

**Science  
&play®**

*ROBOTICS*

# SCORPION ROBOT

BUILD YOUR GUARDIAN SCORPION

DEDICATED APP



V65697

Authorised representative (for GB market):

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Manufacturer:

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## WARNING!

Only for children aged 8 years and older. The instructions for adults are included and must be observed.

Please keep this manual for future reference



**Clementoni®**

# REMOVING AND INSTALLING THE BATTERIES

1. Make sure that the robot is switched off.
2. Use a multi-purpose screwdriver to loosen the screw fastening the cover to the battery compartment.
3. Remove the flat batteries.
4. Insert the batteries (4 x 1.5 V AAA) and ensure that their pole markings match those on the battery compartment.
5. The batteries must be inserted by an adult.
6. Close the battery compartment and tighten the screw.
7. Make sure that the device works.

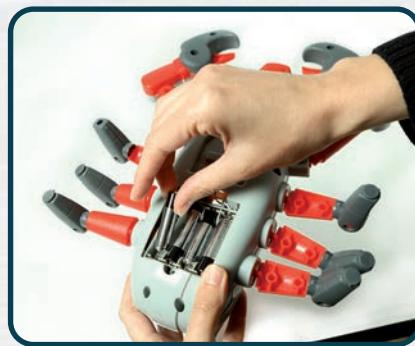
**Power supply:** 6 VDC

**Batteries:** 4 x 1.5V AAA

*Batteries not included.*

**Assembly time:** the time estimated for mounting this kit is **0.5 h/0.75 h**

**INSERTING THE BATTERIES  
ASK AN ADULT TO HELP YOU!**



## INSTRUCTIONS FOR SUPERVISING ADULTS:

This game is suitable for children aged 8 years and older. An adult should be present when the instrument is assembled and during handling and installation of the electrical parts.

## INTRODUCTION

With this kit you will be able to build a loyal **Guardian Scorpion**, but be careful not to make it angry: it might sting you with its tail! Made up of more than **100 pieces**, the Scorpion Robot will become a loyal play companion with its super-realistic movements and its sensors.

Build it with your friends or your family and discover how it manages to move every one of its parts!

By downloading the **free app** you can fully exploit the potential of your Scorpion thanks to its various functions and 2 different play modes!



## Printed circuit board

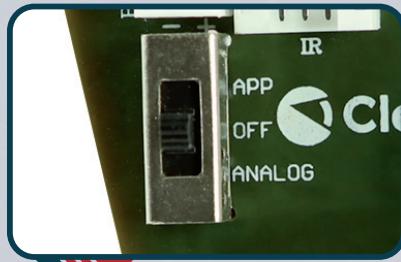
Your robot's **PCB (Printed Circuit Board)** consists of a **glass-reinforced epoxy** (a green insulating material) **base plate** on which the **electrical components** (resistors, capacitors, inductors, etc.) are mounted, plus a **copper circuit** (metallic green) used to conduct electricity through the components.

**Move the switch to access the play modes:**

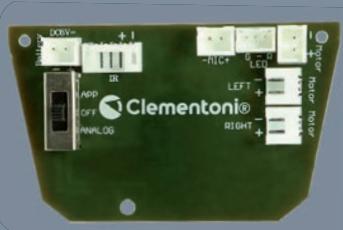
**ANALOG:** Clapping mode

**OFF:** Robot off

**APP:** App mode



**The PCB and its components.**



**ANALOG-OFF-APP switch**

**IR:** Molex infrared sensor

**Battery:** Molex battery block

**MIC:** Molex microphone

**LED:** Molex LED

**Motor:** Molex tail motor

**Motor LEFT:** Molex left legs motor

**Motor RIGHT:** Molex right legs motor

## Infrared sensor

The infrared sensor (abbreviated with "**IR sensor**") is made up of an **emitting LED** and a **receiver photodiode** and is used to identify objects lying in its range of action.

The emitter sends infrared signals in front of itself (signals with **wavelengths between 900 nm and 1000 nm**).

If an object is present, the emitted signal is reflected backwards and the receiver detects the obstacle's presence.

If there is no object, the signal is not reflected back to the photodiode, so the sensor understands that there are no objects lying ahead.

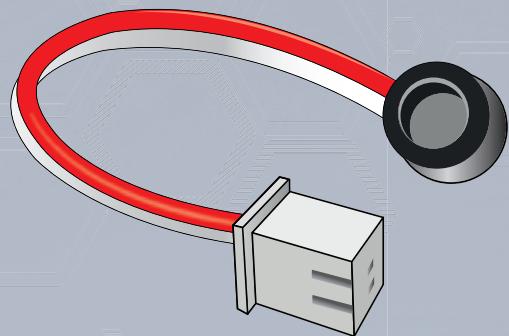


## Microphone

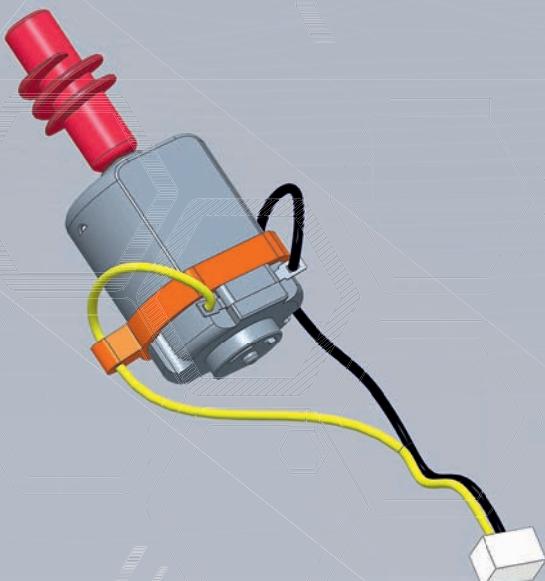
The **microphone** is a component that converts sound pressure waves into electrical signals. The microphone fitted on the scorpion can perceive your hand-clapping or high-frequency signals and transform them into electrical impulses.

**High-frequency** signals are mechanical sound waves.

Unlike acoustic phenomena, strictly speaking, the frequencies characterising ultrasounds are higher than those audible by the average human ear.



## Motor with gear reducer



The “**involute screw**” is often called a “**worm screw**” and is designed to transmit motion from one rotation axis to another one that is perpendicular to it. This type of screw attached to the motor allows for reducing the speed of motion transmitted by the motor while considerably increasing the torque.

These types of gear reducers are used in any application involving machines, both hydraulic and electrical. Below are a few application examples of gear reducers: **conveyor belts, medical machinery, kitchen blenders, printing devices, vehicles, construction machinery**.

This type of gear can be found attached to all 3 motors of your Scorpion Robot.

## ROBOTICS



Robotics is a discipline combining scientific, electronic, information technology and mechanics knowledge that is becoming increasingly important for industries, but also for our daily lives. Its aim is to study and develop effective methods to automatically execute commands capable of resolving problems. The instrument that enables robotics to attain this goal is the robot. The term "robot" derives from the Czech word "**robota**" ("drudgery" in English), which was used for the first time by the writer Karel Čapek, but its true origins lie in the Slavic "rabataa", denoting a machine capable of replacing man in performing a task.

The robot is a machine capable of helping man in many activities (assembling and transporting objects, cleaning floors, and so forth) thanks to the so-called **Artificial Intelligence (AI)**, its ability to behave as if it were able to reason. However, the true power of robots lies in the ability to reason of the programmer who instructs them what to do. It is reasonable to expect an increasingly intense and widespread use of robots in the future, but nowadays they are already used far more than we tend to believe, even though they do not at all resemble the robots we see in science-fiction films. Try recognising the robotic components in objects you use daily and discover new ones with the help of your friends.

## ROBOTS INSPIRED BY ANIMALS

Nature is often capable of surprising us, frequently proving itself more "**advanced**" than any technological device.

Its laws and mechanisms thus become a source of inspiration also for engineering and, in particular, for robotics: the study of biology, for example, has led to the creation of a new generation of robots capable of simulating the behaviour of plants or the specific characteristics of certain animals for moving in different environments.

**Soft and flexible:** these are the characteristics that machines lack but that in the future will be indispensable for having robots that are capable of helping us in the most diverse situations.



This toy is the perfect example of an animaloid: the programming and movements of the **Scorpion Robot** are inspired by scorpions, fascinating arachnids that have pincers and a poisonous tail.

## FUN FACTS ABOUT SCORPIONS

Unfortunately, popular belief has always demonised **scorpions**, yet these arachnids are not as dangerous as people have made us believe. The truth is that, apart from a few exceptions, scorpions cannot harm humans.

Of the almost **2,000 known species of scorpions**, only 25 produce a venom strong enough to threaten the life of an adult person. Their behaviour is for the most part reclusive and they rarely attack to harm. In fact, the scorpion can control when to produce venom and how much of it to inoculate from its tail depending on the specific need: to kill prey or to defend itself from potential threats.



**Did you know that these animals evolved from gigantic creatures measuring roughly one metre?** The first ancestors of these formidable animals date to over **400 million** years ago, long before the appearance of dinosaurs.

With such a long history, we can see why they are such astonishingly resistant animals. Imagine that **a scorpion can stay a whole year without eating or drinking!**

This is possible because they are able to greatly slow down their metabolism, and thanks to specially shaped lungs they can remain submerged for hours and survive.

Another distinctive feature of scorpions is that they can "**glow in the dark**".

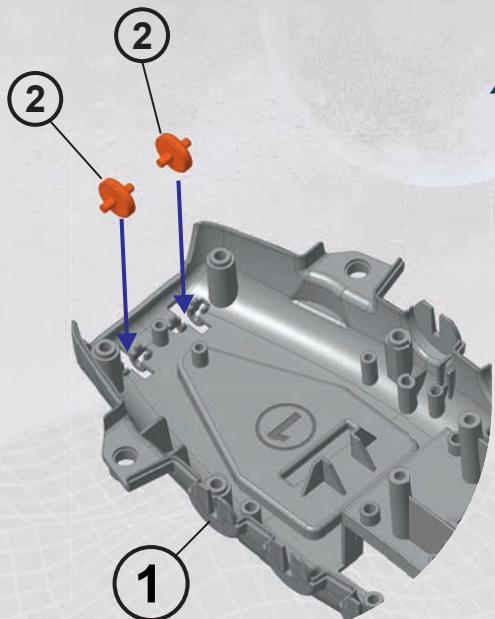
In fact, they do not shine on their own, but if they are illuminated by ultraviolet light their cuticle (i.e. their skin) **will reflect fluorescent light**.

The older the scorpion is, the more it will reflect this light.

Did you know that fossils from millions of years ago can still glow in this very special way?

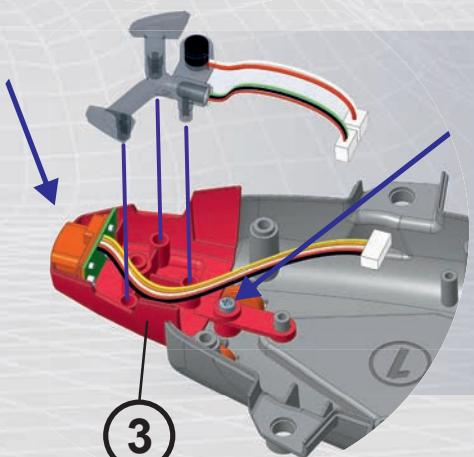
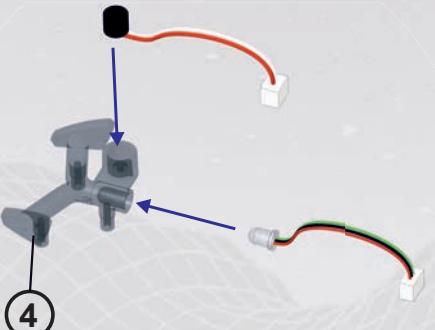


# ASSEMBLY



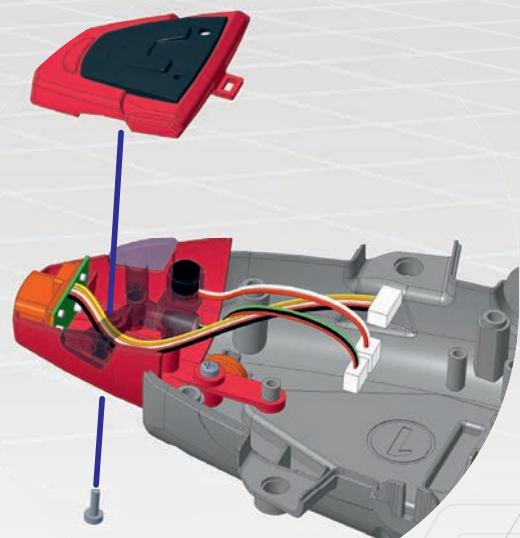
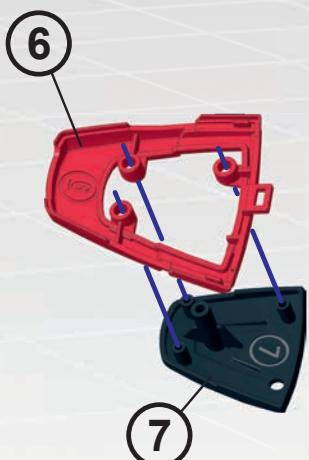
1. Insert the wheels in their housings and make sure that they click into place and turn properly.

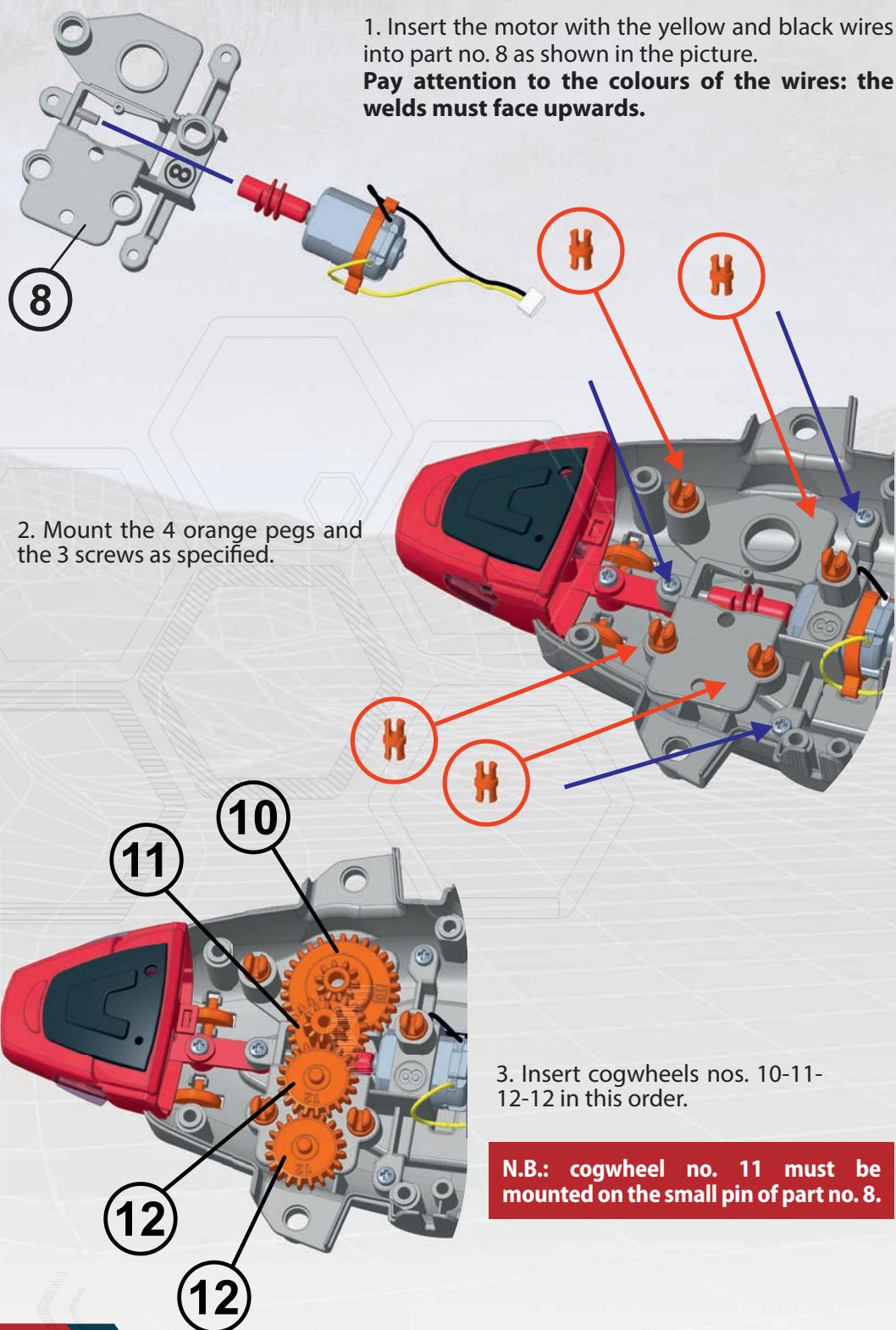
2. Insert the microphone and the LED into their respective housings on component no. 4.



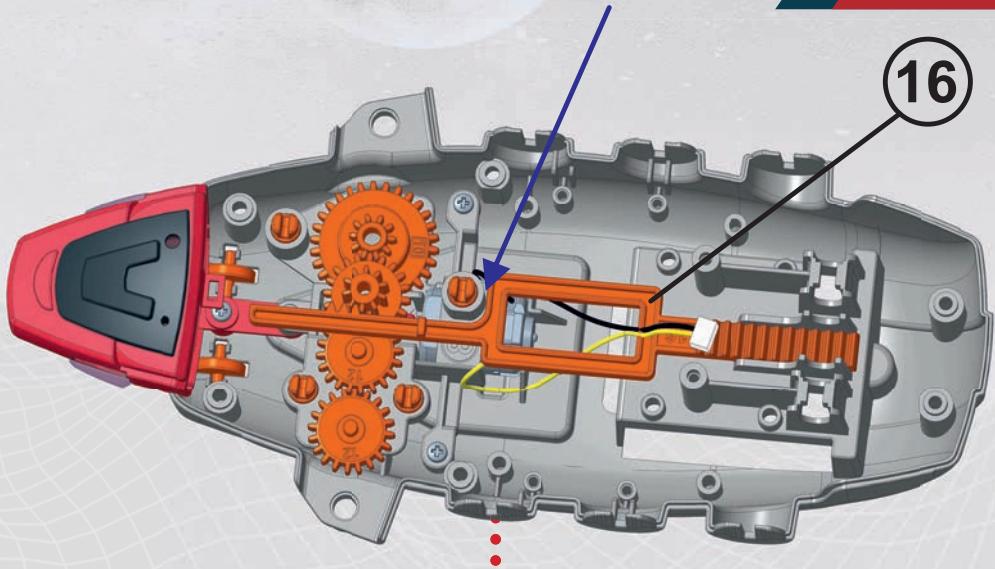
1. Place the lower part of the head and screw it on as shown in the figure.
2. Insert the IR sensor with the welds facing upwards and pass the wires to the side of the central hole as shown in the figure.
3. Place component no. 4 in the relevant spaces as shown in the picture.

**N.B.: the sensor wires must face upwards as shown in the figure.**

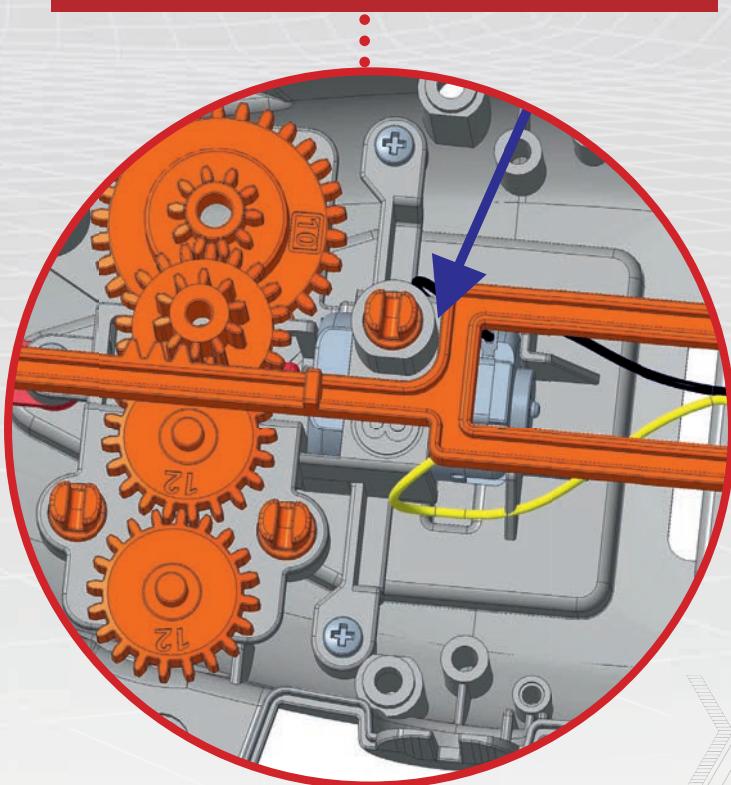


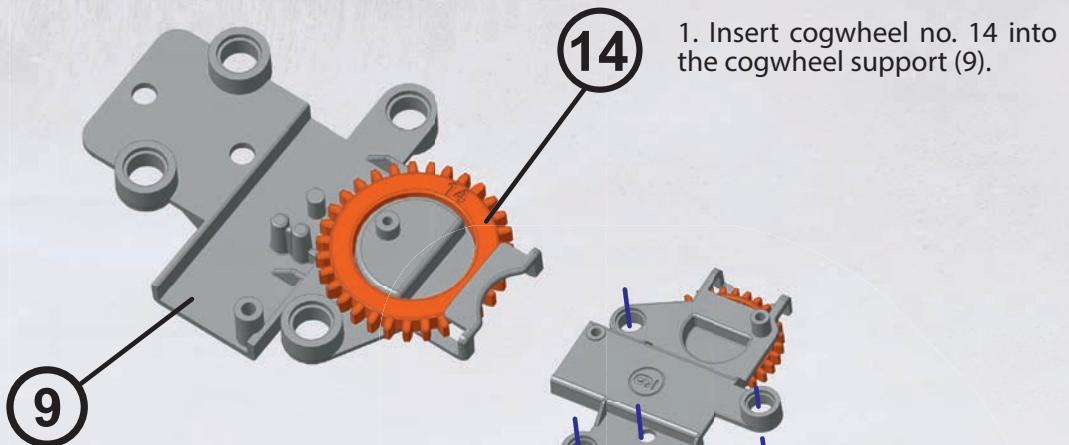


1. Place the rack in the appropriate housing as shown in the picture.
2. Make the head slide until it touches the pin.
3. Pass the motor wires through the central hole.



**N.B.: make sure that you remove all protruding parts of the rack when you detach it from the sprue.**

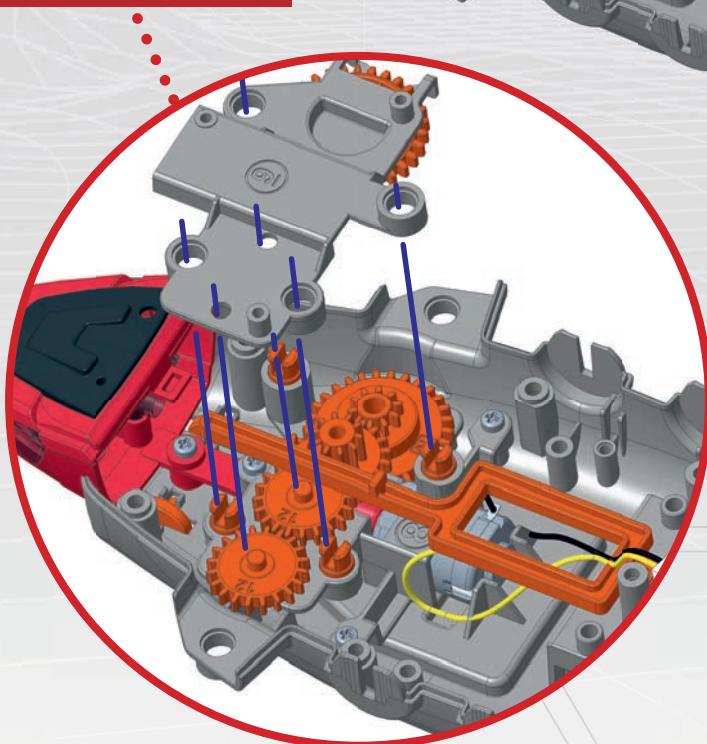
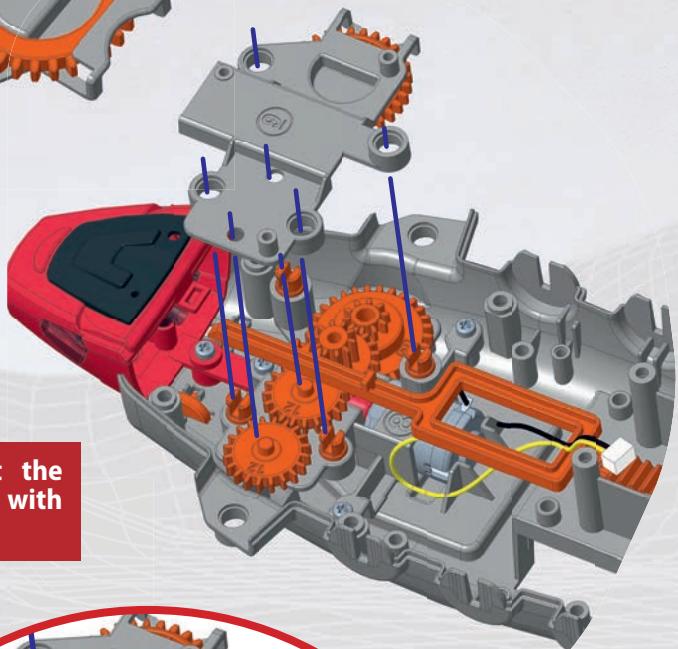




1. Insert cogwheel no. 14 into the cogwheel support (9).

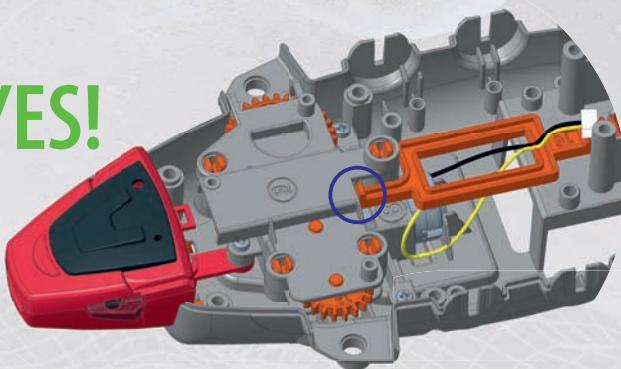
2. While holding in place cogwheel no. 14 that has just been mounted, turn part no. 9 upside-down and mount it as shown in the picture.

**WARNING!** Make sure that the cogwheel pins are aligned with the holes of part no. 9.



**IMPORTANT!** Once the cogwheel block has been assembled, the tooth of the rack shown below must be in the fully forward position as shown in the picture.

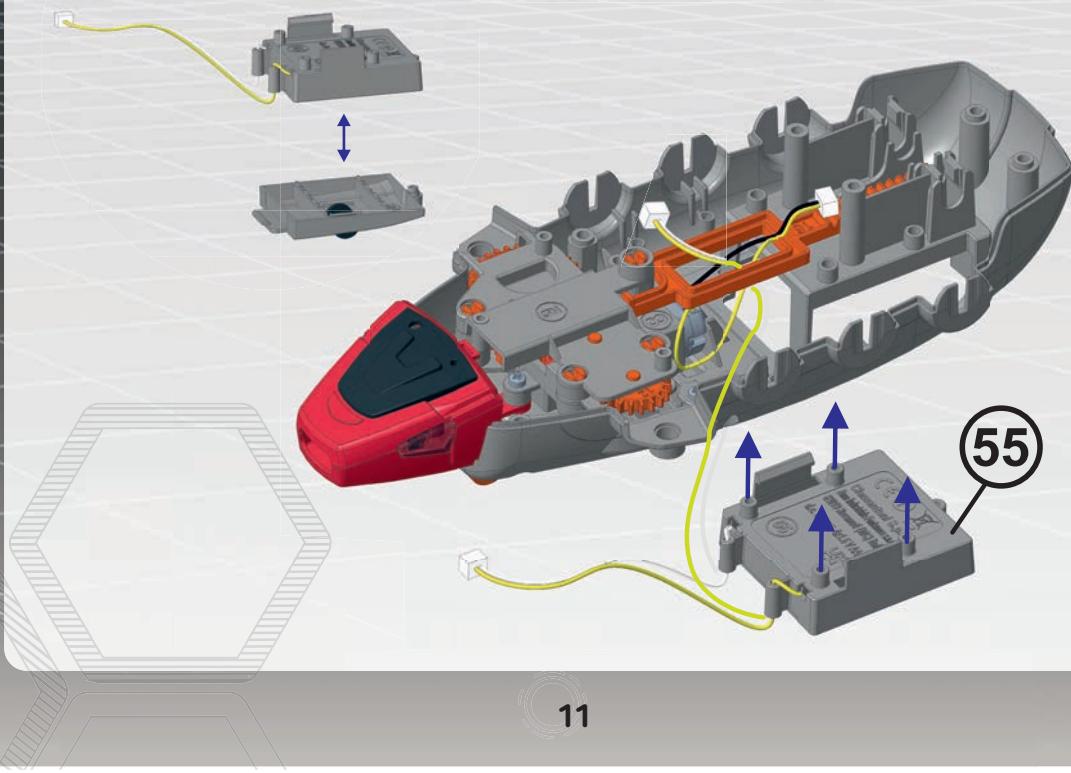
**YES!**

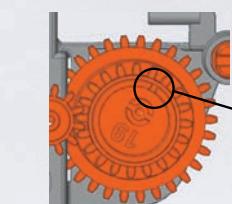
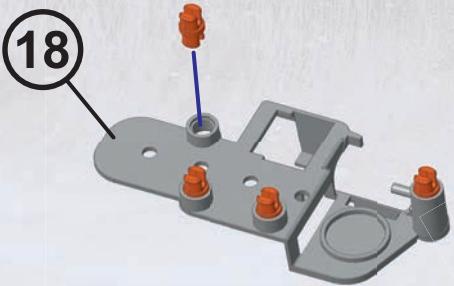


**NO!**

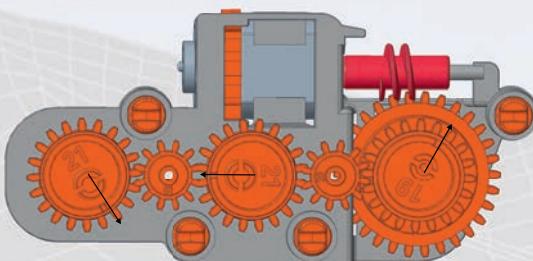


1. Unmount the cover of the battery compartment (55).
2. Insert the battery compartment from underneath by passing the wires through the central hole of the rack.
3. After inserting it, press until you hear a slight “clack”.

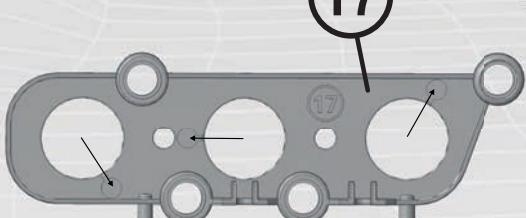




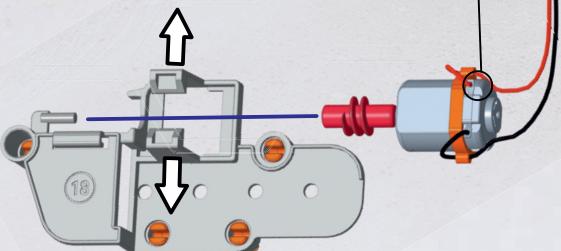
Cogwheels nos. 19 and 21 have small cuts that will help you to orient them correctly during the assembly phase.



21 20 21 20 19



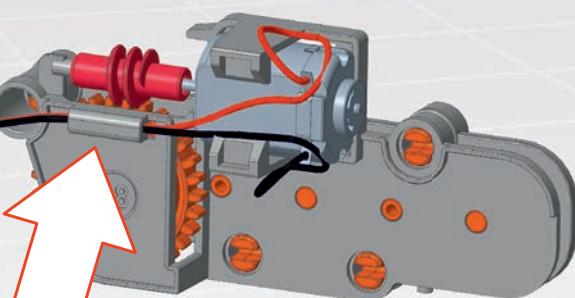
1. Widen the flaps and insert one of the motors with the red and black wires.

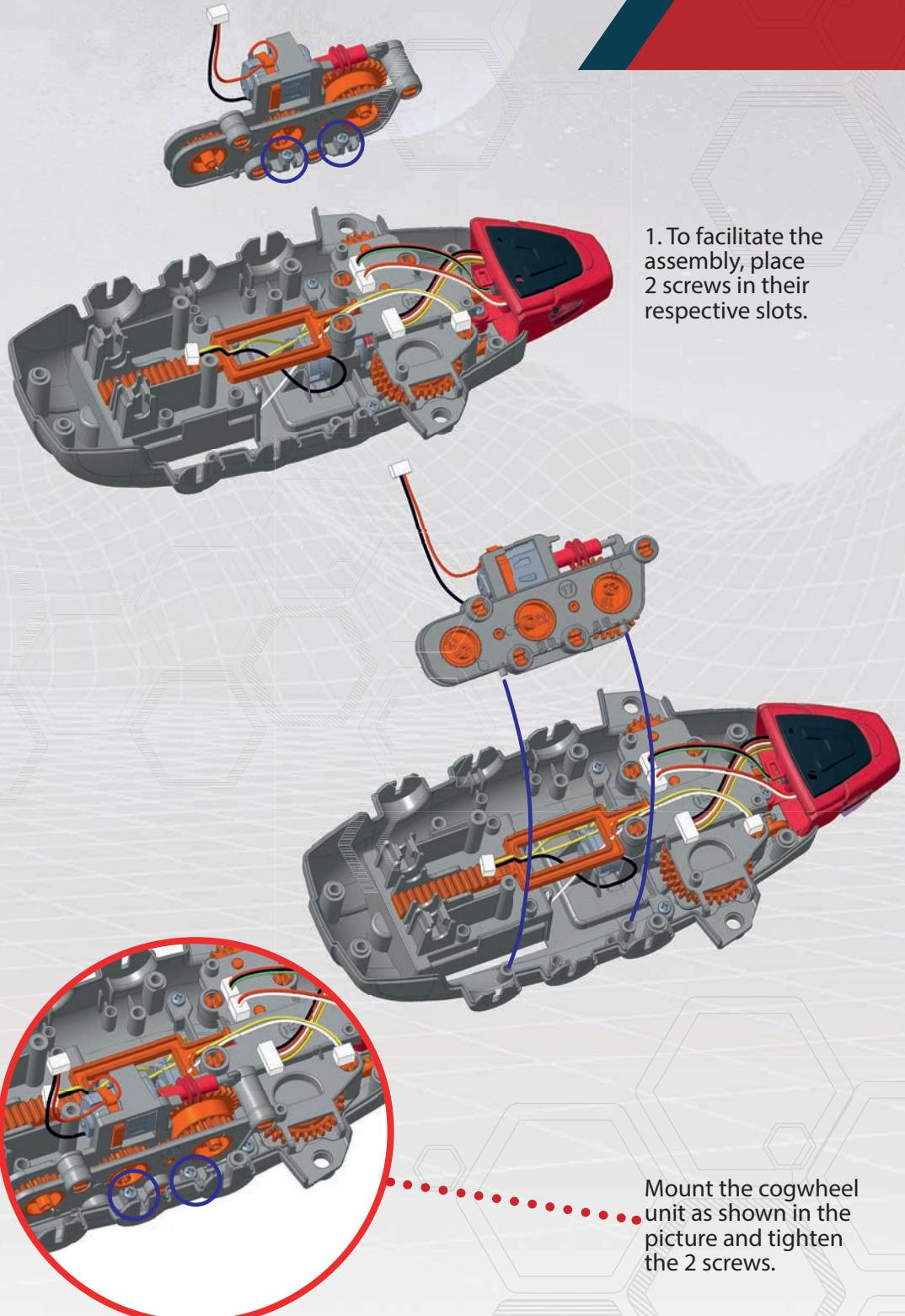


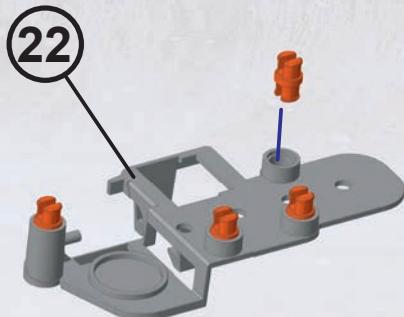
2. Make sure that the motor is completely inserted and that the black band protrudes as shown in the figure. Mount the cogwheels and adjust them as shown in the picture.

3. Mount part no. 17 on part no. 18, making sure that the cogwheel pins and the pegs are aligned with the respective holes.

4. Before mounting the cogwheel supports, pass the wires as shown in the figure.

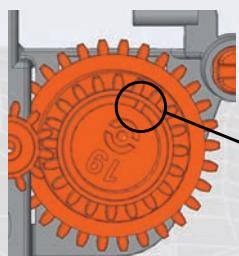
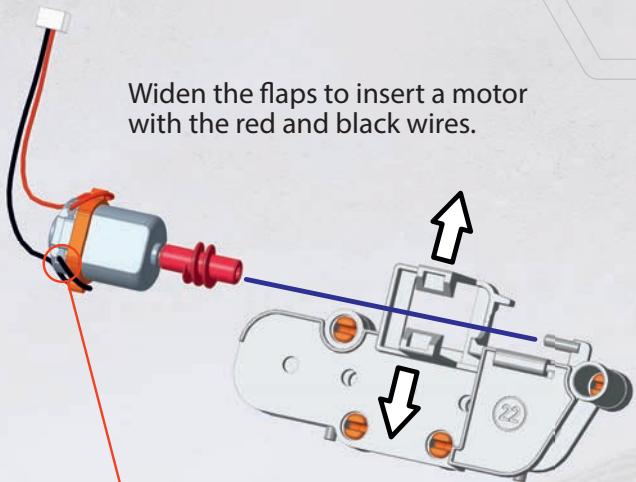






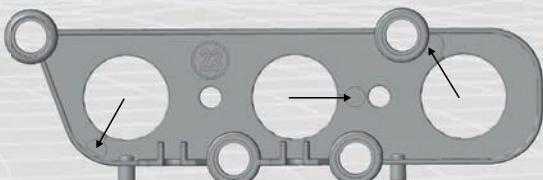
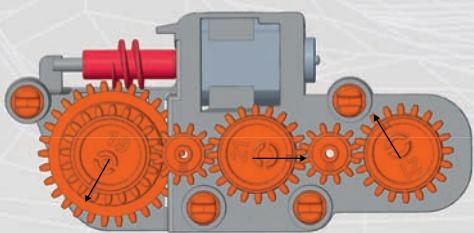
Perform the same procedure shown on page 12.

Widen the flaps to insert a motor with the red and black wires.

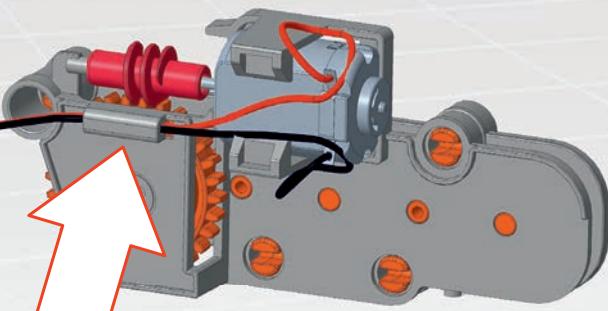


The wire welds must be on the same side of number 22, not behind.

Cogwheels nos. 19 and 21 have small cuts that will help you to orient them correctly during the assembly phase.

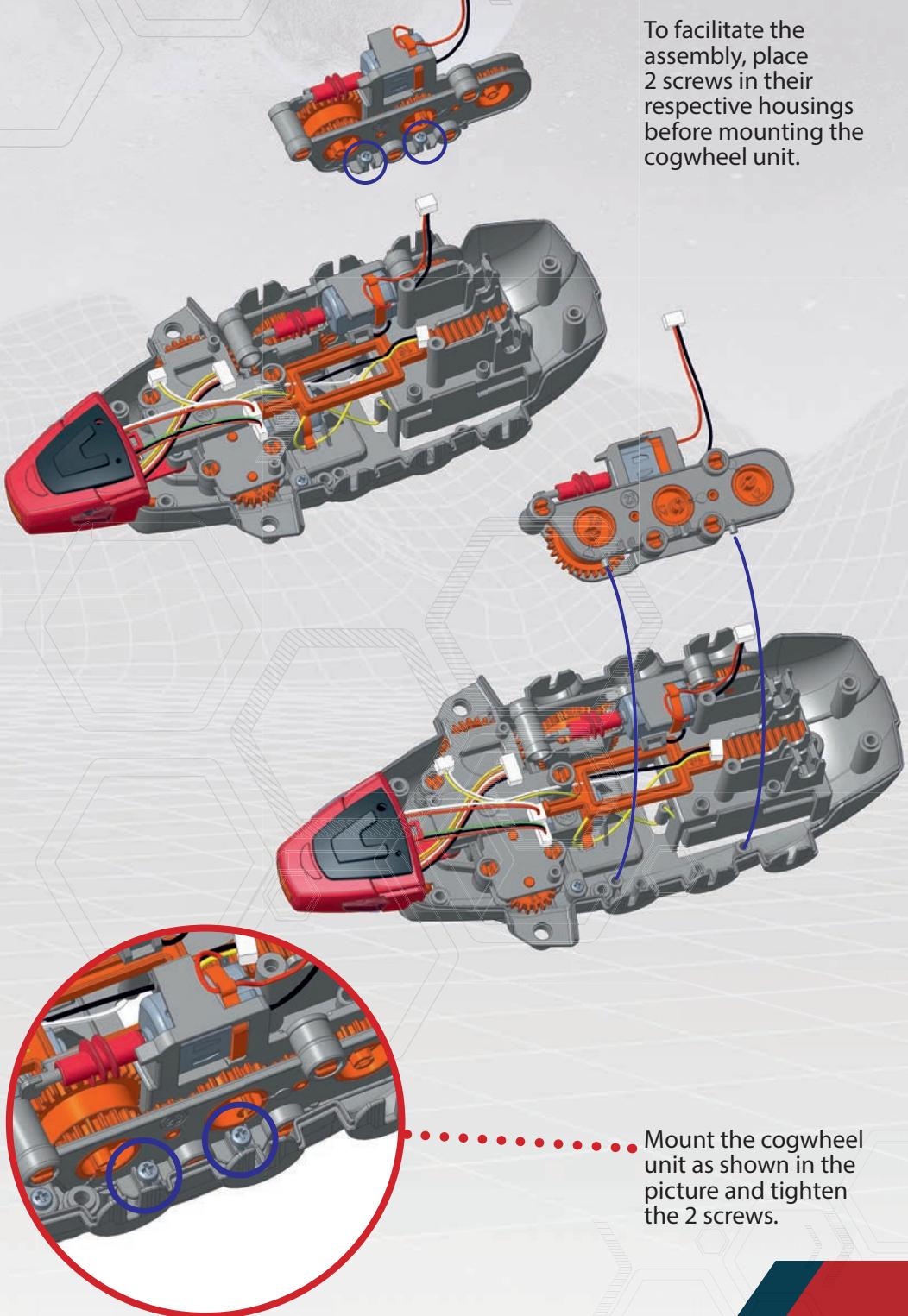


19 20 21 20 21



Before mounting the cogwheel supports, pass the wires as shown in the figure.

To facilitate the assembly, place 2 screws in their respective housings before mounting the cogwheel unit.

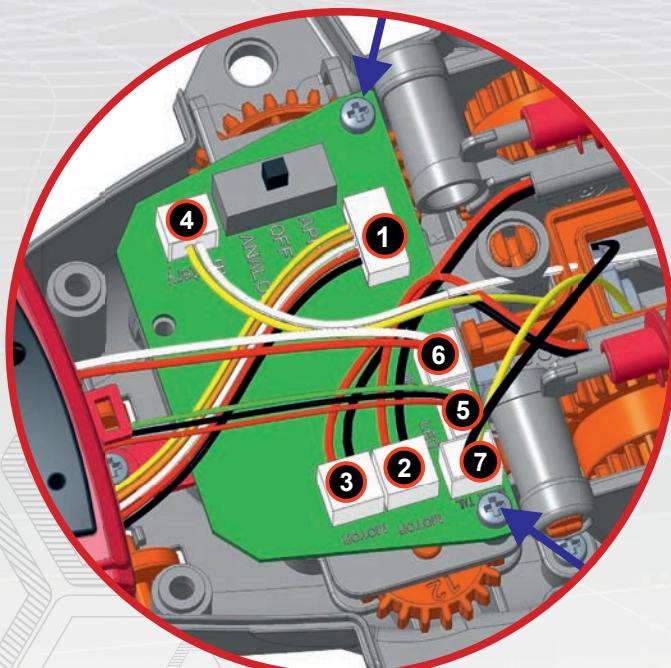
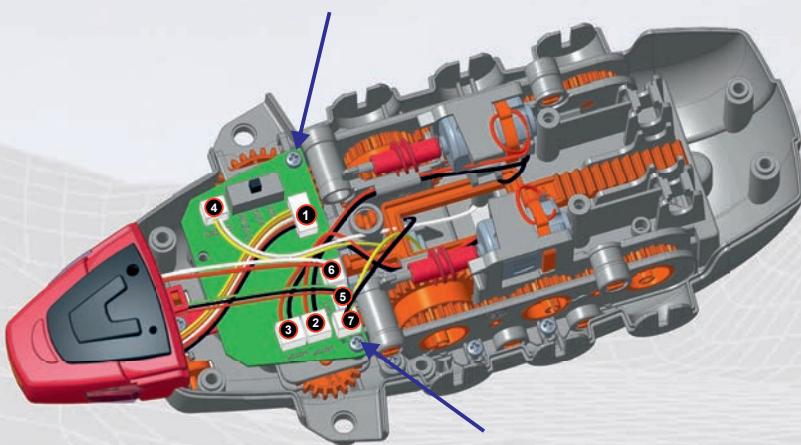


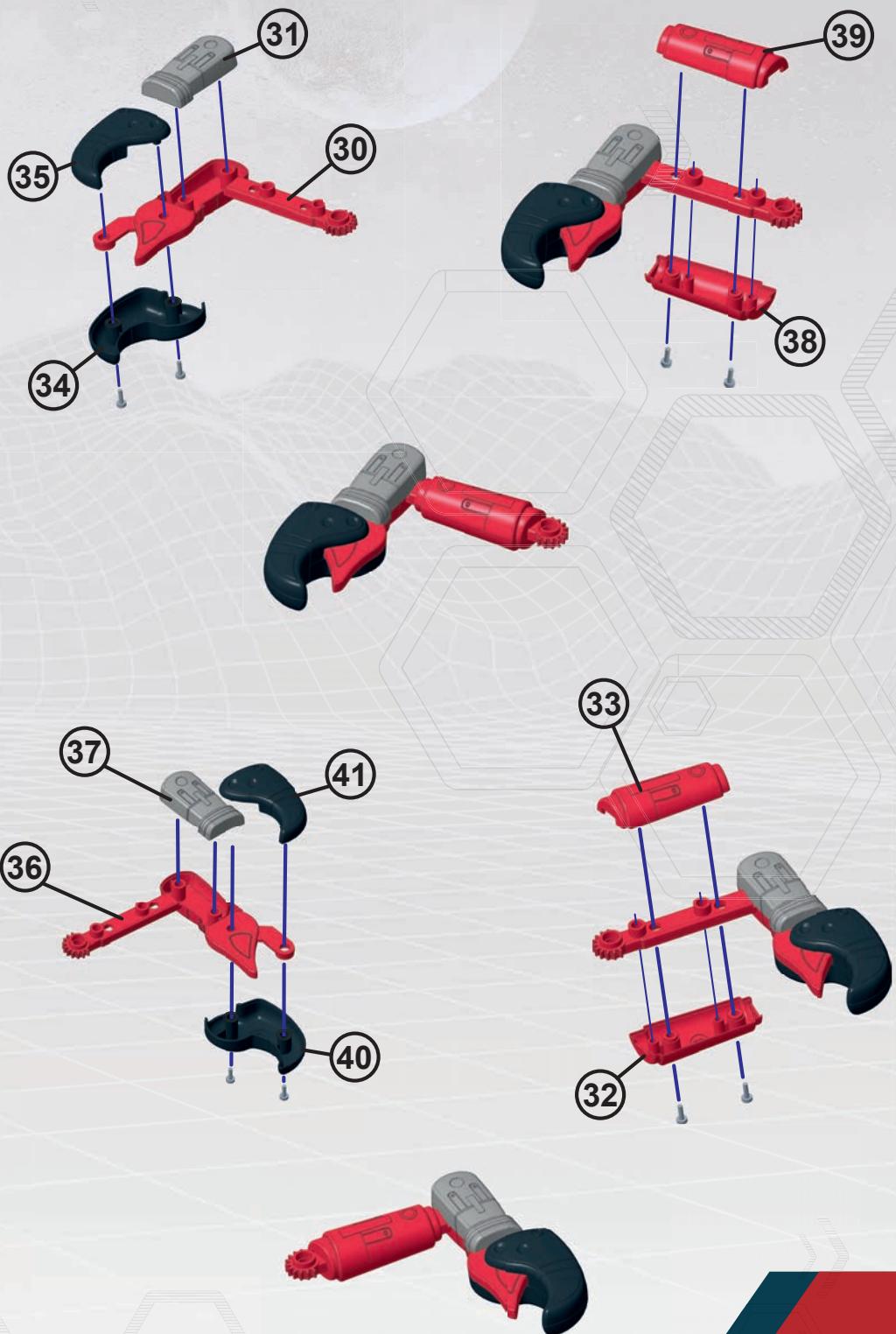
Mount the cogwheel unit as shown in the picture and tighten the 2 screws.

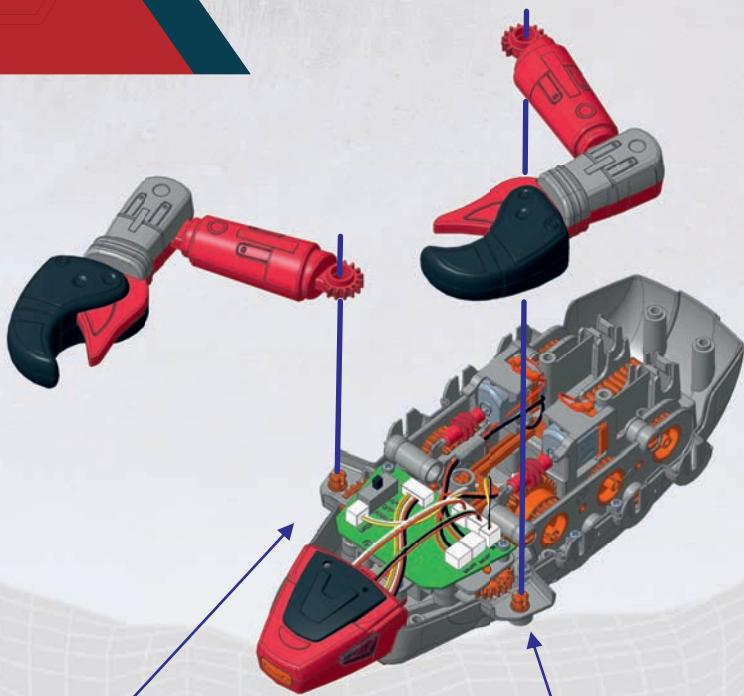
**Mount the printed circuit board** by screwing on only the two screws specified.  
*(Use the two smaller screws included in the bag)*

Then, connect the wires in the following order:

1. IR sensor (5 wires).
2. Left motor (red and black wires).
3. Right motor (red and black wires).
4. Battery compartment (white and yellow wires).
5. LED (3 wires: green, black and red).
6. Microphone (white and red wires).
7. Motor for tail and pincers (yellow and black wires).





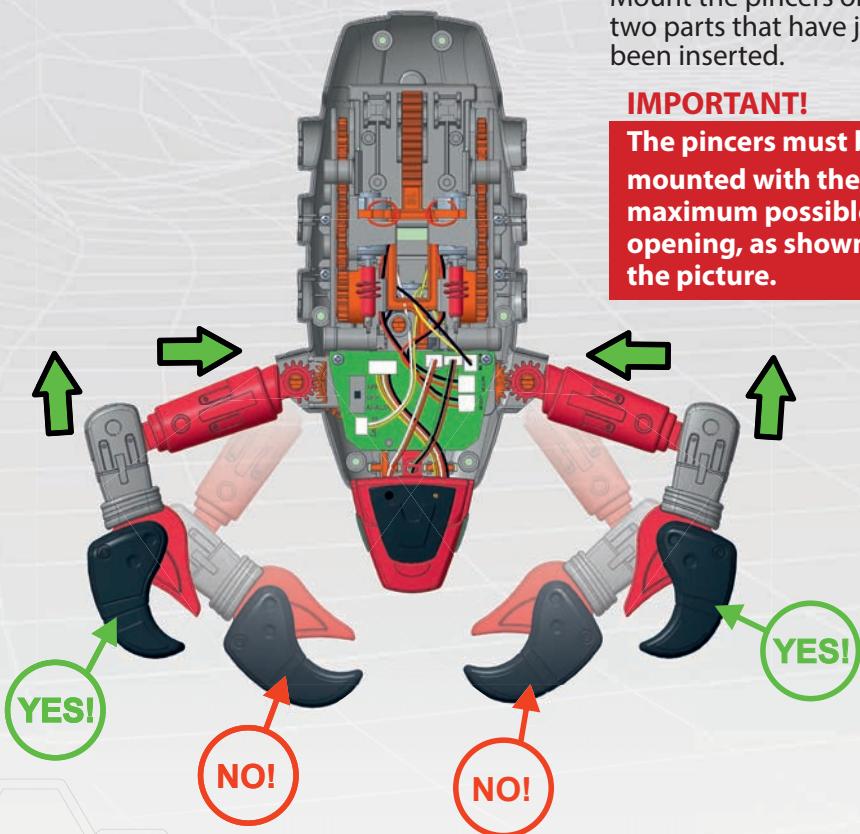


Insert 2 orange pegs.

Mount the pincers on the two parts that have just been inserted.

**IMPORTANT!**

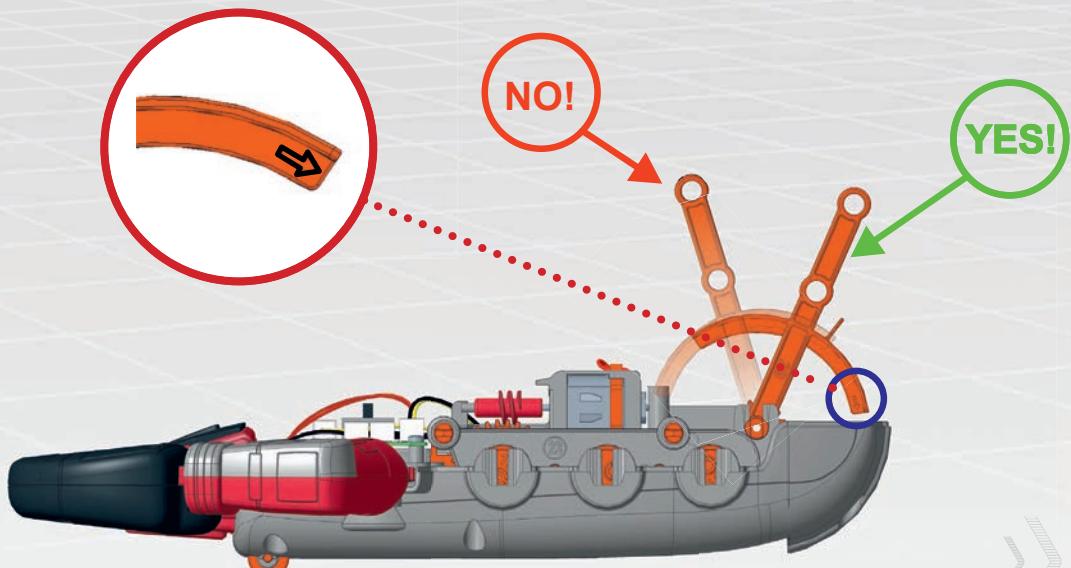
The pincers must be mounted with the maximum possible opening, as shown in the picture.

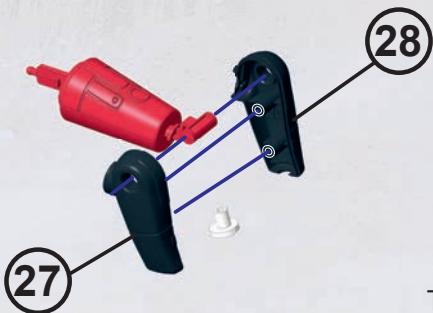
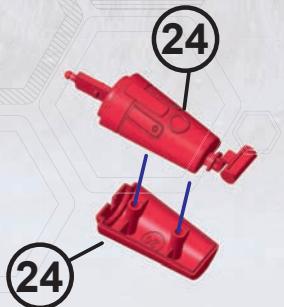




**IMPORTANT:** mount the tail pin (29) inclined and with the arrow facing backwards, as shown in the picture.

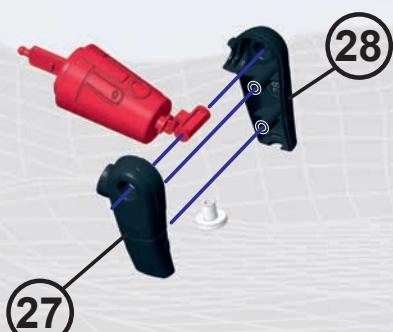
These steps are important to ensure that the pincers and tail function properly. Both the pincers and the tail pin must be fully “open” before closing the body with the top part.





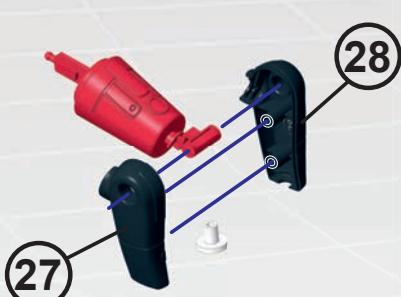
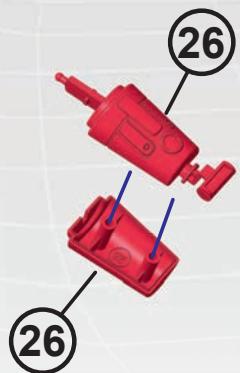
x2

This symbol is visible under the leg.



x2

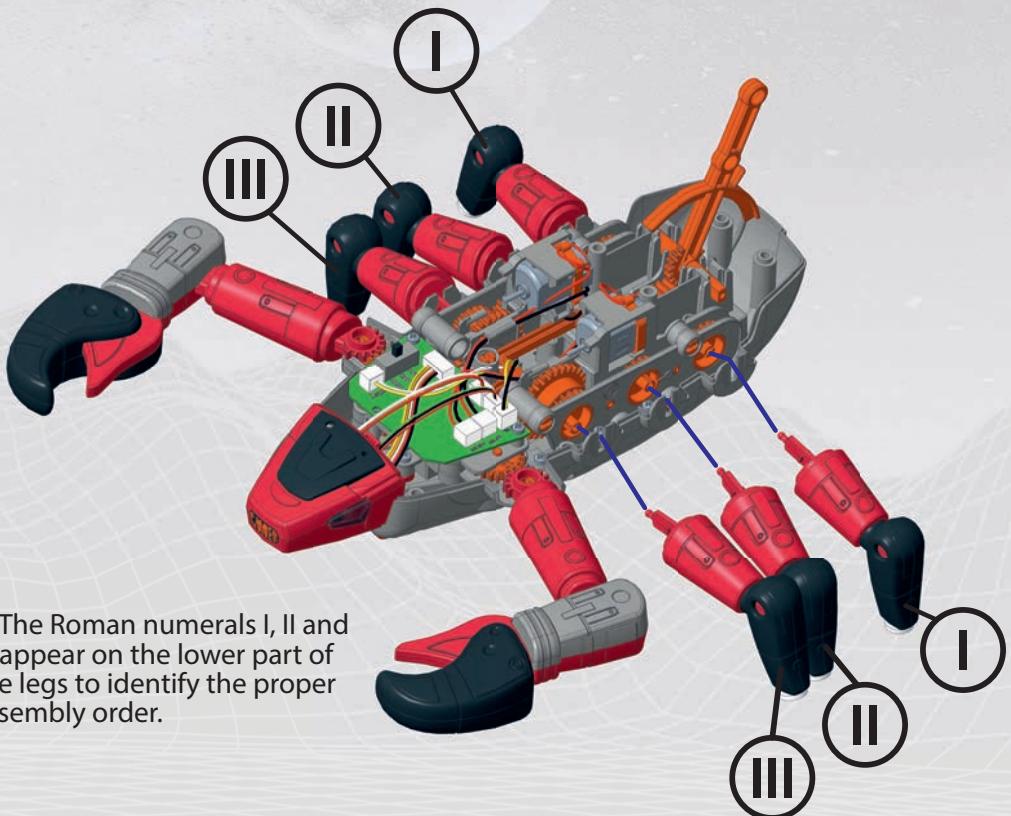
This symbol is visible under the leg.



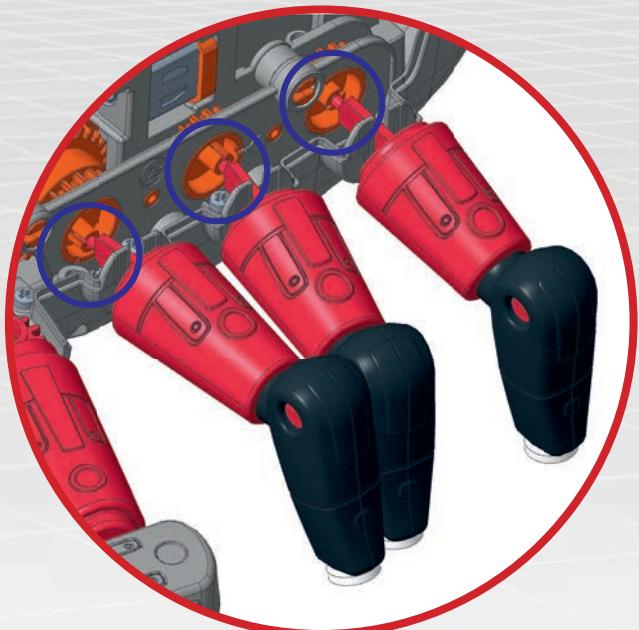
x2

This symbol is visible under the leg.

1. Mount the legs in the specified order.

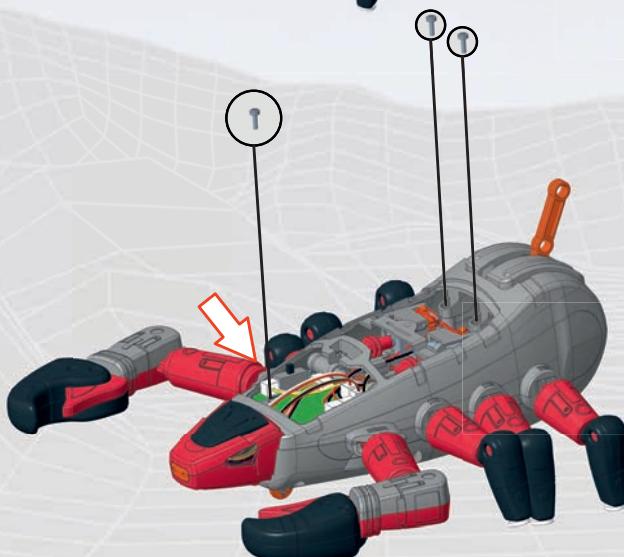


2. The Roman numerals I, II and III appear on the lower part of the legs to identify the proper assembly order.

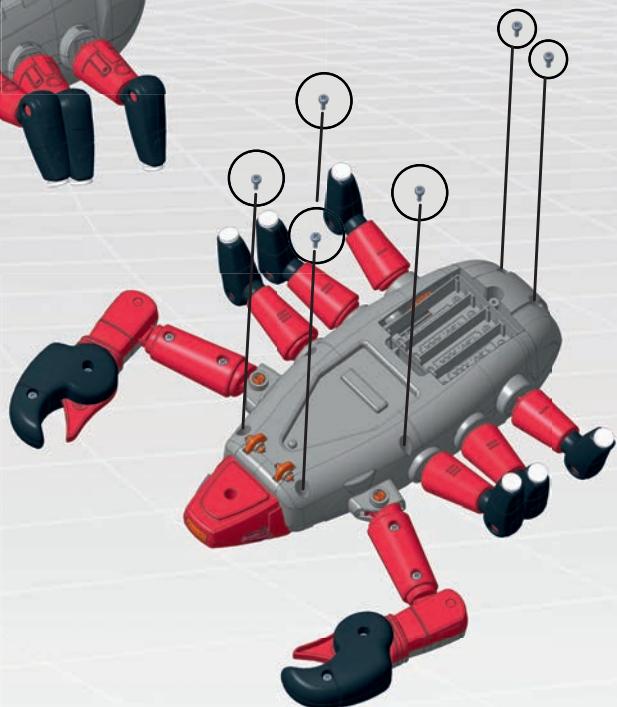


3. **Take care** to ensure that the small spheres on the ends of the legs slot into the relevant cylinders and make sure that they do not come out of their housing when the body is closed with the upper part.

1. Mount the upper body, making sure that the orange tab of the tail pin protrudes from the slot as shown in the figure.



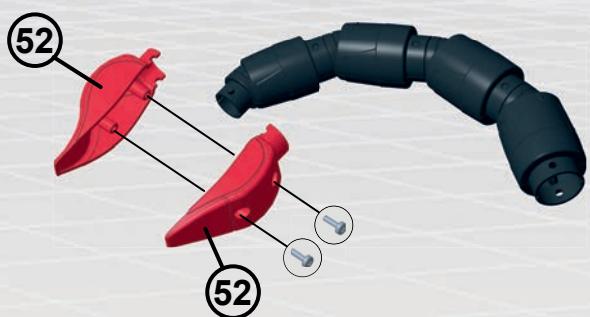
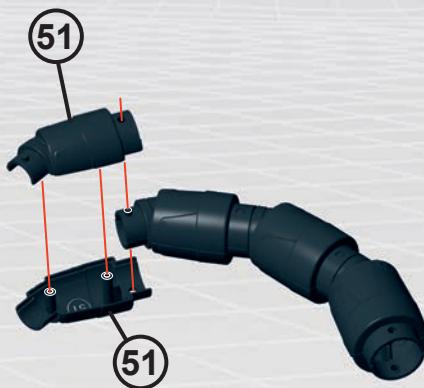
2. Be careful not to pinch the wires when inserting the screw.

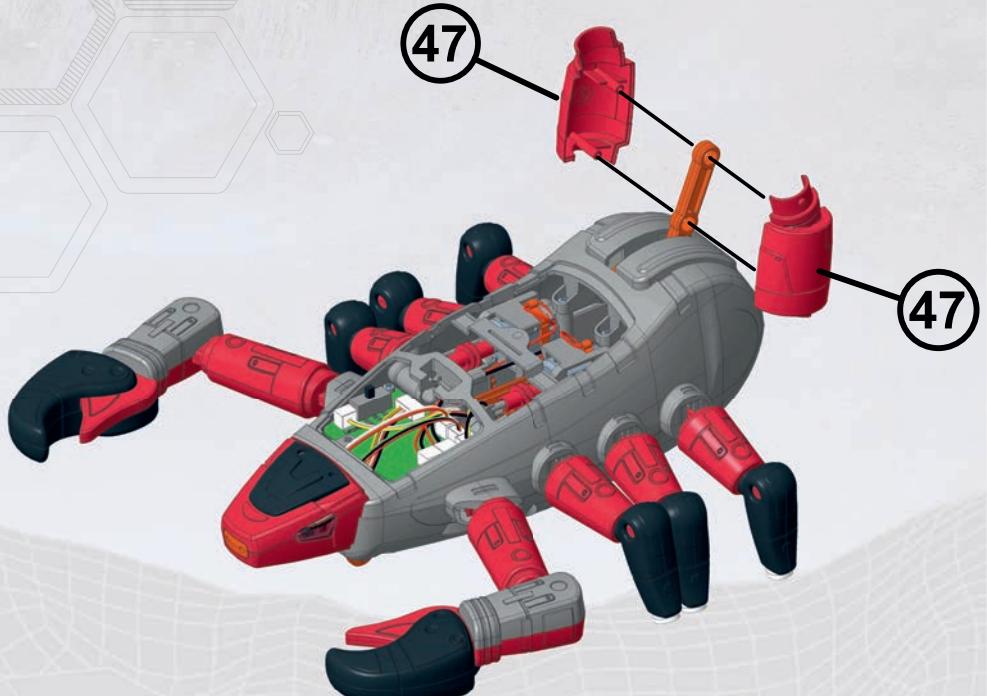


**Warning:** do not tighten the screws too vigorously.



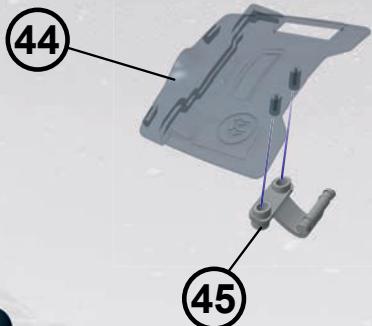
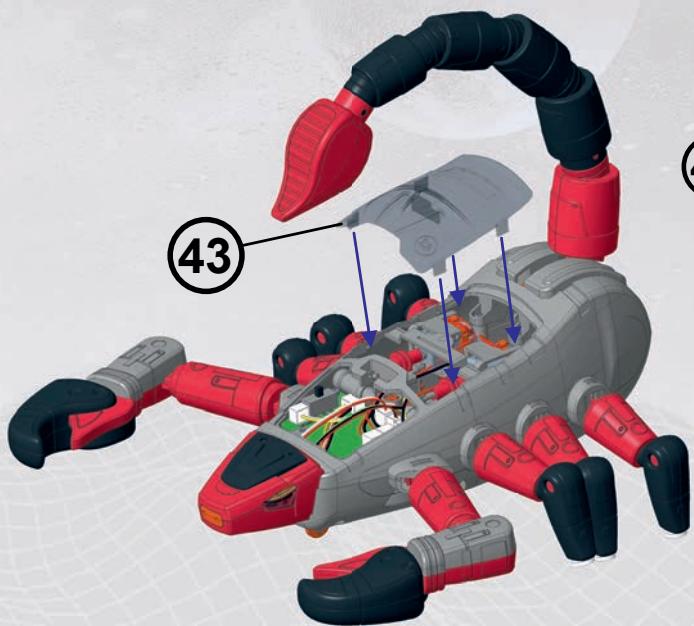
Do not tighten this part too vigorously, since it will need to be reopened slightly to mount the tail.



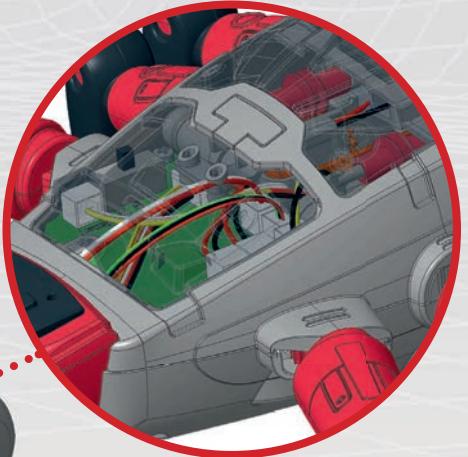
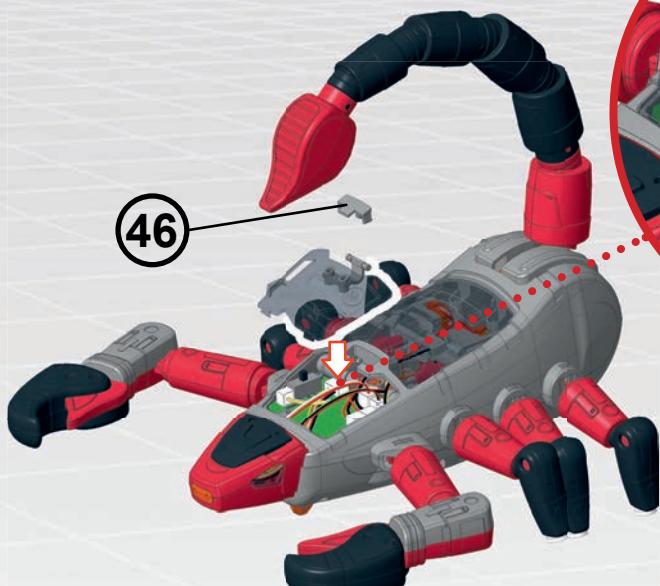


Open the first  
grey module  
of the tail to  
mount it on the  
red part.





Assemble the two parts of the cover.



Mount the cover and secure it in place with the plug (46).

54

Insert the 4 x 1.5V AAA batteries and close the cover with the screw.



## ANALOG MODE

To play in this mode, shift the switch to **ANALOG** and clap your hands: you will notice how the scorpion responds to your hand-clapping with movements that are always different and unpredictable!



## HOW TO DOWNLOAD THE APP

If your device works with the **Android™** operating system, you must access the Google Play™ store and search for the **Scorpion Robot** app. Once you've found it, you must download it.

If your device works with the **iOS** operating system, you must access the App StoreSM and search for the **Scorpion Robot** app. Once you've found it, you must download it.



## APP MODE

To play in this mode, **shift the switch to APP** and launch the app on your mobile device.

This app works with the technology based on high-frequency commands.

### PLEASE NOTE.

Since these particular sounds are difficult to hear, you should observe the following rules to ensure correct operation:

- The device must not be in silent mode and must have the volume function active.
- The device must not be farther than 2 m (about 6.5 ft) from the robot.
- Do not give commands to the robot if it is reproducing sound effects.

## FREE MODE

The app's first play mode is the **Free Mode**, which allows you to control the robot using a smartphone or tablet.

The application sends commands to the robot by means of high-frequency sounds, which the robot can perceive, decode and translate into actions.



**WARNING!** To perform a function, press and hold the relevant control until the loading bar is full.

## SEQUENCE MODE

This game section allows you to **programme the robot** by composing a desired sequence of commands among those available.

As you can see from the screen, in the app you can create sequences, each consisting of 6 commands. Once you have pressed **PLAY**, the app will send commands.



## LIST OF FUNCTIONS



**MOVE FORWARD:** the scorpion moves forward.



**MOVE BACKWARD:** the scorpion moves backwards.



**TURN LEFT:** the scorpion turns left.



**TURN RIGHT:** the scorpion turns right.



**CLOSE TAIL:** the scorpion closes its tail and pincers.



**OPEN TAIL:** the scorpion opens its tail and pincers.



**CLOSE AND OPEN TAIL:** the scorpion opens and closes its tail and pincers.



**ATTACK:** the scorpion is in attack mode: whatever its sensor detects will be attacked.



**SCARY:** the scorpion is afraid: any movement could cause unexpected reactions.



**GUARDIAN:** the scorpion defends the surrounding area: any detected movement will cause an attack.



**MOVE OBJECT:** the scorpion shifts the objects that have been placed in front of it and then returns to its original position.



**AVOID OBSTACLE:** the scorpion walks while avoiding any obstacle detected by the sensor.



**GREEN LED:** the scorpion's eyes glow with a green light.



**RED LED:** the scorpion's eyes glow with a red light.



**FLASHING LED:** the scorpion's eyes glow with a green-red light.

## INSTRUCTIONS FOR CORRECT USE OF TOYS/ GAMES WITH REPLACEABLE BATTERIES

### WARNING!

- Batteries must be installed by an adult.
- The + and - symbols on the batteries must be lined up correctly.
- Old batteries must be removed from the game.
- The power terminal block must not be short-circuited.
- Never touch the contacts inside the battery case, as this could cause a short circuit.
- The rechargeable batteries must be removed prior to being charged. Only recharge under adult supervision.
- Never attempt to recharge non-rechargeable batteries.
- Different types of batteries or new and used batteries should not be used at the same time.

### OTHER RECOMMENDATIONS:

- Batteries are dangerous if swallowed; keep away from children.
- Always remove batteries prior to long-term storage.
- Do not try to open the batteries.
- Do not throw batteries into a fire.

### INSTRUCTIONS FOR BATTERY DISPOSAL



The symbol indicates that dead batteries must be disposed of in accordance with current regulations for waste disposal. Chemical symbols for mercury (Hg), cadmium (Cd) and/or lead (Pb) which appear below the crossed-out wheelie bin symbol indicate that there is a significant percentage of the relative substance in the battery. These substances are highly damaging to the environment and human health. The correct disposal of batteries allows their isolation and the targeted treatment of harmful substances, and allows recycling of precious primary materials, reducing negative effects on persons and the environment. The disposal of worn-out batteries in landfills or the environment significantly increases the risk of water pollution. Pursuant to European Directive 2013/56/EU, it is prohibited to dispose of batteries and accumulators as urban waste and consumers are obliged to participate in separated waste collection so as to facilitate the treatment and recycling of the same.

### HOW TO DISPOSE OF BATTERIES

Discharge the batteries completely by leaving the game on until the batteries have fully run out. Remove the batteries from the game before disposal. Dispose of all batteries in accordance

with current regulations, by using the appropriate containers at an authorised recycling centre or by returning them to the shop where they were purchased. Returning them is free! Penalties are applied for incorrect disposal.

**INSTRUCTIONS FOR THE DISPOSAL OF ELECTRICAL AND ELECTRONIC DEVICES SUBJECT TO SEPARATE WASTE DISPOSAL**

**IMPORTANT!** The crossed-out wheelie bin symbol indicates that in European Union member states (Dir. 2012/19/EU) and in those that adopt separated waste collection systems, all components of the product marked by this symbol (or indicated as such in the game instructions) are subject to separated waste collection laws at the end of their life. It is prohibited to dispose of such components as mixed urban waste.

**HOW TO DISPOSE OF WEEE**

It is mandatory to separately collect those components marked by the symbol (or indicated as such in the relevant documentation) and deliver them to authorised recycling centres for the purposes established, or where possible, to return the product for disposal back to the shop when a similar product is purchased, or for free in the event the external dimensions of the component are less than 25 cm.

Users of the product play a critical role in ensuring the correct disposal of electrical and electronic equipment that has reached the end of its life. It is therefore important for each user to be aware of their role and to always dispose of electrical/electronic waste in accordance with current legislation, thereby contributing to the correct management of waste and encouraging its reuse, recycling and/or recovery.

**رجاء قراءة التعليمات وحفظها للرجوع إليها في المستقبل**  
**قد تختلف الألوان وتفاصيل المحتوى عما هو موضح.**

**WARNING!** Components marked by the symbol contain substances that are harmful to the environment and human health. It is therefore prohibited to dispose of them as mixed urban waste or together with other domestic waste. Incorrect disposal may result in damage to the environment and may be punished by the law. These components should not be used improperly. In particular, it is prohibited to remove the electrical and electronic parts from the toy or use the toy if damaged. These actions could cause health hazards.



**N.B.:** the above information only relates to the parts of the toy marked with the prohibitive symbol (or those parts indicated in the information leaflet as being subject to this restriction).

Other game components (boards, accessories, etc.) and their packaging are not subject to the above-described indications and must be disposed of according to the METHODS provided for by current standards. These other components do not need to be delivered to authorised recycling centres for electrical and electronic equipment or returned to the shop when a new product is purchased. Domestic (non-professional) users are invited to contact their local retailer, the public waste disposal authorities or the Customer Service department of: CLEMENTONI S.p.A. (tel. +39 071 75811; fax +39 071 7581234; e-mail: info@clementoni.it) for all information pertaining to the product's correct disposal.

**Clementoni** Registered on the electronic and electrical manufacturers' register:  
REGISTRATION IN PROGRESS

### OPERATING TIPS

In case of anomalies occurring during use, the following simple checks should be carried out.

### The toy is not working properly

Are the batteries inserted correctly?  
Do the batteries need to be replaced?

### The toy switches off or seizes up

Reset the toy in one of the following two modes, or attempt both:

- switch the toy off and then on again;
- remove the batteries for at least 10 seconds before reinserting them.

If any malfunctions occur due to an electrostatic discharge, the toy should be switched off and then on again to restore its correct operation.

If the problem persists, use the toy in another location.

### Maintenance

- Use a soft damp cloth to clean the toy, without any type of detergent.
- Do not use chemical solvents.
- Do not expose it to direct sunlight nor to any other source of heat.
- Do not pour liquids onto the toy nor immerse it in water.
- Do not dismantle it or allow it to fall.
- Remove the batteries from the toy if it is not used for extended periods of time.

**WARNING: This toy is fragile. Please be careful not to let it fall and do not force the movement of the wheels manually (for example by using it as a car or forcing the wheels by hand): it may break.**

**WARNING:** all packaging materials, such as adhesive tapes, bags, plastic sheets, metal wires and labels, are not part of the game and must be kept out of reach of children.

Should the operating problems persist, contact the Courtesy Service at the following link:

<https://www.clementoni.com/en/form/>

Made in Italy

Designed, developed and tested in Italy.