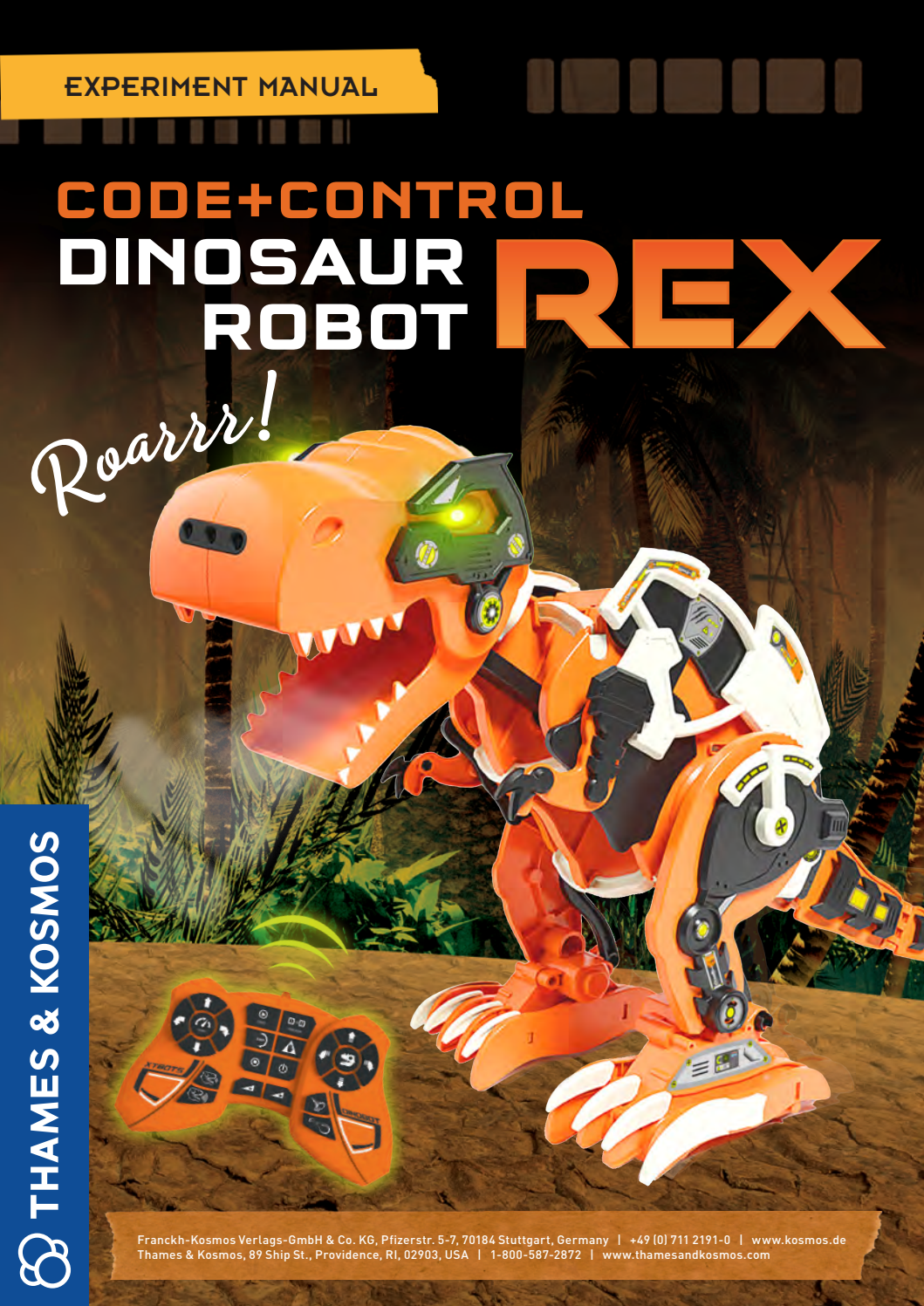
EXPERIMENT MANUAL

CODE+CONTROL DINOSAUR ROBOT REX

Roarrr!



THAMES & KOSMOS

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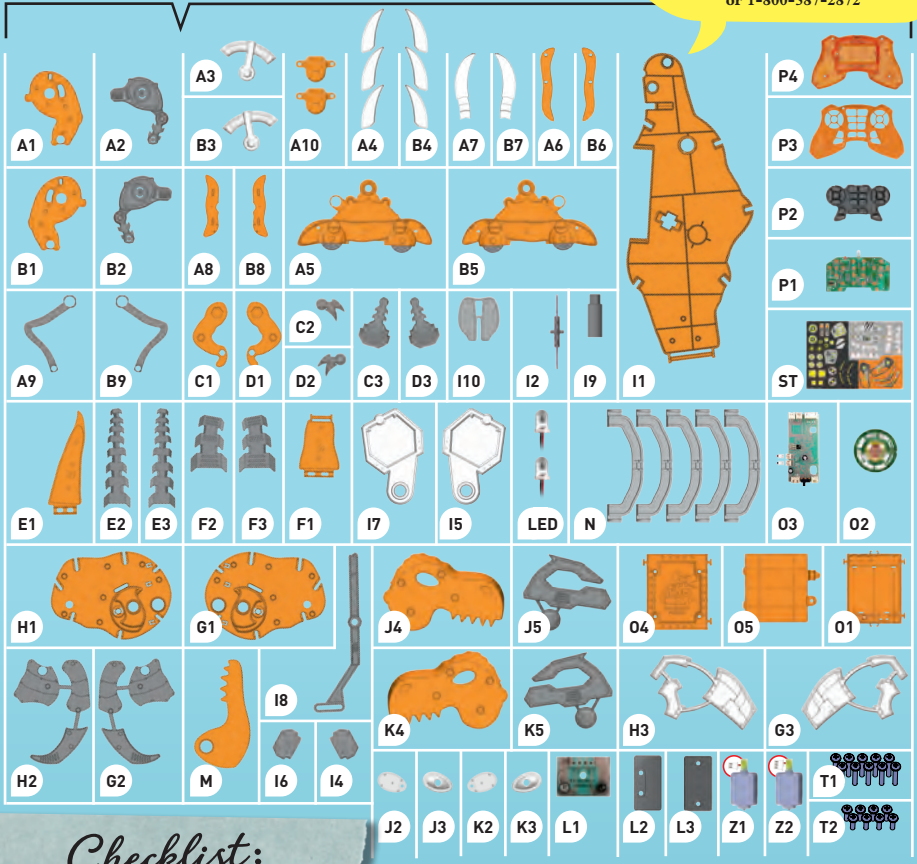
Thames & Kosmos, 89 Ship St., Providence, RI, 02903, USA | 1-800-587-2872 | www.thamesandkosmos.com

KIT CONTENTS

What's in your experiment kit:



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

Checklist:

✓	No.	Description	Quantity	Part No.
◯	A1	Right leg	1	726752
◯	A2	Right leg armor	1	726764
◯	A3	Right leg adornment	1	726747
◯	A4	Small claws, right foot	3	726747
◯	A5	Right foot	1	726774
◯	A6	Outer foot cover, right	1	726745
◯	A7	Large claw, right foot	1	726747
◯	A8	Inner foot cover, right	1	726745
◯	A9	Lever, left leg	1	726744
◯	A10	Engine cover	2	726760
◯	B1	Left leg	1	726753

✓	No.	Description	Quantity	Part No.
◯	B2	Left leg armor	1	726765
◯	B3	Left leg adornment	1	726747
◯	B4	Small claws, left foot	3	726747
◯	B5	Left foot	1	726775
◯	B6	Outer foot cover, left	1	726745
◯	B7	Large claw, left foot	1	726747
◯	B8	Inner foot cover, left	1	726745
◯	B9	Lever, right leg	1	726744
◯	C1	Right arm	1	726745
◯	C2	Claw, right arm	1	726743
◯	C3	Armor, right arm	1	726743

TABLE OF CONTENTS

TIP

ADDITIONAL INFORMATION CAN BE FOUND IN THE CHECK IT OUT SECTIONS ON PAGES 31 AND 32.

YOU WILL ALSO NEED:
Diagonal cutters or scissors and nail file, Phillips-head screwdriver (PH1 size recommended), 6 AA batteries (1.5-volt, type LR6).

✓	No.	Description	Quantity	Part No.
○	D1	Left arm	1	726745
○	D2	Claw, left arm	1	726743
○	D3	Armor, left arm	1	726743
○	E1	Tail tip	1	726745
○	E2	Armor for tail tip, right	1	726743
○	E3	Armor for tail tip, left	1	726743
○	F1	Tail center	1	726745
○	F2	Armor for tail center, right	1	726743
○	F3	Armor for tail center, left	1	726743
○	G1	Body, right	1	726754
○	G2	Body armor, right	1	726766
○	G3	Body adornment, right	1	726772
○	H1	Body, left	1	726755
○	H2	Body armor, left	1	726767
○	H3	Body adornment, left	1	726773
○	I1	Body, center	1	726751
○	I2	Axis	1	726784
○	I4	Right body connector, gray	1	726768
○	I5	Left body connector, white	1	726771
○	I6	Left body connector, gray	1	726769
○	I7	Right body connector, white	1	726770
○	I8	Large lever	1	726744
○	I9	Connector	1	726744
○	I10	Cervical vertebra	1	726746
○	J2	Right eye support	1	726746
○	J3	Right eye	1	726746
○	J4	Head, right	1	726761

✓	No.	Description	Quantity	Part No.
○	J5	Head armor, right	1	726743
○	K2	Left eye support	1	726746
○	K3	Left eye	1	726746
○	K4	Head, left	1	726762
○	K5	Head armor, left	1	726743
○	L1	Infrared sensor	1	726776
○	L2	Sensor housing, front	1	726744
○	L3	Sensor housing, rear	1	726744
○	LED	Cable with LED	2	726777
○	M	Jaw	1	726763
○	N	Ribs	5	726746
○	01	Battery box bottom, REX	1	726756
○	02	Speaker	1	726782
○	03	Circuit board, REX	1	726783
○	04	Control box cover, REX	1	726758
○	05	Battery box cover, REX	1	726759
○	P1	Circuit board, remote	1	726779
○	P2	Rubber buttons, remote	1	726778
○	P3	Remote control front	1	726749
○	P4	Remote control back with battery cover	1	726748
○	ST	Sticker sheet	1	726742
○	T1	Long screw	10	726785
○	T2	Short screw	8	726786
○	Z1	Right motor	1	726780
○	Z2	Left motor	1	726781

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 vehicle during operation.

Keep hands, hair, and clothing away from the tires and tracks 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 six 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 23 and 25. 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 REX, your Code+Control Dinosaur Robot.

— 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.

TIP

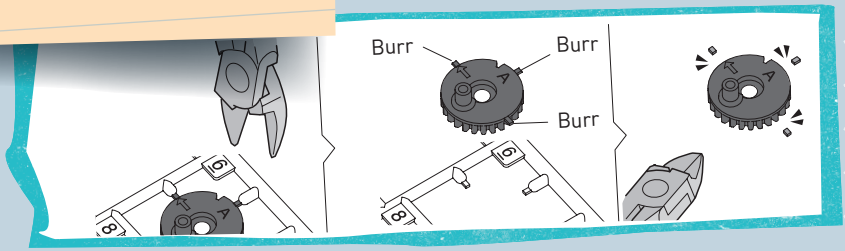
IMPORTANT:

DO NOT SEPARATE THE PARTS UNTIL, THEY ARE NEEDED.
REMOVE EXCESS MATERIAL (BURRS) BEFORE ASSEMBLY USING DIAGONAL CUTTERS OR A NAIL FILE.

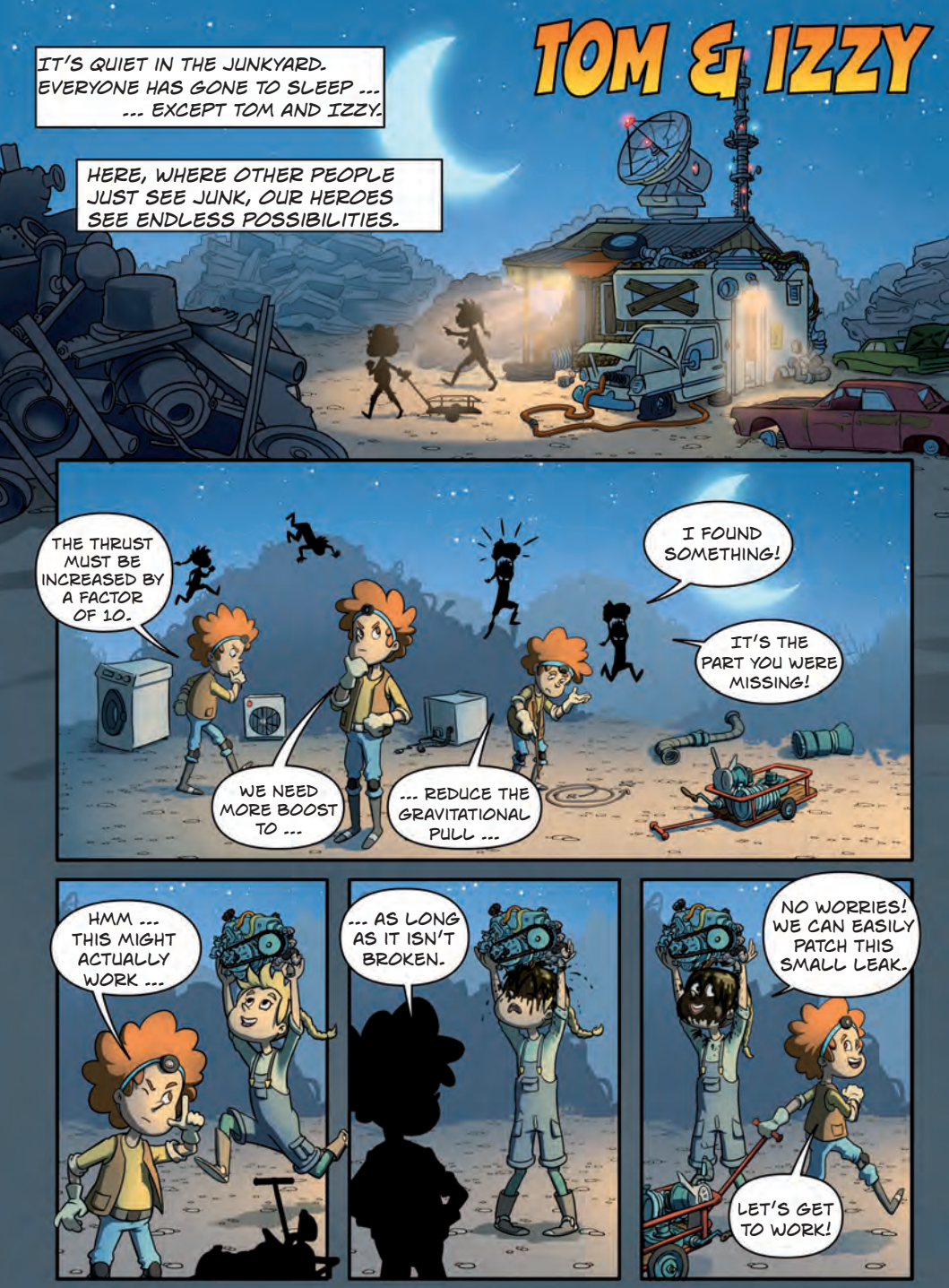
— Particular care must be taken when cutting the plastic parts out of the frames, as sharp points can be created. These can be removed with the help of scissors or diagonal cutters and a nail file. Please supervise your child whenever they are using scissors or diagonal cutters until you feel they are ready to use them independently.

— REX 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.

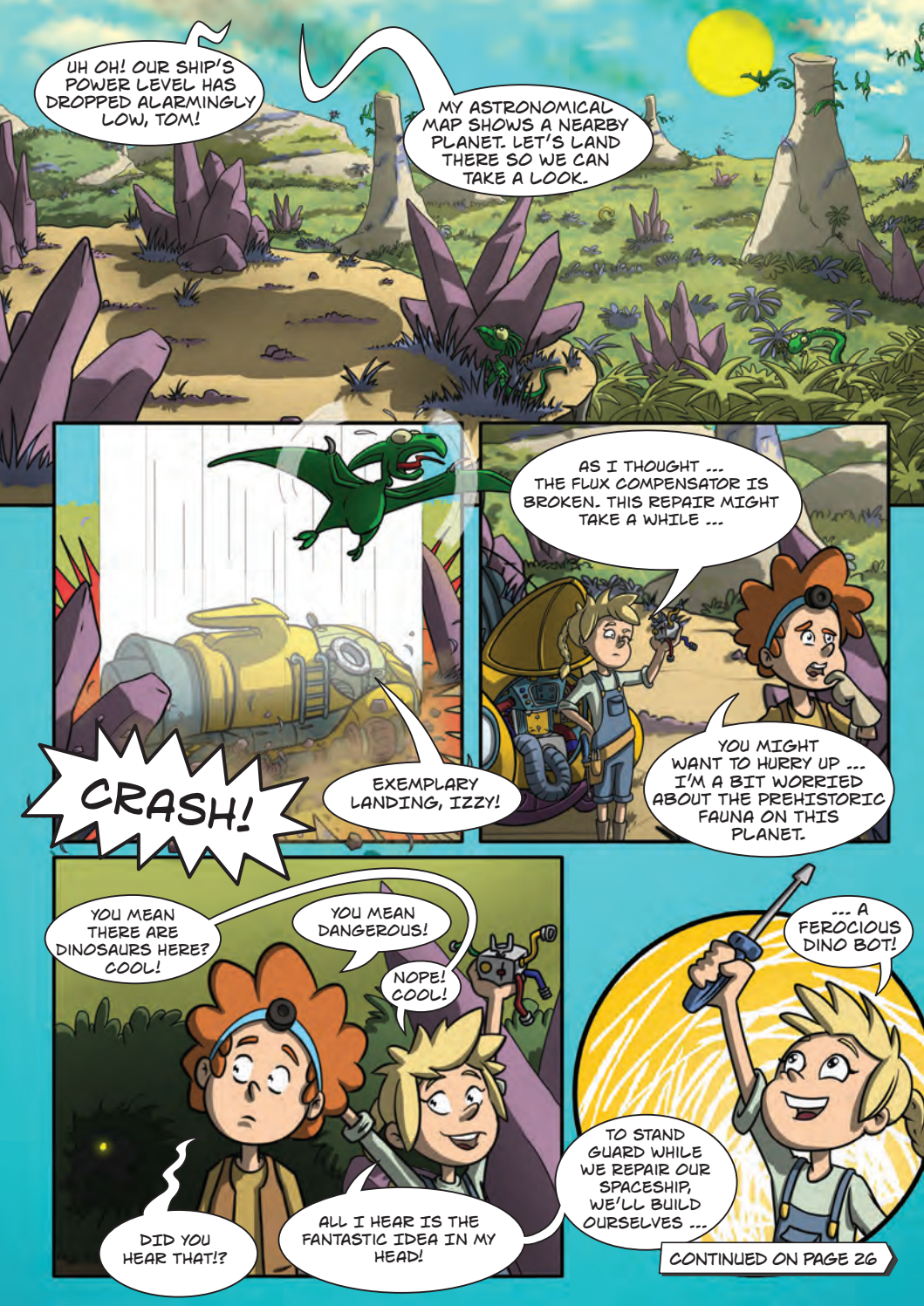
— And most importantly: Have fun!




REX!
AND THE
DINO PLANET ADVENTURE!


TOM & IZZY
IT'S QUIET IN THE JUNKYARD. EVERYONE HAS GONE TO SLEEP ... ... EXCEPT TOM AND IZZY.
HERE, WHERE OTHER PEOPLE JUST SEE JUNK, OUR HEROES SEE ENDLESS POSSIBILITIES.
THE THRUST MUST BE INCREASED BY A FACTOR OF 10.
WE NEED MORE BOOST TO ...
... REDUCE THE GRAVITATIONAL PULL ...
I FOUND SOMETHING!
IT'S THE PART YOU WERE MISSING!
HMM ... THIS MIGHT ACTUALLY WORK ...
... AS LONG AS IT ISN'T BROKEN.
NO WORRIES! WE CAN EASILY PATCH THIS SMALL LEAK.
LET'S GET TO WORK!


IZZY CAN REPAIR ANYTHING. SHE IS A GENIUS WHEN IT COMES TO MECHANICS.
TOM, ON THE OTHER HAND, IS A SCIENTIST THROUGH AND THROUGH.
TOGETHER, THESE TWO CAN BUILD ANYTHING!
I THINK IT'S READY!
HE'S ALWAYS GAME TO TRY OUT AN EXPERIMENT!
YES! WE DID IT!
NOTHING CAN STOP US NOW!
WHERE SHOULD WE FLY TO FIRST?
WHEREVER WE WANT!
WE CAN GO ANYWHERE!

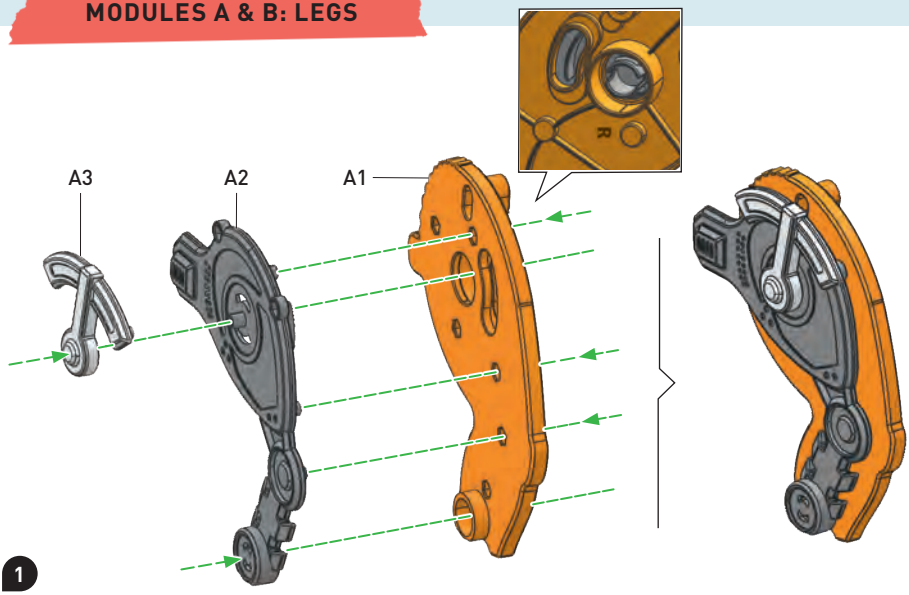


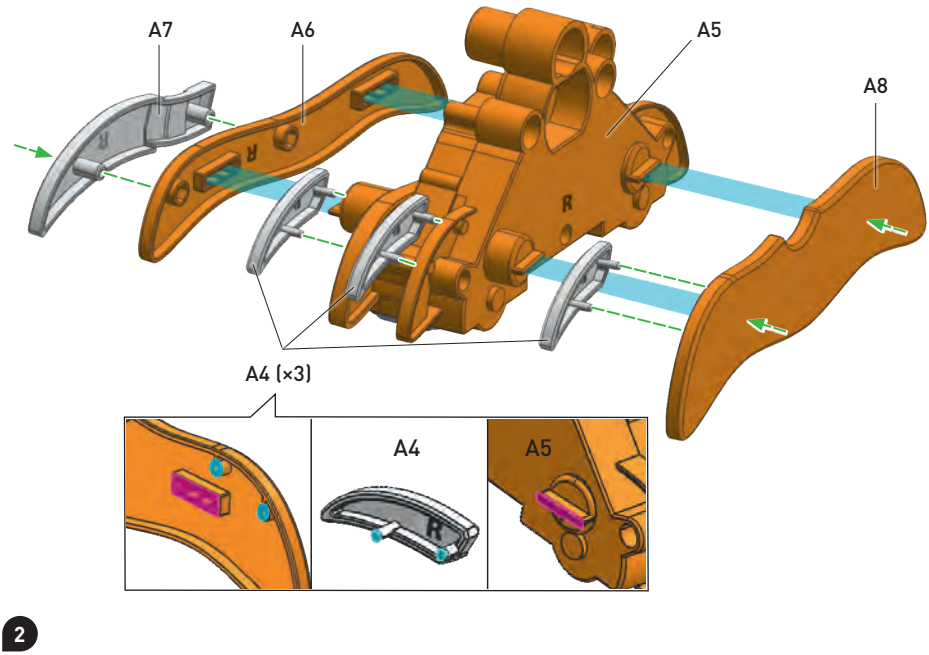
CONTINUED ON PAGE 26

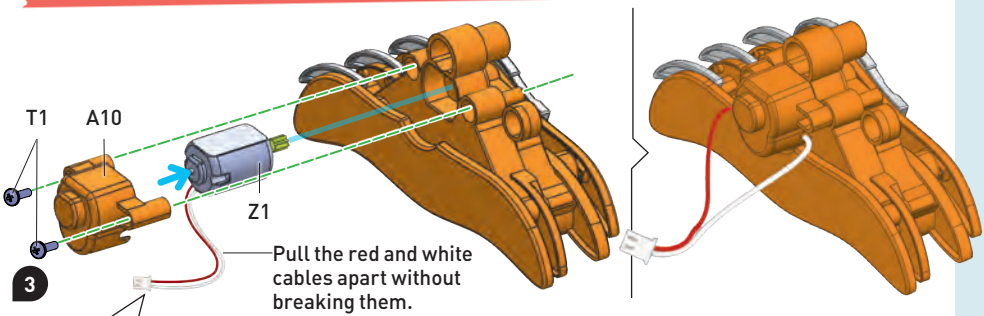
Your Own Guardian Tyrannosaurus Rex!

It's time to bring REX, your new dino defender, to life! The following pages will guide you through assembling a bipedal robot modeled after a Tyrannosaurus Rex — the king of the dinosaurs — with motors, LEDs, a speaker, and a remote controller. Once complete, you will learn how to control and program your robot to move, make sounds, and vigilantly stand guard using its infrared sensor!

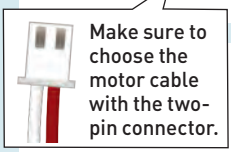
MODULES A & B: LEGS

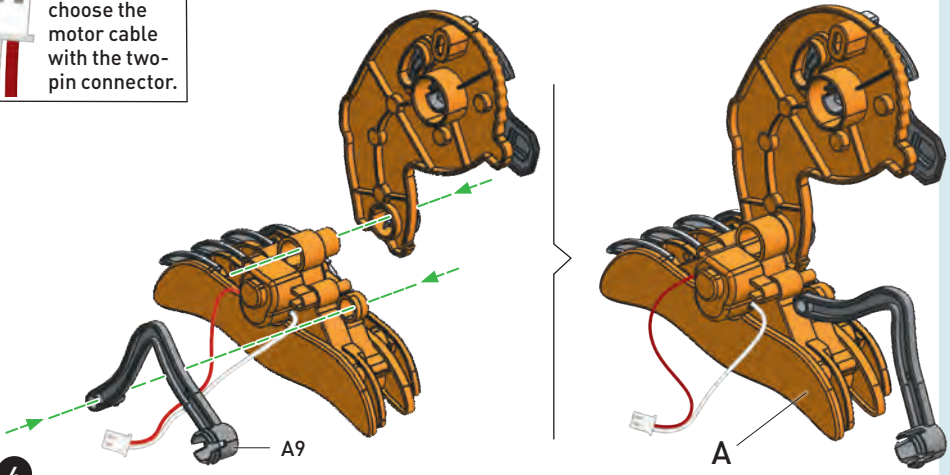




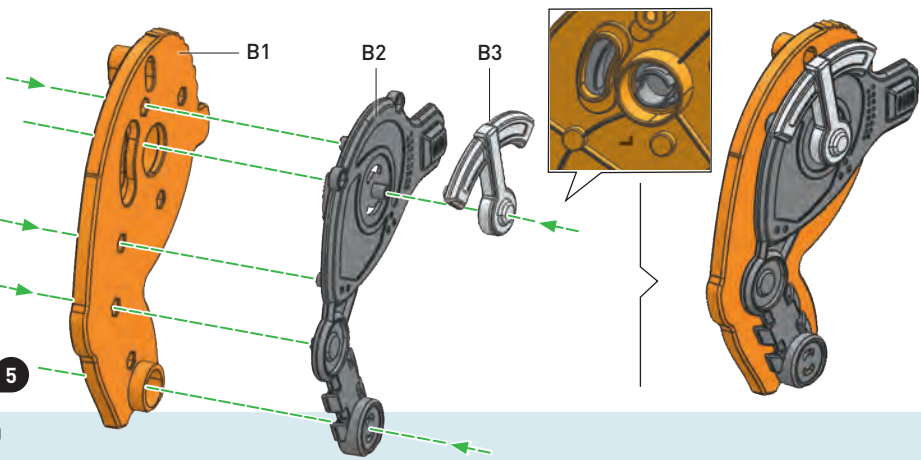

T1
A10
Z1
Pull the red and white cables apart without breaking them.

3

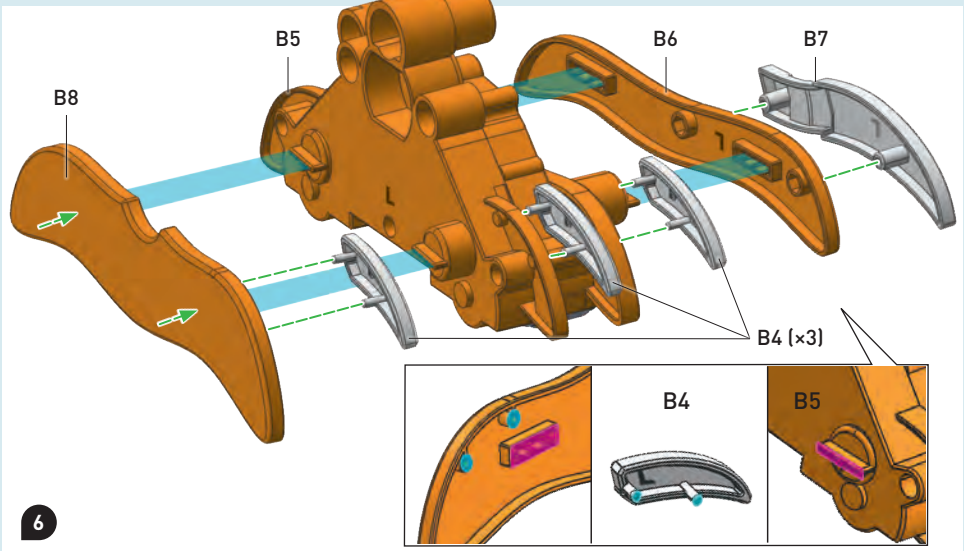

Make sure to choose the motor cable with the two-pin connector.


A9
A

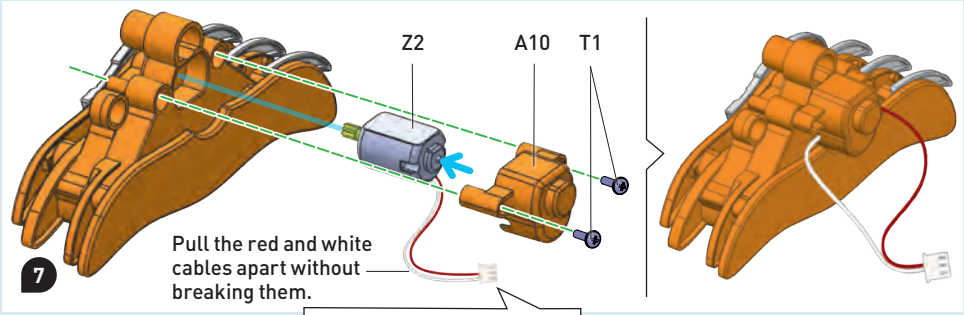
4


B1
B2
B3

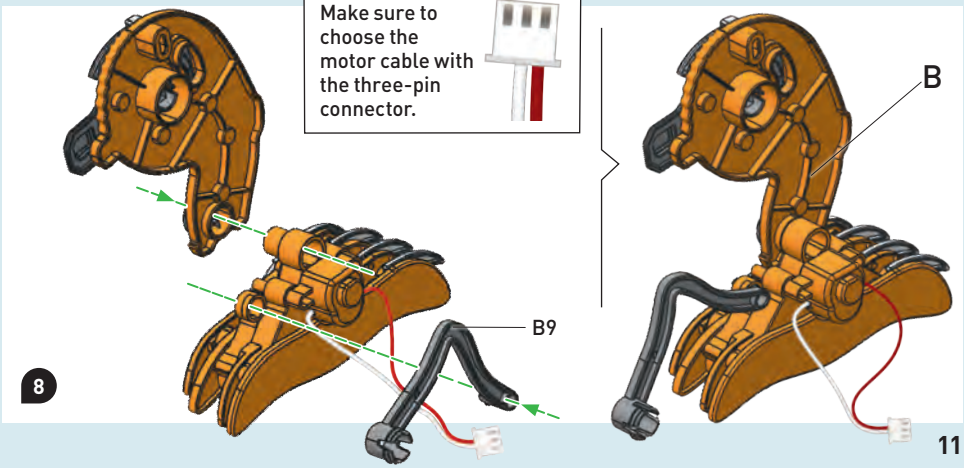
5


B5
B6
B7
B8
B4 (×3)
B4
B5

6

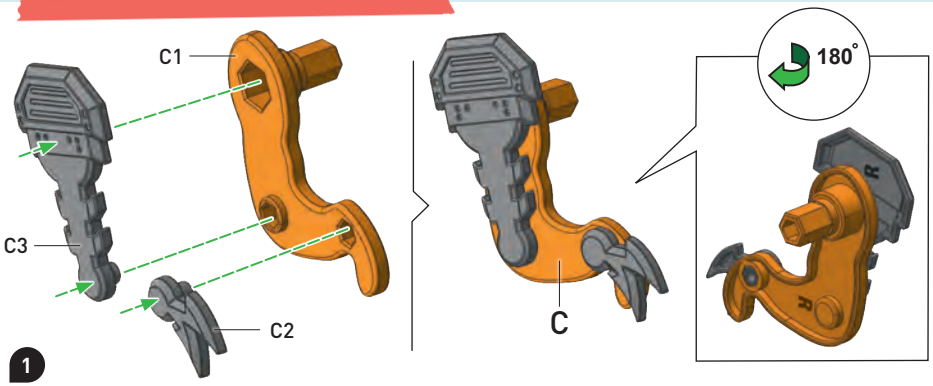

Z2
A10
T1
Pull the red and white cables apart without breaking them.

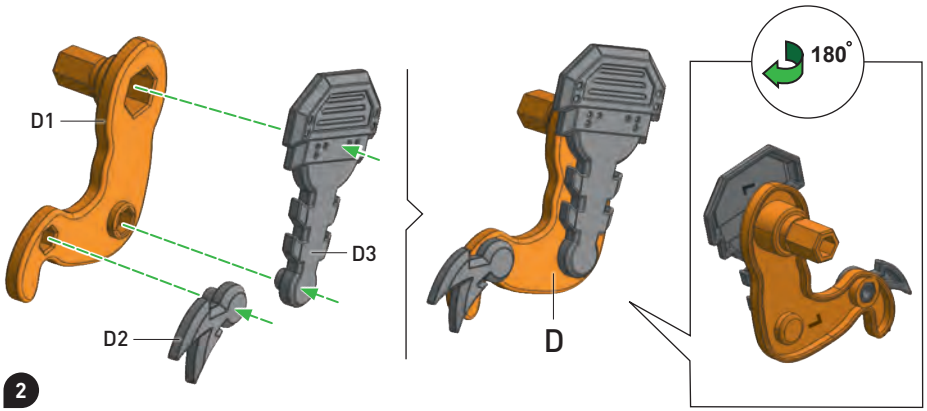
7


Make sure to choose the motor cable with the three-pin connector.
B
B9

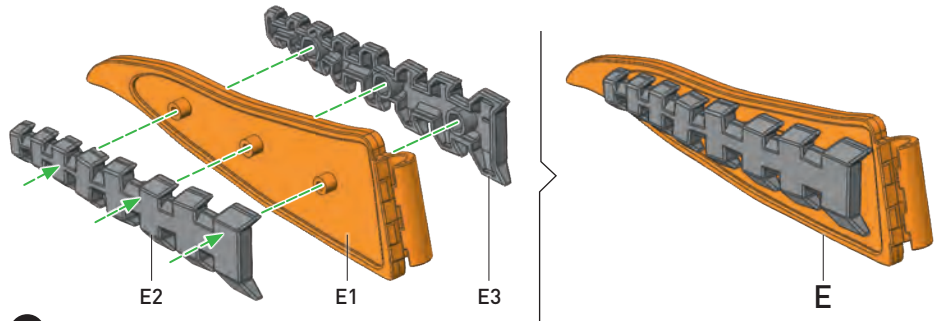
8

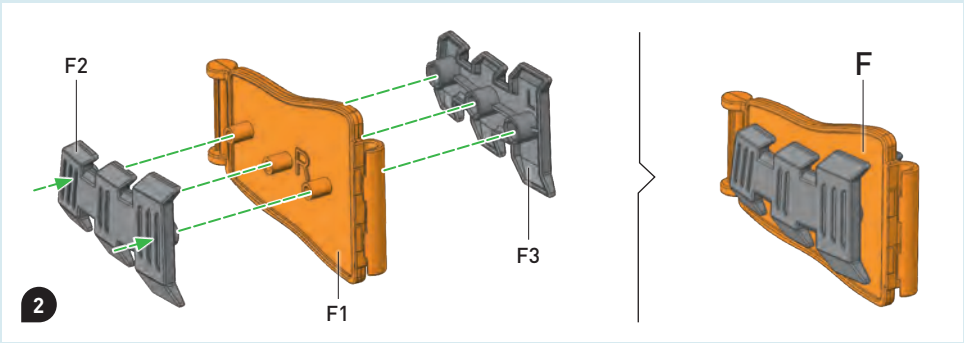
MODULES C & D: ARMS



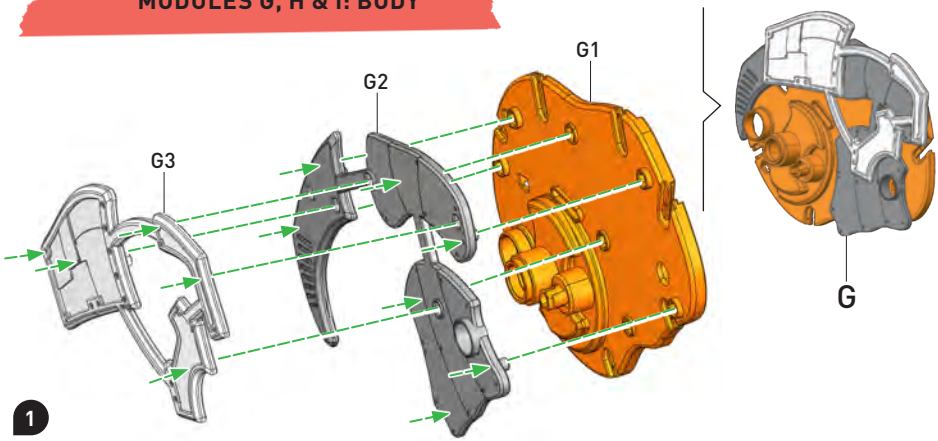


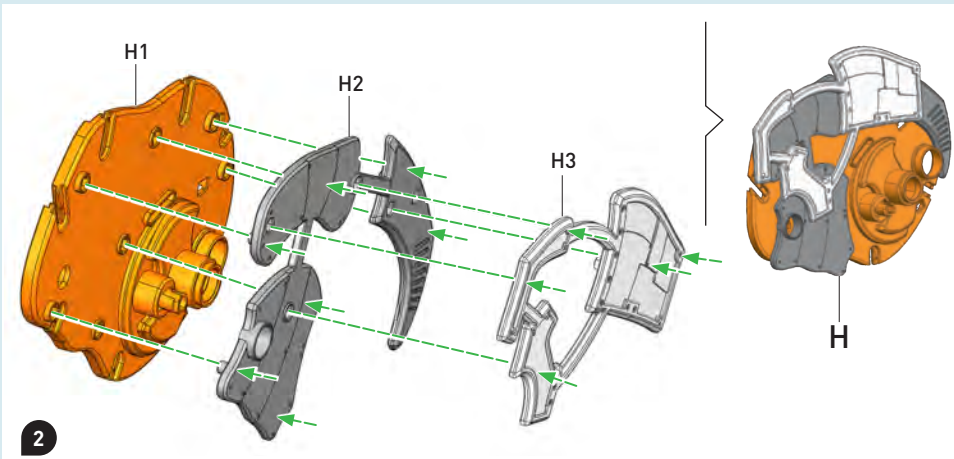
MODULES E & F: TAIL

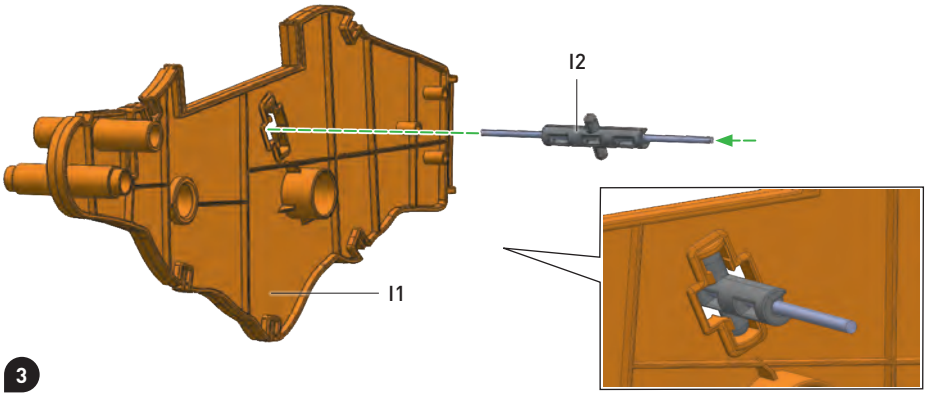




MODULES G, H & I: BODY







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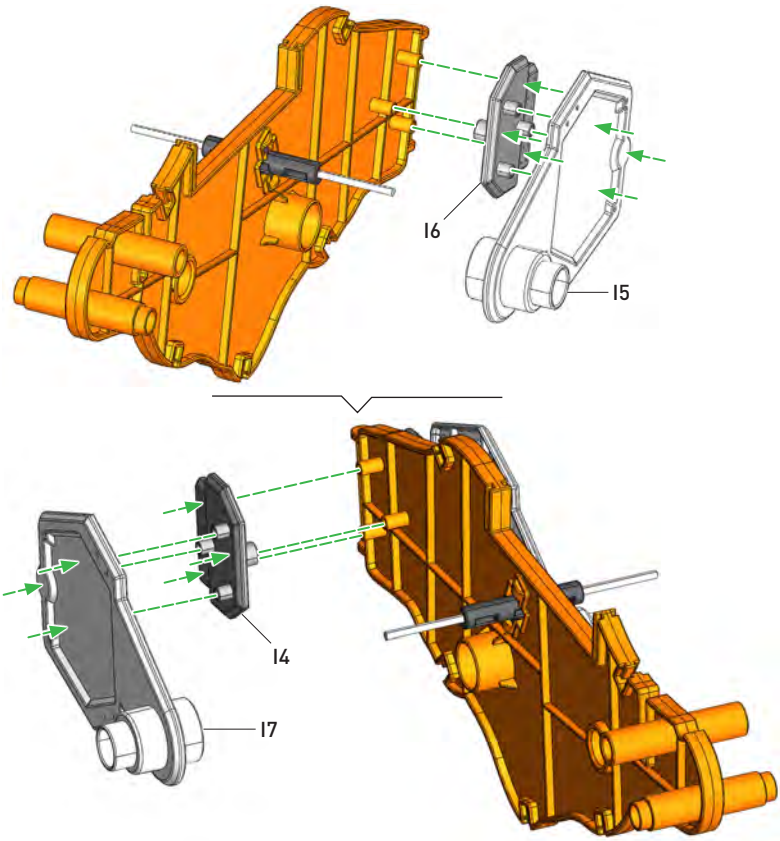

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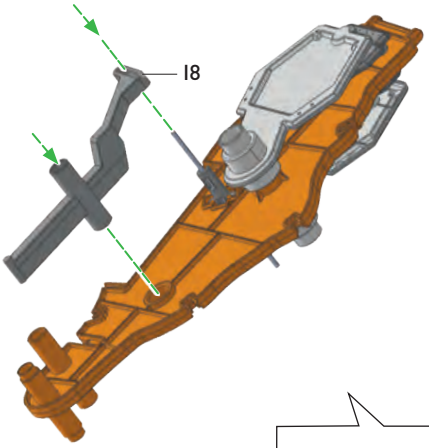

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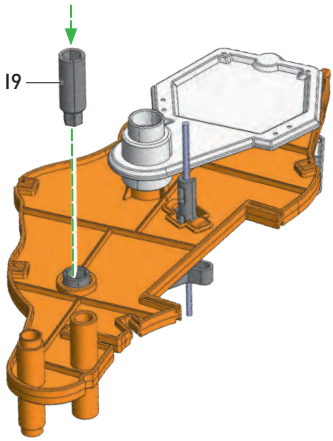

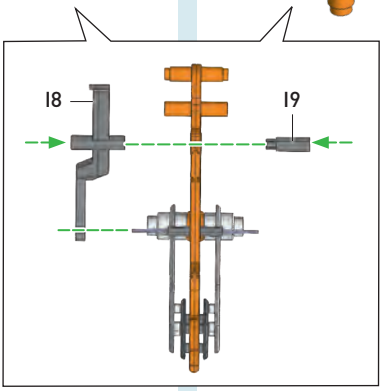

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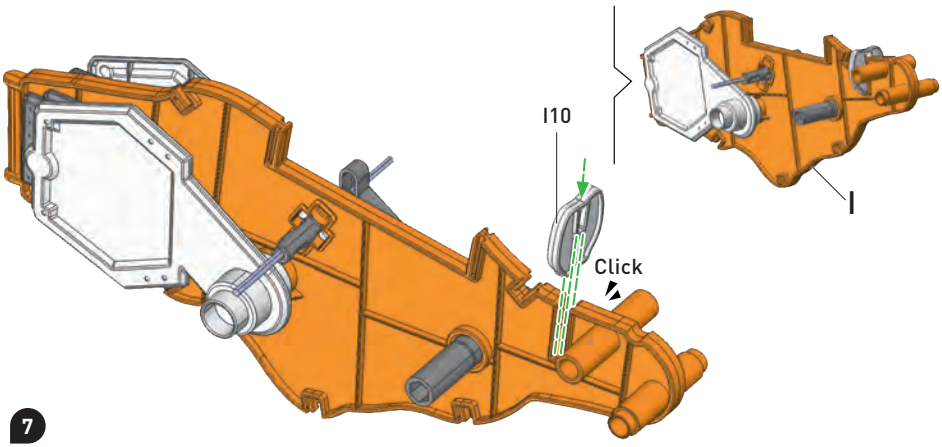

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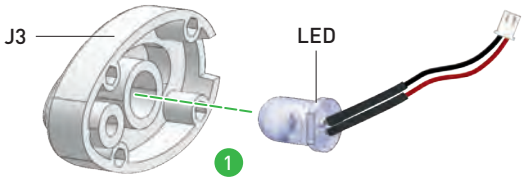

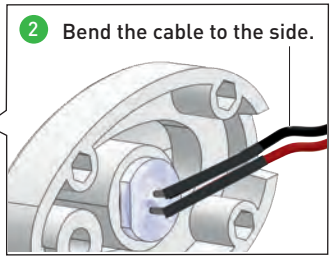

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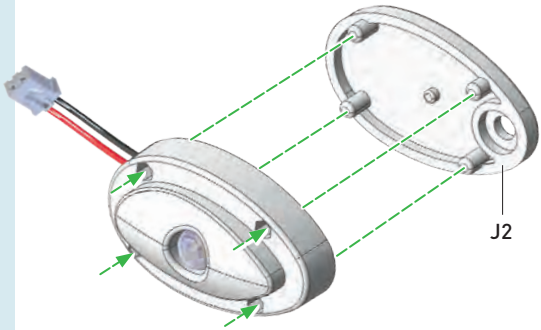

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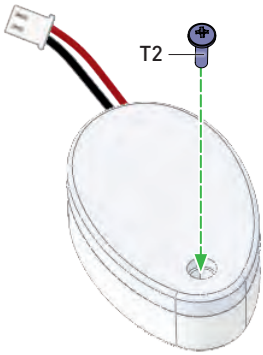

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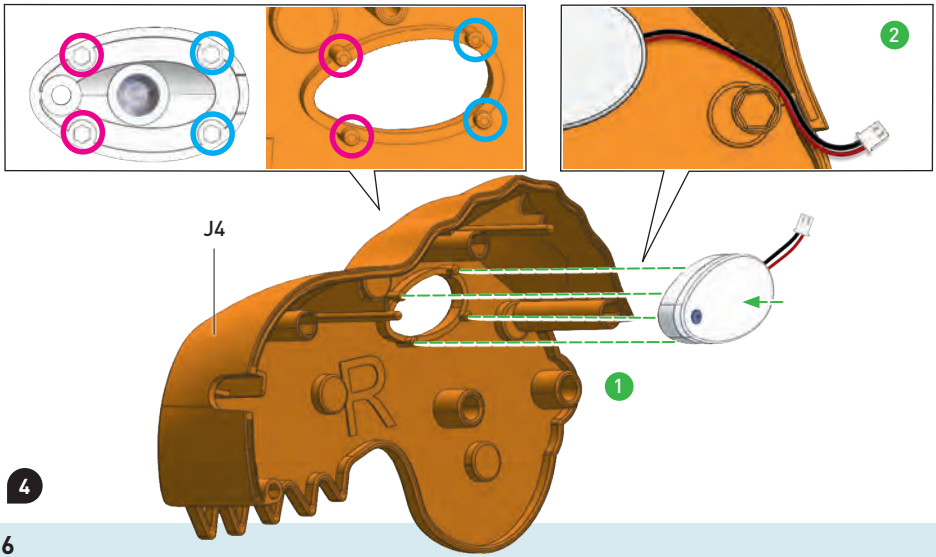

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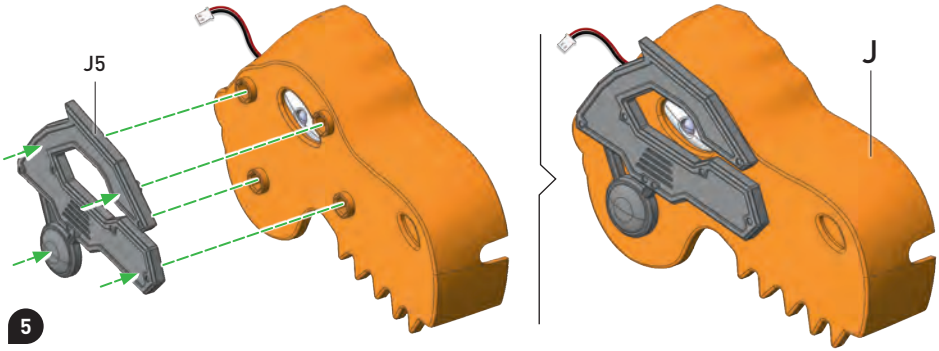

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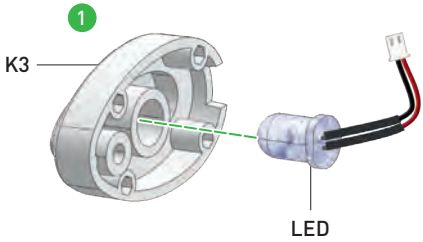

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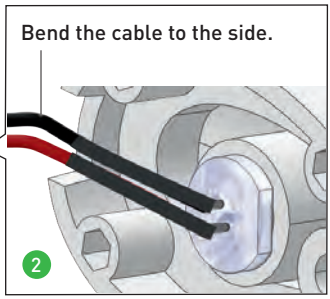

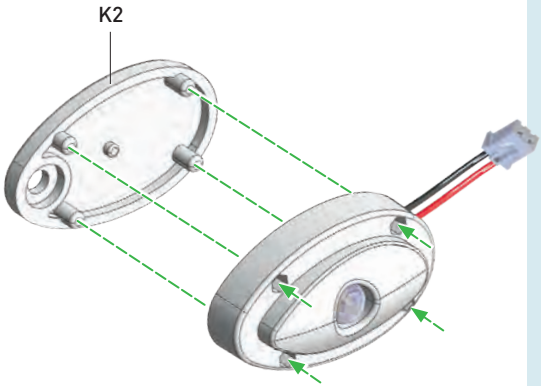

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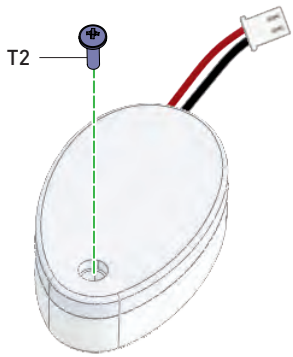

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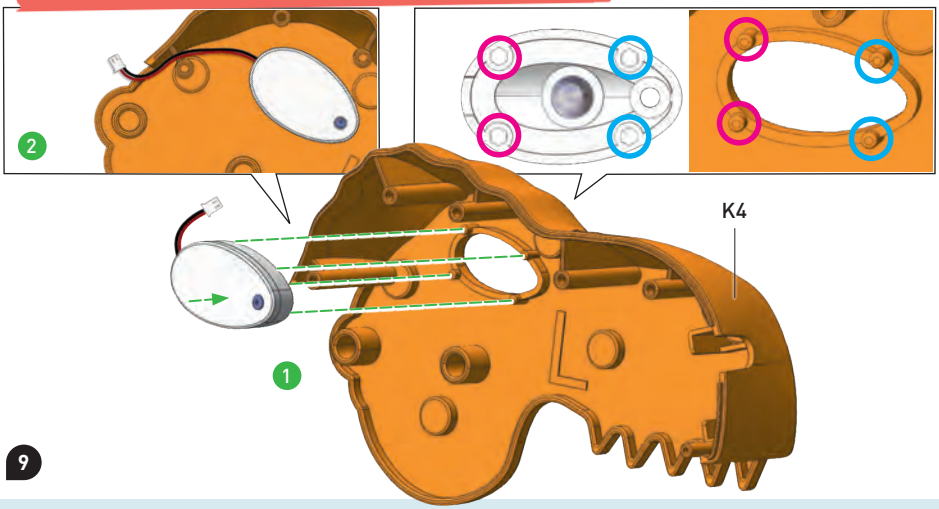
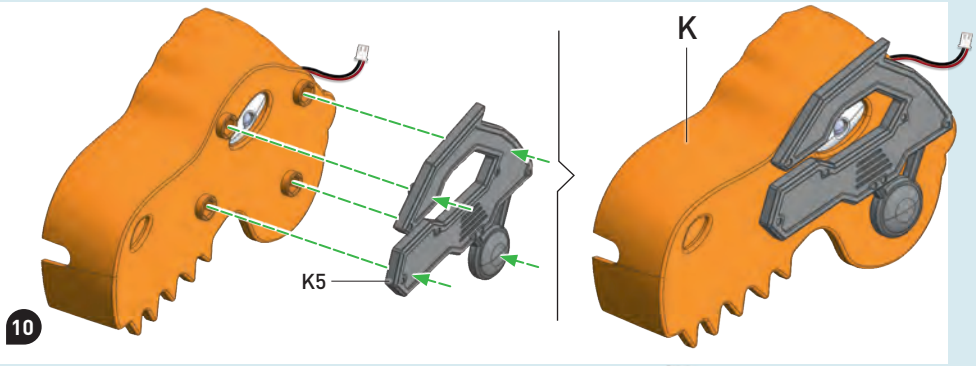
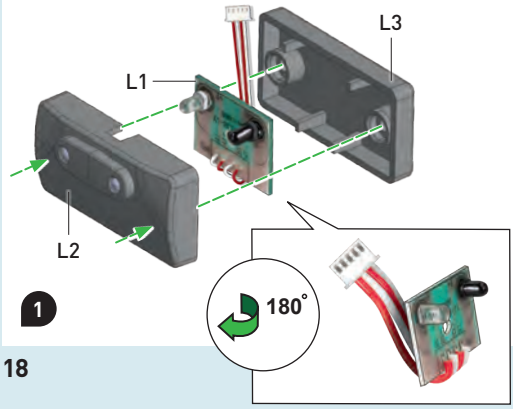
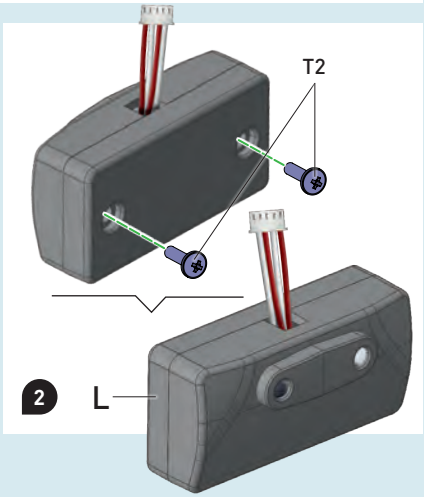
MODULES J & K: HEAD (CONTINUED)



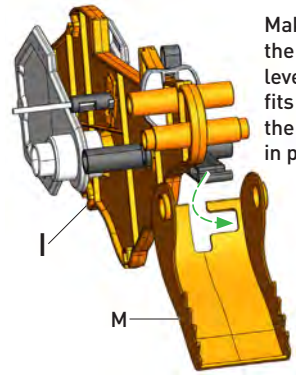


MODULE L: SENSOR

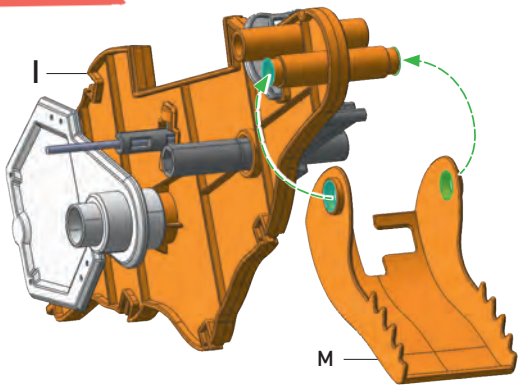




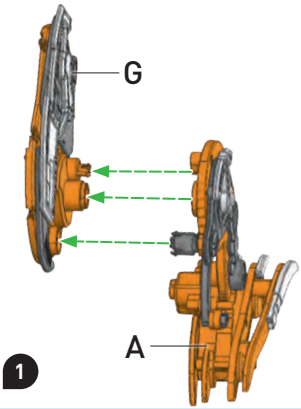
ATTACHING REX'S LOWER JAW



Make sure the large lever (I8) fits into the notch in part M.



COMBINING THE MODULES



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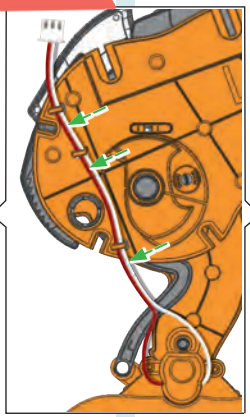

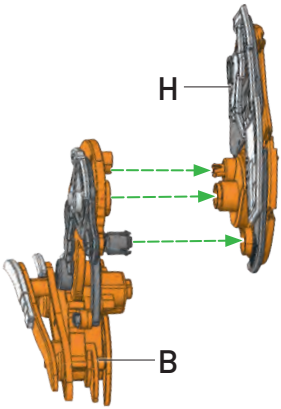

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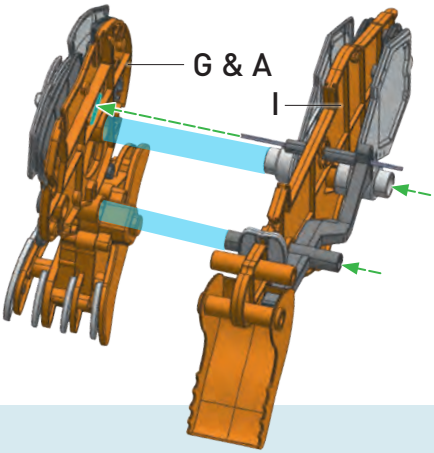
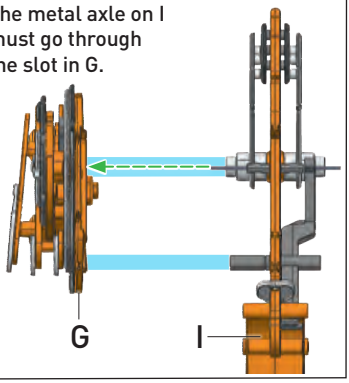
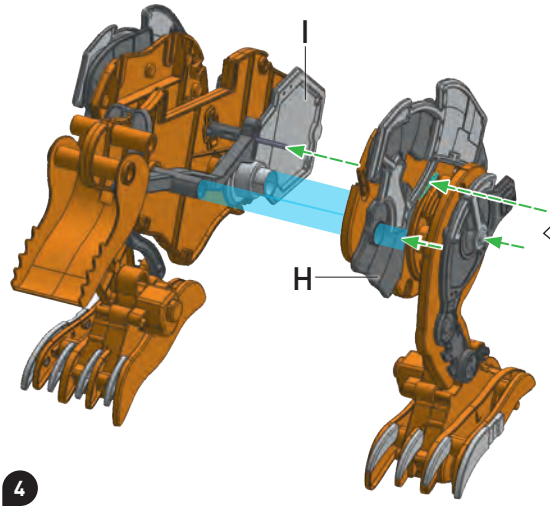
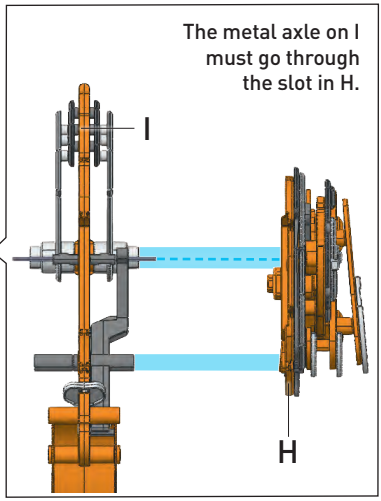


3

The metal axle on I must go through the slot in G.







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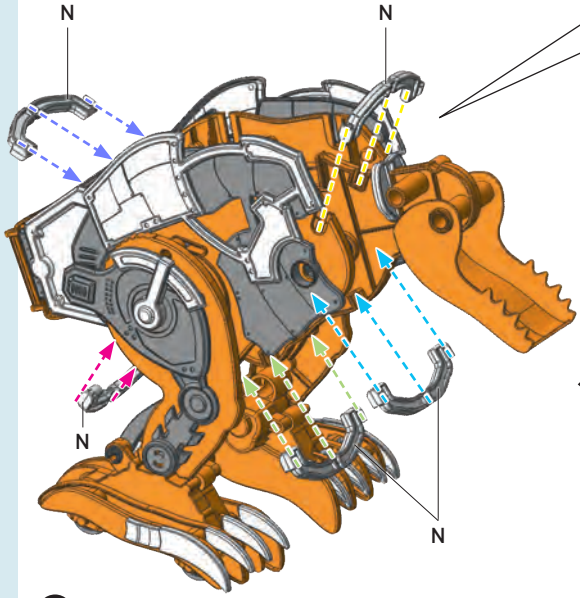

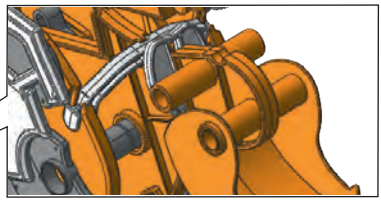

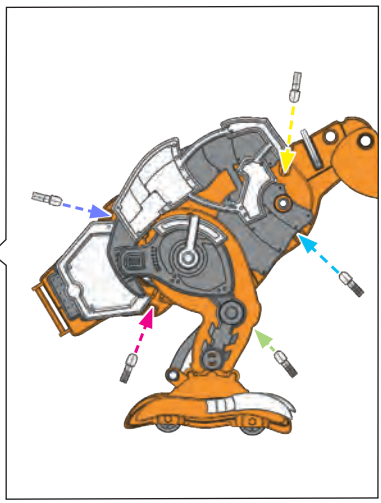

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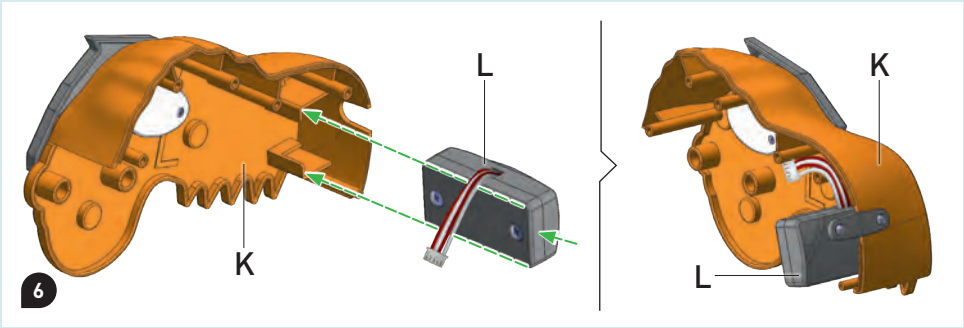
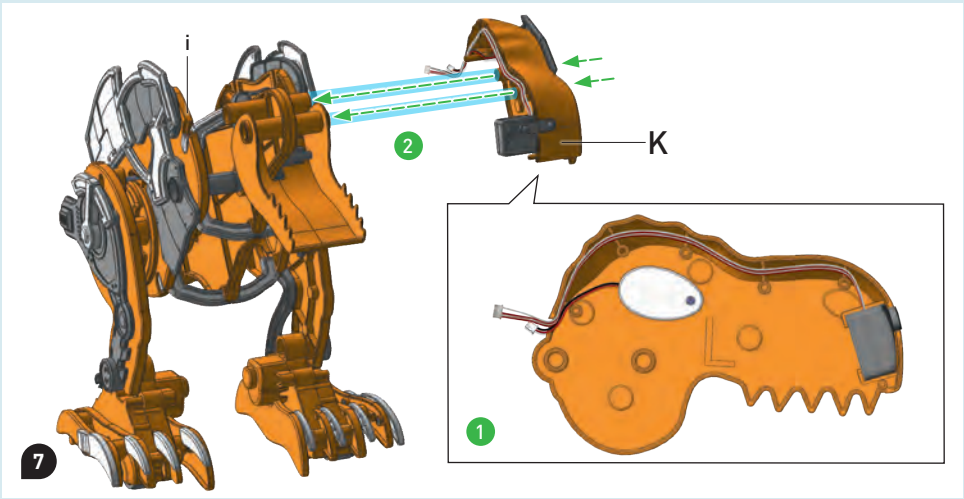
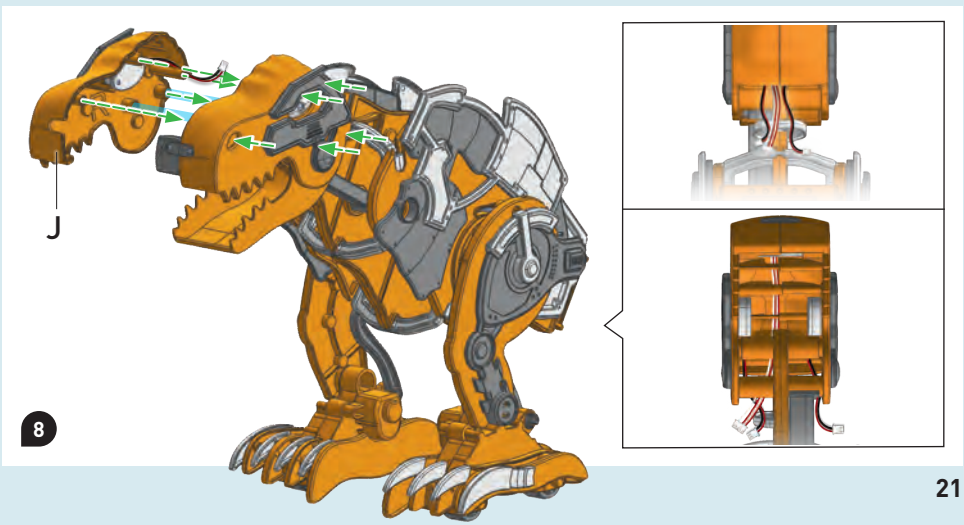
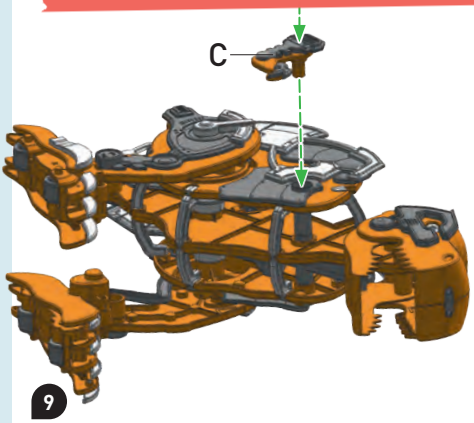

L
K
K
L
6


i
2
K
1
7


J
8

COMBINING THE MODULES (CONTINUED)



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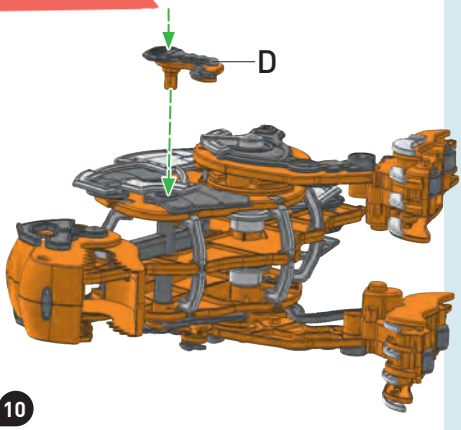

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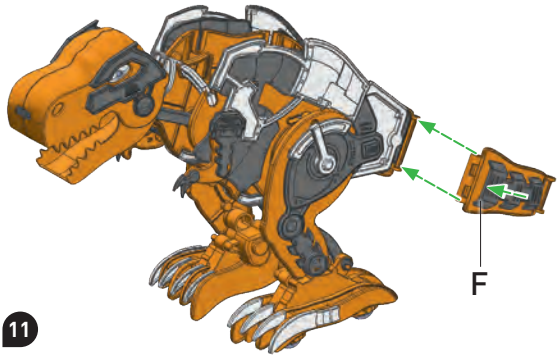

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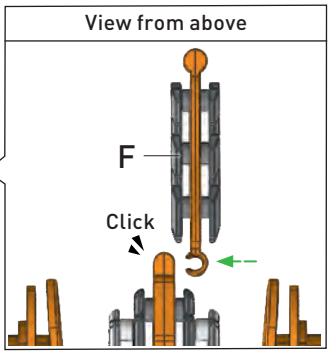

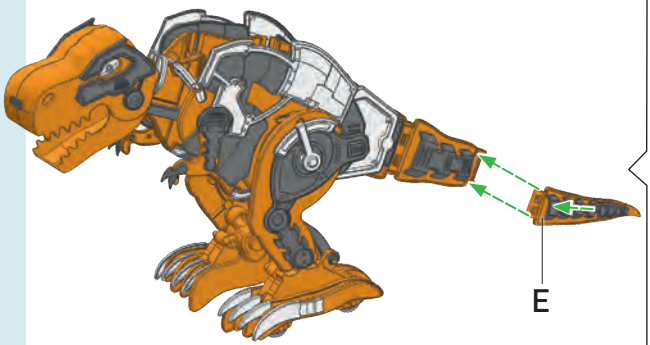

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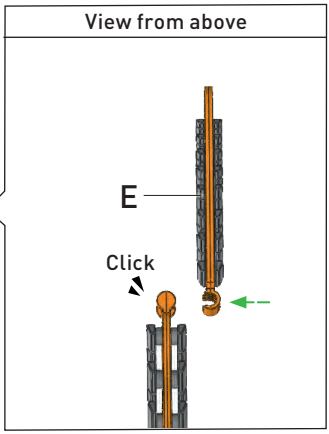
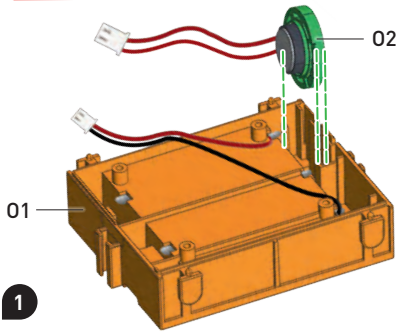


MODULE 0: BATTERY AND CONTROL BOX



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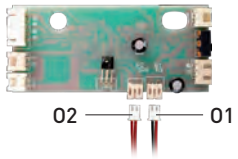

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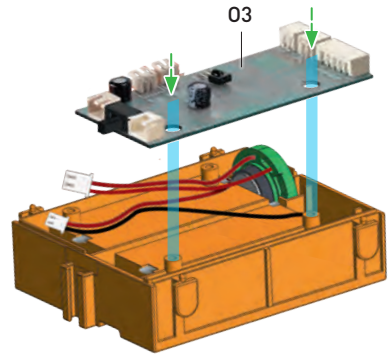

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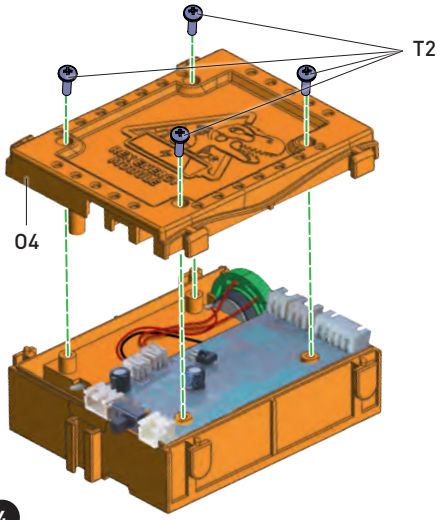

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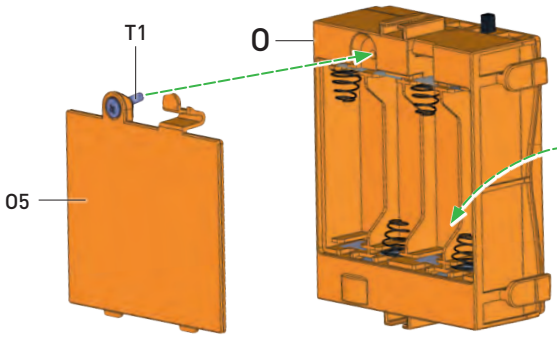
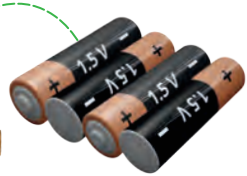


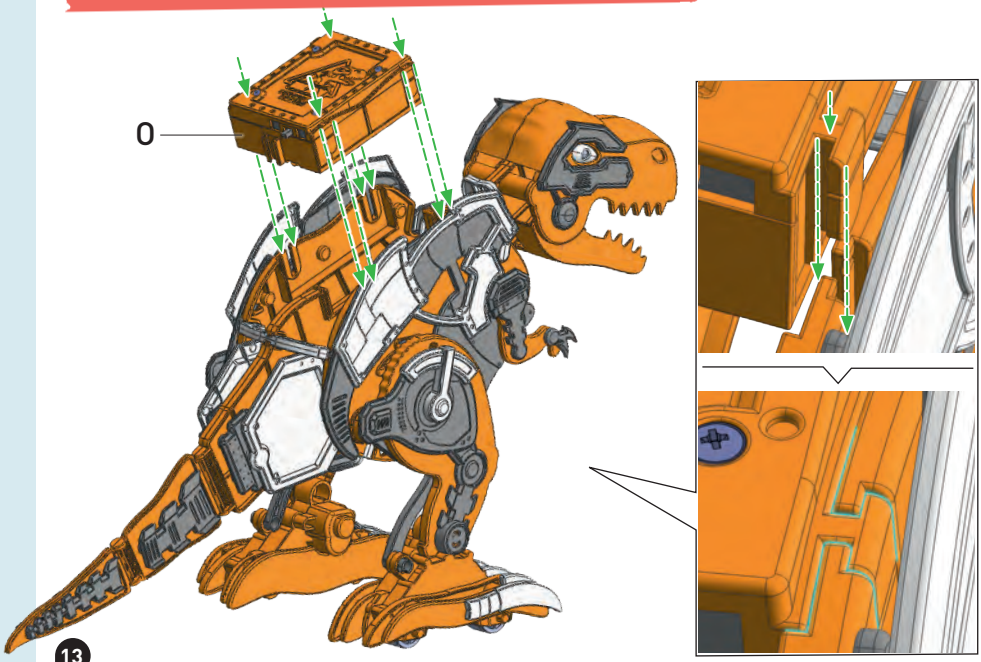
5

Ensure the polarities of the batteries are correct when you insert them. Information on handling the batteries can be found on page 2.

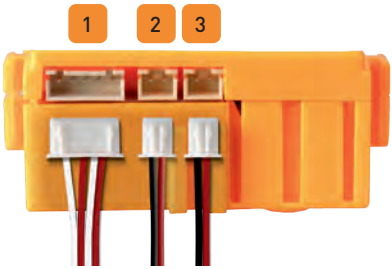


4 AA batteries
(1.5-V, LR6)

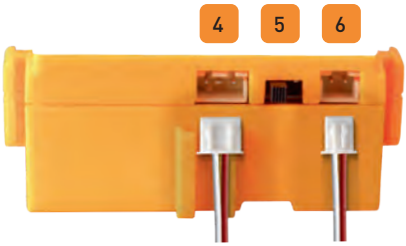
COMBINING THE MODULES (CONTINUED)



CONNECTING THE CABLES

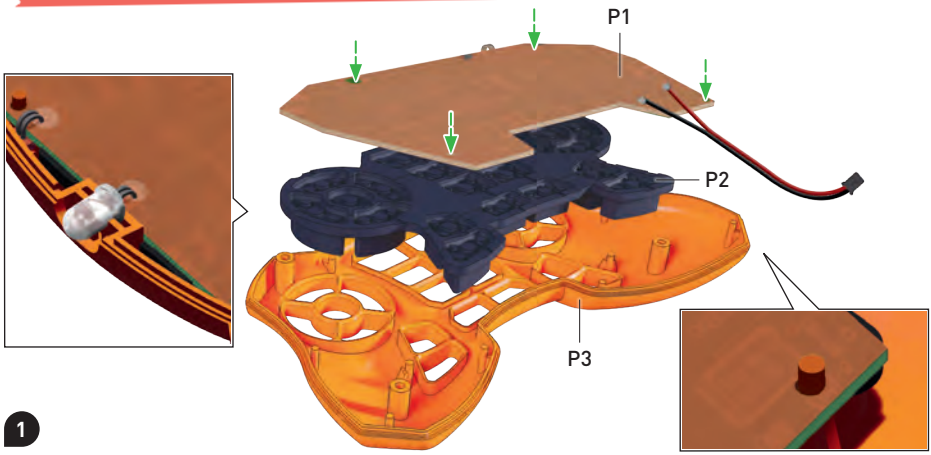


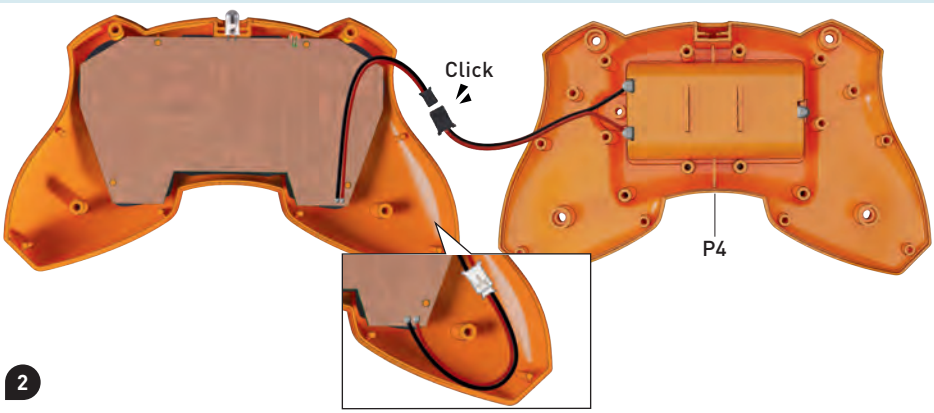
1 SENSOR
2 LED K
3 LED J

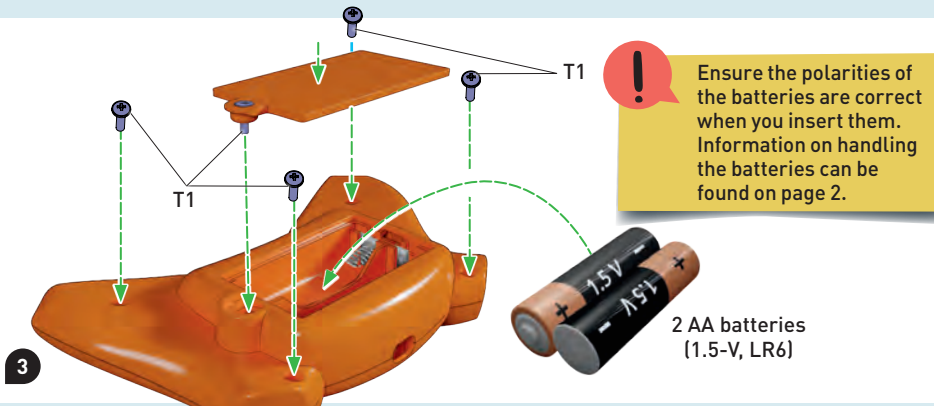


4 MOTOR B
5 ON/OFF SWITCH
6 MOTOR A

ASSEMBLING THE REMOTE CONTROLLER







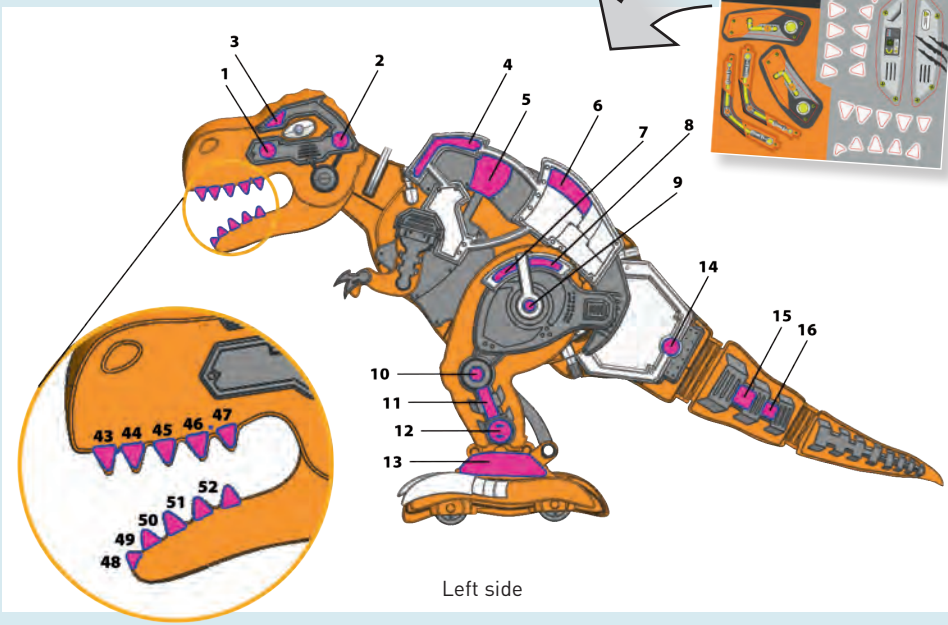
Ensure the polarities of the batteries are correct when you insert them. Information on handling the batteries can be found on page 2.


VOILA! MEET REX, OUR NEW DINO-PROTECTOR. USE THIS REMOTE TO PUT HIM IN GUARD MODE SO THAT WE CAN FOCUS ON REPAIRING THE SHIP.
EK!
DINO-MITE!
LATER ON ...
ALMOST THERE! CAN YOU PLEASE PASS ME THE SCREWDRIVER?
HERE, IZZY. NO SIGN OF ANY CREATURES ... I GUESS THERE WAS NO REASON TO WORRY.
KNOCK ON WOOD BEFORE ... UH OH ... DO YOU HEAR THAT?
SKRIIIII!
ROARR!
HA! ONE YELL FROM REX AND THEY TURNED INTO A COUPLE OF SCARE-ODACTYLS!
SEE WHAT I DID THERE?
NICE TRY-CERATOPS, GUYS!
DINO-SCORE!

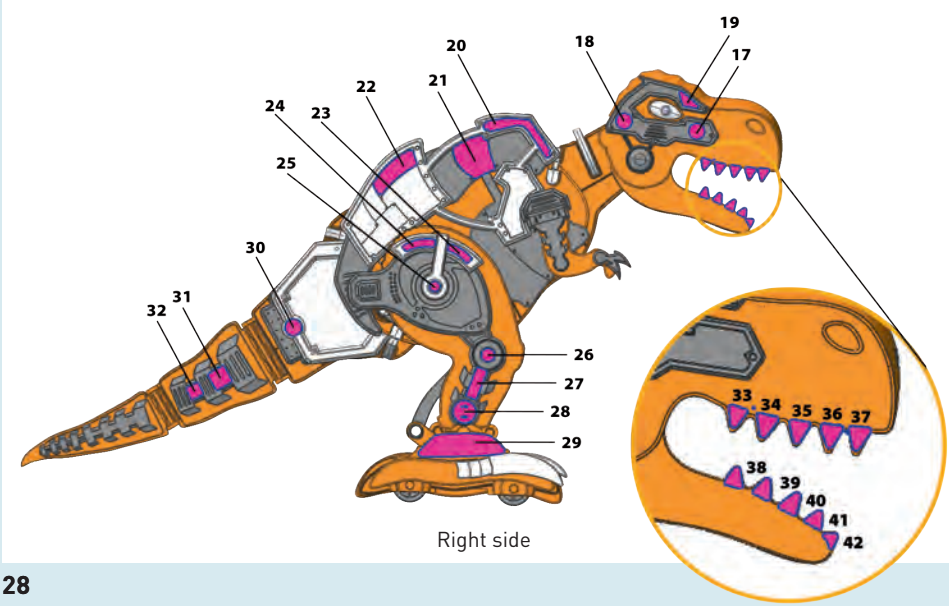

GADZOOKS!
I CAN'T WATCH! I'M A NERVOUS REX!
ROAR!
ROARR!
REMEMBER THAT EMERGENCY BUTTON I SHOWED YOU?
THE "BLAST FROM THE PAST" BUTTON?! HERE GOES NOTHING!
PFFT!
...
IT WORKED!
PFFT...
IT'S CONTAGIOUS TOO!
IT EX-STINKS!
BUCKLE UP, REX! IT'S TIME TO DINO-SOAR OUT OF HERE!
I THINK REX FINDS YOUR PUNS PTERO-BLE!
PFFT.

STICKER PLACEMENT

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



Left side



Right side

REX'S REMOTE CONTROLLER

REX can be controlled in real-time and reacts to buttons pressed on the remote controller.

The wireless control unit communicates with the robot via an invisible infrared beam, so make sure that there isn't anything between REX and the remote controller and that they aren't too far apart.

THE CONTROLS:

The table below shows the button on the remote controller and REX's corresponding action.

	Step forward / backward		Roll forward / backward
	Sharp 90° left / right turn		Wide 90° left / right turn
	Roll speed: fast / slow		Mega roar
	Volume up / volume down		Demo mode
	Short roar		Long roar
	Fart noise		Lip smacking sound
	Standby mode		Stop / pause action
	Guardian mode	180°	Turn 180°
1→2	Programming mode		

SPECIAL FUNCTIONS

GUARDIAN MODE

By pressing **this button,** REX goes into guardian mode, and is ready to protect you. When someone or something passes REX's sensor, REX will react by moving and roaring. The sensor's range is about 24 inches, which is the perfect distance for REX to monitor a doorway. After the alarm is triggered, REX goes into standby mode. To reactivate the alarm, press the guardian mode button again.

PROGRAMMING MODE

1. Press the **programming button** on REX's remote controller.
2. Now program REX by pressing the buttons on the remote control for the corresponding actions you wish for REX to perform. You can program up to 50 commands in a row.
3. To play the program, press the programming mode button again.

CHECK IT OUT

Mechagodzilla

Grimlock

Real dinosaurs became extinct millions of years ago, but these giant reptiles still fascinate us today. Conversely, when we imagine the future, we picture a word full of advanced technology and life-like robots. REX bridges these two exciting worlds: the prehistoric past that we continue to learn about and the future we are heading toward.

DiNO-ROBOTS IN *Science Fiction*

Godzilla, a well-known Japanese film character, is a lizard mutated by radioactive radiation. In the movies, **Mechagodzilla** is Godzilla's man-made, robotic doppelgänger that was designed to defend Japan. In Transformers, a toy line that went on to spawn TV shows, movies, comic books, and other media, **Grimlock,** the leader of the Dinobots, can transform from a humanoid robot to one resembling a fearsome T. Rex.

What qualities does it share with REX?

CHECK IT OUT

Animatronic in an amusement park

ANIMATRONICS

Animatronics is a portmanteau (meaning parts of multiple words that are combined to make one new word) used to describe the synthesis of **Anima**tion and Elec**tronics**. Animatronics are robots that are based on real, living creatures with the intention of looking as similar as possible to the original. This type of robot is most often used in amusement parks, but also in movies. The 1993 film **Jurassic Park** became a major milestone for animatronics. In the film, dinosaurs are brought to life, with the intention of opening a safari park, through genetic engineering. Many of the special effects in the film used animatronics and still look impressively realistic 30 years later. Today, similar effects can be achieved with 3D programs on a computer.

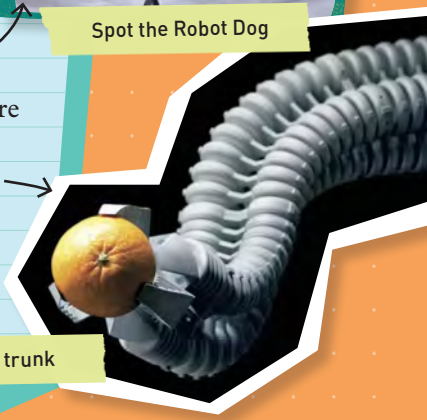
Inner workings of an animatronic dinosaur

Bionics & Biomimicry

Bionics is the emulation of the way animals behave in the design of modern technology, with the purpose of solving complex human problems. While robots inspired by dinosaurs are mainly for entertainment, there are robots modeled after other animals that perform very useful tasks.

For example, the **dog-like robot, Spot,** can explore dangerous areas, like buildings with compromised structures. An elephant's trunk inspired the **robot arm** pictured to the right. With its wide range of motion and gripping ability, it can be used in factories to assist humans with their work.

Spot the Robot Dog



Robot trunk

Project management and text: Jonathan Felder
Technical product development: Deryl Tjahja; Blue Rocket, Hong Kong
Instruction manual design concept: Atelier Bea Klenk, Berlin
Layout instructions: Studio Gibler, Stuttgart
Illustrations: Blue Rocket, Hong kong
Adventure comic illustrations: Daniel Alles, Hamburg
Photos: Jamie Duplass (all adhesive strips); Bill Ward, p. 32, published on wikipedia.org under creative commons 2.0; Boston Dynamics, p. 32; Festo Vertrieb GmbH & Co. KG, p. 32; Gojipedia; p. 31 (Mechagodzilla), published on godzilla.fandom.com; Paramount Pictures/Hasbro, p. 31 (Grimlock); art rich, p. 32 (@adobestock.com); FOTOKITA, p. 8 (@shutterstock.com)
Packaging design Concept: Peter Schmidt Group, Hamburg
Packaging layout: Studio Gibler, Stuttgart
Packaging photos: Blue Rocket, Hong Kong
Background graphics: Studio Gibler, Stuttgart

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