

EXPERIMENT MANUAL

ROBOTICS
SMART MACHINES

JUNIOR



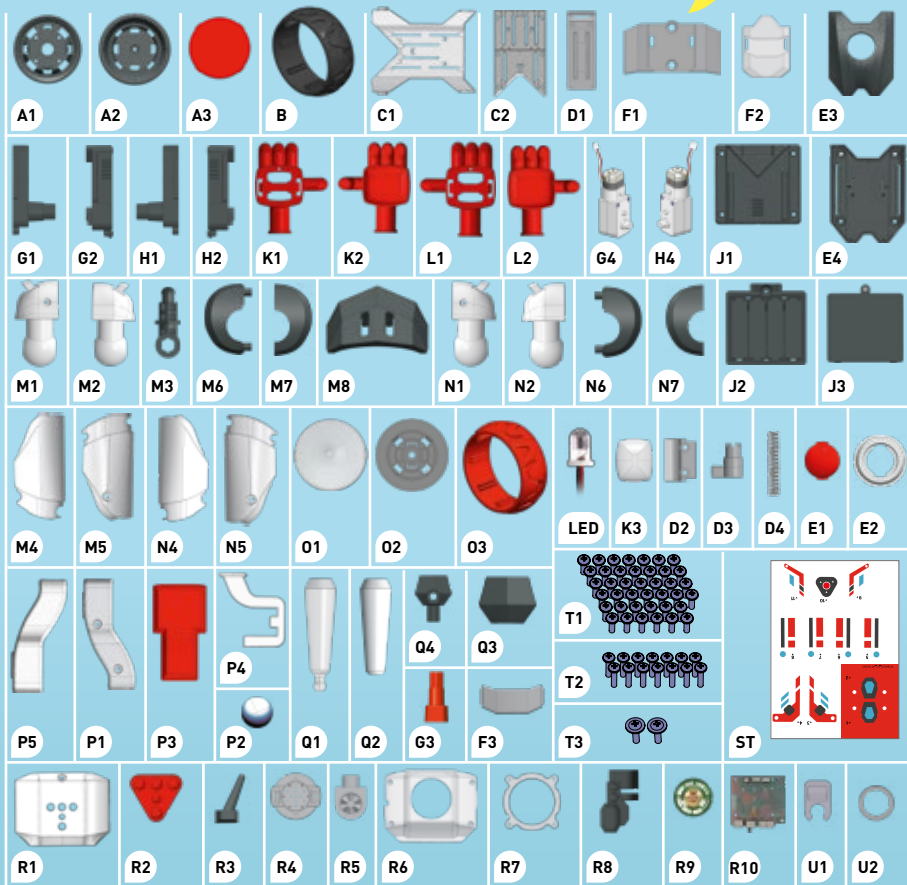
THAMES & KOSMOS

KIT CONTENTS

Good to know!

Do you have any questions or are you missing any parts? Our tech support team will be happy to help you!
 support@thamesandkosmos.com
 or 1-800-587-2872

What's in your experiment kit:



Checklist:

✓ No.	Description	Quantity	Part No.
○ A1	Wheel front	4	620399-A1
○ A2	Wheel back	4	620399-A2
○ A3	Hubcap	2	620399-A3
○ B	Black tire	2	620399-B
○ C1	Chassis top	1	620399-C1



YOU WILL ALSO NEED:

Diagonal cutters or scissors and nail file, Phillips-head screwdriver (PH1 size recommended), 4 AA batteries (1.5-volt, type LR6).

✓ No.	Description	Quantity	Part No.
○ C2	Chassis bottom	1	620399-C2
○ D1	Chassis connector top	1	620399-D
○ F1	Base plate	1	620399-F1
○ F2	Base plate cover	1	620399-F2
○ E3	Button plate	1	620399-E3



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✓ No.	Description	Quantity	Part No.	✓ No.	Description	Quantity	Part No.
○ G1	Left motor hub with axle	1	620399-G1	○ D2	Chassis connector bottom	1	620399-D2
○ G2	Left motor hub	1	620399-G2	○ D3	Chassis connector pin	2	620399-D3
○ H1	Right motor hub with axle	1	620399-H1	○ D4	Metal spring	1	620399-D4
○ H2	Right motor hub	1	620399-H2	○ E1	Button	1	620399-E1
○ K1	Left hand back	1	620399-K1	○ E2	Button ring	1	620399-E2
○ K2	Left hand front	1	620399-K2	○ P5	Balance support, right	1	620399-P5
○ L1	Right hand back	1	620399-L1	○ P1	Balance support, left	1	620399-P1
○ L2	Right hand front	1	620399-L2	○ P3	Balance support, top	1	620399-P3
○ G4	Left motor	1	620399-G4	○ P4	Balance support connector	1	620399-P4
○ H4	Right motor	1	620399-H4	○ P2	Metal ball	1	620399-P2
○ J1	Battery compartment base	1	620399-J1	○ Q1	Antenna, left	2	620399-Q1
○ E4	Button plate back	1	620399-J2	○ Q2	Antenna, right	2	620399-Q2
○ M1	Left upper arm top	1	620399-M1	○ Q4	Antenna holder back	1	620399-Q4
○ M2	Left upper arm bottom	1	620399-M2	○ Q3	Antenna holder front	1	620399-Q3
○ M3	Shoulder joint	2	620399-M3	○ G3	Motor axle	2	620399-G3
○ M6	Left wrist outside	1	620399-M6	○ F3	Base plate front	1	620399-F3
○ M7	Left wrist inside	1	620399-M7	○ T1	Short screw	40	724198
○ M8	Shoulder cap	2	620399-M8	○ T2	Long screw	14	620399-T2
○ N1	Right upper arm top	1	620399-N1	○ T3	Wide-head screw	2	620399-T3
○ N2	Right upper arm bottom	1	620399-N2	○ ST	Sticker sheet	1	620399-ST
○ N6	Left wrist outside	1	620399-N6	○ R1	Head top	1	620399-R1
○ N7	Left wrist inside	1	620399-N7	○ R2	Button pad	1	620399-R2
○ J2	Battery compartment	1	620399-J2	○ R3	Antenna side	1	620399-R3
○ J3	Battery compartment cover	1	620399-J3	○ R4	Head base	1	620399-R4
○ M4	Right forearm outside	1	620399-M4	○ R5	Head base pins	2	620399-R5
○ M5	Right forearm inside	1	620399-M5	○ R6	Head bottom	1	620399-R6
○ N4	Left forearm outside	1	620399-N4	○ R7	Head base ring	1	620399-R7
○ N5	Left forearm inside	1	620399-N5	○ R8	Head side	1	620399-R8
○ O1	Eye cover	2	620399-O1	○ R9	Speaker	1	620399-R9
○ O2	Eye connector	2	620399-O2	○ R10	Robot PCB	1	620399-R10
○ O3	Red tire	2	620399-O3	○ U1	Shoulder clip	2	620399-U1
○ LED	Light	2	620399-LED	○ U2	Shoulder ring	2	620399-U2
○ K3	Hand cap	2	620399-K3				



SAFETY INFORMATION



WARNING! Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled. Store the experiment material and assembled models out of the reach of small children.

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 caregivers are included and shall be followed.

WARNING. This kit contains functional sharp edges or points. Do not injure yourself!

Warning. To be used under the direct supervision of an adult. Keep the toy out of reach of children under 8 years old.

Keep packaging and instructions as they contain important information.

Assembly must be performed under adult supervision.

Do not pick up the robot during operation.

Keep hands, hair, and clothing away from the tires when the robot is powered on.

Avoid hitting people, animals, and household furniture with the robot.

SAFETY FOR EXPERIMENTS WITH BATTERIES

- › The wires are not to be inserted into socket-outlets. Never perform experiments using household current! The high voltage can be extremely dangerous or fatal!
- › To operate the models, you will need four AA batteries (1.5-volt, type LR6), which could not be included in the kit due to their limited shelf life.
- › The supply terminals are not to be short-circuited. A short circuit can cause the wires to overheat and the batteries to explode.
- › Different types of batteries or new and used batteries are not to be mixed.
- › Do not mix old and new batteries.
- › Do not mix alkaline, standard (carbon-zinc), or rechargeable (nickel-cadmium) batteries.
- › Batteries are to be inserted with the correct polarity (+ and -). Press them gently into the battery compartment. See page 8. This page shows how the batteries are inserted, removed, and changed.
- › Always close battery compartments with the lid.
- › Non-rechargeable batteries are not to be recharged. They could explode!
- › Rechargeable batteries are to be removed from the toy before being charged.
- › Exhausted batteries are to be removed from the toy.
- › Dispose of used batteries in accordance with environmental provisions, not in the household trash.
- › Avoid deforming the batteries.
- › The toy is not to be connected to more than the recommended number of power supplies.
- › As all of the experiments use batteries, have an adult check the experiments or models before use to make sure they are assembled properly. Always operate the motorized models under adult supervision. After you are done experimenting, remove the batteries from the device compartments.

NOTES ON DISPOSAL OF ELECTRICAL AND ELECTRONIC COMPONENTS

The electronic components of this product are recyclable. 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.



IMPORTANT INFORMATION

Dear Parents and Supervising Adults,

Children want to be amazed, understand, and create new things. They want to try everything out and do it for themselves. They want to know! They can do all of this with Thames & Kosmos experiment kits. We hope you and your child have a lot of fun experimenting with Robotics: Smart Machines - Junior.

- Before building and experimenting, read the instructions together with your child and discuss the safety information together. Stand by to assist your child with any challenging steps of assembly or usage.
- If your child is working on a table top, give them something to work on to prevent damage to the furniture.
- Particular care must be taken when cutting the plastic parts out of the frames, as sharp points can be created. These can be removed with the help of diagonal cutters or scissors and a nail file. Please supervise your child whenever they are using scissors or diagonal cutters until you feel they are ready to use them independently.
- The robot should not be grabbed or picked up while it is moving. Hands, hair, and clothing should be kept away from moving parts. Avoid hitting people, animals, and household furniture with the robot.
- And most importantly: Have fun!

CARE AND MAINTENANCE

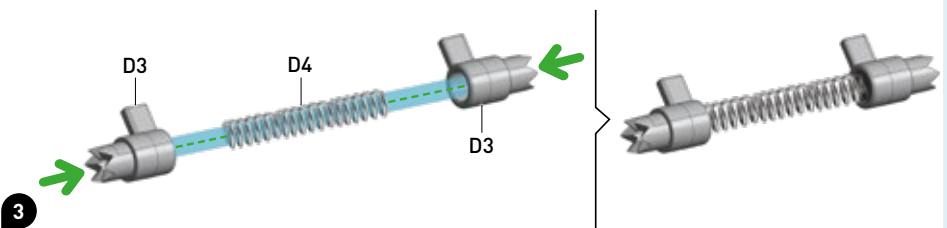
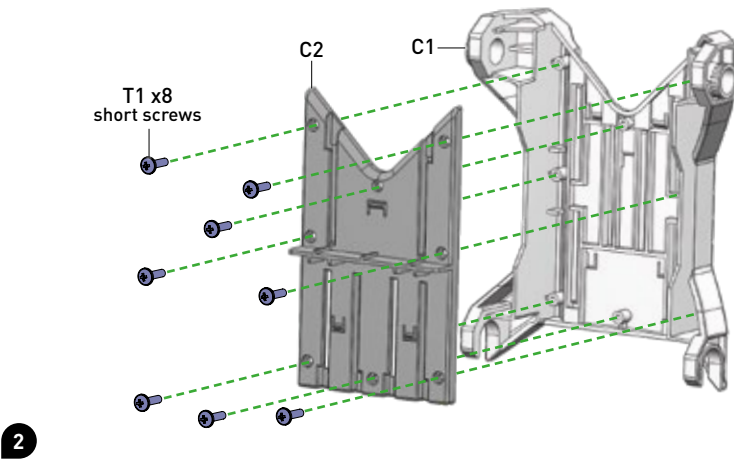
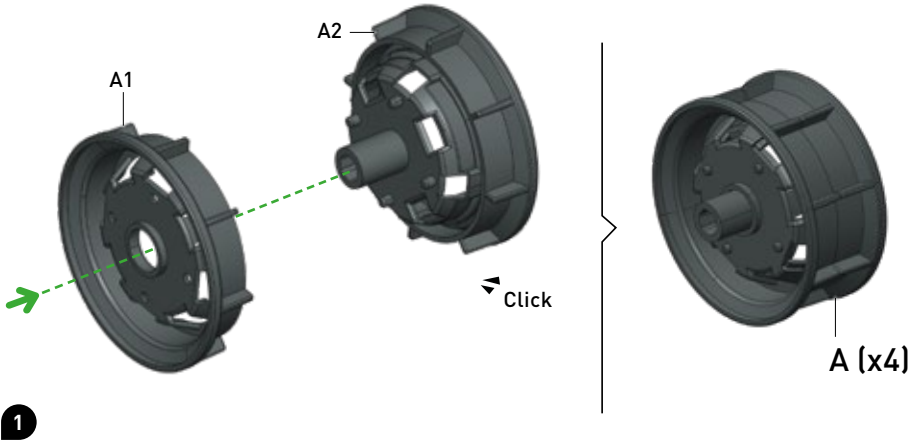
- › Replace the batteries if the power decreases.
- › After you are done experimenting, remove the batteries from the battery compartments.
- › Check regularly that the plugs and other parts are not damaged. In case of deterioration, do not use the product until it has been repaired.
- › To clean, wipe the toy gently with a clean dry cloth.
- › The toy may malfunction under electrostatic discharge interference. If the toy does not respond, reset it (turn it off and on again).
- › Do not submerge the toy in water as it can damage the electronic assemblies.
- › To protect the electrical and mechanical components, we recommend that the toy is only operated indoors.
- › Avoid contact with metal objects and liquids.
- › Keep the toy away from direct heat.

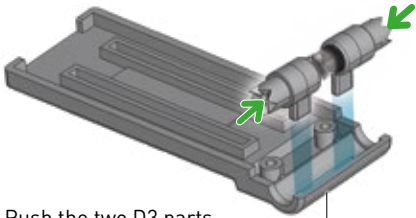


Your Own Robotic Friend!

Are you ready? It's time to assemble your robot companion, complete with light-up eyes and poseable arms. First, you will build the subassemblies. For this, parts with the same letter go together. Then you will put the subassemblies together into the complete robot assembly. Finally, you will learn how to control and program Junior!

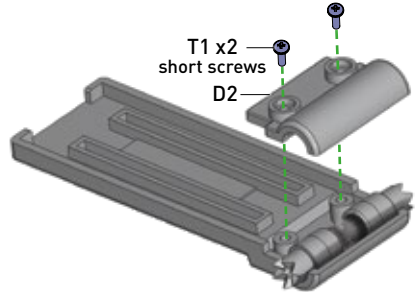
MODULES A, C, D, E & F: WHEELS AND CHASSIS



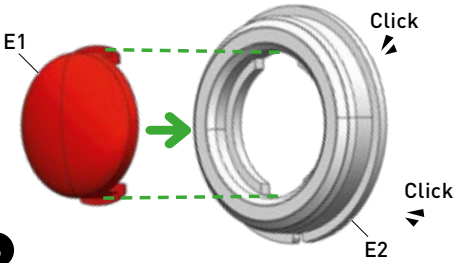


Push the two D3 parts together slightly, compressing the spring (D4), so that the tabs of D3 fit into the slot of D1.

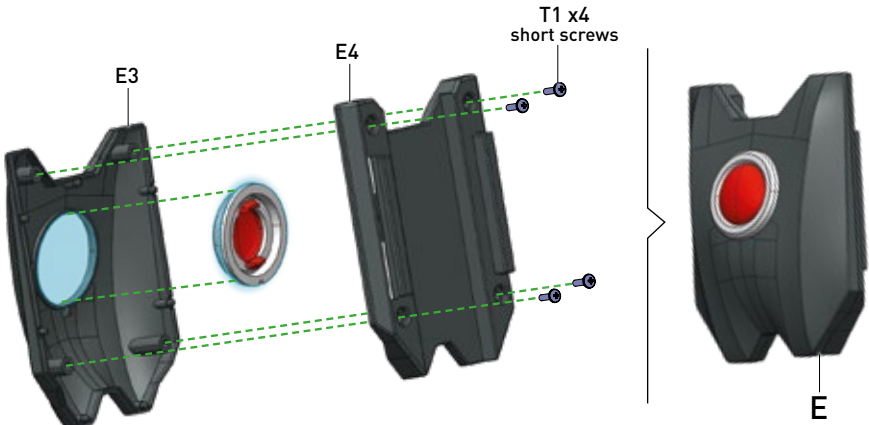
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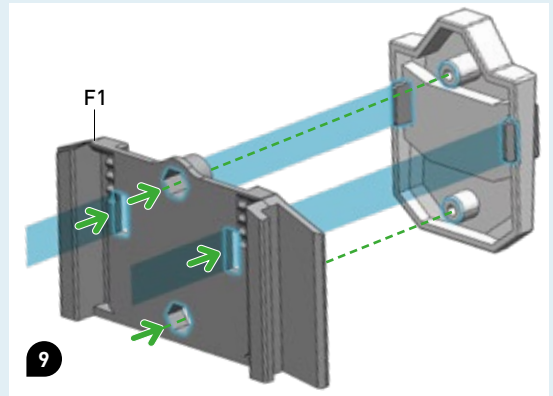
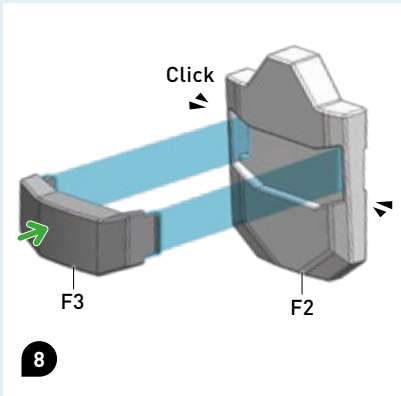
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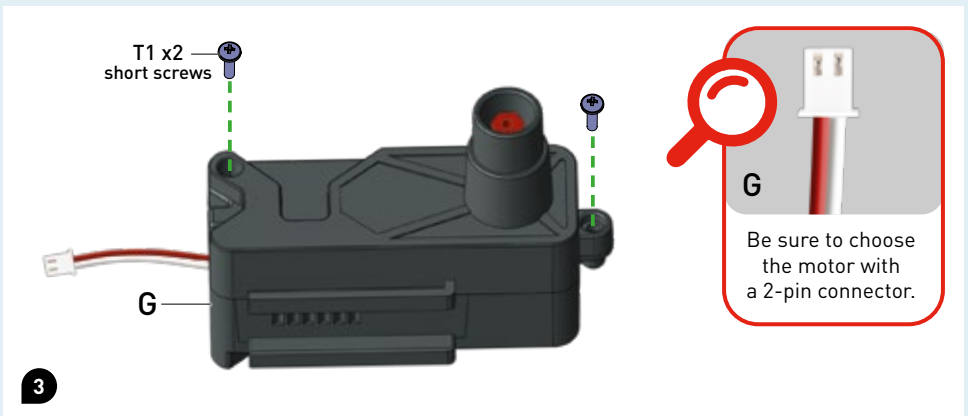
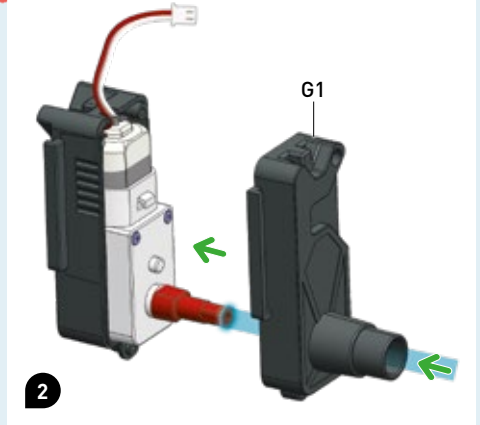
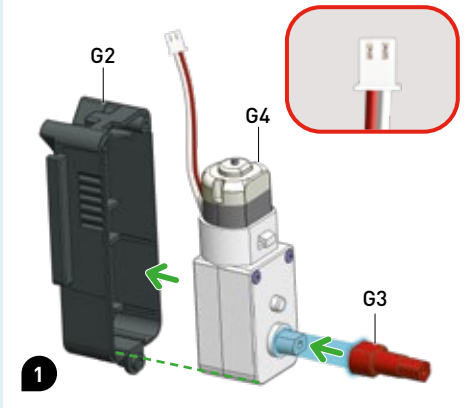
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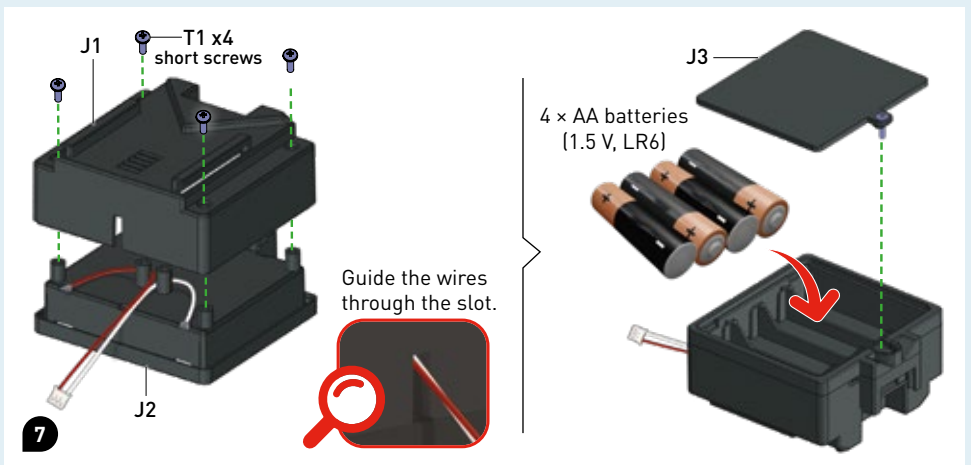
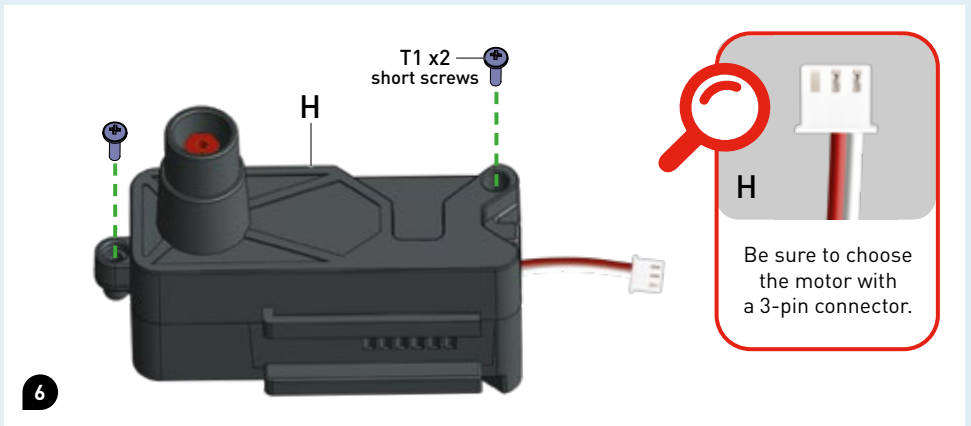
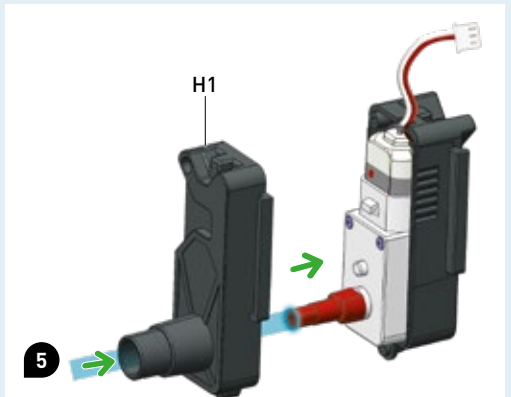
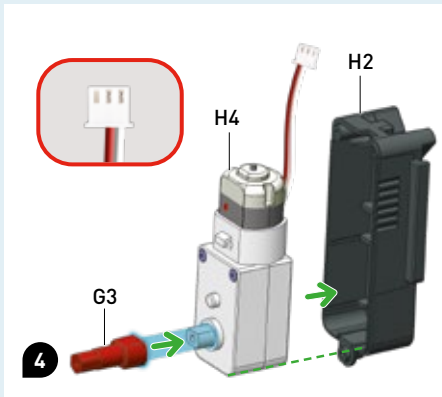


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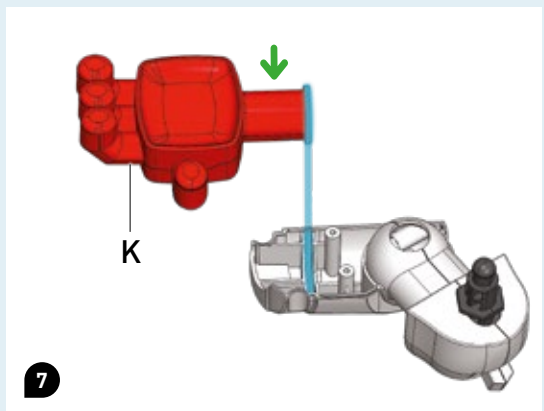
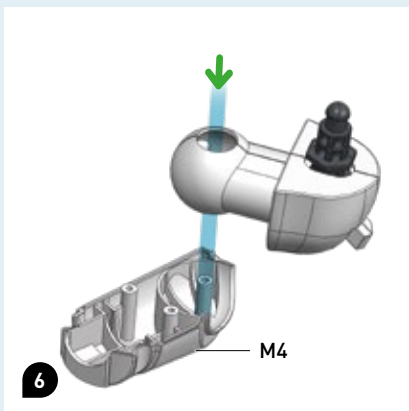
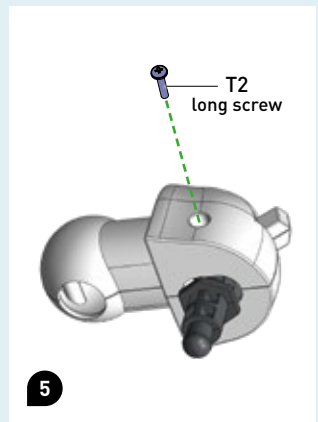
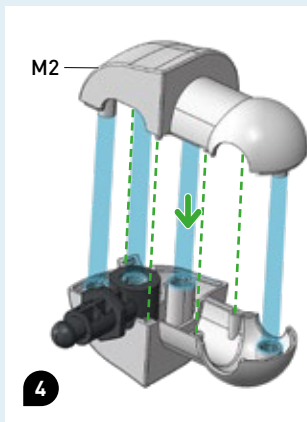
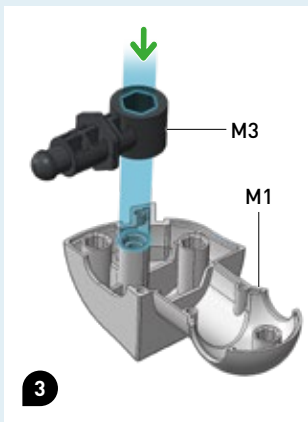
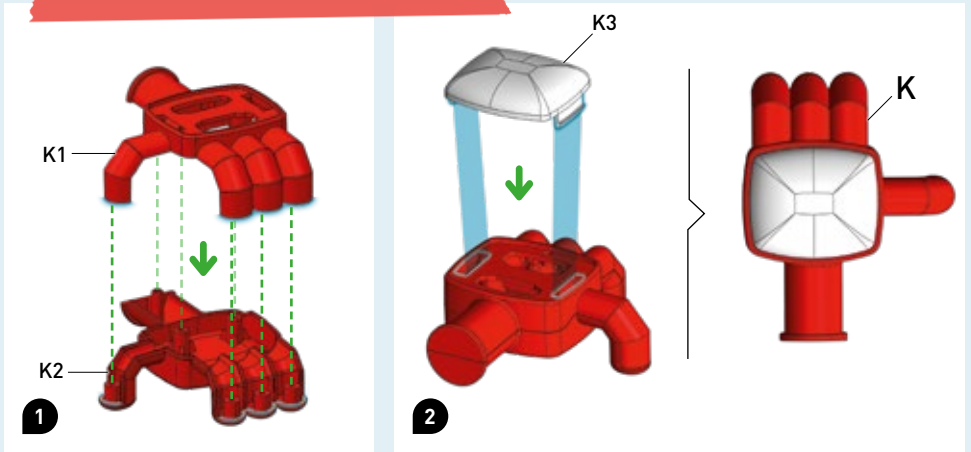


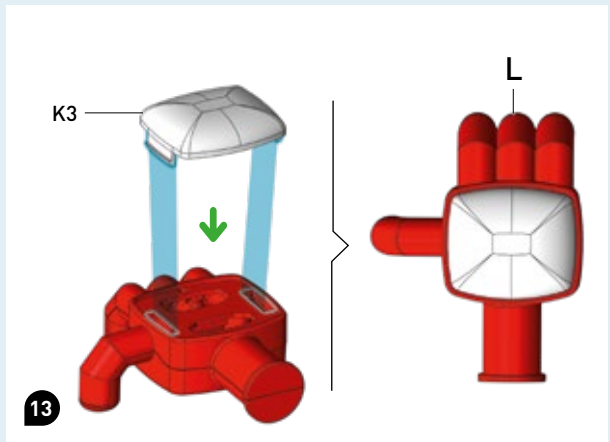
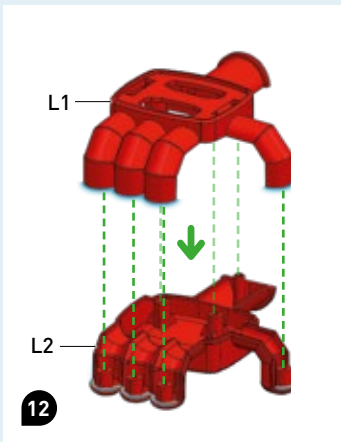
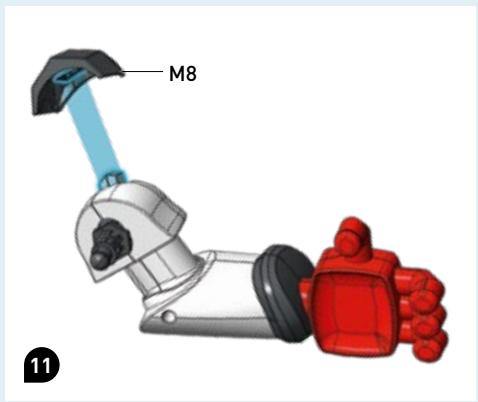
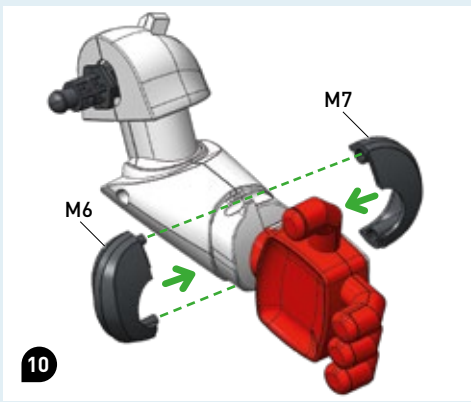
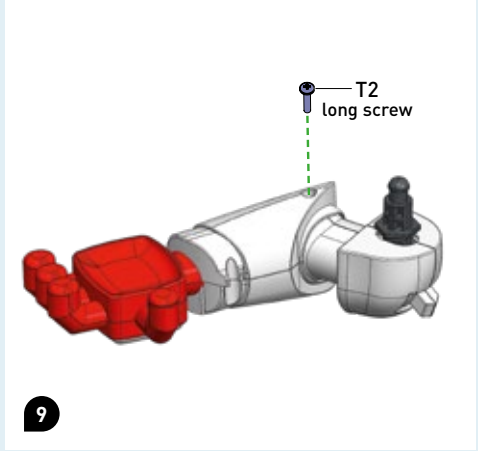
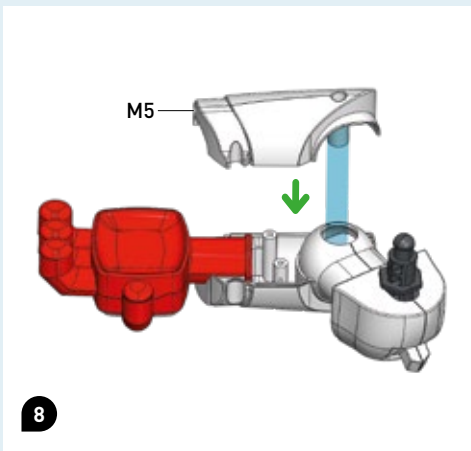
MODULES G & H: MOTORS



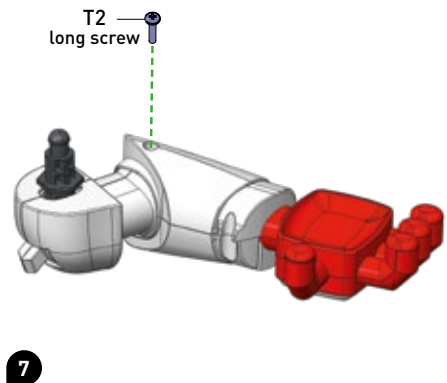
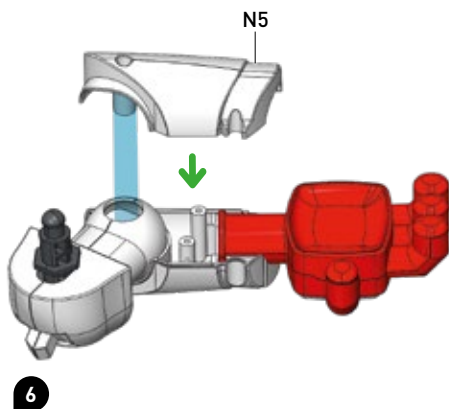
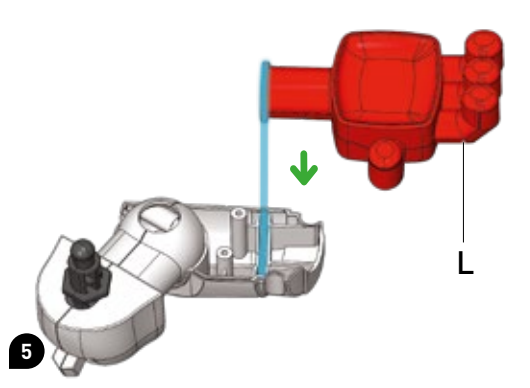
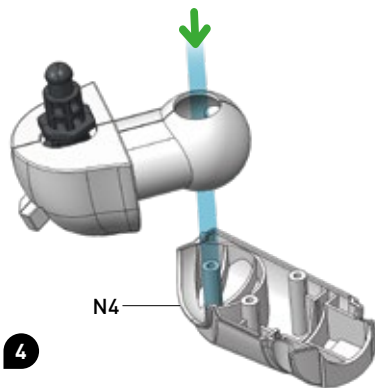
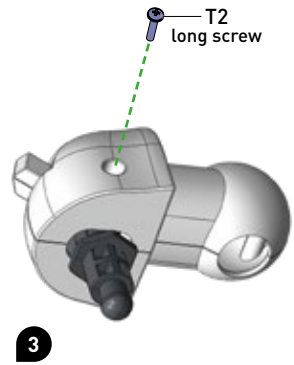
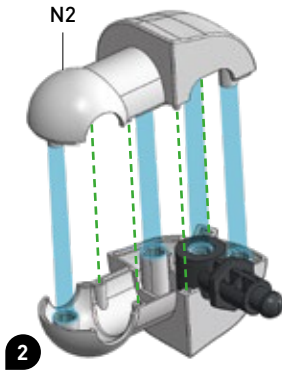
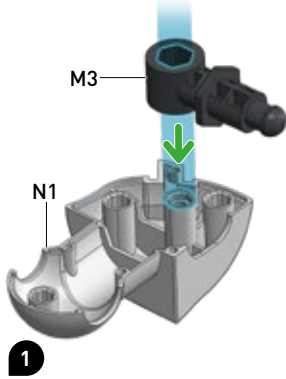


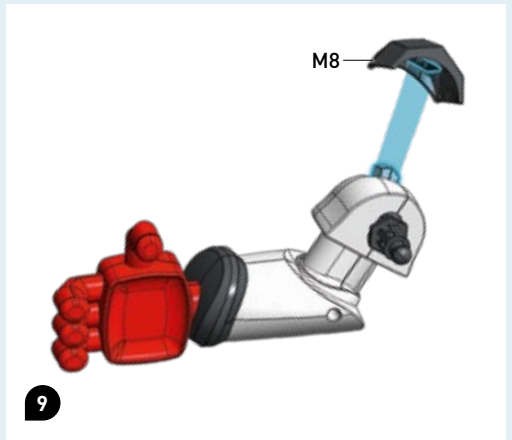
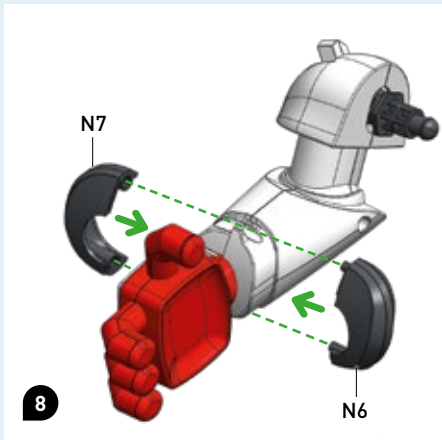
MODULES K & L: HANDS



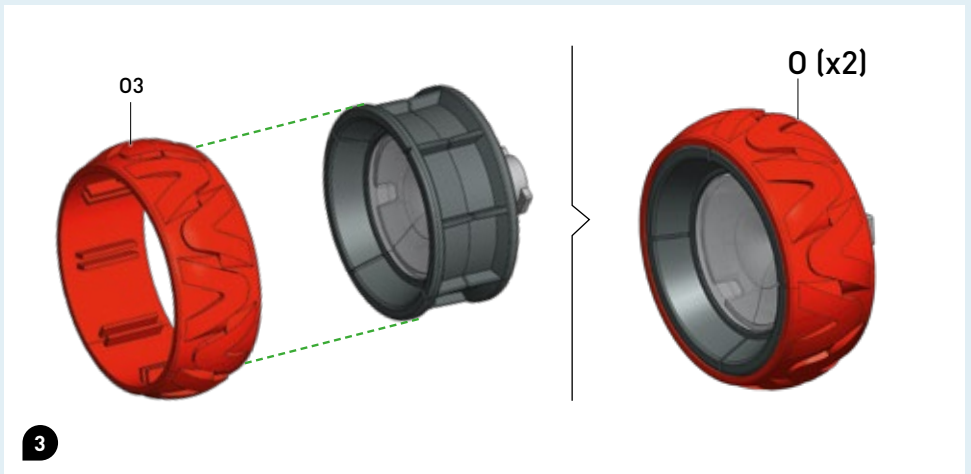
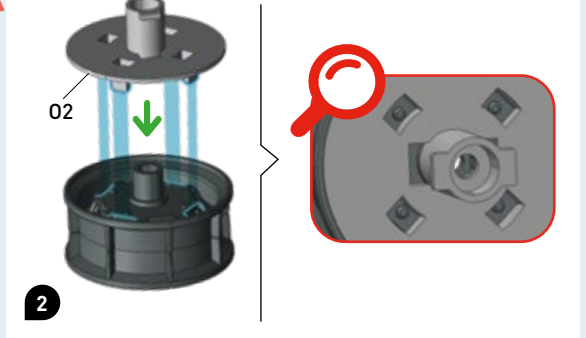
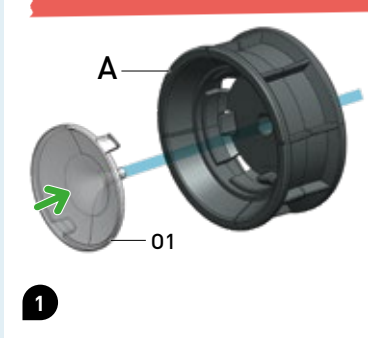


MODULES M & N: ARMS

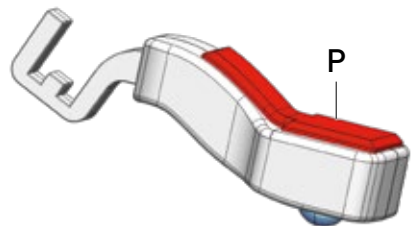
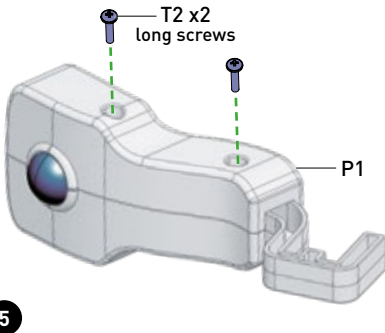
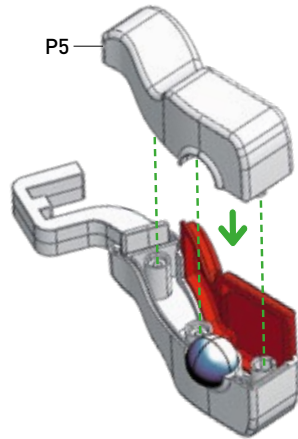
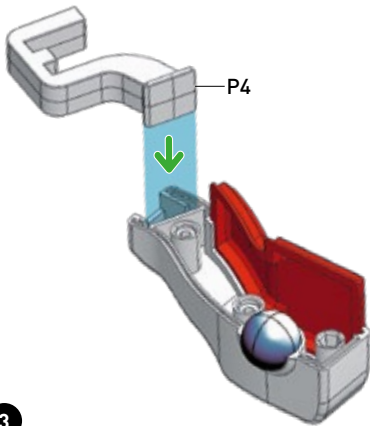
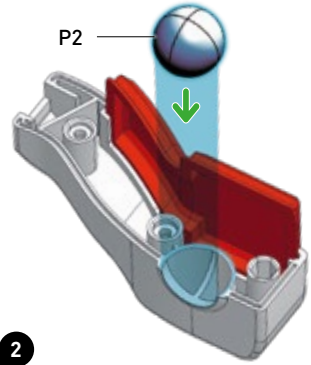
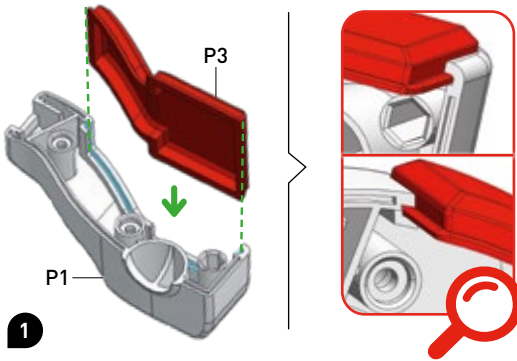




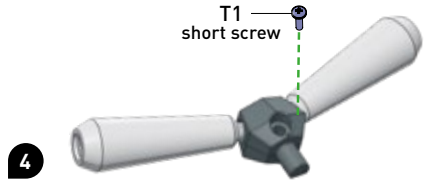
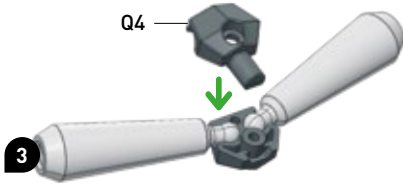
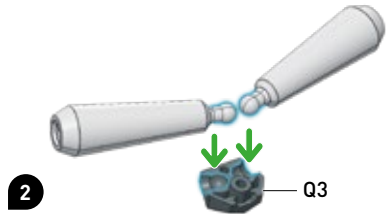
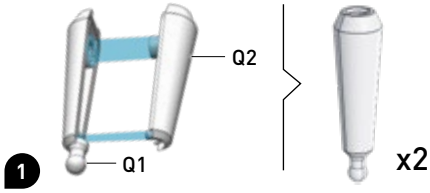
MODULE 0: WHEELS



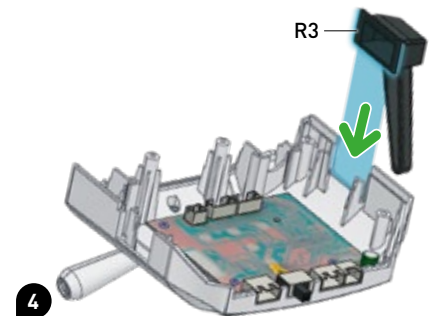
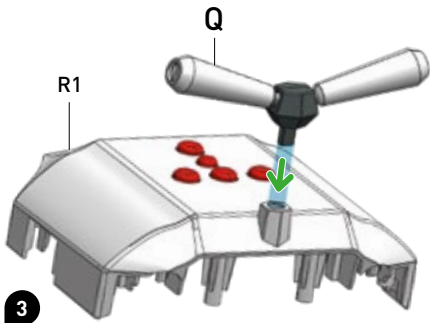
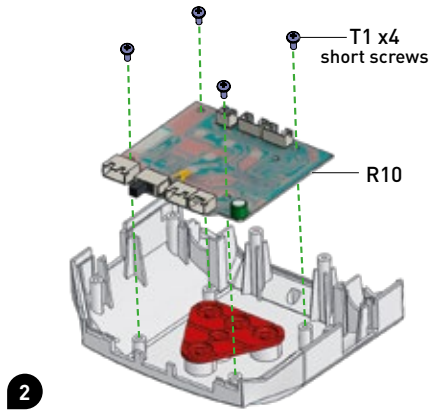
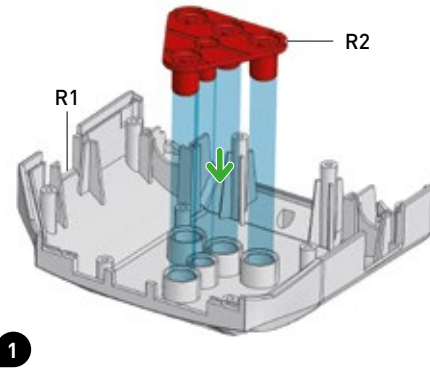
MODULE P: BALANCE

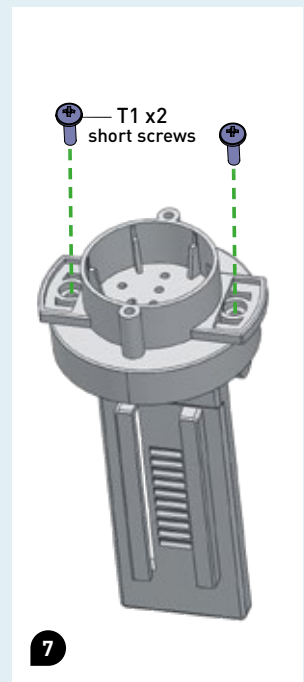
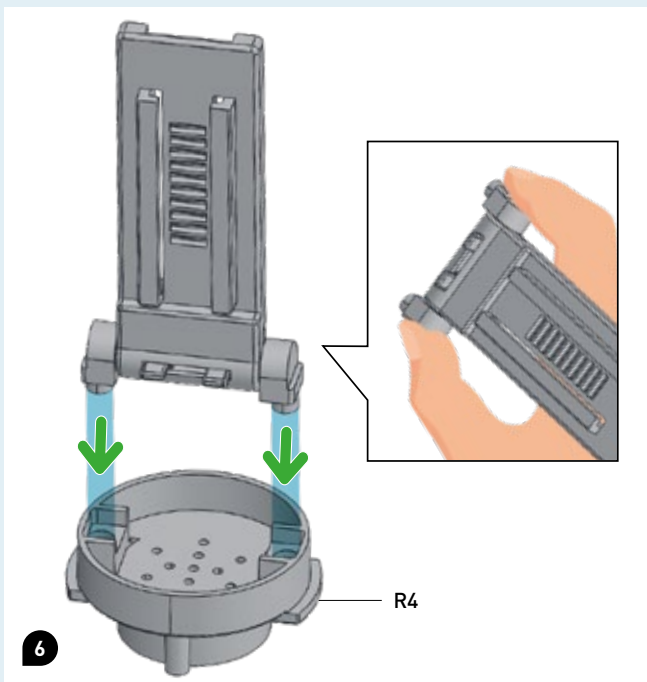
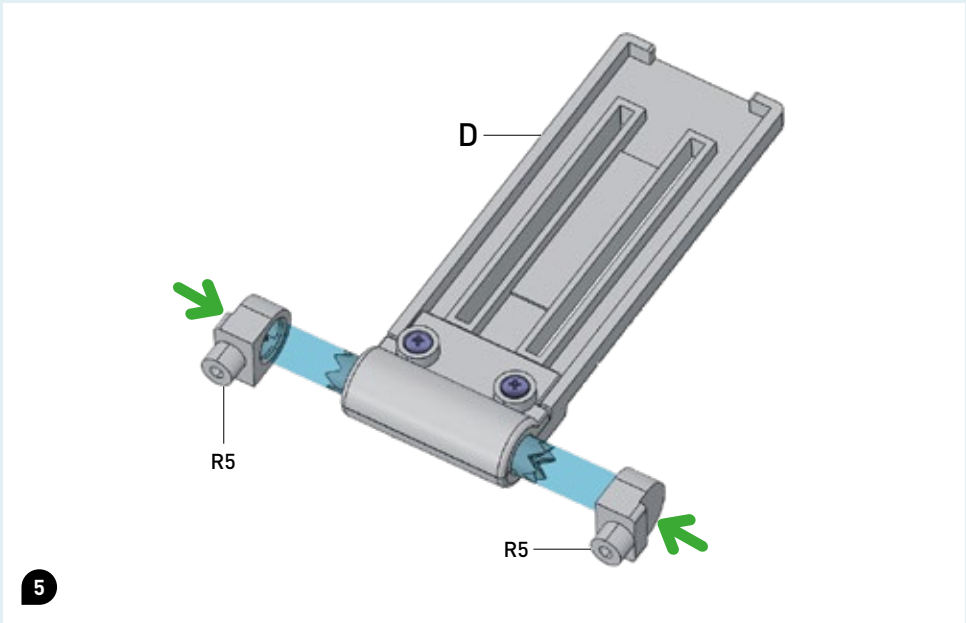


MODULE Q: ANTENNAE

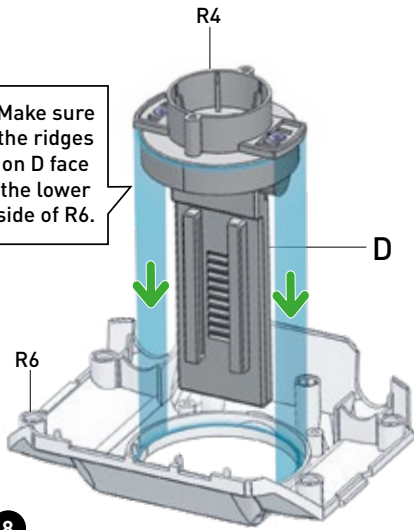


MODULE R: HEAD

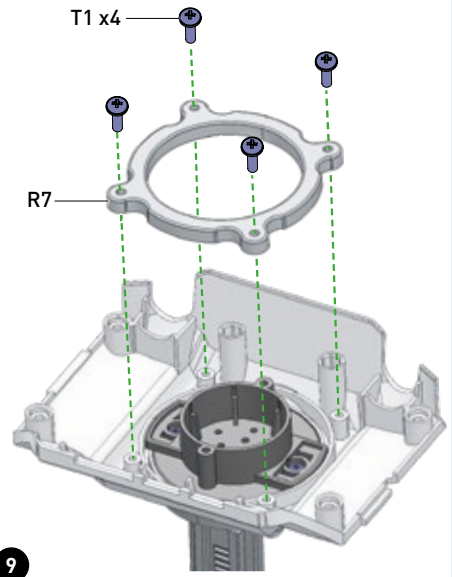




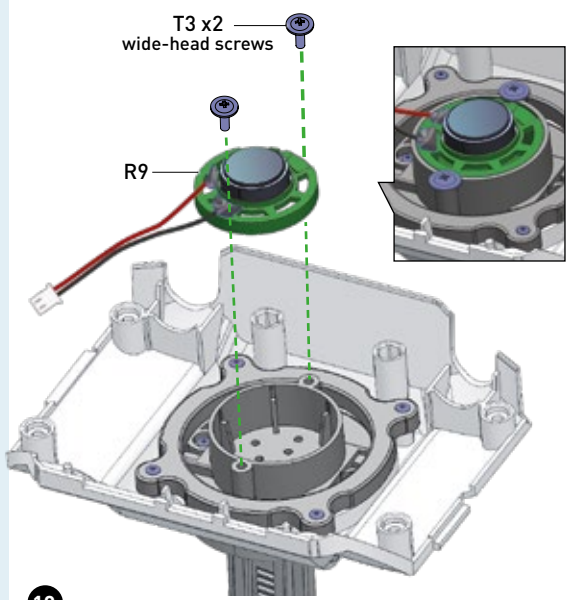
Make sure the ridges on D face the lower side of R6.



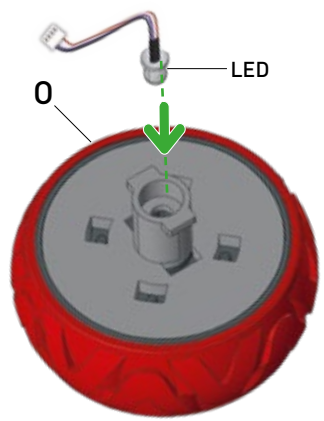
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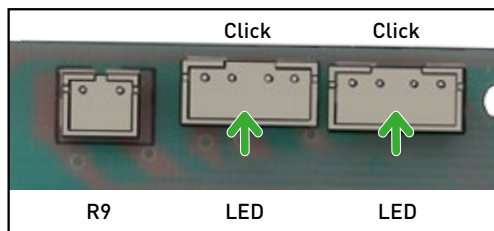
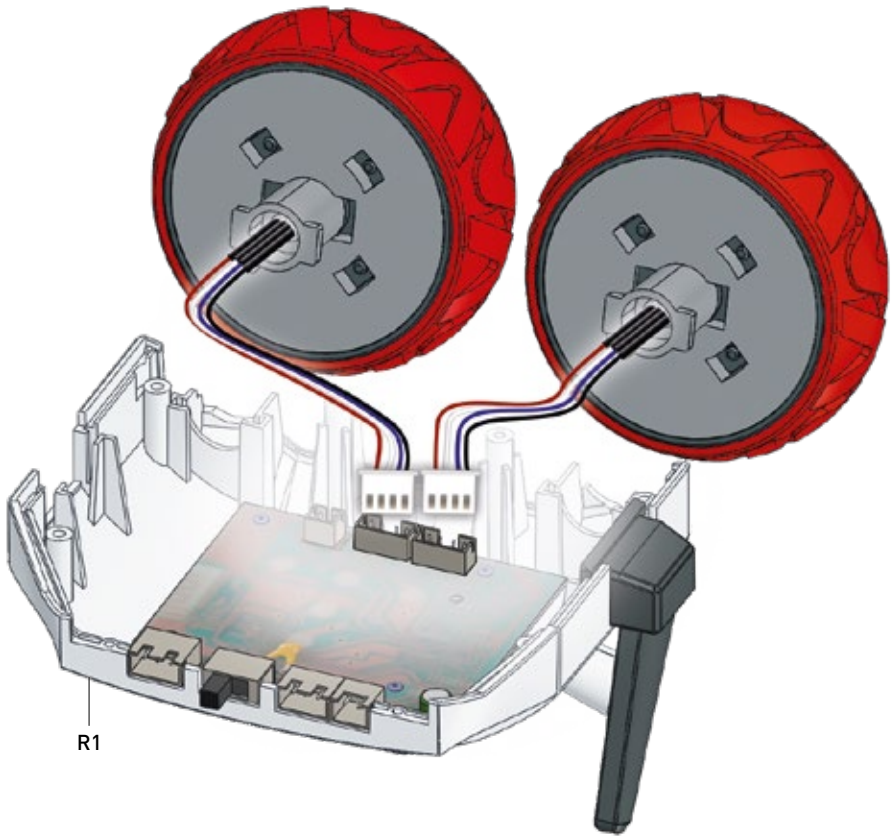


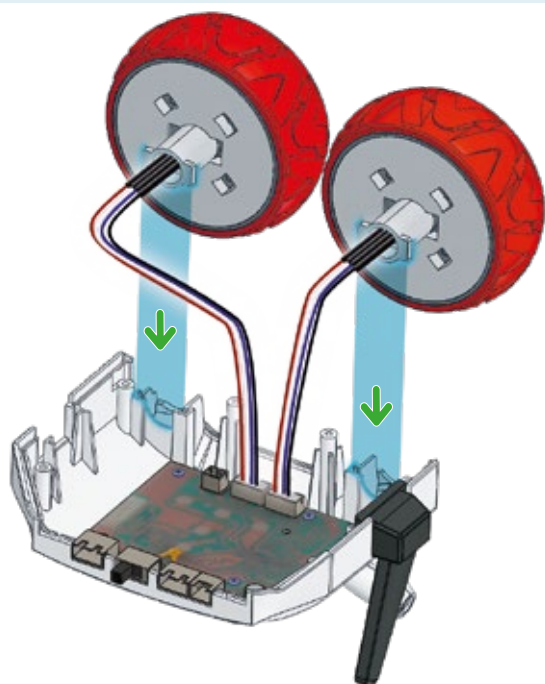
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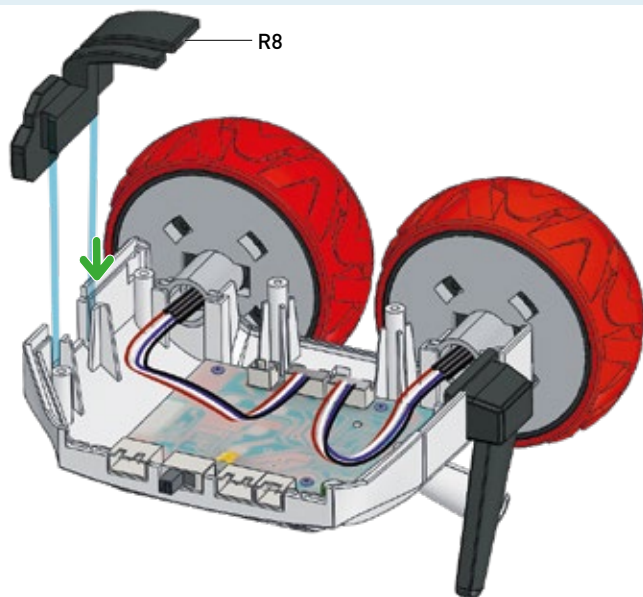
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x2

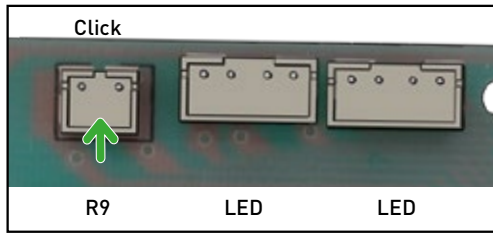
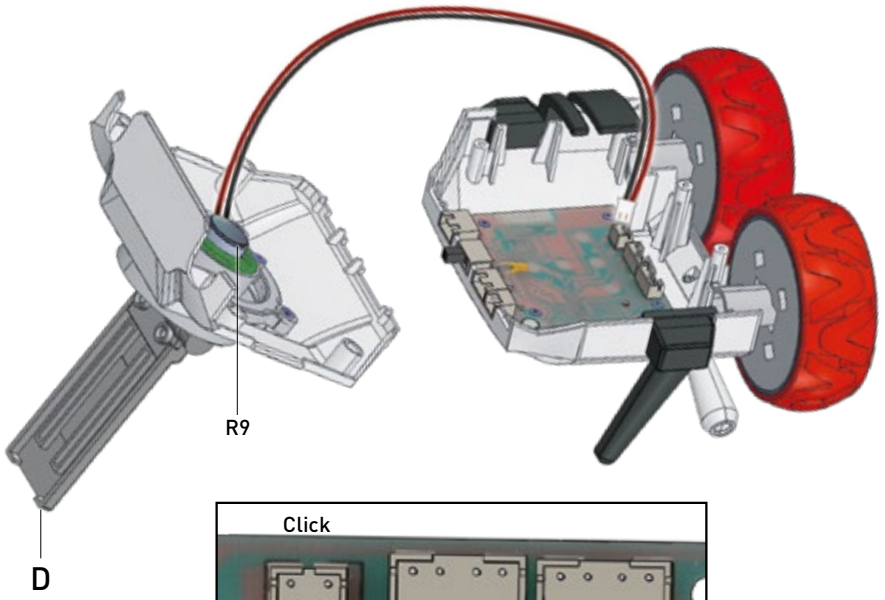




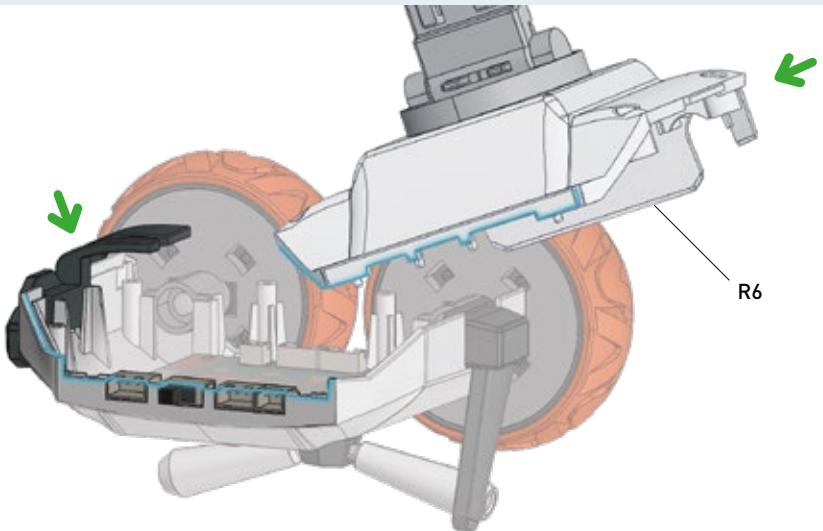
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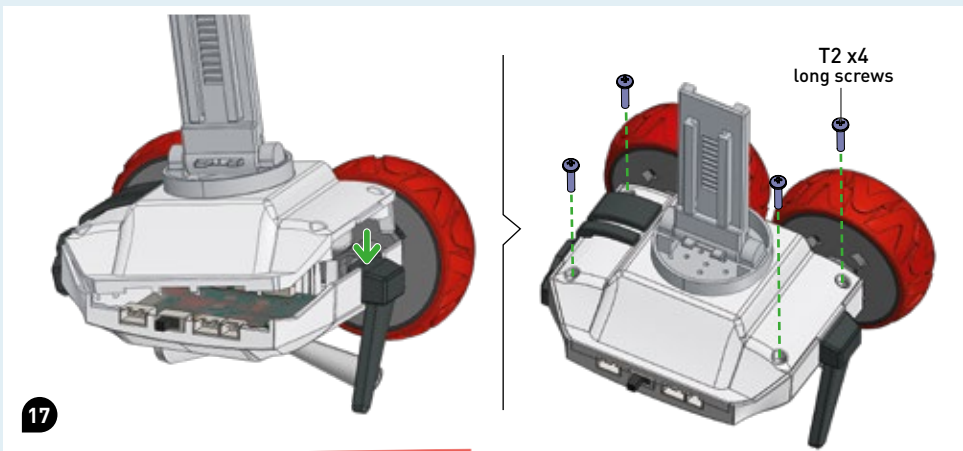
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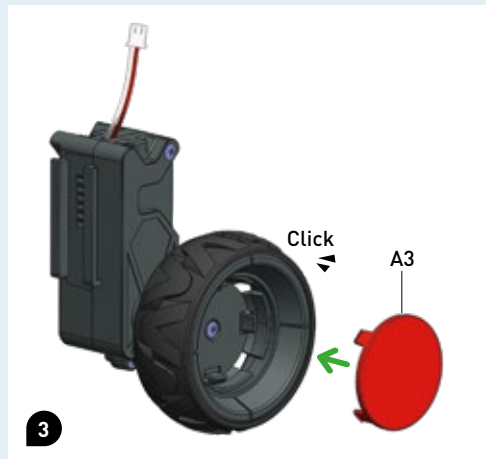
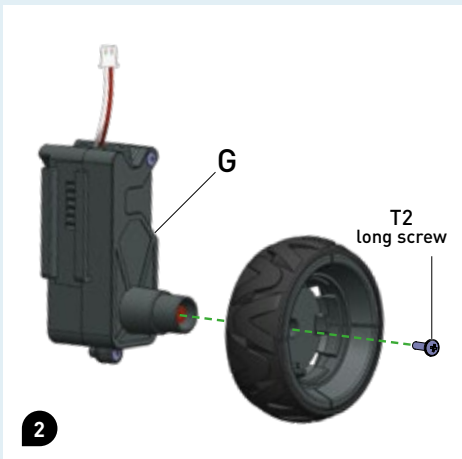
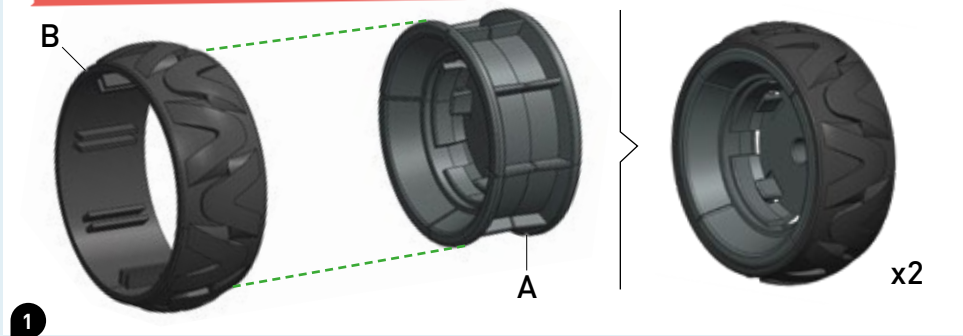
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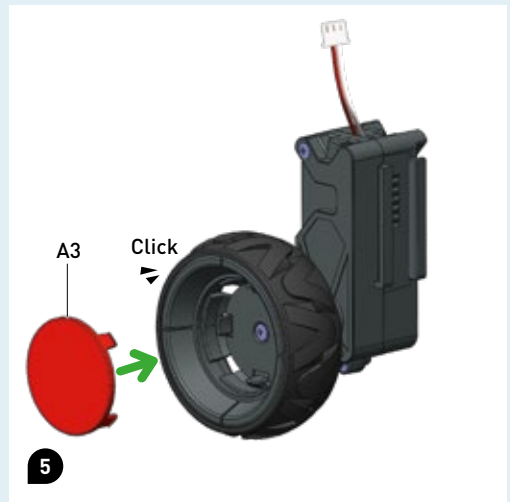
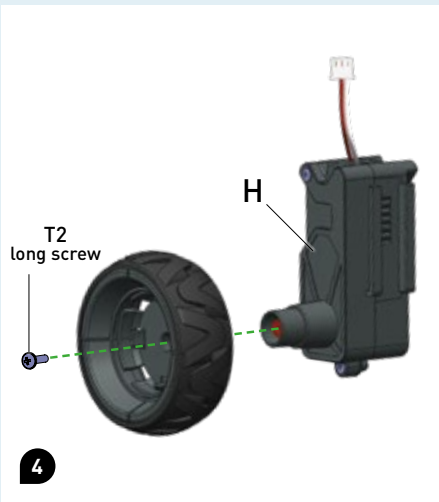


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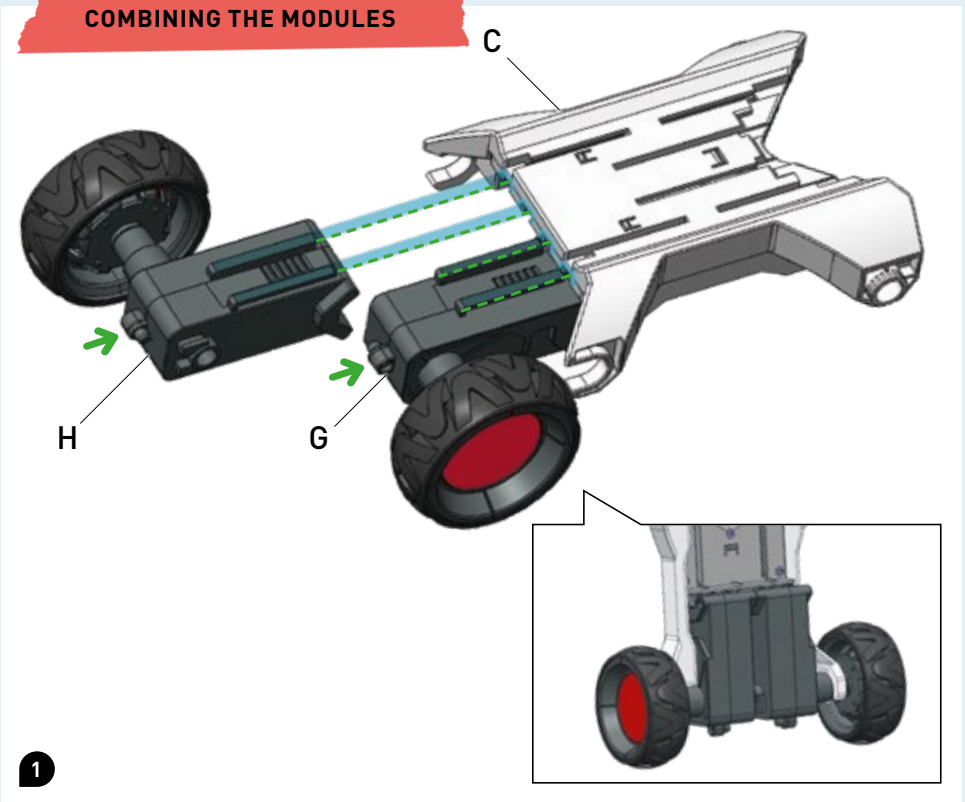


COMPLETING MODULES G & H

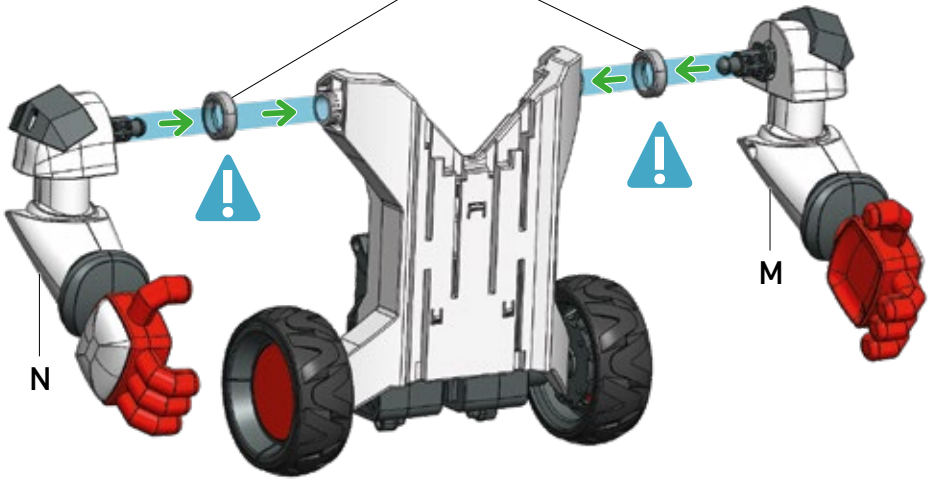




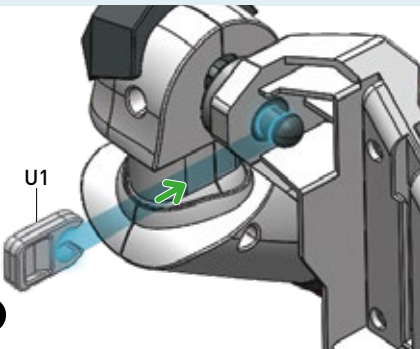
COMBINING THE MODULES



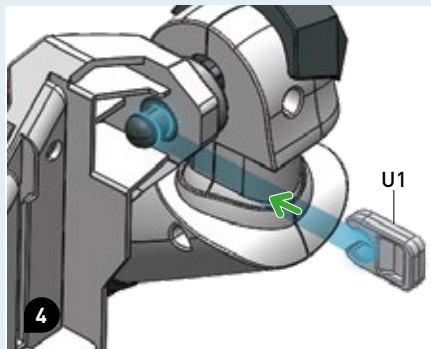
U2 x2

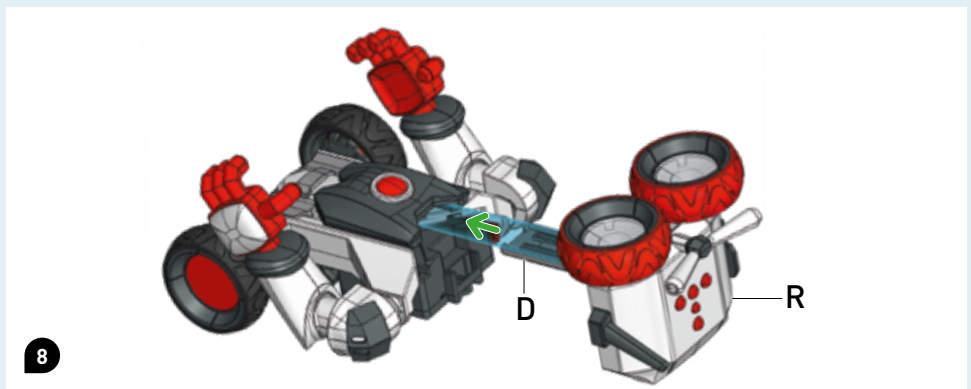
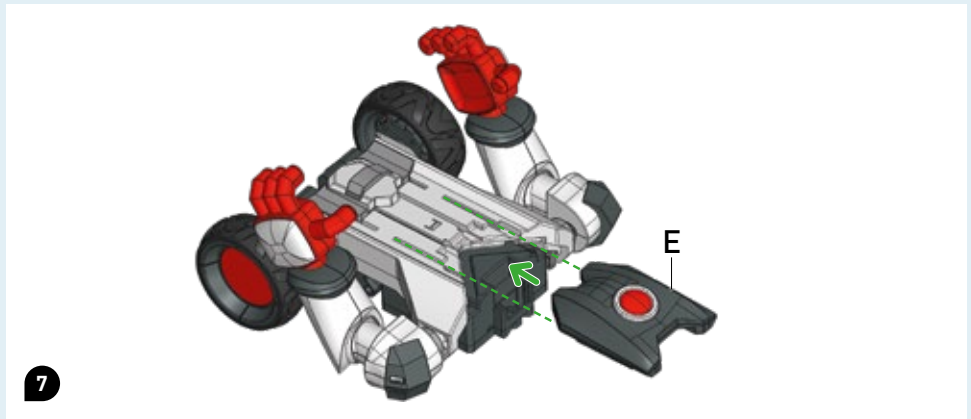
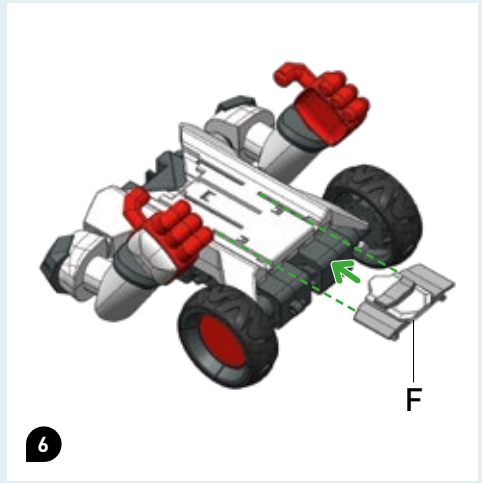
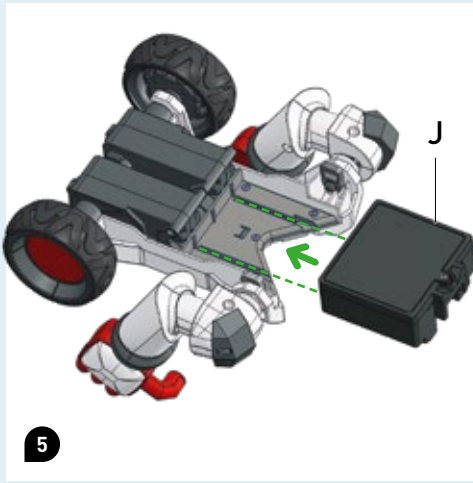


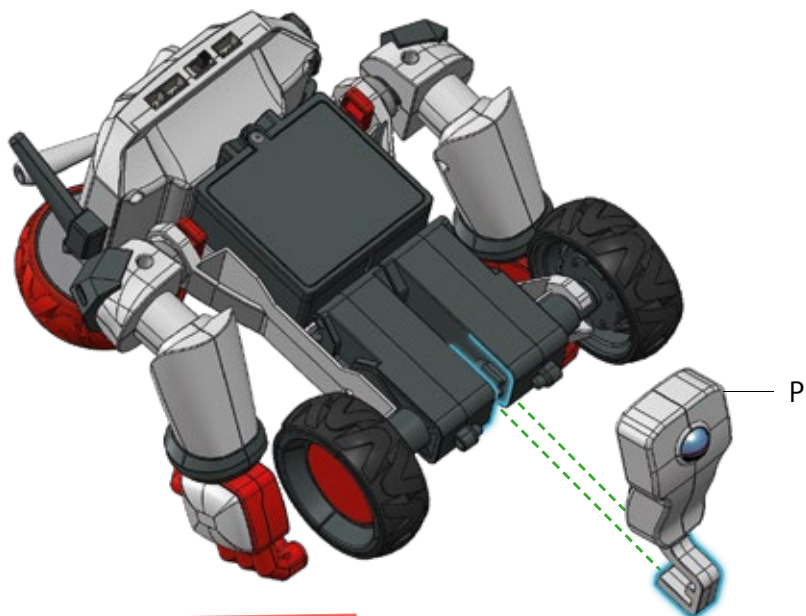
U1



U1

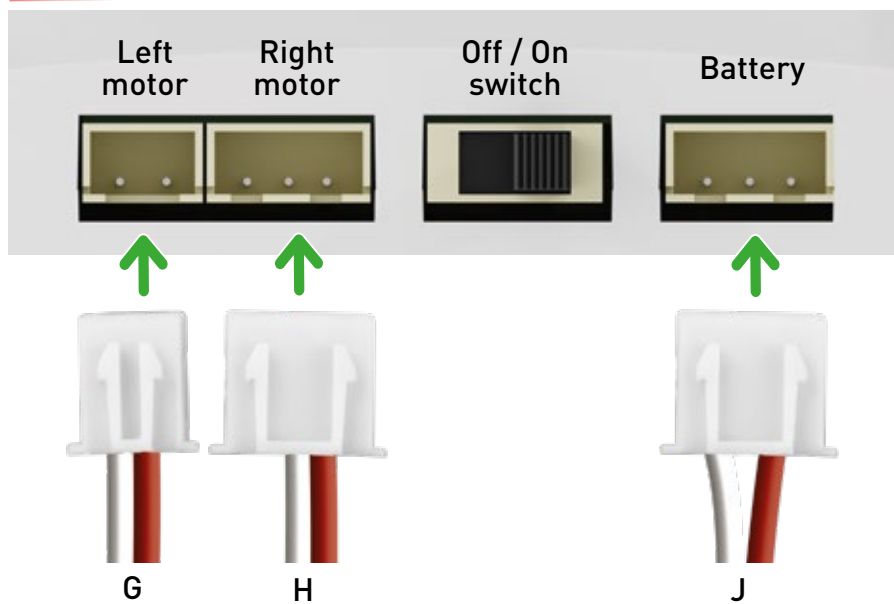


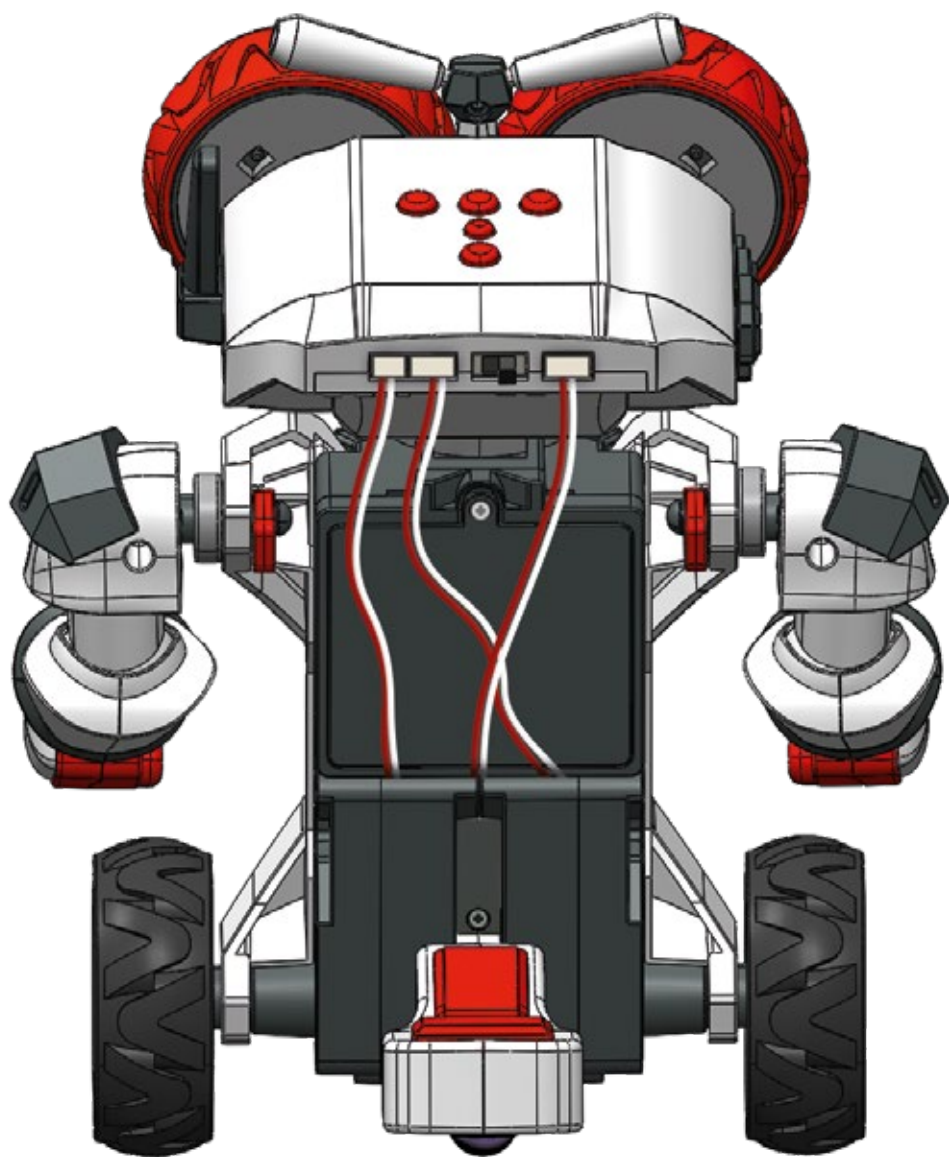




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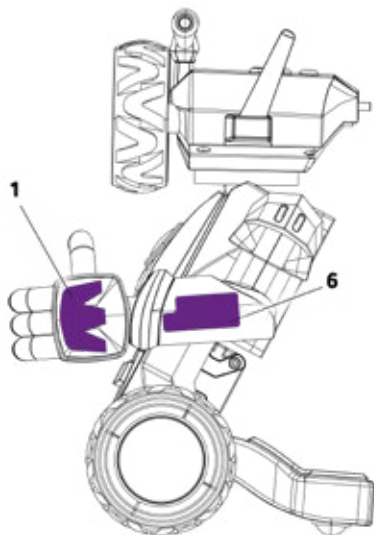
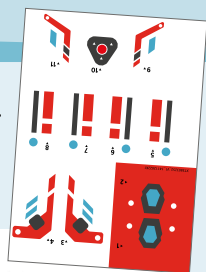
CONNECTING THE CABLES



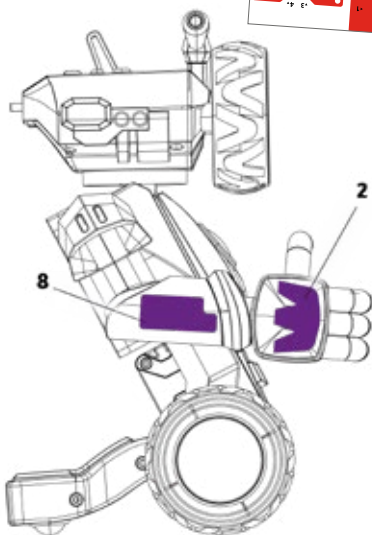


STICKER PLACEMENT

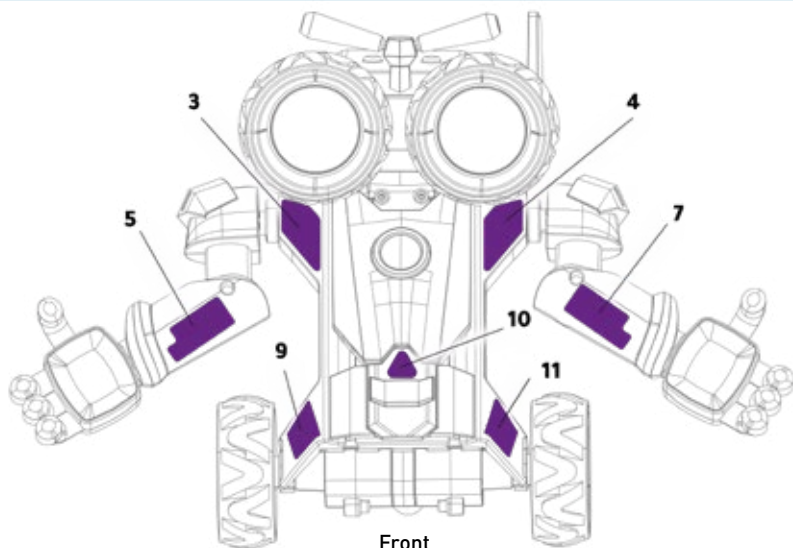
The images below show you where to place Junior's stickers. The numbers below correspond to the numbers on the sticker sheet.



Left side



Right side



Front

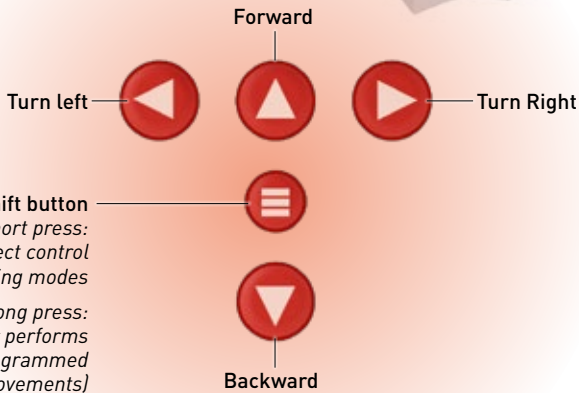
JUNIOR'S CONTROLS

On this page you will learn how to use the buttons to control or program your new robot!



TIP

TO LEARN HOW TO CONTROL AND PROGRAM JUNIOR WITH THE APP, SEE PAGE 28.



Switch between direct control and programming modes

*Short press:
Junior performs preprogrammed movements)*

DIRECT CONTROL MODE

This mode is enabled automatically when you power Junior on. Now, if you press one of the arrow buttons, Junior will perform the corresponding movement. If you have switched on the programming mode, you can return to this mode with a short press of the shift button.

PROGRAMMING MODE

Push the shift button with a short press to switch Junior into this mode. This will be confirmed with two beeps. You can now store up to 50 individual movements by pressing the corresponding buttons. When you have finished programming, press the shift button once. Junior will perform the programmed movements. Press the shift button again to return to direct control mode.

Let's Code!

You can program your robot to do so many things!



App and Programming

To take advantage of all of the functionality this robot has to offer, you must first download the Thames & Kosmos Junior app to a smartphone or tablet with help from an adult. Depending on your smartphone or tablet, scan one of the two QR codes on the right, or search the Google Play Store or the Apple App Store for the “Thames & Kosmos Junior” app to find the app and download it.



iOS
(Apple App Store)



Android
(Google Play Store)



THE APP



CONNECT JUNIOR TO THE APP



Once you've opened the app, ensure Bluetooth is enabled on your device, then select this icon to connect Junior to your device.

THREE WAYS TO PLAY



Directly control Junior's movements from the app.



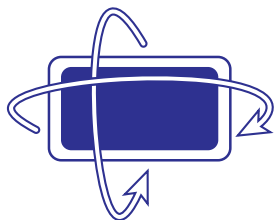
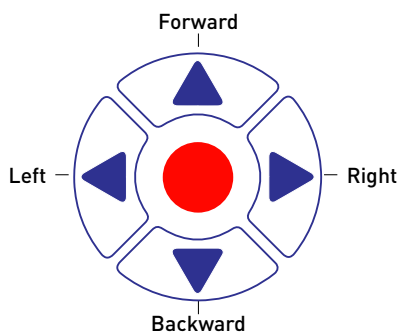
Write a program for Junior and then press play to watch your robot perform.



Play with Junior in workshop mode, and unlock new features by fixing errors.



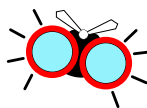
REMOTE CONTROLS



Gyroscopic controls: Tap this icon to control Junior's motion by tilting your device!



Change Junior's speed.



Light up Junior's eyes.

Unlock new modes in the workshop to change Junior into a Ninja, Ghost, and more.



Let Junior be heard! Tap one of these to have Junior make noise.

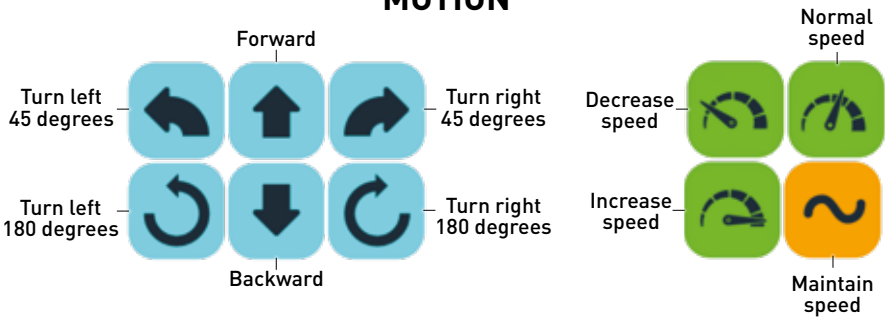


THE APP: PROGRAM

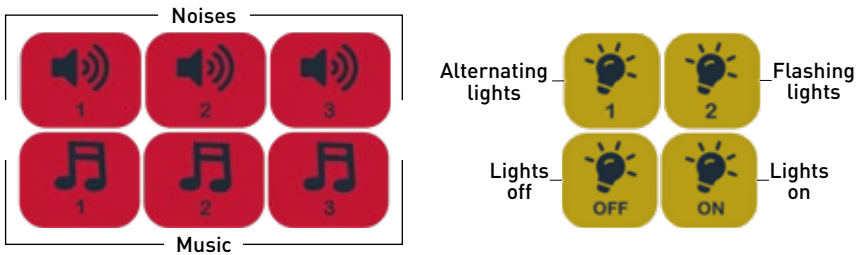


The programming matrix is structured like a timeline, which you fill in from left to right.

MOTION



SOUNDS & LIGHTS





WORKSHOP

Play with Junior in Workshop mode. Then repair the different types of errors that Junior displays (oil, electricity, or software) and gain levels to unlock new characters. Turn Junior into a ninja, an alien, a race car driver, or a ghost in the app. See the next page for instructions on how to fix errors.



FIX ERRORS



Tap the gear to open the workshop status screen.



Tap the flashing icon that shows Junior's error.



Tap the error folder icon to fix it.



Fill up the level bar to unlock new looks for Junior inside the app!



FCC Part 15 Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF Exposure Statement

To comply with the FCC RF exposure compliance requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with an accessory that contains no metal and that positions the device a minimum of 20 cm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

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