

# MORE EXCITING EXPERIMENTS!



**CYBORG-HAND -  
YOUR XXL HYDRAULIC HAND**



**FLIP-MONSTER -  
YOUR DYNAMIC  
ROBOT**



**BITSY - YOUR SMART ROBOT FRIEND**

**LET  
KNOWLEDGE  
GROW.**

Do you have any questions?  
Our customer service will be glad to help you!

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[kosmos.de/servicecenter](http://kosmos.de/servicecenter)

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Pfizerstrasse 5-7  
70184 Stuttgart, DE  
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Manual

# Solar -Bots

Build exciting solar models

*Wow!*

I am moving with just the power of the sun!



*cool types of motion*



SCAN QR CODE FOR FULL-COLOUR MANUAL

LANGUAGES:

English, Deutsch,  
Français, Italiano,  
Español, Nederlands

AND MANY MORE



or go to: [www.kosmos.de/int/SolarBots](http://www.kosmos.de/int/SolarBots)



STEM  
EXPERIMENT KIT

**KOSMOS**

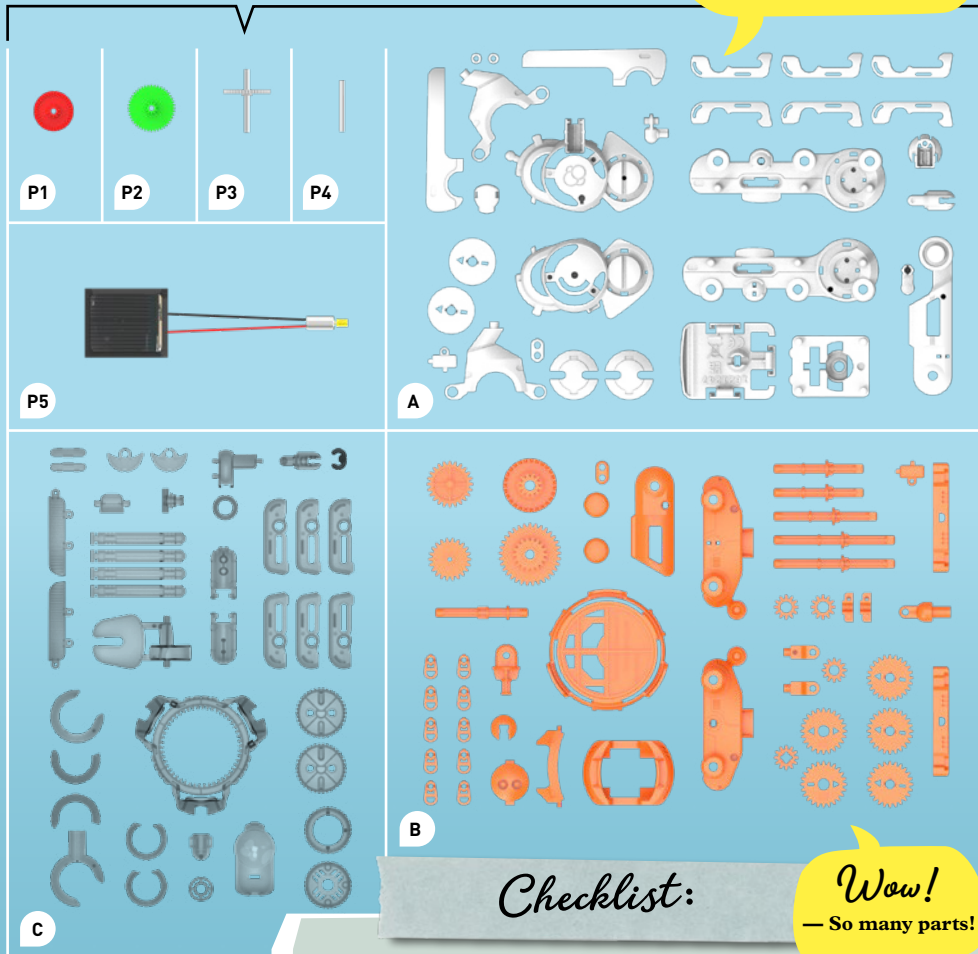


— EQUIPMENT

*Good to know!*

— You can re-order the kit parts at [kosmos.de](http://kosmos.de) in the service area.

What's in your experiment kit:



*Checklist:*

*Wow!*  
— So many parts!

**i YOU WILL ALSO NEED:**  
*Diagonal pliers or scissors,  
light bulb or halogen lamp*

✓ No.	Name	Quantity	Item no.
○ P1	Gear wheel - red	1	728349
○ P2	Gear wheel - green	1	728349
○ P3	White gear wheel with metal rod	1	728349
○ P4	Round metal rod	1	728349
○ P5	Solar cell and motor	1	728350
○ A	Sprue A with parts A1 - A23	1	728346
○ B	Sprue B with parts B1 - B32	1	728347
○ C	Sprue C with parts C1 - C30	1	728348

Imprint

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Layout of the packaging: Studio Gibler, Stuttgart

Photos for the packaging: CIC Components Industries Co., Background graphics U1: Studio Gibler

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Subject to technical changes

Marking of packaging materials:  
[www.kosmos.de/disposal](http://www.kosmos.de/disposal)



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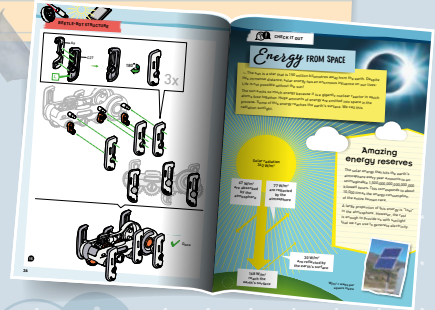
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Contents ..... 3  
Safety information ..... 4  
Important information ..... 5

**ASSEMBLY INSTRUCTIONS STARTING ON PAGE 6**

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**ADDITIONAL INFO  
CAN BE FOUND ON THE  
"CHECK IT OUT" PAGE 38**



*Yay!*  
— Get started!



## WARNING



Not suitable for children under three years. Small parts. Choking hazard.

WARNING: This toy is only intended for use by children over the age of 8 years, due to accessible electronic components. Instructions for parents or care givers are included and shall be followed.

Keep the packaging and instructions as they contain important information.

May only be operated when fully assembled. Proper assembly must be checked by an adult before use.

## NOTES ON HANDLING ELECTRONIC COMPONENTS:

>>> To protect the electrical and mechanical components, we recommend operating the robot indoors only. Avoid contact with metallic objects and liquids of all kinds! Do not use any other energy source other than the solar cell supplied.

## NOTES ON DISPOSAL OF ELECTRICAL AND ELECTRONIC COMPONENTS

The electronic components of this product are recyclable/reusable. For the sake of the environment, do not throw them into the household trash at the end of their lifespan. They must be delivered to a collection location for electronic waste, as indicated by the following symbol:



Please contact your local authorities for the appropriate disposal location.



## THE RIGHT TOOL

The right tools can make assembly much easier. The parts are best cut out with small diagonal pliers for electronics work or model-making pliers. This makes it possible to cut so precisely that no burrs remain on the parts and there is no need to file at all. If you don't have any pliers like this at home, you can ask your parents for a pair of nail clippers. Otherwise a normal pair of scissors also works, but they usually do not cut as precisely as a small diagonal pliers, so the material often has to be filed down.

## — IMPORTANT INFORMATION

# Dear parents!

Children want to marvel, understand and create something new. They want to try everything out and explore things by themselves. They want to know more! They can do all this with our KOSMOS experimental kits.

And much more than just an experiment comes of this - a strong person grows.

— Before building and experimenting, read through the instructions together with your child and discuss the safety information. Be ready to help your child with tricky setups and experiments and accompany them through all steps.

— If your child is working at a table, use an underlay to prevent damage to the furniture.

— Be particularly careful when cutting out the plastic parts with diagonal pliers, as sharp burrs can occur. These can be removed with diagonal pliers and a file. Provide diagonal pliers to your child and please supervise them until you see that they can confidently use them.

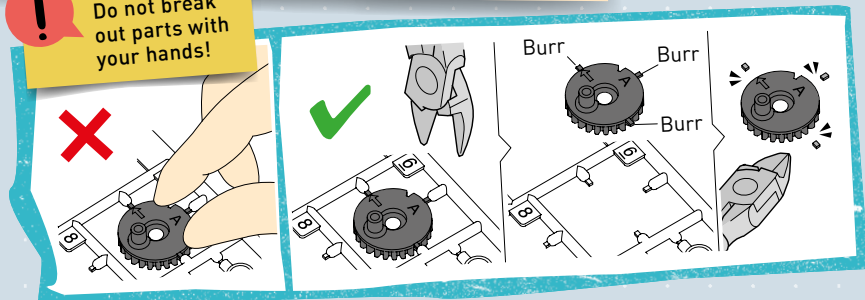
We hope you and your child have a lot of fun with the solar bots!



## IMPORTANT:

ONLY REMOVE THE PARTS WHEN YOU NEED THEM AND REMOVE EXCESS MATERIAL BEFORE ASSEMBLY BY USING DIAGONAL PLIERS AND A NAIL FILE

 Do not break out parts with your hands!





## THE ROBOT AND ITS VEHICLES



# Hello!

My name is Helio the solar bot. I live in Sun City because the sun shines here almost every day. That gives me the energy to experience lots of exciting adventures. I have the right vehicle for every purpose, which I would like to briefly introduce to you on this page.

### Orbit platform



When the sun goes down in the evening here in Sun City, I love to relax on the orbit platform. At sunrise, I am woken up by the gentle turning of the orbit. The platform also prevents me from rolling off unintentionally.

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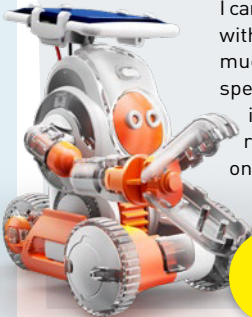
### Running mecha



This two-legged robot vehicle is ideal for exploration trips. The elevated position gives me a great overview. Thanks to the two legs, I can also explore unpaved paths.

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### Trike speedster



I can also move independently without a vehicle, but I'm much faster with the trike speedster. The steering is also great. So I can really go full throttle on the roads!

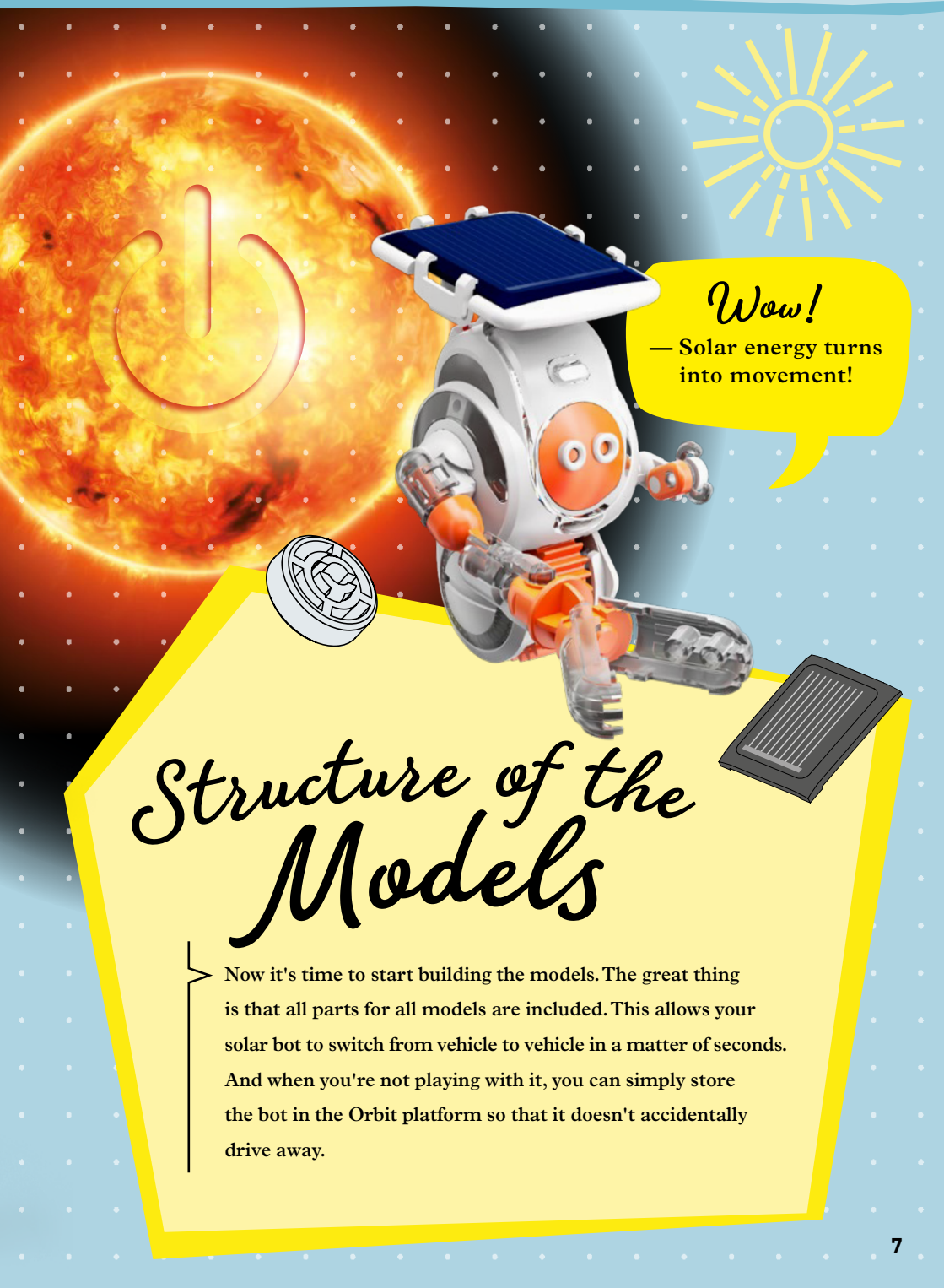
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### Beetle bot

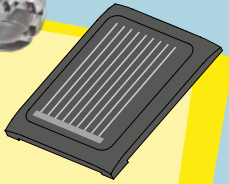


This vehicle with six legs is ideal for rough terrain. The beetle-like locomotion gives me a lot of stability and traction on loose surfaces.

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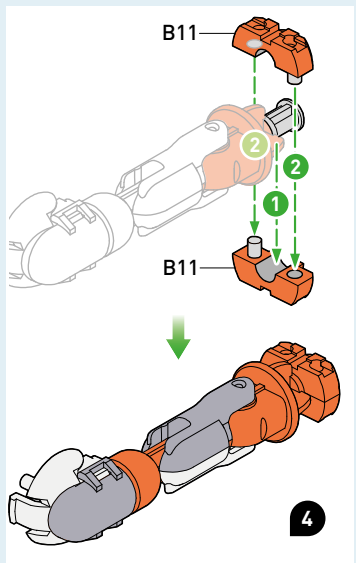
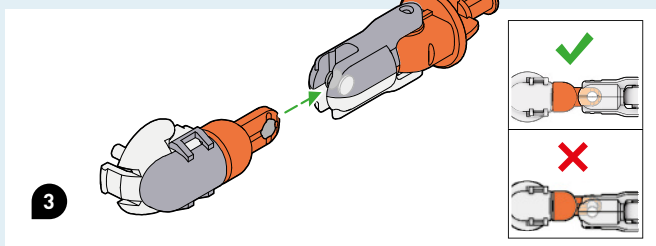
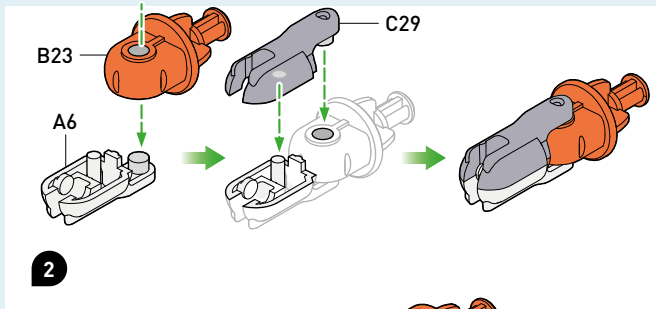
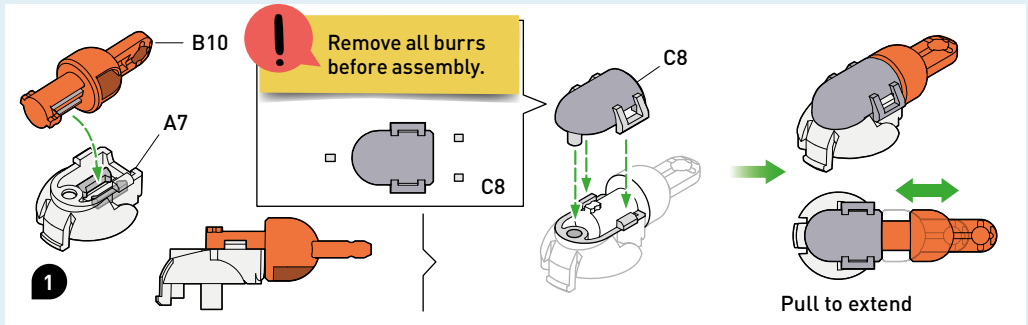
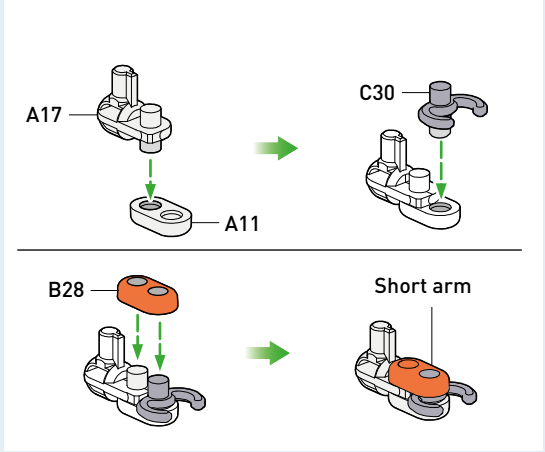
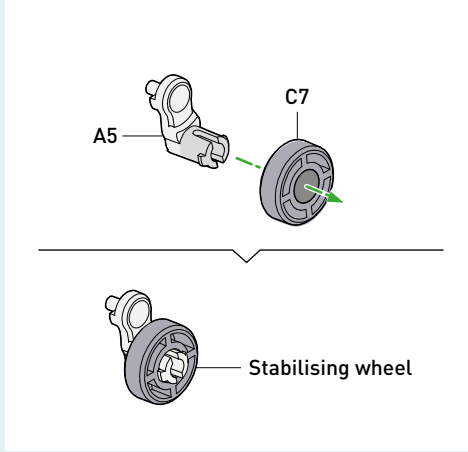


*Wow!*  
— Solar energy turns into movement!

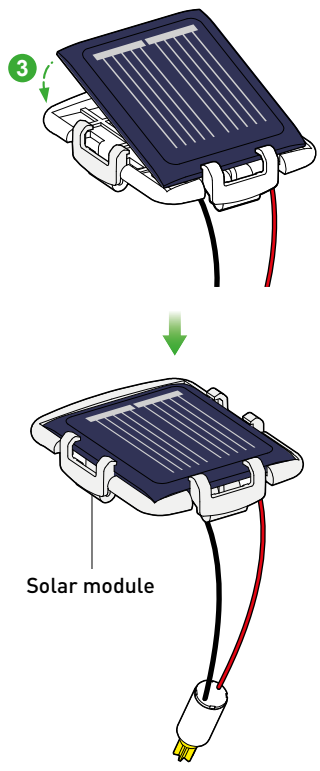
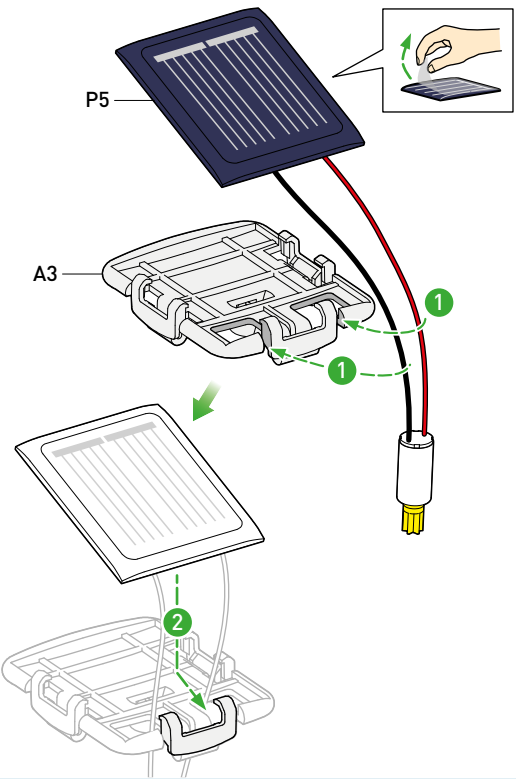
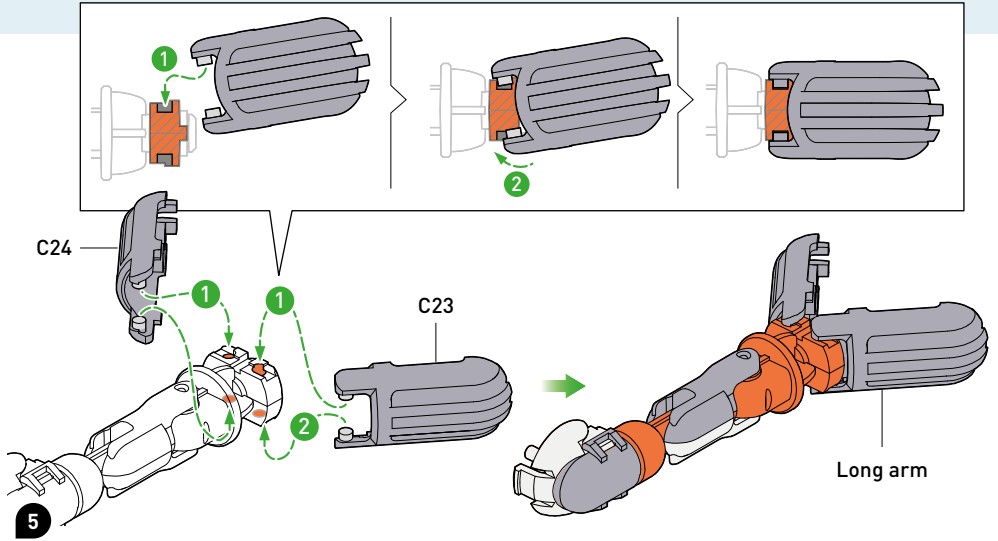


# Structure of the Models

Now it's time to start building the models. The great thing is that all parts for all models are included. This allows your solar bot to switch from vehicle to vehicle in a matter of seconds. And when you're not playing with it, you can simply store the bot in the Orbit platform so that it doesn't accidentally drive away.

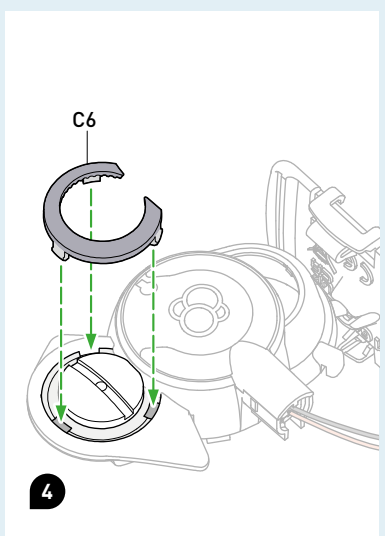
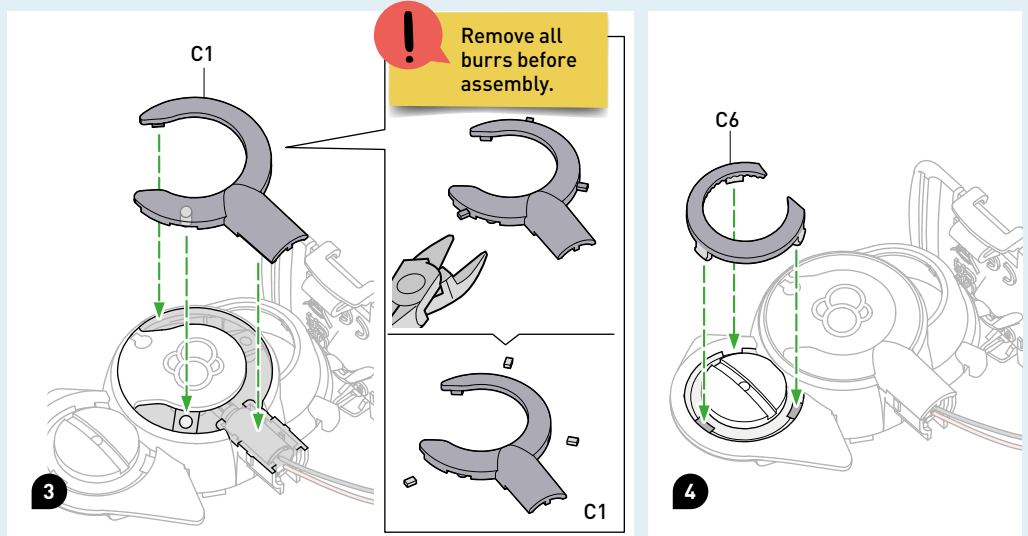
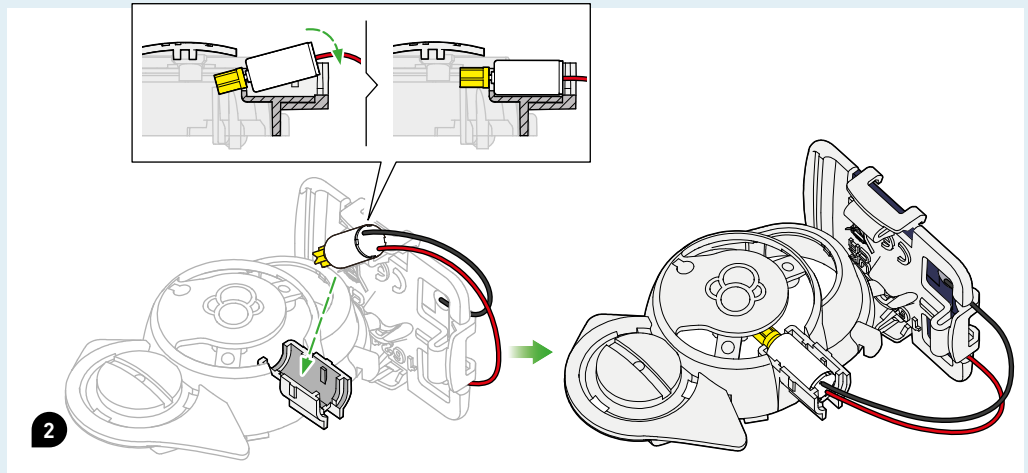
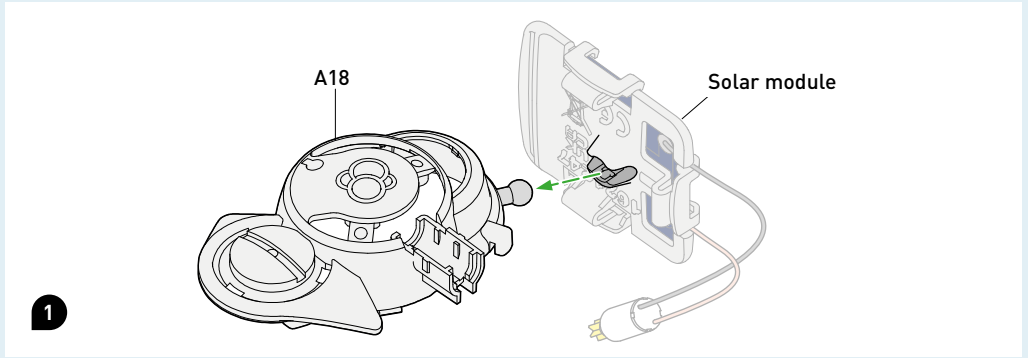


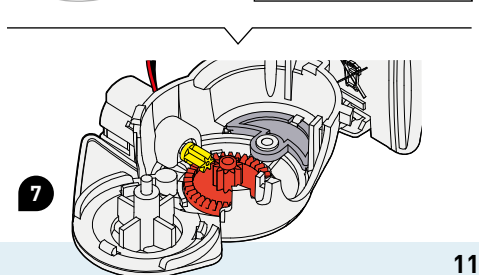
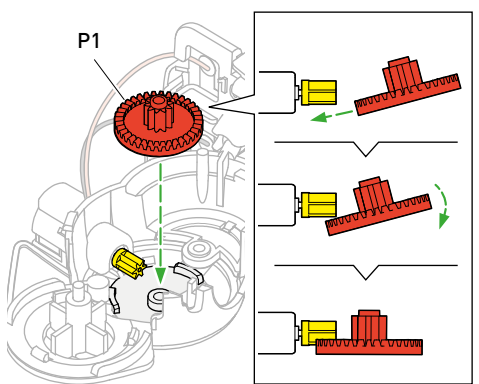
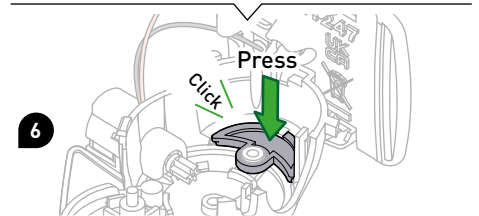
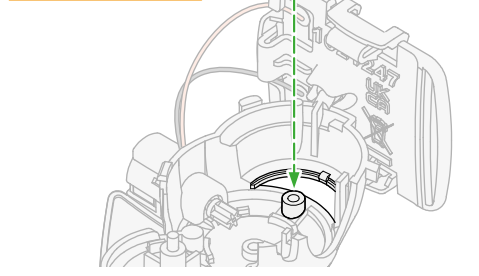
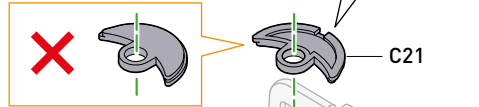
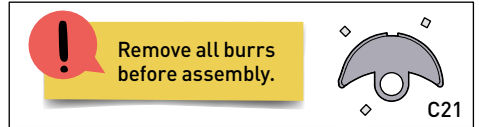
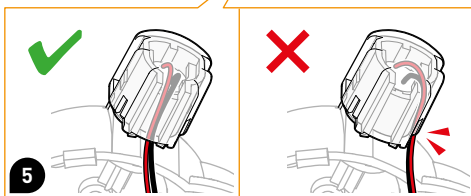
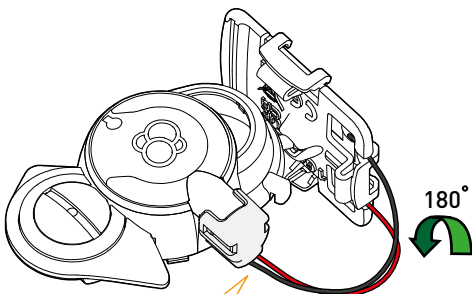
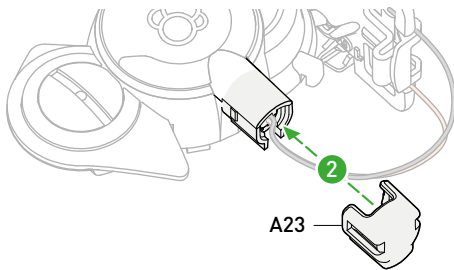
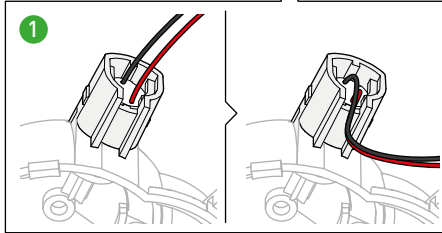
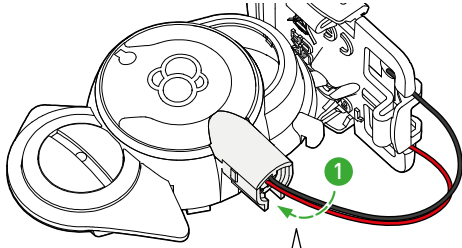


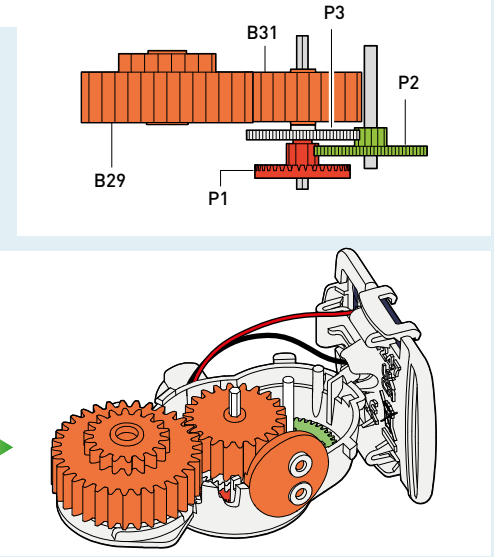
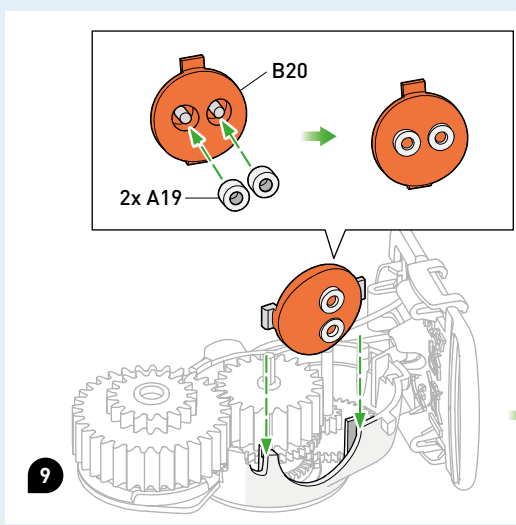
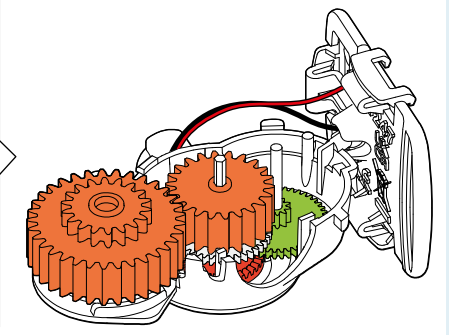
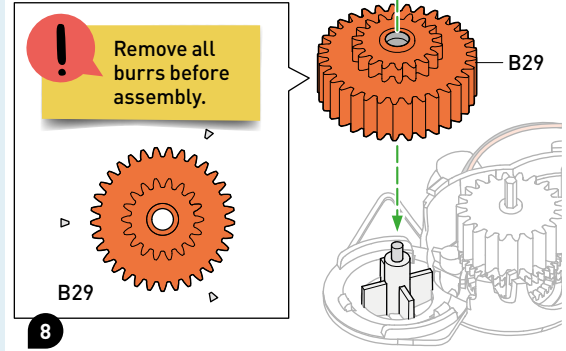
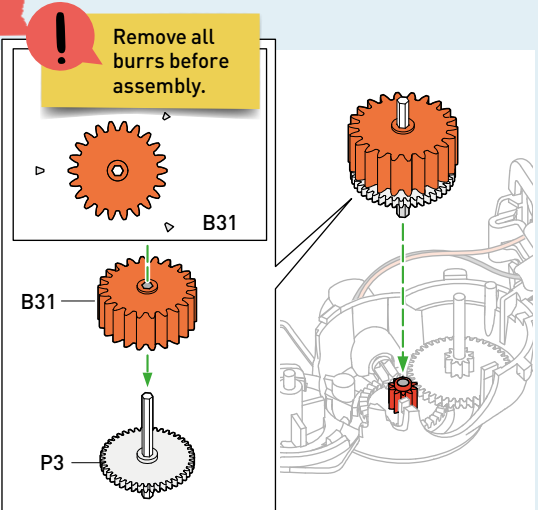
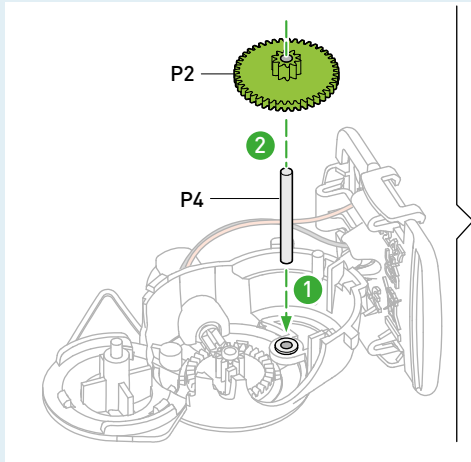


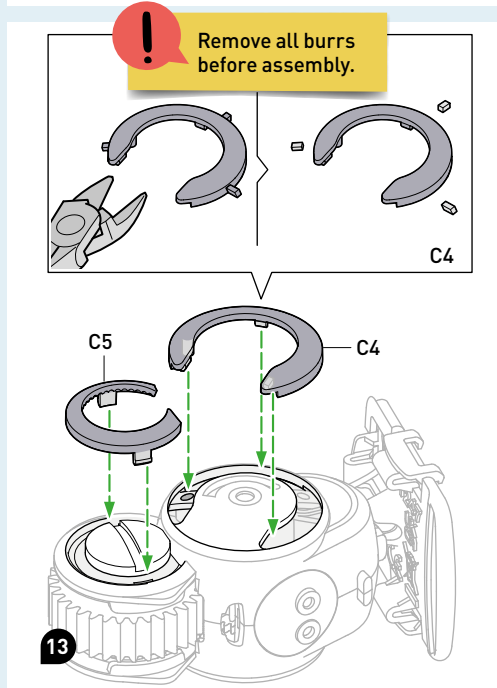
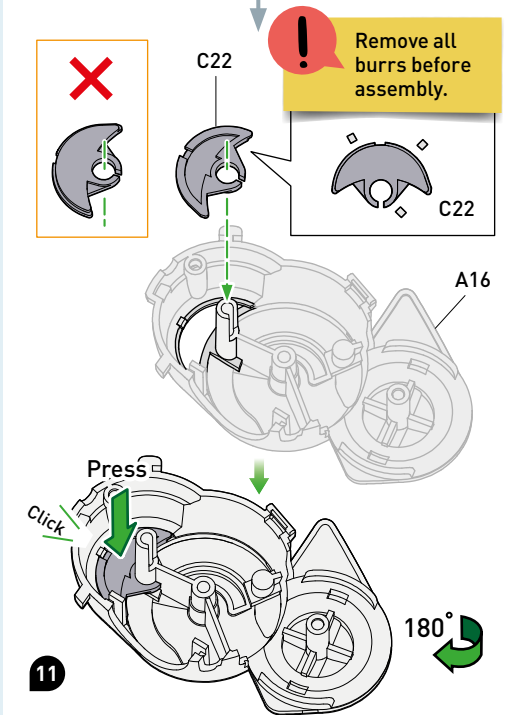
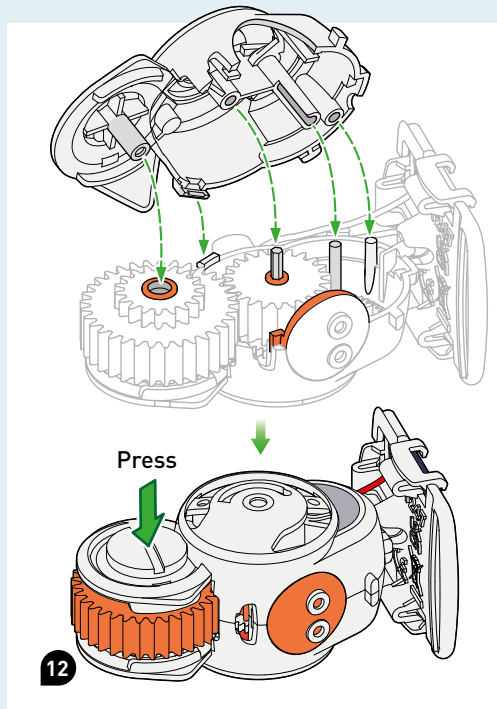
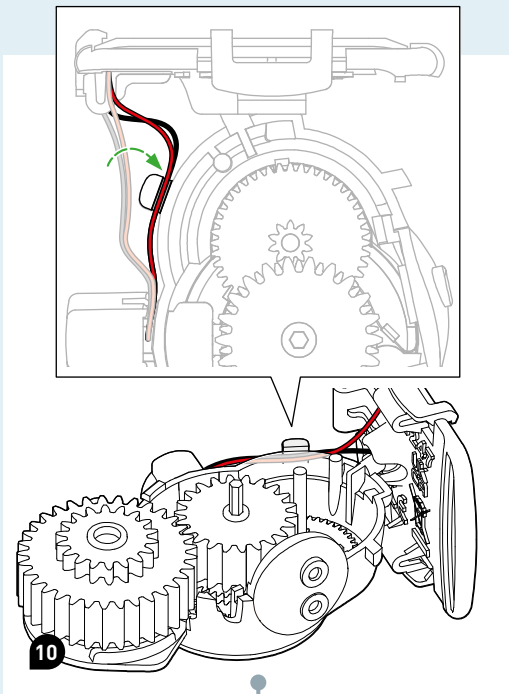


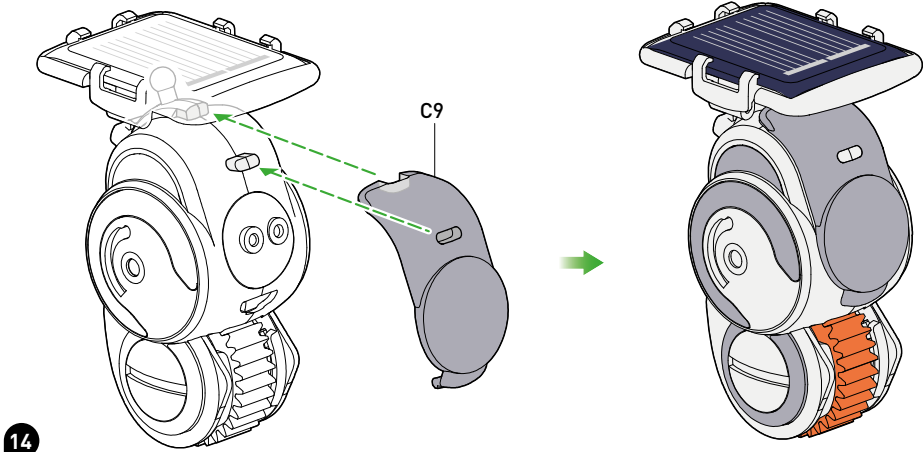
# ROBOT STRUCTURE



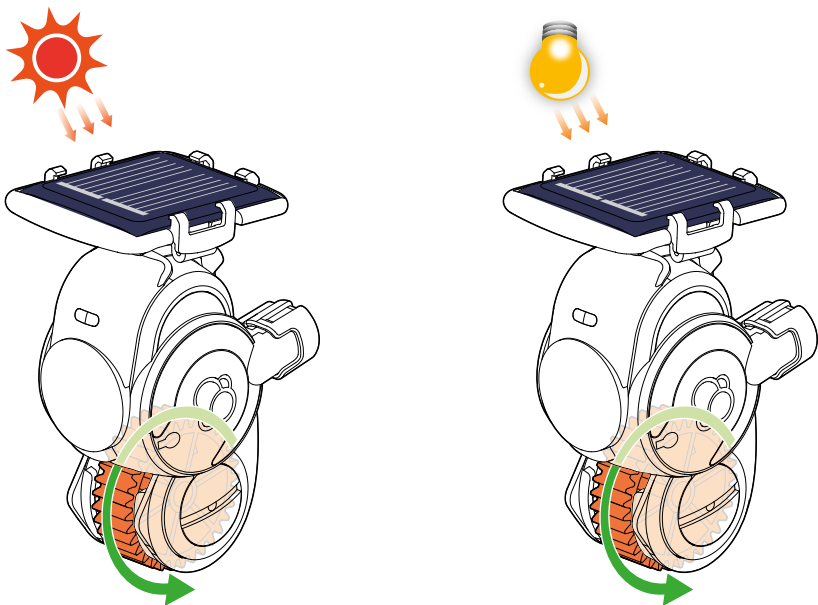




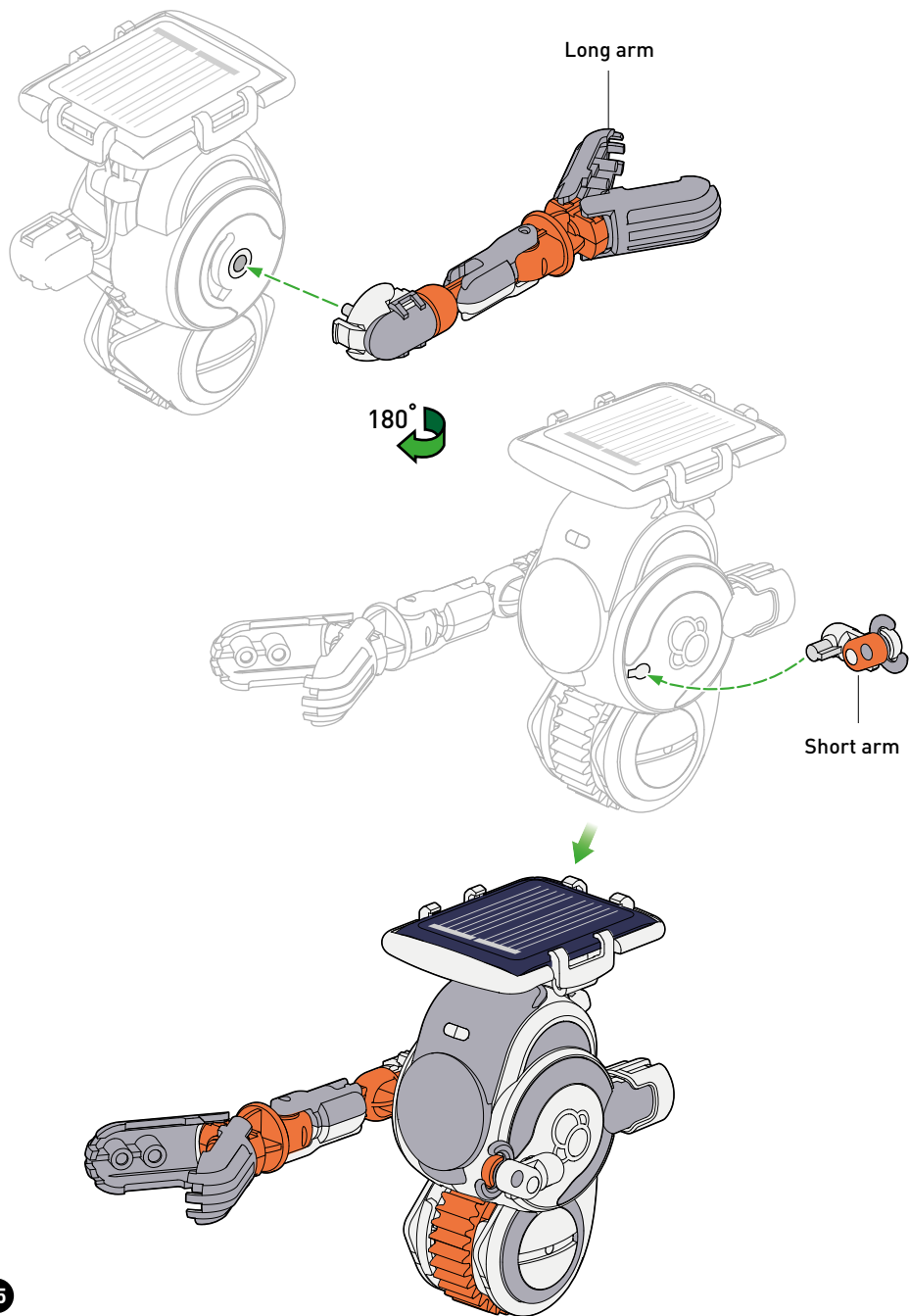




Test the function in direct sunlight or with a light source of 50 watts or more (e.g. halogen lamp or traditional light bulb). Helio cannot be operated on cloudy days, in the shade, in indirect sunlight or with lamps that are too weak (e.g. LED lamps).

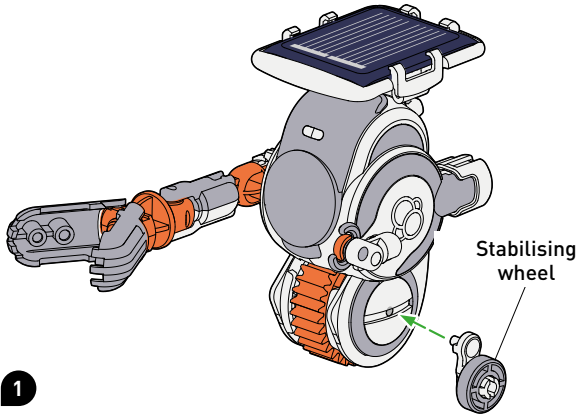
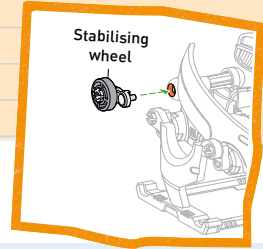


If the gearbox does not turn, you should check the correct assembly from page 10.

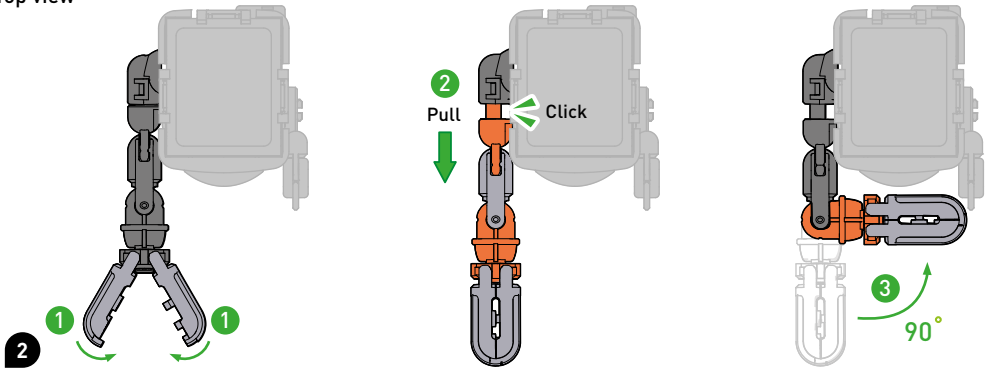


**TIP**

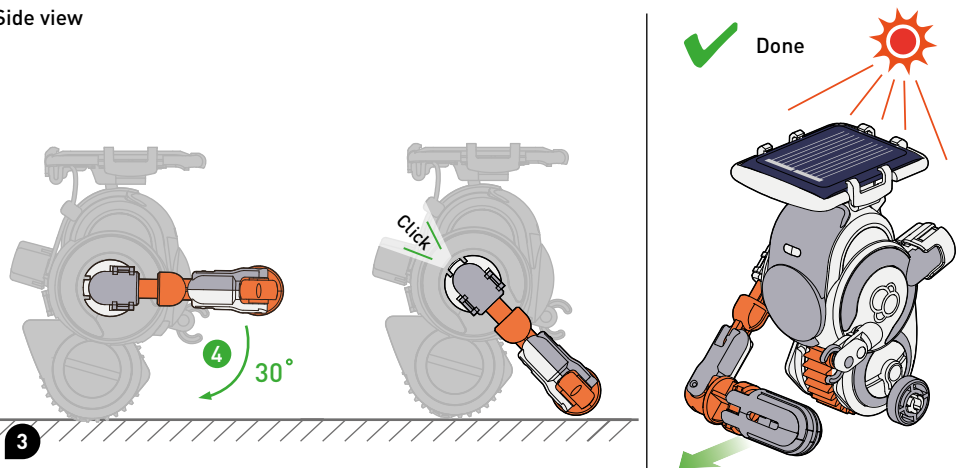
IF THE STABILISING WHEEL IS NOT NEEDED, IT CAN BE STOWED IN THE RUNNING MECHA. THIS WAY IT IS NOT LOST (SEE PAGE 27, SECTION 14).



Top view

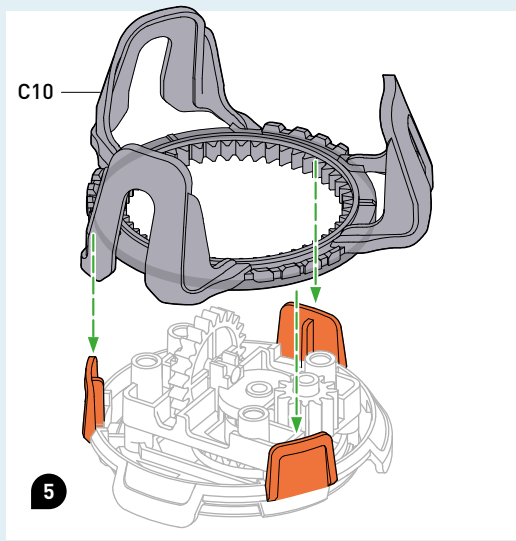
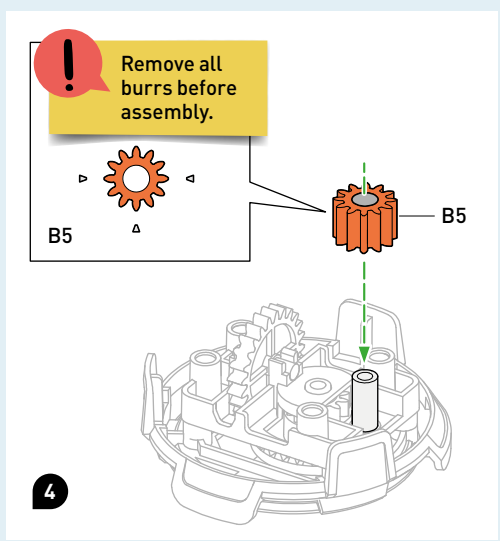
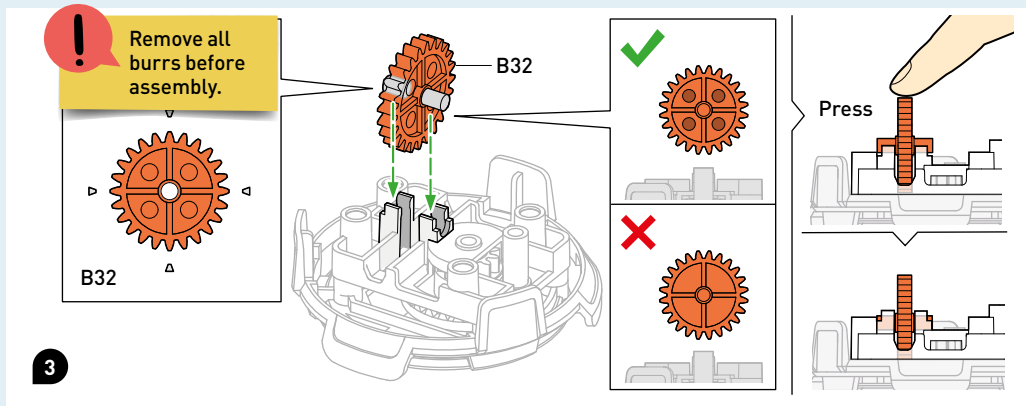
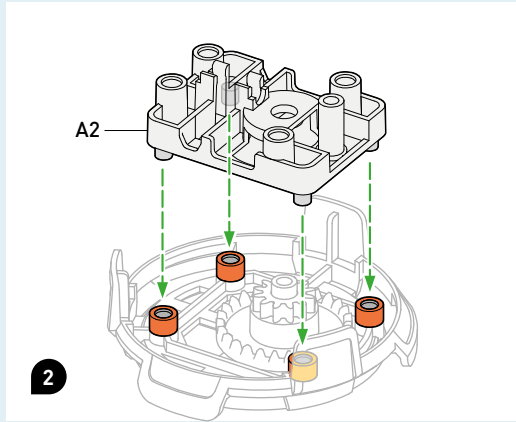
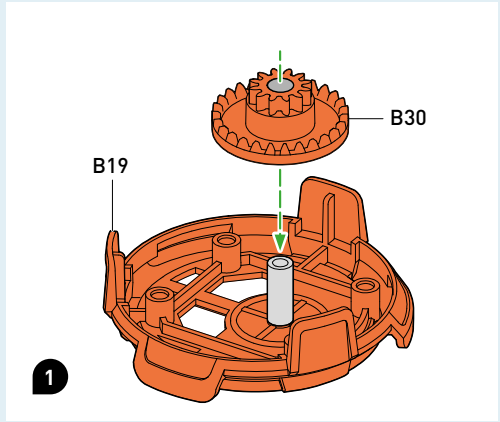


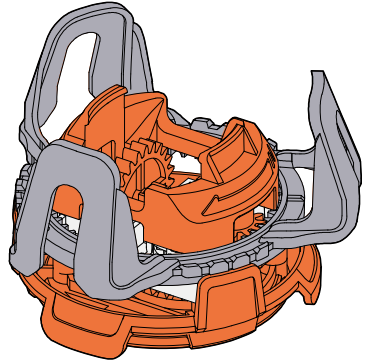
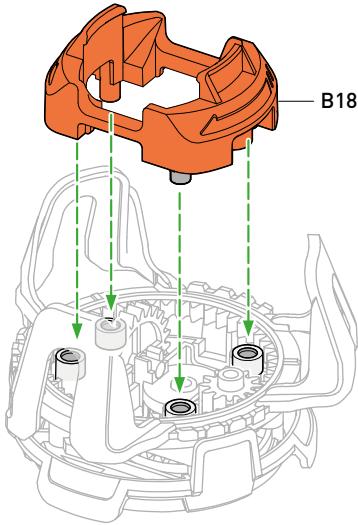
Side view





# ORBIT PLATFORM STRUCTURE

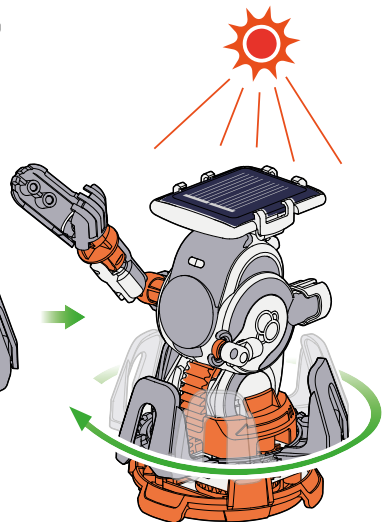
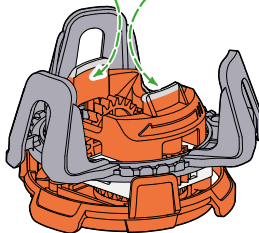
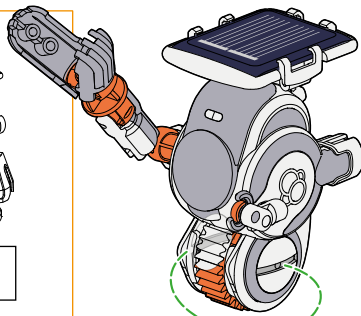
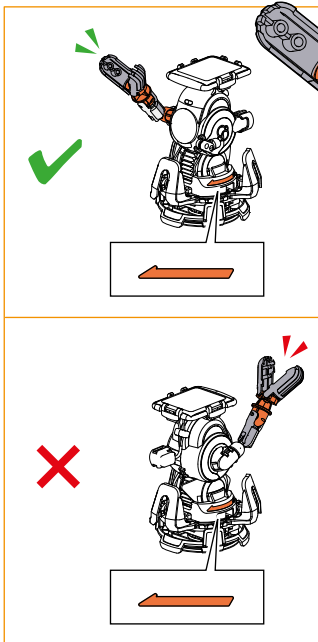




Done

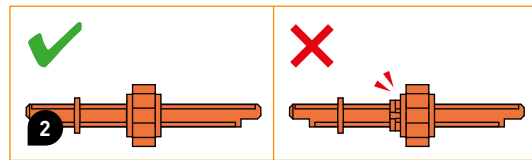
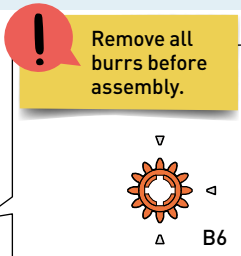
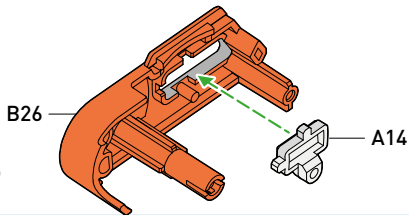
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**HOW TO PLAY**

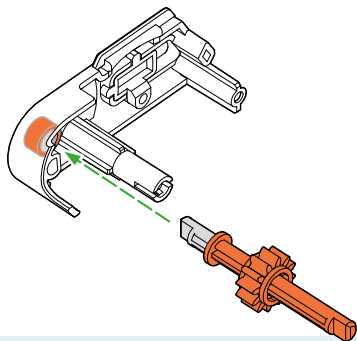


# TRIKE SPEEDSTER BODY

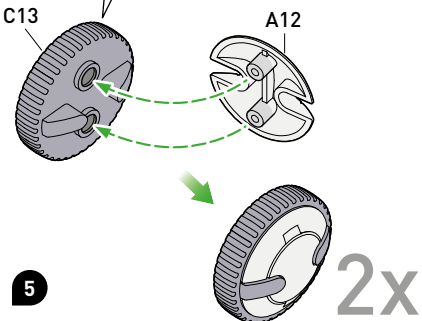
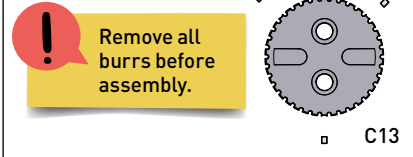
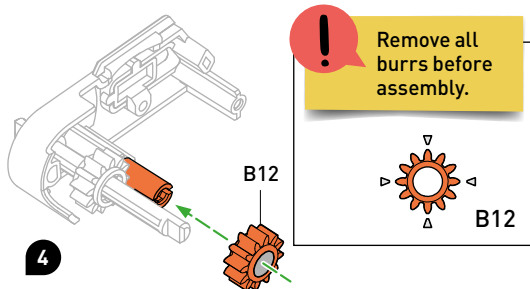
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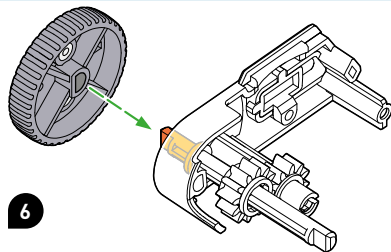
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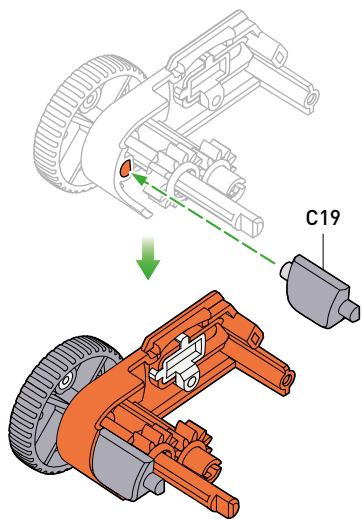
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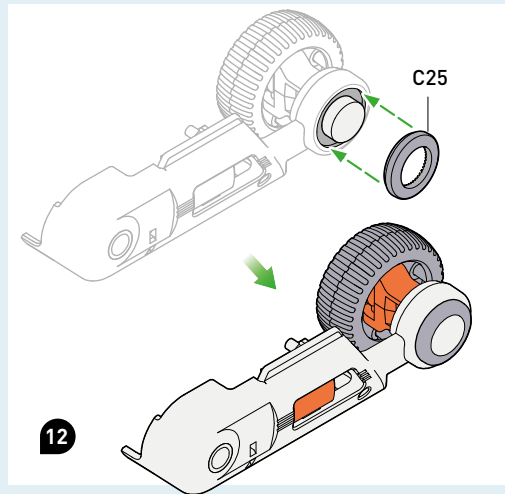
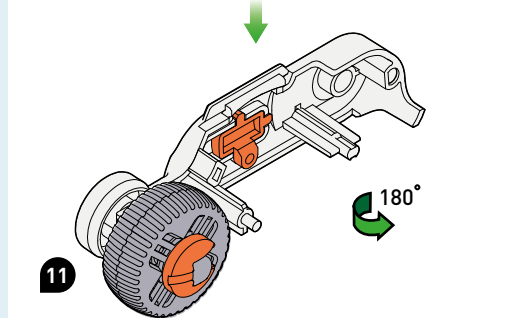
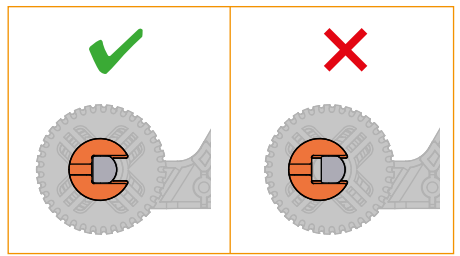
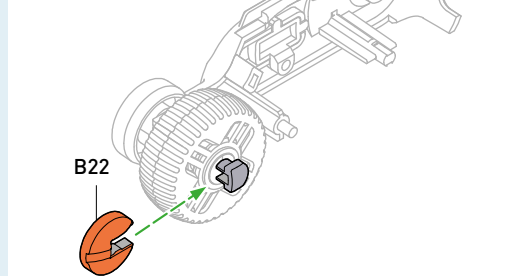
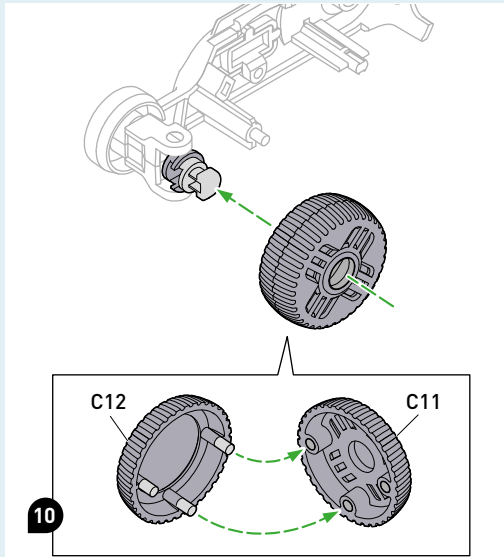
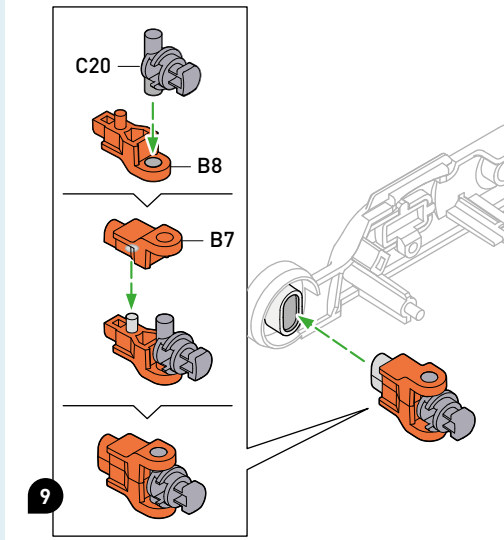
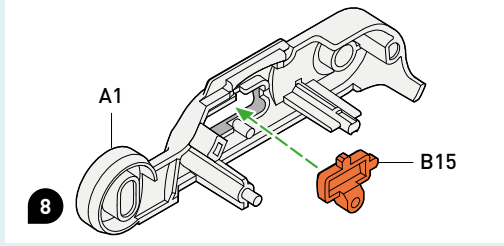


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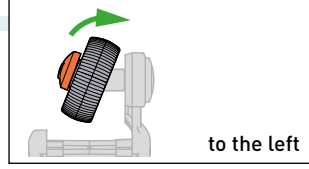
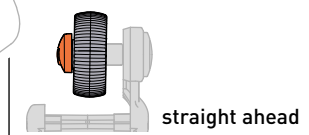
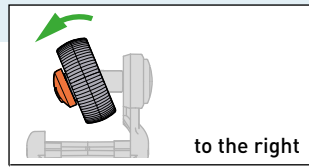
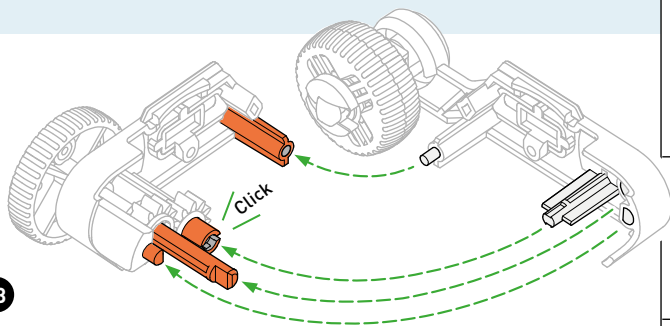


7

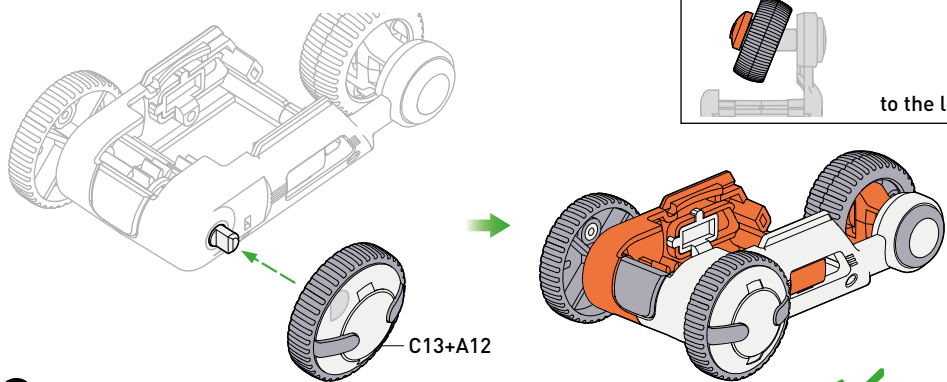




13

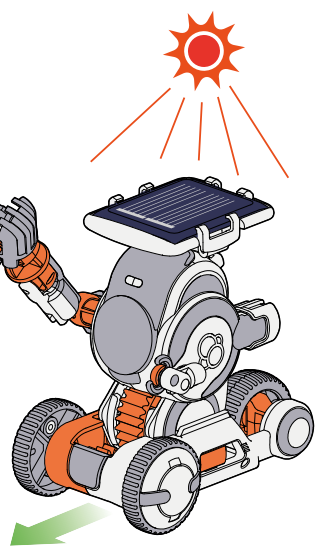
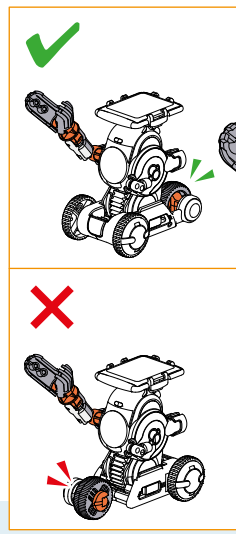
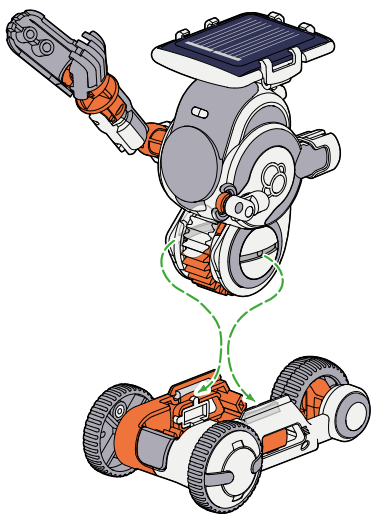


14



 Done

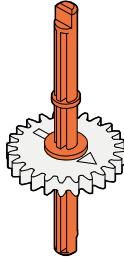
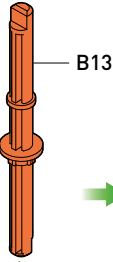
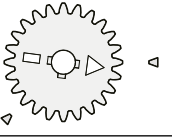
### HOW TO PLAY



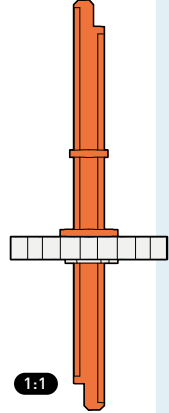
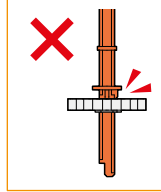
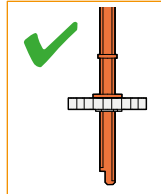
**!** Remove all burrs before assembly.

**1**

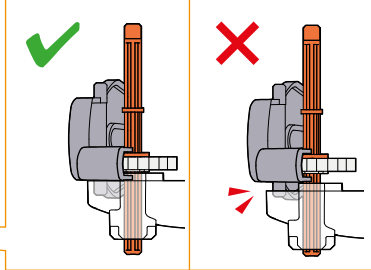
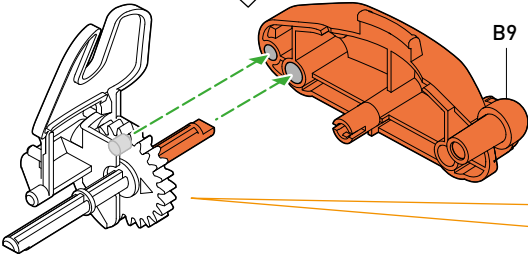
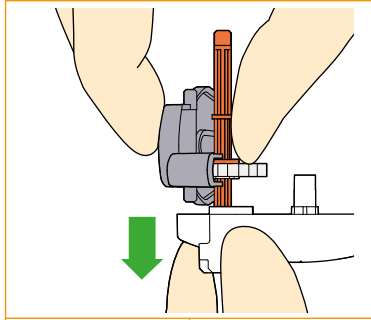
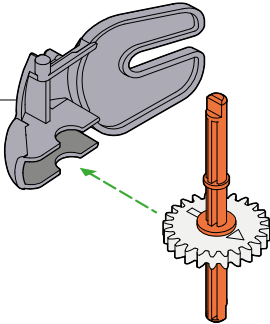
A15



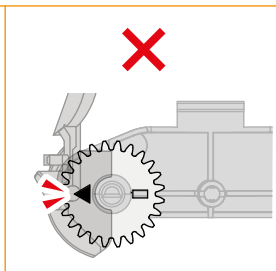
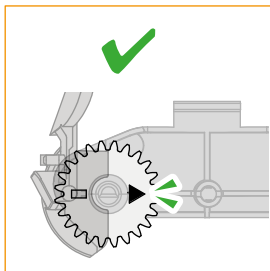
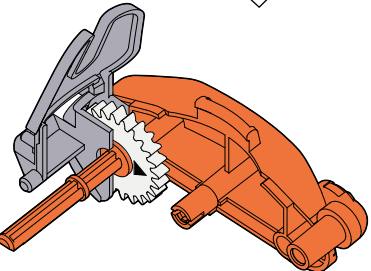
2x



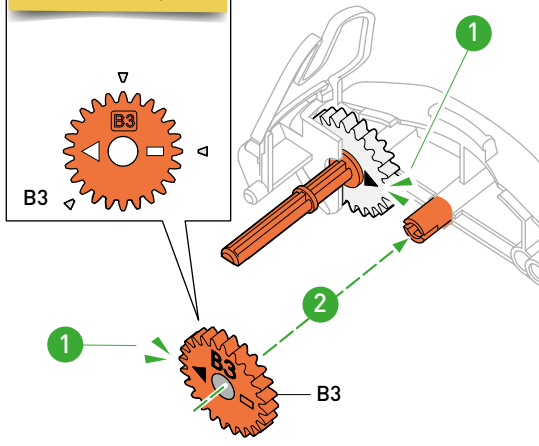
C17



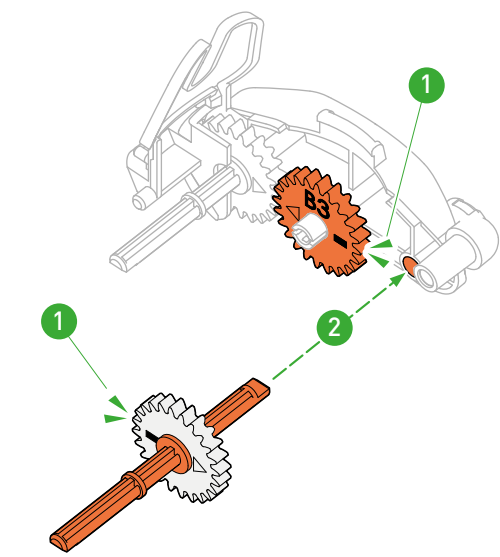
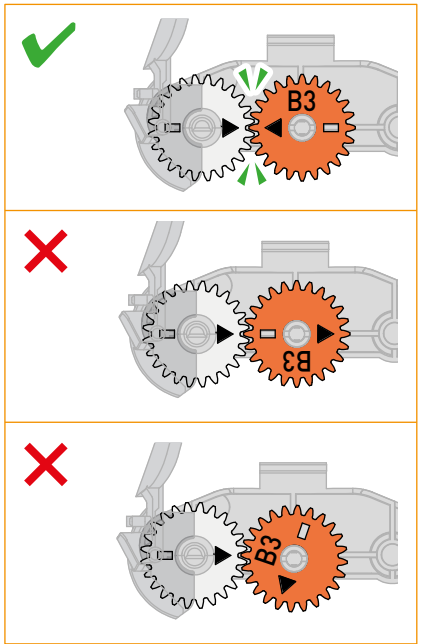
**2**



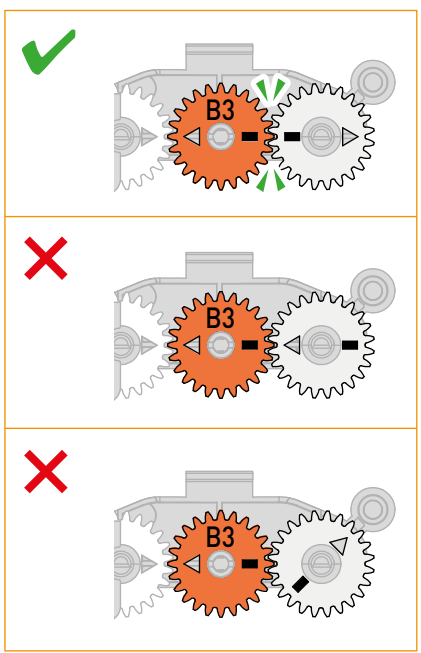
**!** Remove all burrs before assembly.

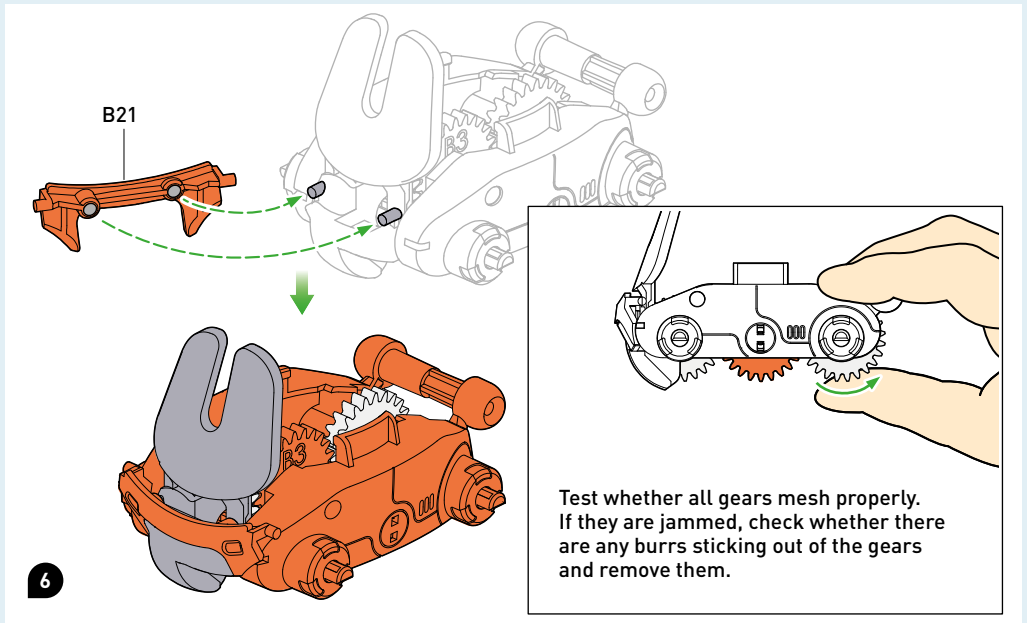
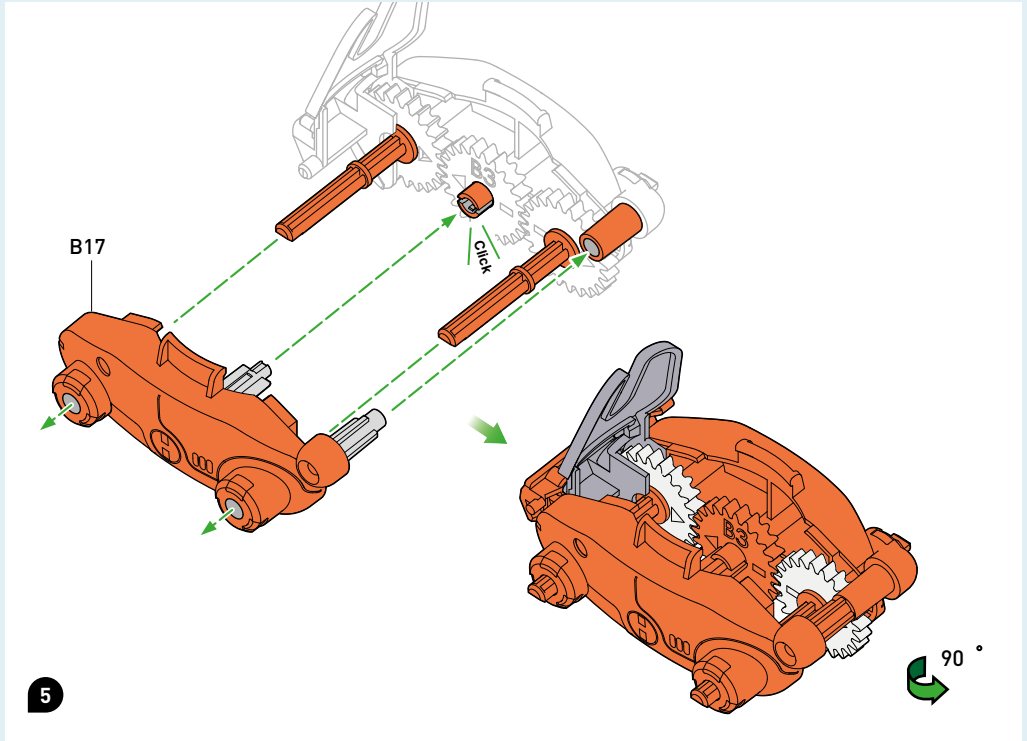


**3**

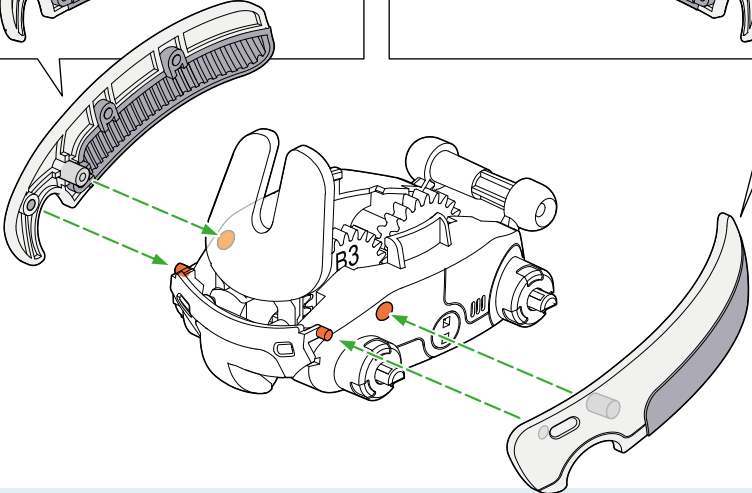
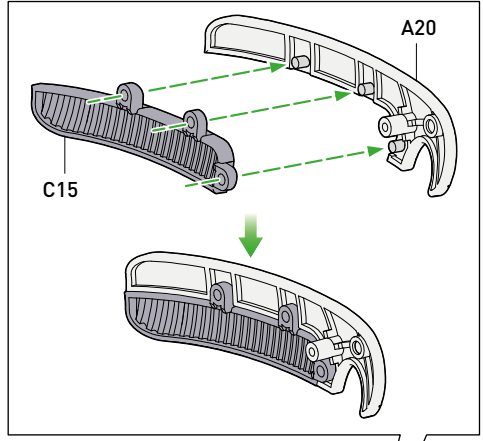
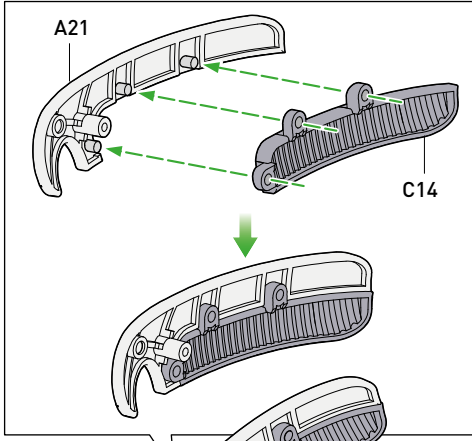


**4**

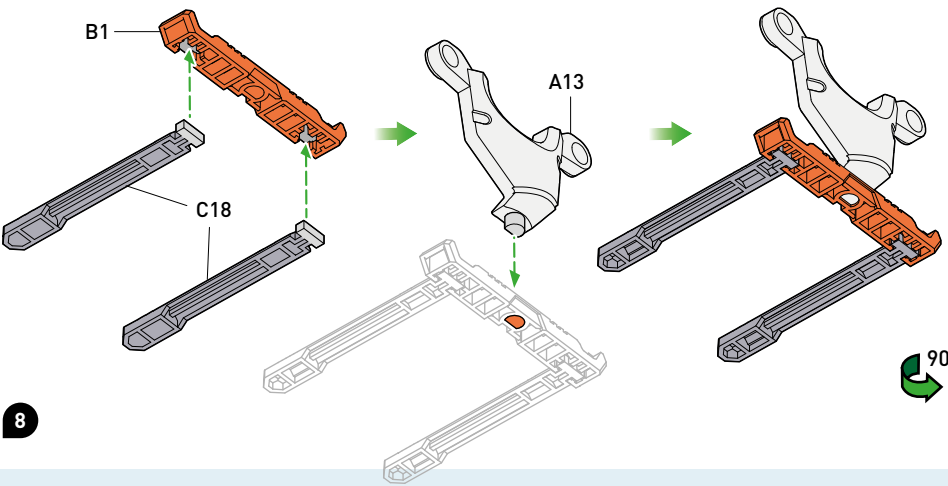




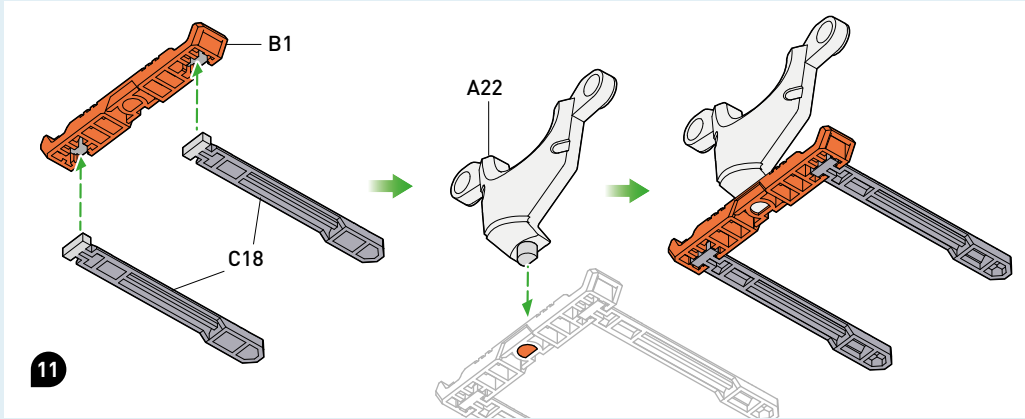
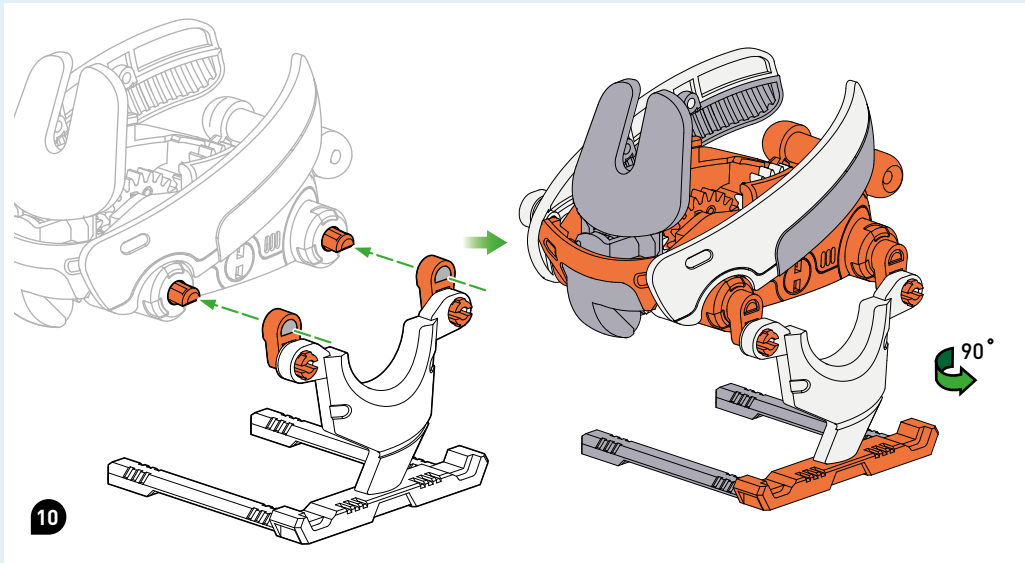
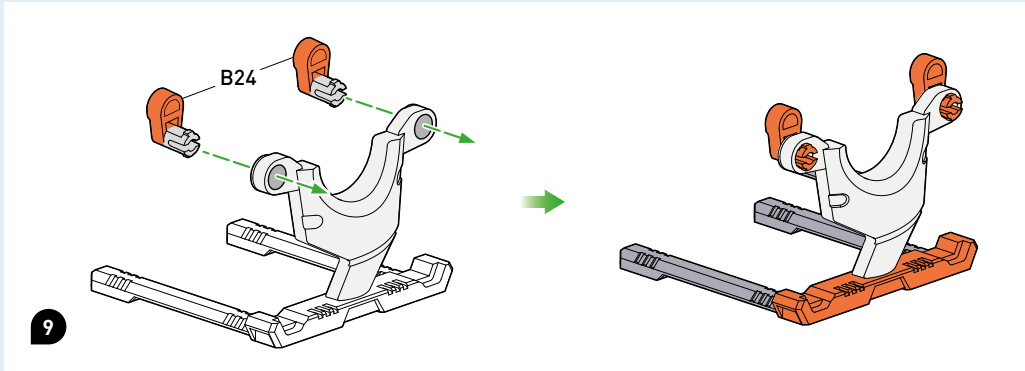


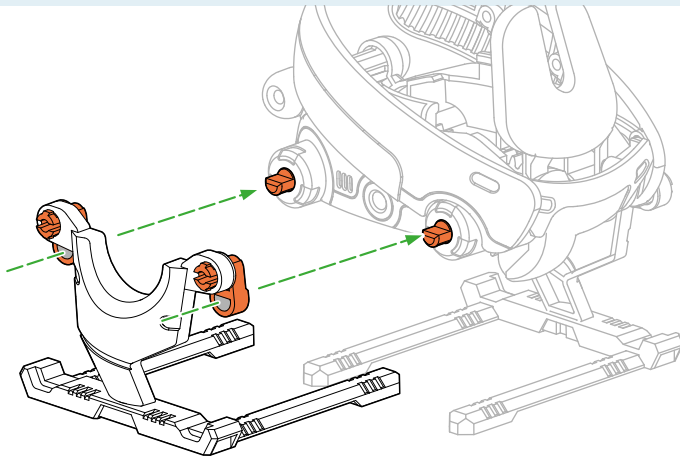
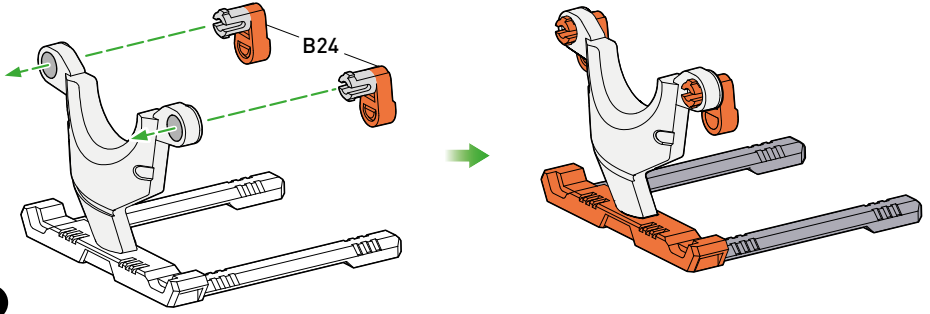


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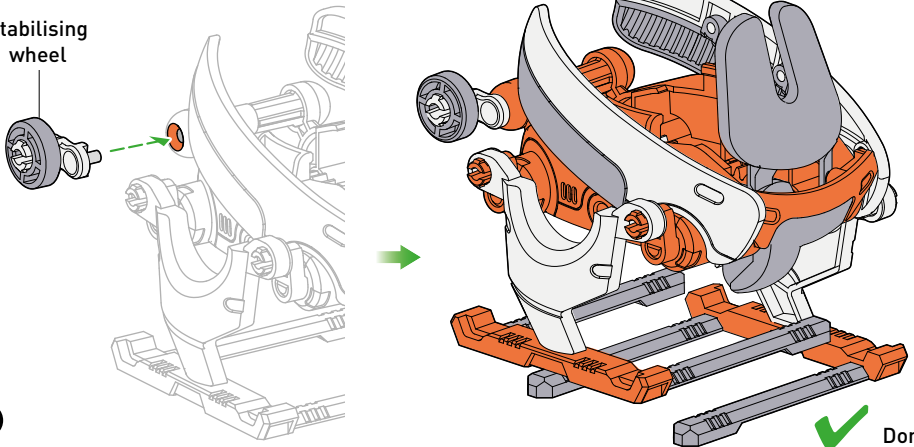


8

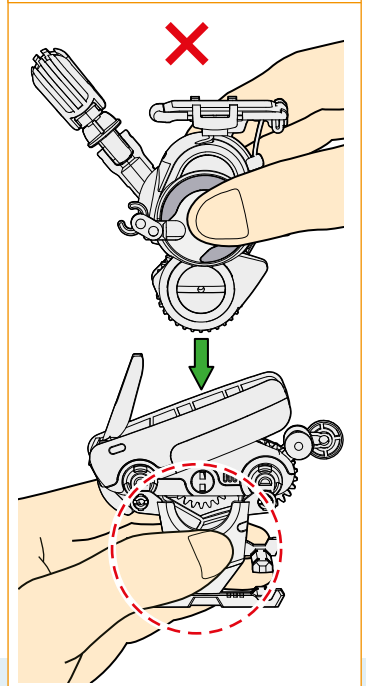
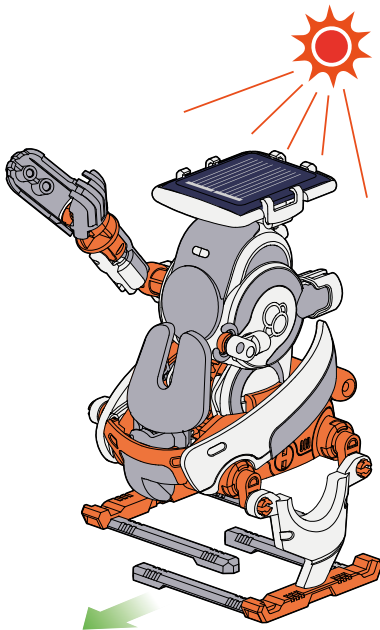
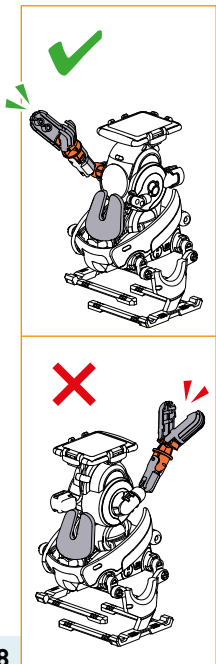
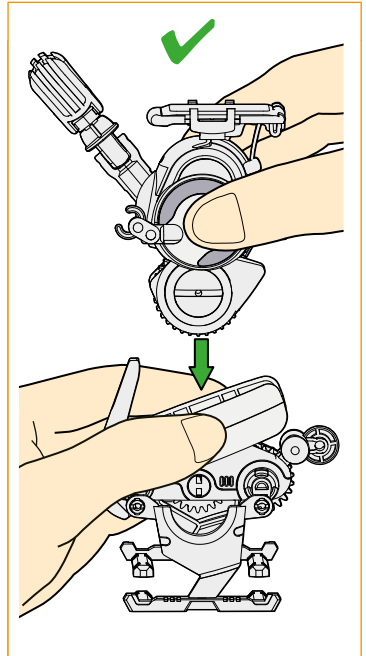
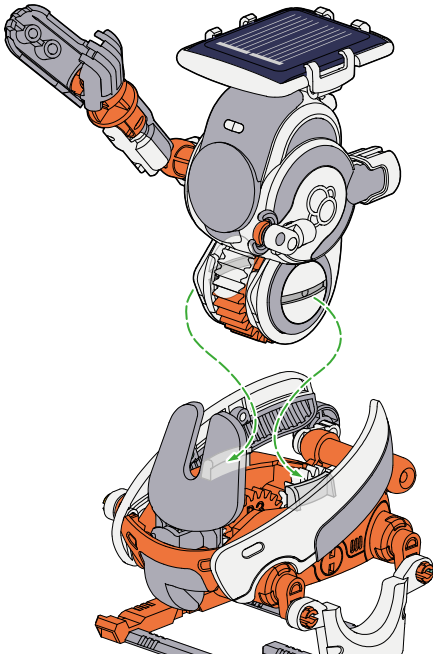




Stabilising wheel




## HOW TO PLAY

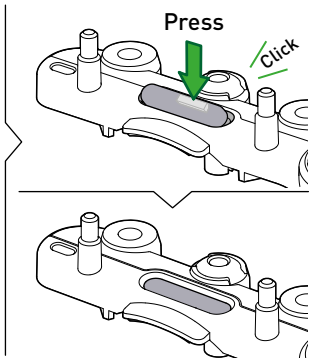
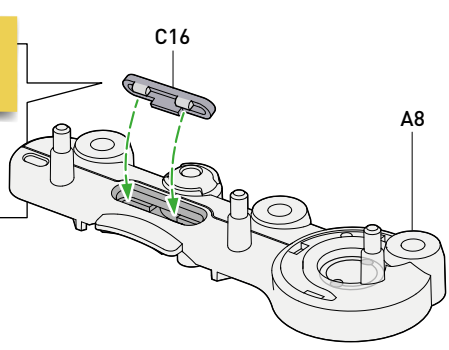


**BEE-TLE-BOT STRUCTURE**

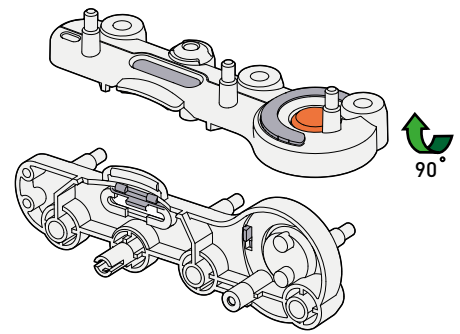
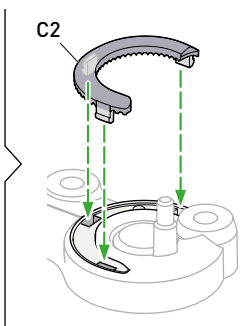
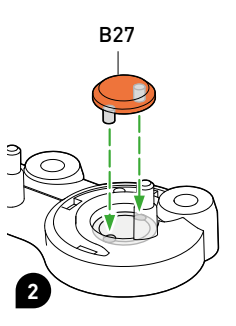
**!** Remove all burrs before assembly.



C16

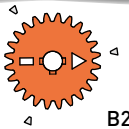


**1**

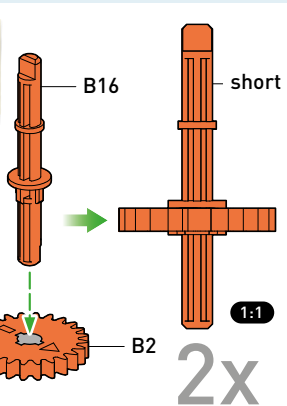


**2**

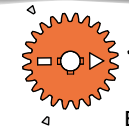
**!** Remove all burrs before assembly.



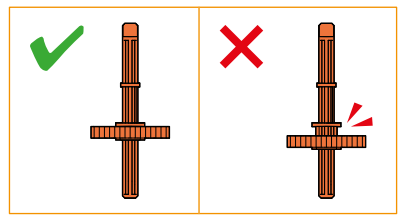
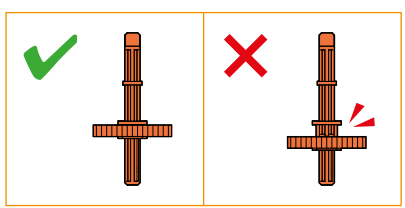
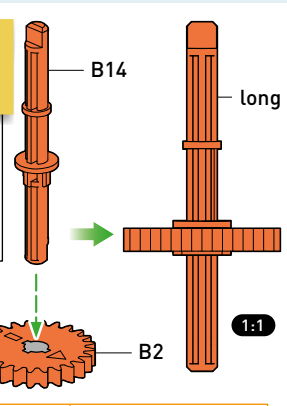
B2



**!** Remove all burrs before assembly.

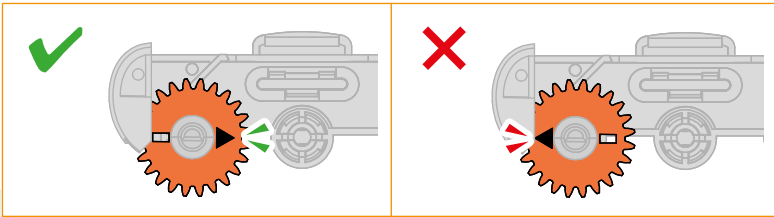
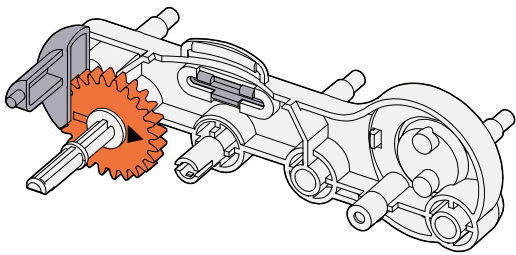
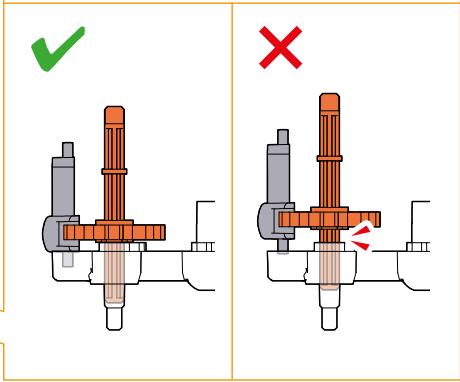
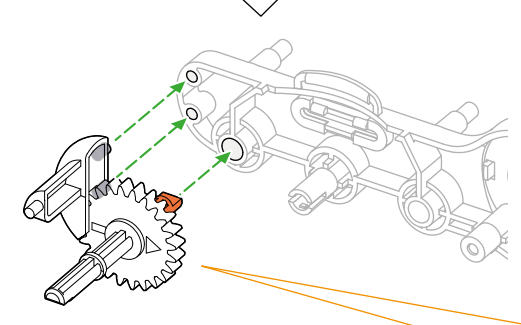
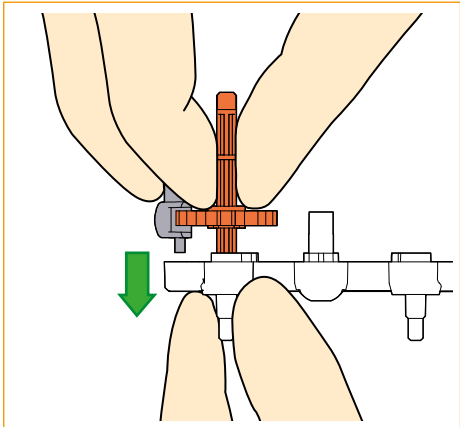
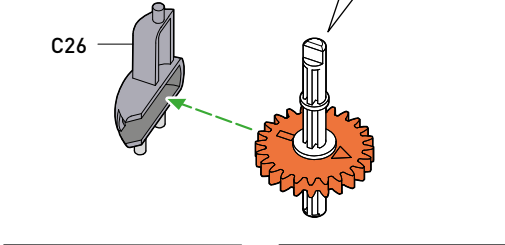
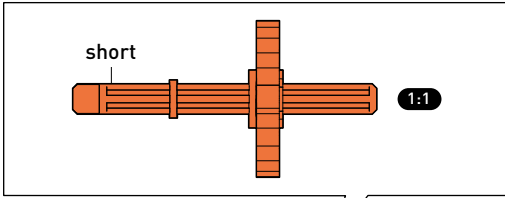


B2

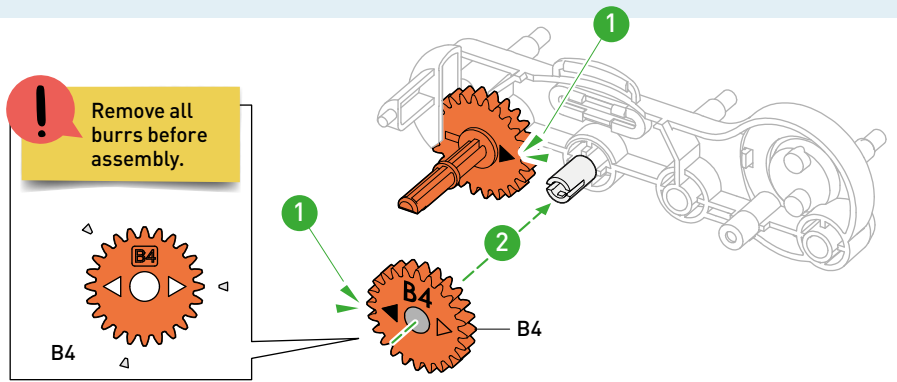


**3**

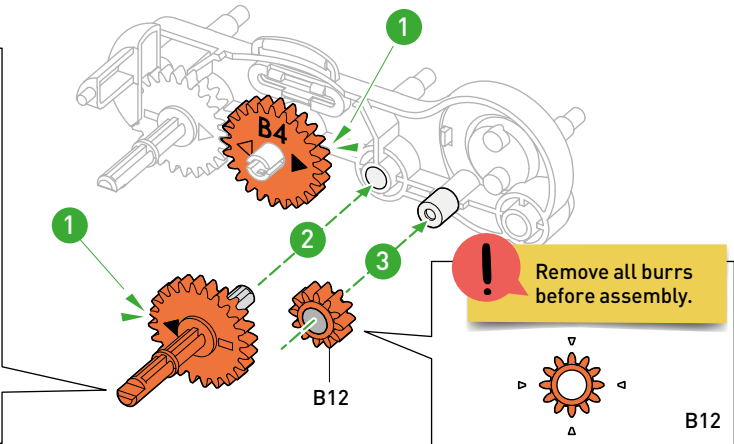
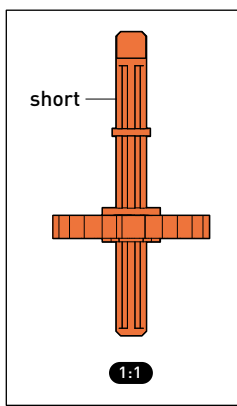
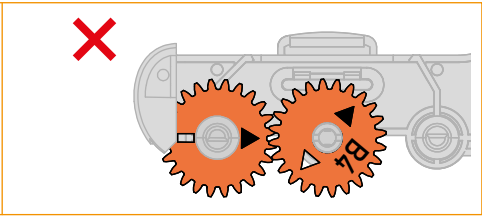
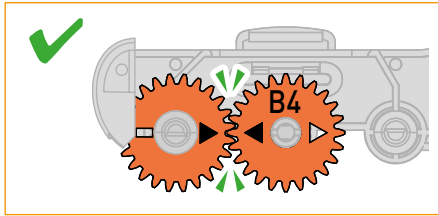
**4**



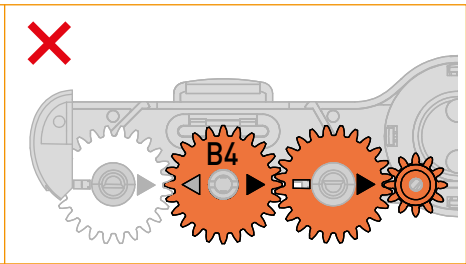
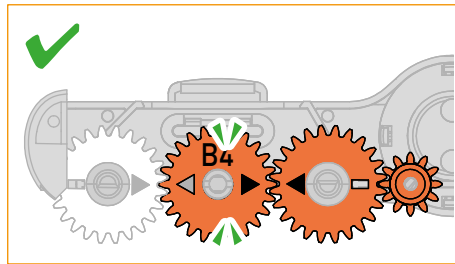
**!** Remove all burrs before assembly.

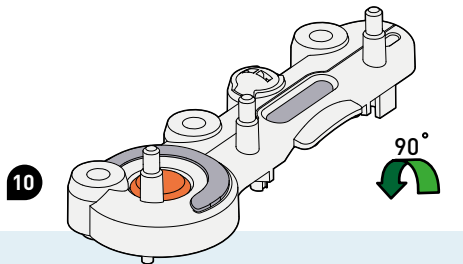
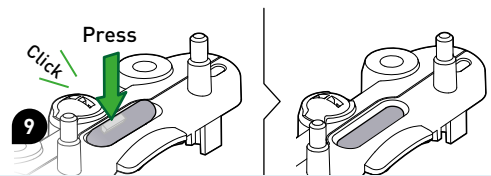
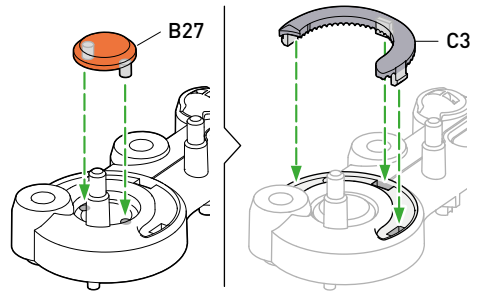
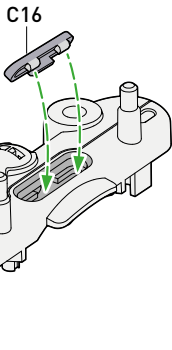
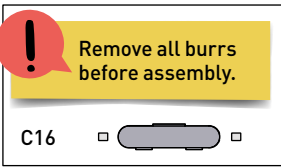
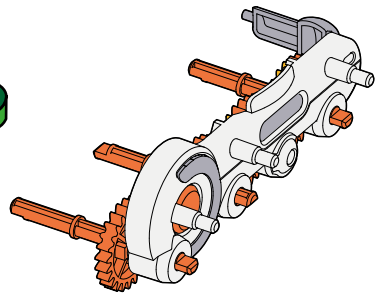
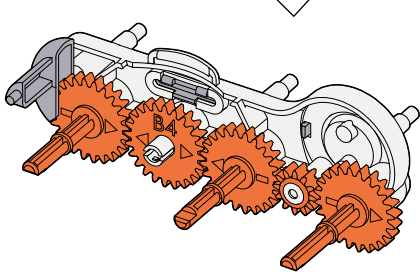
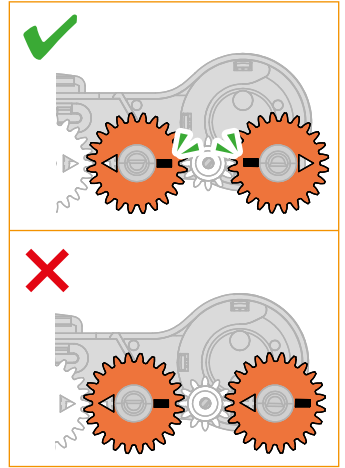
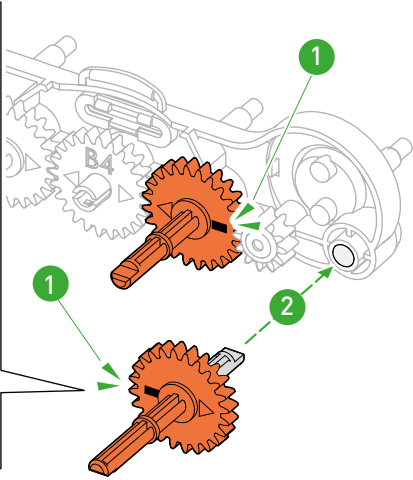
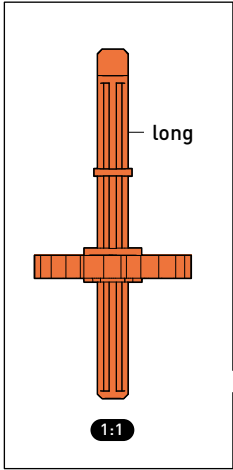


6

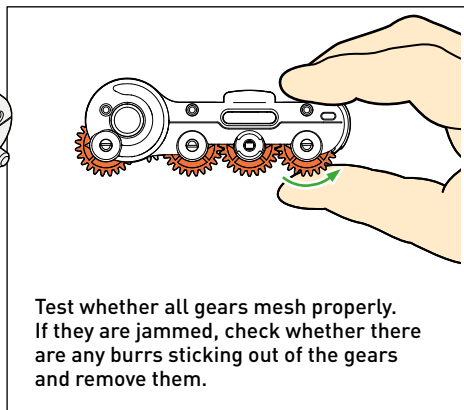
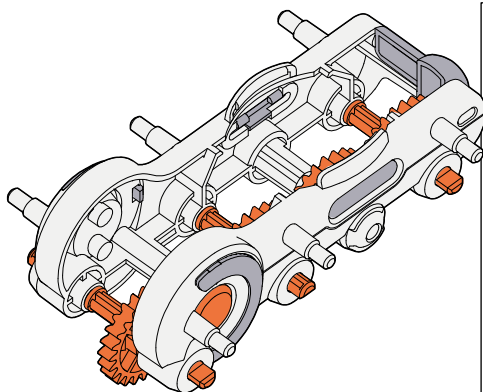
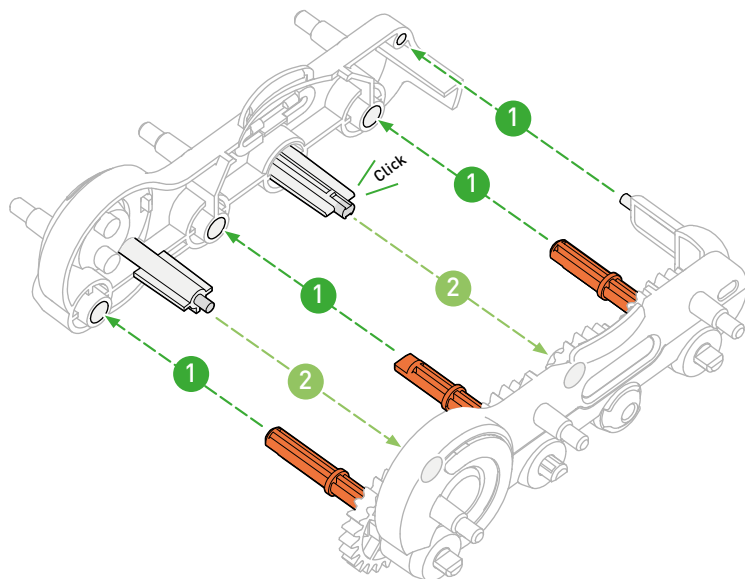


7

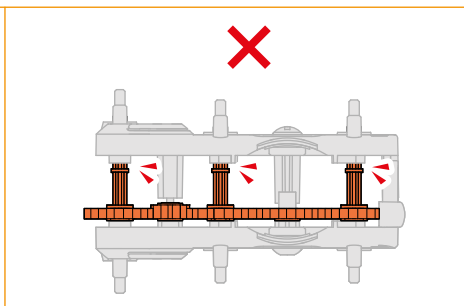
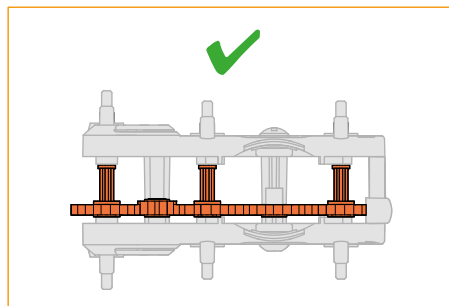


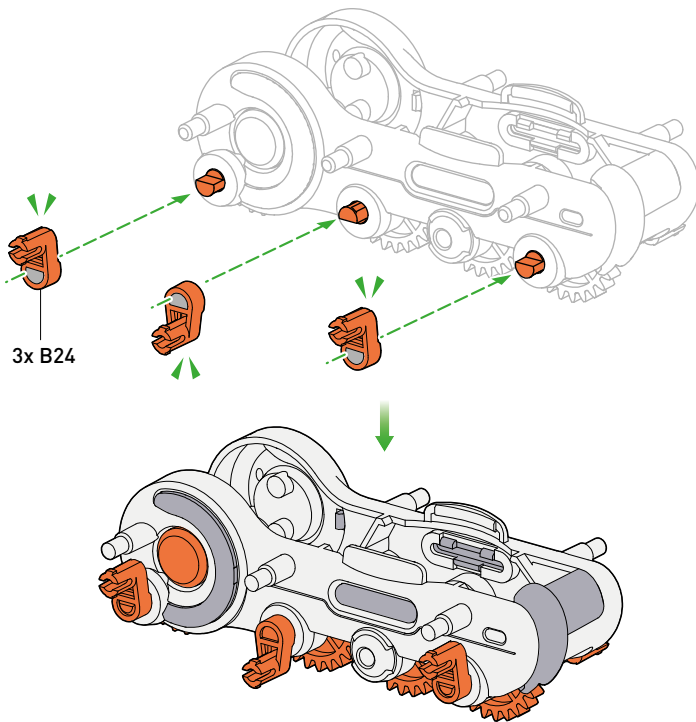


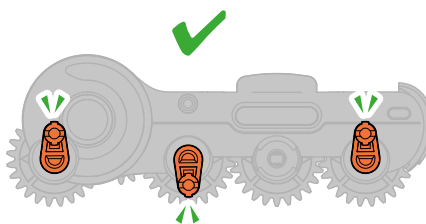




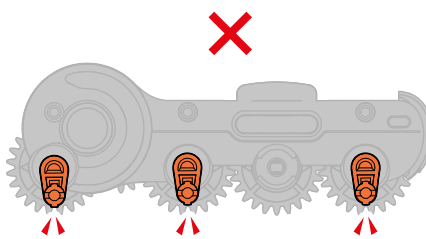
Test whether all gears mesh properly. If they are jammed, check whether there are any burrs sticking out of the gears and remove them.

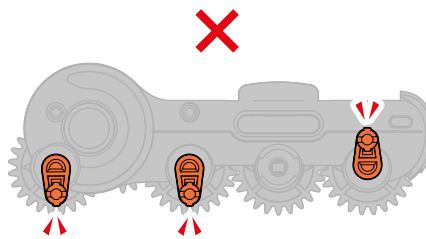


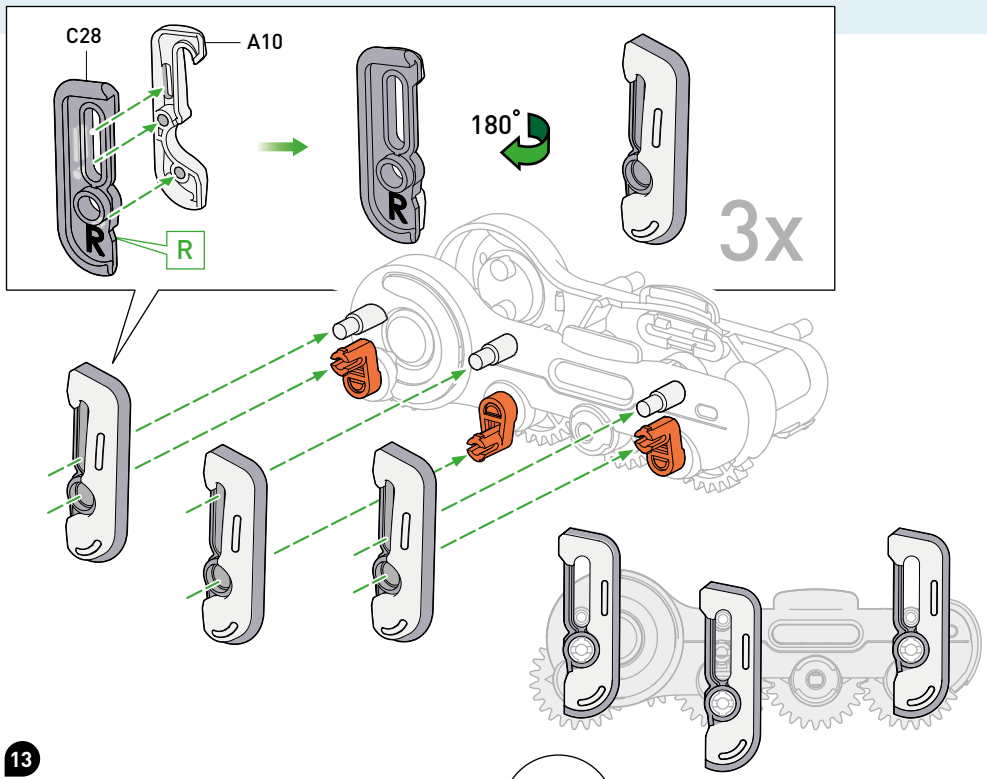




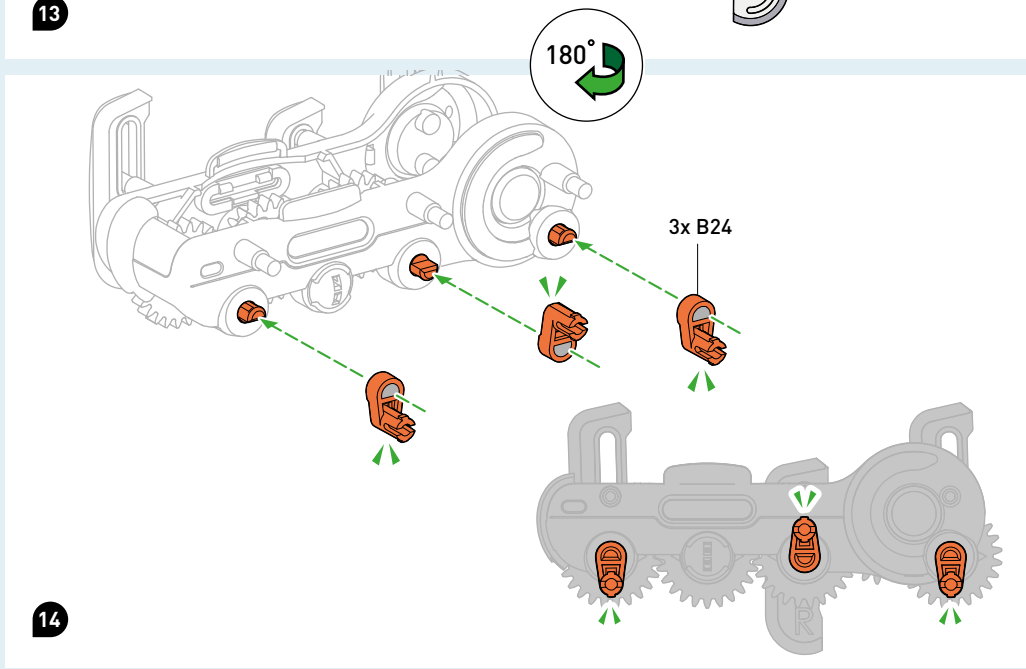
Use B24 exactly as shown here. If you cannot attach the parts in this way, please check the assembly steps on pages 30 to 32.



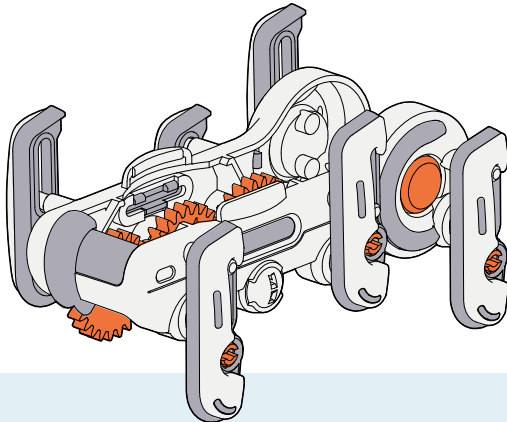
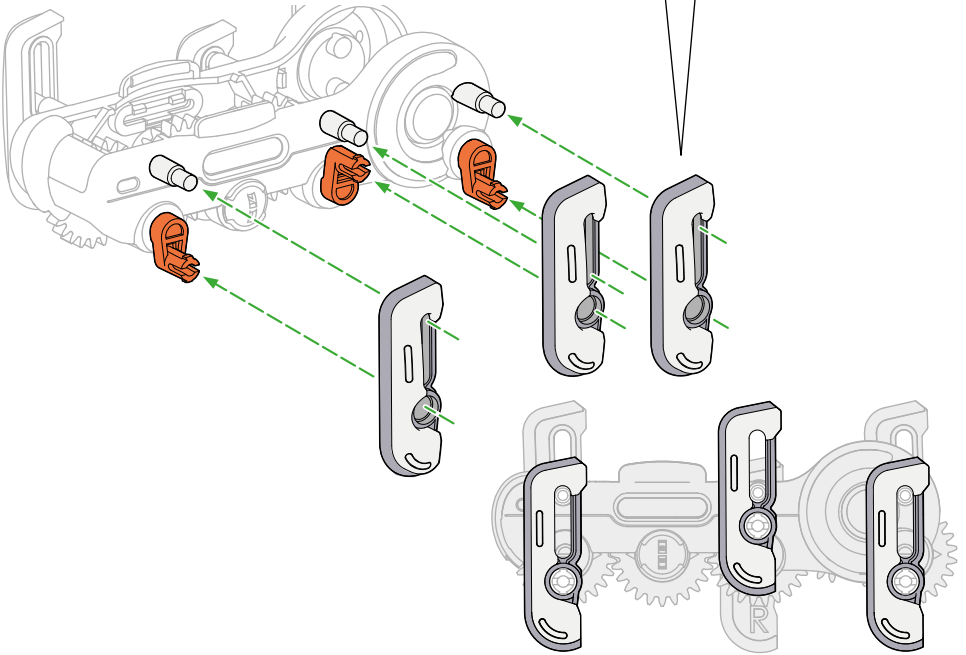
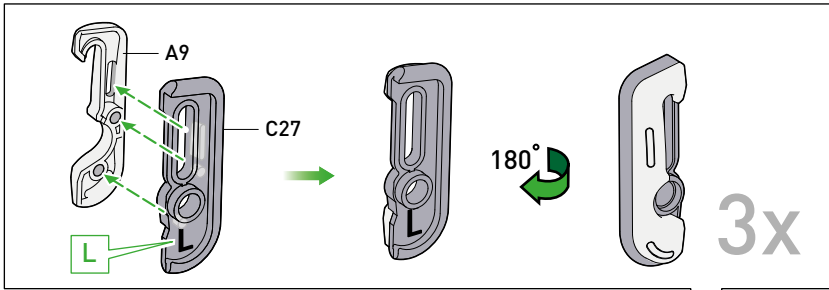




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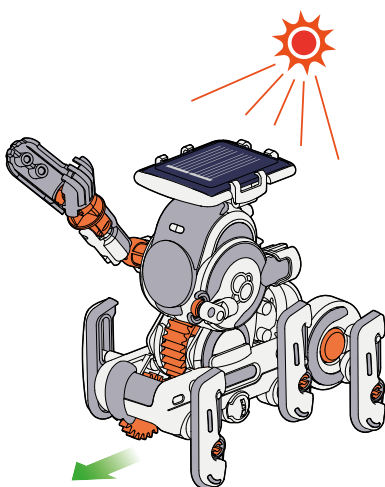
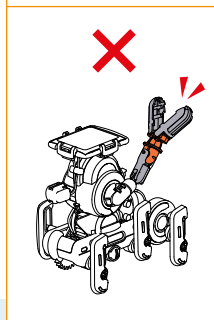
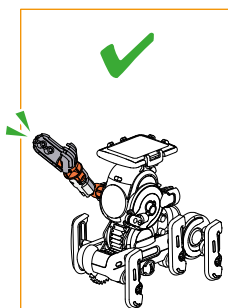
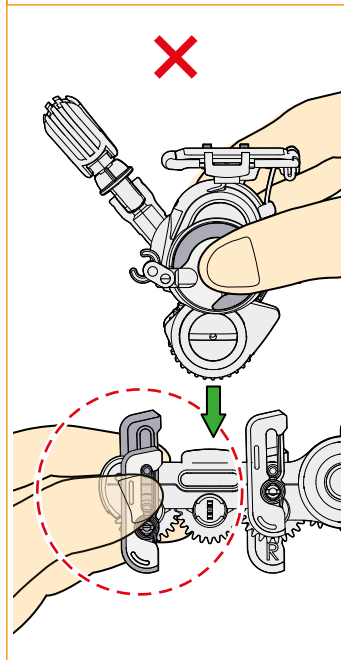
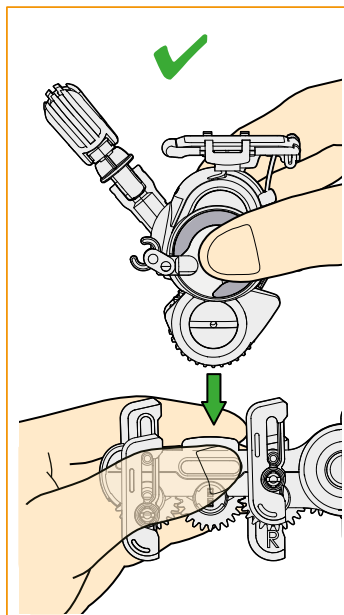
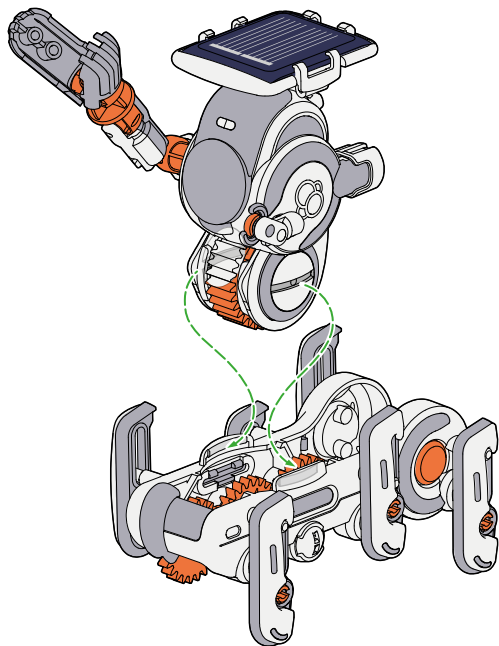


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Done

## HOW TO PLAY



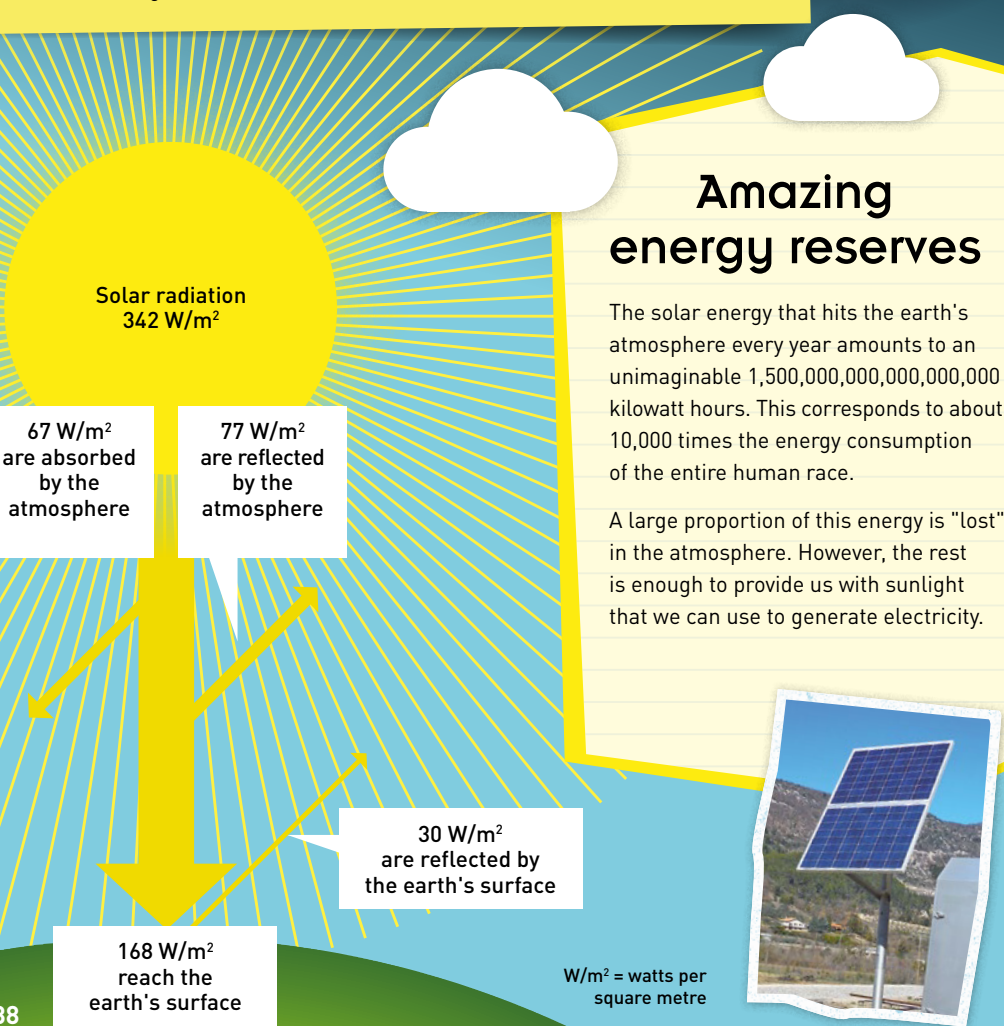


## CHECK IT OUT

# Energy FROM SPACE

— The sun is a star that is 150 million kilometres away from the earth. Despite this immense distance, solar energy has an enormous influence on our lives: Life is not possible without the sun!

The sun emits so much energy because it is a gigantic nuclear reactor in which atoms fuse together. Huge amounts of energy are emitted into space in the process. Some of this energy reaches the earth's surface. We call this radiation sunlight.



## Amazing energy reserves

The solar energy that hits the earth's atmosphere every year amounts to an unimaginable 1,500,000,000,000,000 kilowatt hours. This corresponds to about 10,000 times the energy consumption of the entire human race.

A large proportion of this energy is "lost" in the atmosphere. However, the rest is enough to provide us with sunlight that we can use to generate electricity.



W/m<sup>2</sup> = watts per square metre