



# 風力補充包

## WIND POWER KIT

# FUN LAB



# 1265

25 PCS

7+

知識來自於經驗

KNOWLEDGE COMES FROM EXPERIENCE ALONE

20 MODELS TO BUILD

$(x) = \frac{d}{3}$ ,  $x \sqrt{x}$

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各位小朋友，歡迎您加入 Gigo 智高的 FUN LAB 積木實驗室。  
 在 FUN LAB 補充包當中，我們添加了更多的趣味零件，透過與 #1261 科學探索組的相互結合，就能延伸出更多的創意。  
 在我們動手組裝的過程當中，不僅能體驗創作的樂趣，更能學習到各種有趣的知識！讓我們將這些知識活用於日常生活吧！  
 現在，就讓我們一起探索、學習 FUN LAB 積木實驗室吧！

Hello, everyone. Welcome to join Gigo's Fun Lab.

We add more versatile components into our Fun Lab. Through the combination with #1261 Science Discovery Set, you are able to extend more fun and creativity. Not only does it enable you with joyfulness, but also it brings you different kinds of excitements during the process of assembly steps.

Let's incorporate the knowledge into our daily routines. Now, why not join us to discover as well as get yourself involved with Fun Lab?

### #1265 風力補充包 零件表

### #1265 Wind Power Kit : Accessories and Add-Ons



44  
B-扳手  
B-PEG REMOVER  
x1



45  
C-短風車葉片  
C-SHORT BLADE  
x6



47  
C-短紙卡固定鍵  
C-SHORT BUTTON FIXER  
x10














































48  
C-OD106mm螺旋槳  
C-OD106 PROPELLER  
x1



49  
C-多向接頭  
C-UNIVERSAL ADAPTER  
x1



50  
B-中心眼珠  
B-EYE-1  
x4

 1 C-軸扣鍵 C-AXLE CONNECTOR x10	 2 C-自轉軸鍵 C-AXLE x5	 3 C-凸輪連結鍵 C-CAM CONNECTOR x4	 4 C-長結合鍵 C-LONG PEG x15	 5 B-短結合鍵 B-SHORT PEG x15	 6 C-軸固定鍵 C-AXLE FIXING x5	 7 C-底座結合器 C-BASE GRID CONNECTOR x2	 8 C-軸轉接器 C-ROD CONNECTOR x2
 9 C-關節鍵 C-HINGE x4	 10 C-單向轉接鍵 C-FRONT CONVERTER x4	 11 C-二合一結合鍵 C-TWO-IN-ONE CONVERTER x4	 12 C-3孔1/4弧長條 C-BENDED ROD x8	 13 C-3孔超長條 C-3 HOLE DUAL ROD x4	 14 C-3孔長條 C-3 HOLE ROD LATERAL CLOSED x4	 15 C-3孔長條側有孔 C-3 HOLE ROD x4	
 16 C-5孔超長條 C-5 HOLE DUAL ROD x4	 17 C-5孔長條 C-5 HOLE ROD x4	 18 C-5孔長條側有孔 C-5 HOLE ROD FRONT CLOSED x4	 19 C-曲軸 C-CRANK x2	 20 C-15孔超長條 C-15 HOLE DUAL ROD x6	 21 C-11孔超長條 C-11 HOLE ROD x6		
 22 C-5x5孔正方框 C-5X5 FRAME x4	 23 C-5x10孔長方框 C-5X10 FRAME x4	 24 C-5x15孔長方框 C-5X15 FRAME x4	 25 C-5x13孔超長方框 C-5X13 DUAL FRAME x1	 26 C-10T鍊輪 C-10T CHAIN GEAR x2			
 27 C-20T齒輪 C-20T GEAR x6	 28 C-40T齒輪 C-40T GEAR x6	 29 C-60T齒輪 C-60T GEAR x4	 30 C-80T齒輪 C-80T GEAR x2	 31 C-OD33mm滑輪 C-OD33mm PULLEY x2	 32 C-OD53mm滑輪 C-OD53mm PULLEY x2	 33 C-渦桿 C-WORM GEAR x1	
 34 C-OD70x13mm橡膠輪 C-RACING TIRE x2	 35 C-100mm橡皮筋 C-100mm RUBBER BAND x2	 36 C-OD56mm橡膠圈 C-OD56 O-RING x2	 37 C-OD36mm橡膠圈 C-OD36 O-RING x2	 38 C-墊片 C-WASHER x5	 39 C-30mm II軸 C-30mm AXLE II x4	 40 C-70mm II軸 C-70mm AXLE II x4	
 41 C-100mm II軸 C-100mm AXLE II x4	 42 C-150mm I軸 C-150mm AXLE I x2	 43 C-特多龍線 C-STRING x1	 46 C-8x12底座 C-BASE GRID x2				

### 小提醒：

課程開始前，請先搭配補充包說明書，將 #1261 科學探索組的材料挑出，會更方便進行模型創作喔！

Reminders: Before the class, please read the instructions of Accessories and Add-Ons to pick out listed parts to make it easier for #1265 models assembly.



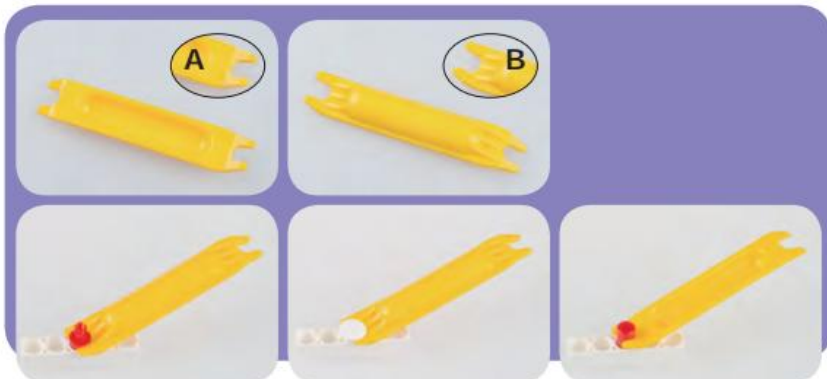
# 課前準備

課前須將 200cm 棉線剪成  
一條 30cm、一條 170cm 備用

Class Preparations: Cut the 200cm string into  
30cmX1, 170cmX1 beforehand.

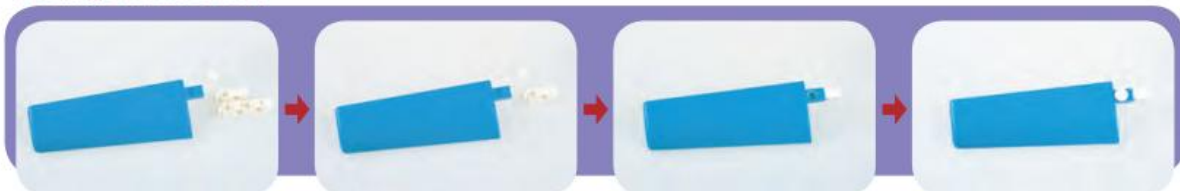
## 板手使用：自轉軸 / 軸扣 / 紙卡固定紐

Remover Usage: Axle/Peg/Fixing



## 葉片組裝技巧

Assembly skills for blades.



## 注意轉動中勿接觸葉片

Do not touch the blades when rotating.

可自由轉動葉片角度，若須紀錄角度可使用量角器、尺，檢查扇葉的角度。

Use a protractor or a ruler to check the angles of the blades.

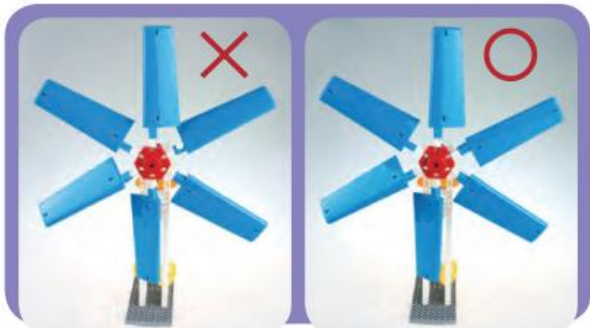


## 統一葉片方向

The direction of the blades should remains the same.

可拿重物壓住底板或膠帶黏貼，避免強風吹倒。

Stabilize it with heavy objects or tape it to avoid blowing down.



# 風力分級

風力分級 (資料來源: 中央氣象局)

風之強弱程度, 通常用風力等級來表示, 而風力的等級, 可由地面或海面物體被風吹動之情形加以估計之。目前國際通用之風力估計, 係以蒲福風級為標準。蒲福氏為英國海軍上將, 於1805年首創風力分級標準。先僅用於海上, 後亦用於陸上, 並屢經修訂, 乃成今日通用之風級。實際風速與蒲福風級之經驗關係式為:  $V=0.836*(B^{3/2})$

B 為蒲福風級數 V 為風速 (單位: 公尺 / 秒)

茲將現行蒲福風級標準, 表列如后 (詳見表 1)

## Wind Scales:

Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land. The scale was devised in 1805 by Francis Beaufort, an Irish Royal Navy officer.

It was adopted officially and first used during the voyage of HMS Beagle under Captain Robert FitzRoy, later to set up the first Meteorological Office (Met Office) in Britain giving regular weather forecasts. In the early 19th century, naval officers made regular wind speed on the 1946.

Beaufort scale is based on the empirical relationship:  $V=0.836*(B^{3/2})$

Please see the chart below for detailed wind scales:

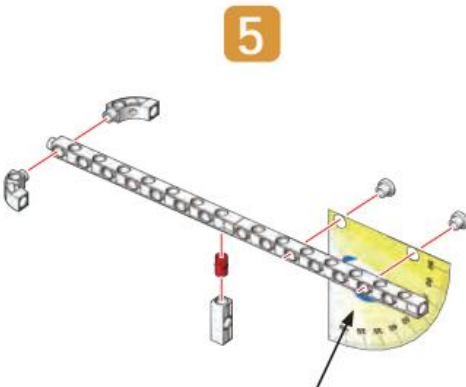
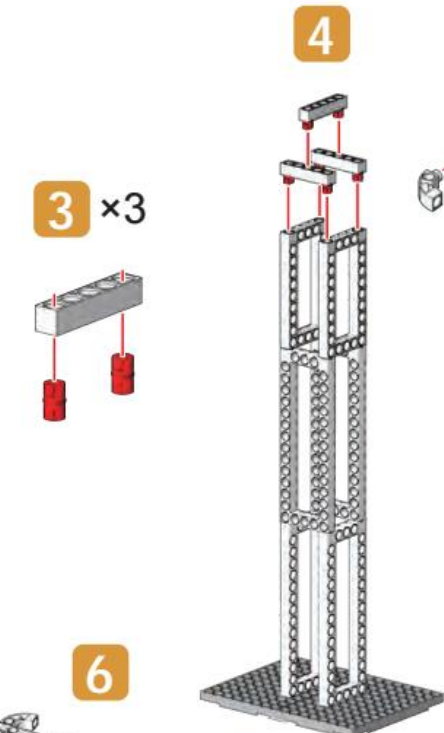
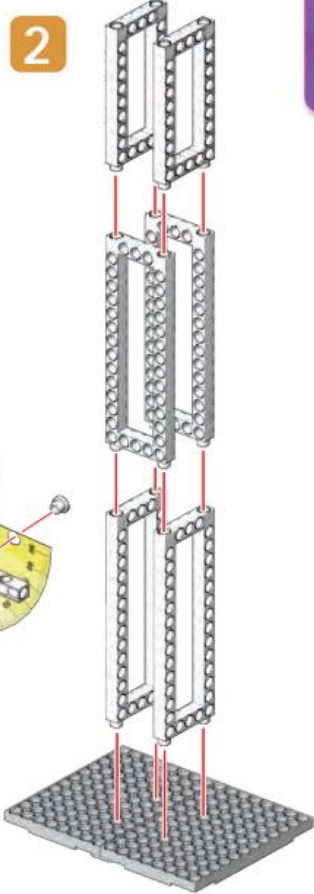
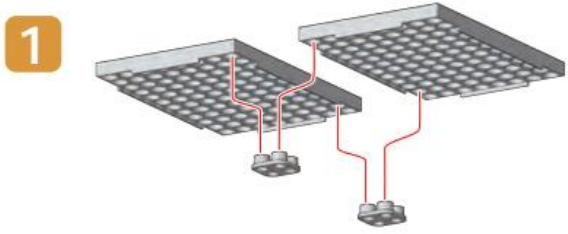
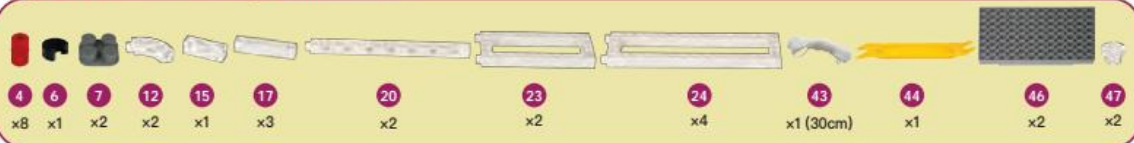
表 1 陸上應用之蒲福風級表 (Beaufort scale)

蒲福風級 Beaufort Number Category	風速 Wind speed		風支稱謂 Description	一般敘述 Land conditions
	kts	m/s		
0	<1	<0.3	無風 Calm	煙直上 Calm. Smoke rises vertically
1	1-2	0.3-1.5	軟風 Light air	僅煙能表示風向, 但不能轉動風標。 Smoke drift indicates wind direction. Leaves and wind vanes are stationary.
2	3-6	1.5-3.3	輕風 Light breeze	人面感覺有風, 樹葉搖動, 普通之風標轉動。 Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.
3	7-10	3.3-5.5	微風 Gentle breeze	樹葉及小枝搖動不息, 旌旗飄展。 Leaves and small twigs constantly moving, light flags extended.
4	11-15	5.5-8.0	和風 Moderate breeze	塵土及碎紙被風吹揚, 樹之分枝搖動。 Dust and loose paper raised. Small branches begin to move.
5	16-20	8.0-10.8	清風 Fresh breeze	有葉之小樹開始搖擺。 Branches of a moderate size move. Small trees in leaf begin to sway.
6	21-26	10.8-13.9	強風 Strong breeze	樹之木枝搖動, 電線發出呼呼嘯聲, 張傘困難。 Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	27-33	13.9-17.2	疾風 High wind, moderate gale, near gale	全樹搖動, 逆風行走感困難。 Whole trees in motion. Effort needed to walk against the wind.
8	34-40	17.2-20.7	大風 Gale, fresh gale	小樹枝被吹折, 步行不能前進。 Some twigs broken from trees. Progress on foot is seriously impeded.
9	41-47	20.7-24.5	烈風 Strong/severe gale	建築物有損壞, 煙囪被吹倒。 Some branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over.
10	48-55	24.5-28.4	狂風 Storm, whole gale	樹被風拔起, 建築物有相當破壞。 Trees are broken off or uprooted, structural damage likely.
11	56-63	28.4-32.6	暴風 Violent storm	少見, 如出現必有大災害。 Widespread vegetation and structural damage likely.
12-17	≥ 64	≥ 32.6	颶風 Hurricane force	極少見, 如出現必有極重大災害。 Severe widespread damage to vegetation and structures.

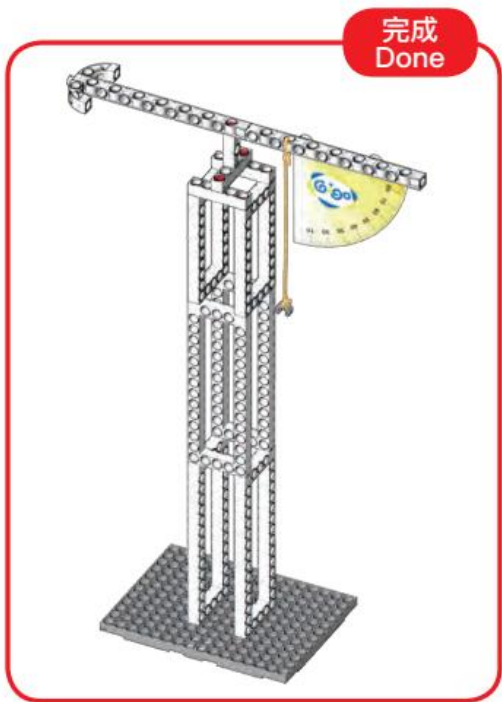
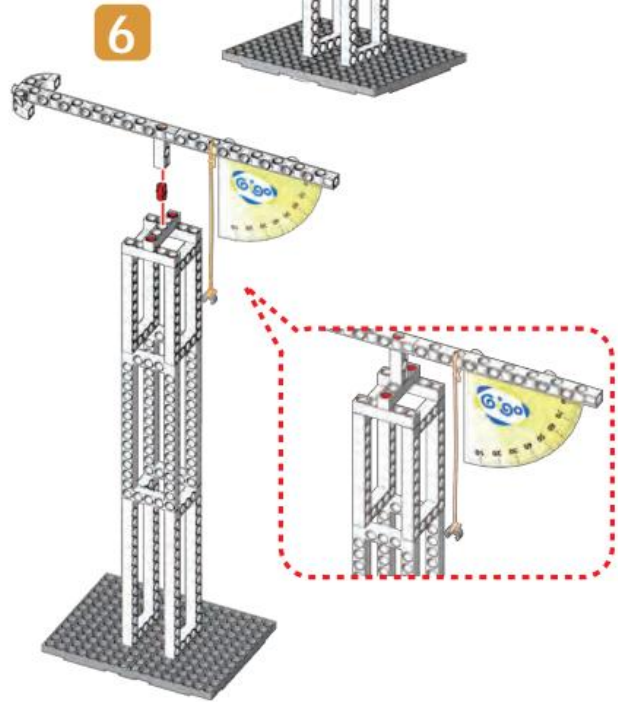
\* 風級 3 到 7 分別是微風、和風、清風、強風和疾風 (風速約介於 3~17m/s), 是一般風力發電機可以使用的範圍。

Wind Scale 3-7 are followed as gentle breeze, moderate breeze, fresh breeze, strong breeze and high wind (wind speed between about 3 - 17m / s); general wind turbines can be applied.



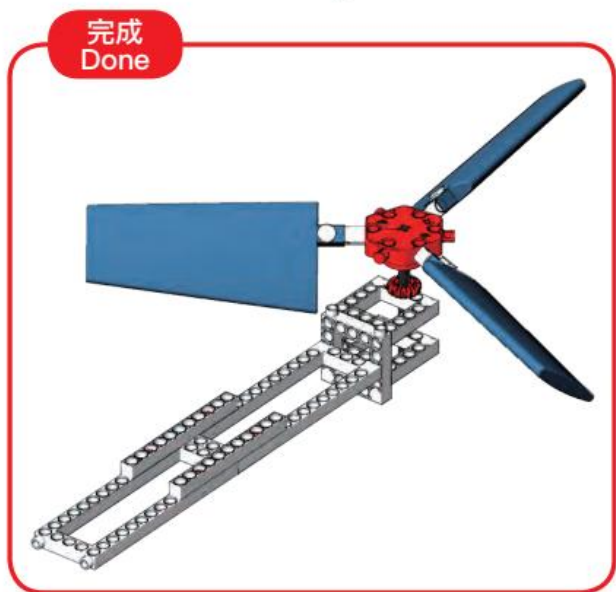
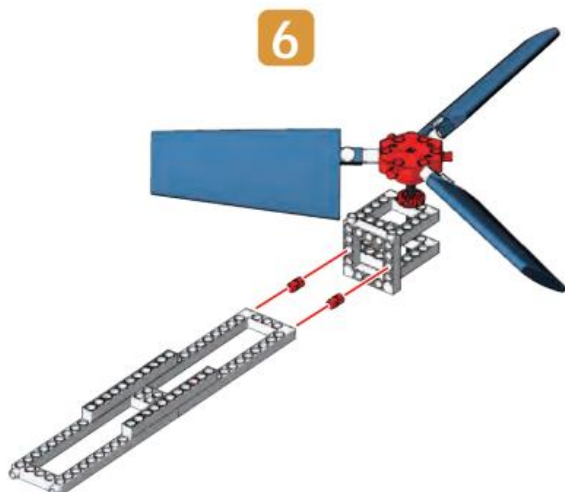
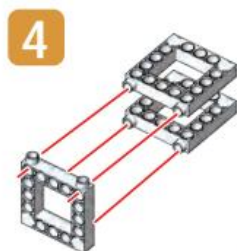
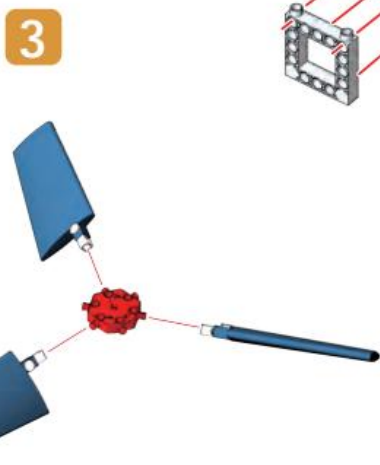
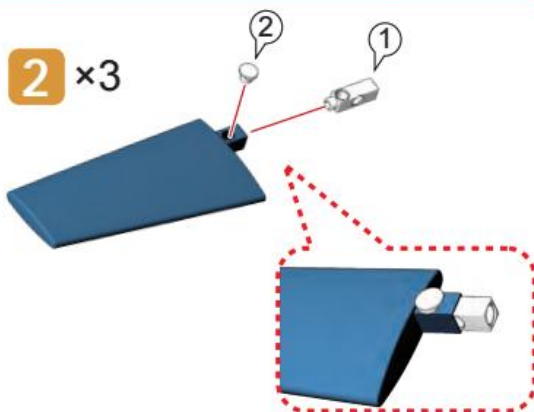
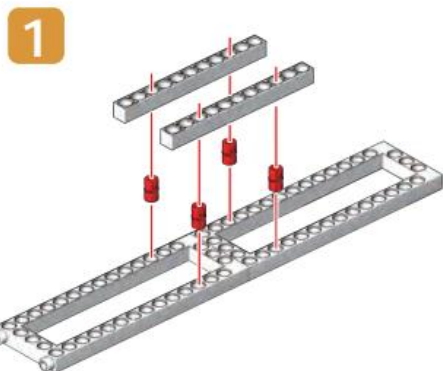


請取 42 頁圖卡，依虛線  
剪下組裝上即可。  
Remove the paper  
sheet on the P. 42. Cut  
along the dotted line,  
then assemble it.

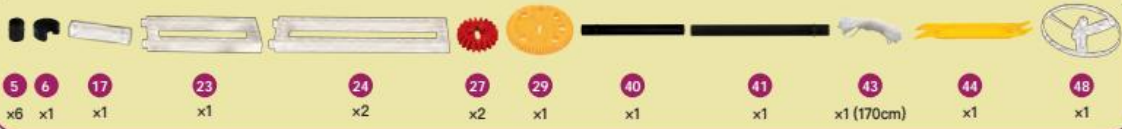


## 手持測風器

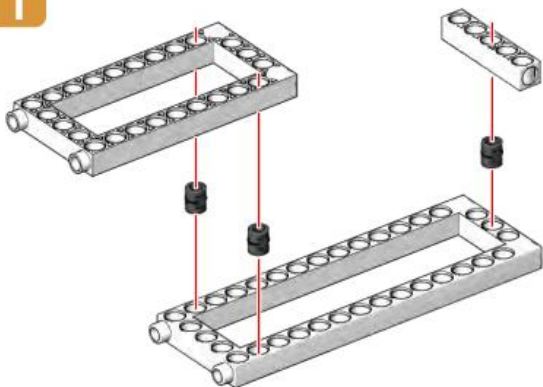
## Handy Anemometer



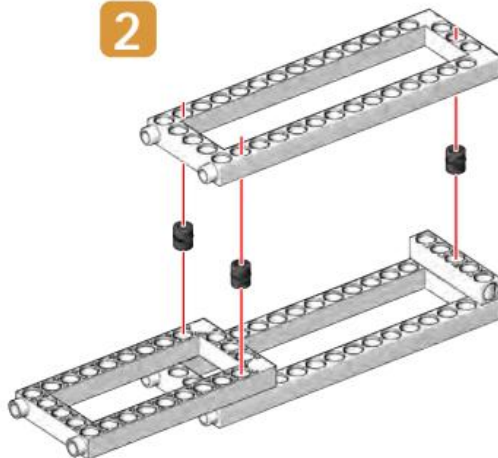




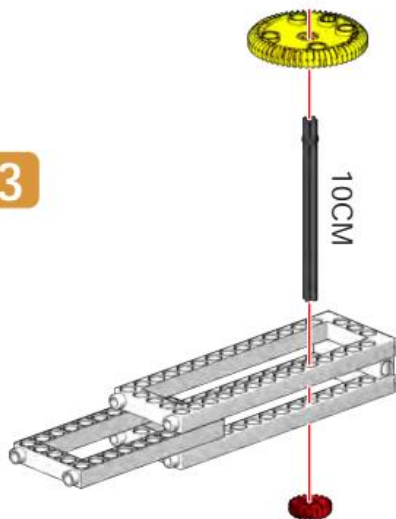
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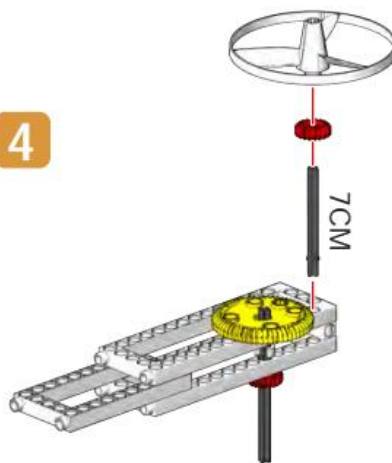
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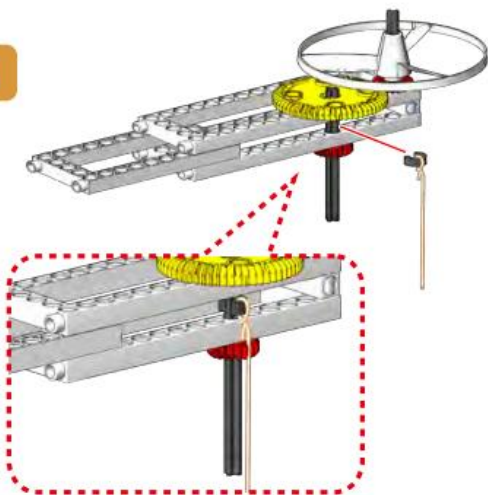
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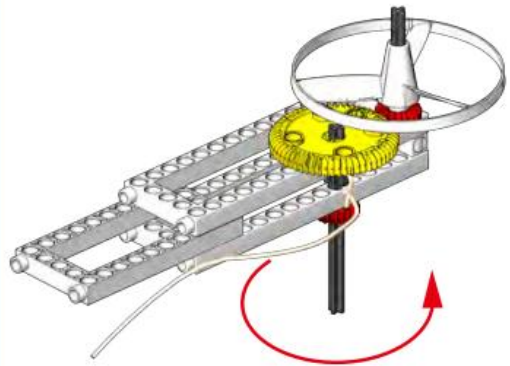
4



5



完成  
Done



## 風帆跑跑車

## Kinetic Sailing Go Kart



16

x2



31

x2



32

x2



36

x2



37

x2



40

x2



44

x1



47

x3

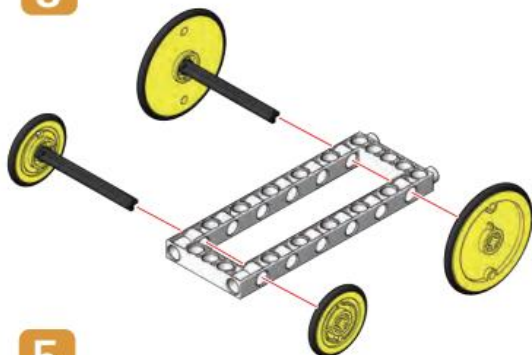
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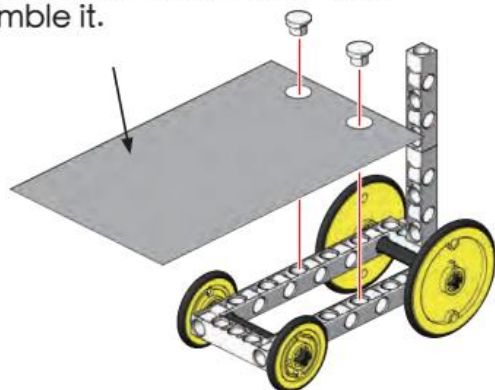
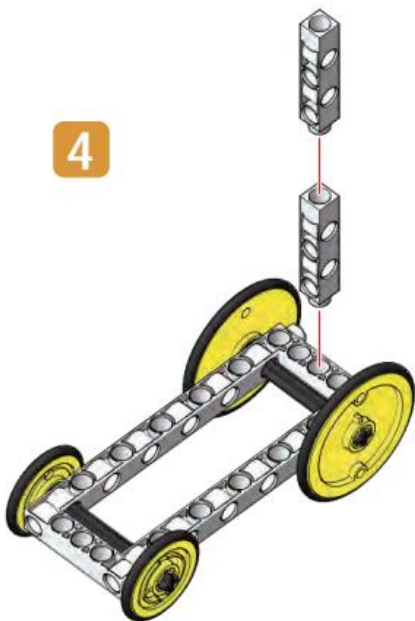
3



5

請取 42 頁圖卡，依虛線剪下組裝上即可。  
Remove the paper sheet on the P. 42.  
Cut along the dotted line, then assemble it.

4



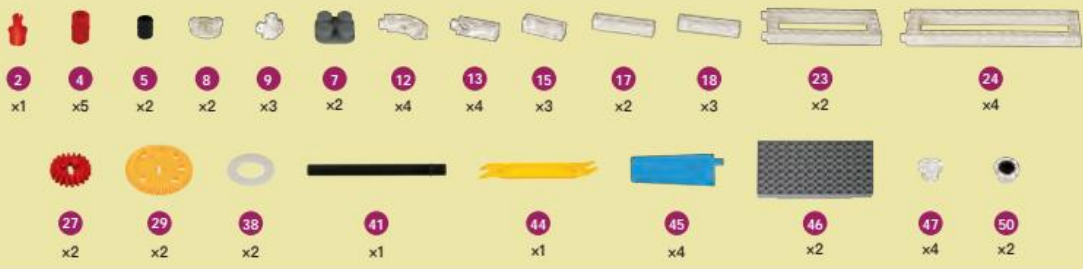
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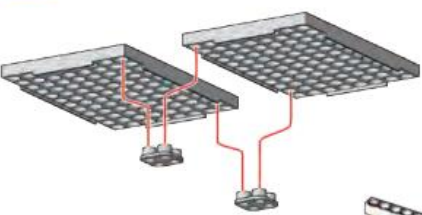
完成  
Done



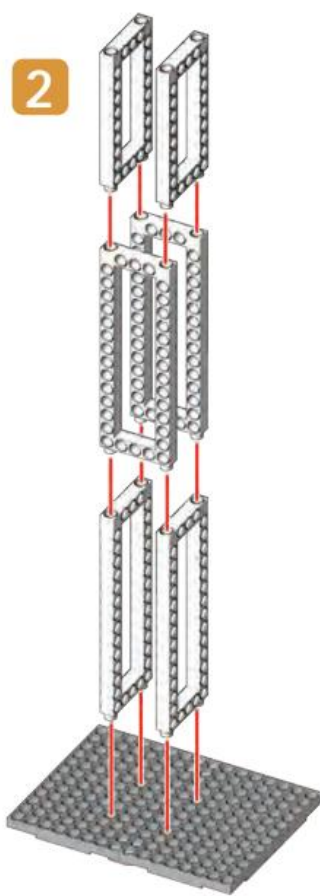




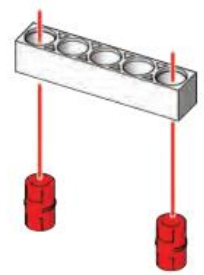
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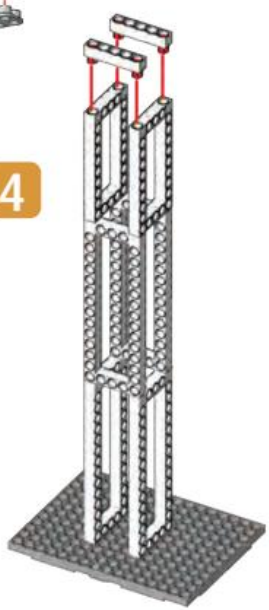
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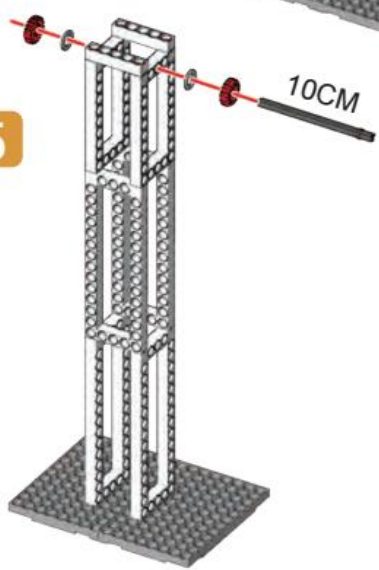
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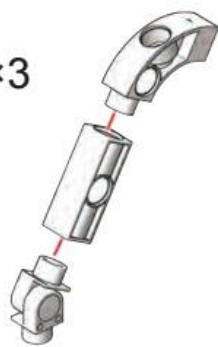
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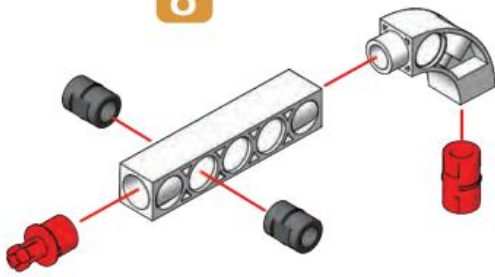
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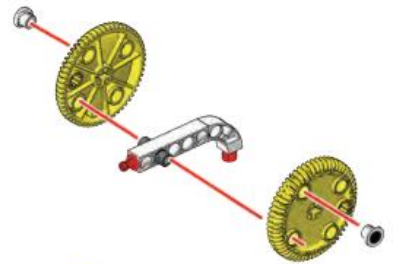
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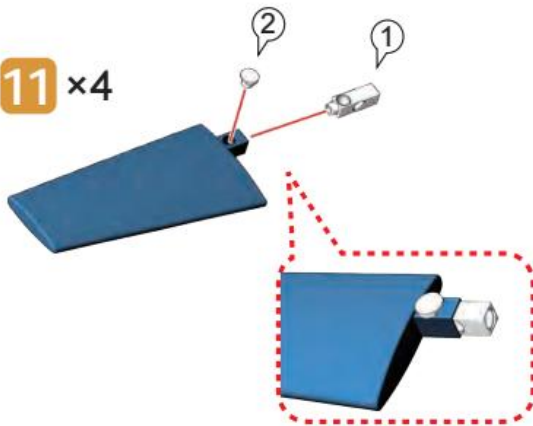
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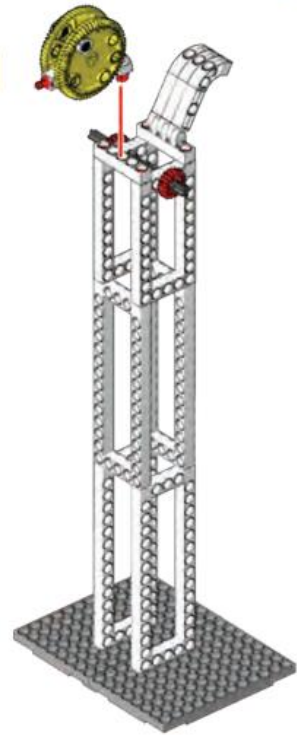
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11 x 4



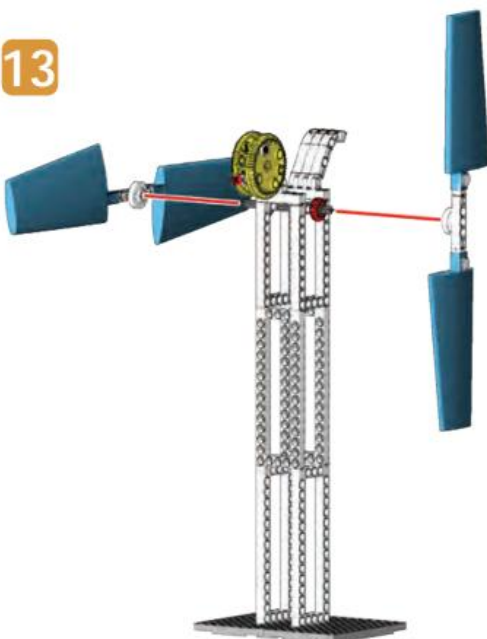
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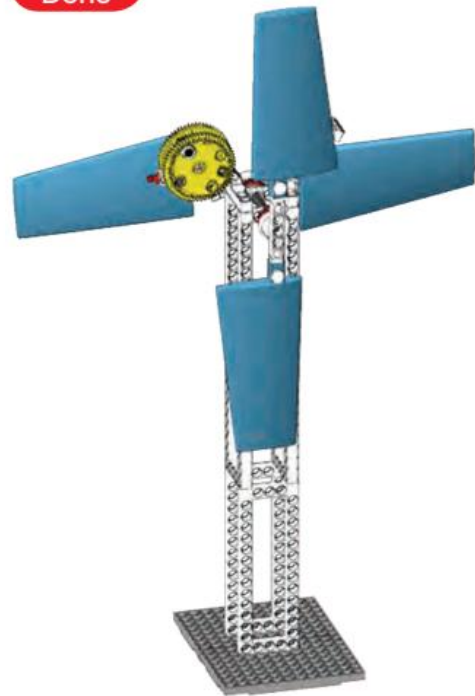
12 x 2



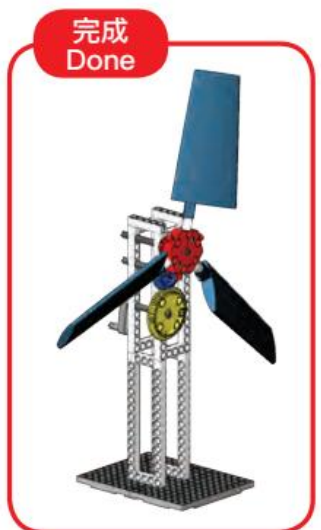
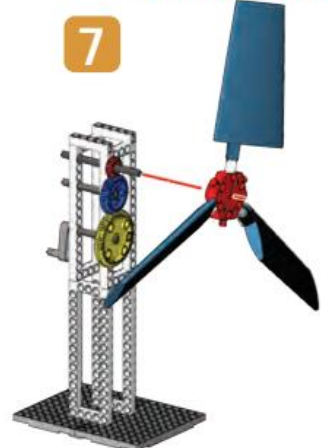
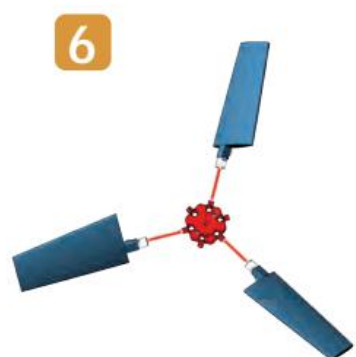
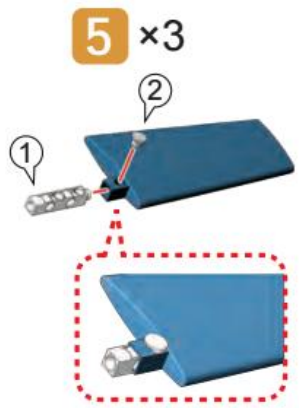
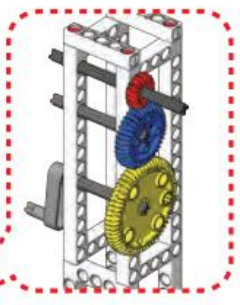
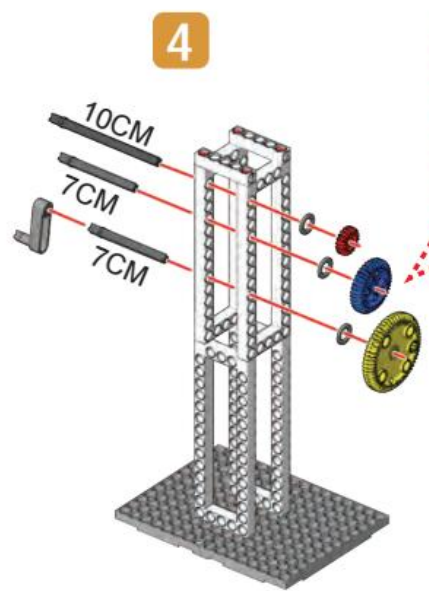
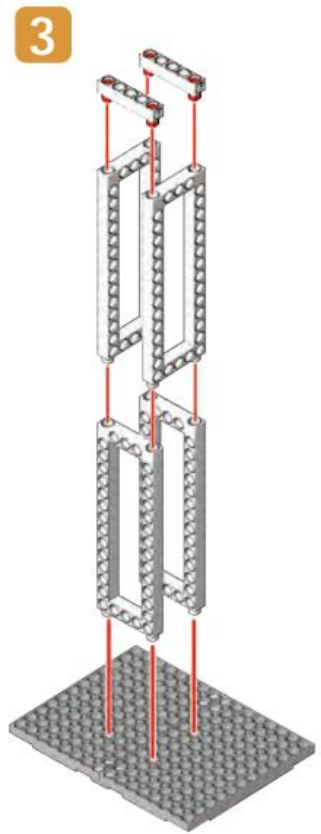
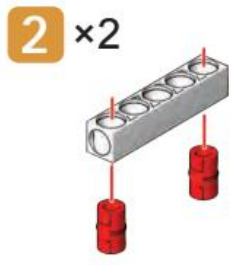
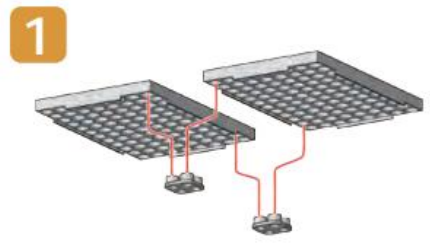
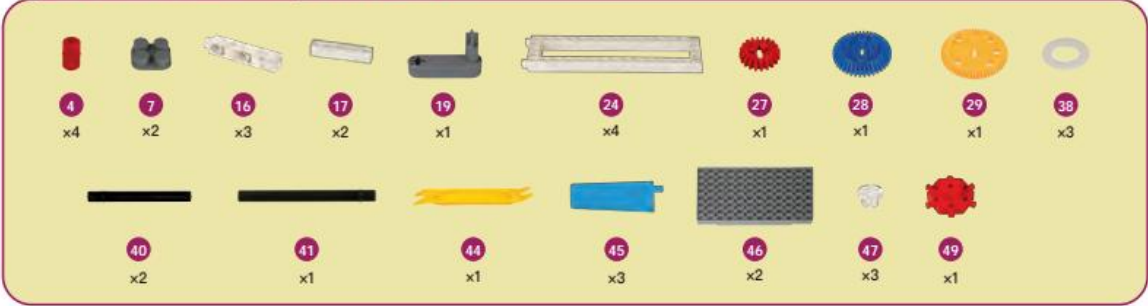
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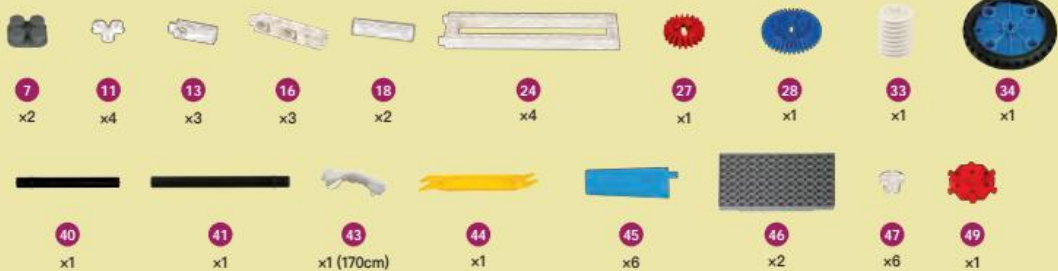


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Done

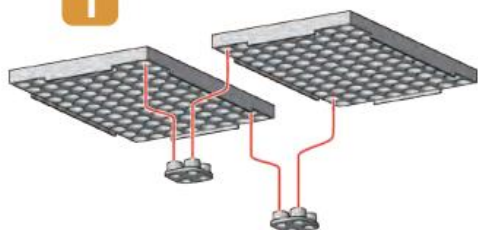




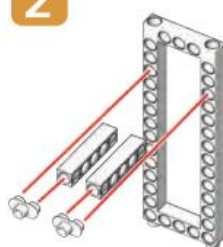




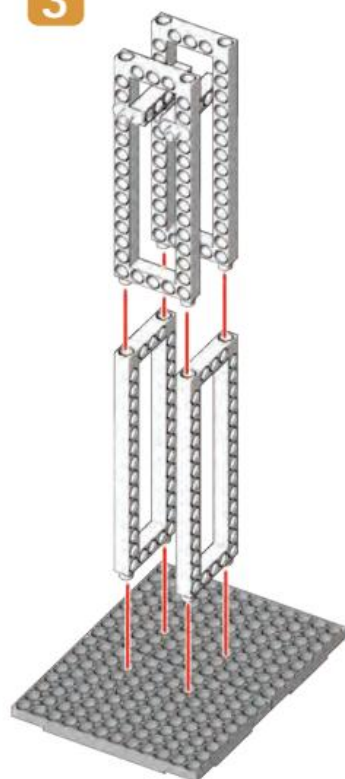
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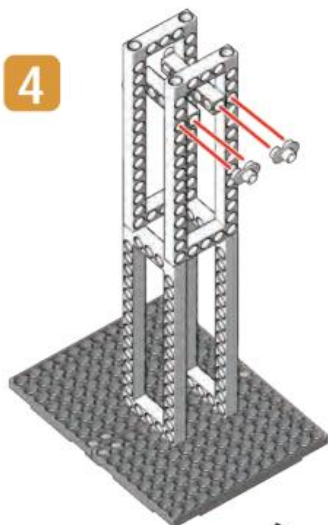
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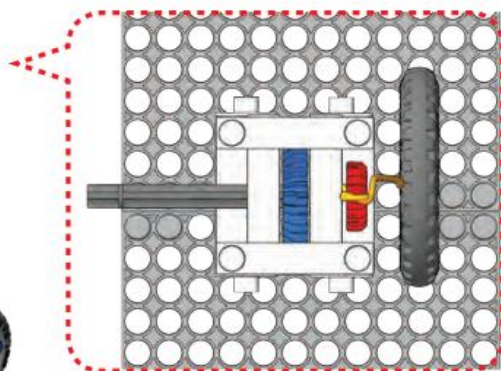
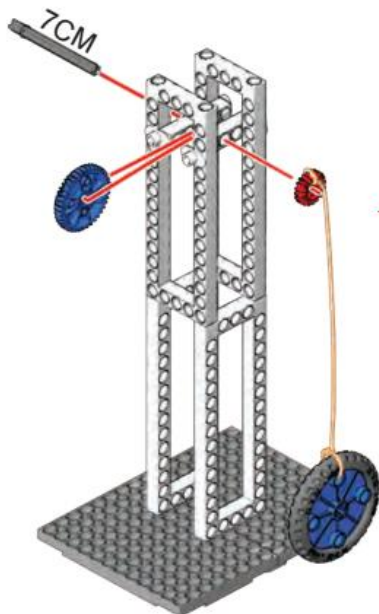
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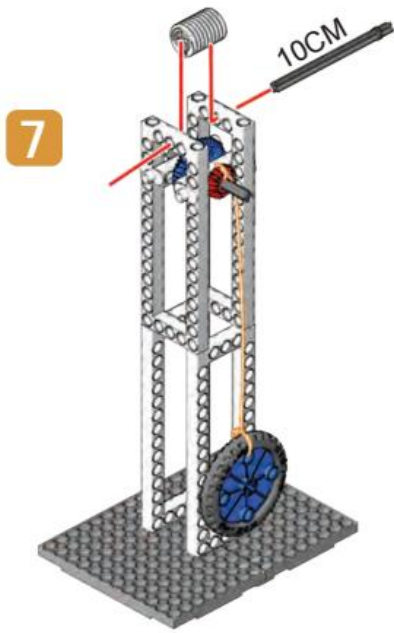
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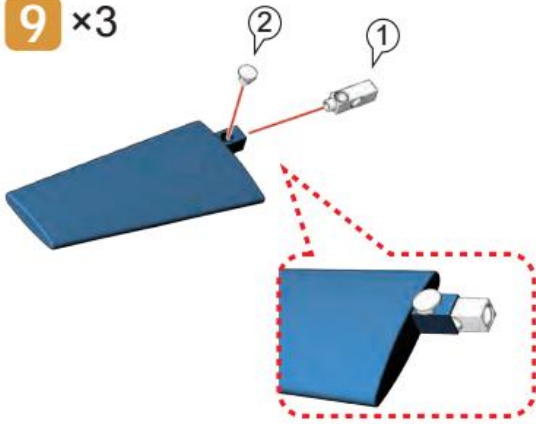




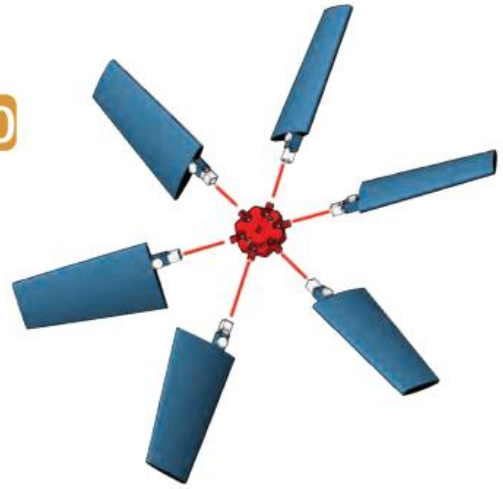
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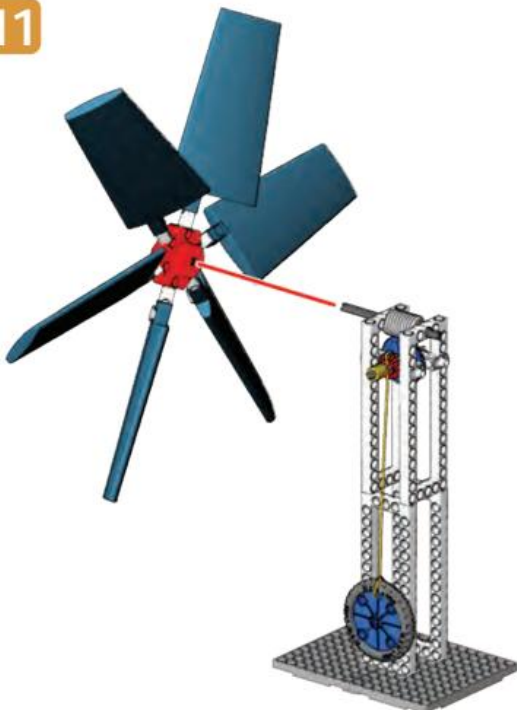
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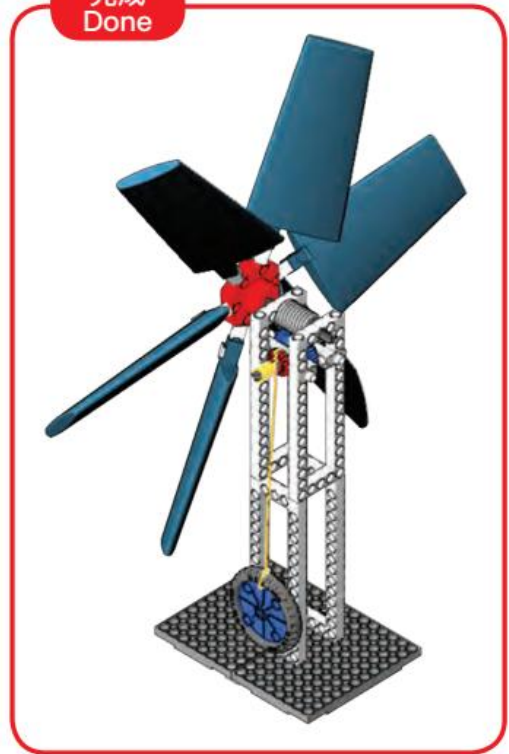
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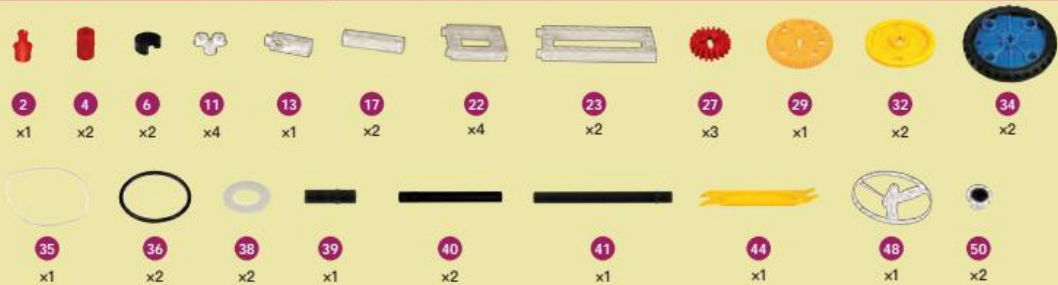


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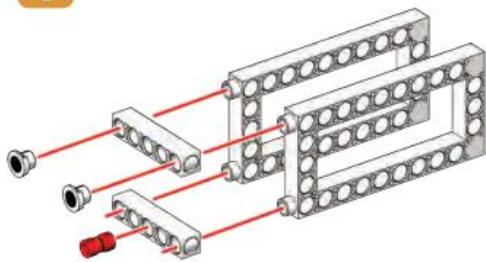


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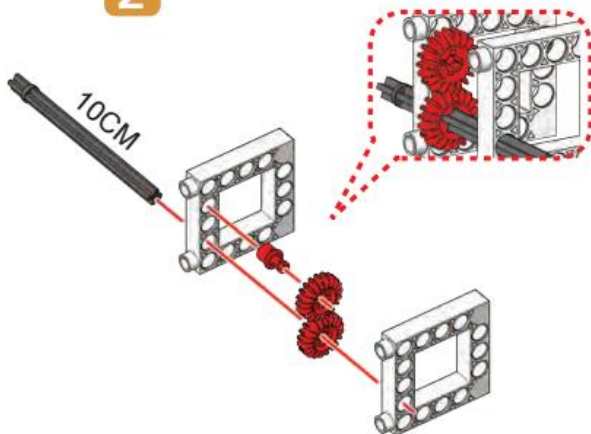




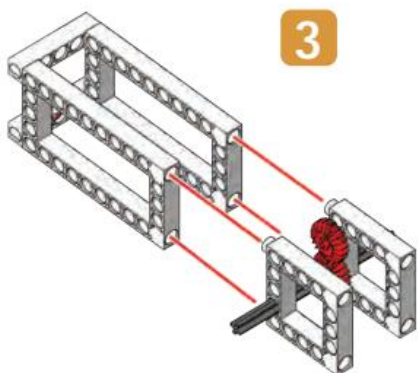
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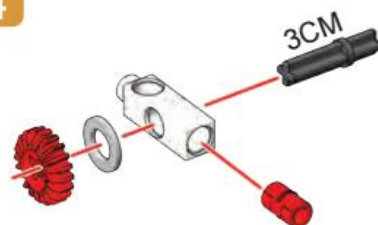
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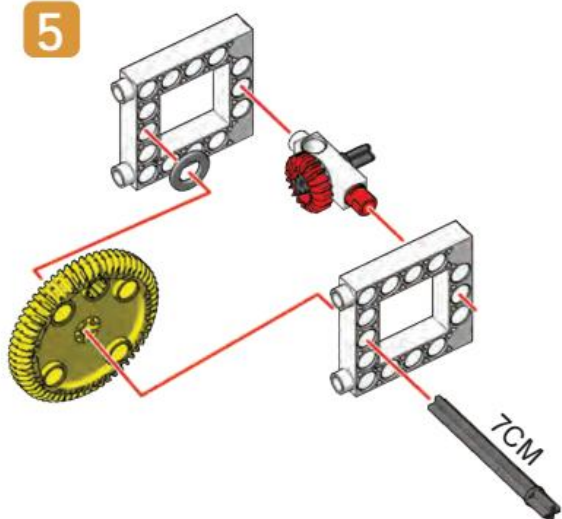
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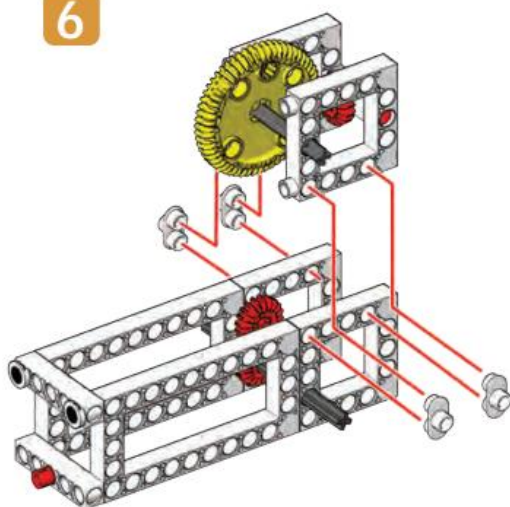
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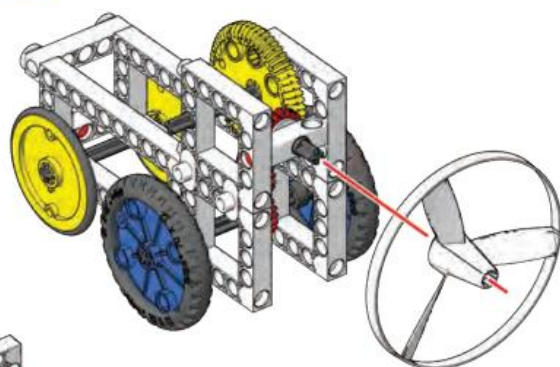
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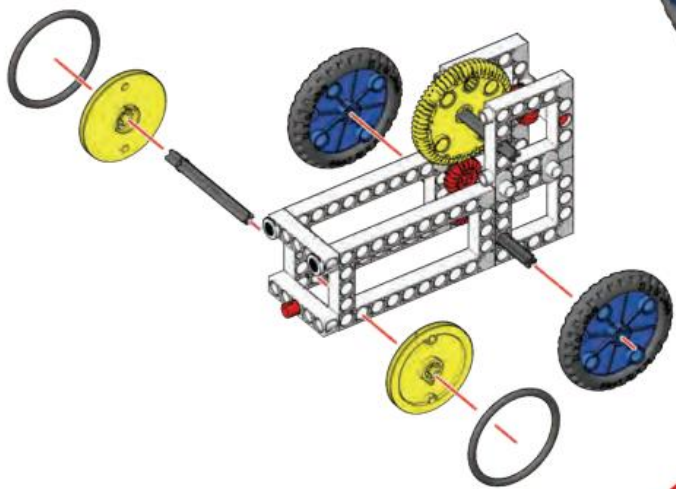
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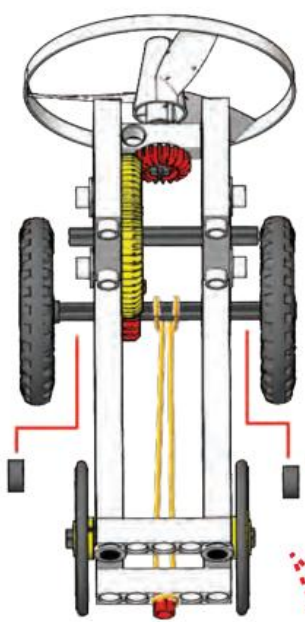
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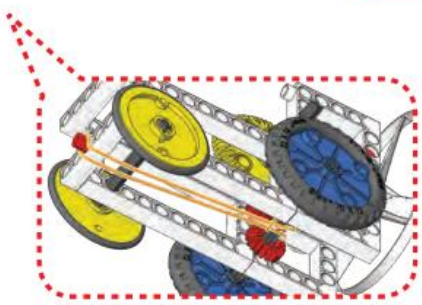
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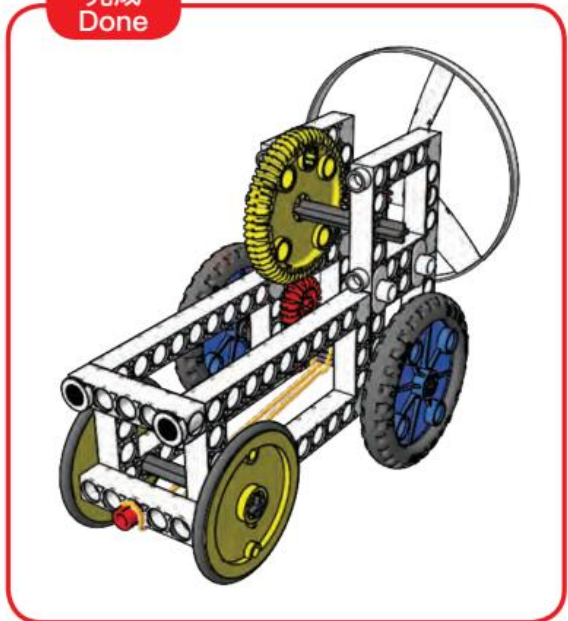
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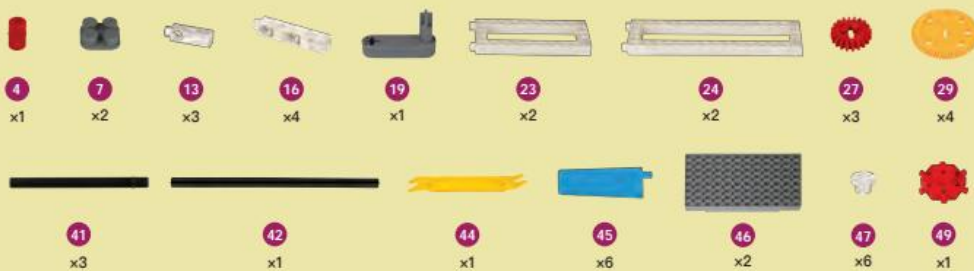
組裝上軸固定器，固定長軸以利轉動。  
Place the axle fixing on the axle for smooth running.



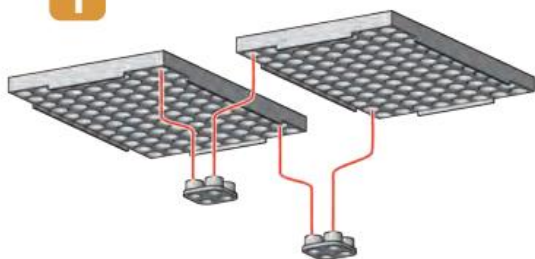
完成  
Done



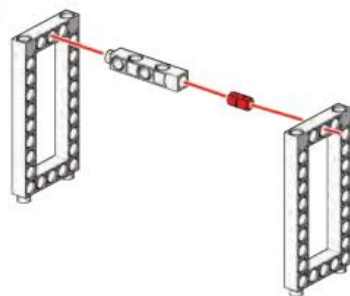




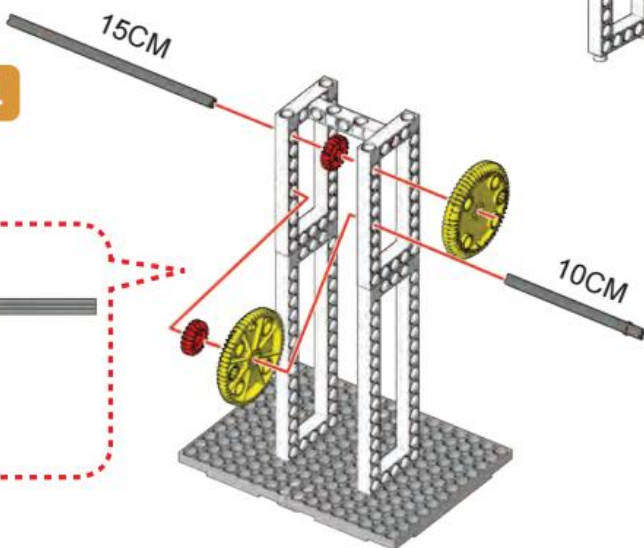
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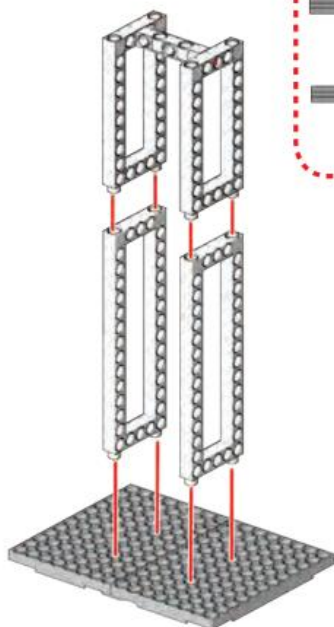
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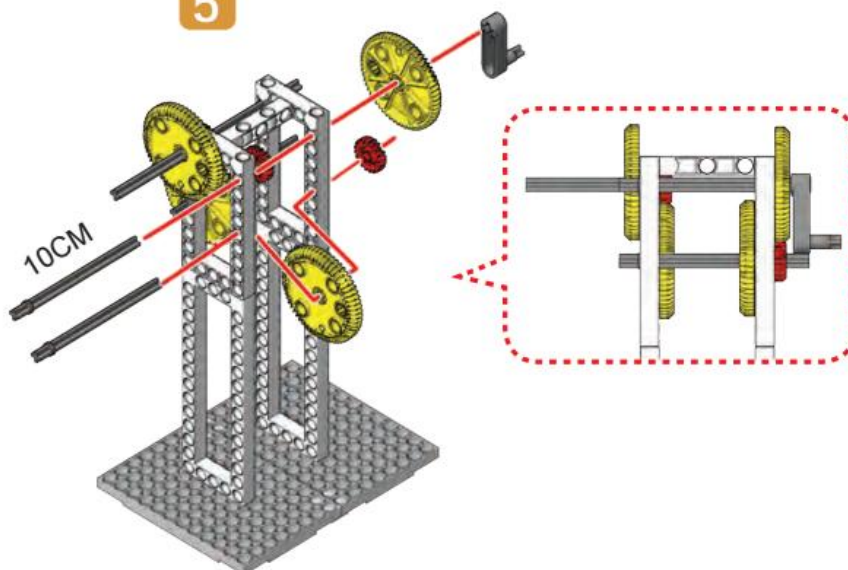
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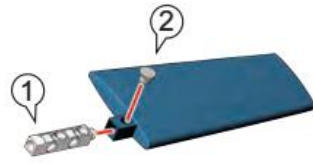
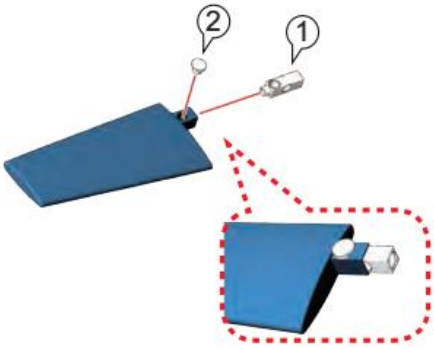
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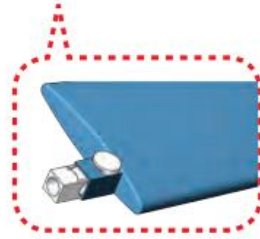
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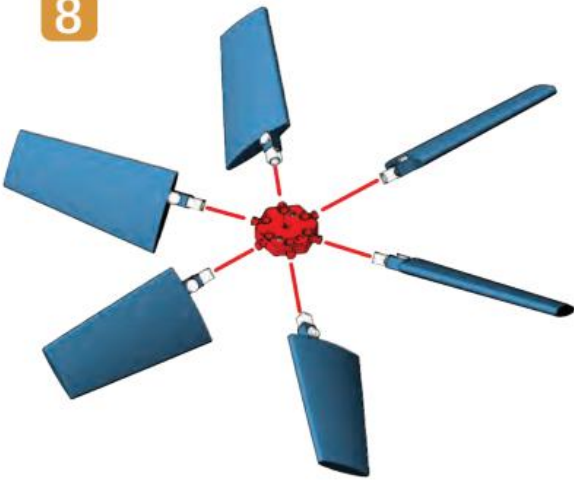
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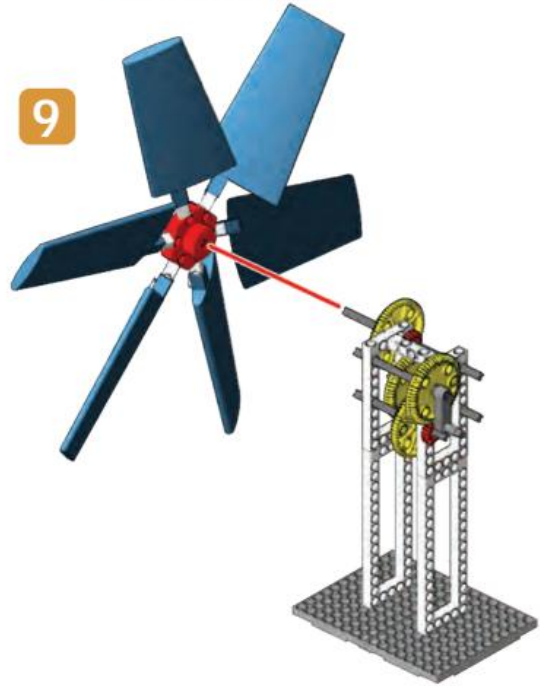
7 x3



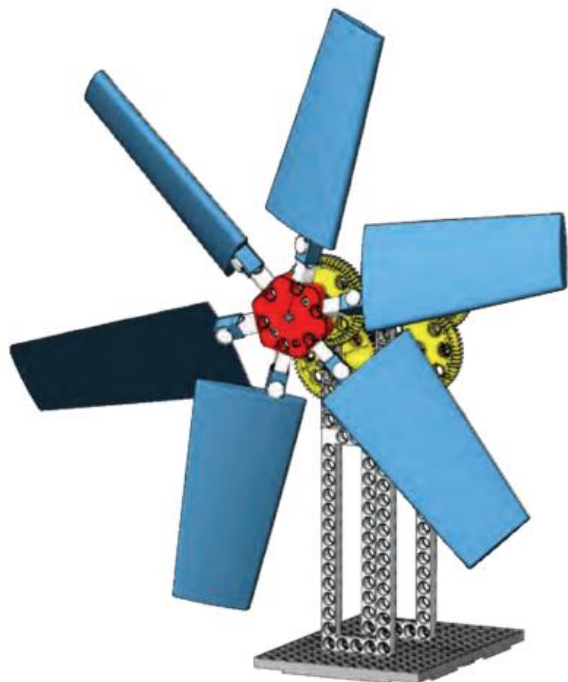
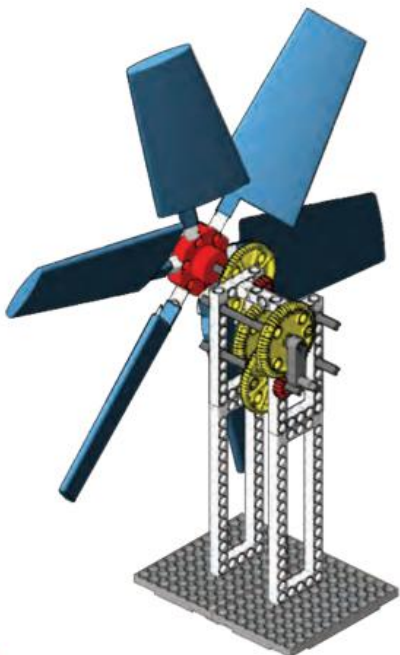
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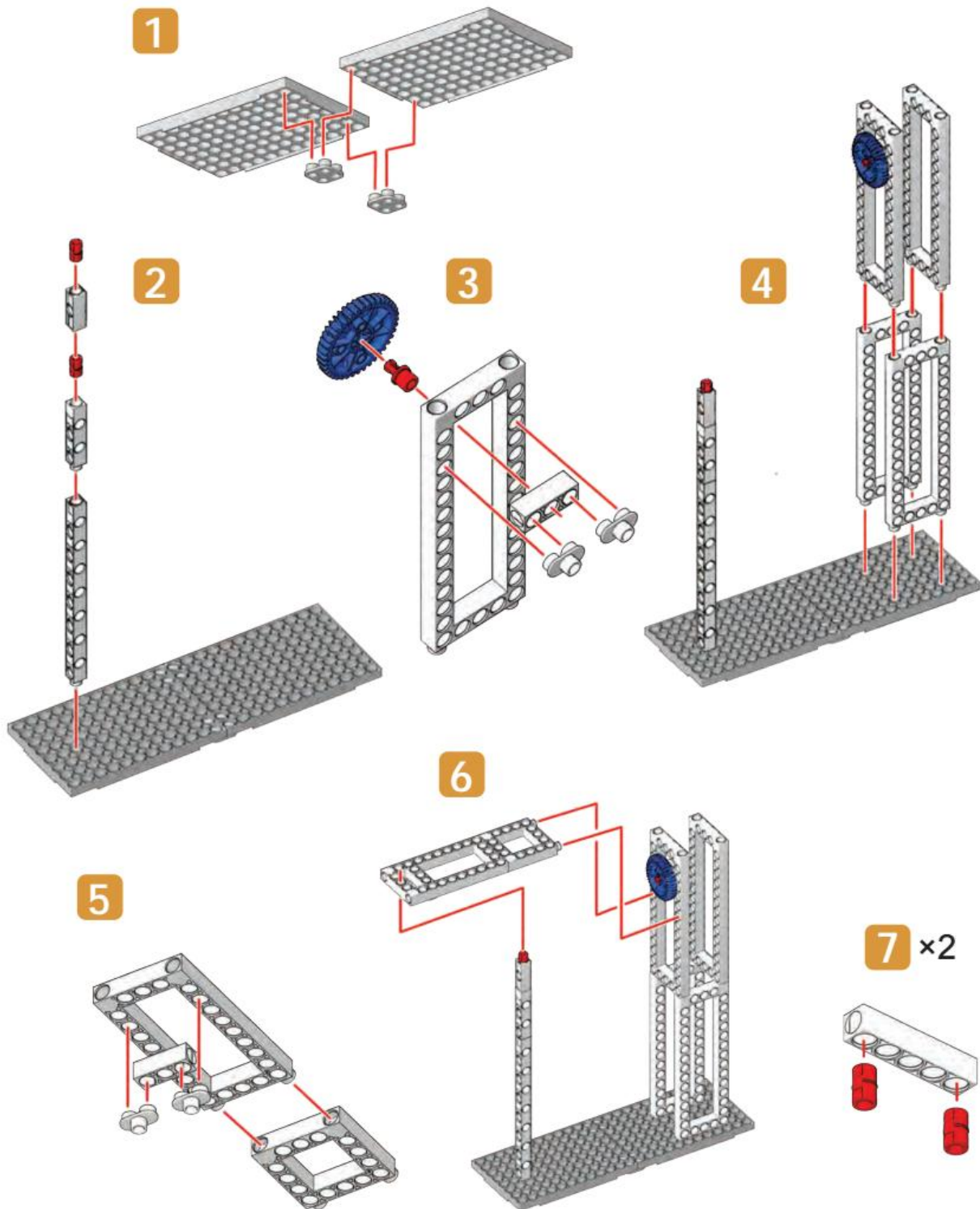
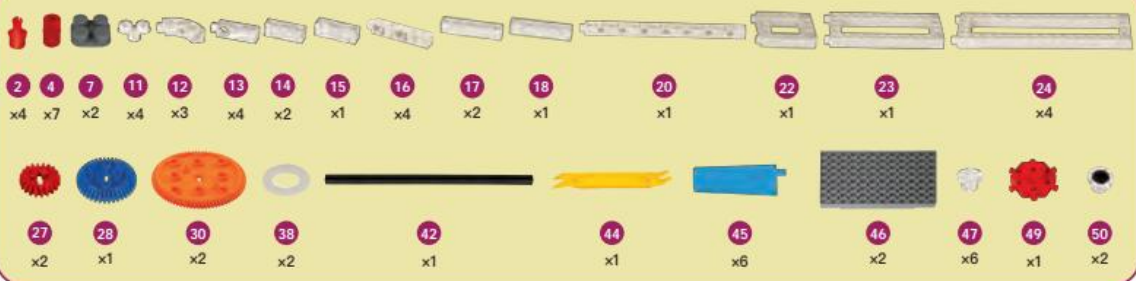


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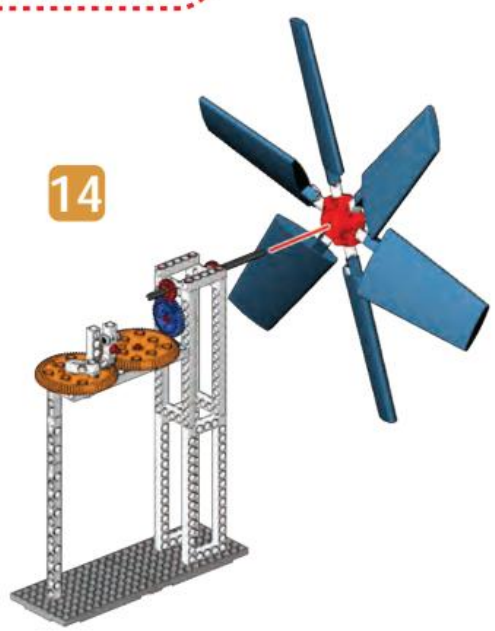
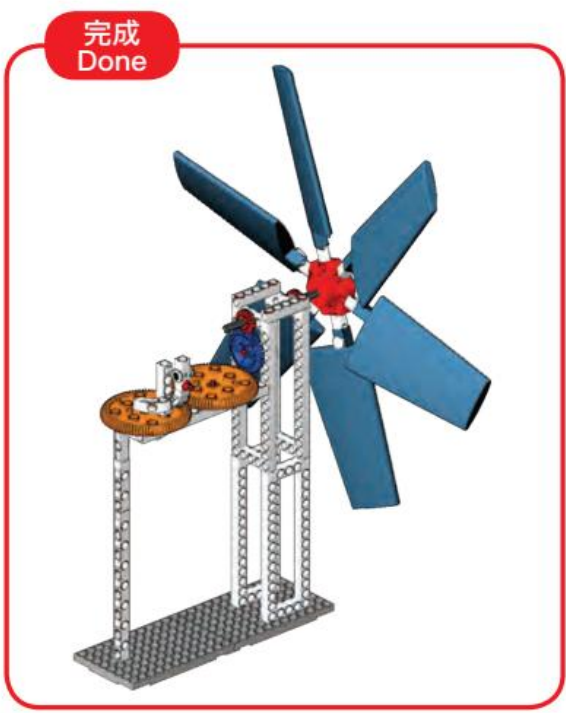
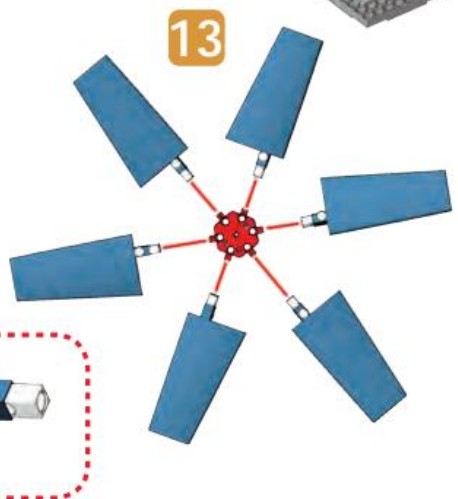
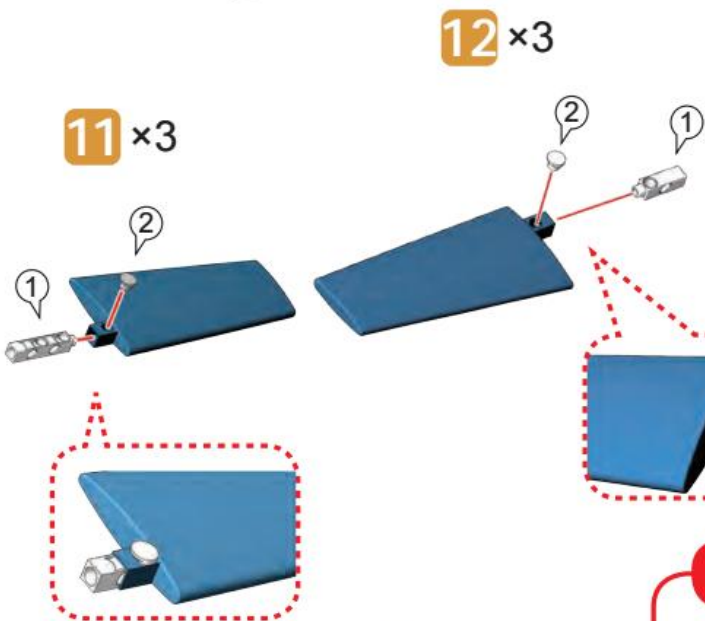
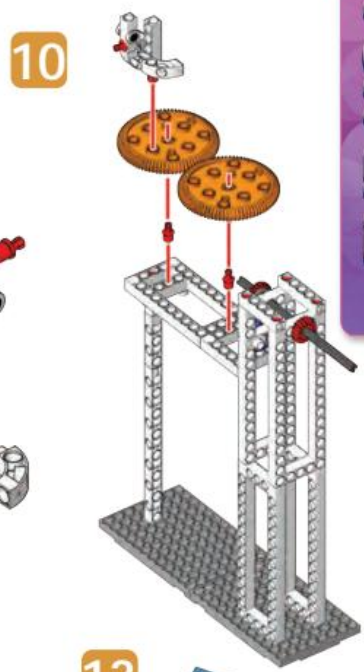
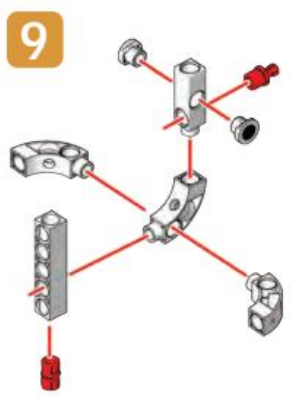
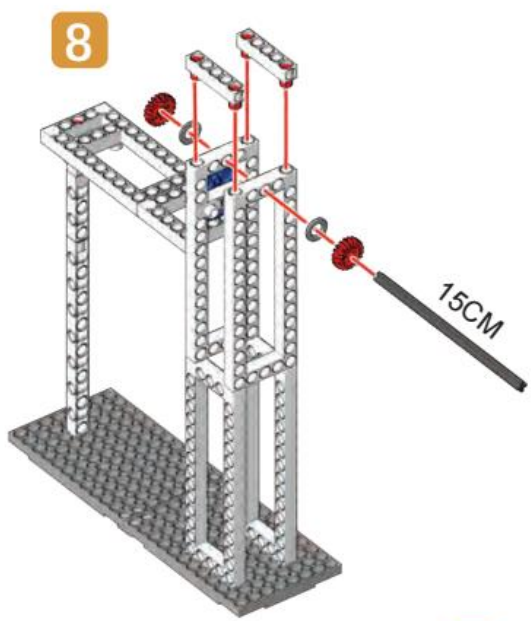


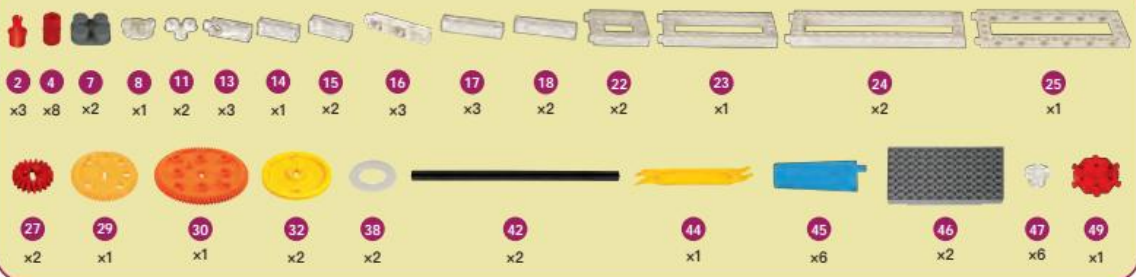
## 觀測器

## Observer

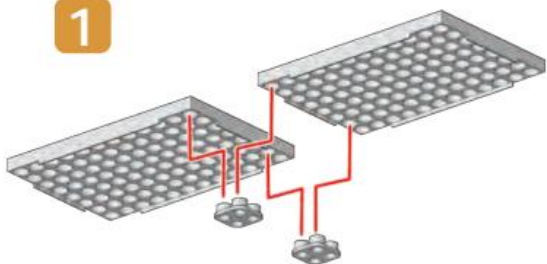




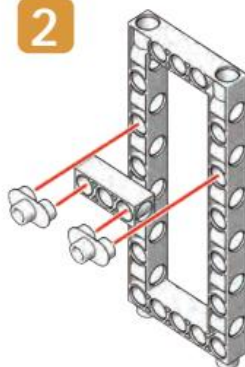




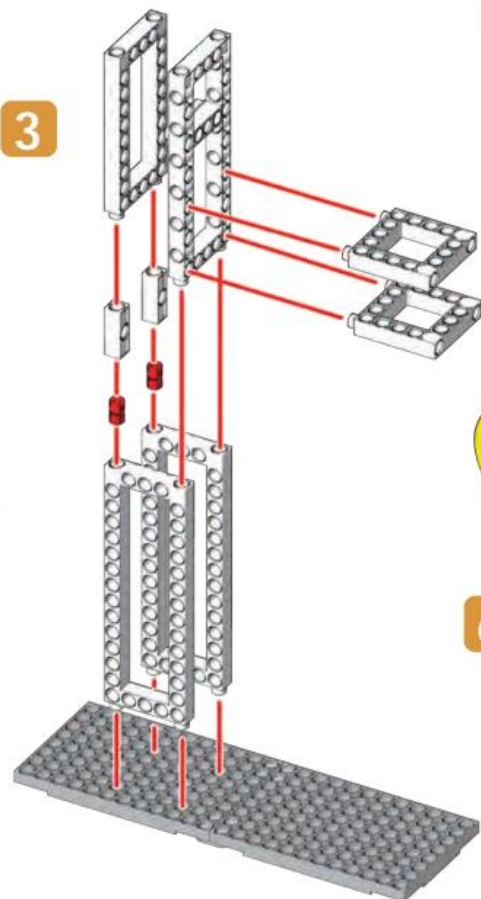
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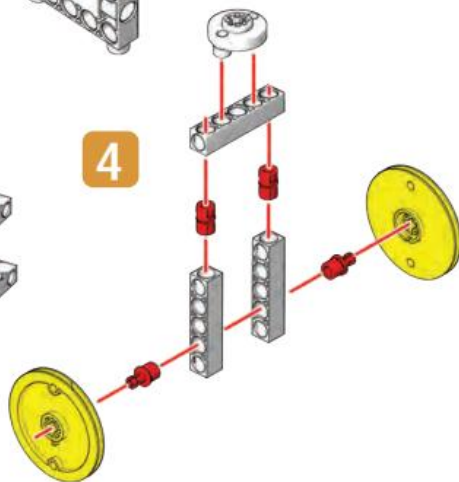
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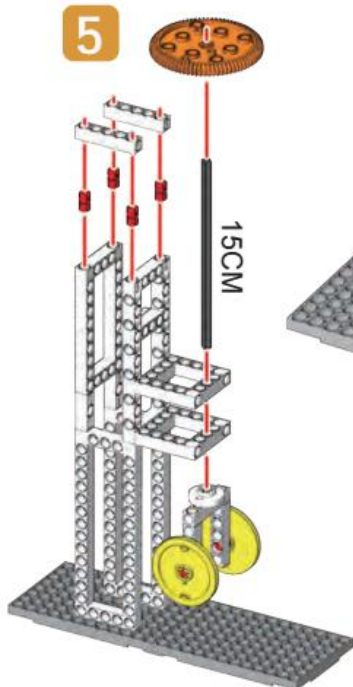
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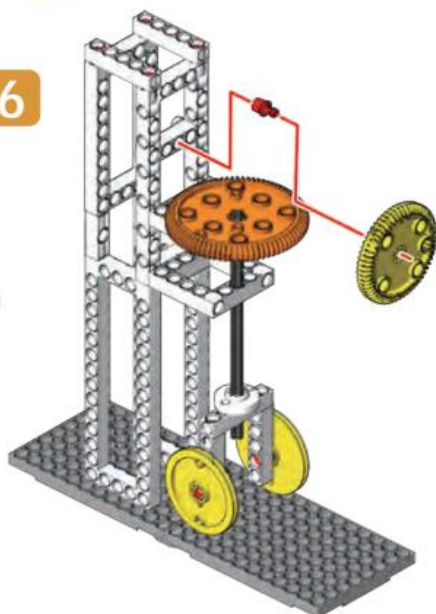
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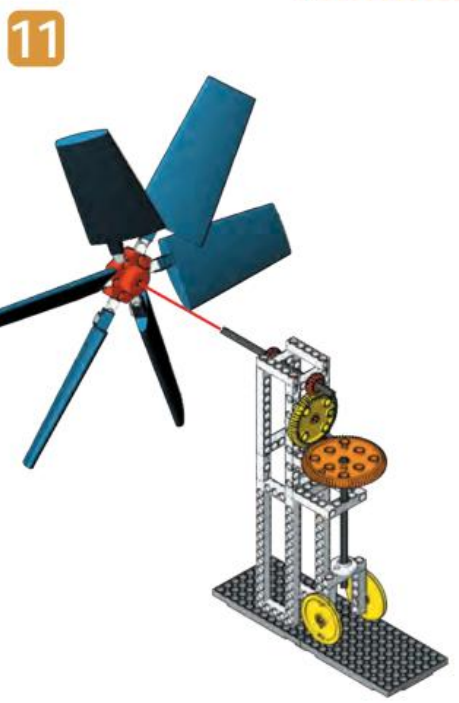
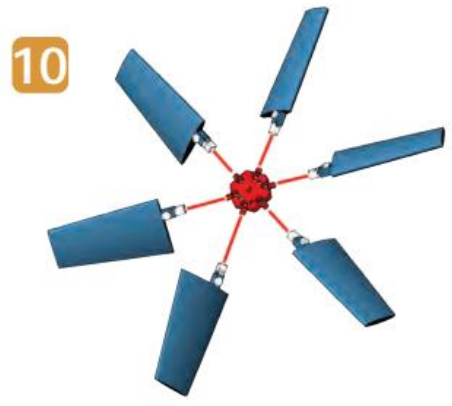
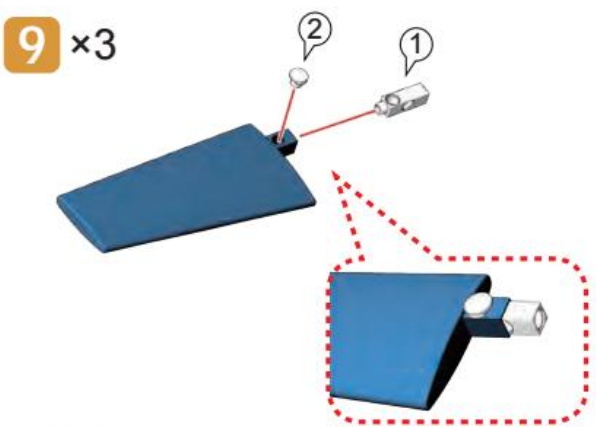
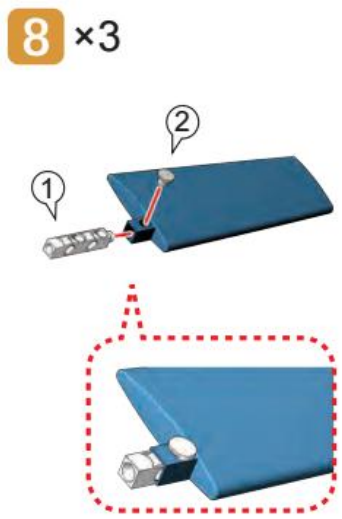
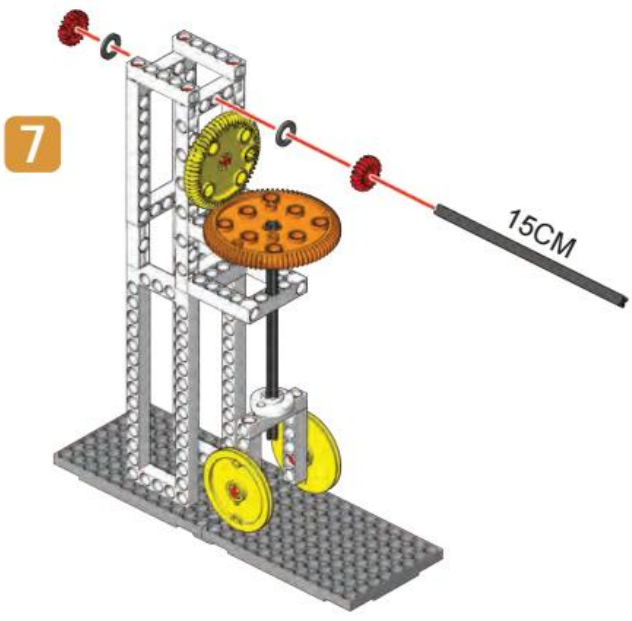


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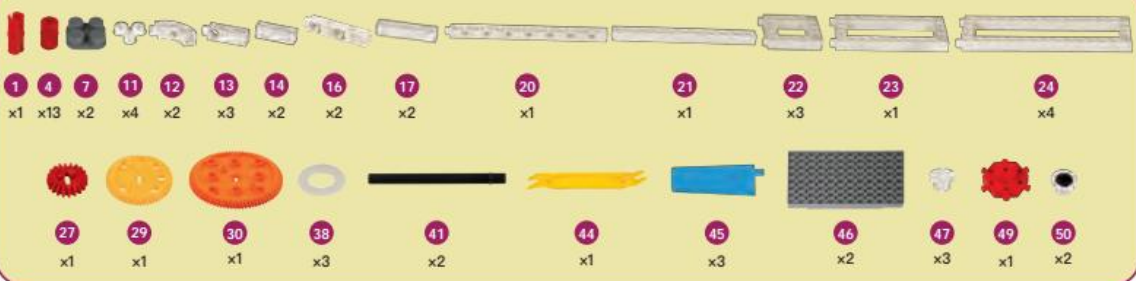


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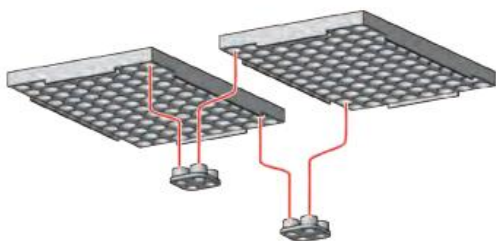




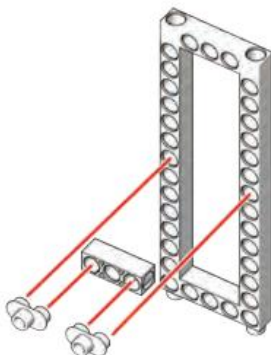




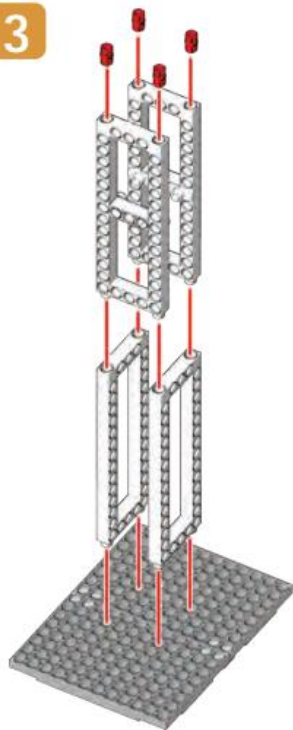
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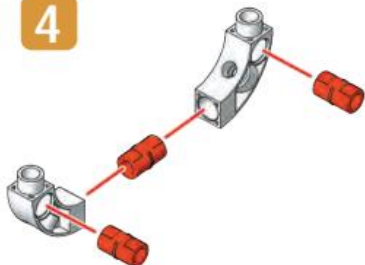
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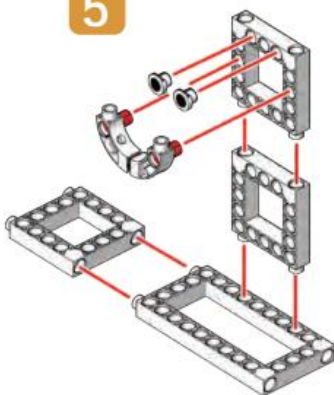
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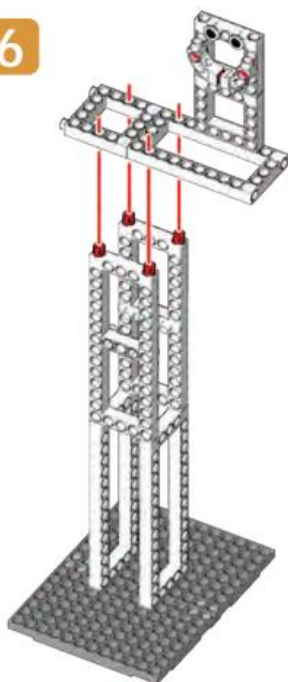
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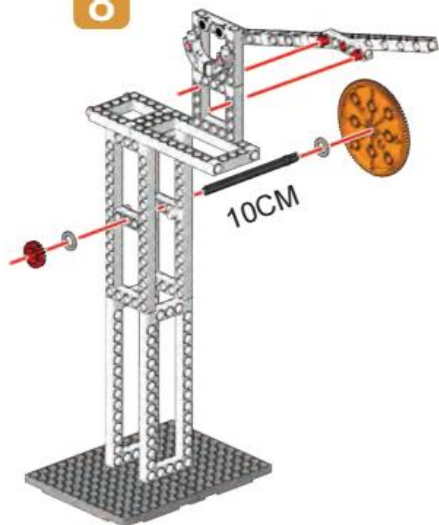
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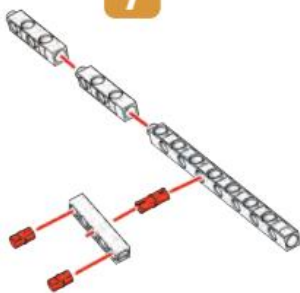
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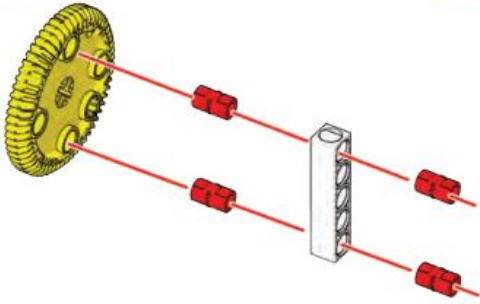
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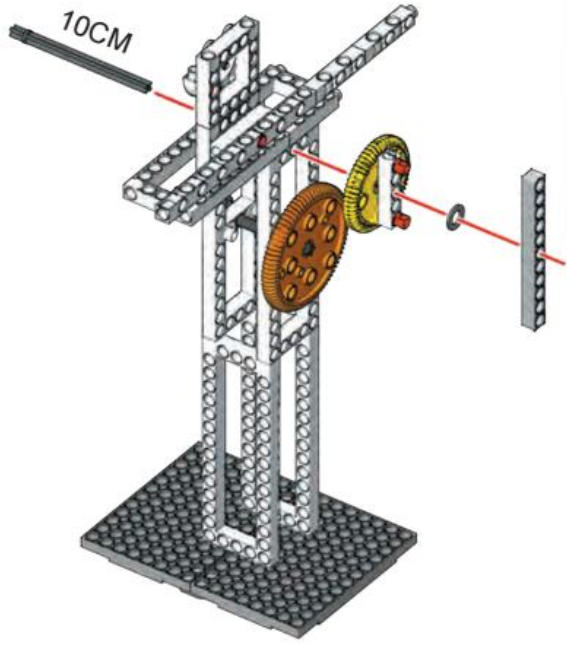
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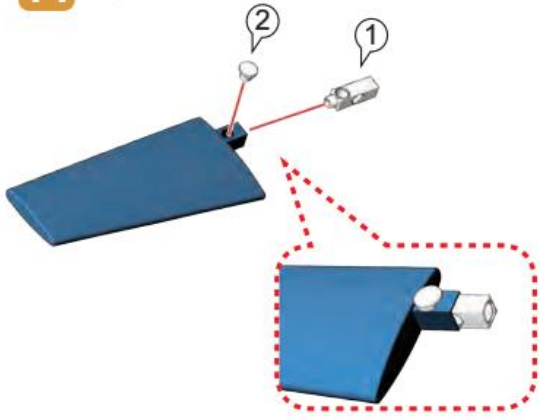
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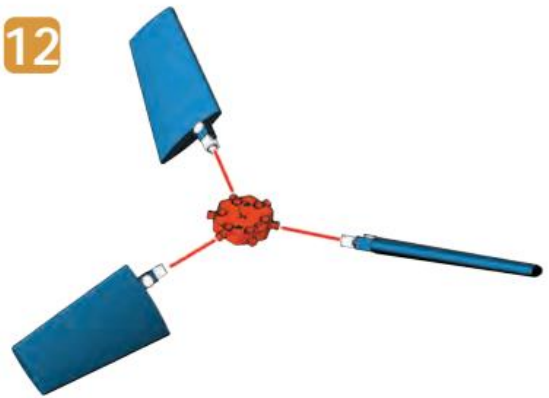
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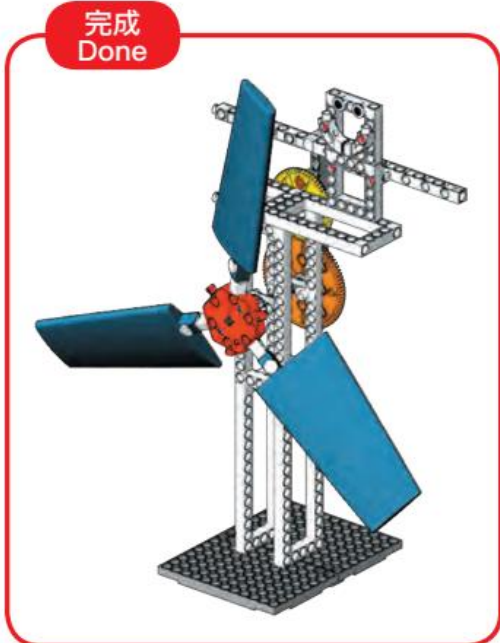
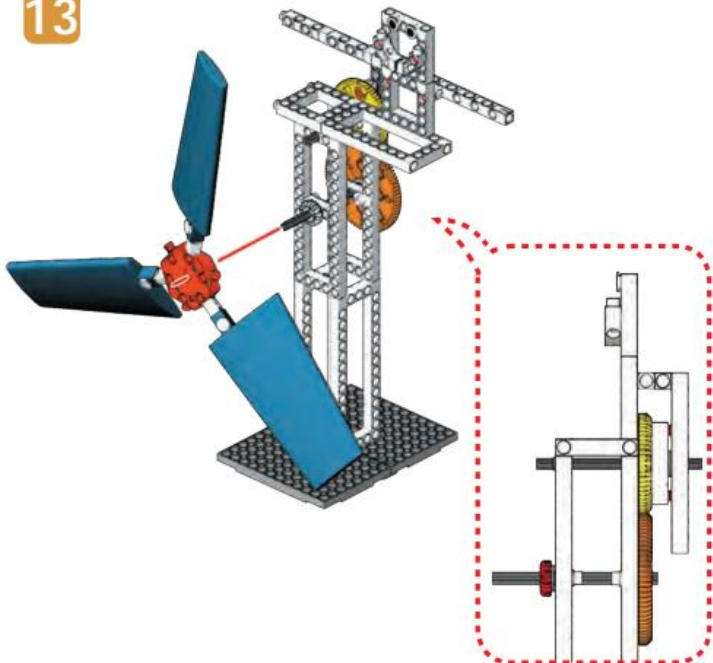
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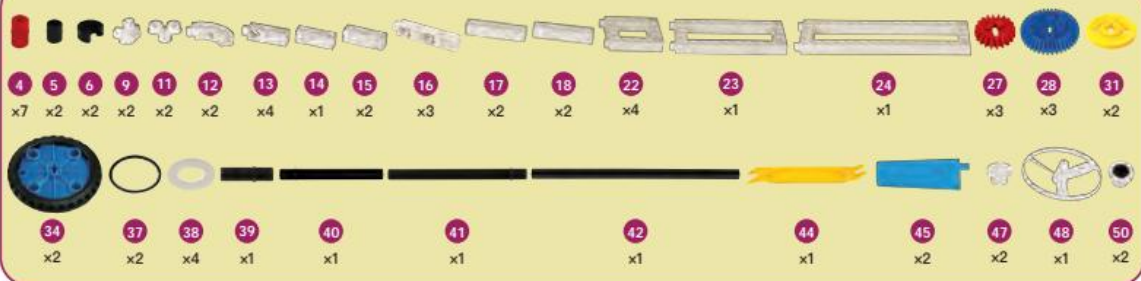


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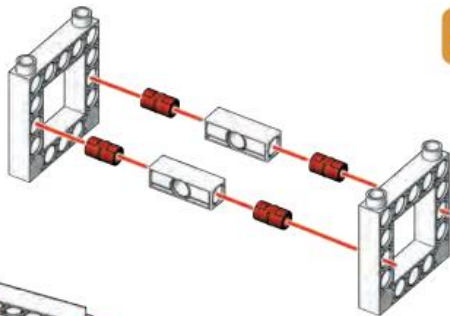


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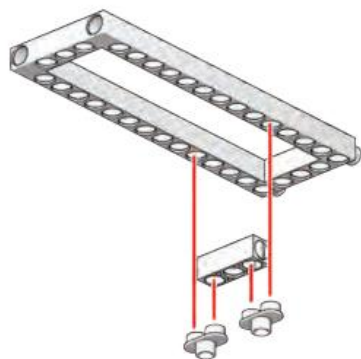




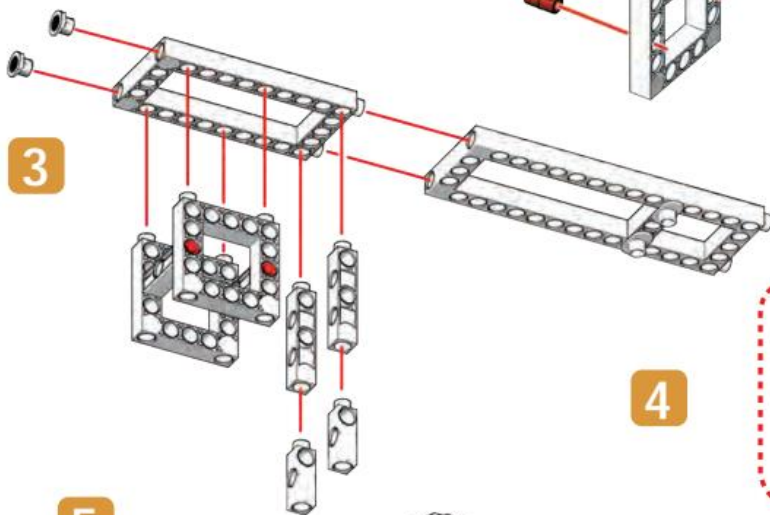
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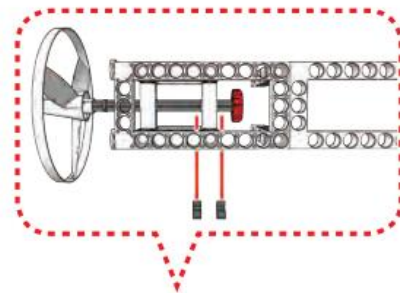
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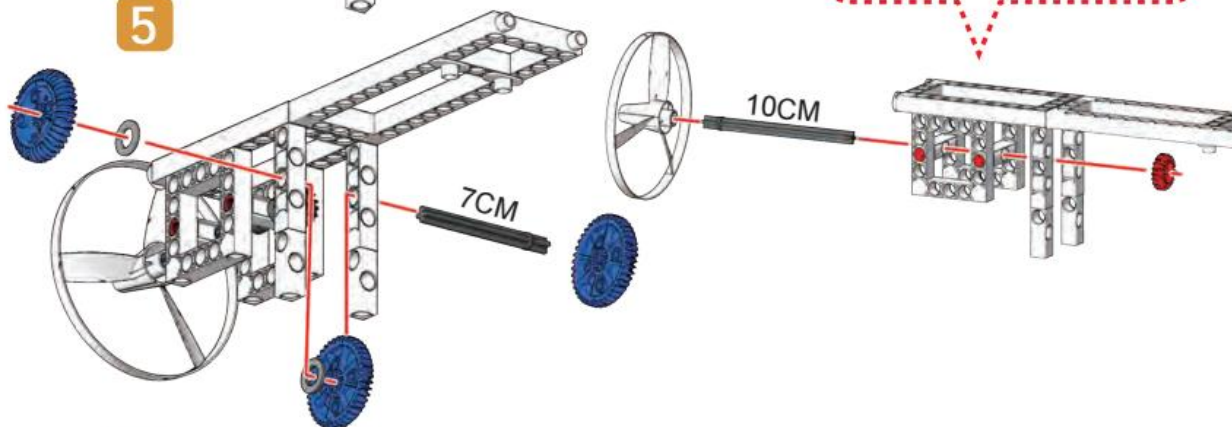
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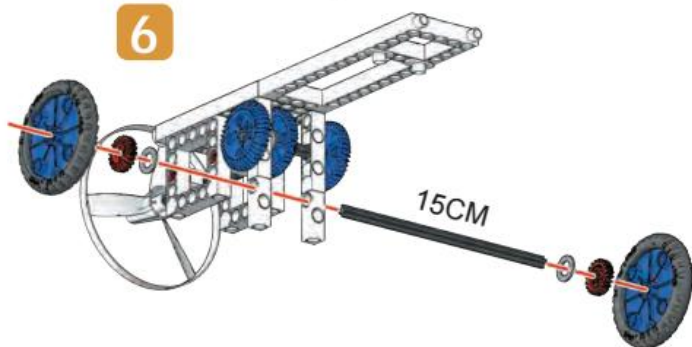
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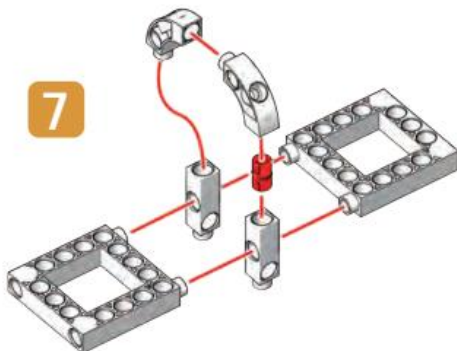
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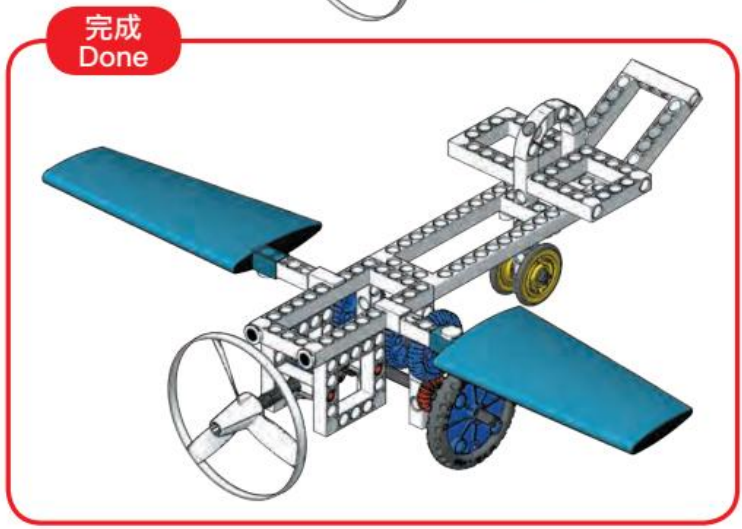
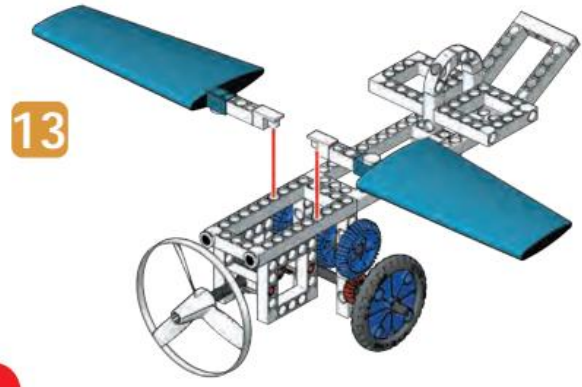
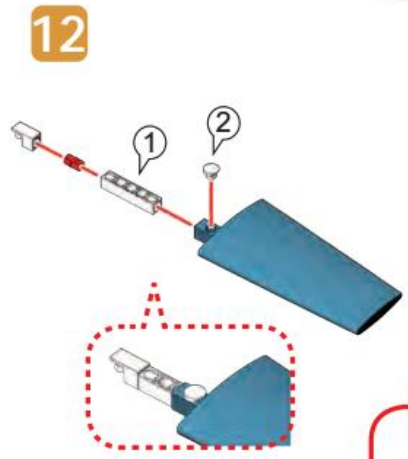
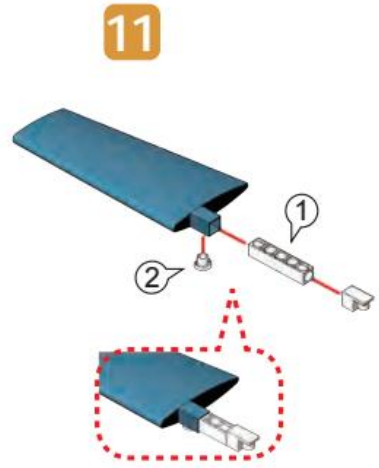
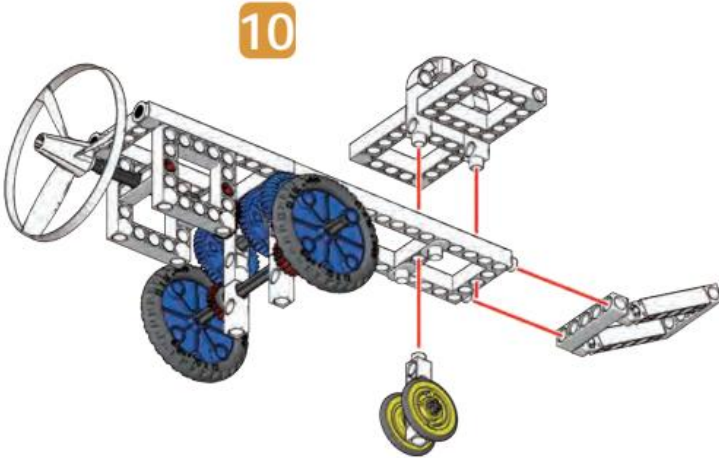
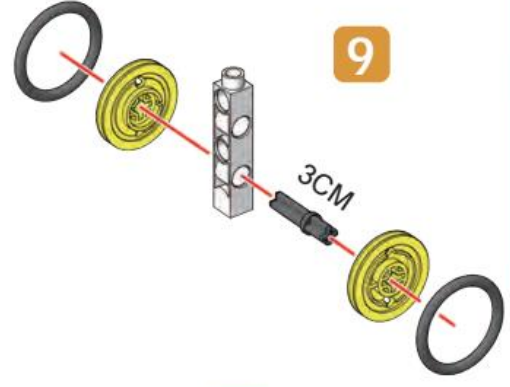
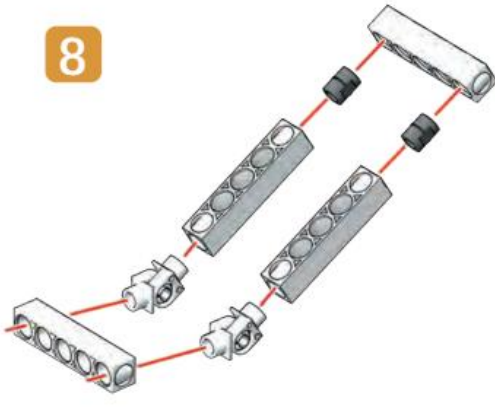
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7

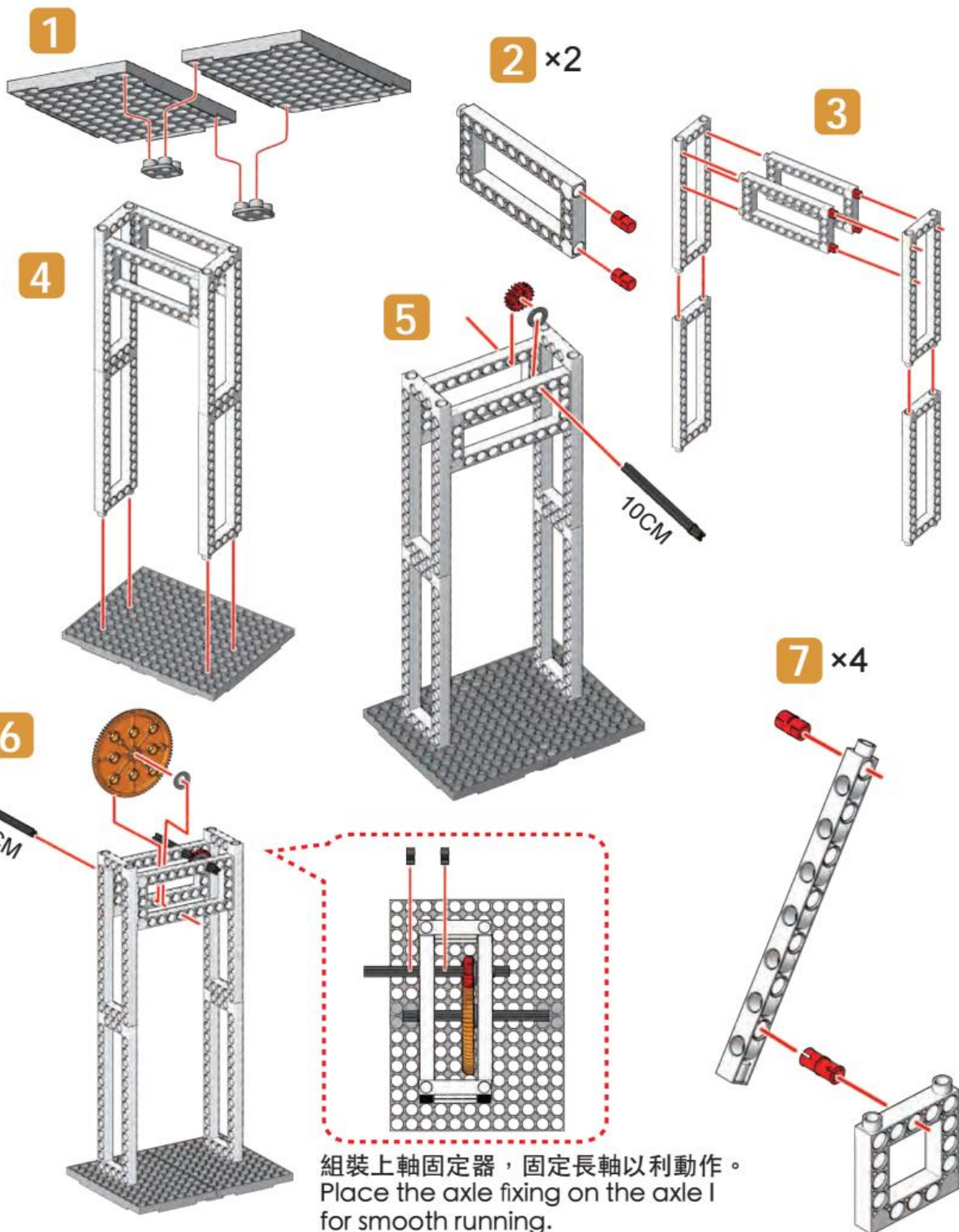
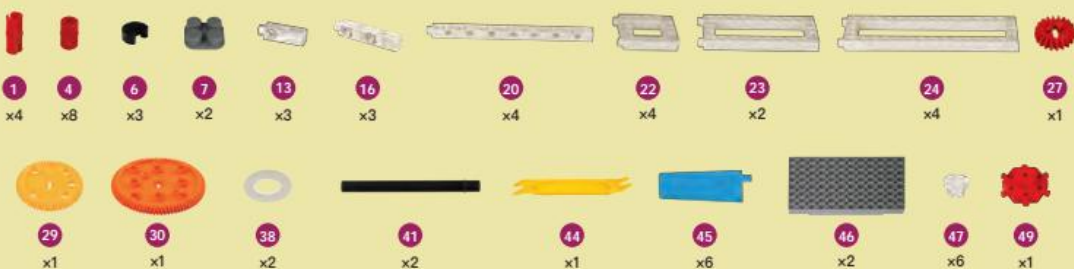






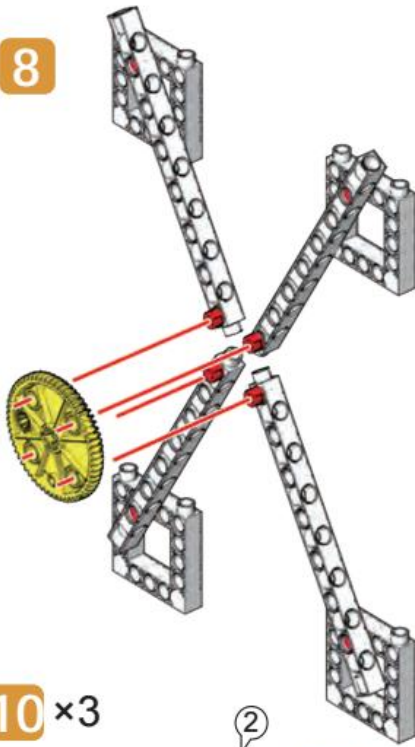
## 風力摩天輪

## Kinetic Ferris Wheel

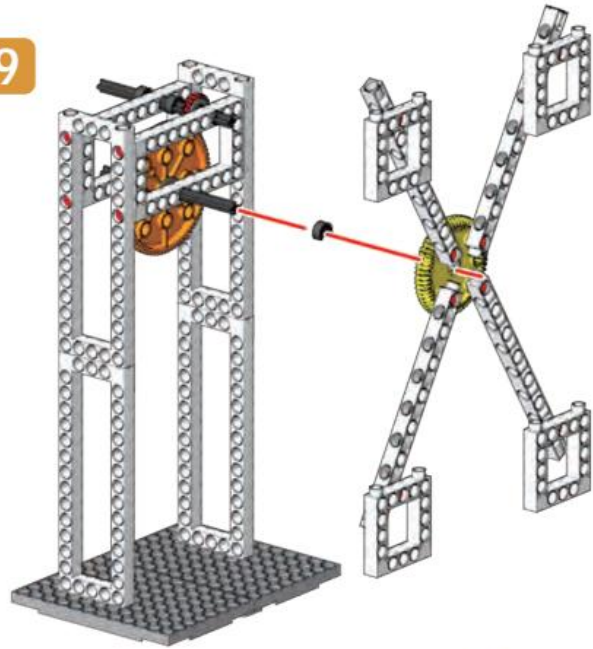




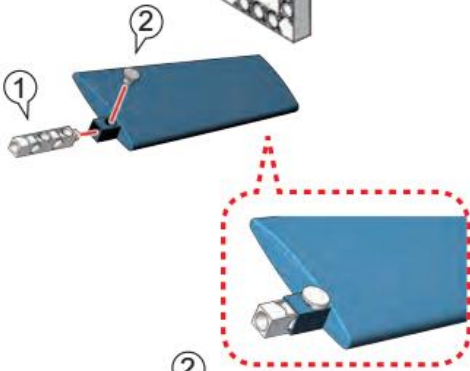
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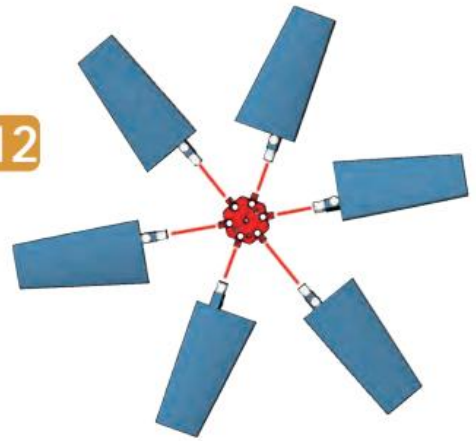
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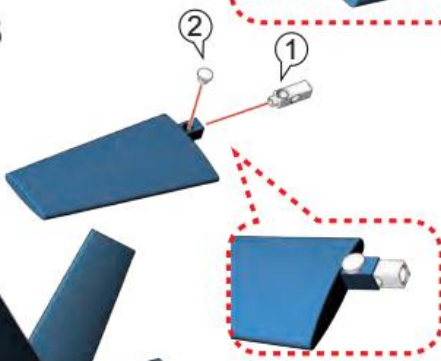
10 x3



12



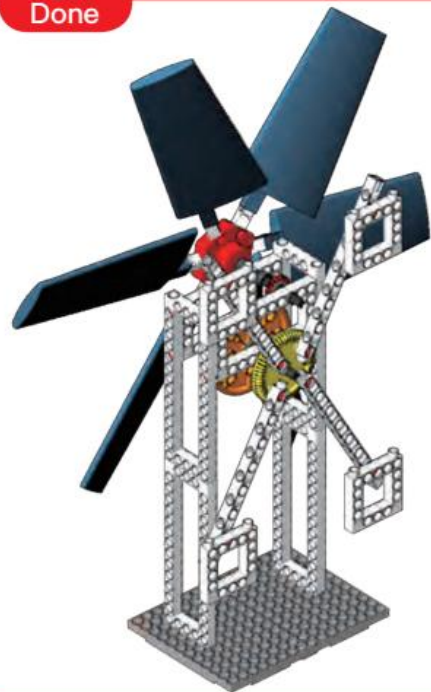
11 x3



13



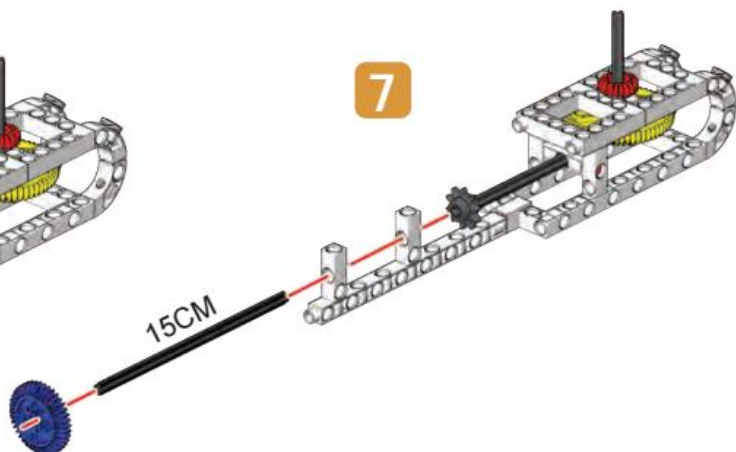
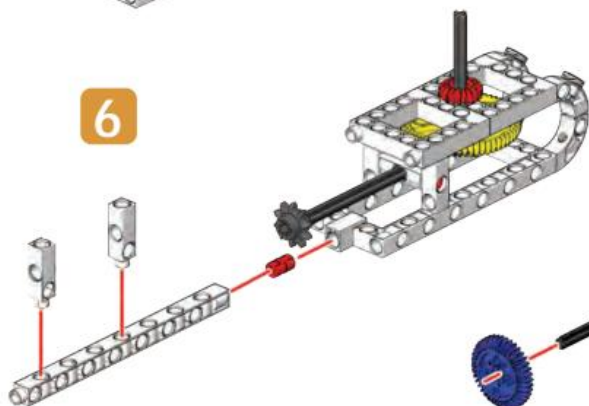
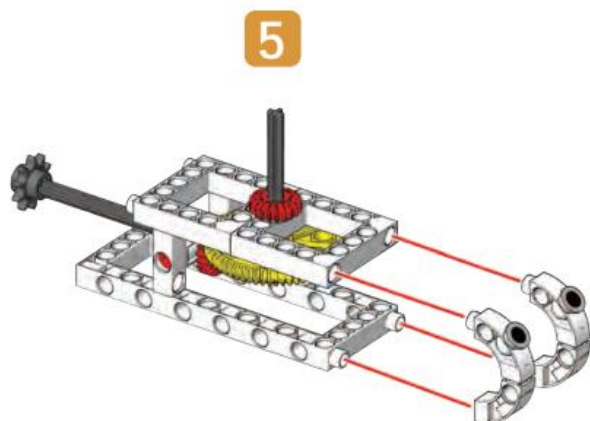
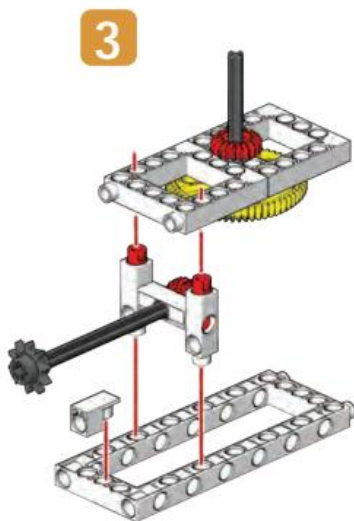
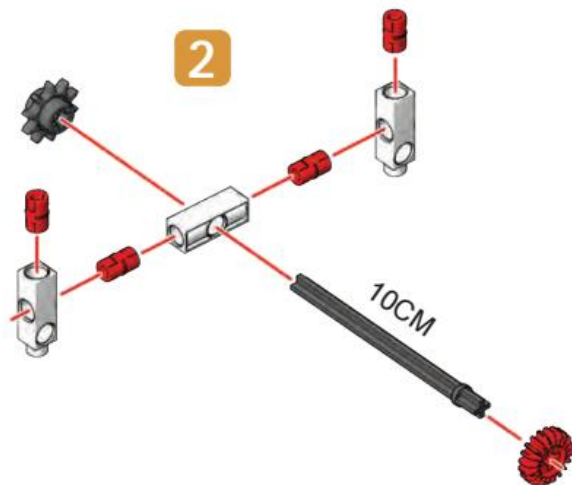
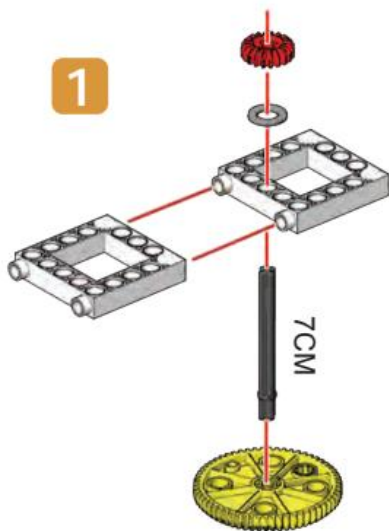
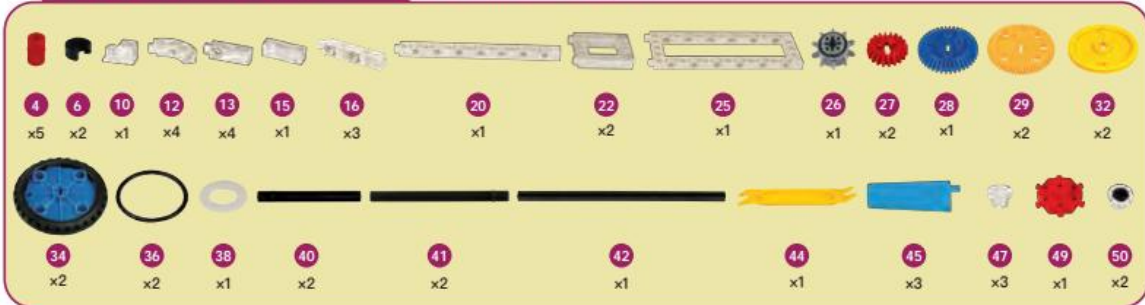
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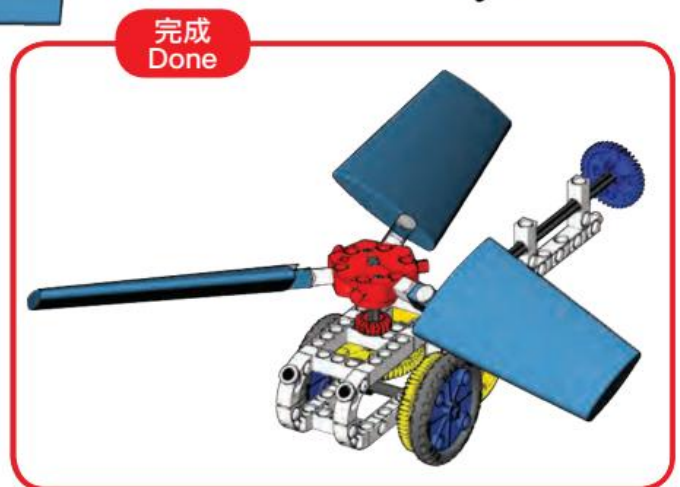
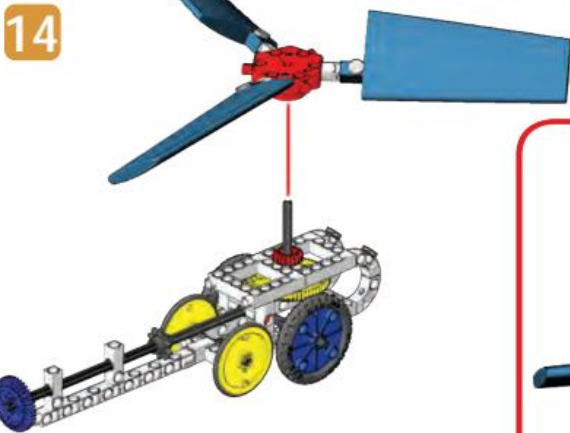
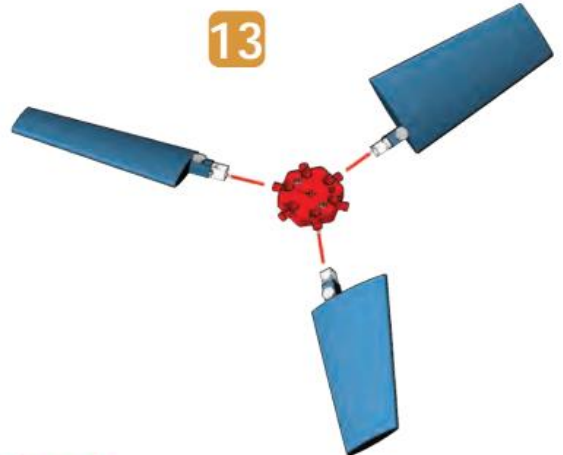
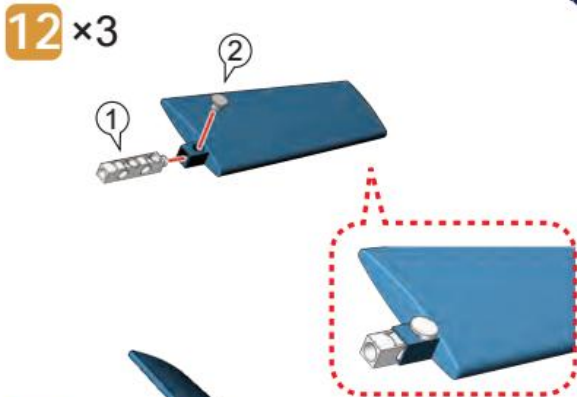
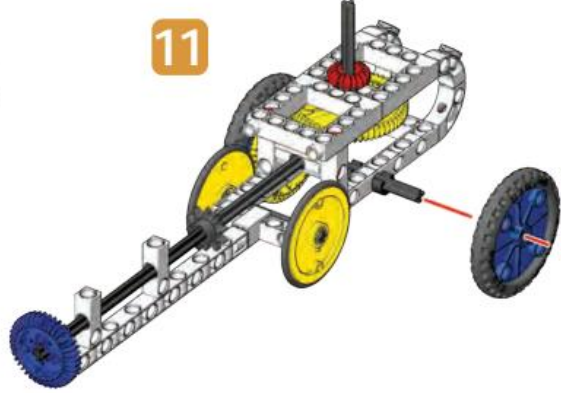
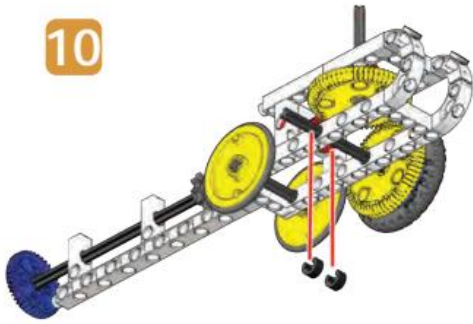
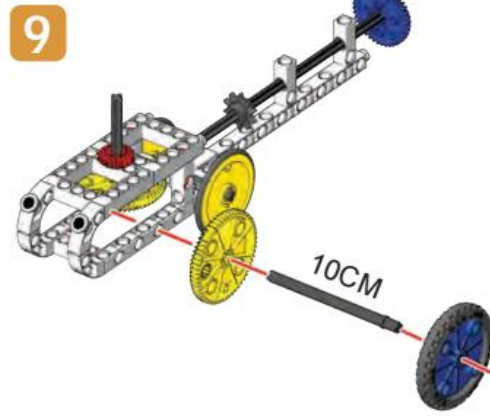
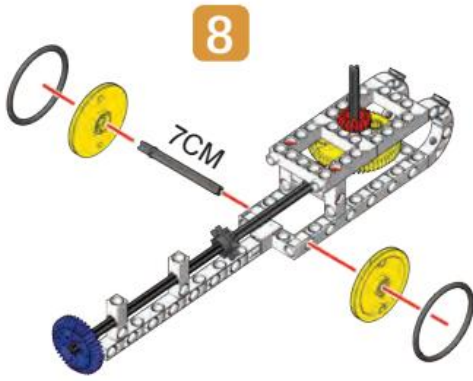


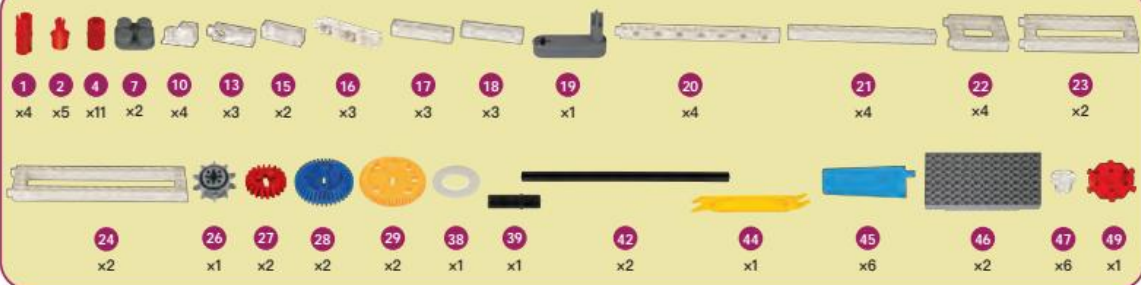


## 風車葉片直升機

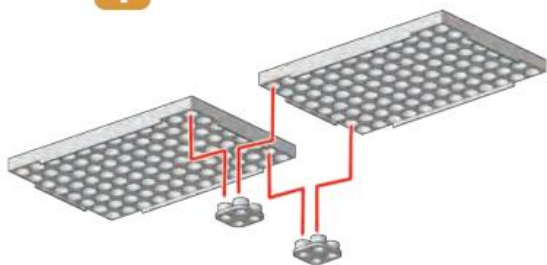
## Windmill Helicopter



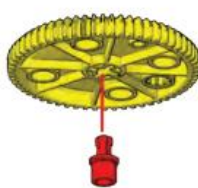




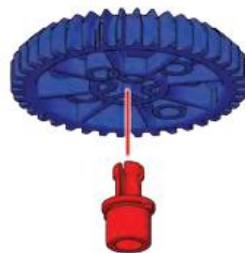
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2 x2



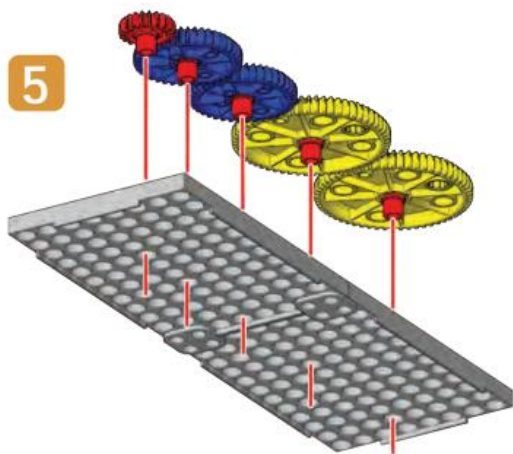
3 x2



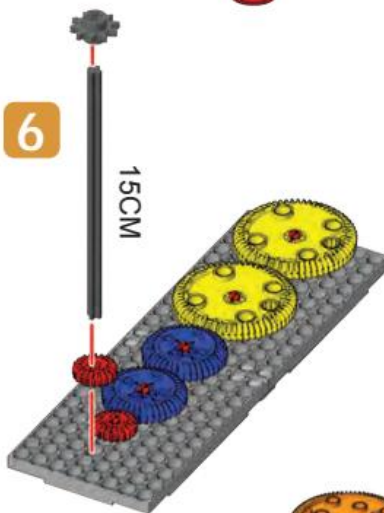
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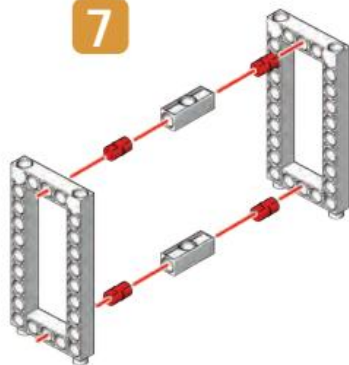
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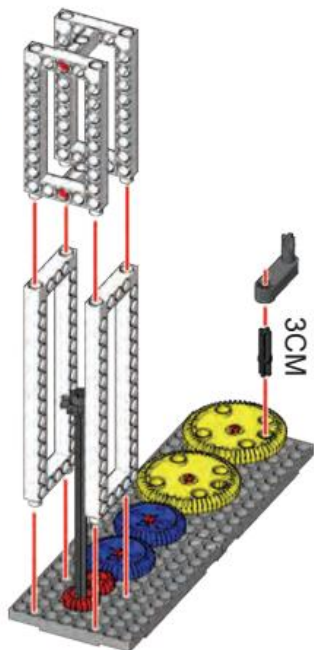
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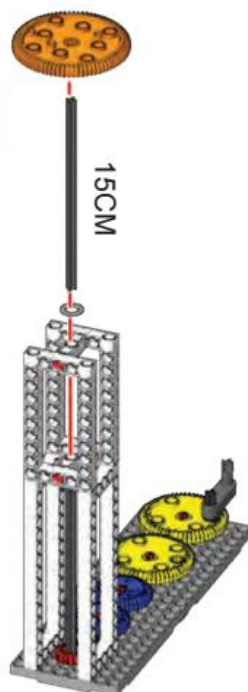
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8

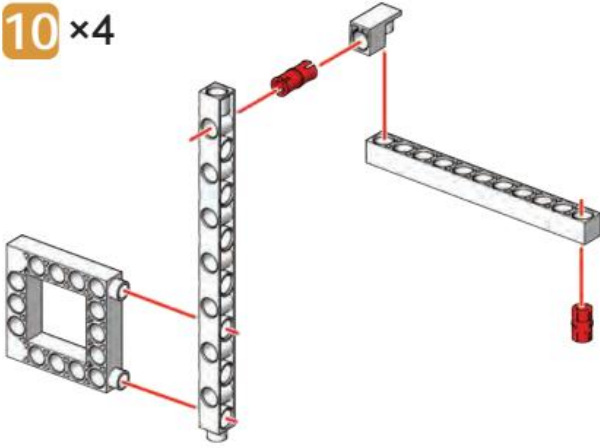


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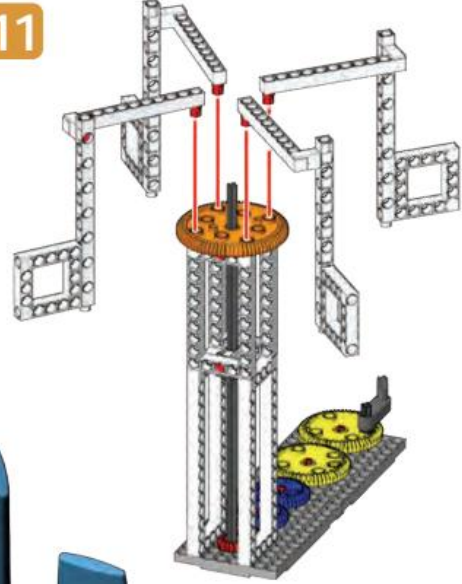




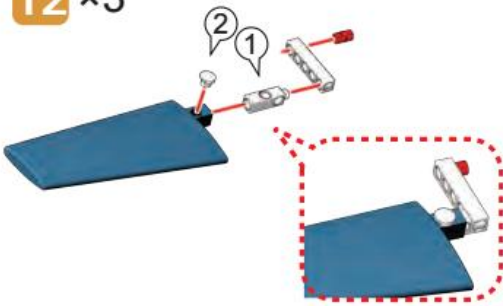
10 x 4



11



12 x 3



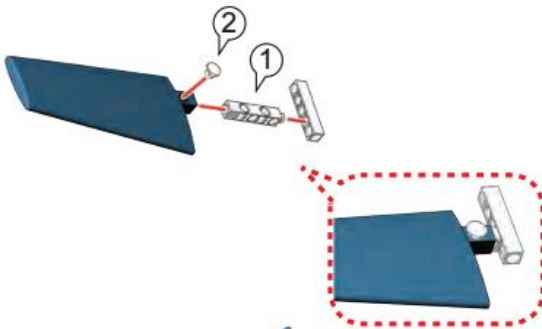
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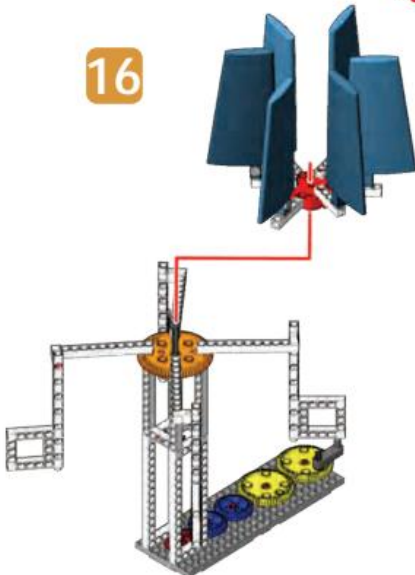
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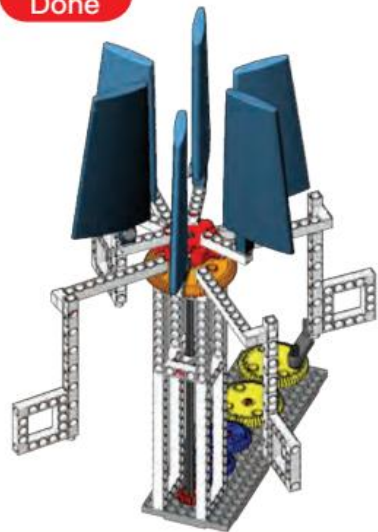
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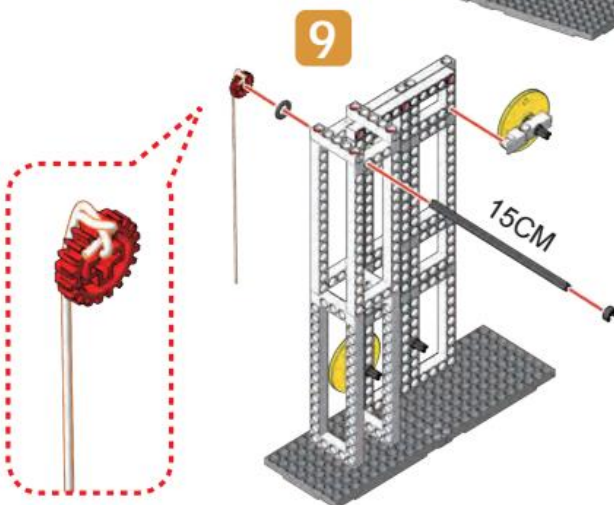
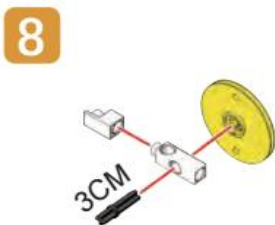
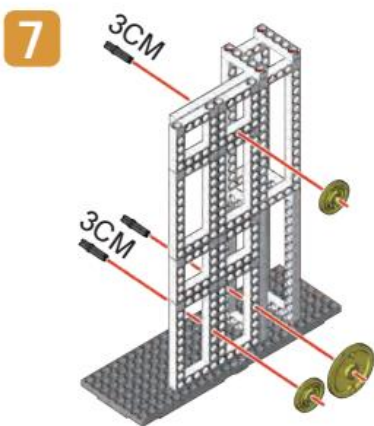
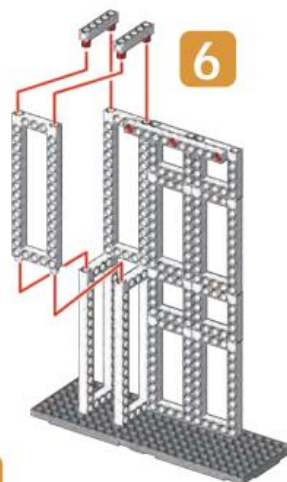
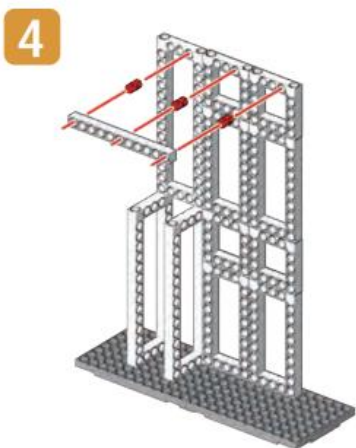
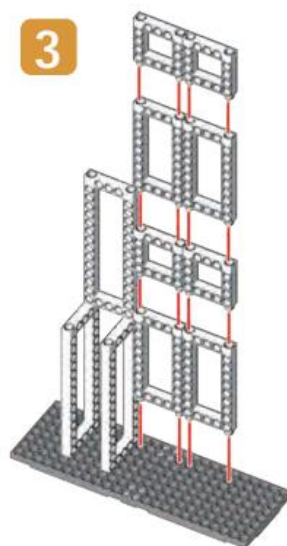
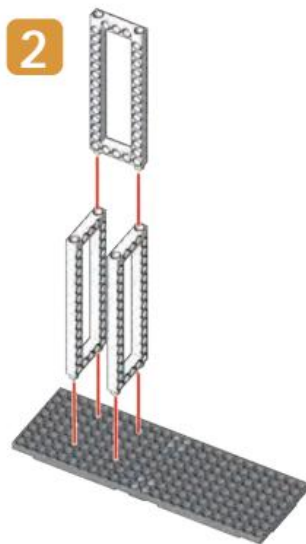
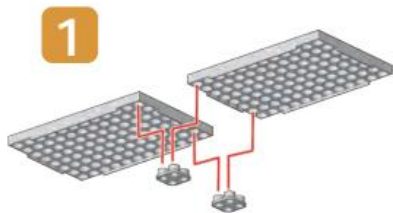
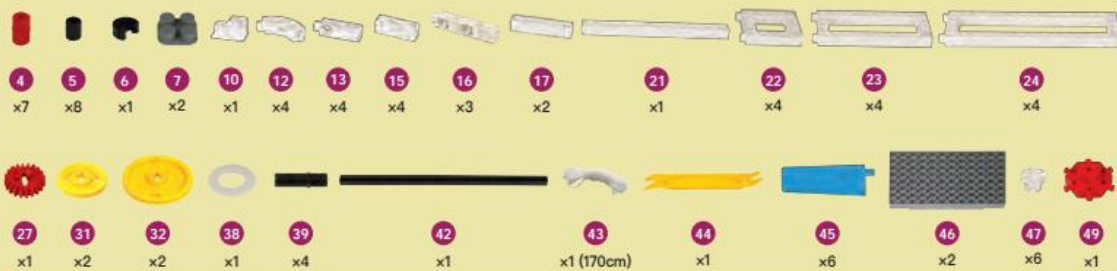


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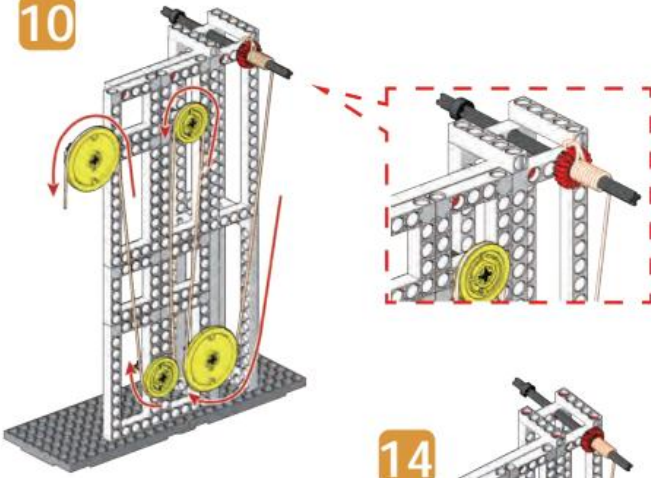
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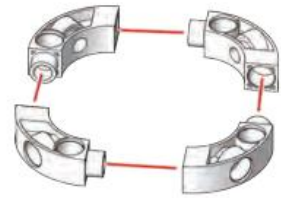
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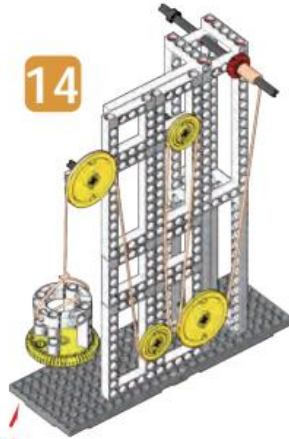
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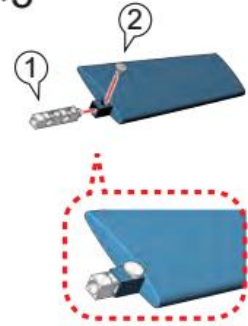
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14



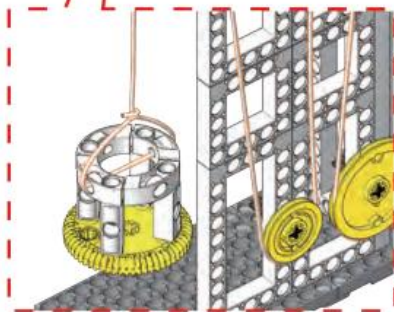
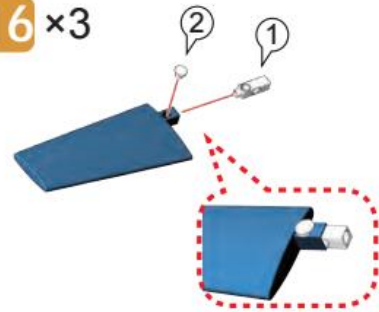
15 x3



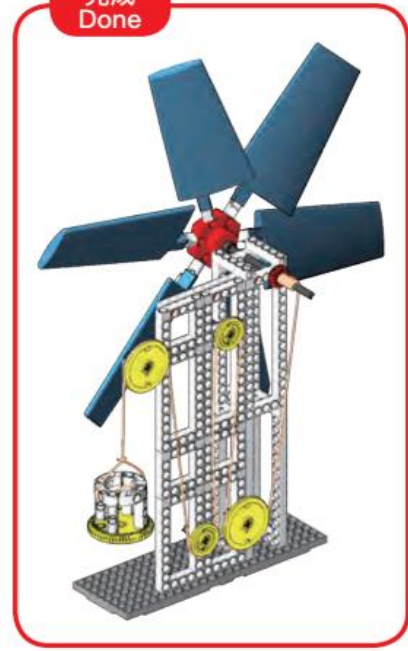
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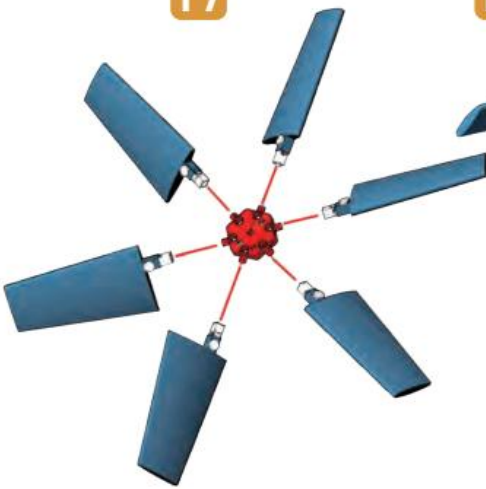
16 x3



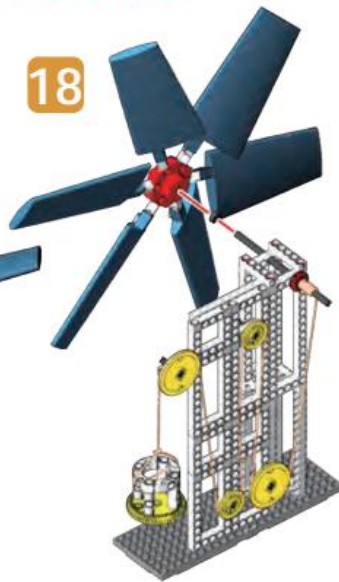
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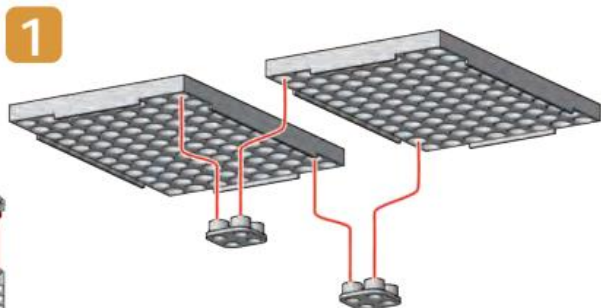
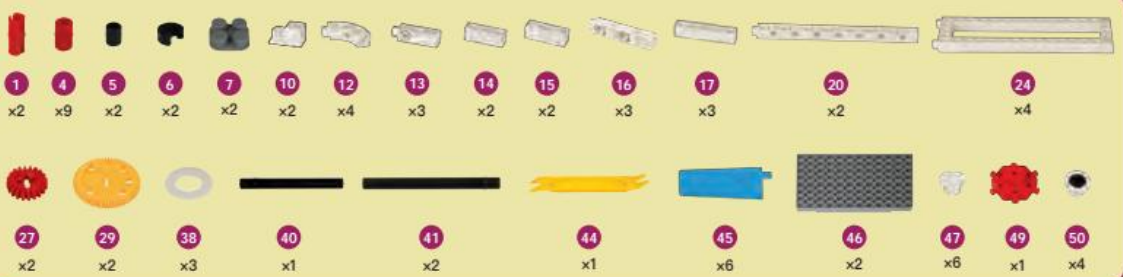
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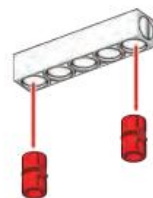
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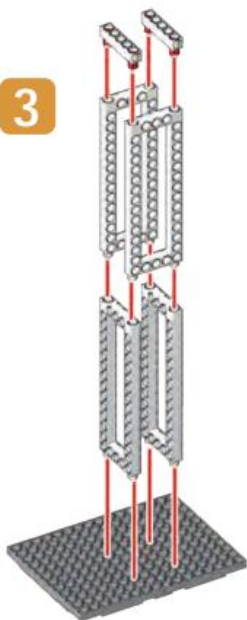




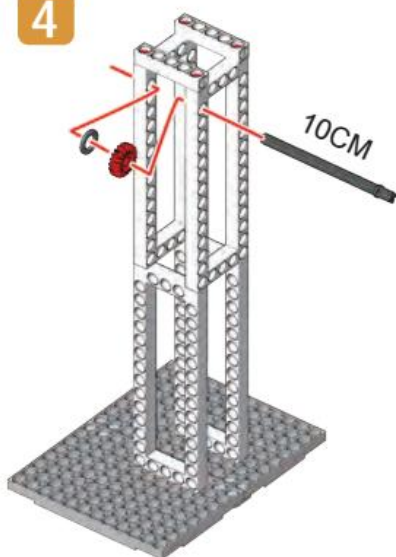
**2** x2



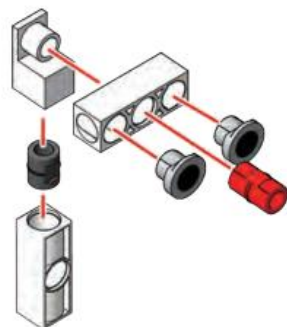
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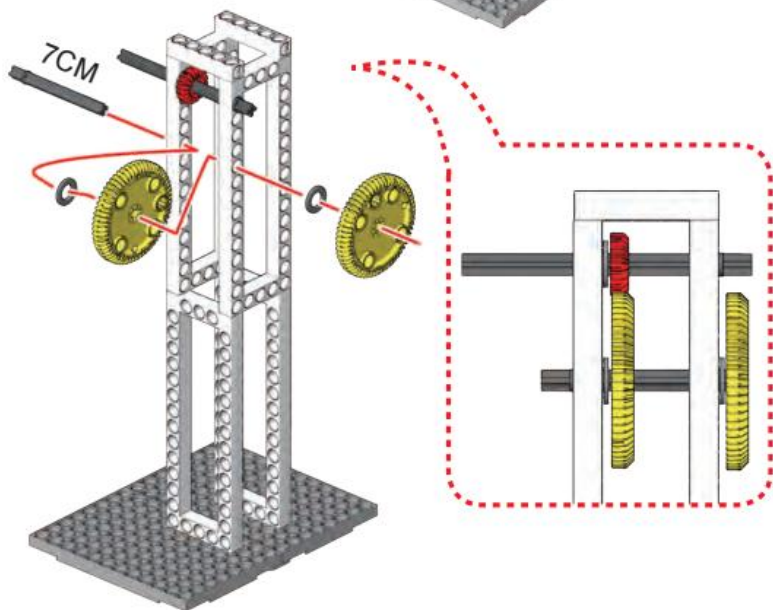
**4**



**6** x2



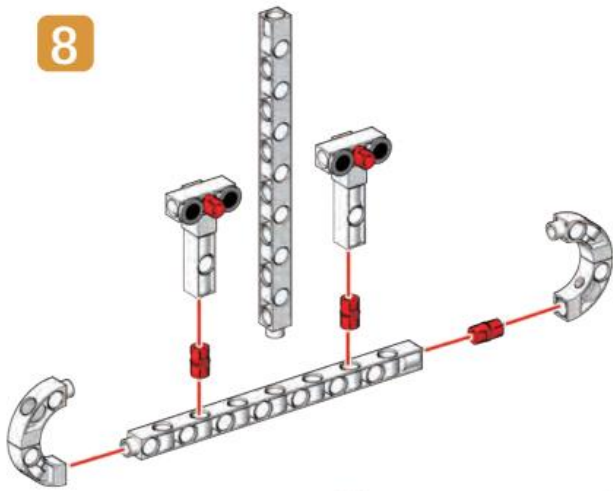
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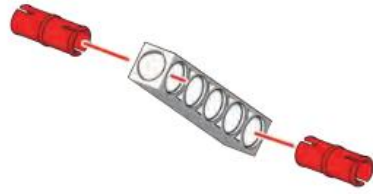
**7** x2



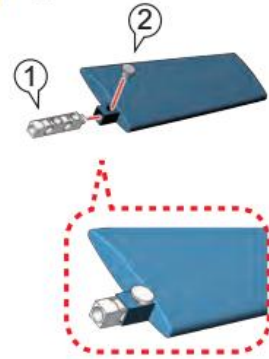
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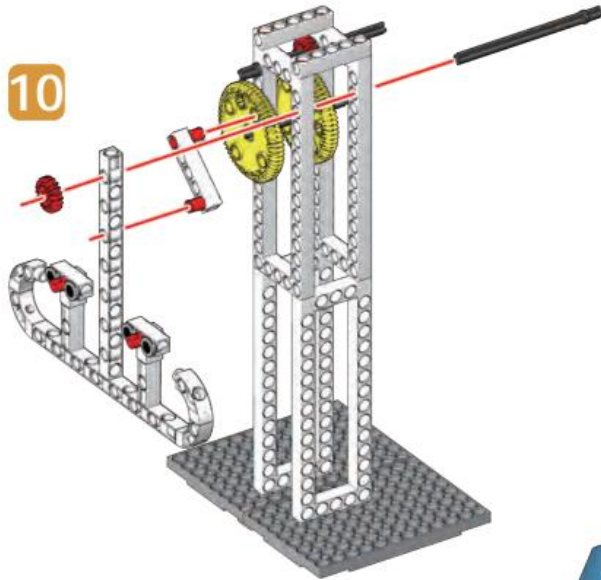
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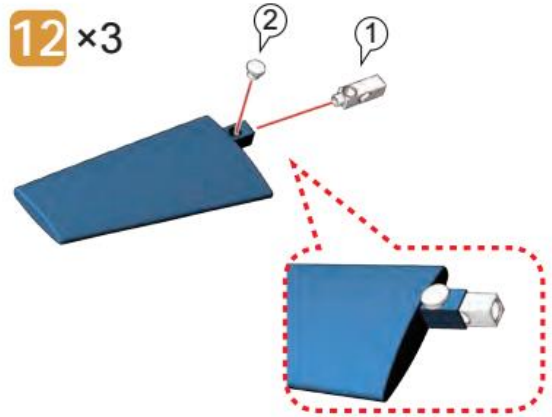
11 x 3



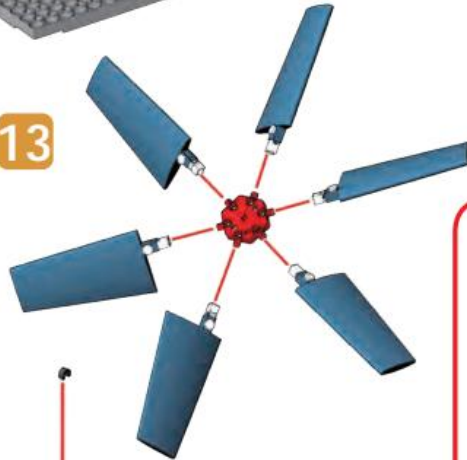
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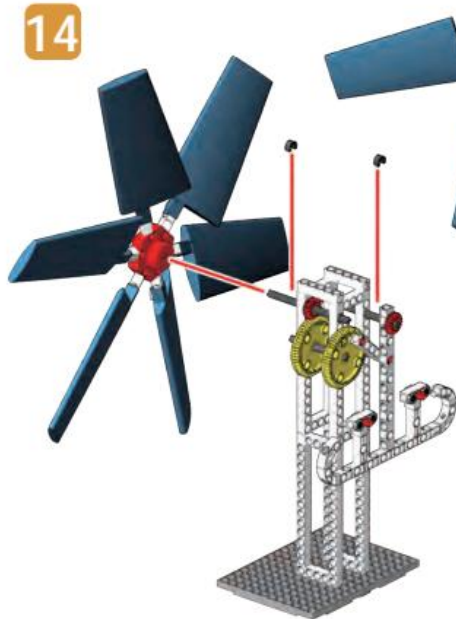
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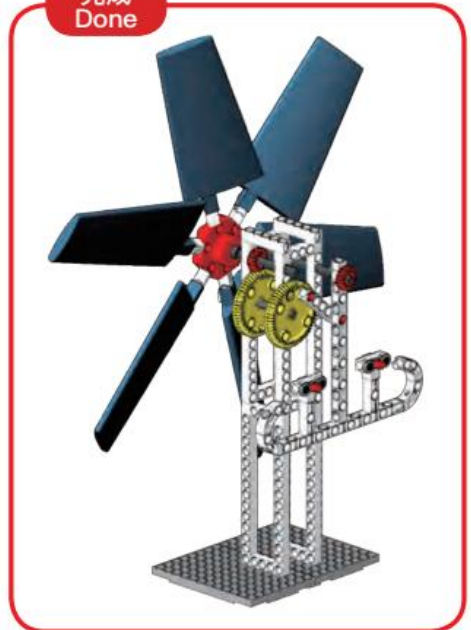
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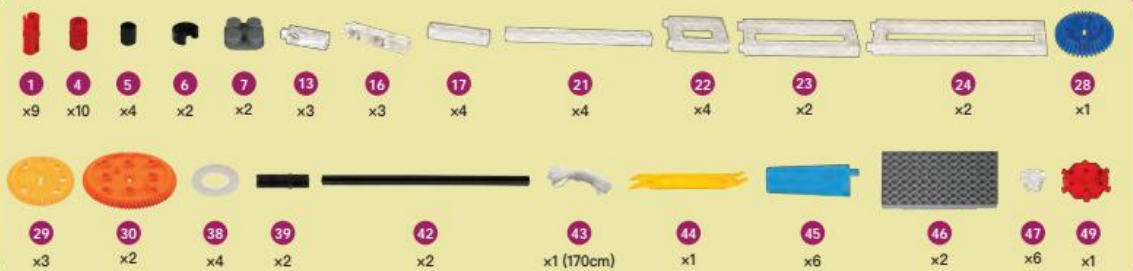


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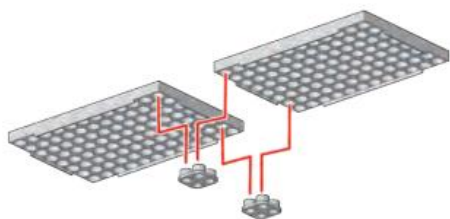


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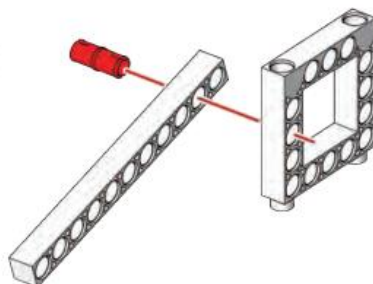




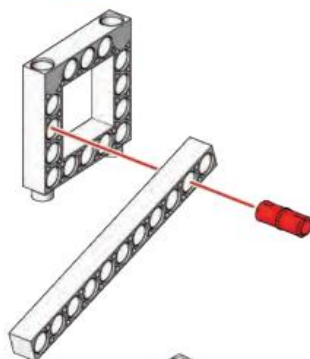
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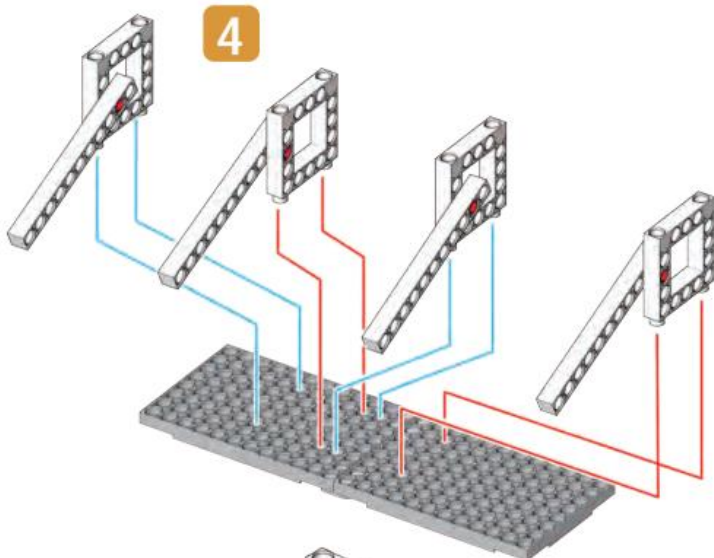
2 x2



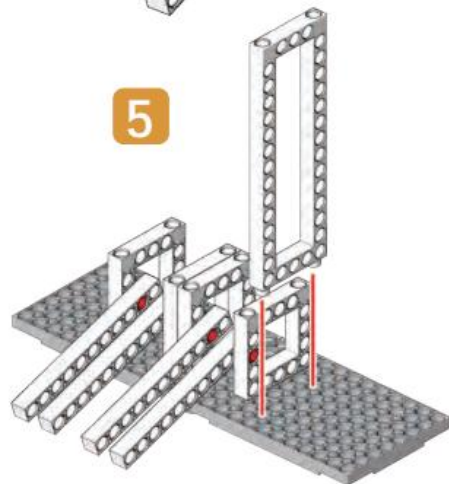
3 x2



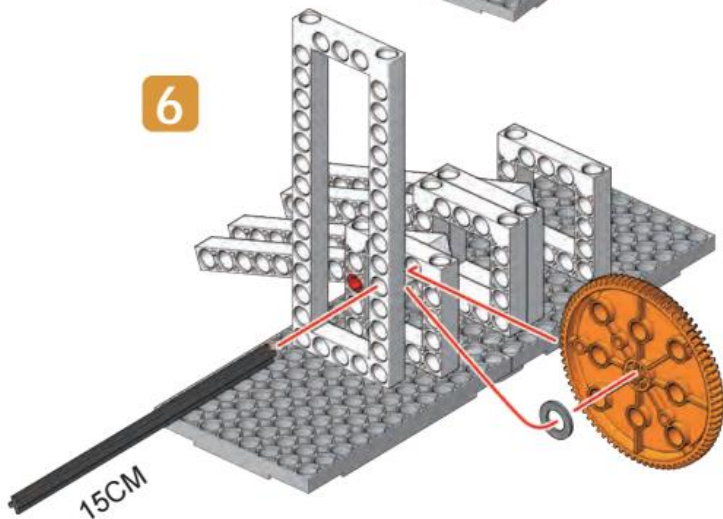
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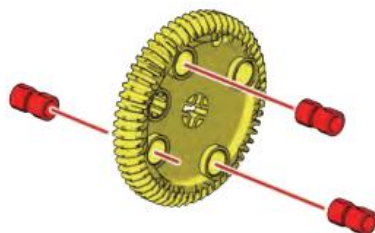
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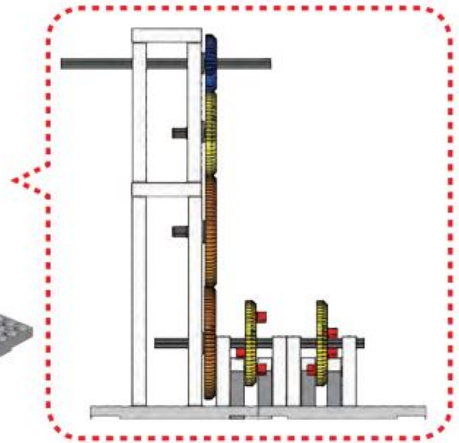
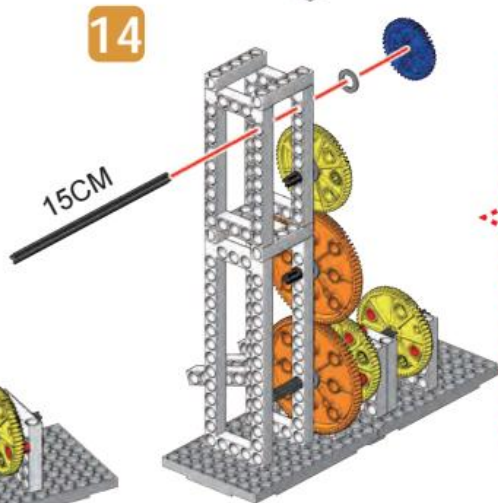
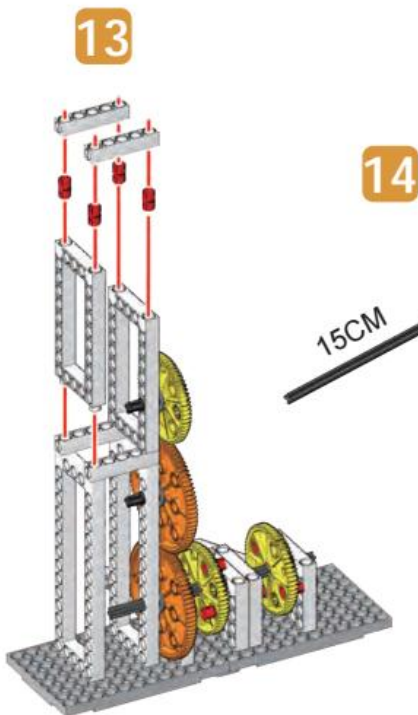
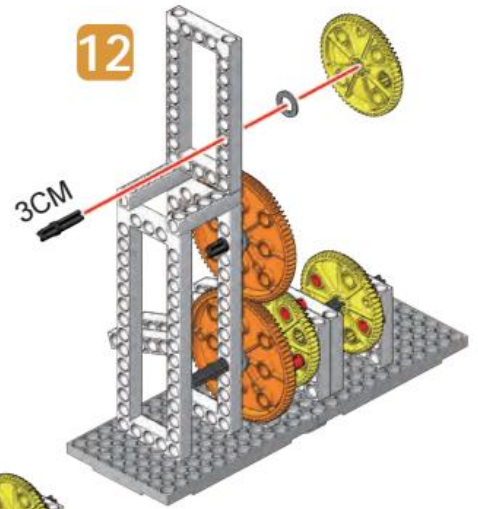
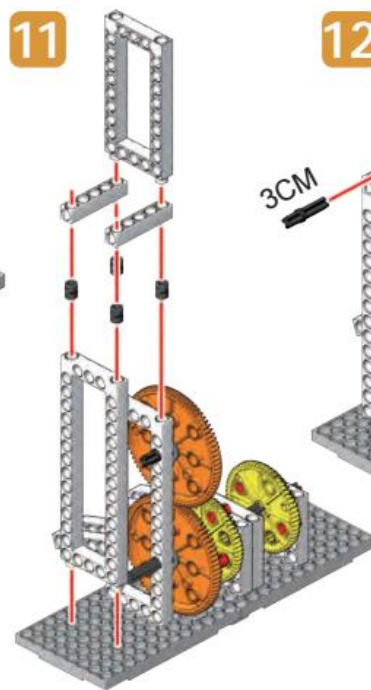
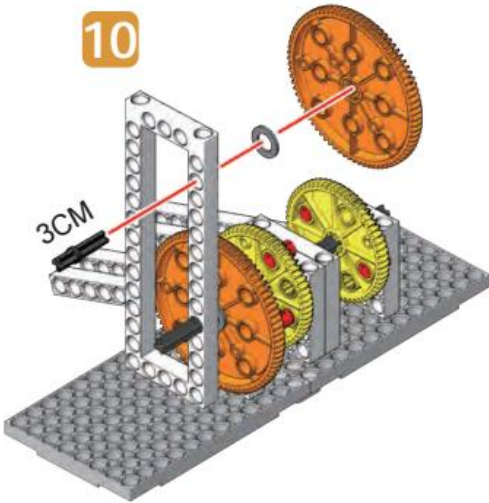
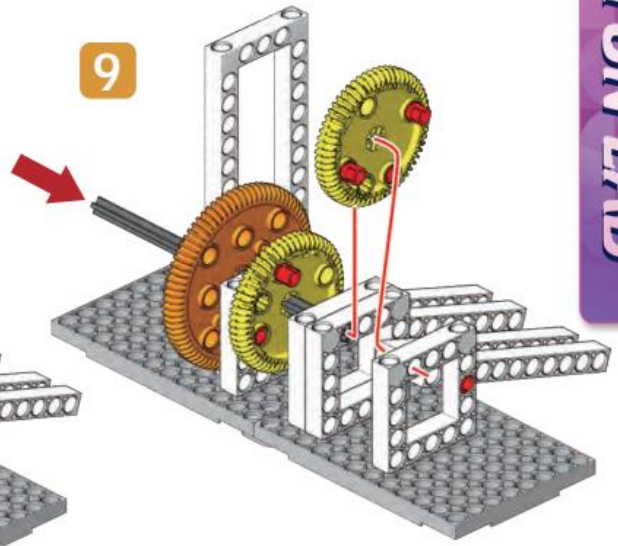
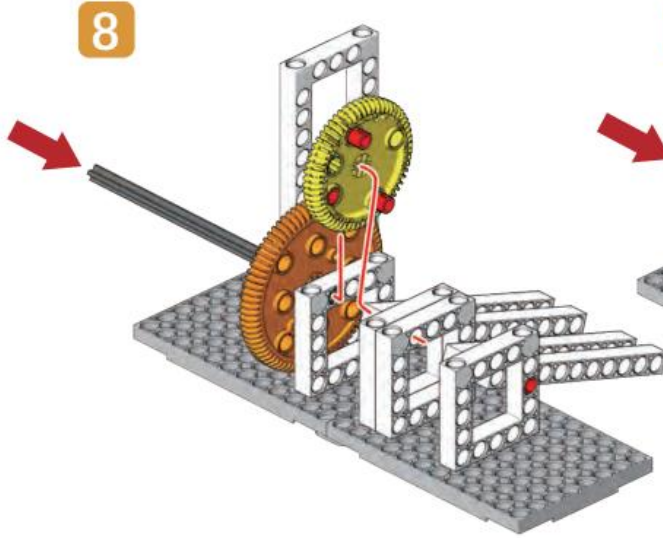
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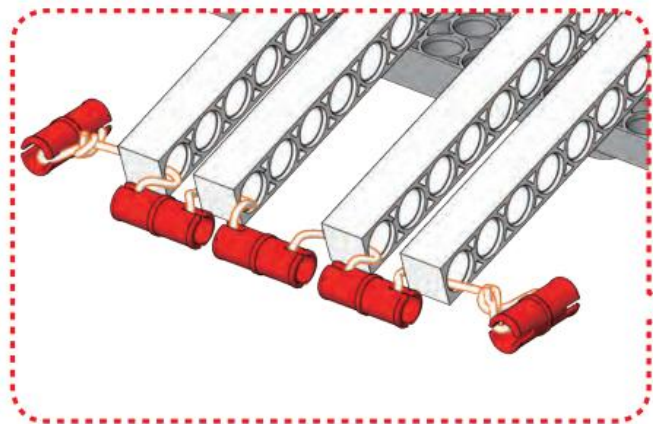


7 x2

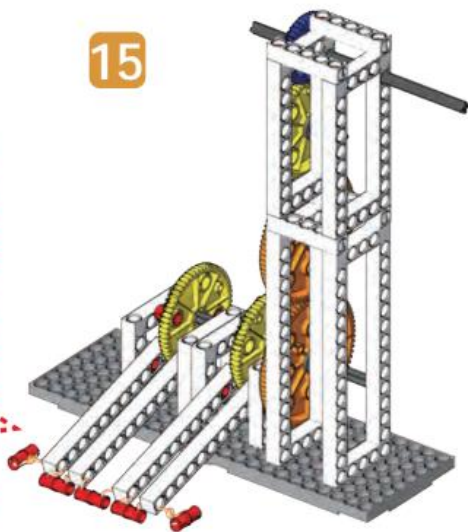




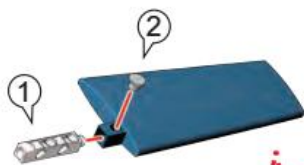




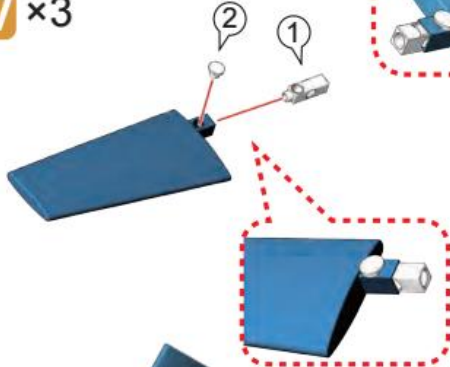
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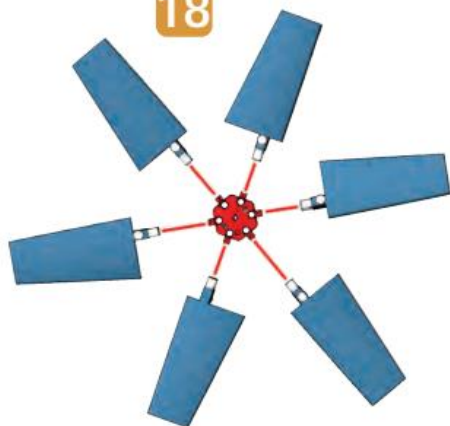
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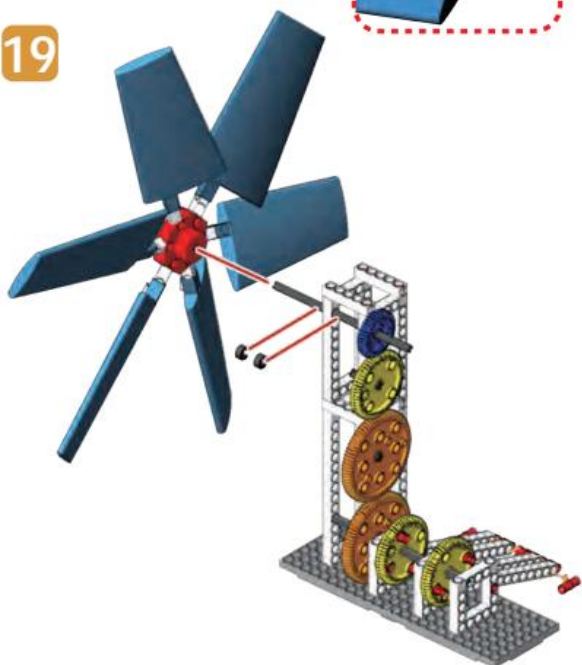
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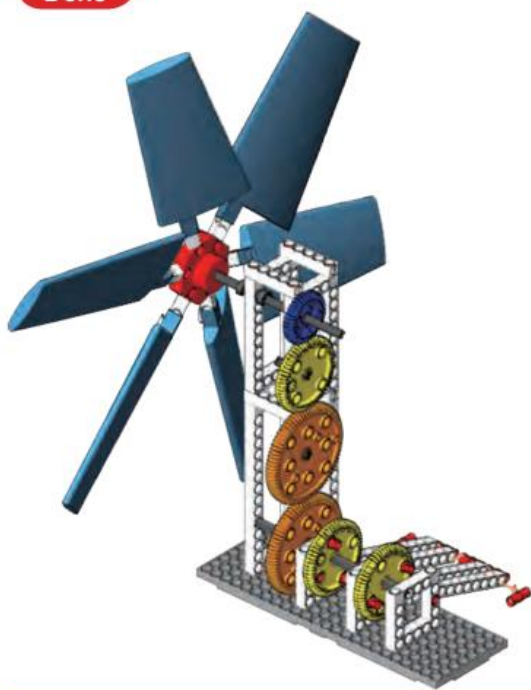
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19

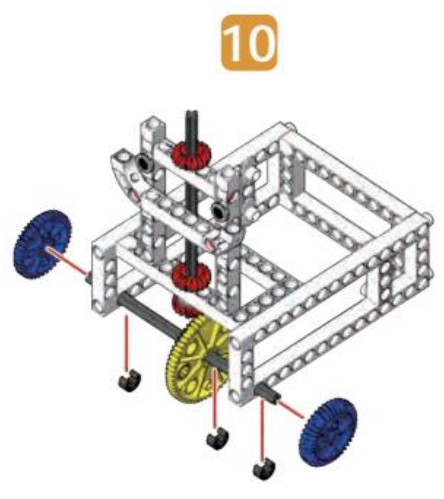
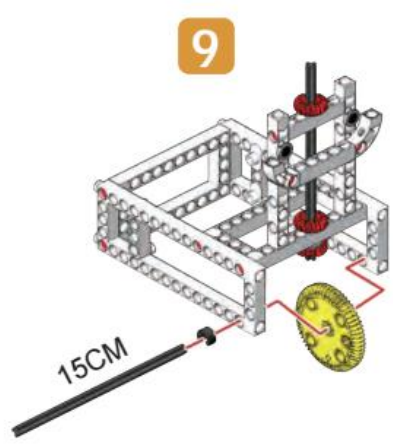
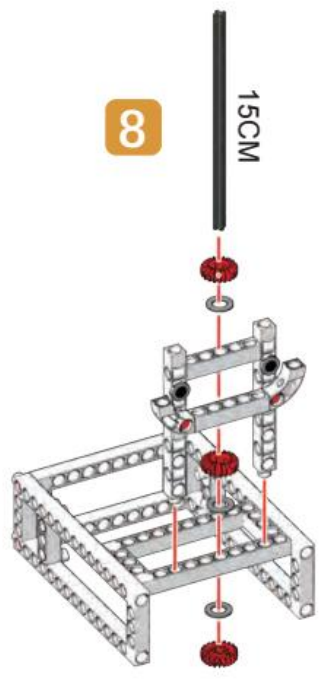
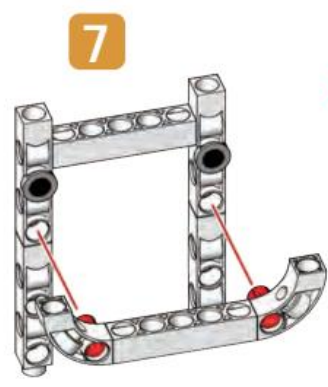
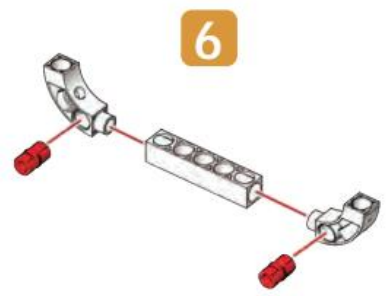
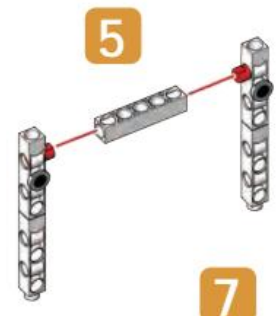
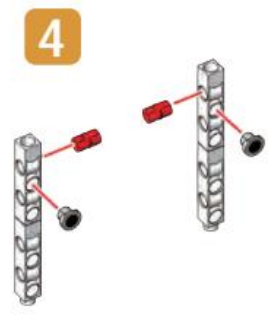
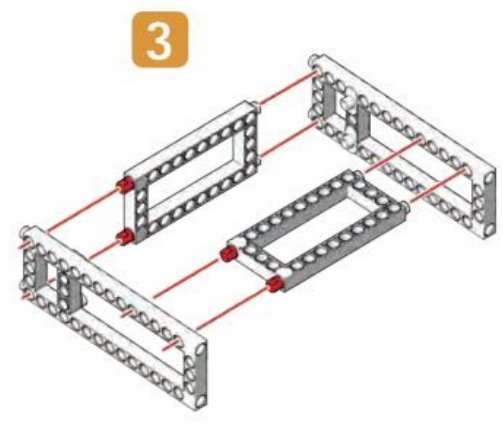
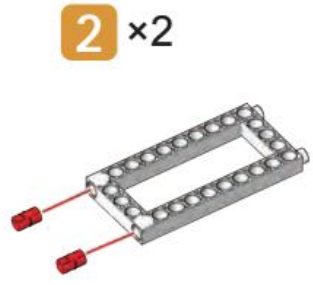
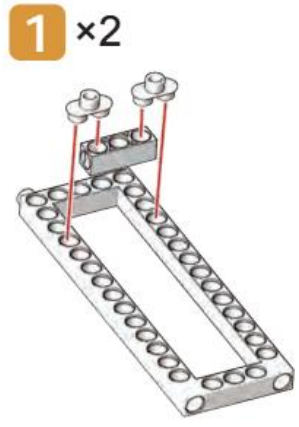


完成  
Done





1	3	4	6	11	12	13	14	16	18	21	23	24
x4	x2	x11	x4	x4	x2	x4	x2	x4	x2	x6	x2	x2
27	28	29	38	42	44	45	47	49	50			
x3	x2	x1	x3	x2	x1	x4	x4	x1	x2			

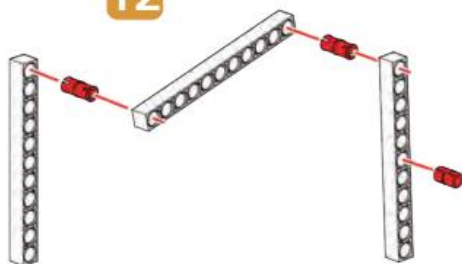




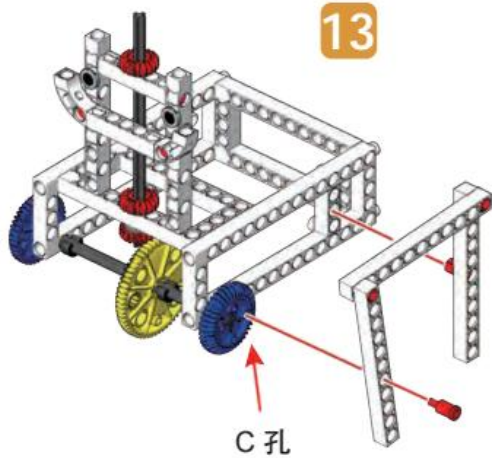
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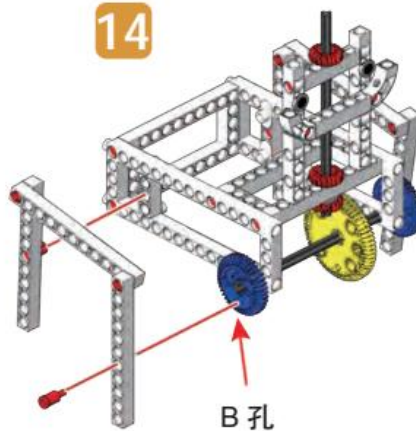
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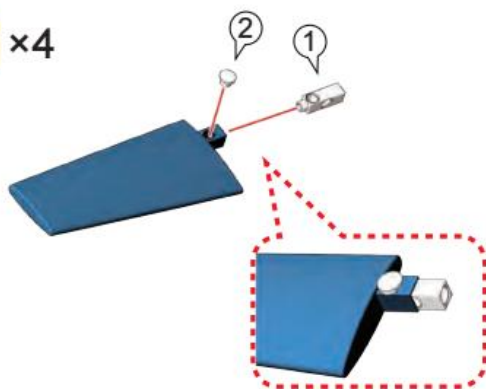
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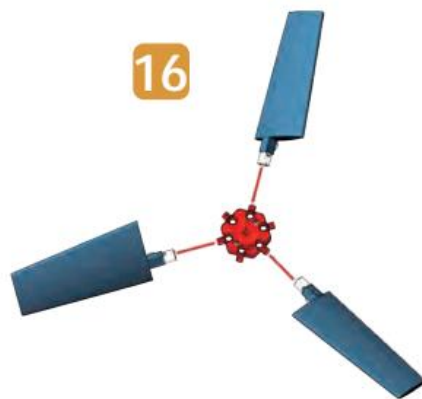
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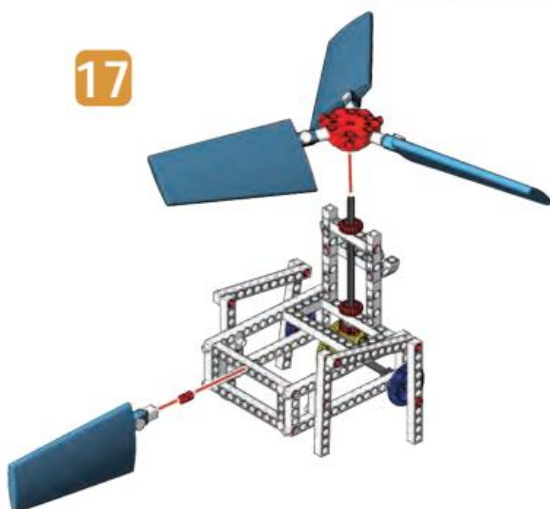
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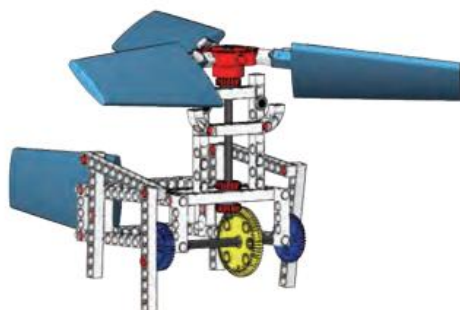
16



17



完成  
Done





▲ 風速儀  
Anemometer

## 圖卡 Pictures

▼ 風帆跑跑車  
Kinetic Sailing Go Kart





# FUN LAB



#1260  
創意積木組  
CREATIVE CUBE



#1261  
科學探索組  
SCIENTIFIC TOUR



#1270  
趣味機關組  
FUN WITH  
MECHANISM



#1262  
電學補充包  
ELECTRICITY KIT



#1263  
電磁補充包  
ELECTROMAG-  
NETISM KIT



#1264  
氣動補充包  
PNEUMATICS  
KIT



#1265  
風力補充包  
WIND POWER  
KIT



#1266  
水力補充包  
HYDRAULICS  
KIT



#1267  
光能補充包  
SOLAR POWER  
KIT



#1268  
基礎遙控補充包  
BASIC  
PROGRAMMABLE  
KIT



#1269  
S4G補充包  
S4G ROBOTIC  
KIT

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