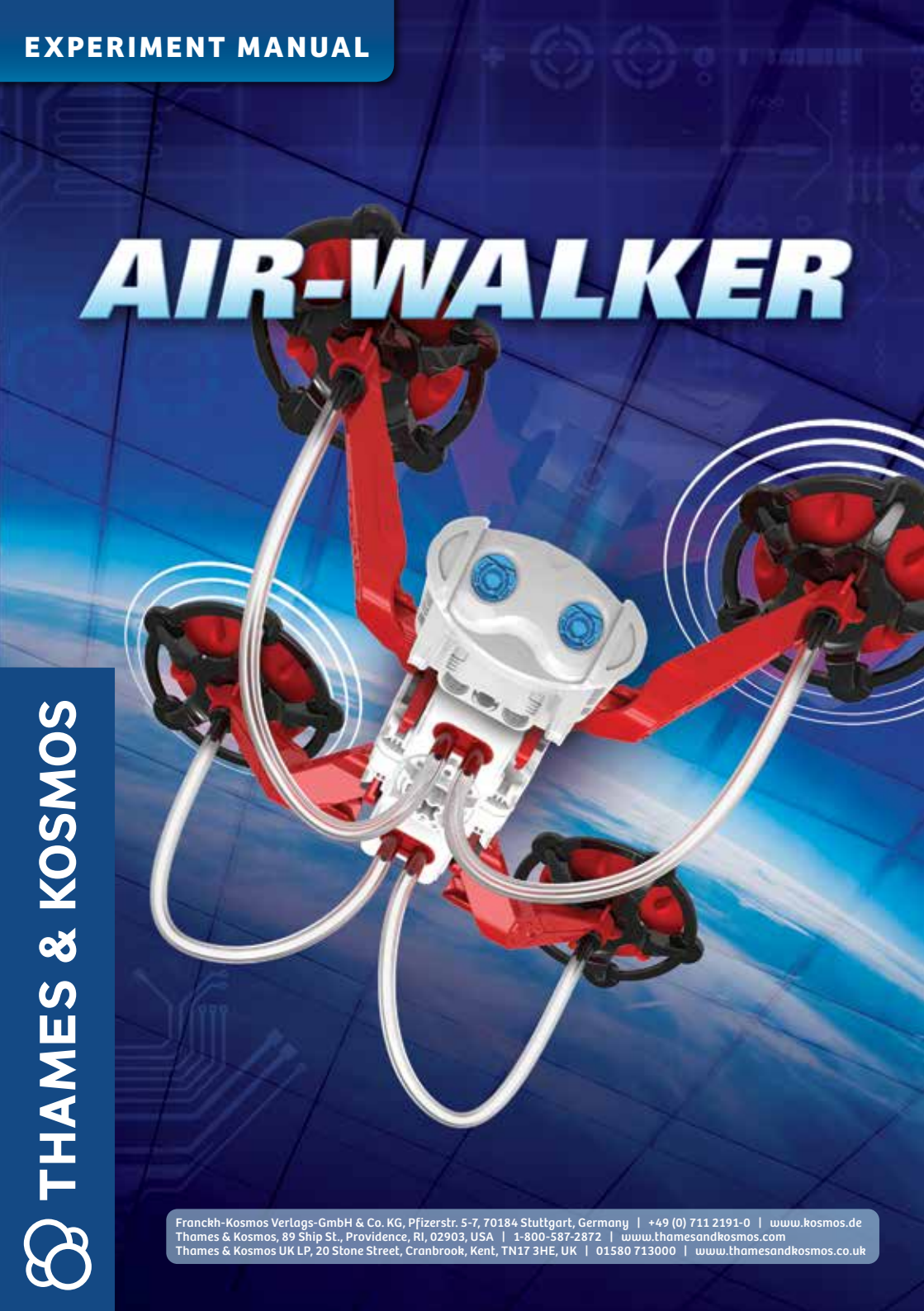
EXPERIMENT MANUAL

AIR-WALKER



THAMES & KOSMOS

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Thames & Kosmos UK LP, 20 Stone Street, Cranbrook, Kent, TN17 3HE, UK | 01580 713000 | www.thamesandkosmos.co.uk

Dear Parents and Adults,

Please read the instructions together with your child before starting and review the safety information with them. Stand by to assist your child in any particularly challenging parts of assembly or usage.

Do not let the robot model climb so high up a vertical surface that it goes out of reach. Prevent the robot from falling onto people or objects that might be damaged by it.

We hope you and your child have a lot of fun with the Air-Walker climbing robot!

Warning. Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled. Strangulation hazard — long tubes may become wrapped around the neck.

Keep the packaging and instructions as they contain important information.

Store the experiment material, particularly the battery-powered motor, and assembled models out of the reach of small children.

SAFETY FOR EXPERIMENTS WITH BATTERIES

- ››› To operate the models, you will need two AA batteries (1.5-volt, type LR6), which could not be included in the kit due to their limited shelf life.
- ››› 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. Press them gently into the battery compartments. See page 10.
- ››› Always close battery compartments with the lid.
- ››› Non-rechargeable batteries are not to be recharged. They could explode!
- ››› Rechargeable batteries are only to be charged under adult supervision.
- ››› Rechargeable batteries are to be removed from the toy before being charged.
- ››› Exhausted batteries are to be removed from the toy.
- ››› The supply terminals are not to be short-circuited.
- ››› Avoid a short circuit of the batteries. A short circuit can cause the wires to overheat and the batteries to explode.
- ››› Dispose of used batteries in accordance with environmental provisions, not in the household trash.
- ››› Be sure not to bring batteries into contact with coins, keys, or other metal objects.
- ››› Avoid deforming the batteries.
- ››› 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 battery compartments.
- ››› Note the safety information accompanying the individual experiments or models!
- ››› The toy is not to be connected to more than the recommended number of power supplies.

NOTES ON ENVIRONMENTAL PROTECTION/ 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:

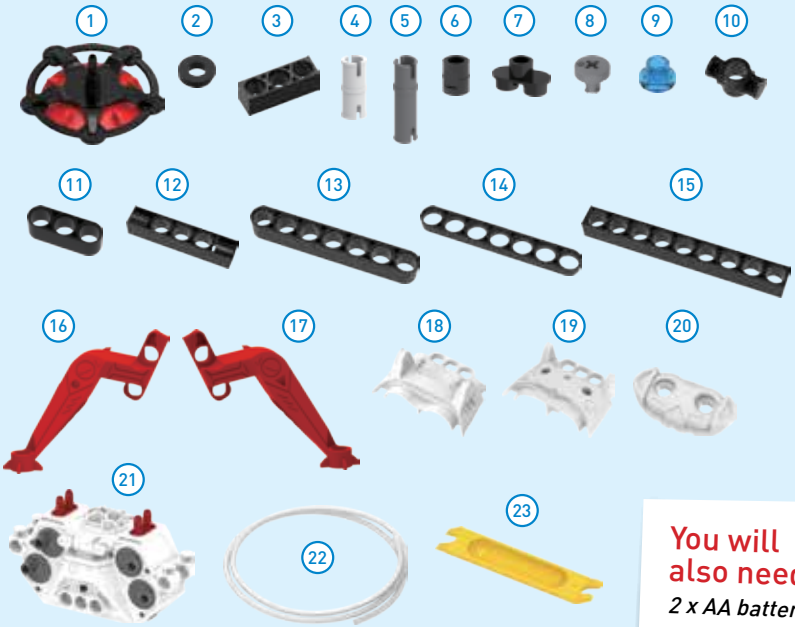
Please contact your local authorities for the appropriate disposal location.

››› TABLE OF CONTENTS

TIP!
You will find additional scientific information in the "Check It Out" sections on Pages 14 to 16.

GOOD TO KNOW!
If you are missing any parts, please contact Thames & Kosmos customer service.
US: techsupport@thamesandkosmos.com
UK: techsupport@thamesandkosmos.co.uk

What's inside your experiment kit:



You will also need:
2 x AA batteries (1.5-volt, type LR6), scissors

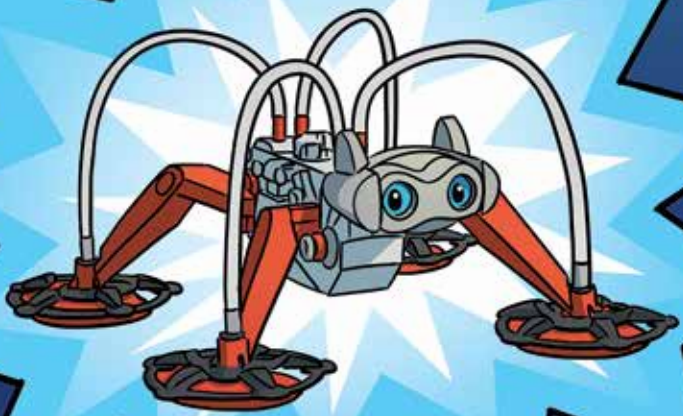
Checklist: Find — Inspect — Check Off

✔	No.	Description	Quantity	Art. No.
❍	1	Suction cup	4	7409-W85-E1D1
❍	2	Tube connector cap	4	7409-W10-F1D
❍	3	3-hole rod	1	7026-W10-Q2D
❍	4	Joint pin	1	7413-W10-T1S2
❍	5	Long joint pin	2	7413-W10-U1S1
❍	6	Short anchor pin	20	7344-W10-C2D
❍	7	Two-to-one converter	2	7061-W10-G1D
❍	8	Cam screw connector	8	7435-W10-H1S
❍	9	Button pin, blue	2	7061-W10-W1TB
❍	10	1-hole connector	6	7430-W10-B1D
❍	11	3-hole wide rounded rod	4	7404-W10-C1D
❍	12	5-hole cross rod	2	7413-W10-R1D
❍	13	7-hole wide rounded rod	4	7404-W10-C2D
❍	14	7-hole flat rounded rod	4	7404-W10-C3D

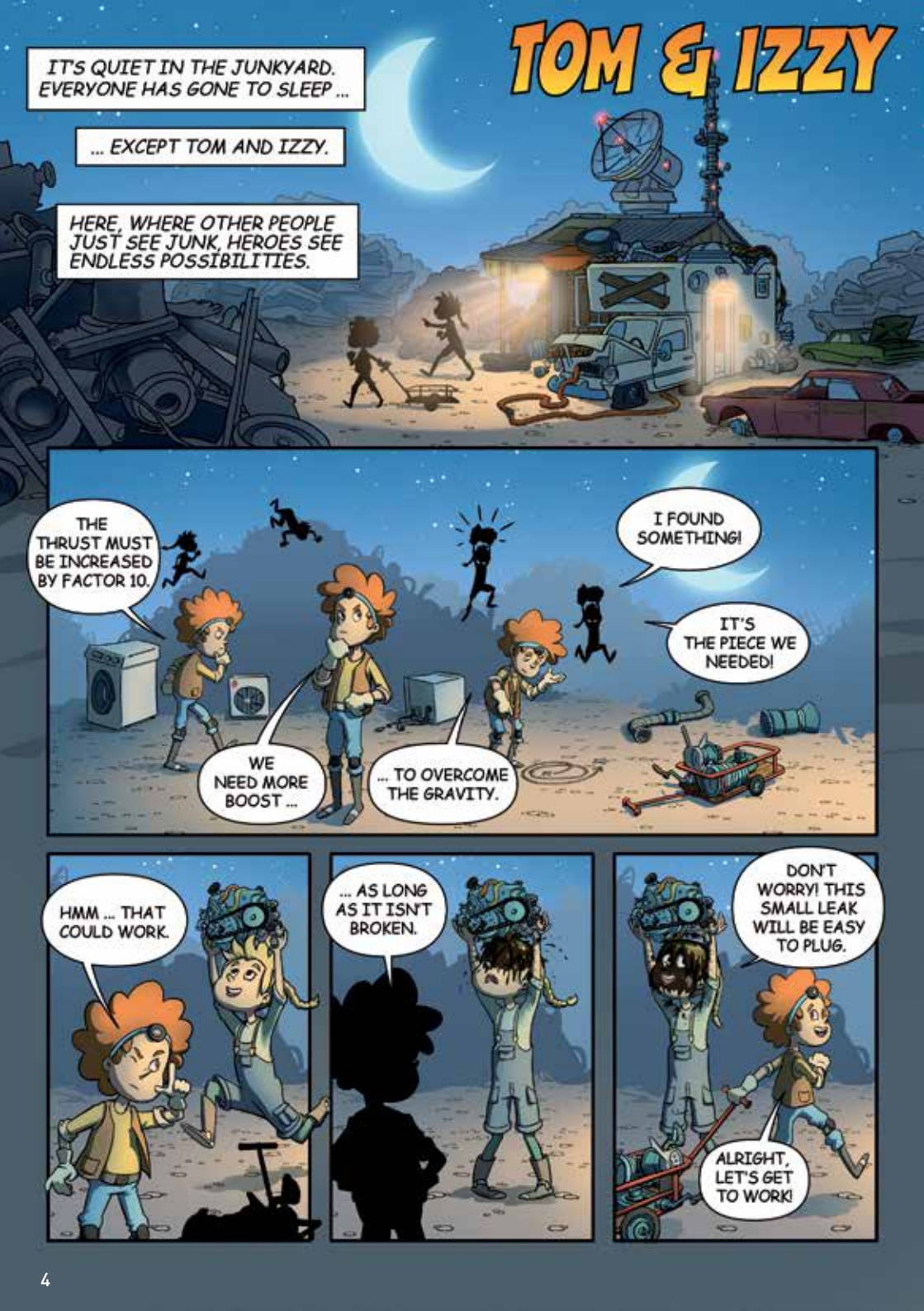
✔	No.	Description	Quantity	Art. No.
❍	15	9-hole rod	1	7407-W10-C1D
❍	16	Leg, left (circle symbol)	2	7435-W10-F1R
❍	17	Leg, right (triangle symbol)	2	7435-W10-F2R
❍	18	Head top	1	7435-W10-G2S
❍	19	Head bottom	1	7435-W10-G1S
❍	20	Head front	1	7435-W10-G3S
❍	21	Motor box body	1	7435-W85-A
❍	22	Hose, 100 cm	1	1156-W85-12
❍	23	Anchor pin lever	1	7061-W10-B1Y

NEXO!

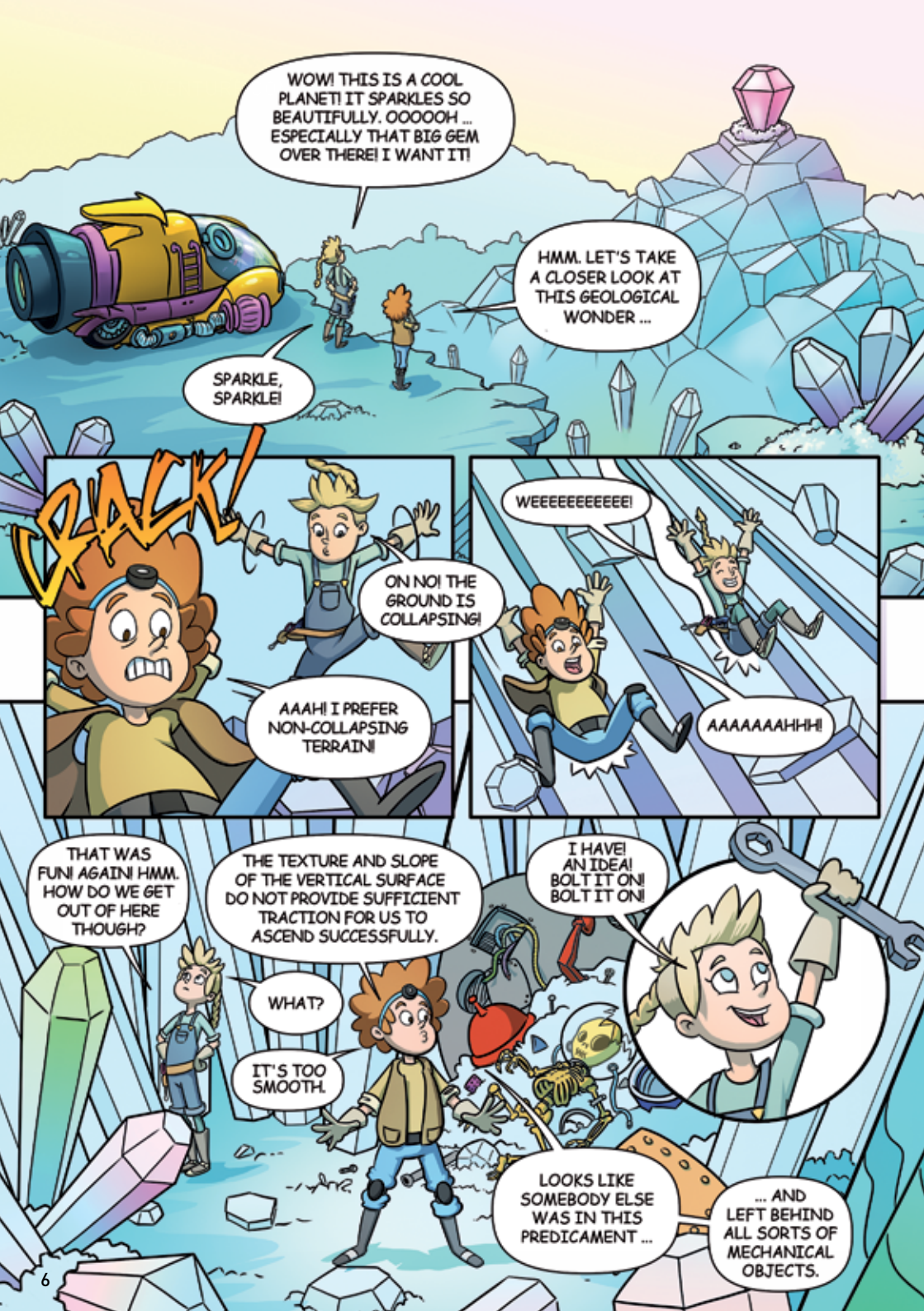
THE AIR-WALKER



... AND THE CRYSTAL PLANET!


TOM & IZZY
IT'S QUIET IN THE JUNKYARD. EVERYONE HAS GONE TO SLEEP ...
... EXCEPT TOM AND IZZY.
HERE, WHERE OTHER PEOPLE JUST SEE JUNK, HEROES SEE ENDLESS POSSIBILITIES.
THE THRUST MUST BE INCREASED BY FACTOR 10.
WE NEED MORE BOOST ...
... TO OVERCOME THE GRAVITY.
I FOUND SOMETHING!
IT'S THE PIECE WE NEEDED!
HMM ... THAT COULD WORK.
... AS LONG AS IT ISN'T BROKEN.
DON'T WORRY! THIS SMALL LEAK WILL BE EASY TO PLUG.
ALRIGHT, 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 ...
... HE'S ALWAYS GAME TO TRY OUT AN EXPERIMENT!
TOGETHER, THEY CAN BUILD ANYTHING!
I THINK IT'S READY!
YES! WE DID IT!
NOTHING CAN STOP US NOW!
WHERE SHOULD WE FLY TO FIRST?
WHEREVER WE WANT!
WE CAN GO ANYWHERE!


WOW! THIS IS A COOL PLANET! IT SPARKLES SO BEAUTIFULLY. OOOOOH ... ESPECIALLY THAT BIG GEM OVER THERE! I WANT IT!
HMM. LET'S TAKE A CLOSER LOOK AT THIS GEOLOGICAL WONDER ...
SPARKLE, SPARKLE!
CRACK!
OH NO! THE GROUND IS COLLAPSING!
AAAH! I PREFER NON-COLLAPSING TERRAIN!
WEEEEEEEEEEE!
AAAAAAAHHH!
THAT WAS FUN! AGAIN! HMM. HOW DO WE GET OUT OF HERE THOUGH?
THE TEXTURE AND SLOPE OF THE VERTICAL SURFACE DO NOT PROVIDE SUFFICIENT TRACTION FOR US TO ASCEND SUCCESSFULLY.
WHAT?
IT'S TOO SMOOTH.
I HAVE! AN IDEA! BOLT IT ON! BOLT IT ON!
LOOKS LIKE SOMEBODY ELSE WAS IN THIS PREDICAMENT ...
... AND LEFT BEHIND ALL SORTS OF MECHANICAL OBJECTS.

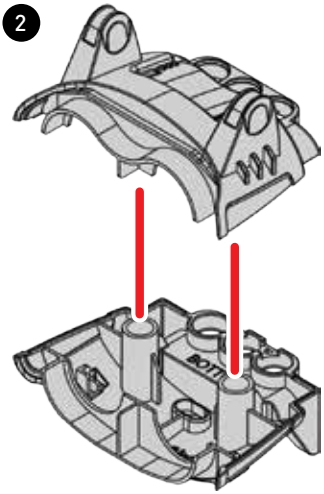
AIR-WALKER

1

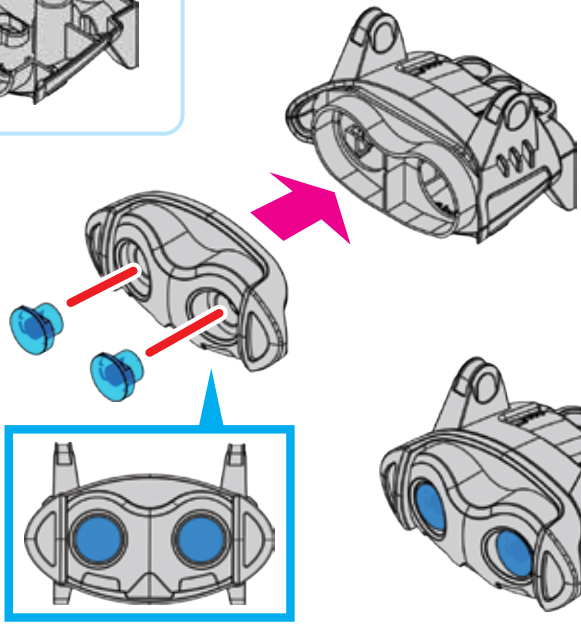
4 x 25 cm

(about 9.75 in each)

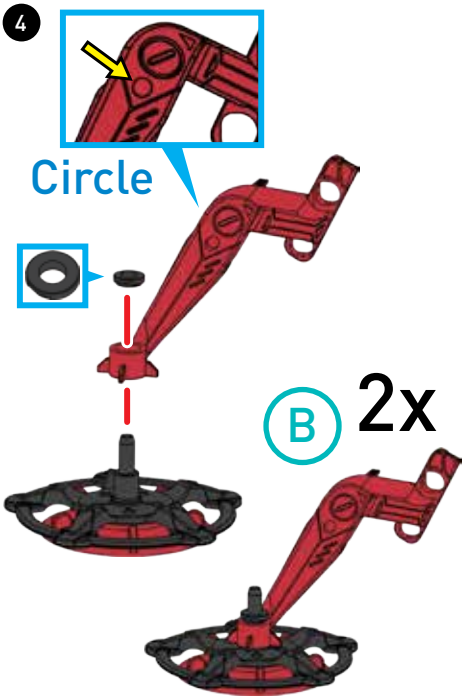
2



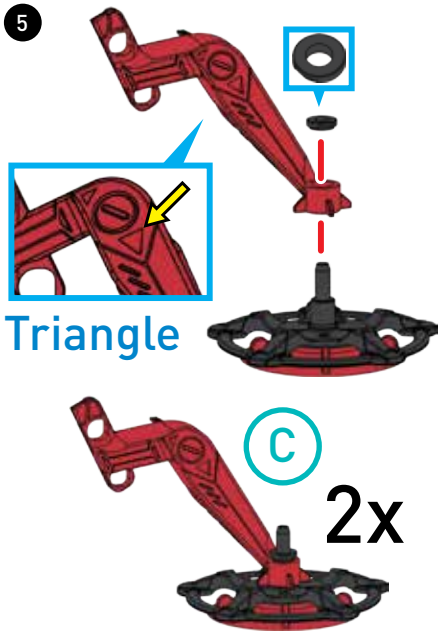
3



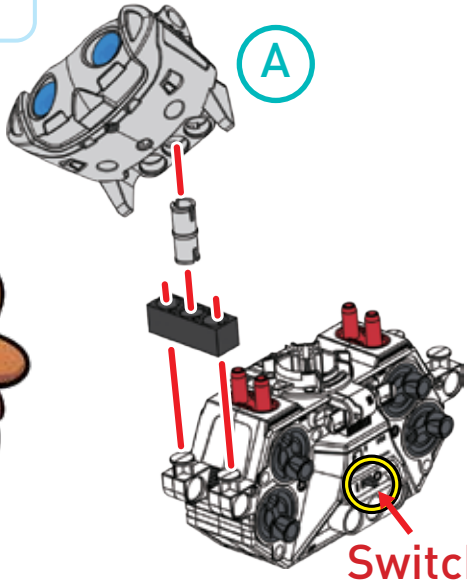
4


Circle
B
2x

5

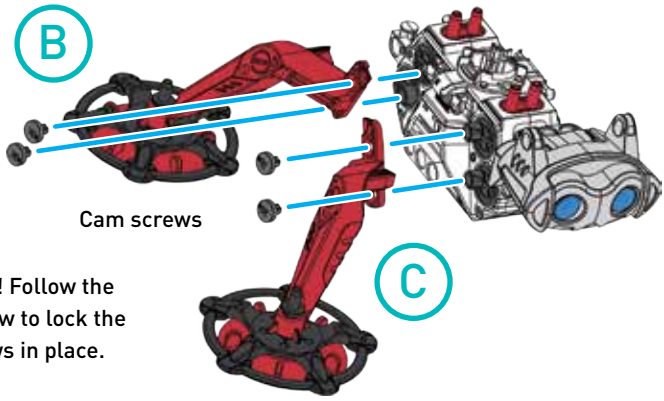

Triangle
C
2x

6

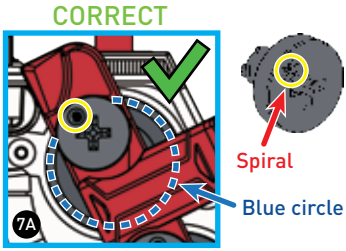

A
Switch

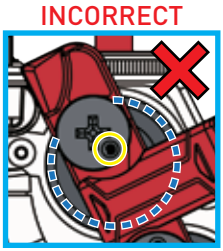

THE SWITCH MUST BE ON THE RIGHT!

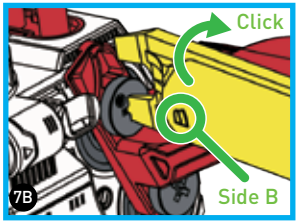
7



Important! Follow the steps below to lock the cam screws in place.



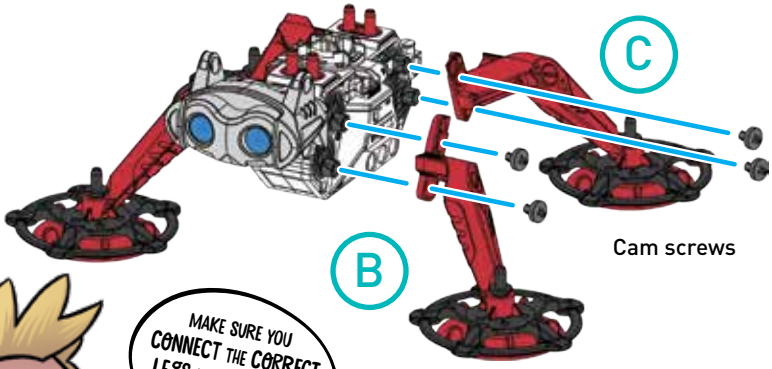




7A. Insert the cam screw through the hole in the leg into the socket in the motor box body with the spiral symbol directly over the outer edge of the gray circle, indicated by the dotted blue circle above.

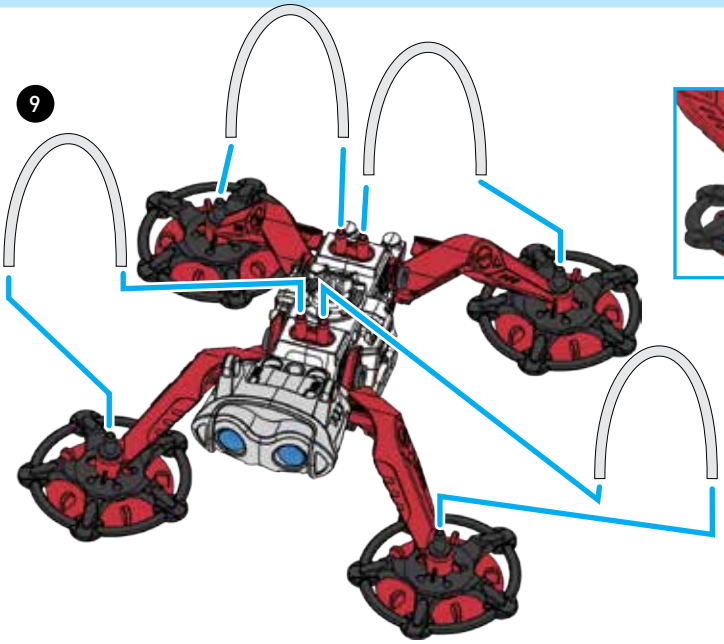
7B. Use the yellow tool (side B) or a screwdriver to turn the cam screw clockwise a little bit until you hear a click and the cam screw is locked in place.

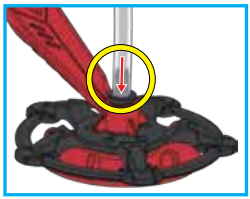
8



Lock the cam screws just like you did in the previous step.

9



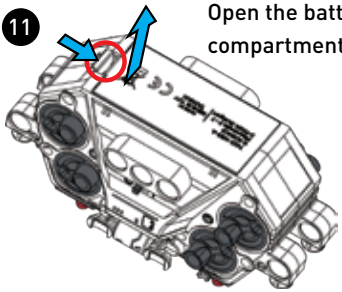


Push the tubes all the way onto the nozzle tips on each foot.

10

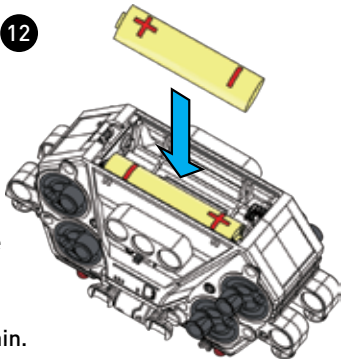
Done!

11



Open the battery compartment.

12



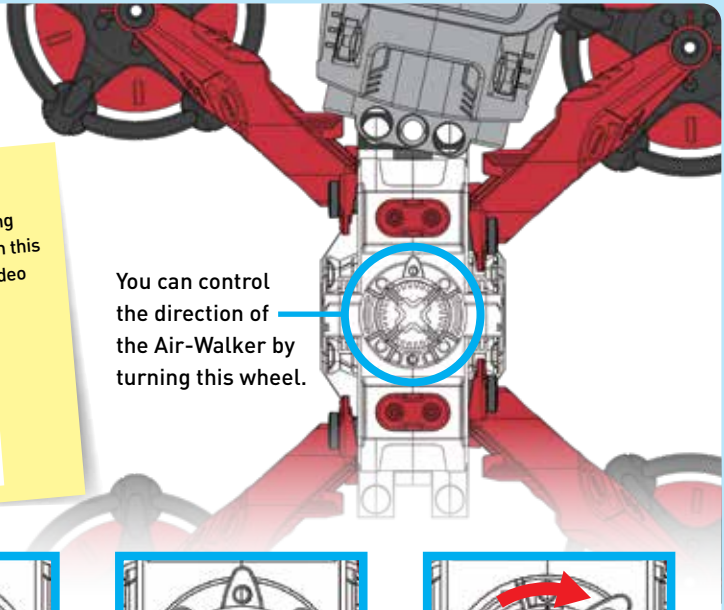
Insert two AA batteries with the correct polarity and close the compartment again.

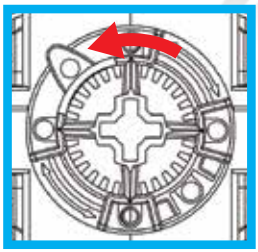
USING THE AIR-WALKER

13

WATCH THIS VIDEO!

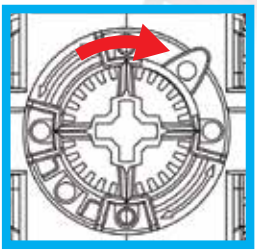
If you are having trouble getting your Air-Walker to climb, scan this QR code to watch an online video containing many helpful tips.





Robot turns left

Robot moves straight



Robot turns right

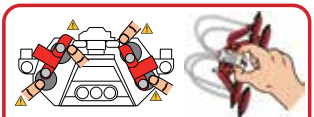
First, test out your Air-Walker on a smooth, horizontal surface, like a tabletop. It should walk forward.

Then, stick it to a smooth, vertical surface like a large glass window. Press the suction cups firmly to the surface. The surface must be extremely smooth.

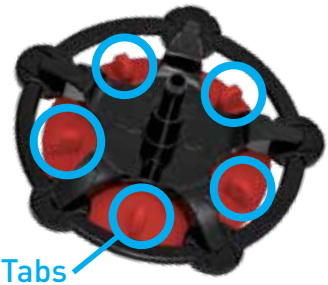
Make sure the surface is clean and dust-free. Moistening the suction cups or the surface with water can also improve the robot's grip.

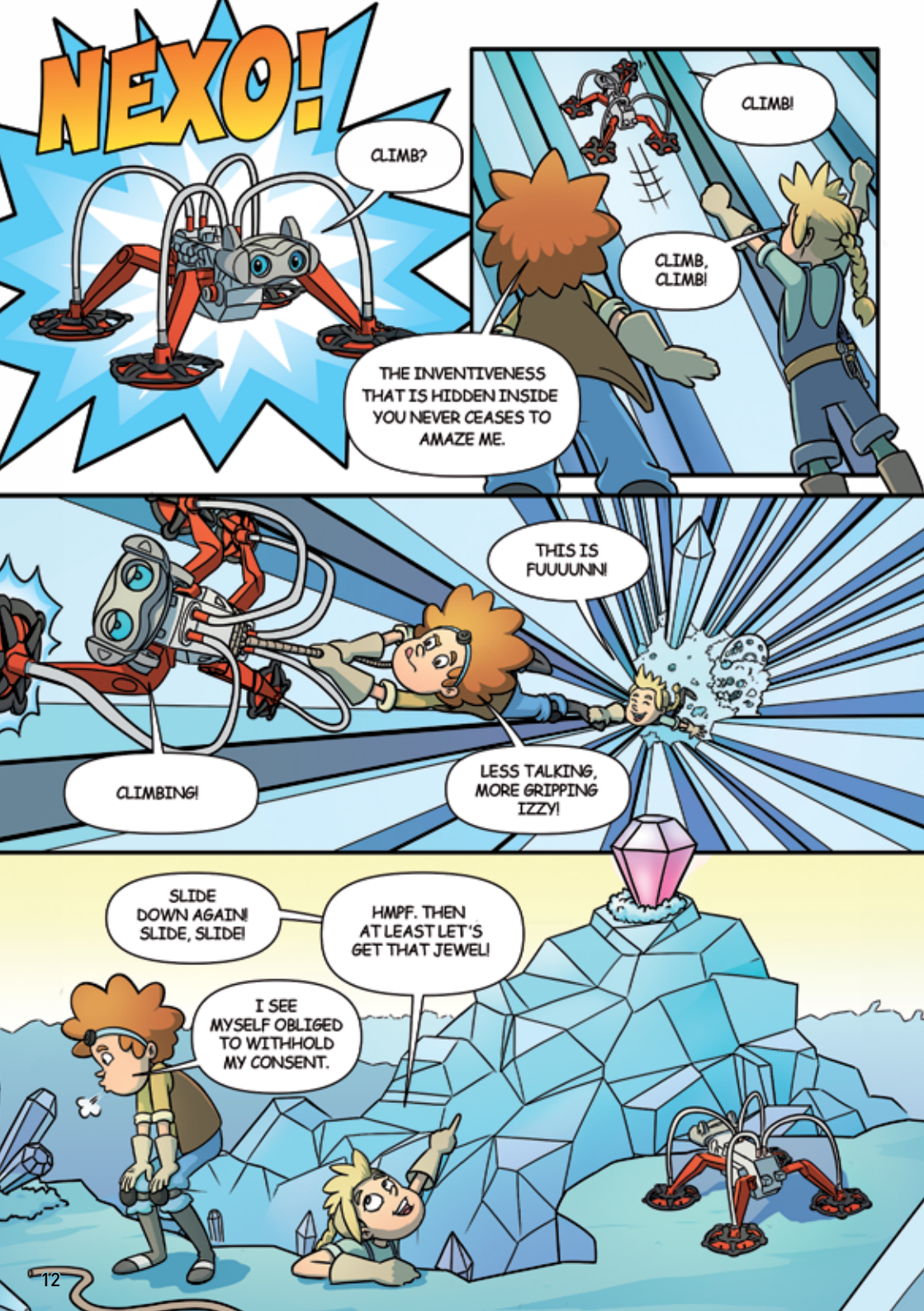
Turn on the switch and watch the robot climb. Keep your hands below the robot at first to catch it in case it falls.

To remove the suction cups from the surface, simply pull on one of the tabs to release the suction.



Warning! Don't hold the model by the moving parts. Don't put your fingers near the moving parts.




NEXO!
CLIMB?
CLIMB!
CLIMB, CLIMB!
THE INVENTIVENESS THAT IS HIDDEN INSIDE YOU NEVER CEASES TO AMAZE ME.
THIS IS FUUUUNN!
CLIMBING!
LESS TALKING, MORE GRIPPING IZZY!
SLIDE DOWN AGAIN! SLIDE, SLIDE!
HMPF. THEN AT LEAST LET'S GET THAT JEWEL!
I SEE MYSELF OBLIGED TO WITHHOLD MY CONSENT.


IT STILL LOOKS HARD TO GET TO ...
CLIMB? CLIMB?
CLIMB!
COME ON, LITTLE ONE CLIMB! CLIMB!
YIPPEE!
WELL DONE, LITTLE NEXO!
HMM. THE CRYSTAL IS TOO VOLUMINOUS FOR THE CARGO BAY OF OUR SHIP, BUT I HAVE AN IDEA ...
CLIMB?
WOO HOO!
OFF ON A NEW ADVENTURE
MISSION ACCOMPLISHED!

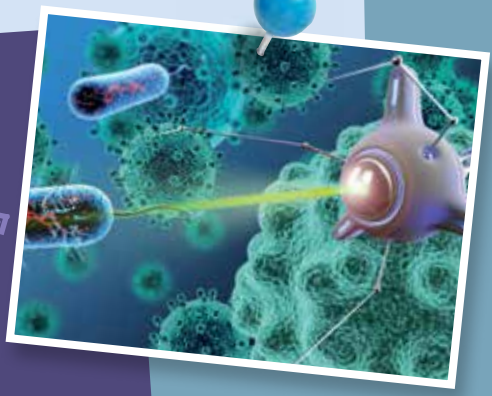
ROBOTICS

The field of robotics has been exciting people for over a century. After all, who wouldn't want to avoid having to perform boring, unpleasant, or even dangerous work and instead spend their time doing something nice? Never having to tidy up, take out the trash, or empty the dishwasher ever again! But robots can help us humans with so much more than that:

MEDICINE

For some years now, doctors have been assisted by robots during operations. They help to make the procedure calmer, more controlled, and more precise.

There is also the hope of developing tiny small-scale medical robots called nanobots, that can find their own way to the diseased parts of the body and provide them with targeted medication.



HUMANOID ROBOTS

Humanoid robots are modeled after humans and sometimes are even able to speak. You might soon find them in shops, hotels, nursing care homes, and hospitals. Because they are particularly patient and do not need to take breaks, they could provide information to customers or assist staff in caring for the sick and injured. The Care-O-Bot® 4 from the Fraunhofer Institute for Manufacturing Engineering and Automation is already capable of perceiving the moods of people in front of it and also expressing its own moods. It is a particularly polite robot!

EXPLORATION ROBOTS

Airborne exploration uses special flying robots, called drones. The underwater world, on the other hand, can be accessed with the help of diving robots. These also help people lay deep cables and look for sunken ships.

Robots are also very useful in space exploration. The Mars Rover provides us with many new insights about the composition of the planet Mars and its formation.

EVERYDAY LIFE

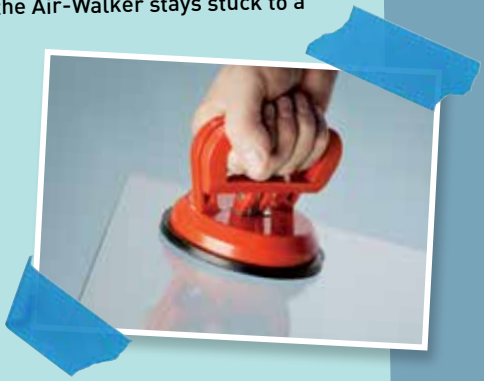
Today, some types of robots are already at work inside homes. Maybe you know somebody who owns a robotic vacuum or a robotic lawnmower.

In contrast to the original devices they replace, these robots are not controlled by humans, but instead by computer programs.

Some robots not only perform the tasks for which they have been specifically prepared, but are also able to learn independently. The ability of a robot to do this is called Artificial Intelligence, or AI for short. Research of AI has a lot of potential: With their help, movie heroes like Wall-E, Baymax, C-3PO and R2-D2 are not only visible on the big screens, but may become a real part of our lives. Until then, we still have to clean up our own room.

HOW DOES THE AIR-WALKER CLIMB?

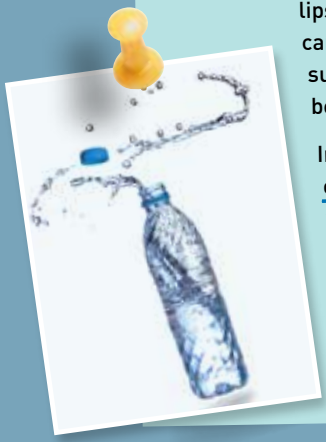
By sucking the air from between the climbing surface and the suction cups, the Air-Walker creates a negative pressure there. This means that the air pressure existing there is lower than the environmental air pressure all around it. This negative pressure ensures the Air-Walker stays stuck to a smooth surface, because basically the entire pressure of the atmosphere above the suction cups is pushing them toward the surface, while there is virtually no pressure pushing them away.



It is important that the contact between the suction cup and the climbing surface is free of gaps and as airtight as possible. Gaps caused by dust or dirt cause leaks that allow additional air to enter, destroying the negative pressure.

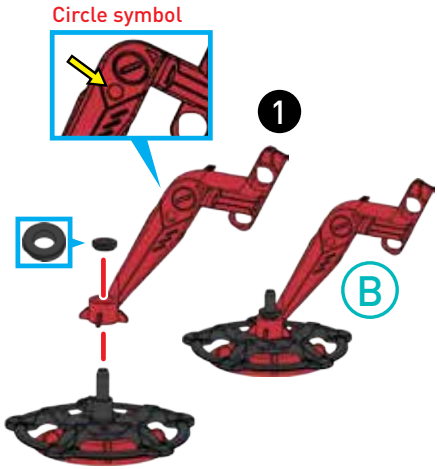
Moistening the suction cups can improve the grip. The thin film of water fills in the small gaps and makes for a better seal.

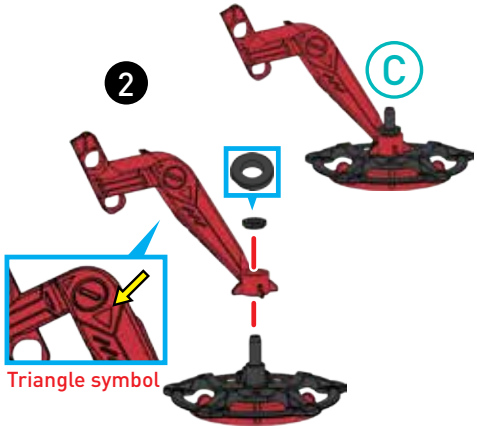
You can create a negative pressure by gently sucking air from an empty water bottle with your mouth. You feel the negative pressure as soon as your lips are pressed against the bottle opening. The force that you can feel is the reason why the Air-Walker sticks to vertical surfaces. Again, it is important to ensure that the contact between the bottle and your lips is airtight.

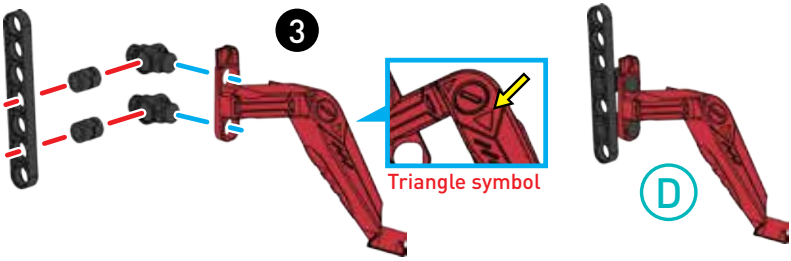


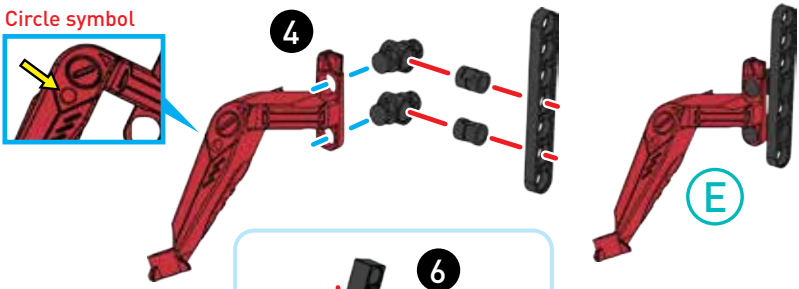
In contrast to negative pressure, there is overpressure. This can be seen, for example, when opening a bottle of soda that has been shaken up. The water shoots out of the bottle due to the increased pressure (compared to the ambient air pressure).

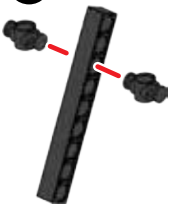
CRAWLER


Circle symbol
1
B


2
C
Triangle symbol


3
Triangle symbol
D


Circle symbol
4
E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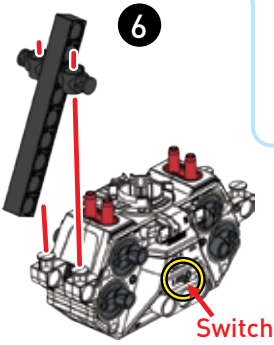
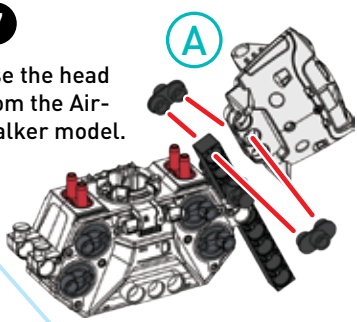

6
Switch

7

Use the head from the Air-Walker model.



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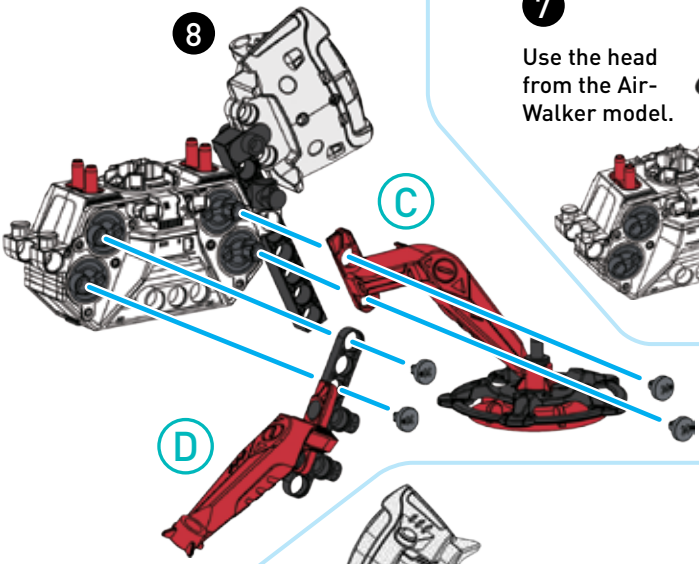

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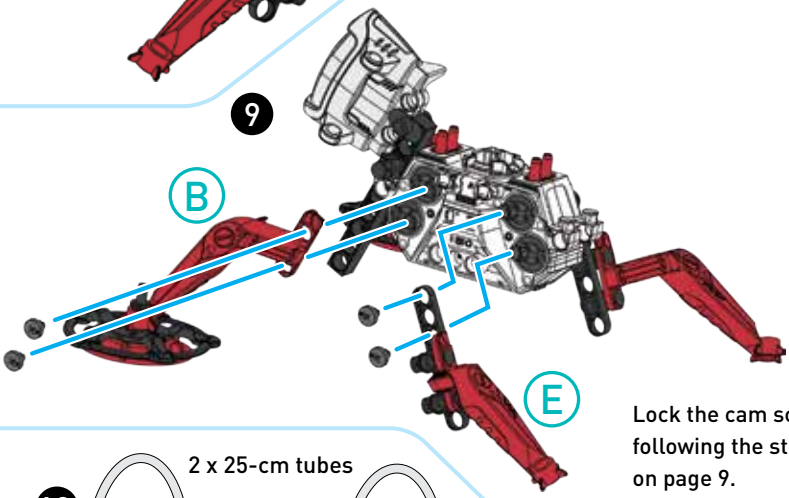
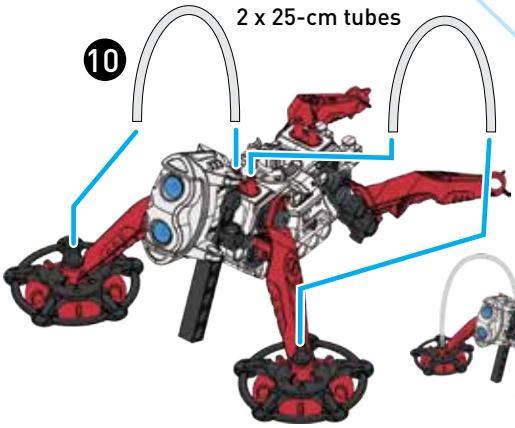


Lock the cam screws following the steps on page 9.

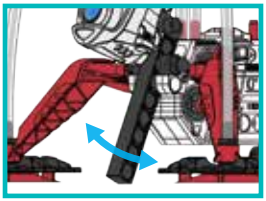
10

2 x 25-cm tubes



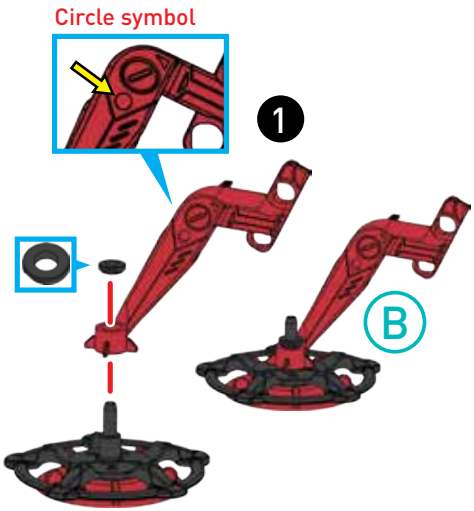
Done!

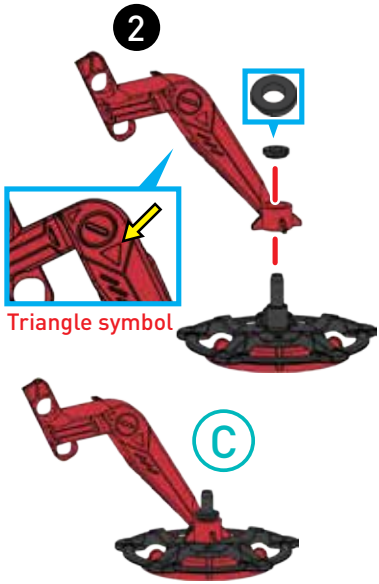
TIP

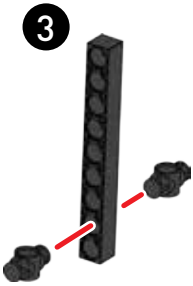


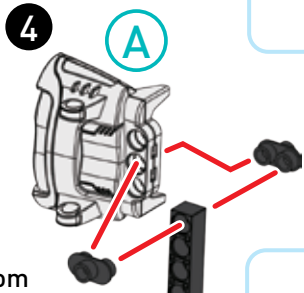
Adjust the long rod so that the model will crawl better.

SIMPLE WALKER

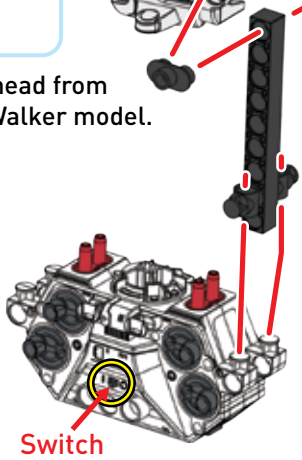


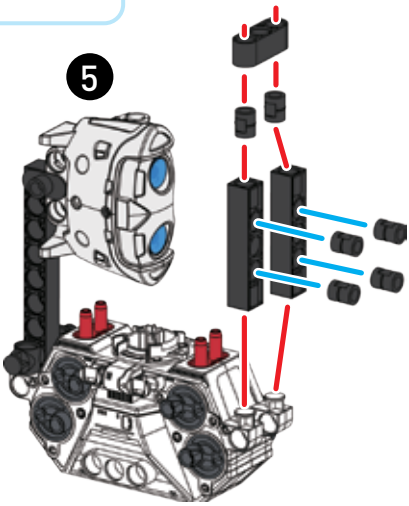






Use the head from the Air-Walker model.





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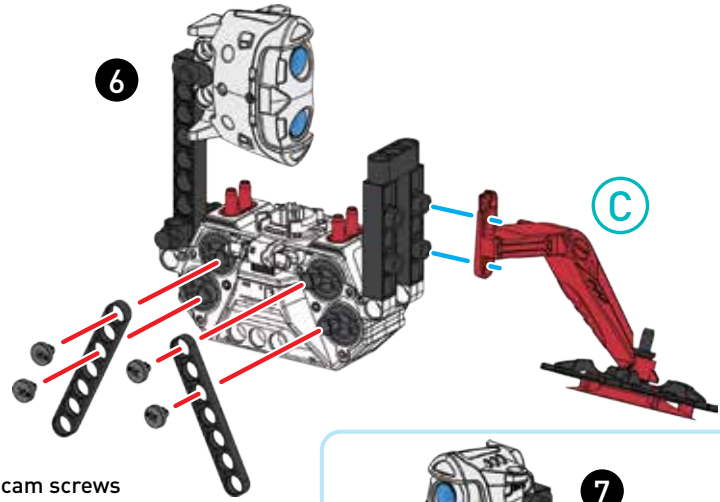
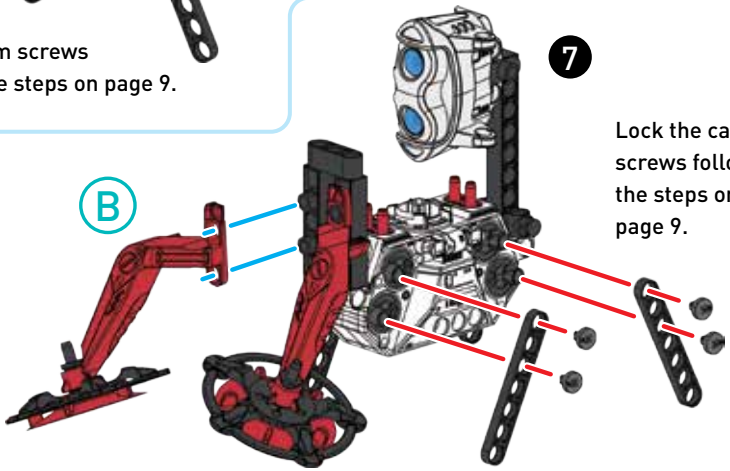


Lock the cam screws following the steps on page 9.

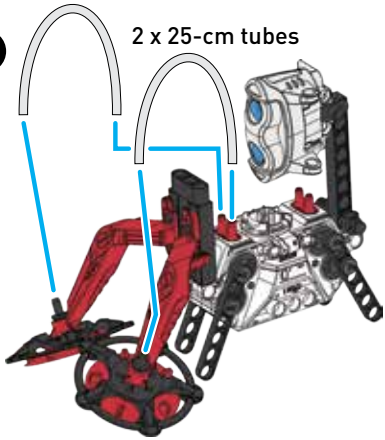
7



Lock the cam screws following the steps on page 9.

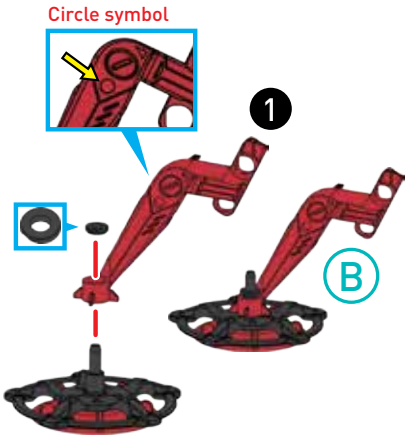
8

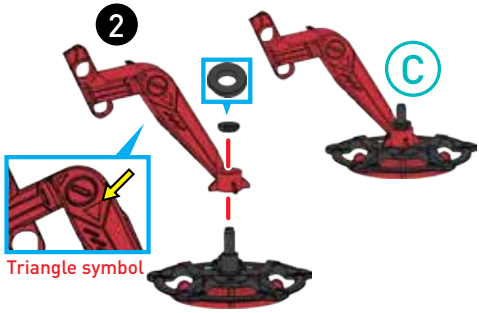
2 x 25-cm tubes

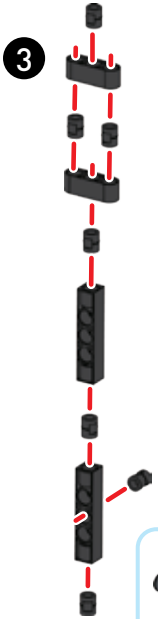


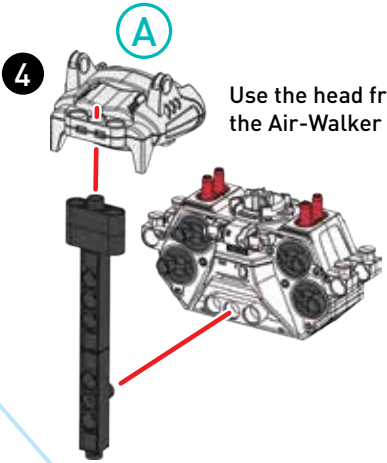
Done!

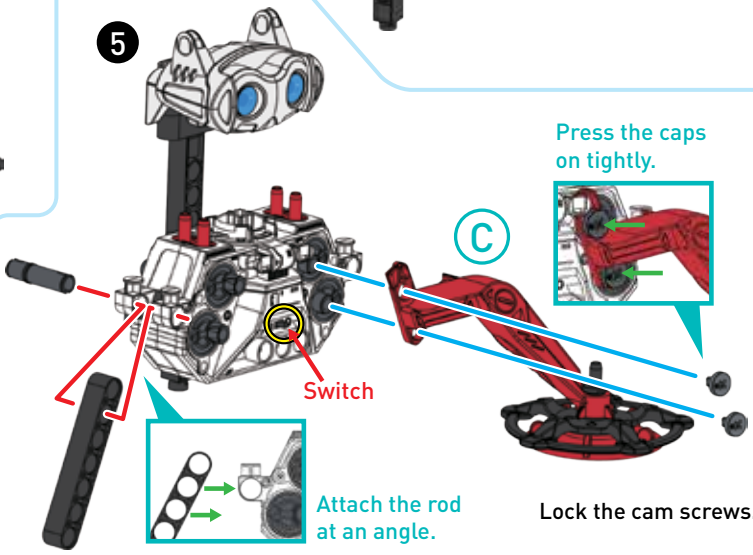
SIDEWAYS WALKER







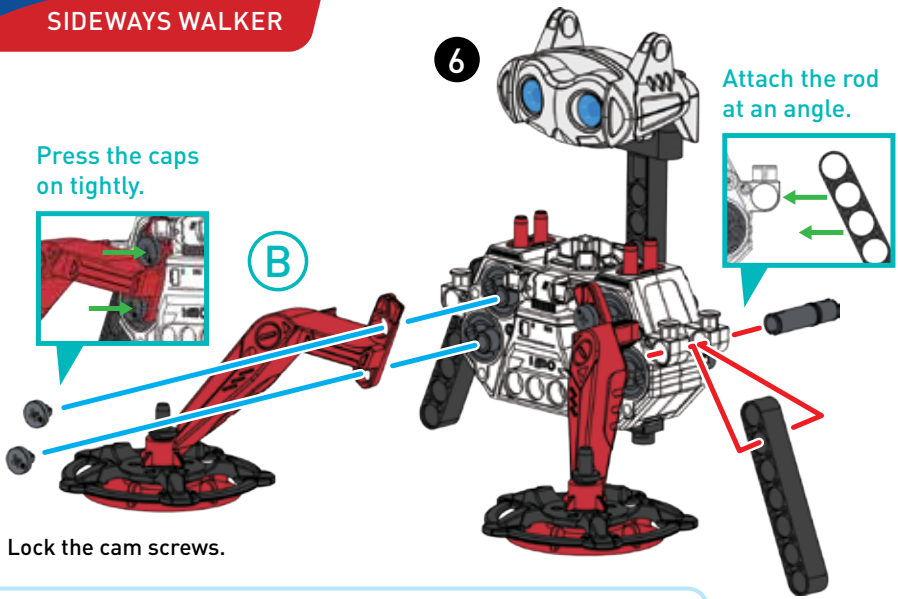




6

Attach the rod at an angle.

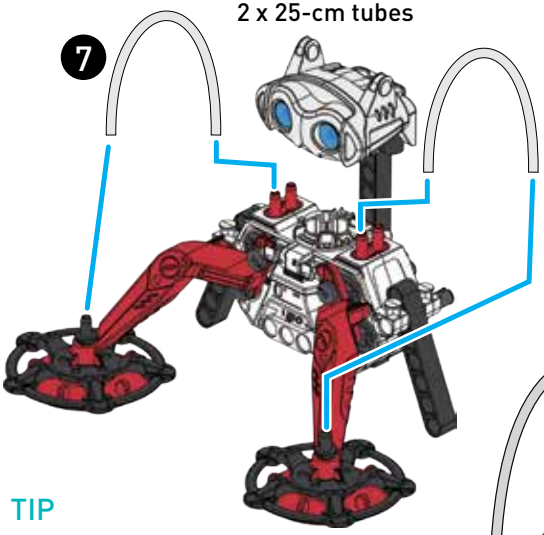
Press the caps on tightly.



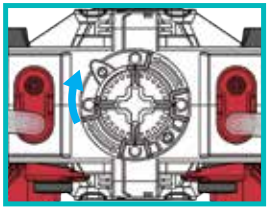
Lock the cam screws.

7

2 x 25-cm tubes



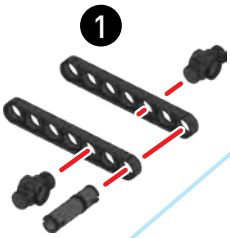
TIP

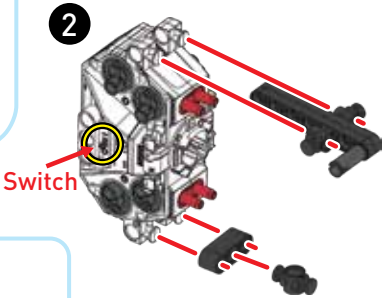


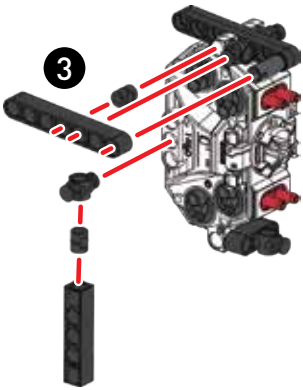
Turn the dial the right, switch on the power, and the model will start moving.

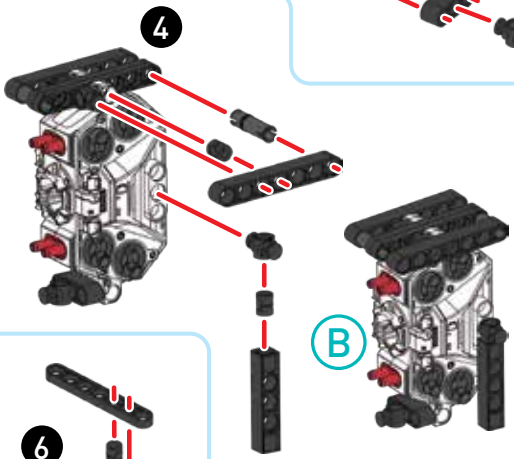
Done!

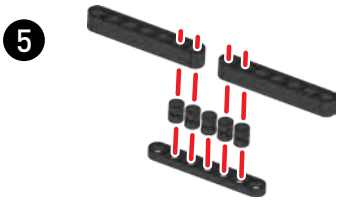
SUCTION LIFTER

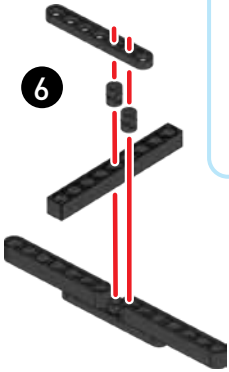


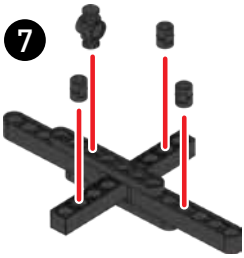


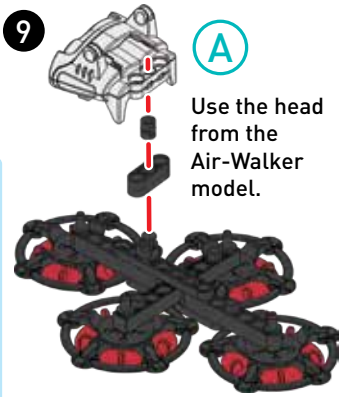


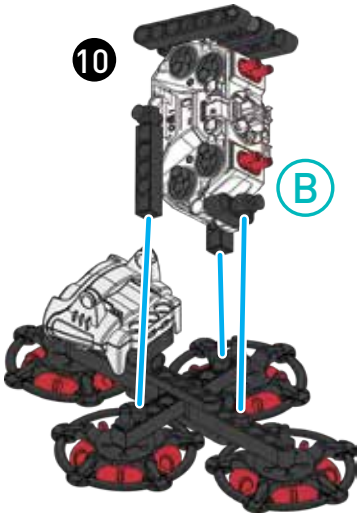


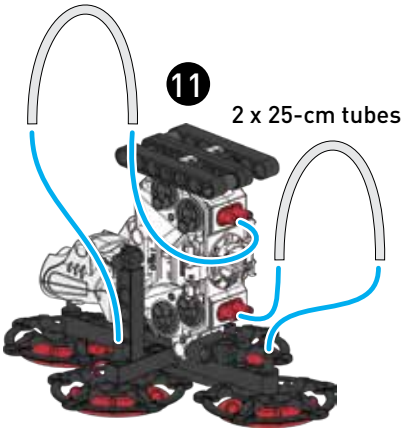


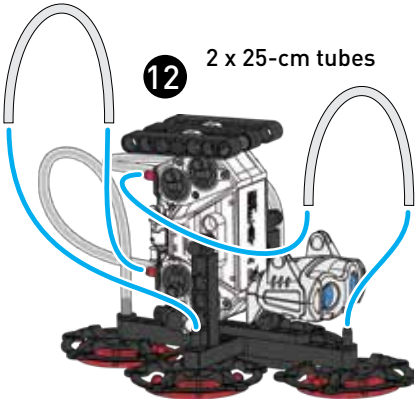






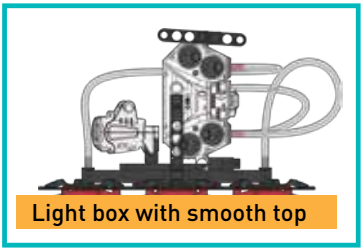




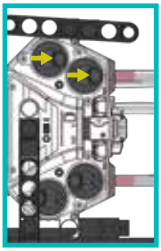


Done!

How to Use



1. Put the suction pads on a light box with a smooth surface, like the kit box.



2. Turn on the switch. The wheels on one side of the body must be pointing toward the tube plugs. Then turn off the switch. You can then lift up the light box with the suction lifter.

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