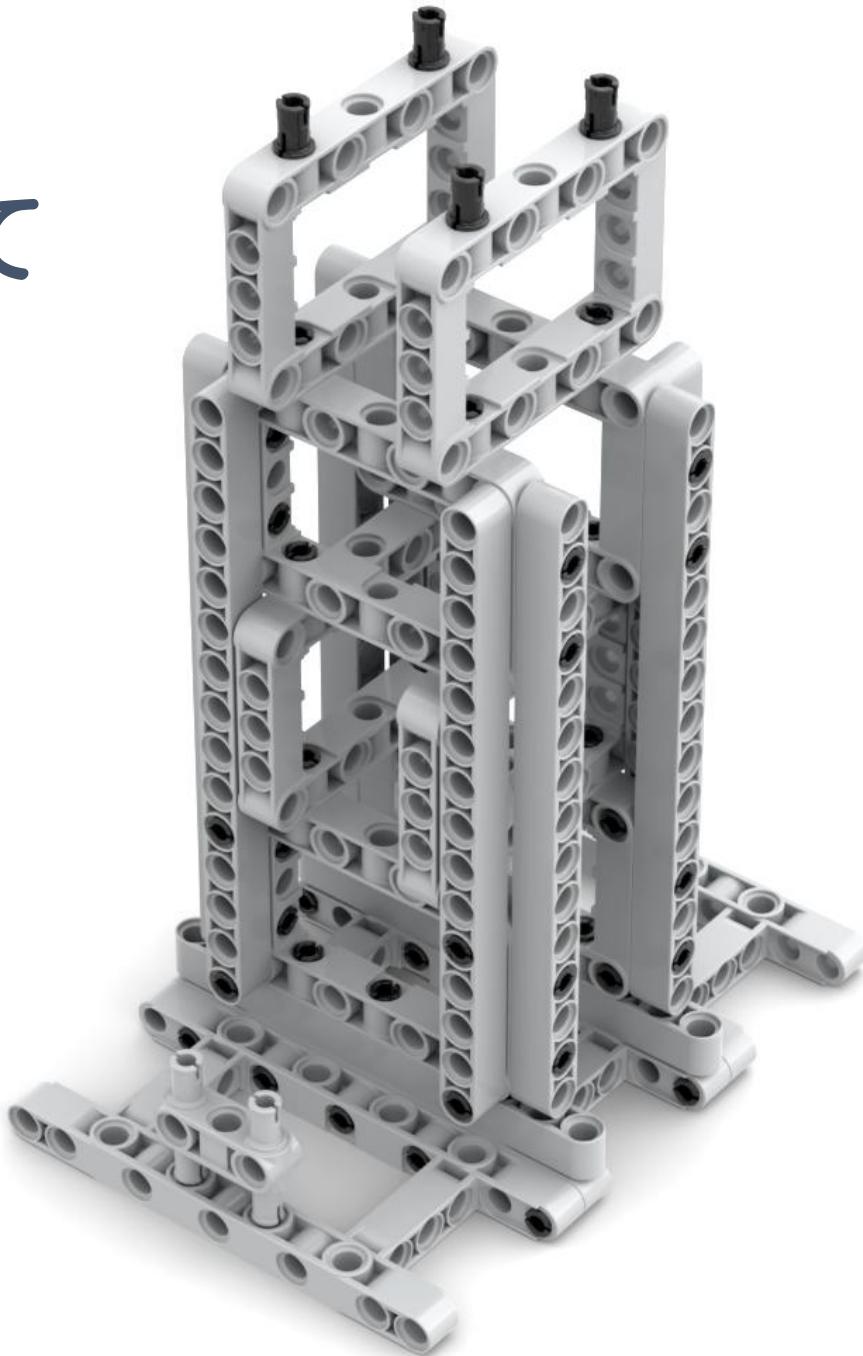
USBケーブル (PC側 : Type A, Mega側 : Type B)

適当な長さの Grove ケーブル

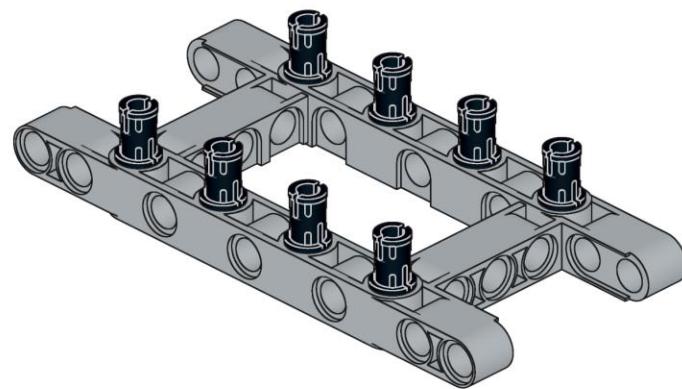
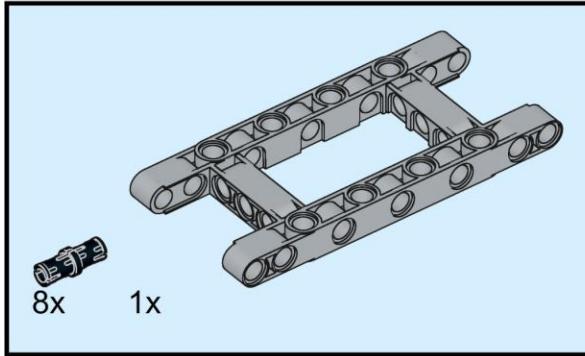
オス・メスジャンパ線 (赤, 黒, 黄, 白)

オス・オスジャンパ線 (赤, 黒, 黄, 白)

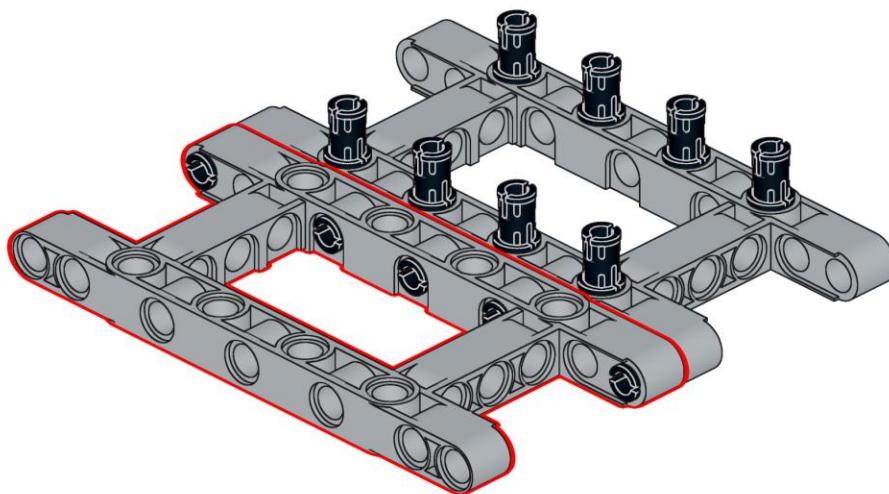
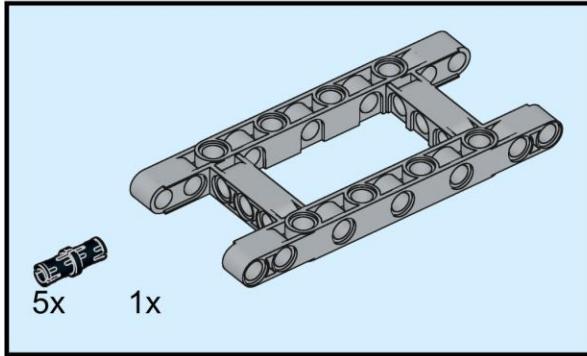
まずは、
台座の組み立て



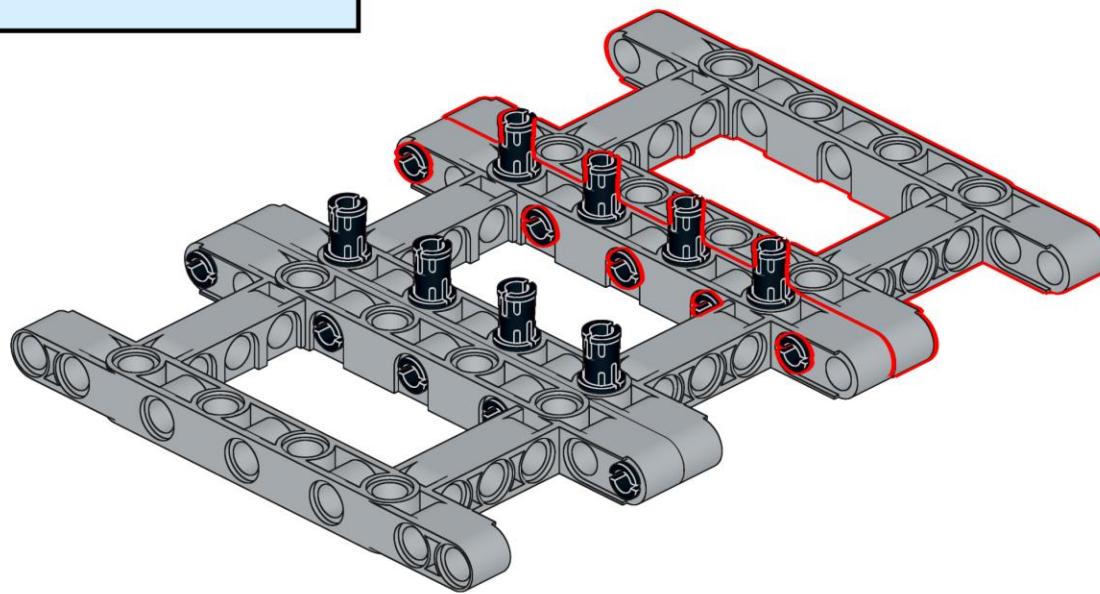
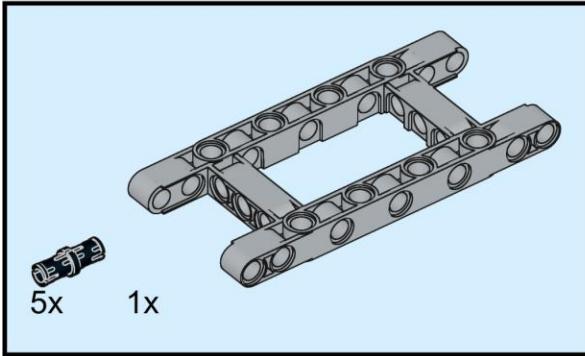
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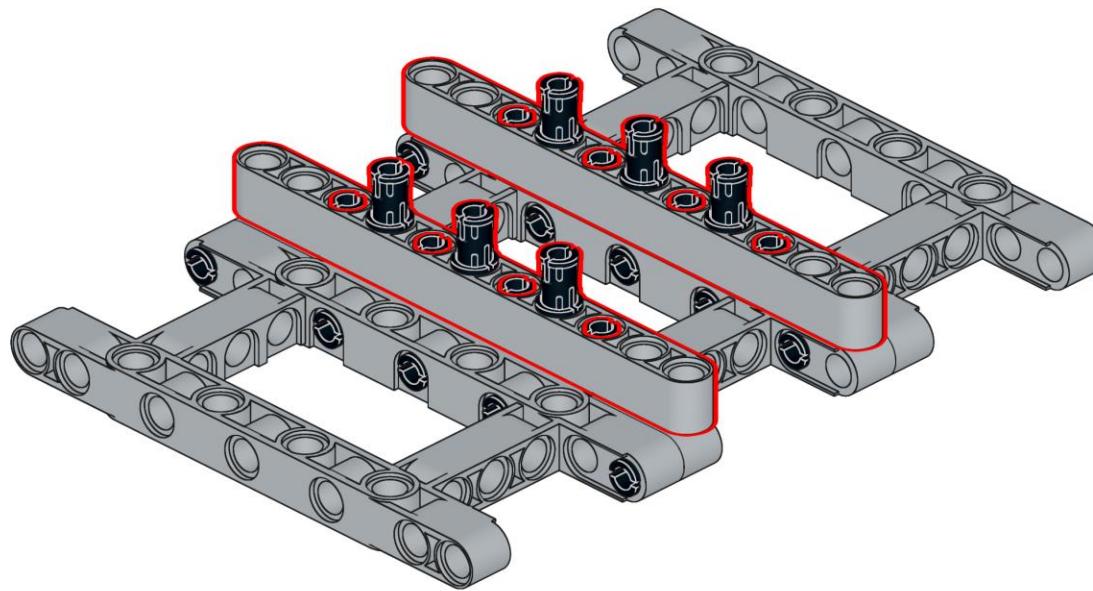
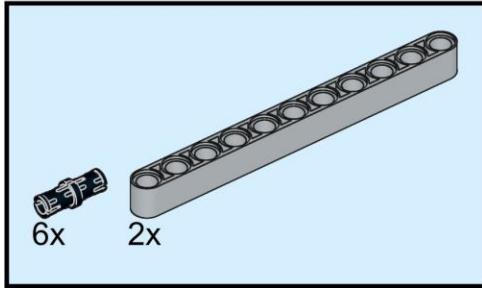
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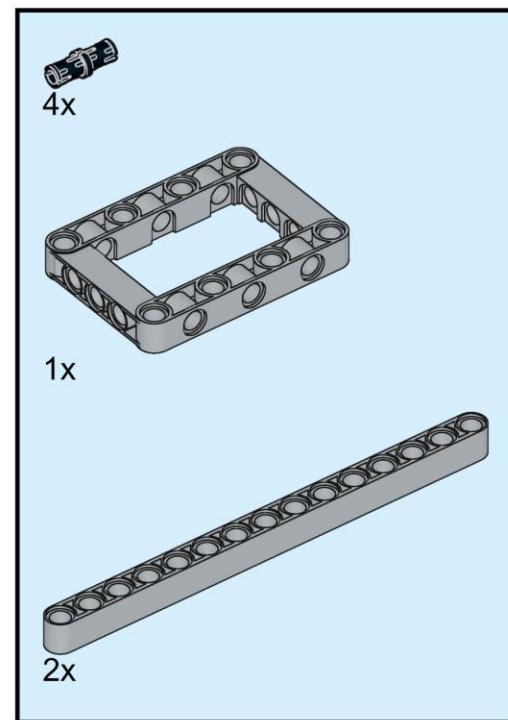
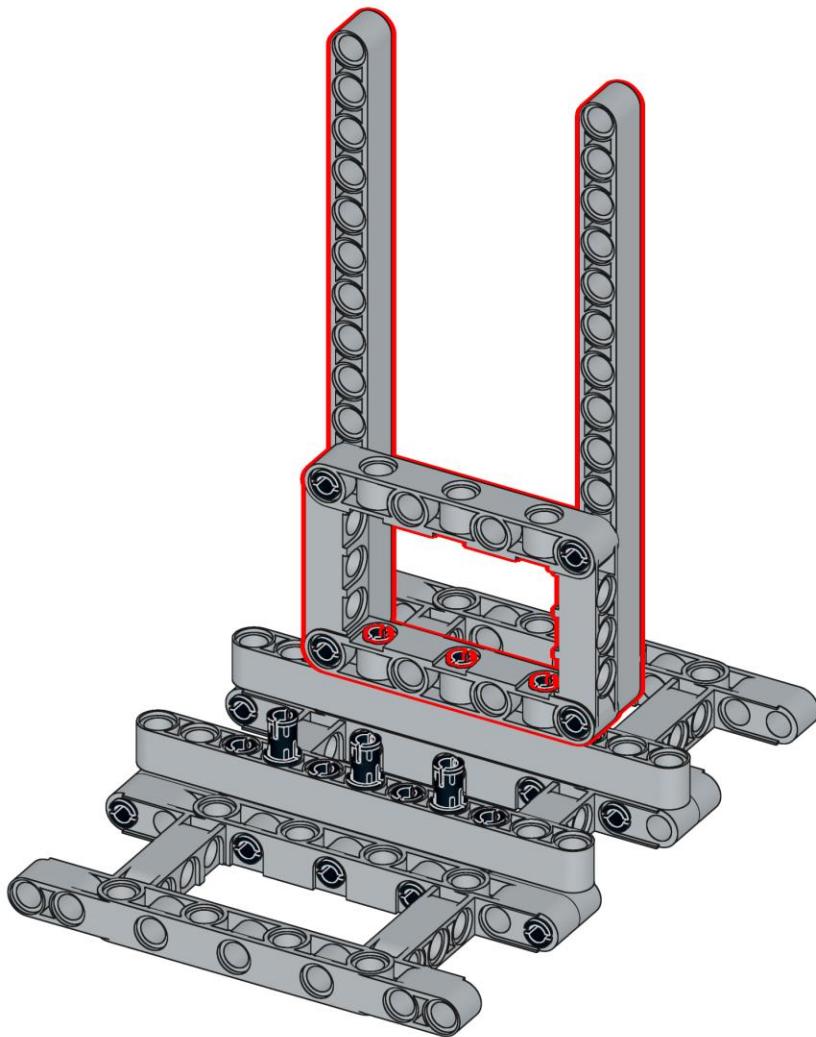
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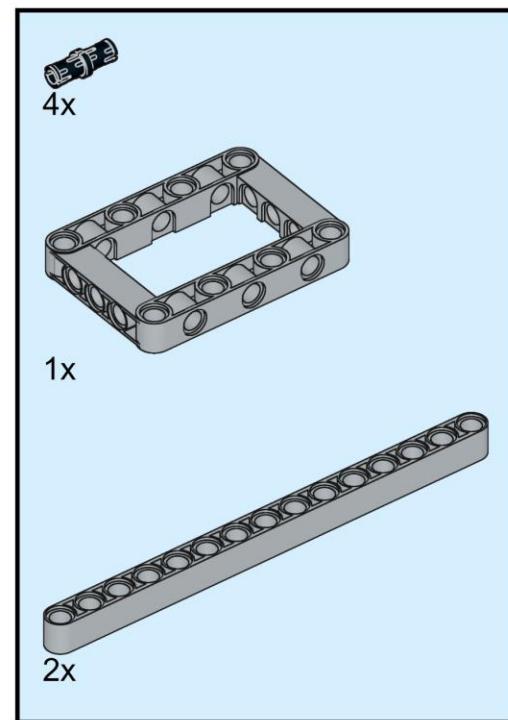
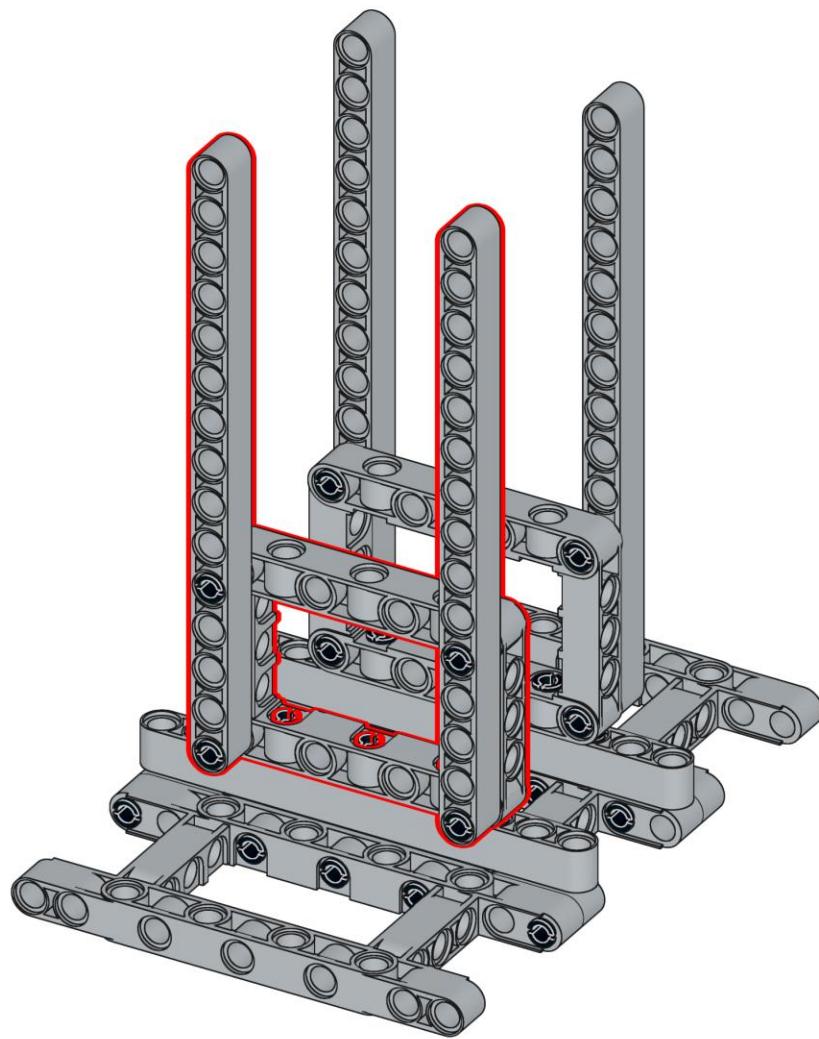
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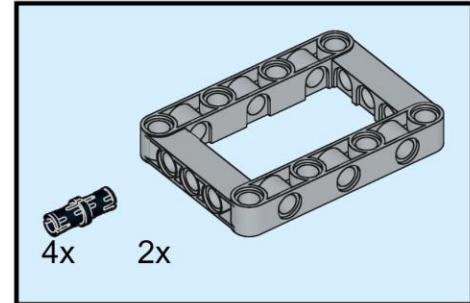
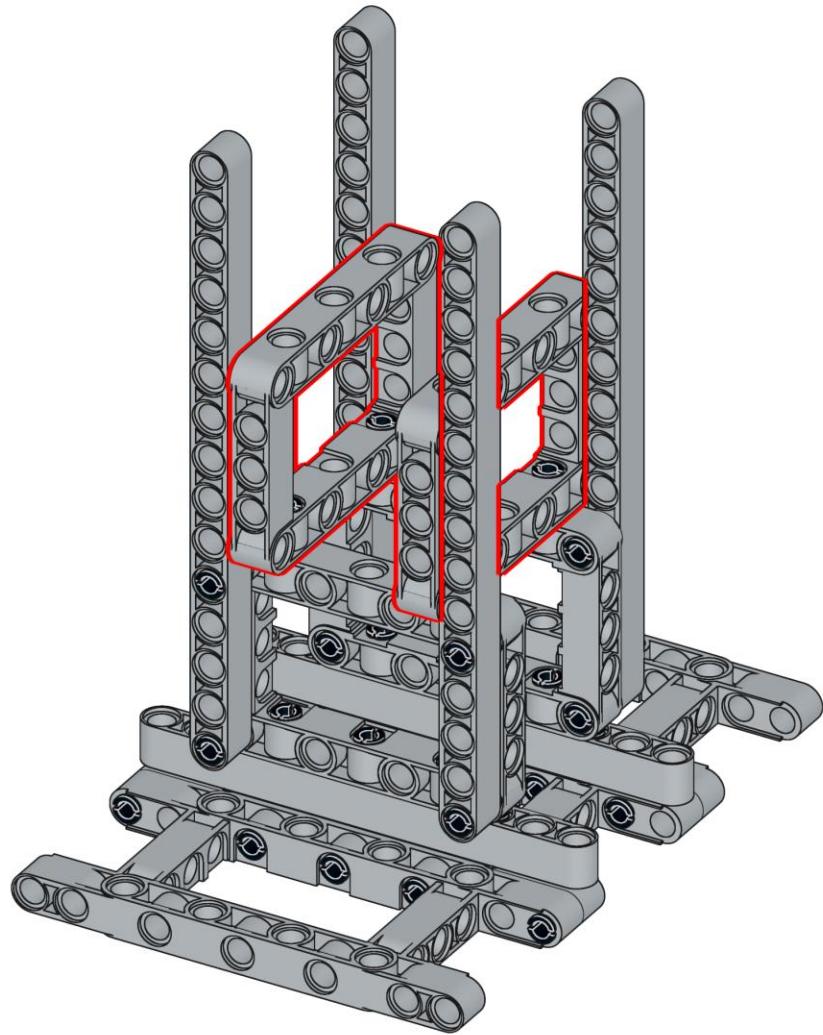
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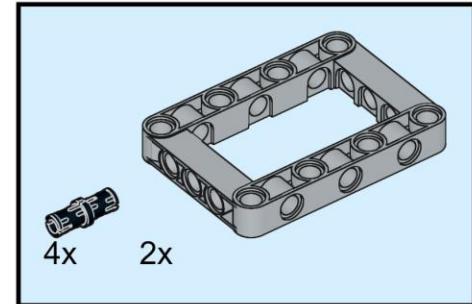
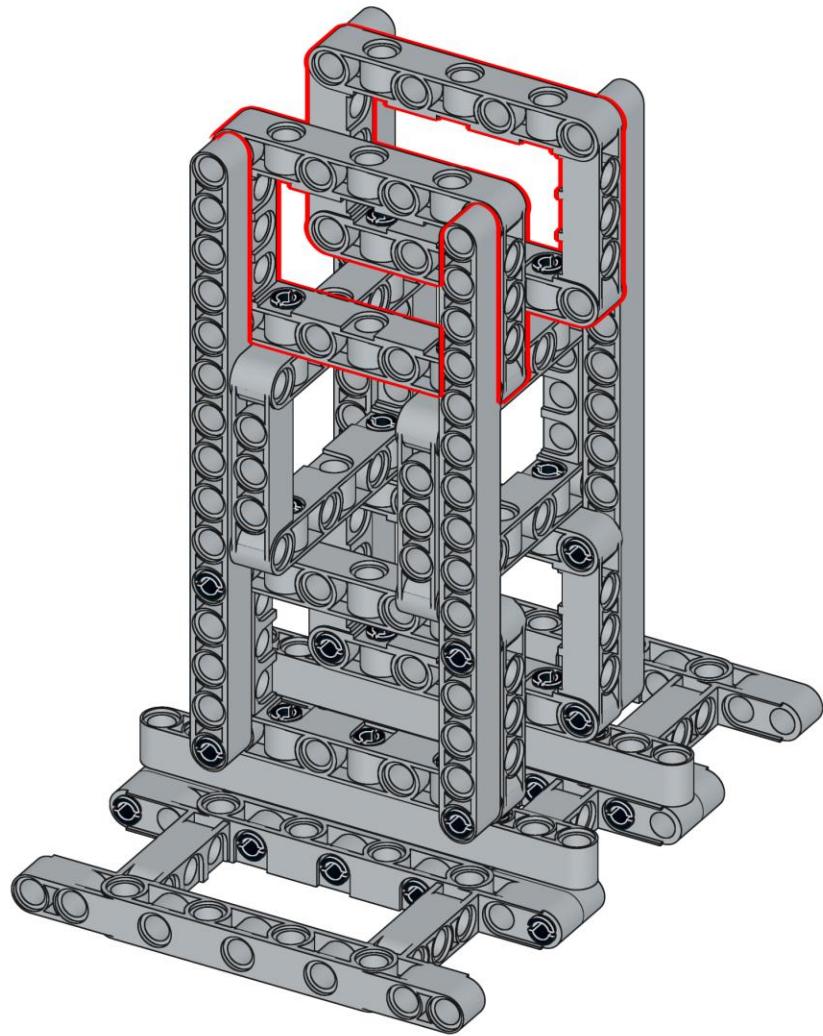
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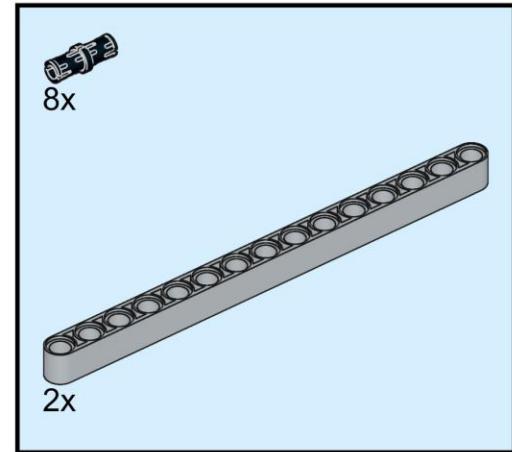
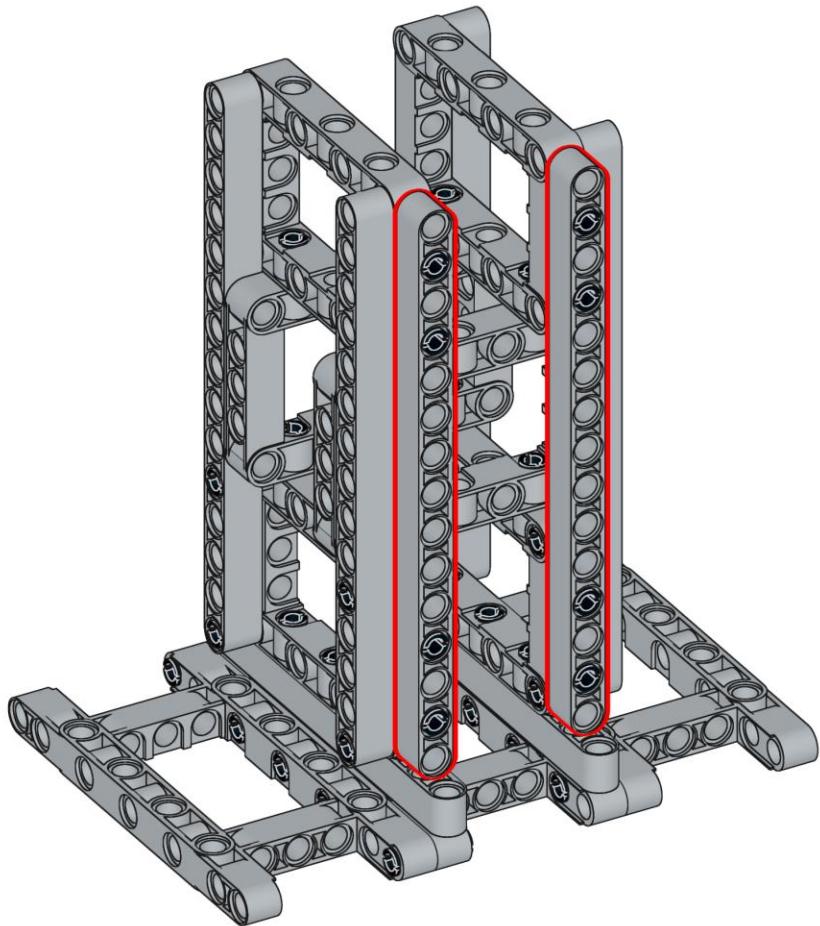
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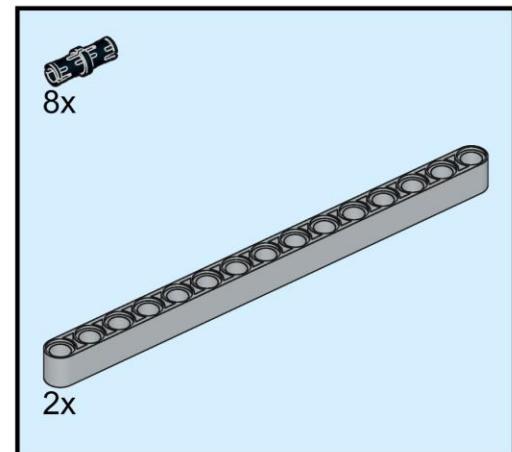
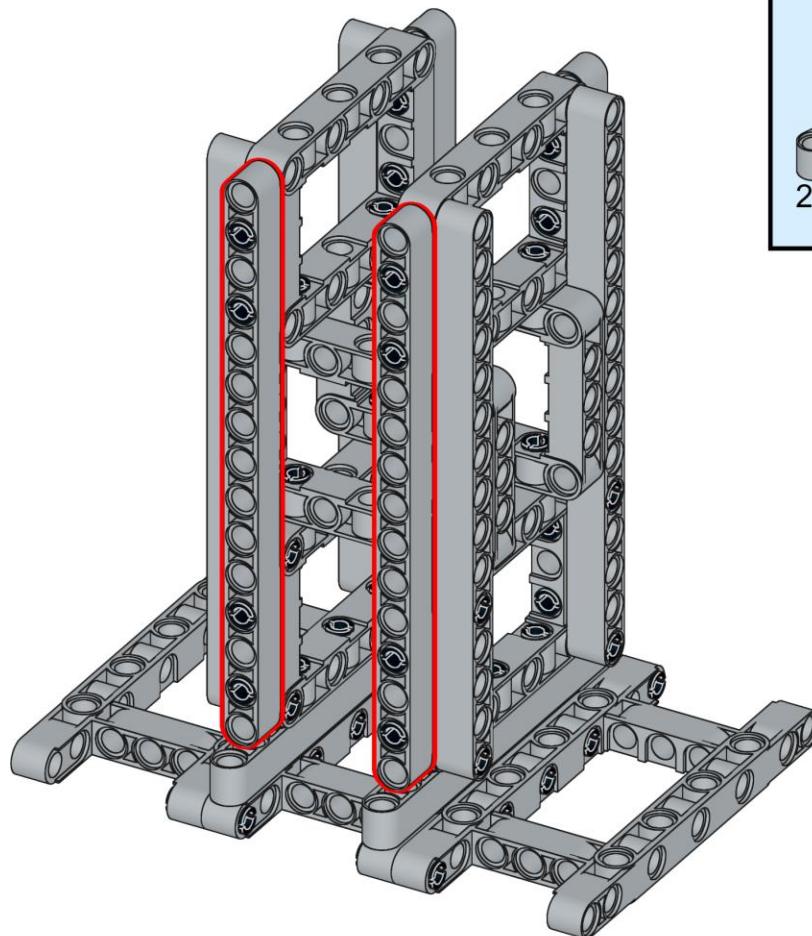
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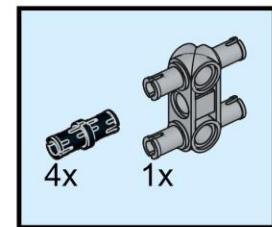
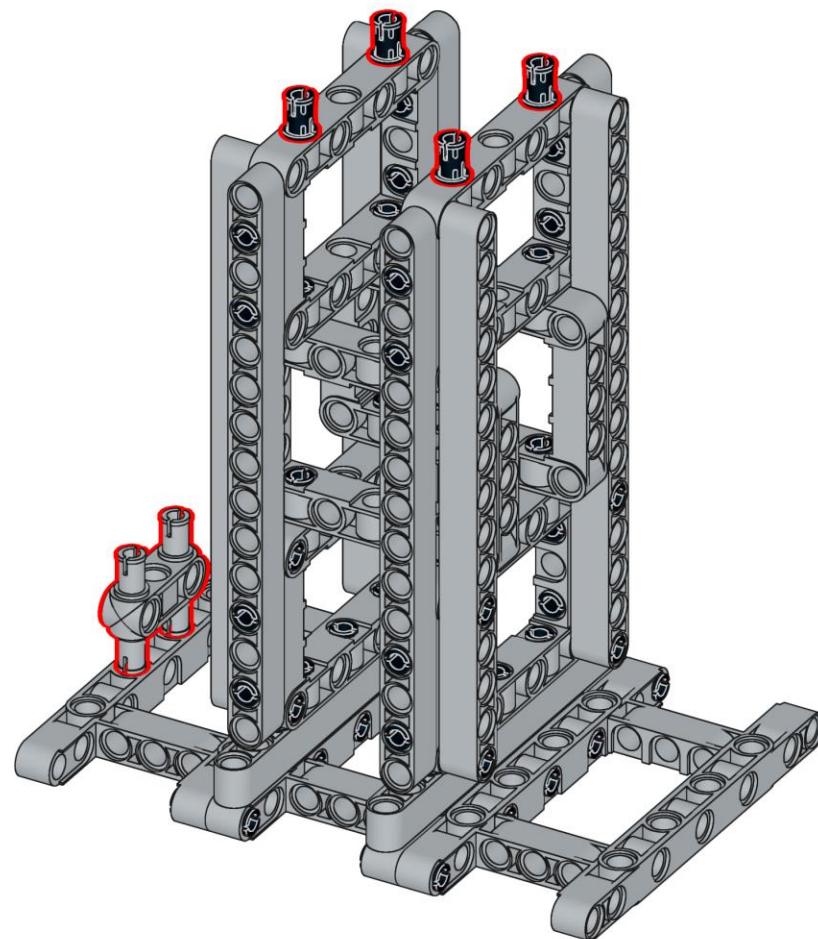
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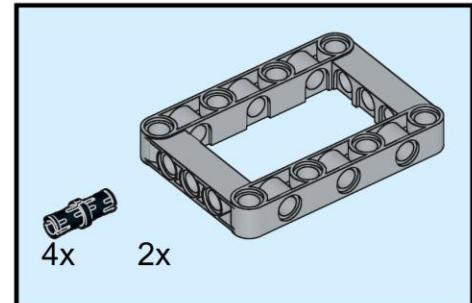
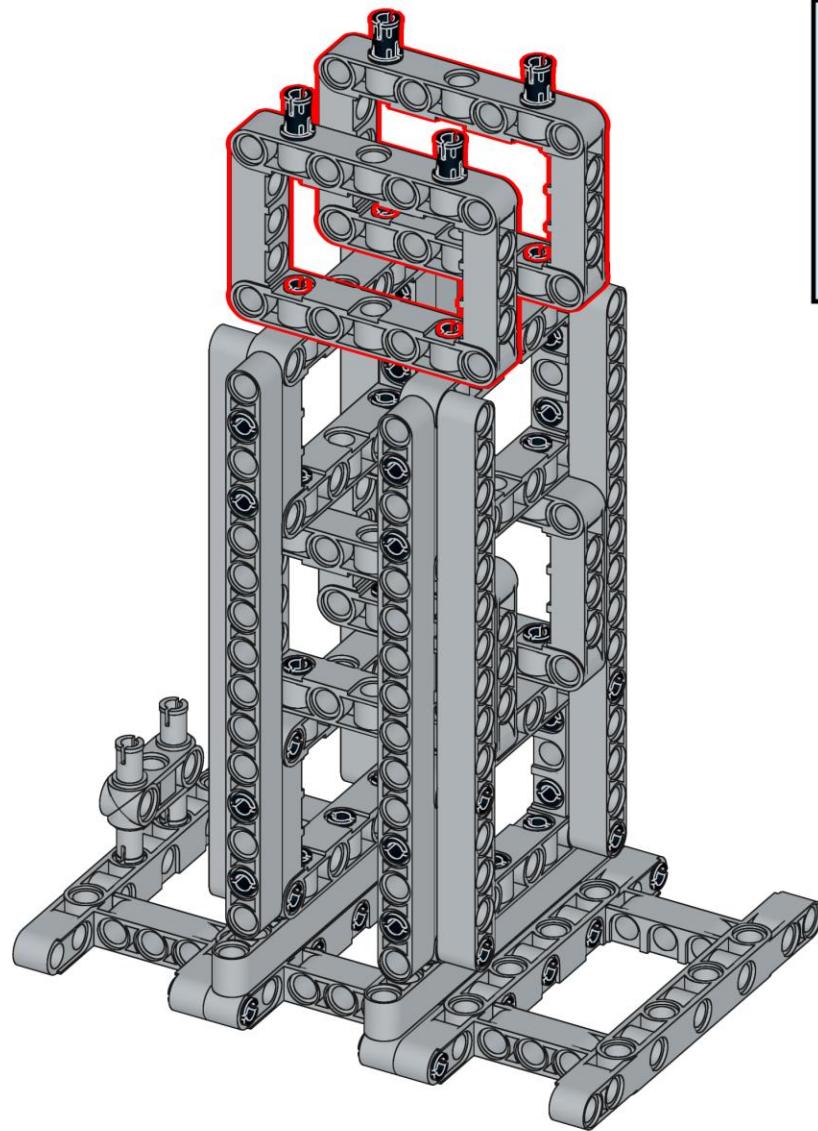
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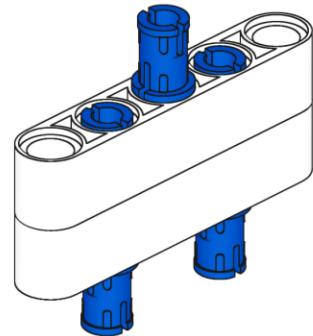
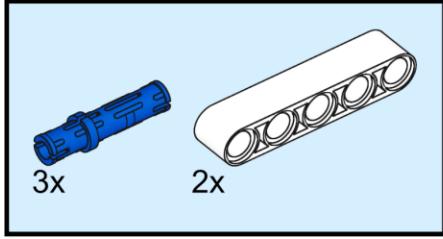
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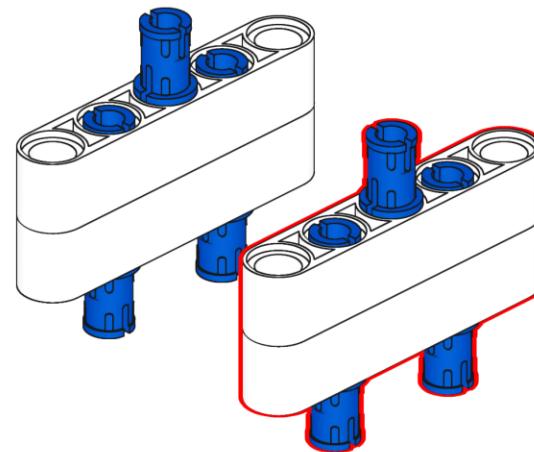
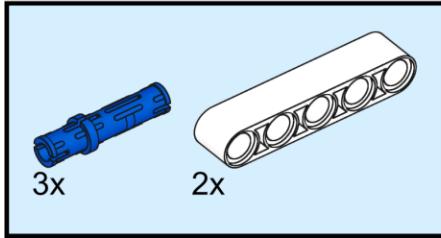
つぎに、
アームと振子の
組み立て



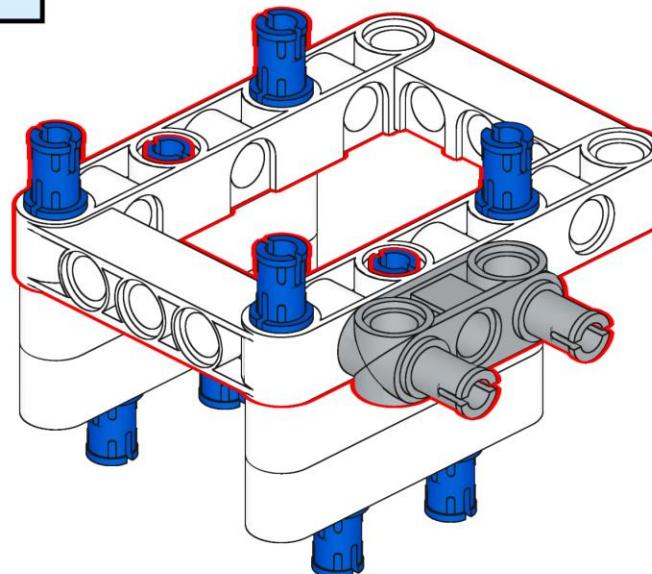
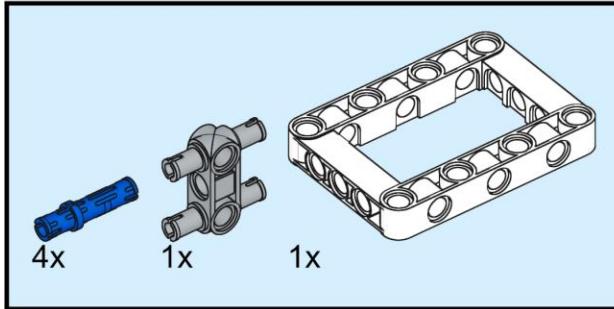
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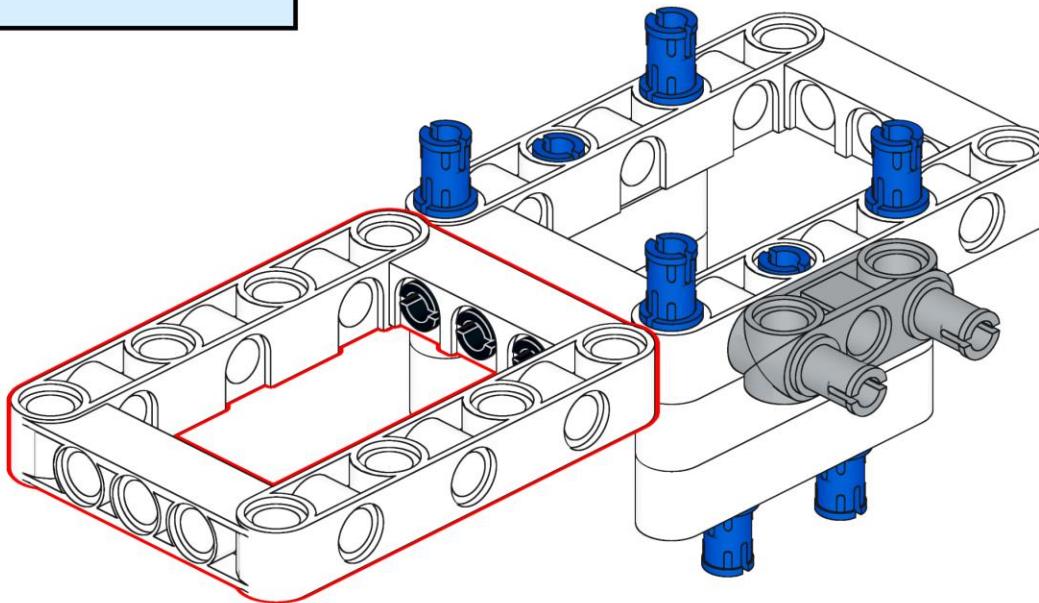
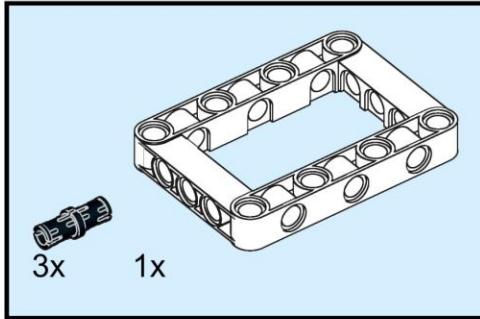
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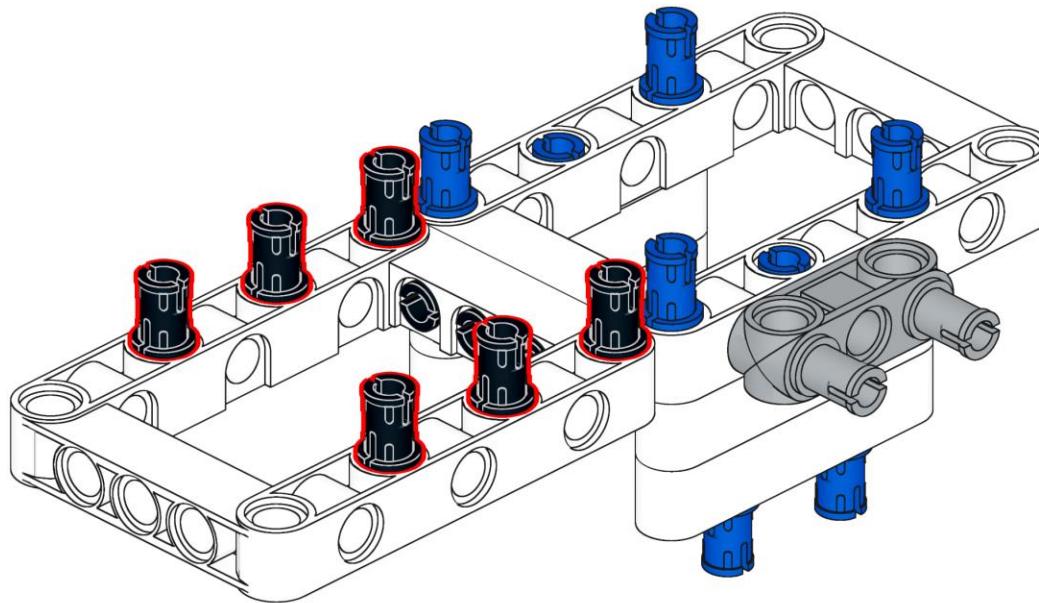
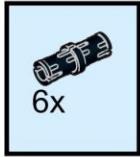
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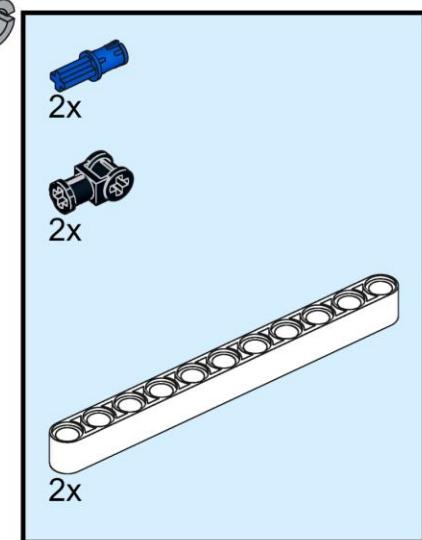
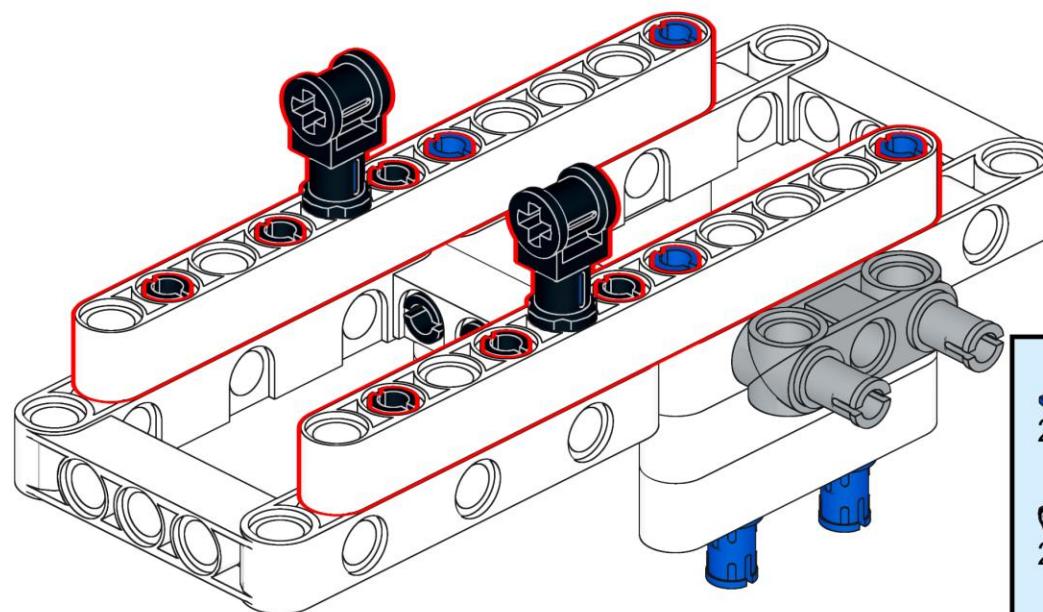
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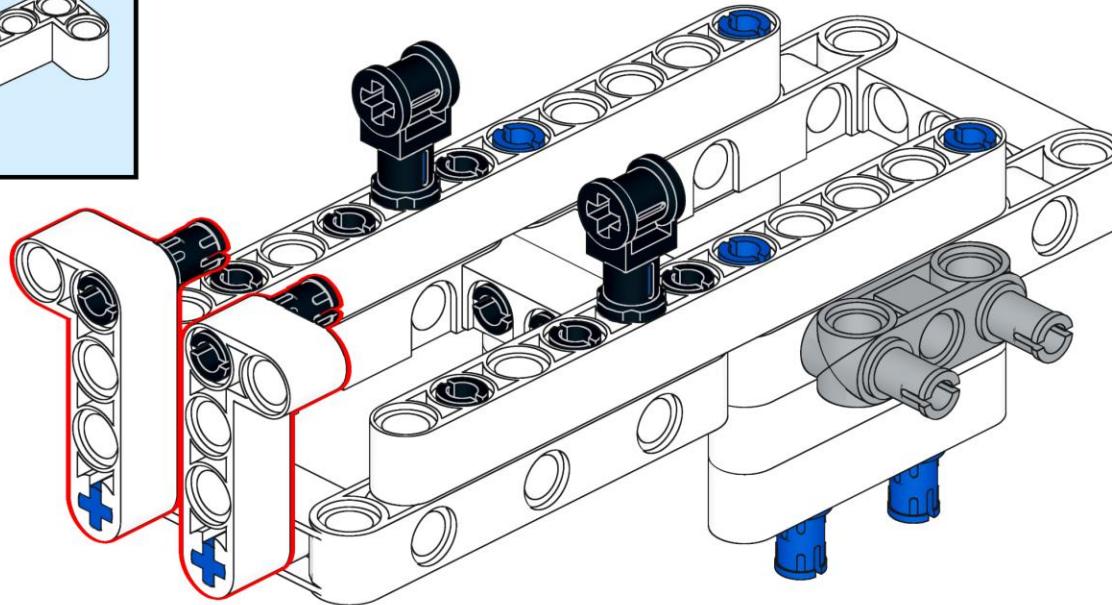
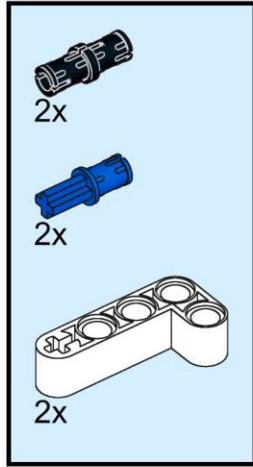
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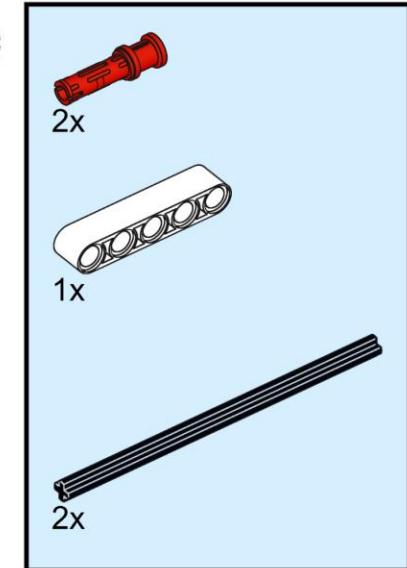
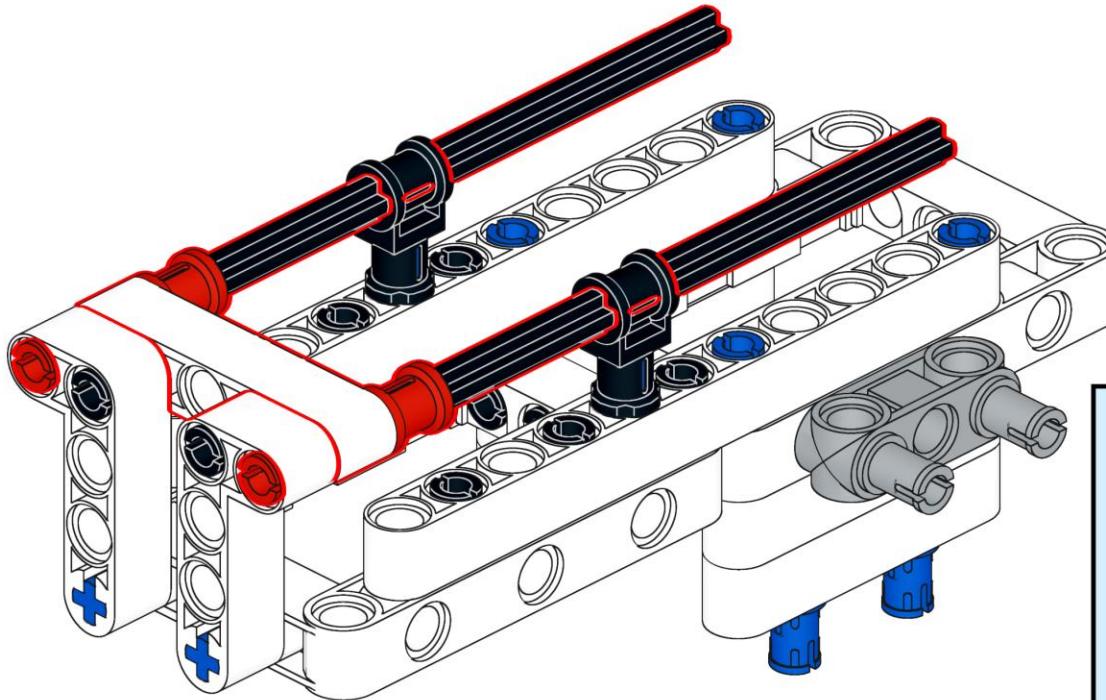
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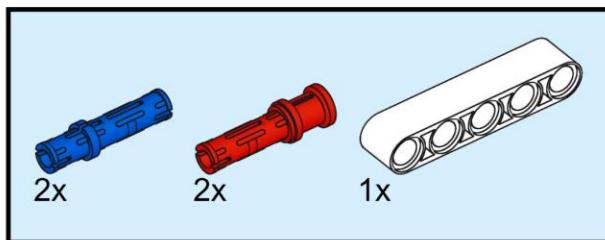
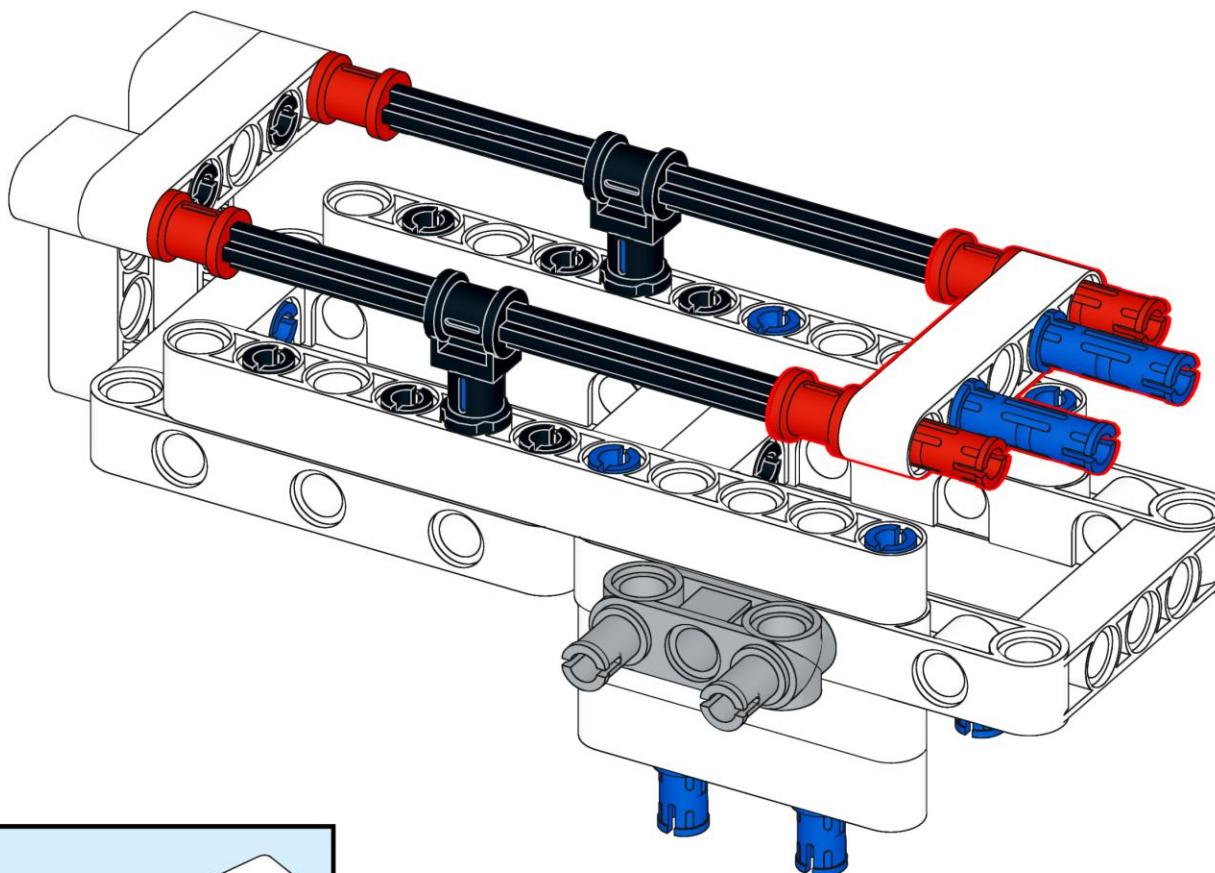
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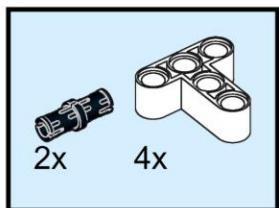
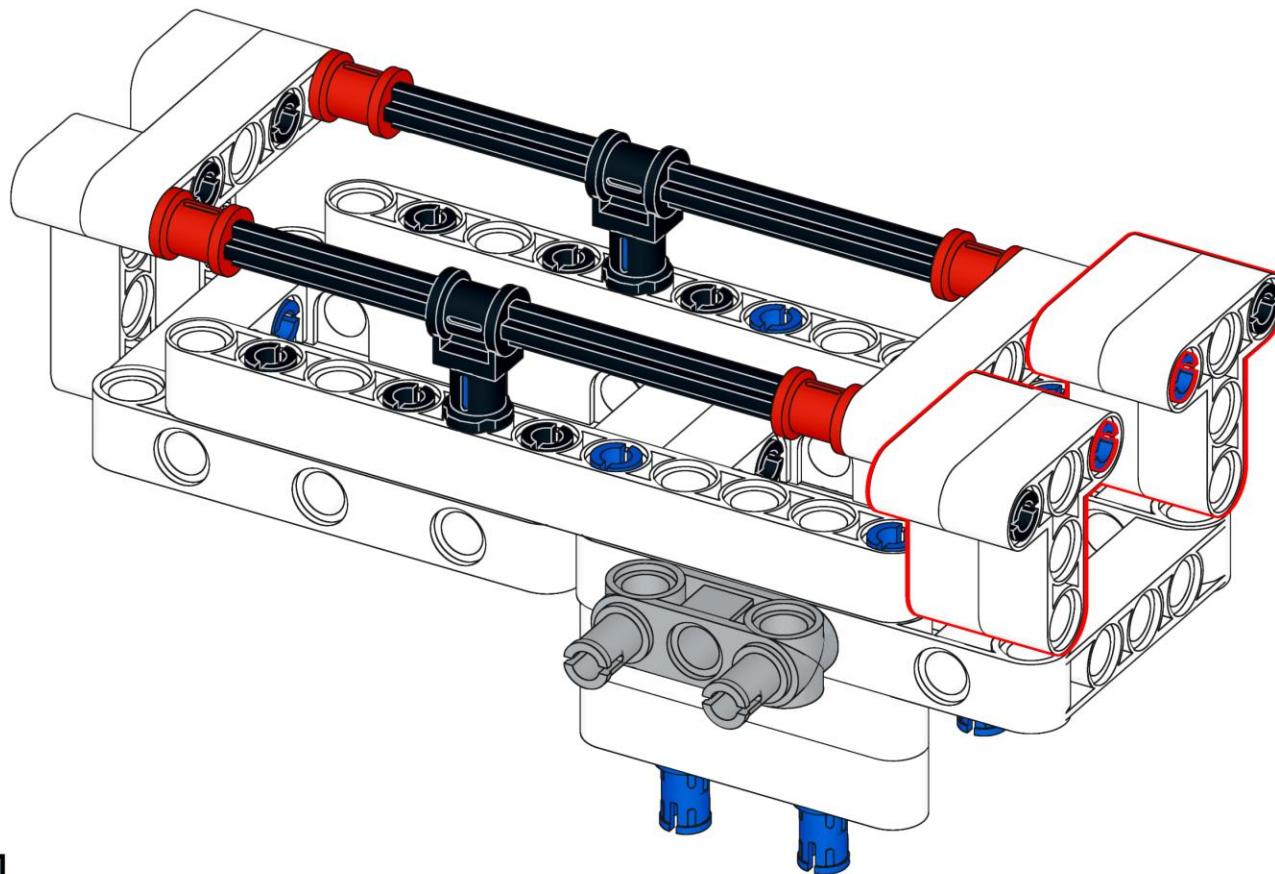
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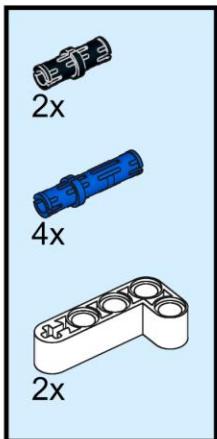
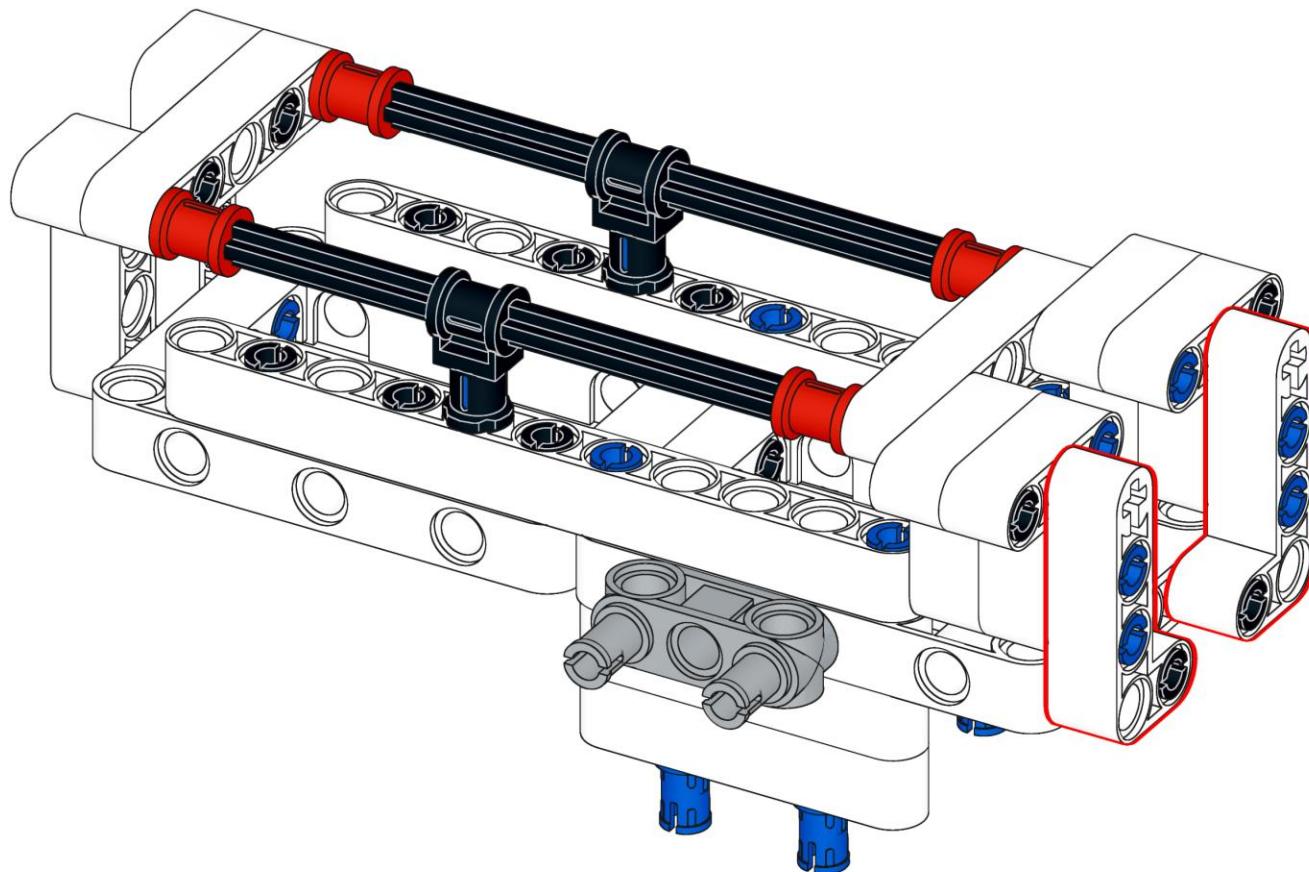
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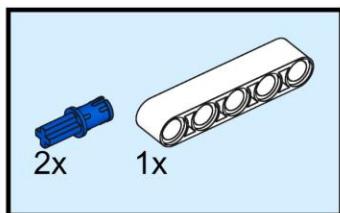
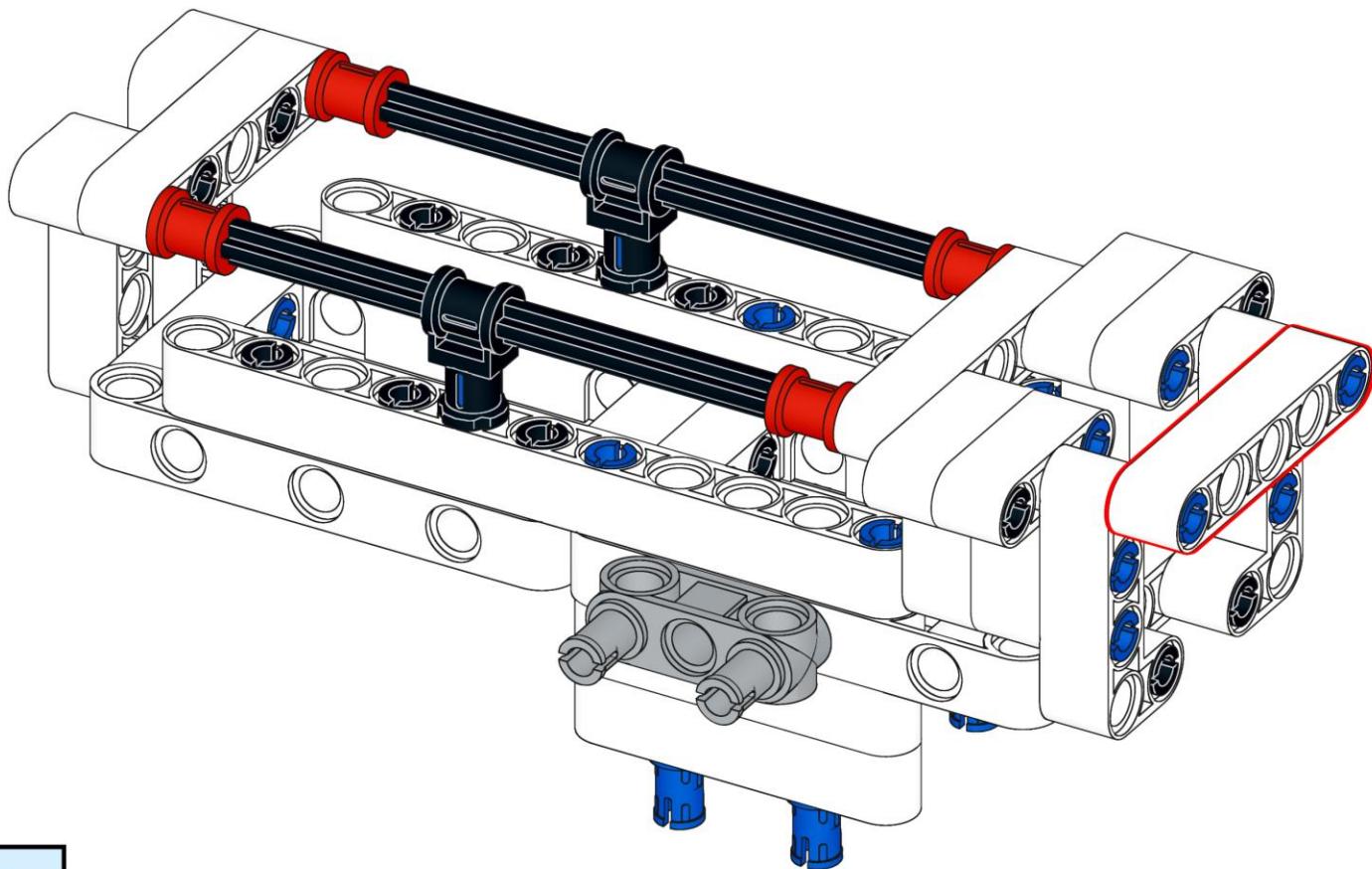
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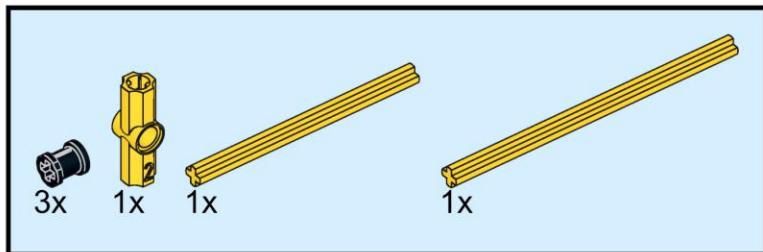
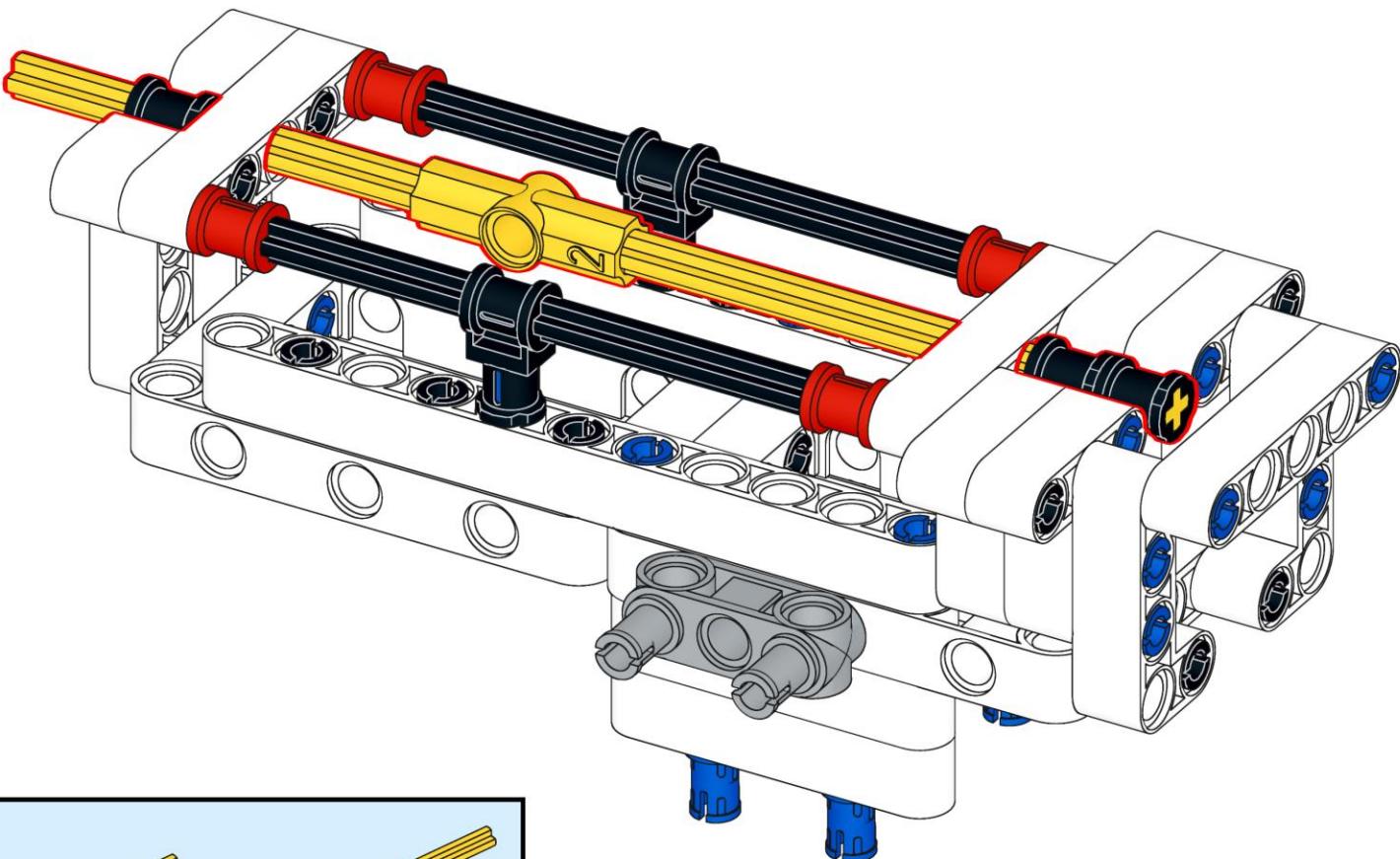
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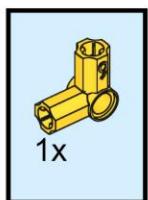
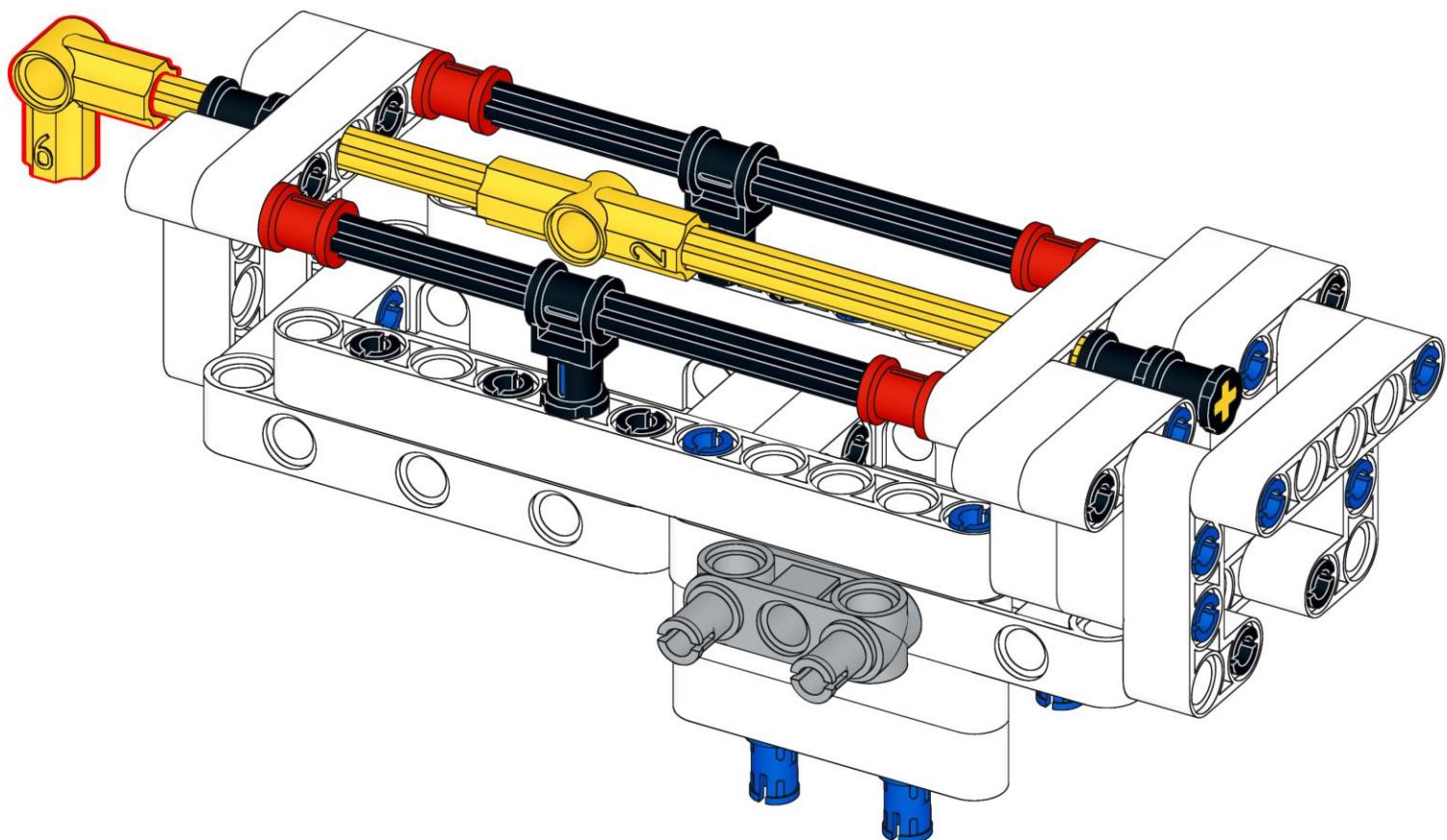
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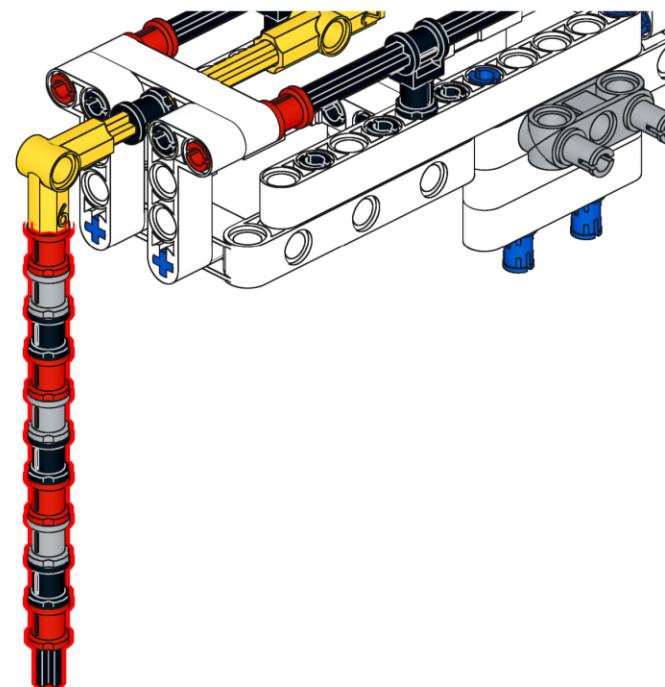
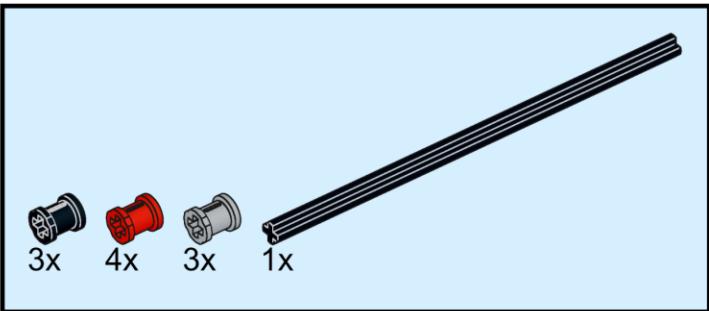


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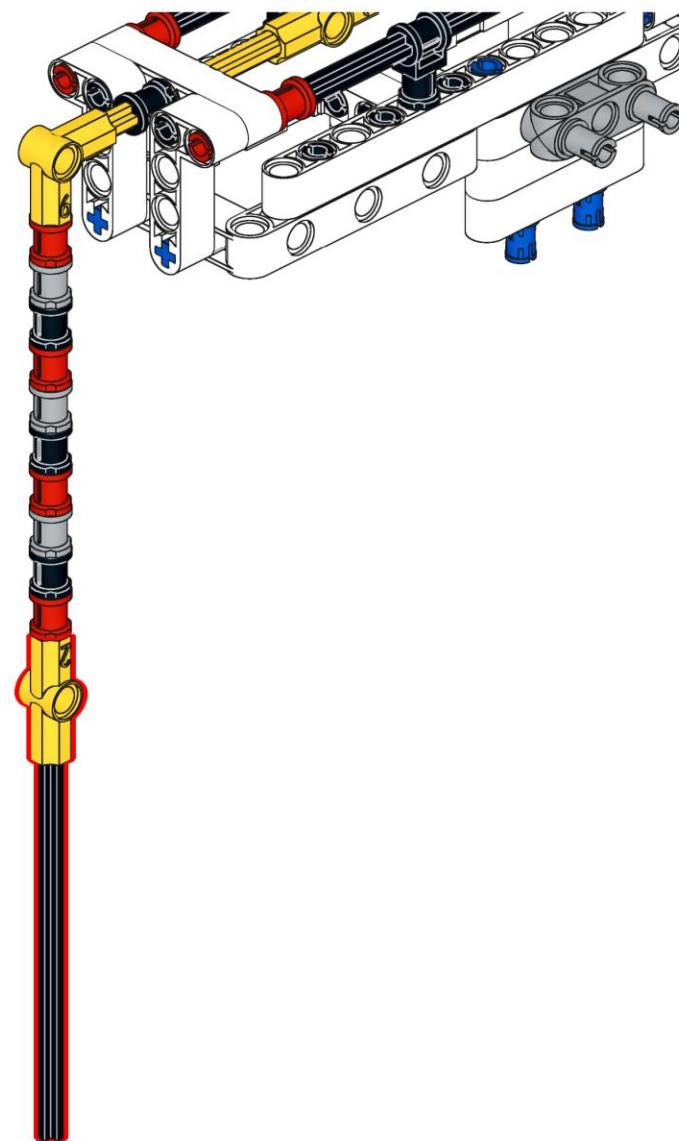
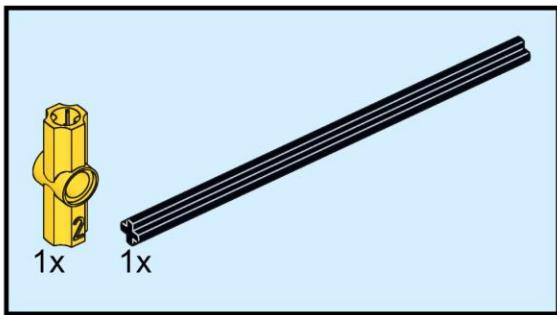


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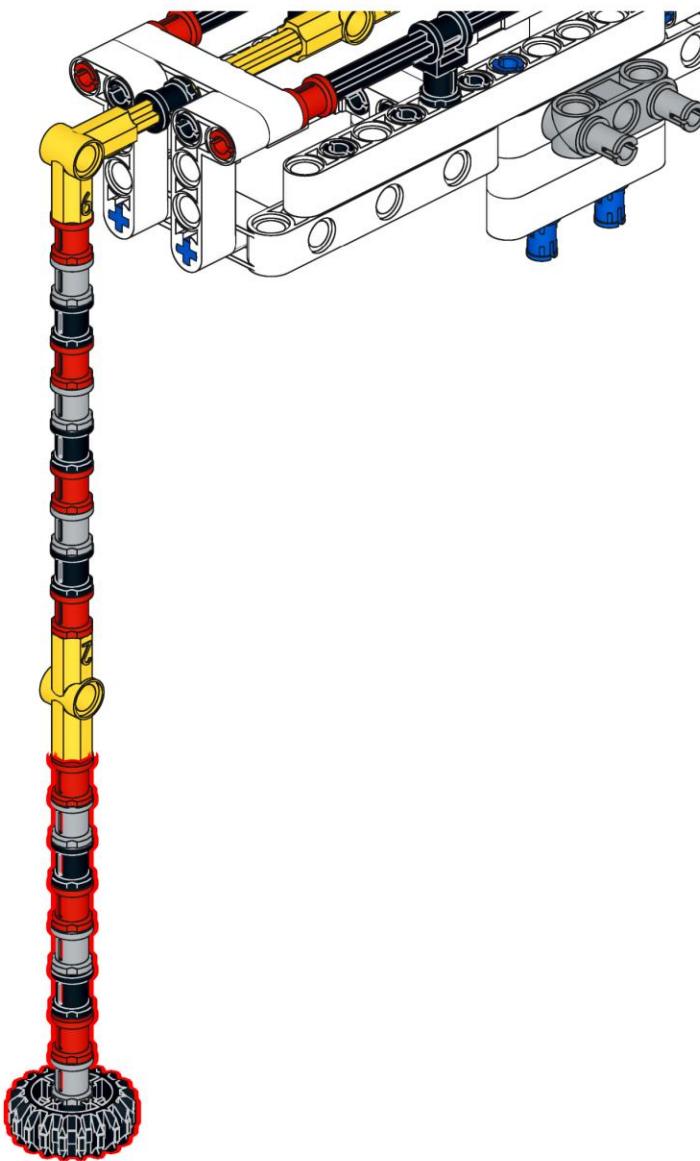
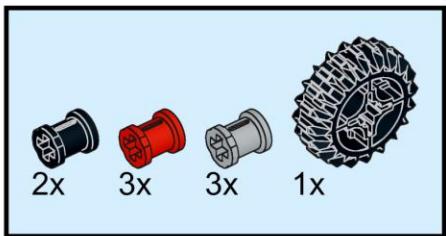
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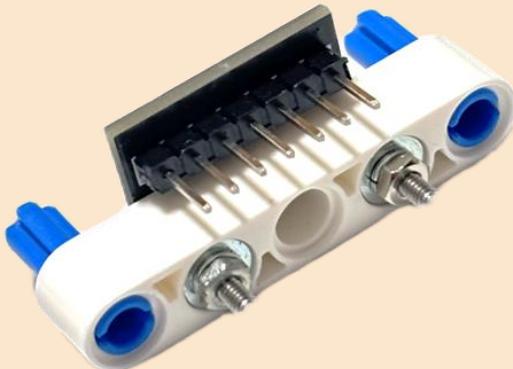
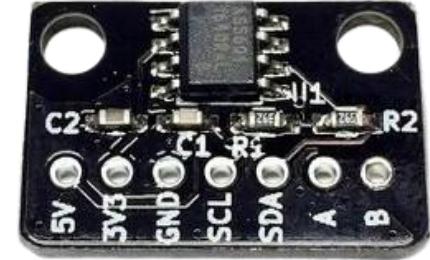
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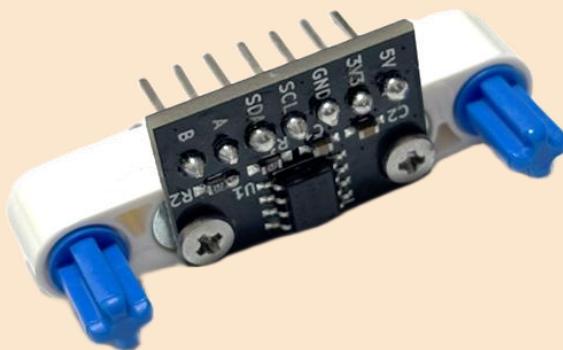
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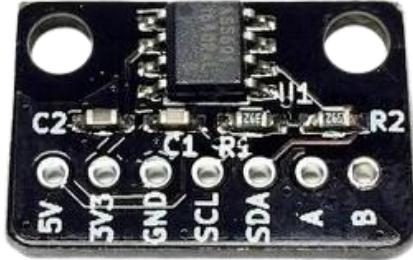


振子用エンコーダ AS5601 の取りつけ

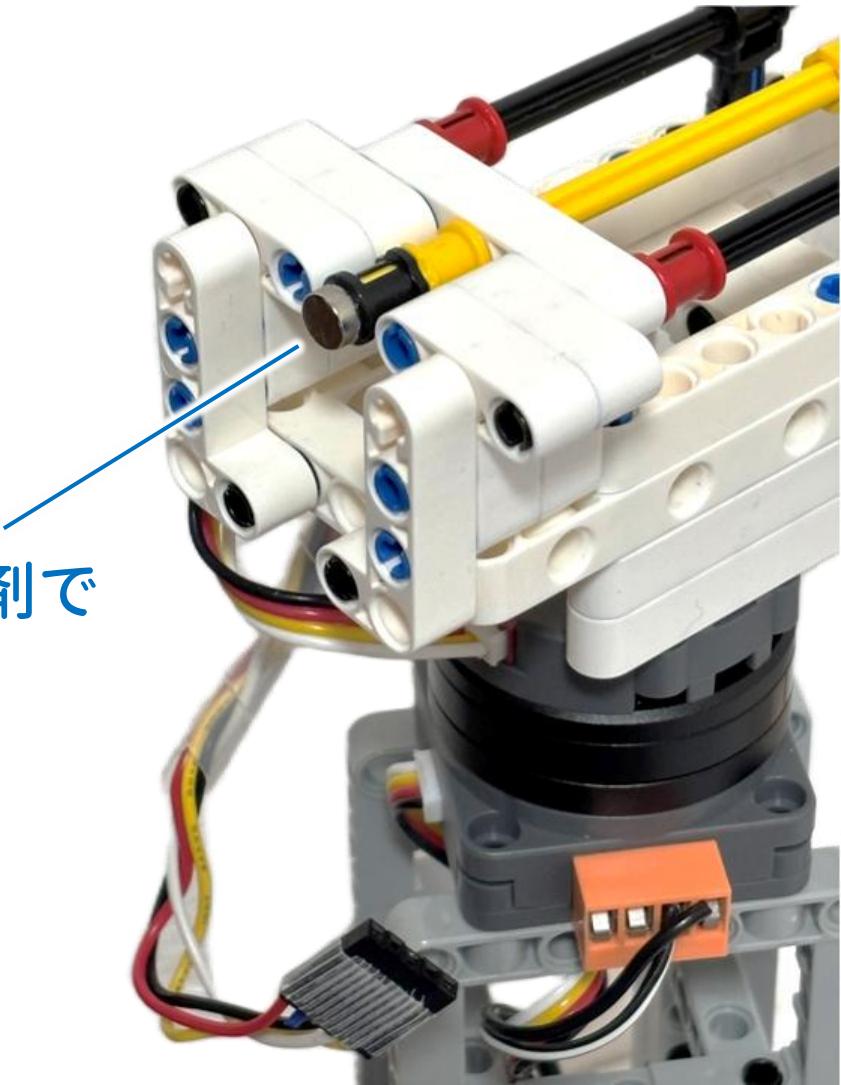


- M2 のネジ・ナット・ワッシャーで LEGO 部品に AS5601 を固定
- ピンヘッダ（別途必要）を基板にはんだ付け



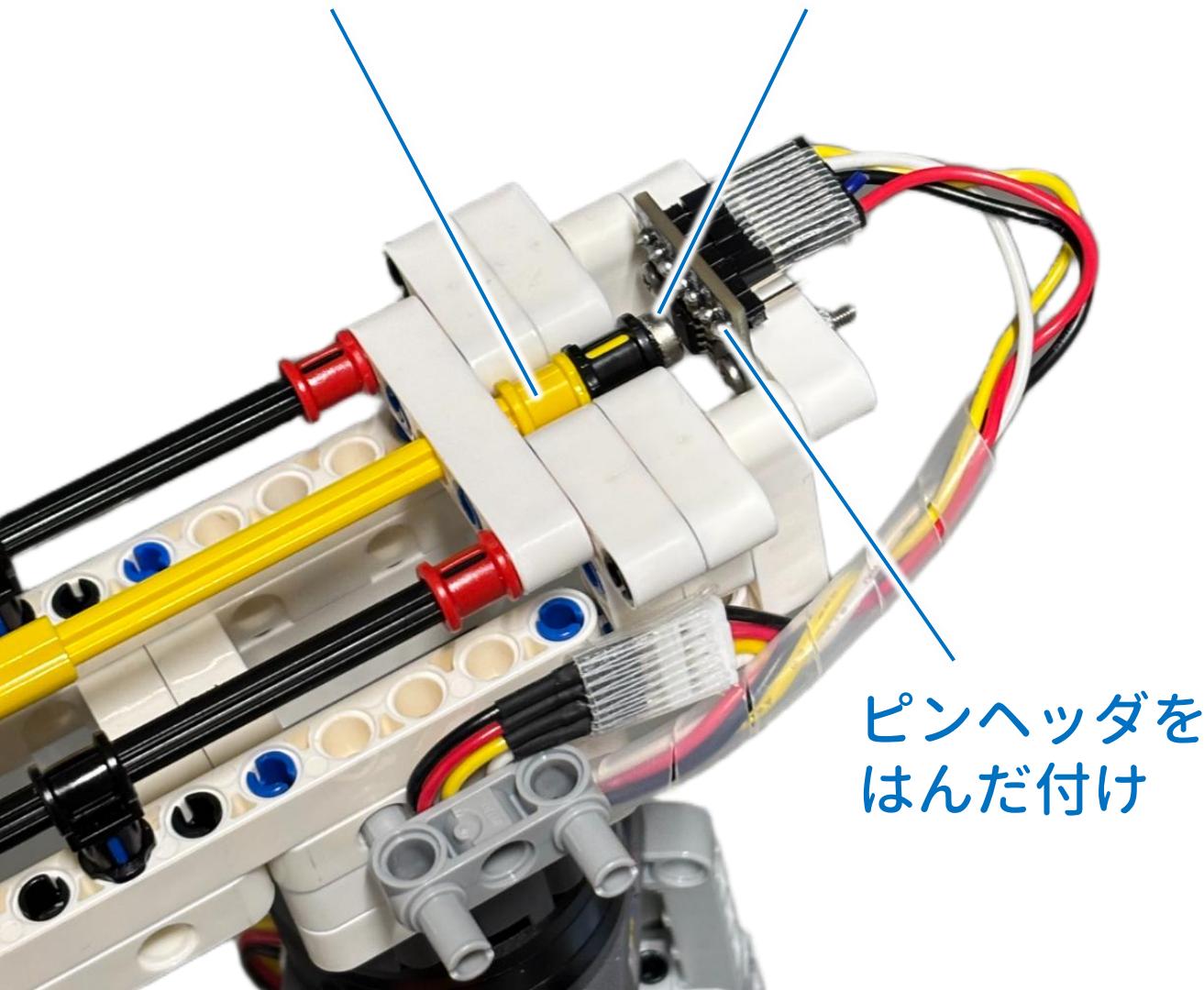


AS5601 付属の磁石を接着剤で
LEGO 部品 (3713) に固定

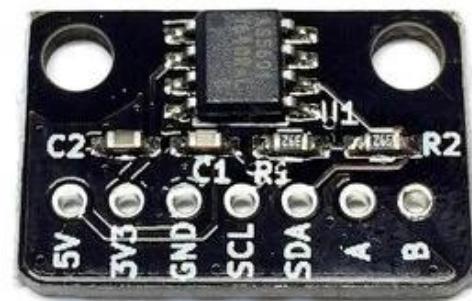


回転摩擦を軽減するため
に少しだけ LEGO 部品
32316 と 3713 の間に
隙間を空けておく

AS5601 付属の磁石を接着剤で
LEGO 部品 (3713) に固定



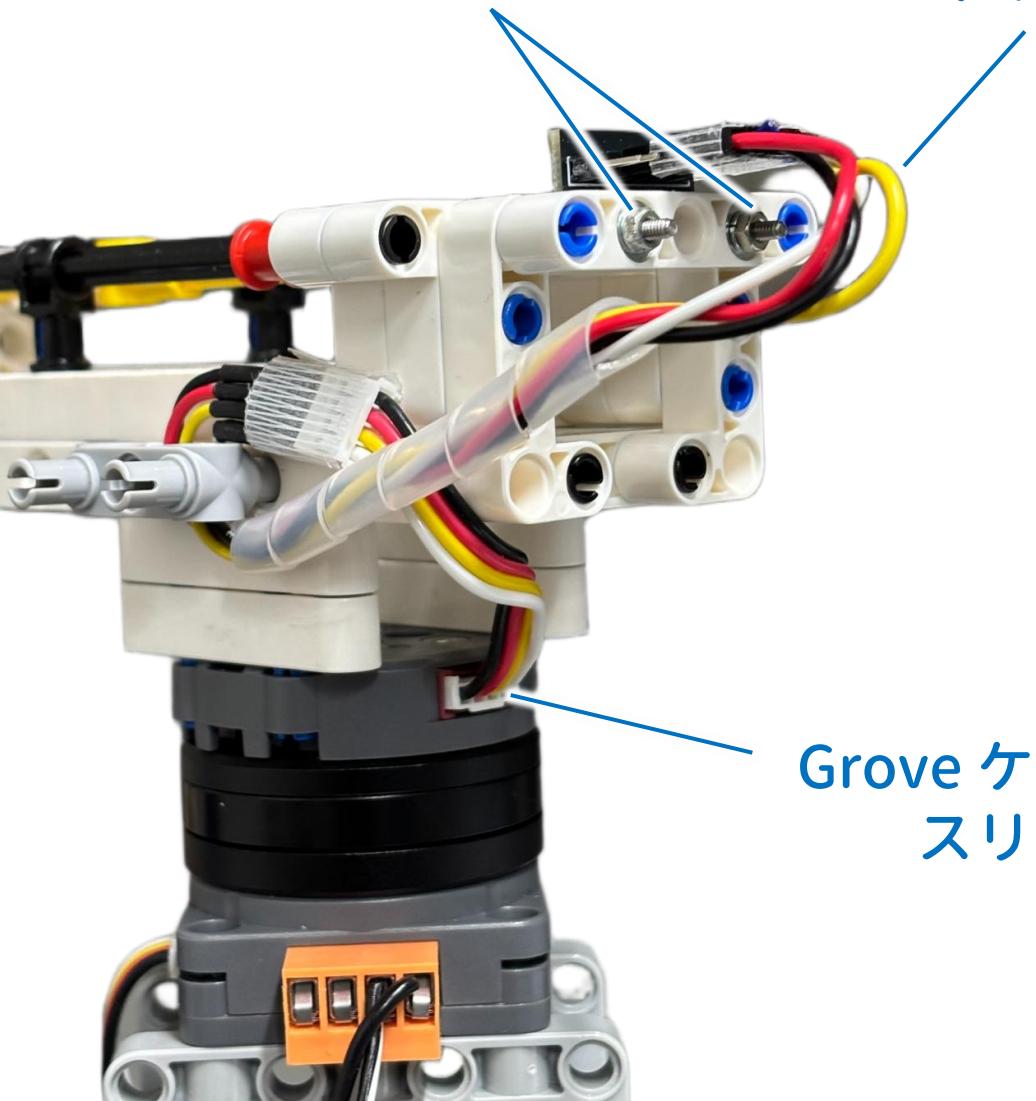
ピンヘッダを
はんだ付け



5V ——————
GND ——————
SCL ——————
SDA ——————

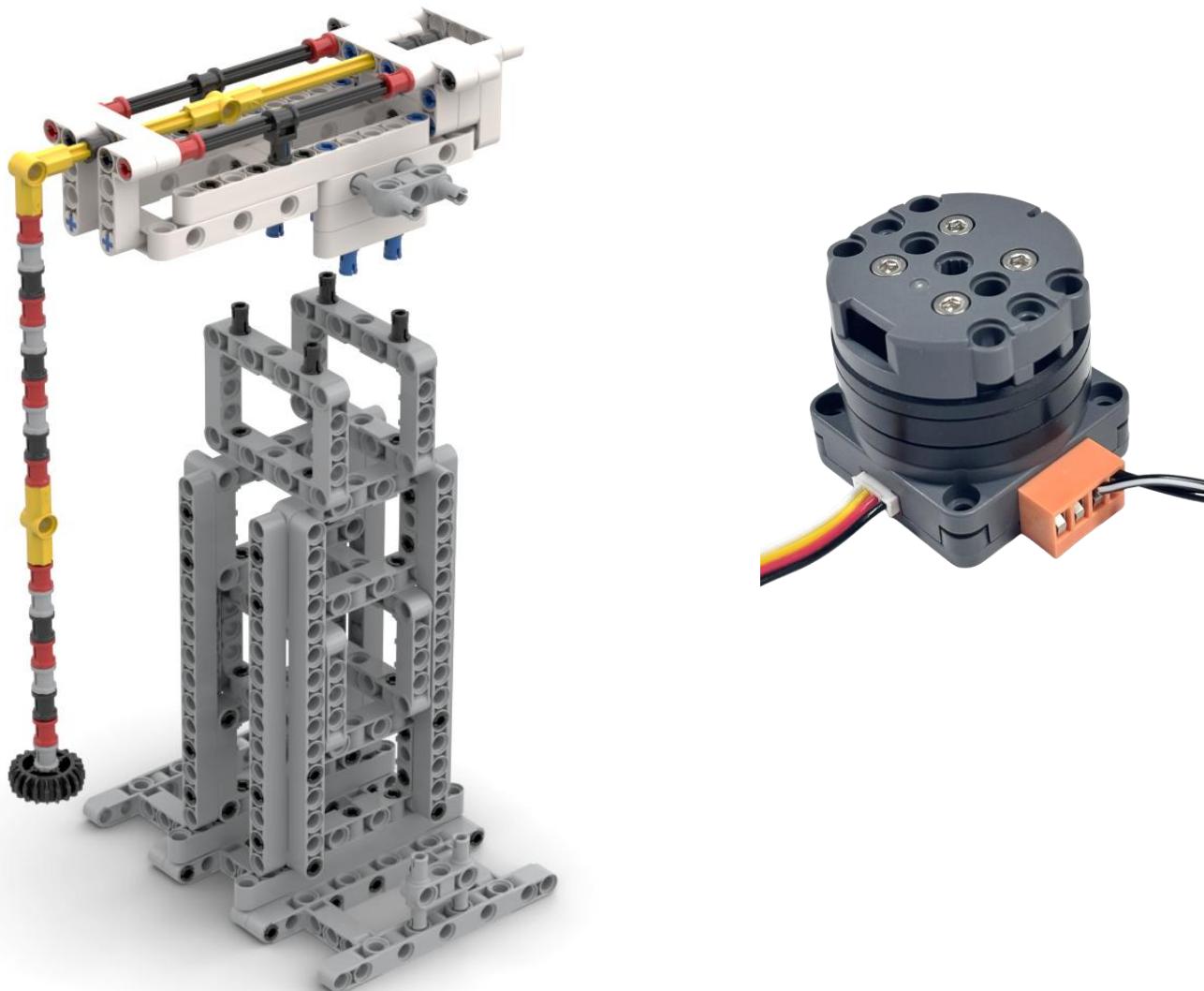
M2 のネジ類で
LEGO 部品に
AS5601 を固定

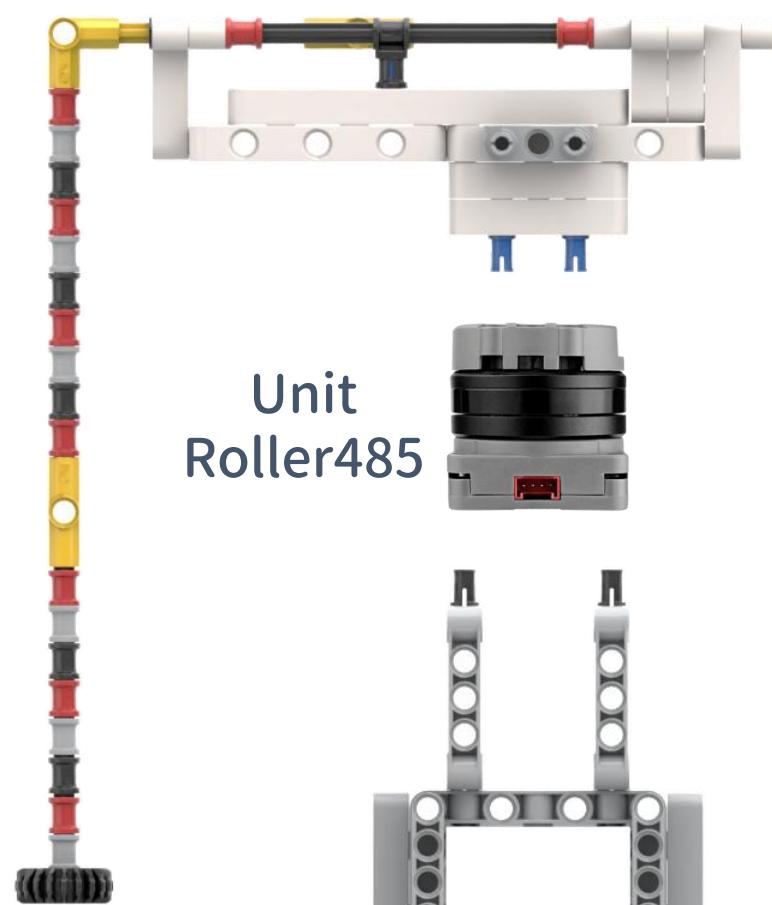
オスメスジャンパ線を介して
Grove ケーブルと AS5601 を接続
(オス側: Grove ケーブル
メス側: AS5601)



Grove ケーブルを Roller485 の
スリップリングに接続

Roller485 を介して 台座とアームを結合

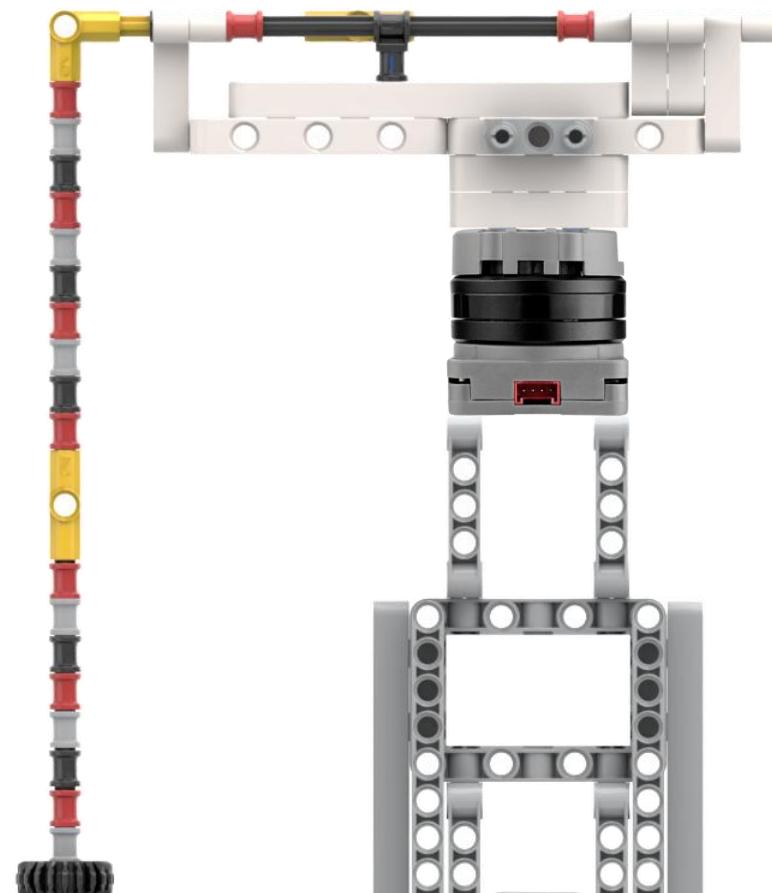




Unit
Roller485



Grove
Hub



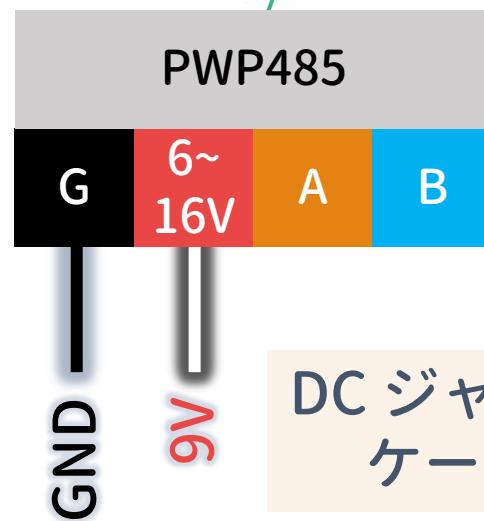
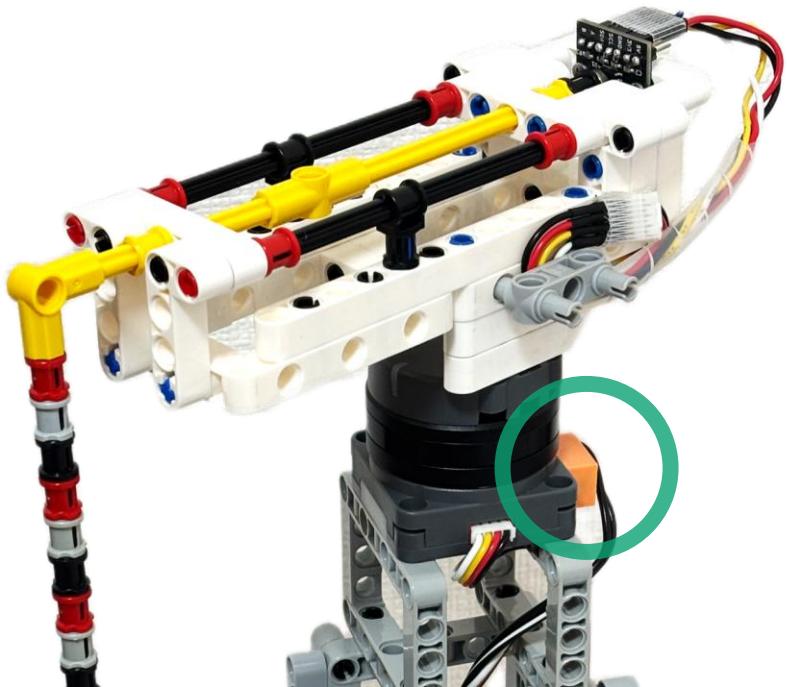
AS5601

Unit
Roller485

外部電源と接続

Grove Hub で
Grove ケーブルを延長

Arduino Mega 2560 との接続



AC アダプタ
(9V/1.3A)



DC ジャック付
ケーブル

手元スイッチ

エクスターナルで
実行する場合は
5V に接続しない

