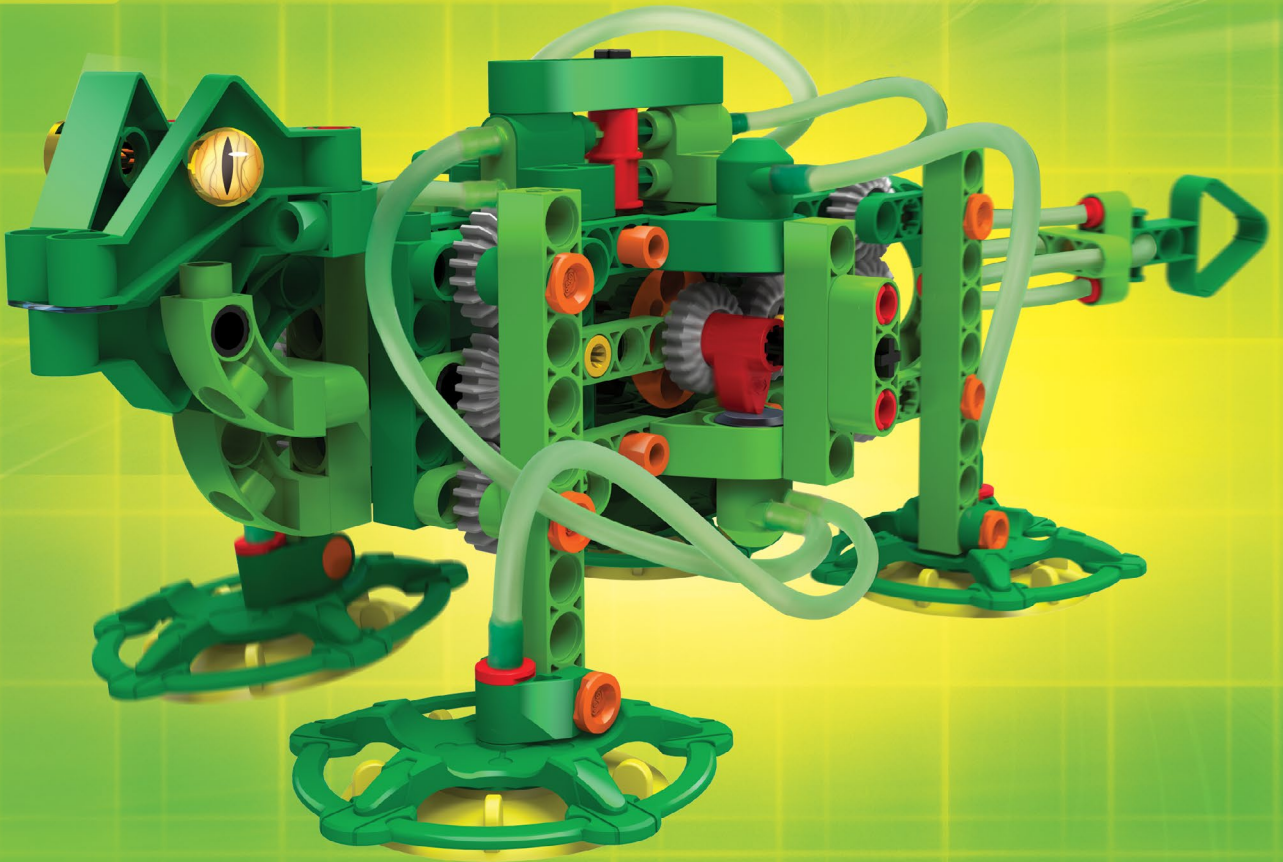


EXPERIMENT MANUAL

# GECKKOBOT



 THAMES & KOSMOS

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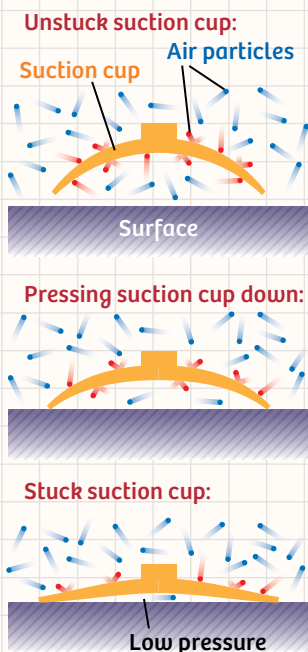
Publisher's Information ..... Inside back cover

**TIP!**  
At the top of each model assembly page, you will find a red bar:  
» It shows how difficult the model's assembly will be:

HOW DO SUCTION CUPS WORK?

**Suction cups** are devices that use air pressure or water pressure to stick to hard, smooth surfaces where a partial vacuum can be created.

A suction cup has a cup-shaped surface made of a flexible material, like silicone, rubber, or plastic. When this cup is pressed against a hard surface, the air inside the cup, between the cup and the surface, gets pushed out. **Air particles** get pushed out, creating a void, or **vacuum**, inside the cup. The regular atmospheric air outside the cup remains the same, containing many more air particles per unit volume of space than inside the cup. All these air particles are constantly flying around through the air and hitting things. Each one makes a tiny impact. The sum of all these tiny impacts is **air pressure**.



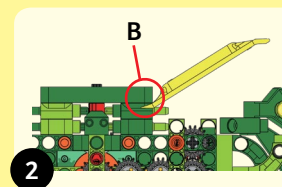
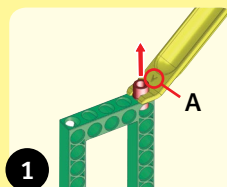
There are a lot more air particles per unit volume on the outside of the cup than on the inside, so the air pressure is a lot higher on the outside than on the inside. This difference in air pressure is what keeps the suction cup stuck to the surface.

Over time, the material of the suction cup returns to its original shape. The forces pulling the suction cup back into its original shape are ultimately stronger than the air pressure keeping the suction cup stuck to the surface. When the suction cup returns to its original shape, the low pressure inside the cup is released, so the suction cup will no longer stick to the surface.

**TIP! The anchor pin lever**

In the box, you will find a little yellow tool called the anchor pin lever.

1. End A of the anchor pin lever makes it easy to remove anchor pins from the frames.
2. End B of the tool can be used for prying up and separating other parts.

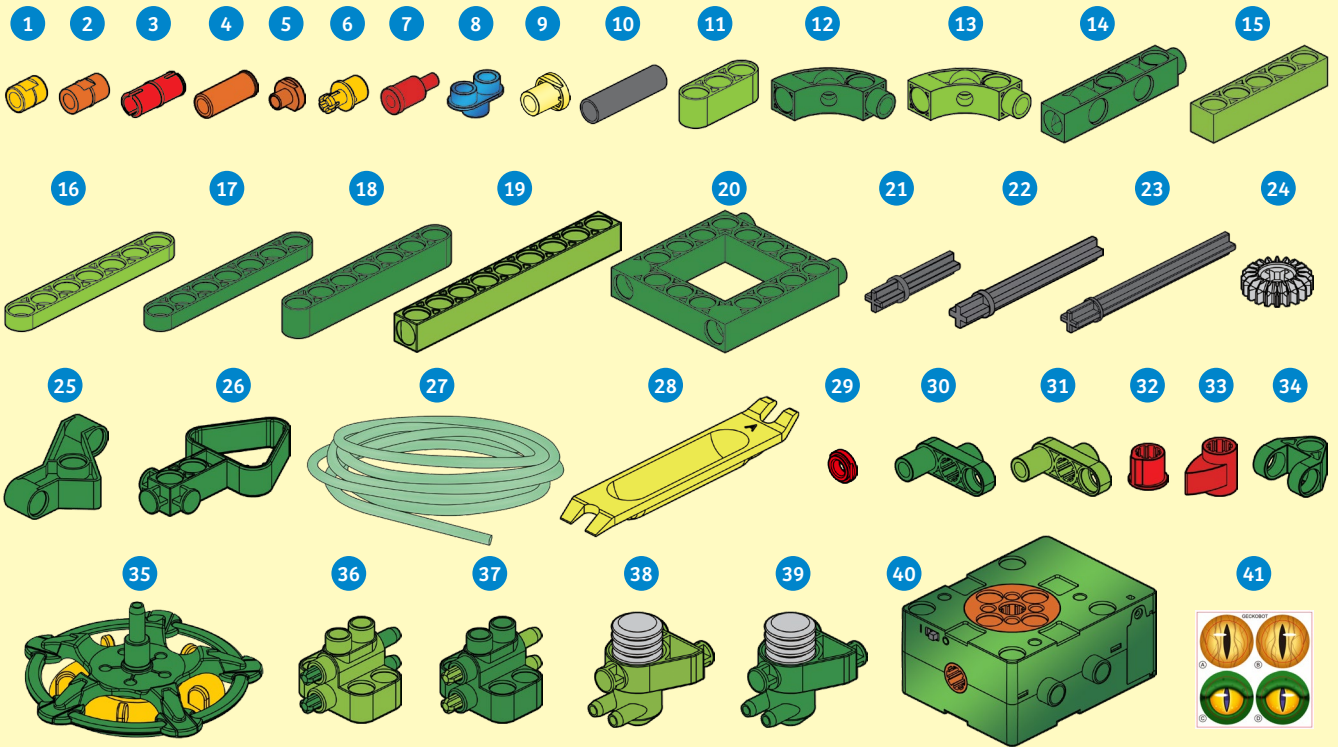




**GOOD TO KNOW!** If you are missing any parts, please contact Thames & Kosmos customer service.

US: techsupport@thamesandkosmos.com  
UK: techsupport@thamesandkosmos.co.uk

## What's inside your experiment kit:



## Checklist: Find – Inspect – Check off

✓	No.	Description	Qty.	Item No.	✓	No.	Description	Qty.	Item No.
<input type="checkbox"/>	1	Short anchor pin (yellow)	10	7344-W10-C2Y	<input type="checkbox"/>	22	Axle, 60 mm	4	7413-W10-M1D
<input type="checkbox"/>	2	Anchor pin (orange)	10	7061-W10-C10	<input type="checkbox"/>	23	Axle, 70 mm	4	7061-W10-Q1D
<input type="checkbox"/>	3	Joint pin	10	1156-W10-A1R	<input type="checkbox"/>	24	Small gear	18	7026-W10-D2S
<input type="checkbox"/>	4	Tube bolt	5	7404-W10-G10	<input type="checkbox"/>	25	Angled arm	3	7404-W10-B2G2
<input type="checkbox"/>	5	Tube bolt cap	12	7409-W10-F20	<input type="checkbox"/>	26	Triangular bracket	1	7388-W10-K1G
<input type="checkbox"/>	6	Shaft plug	4	7026-W10-H1Y	<input type="checkbox"/>	27	Tube, 200 cm	1	7409-W85-200
<input type="checkbox"/>	7	Shaft pin	6	7026-W10-J3R	<input type="checkbox"/>	28	Anchor pin lever	1	7061-W10-B1Y
<input type="checkbox"/>	8	Two-to-one converter	2	7061-W10-G1TB	<input type="checkbox"/>	29	Tube connector cap	4	7409-W10-F1R
<input type="checkbox"/>	9	Long button pin	2	7061-W10-E2TY	<input type="checkbox"/>	30	3-hole crank (dark green)	4	7409-W10-H1G
<input type="checkbox"/>	10	Tube, 30 mm	5	7400-W10-G1D	<input type="checkbox"/>	31	3-hole crank (light green)	4	7409-W10-H1G1
<input type="checkbox"/>	11	3-hole wide rounded rod	7	7404-W10-C1G2	<input type="checkbox"/>	32	Small cam (pear shape)	2	7409-W10-G1R
<input type="checkbox"/>	12	Curved rod (dark green)	5	7061-W10-V1G	<input type="checkbox"/>	33	Large cam (teardrop shape)	2	7409-W10-G2R
<input type="checkbox"/>	13	Curved rod (light green)	5	7061-W10-V1G3	<input type="checkbox"/>	34	3-hole 90-degree converter	4	7409-W10-I1G
<input type="checkbox"/>	14	5-hole dual rod C	4	7026-W10-S3G1	<input type="checkbox"/>	35	Suction cup pad	4	7409-W85-E
<input type="checkbox"/>	15	5-hole rod B	4	7413-W10-K2G2	<input type="checkbox"/>	36	Dual valve (light green)	1	7409-W85-D1G1
<input type="checkbox"/>	16	7-hole flat rounded rod (light green)	8	7404-W10-C3G2	<input type="checkbox"/>	37	Dual valve (dark green)	1	7409-W85-D1G
<input type="checkbox"/>	17	7-hole flat rounded rod (dark green)	4	7404-W10-C3G1	<input type="checkbox"/>	38	Pump (light green)	2	7409-W85-C1G1
<input type="checkbox"/>	18	7-hole wide rounded rod	1	7404-W10-C2G1	<input type="checkbox"/>	39	Pump (dark green)	2	7409-W85-C1G
<input type="checkbox"/>	19	9-hole rod	4	7407-W10-C1G	<input type="checkbox"/>	40	Motor box	1	7409-W85-A
<input type="checkbox"/>	20	Square frame	4	7026-W10-T2G	<input type="checkbox"/>	41	Geckobot eye stickers	1	R20#7409-US
<input type="checkbox"/>	21	Axle, 35 mm	1	7413-W10-O1D					

Centimeters

20  
17  
15

**NOTE! Cutting the tube to length**

You must cut the 200-cm tube into these lengths. The specific lengths needed for each model are indicated in the assembly instructions for each model. You will have 4 cm of tube left over after cutting. You can use the measuring guide on the left edge of this page. You can also write the lengths on the tubes with a pen so they are easier to tell apart.

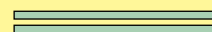
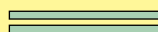
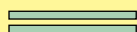
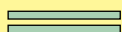
**9 cm x 2**

**15 cm x 2**

**17 cm x 2**

**20 cm x 3**

**27 cm x 2**

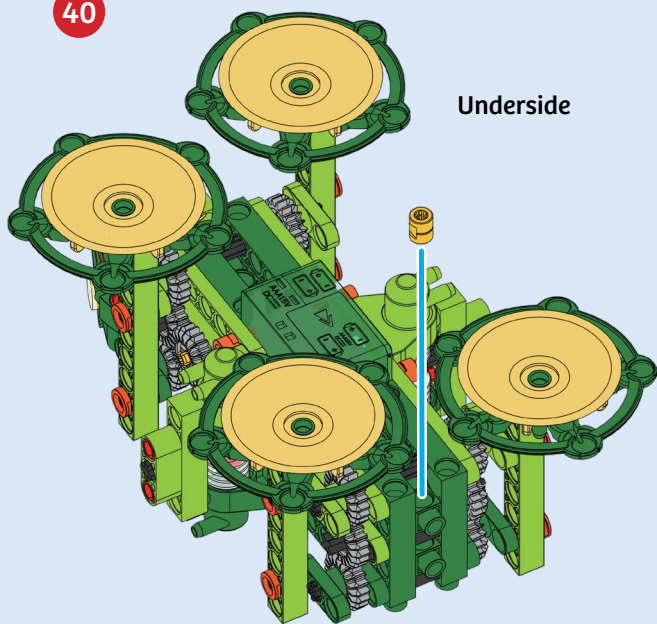


**You will also need:**

2 x AAA batteries (1.5-volt, type AAA/LR03), scissors, ruler or measuring tape, smooth flat climbing surface (such as glass, plastic, or smooth laminate), small Phillips-head screwdriver, a few sheets of paper, sheet of thin plastic (such as a binder cover), marker

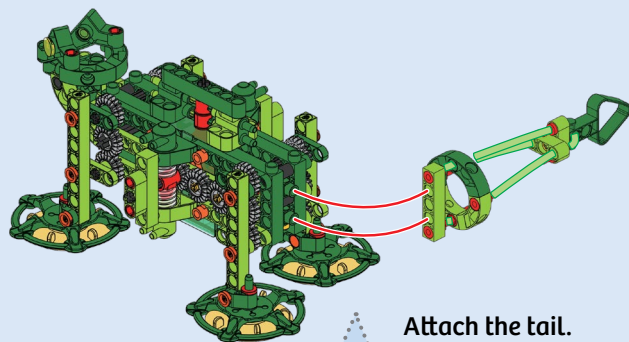


40

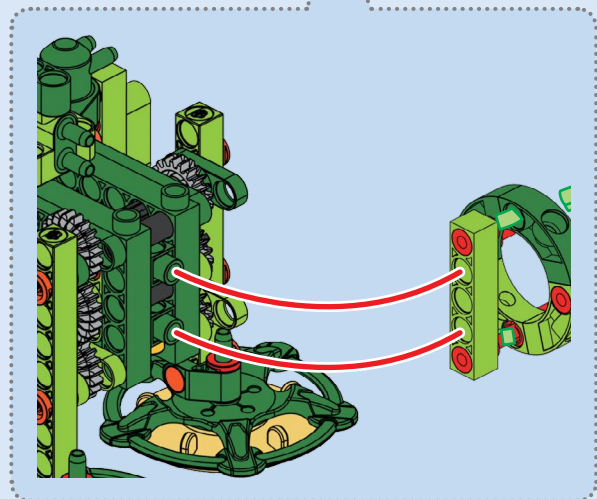


Underside

41

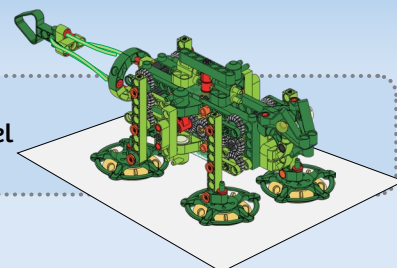


Attach the tail.

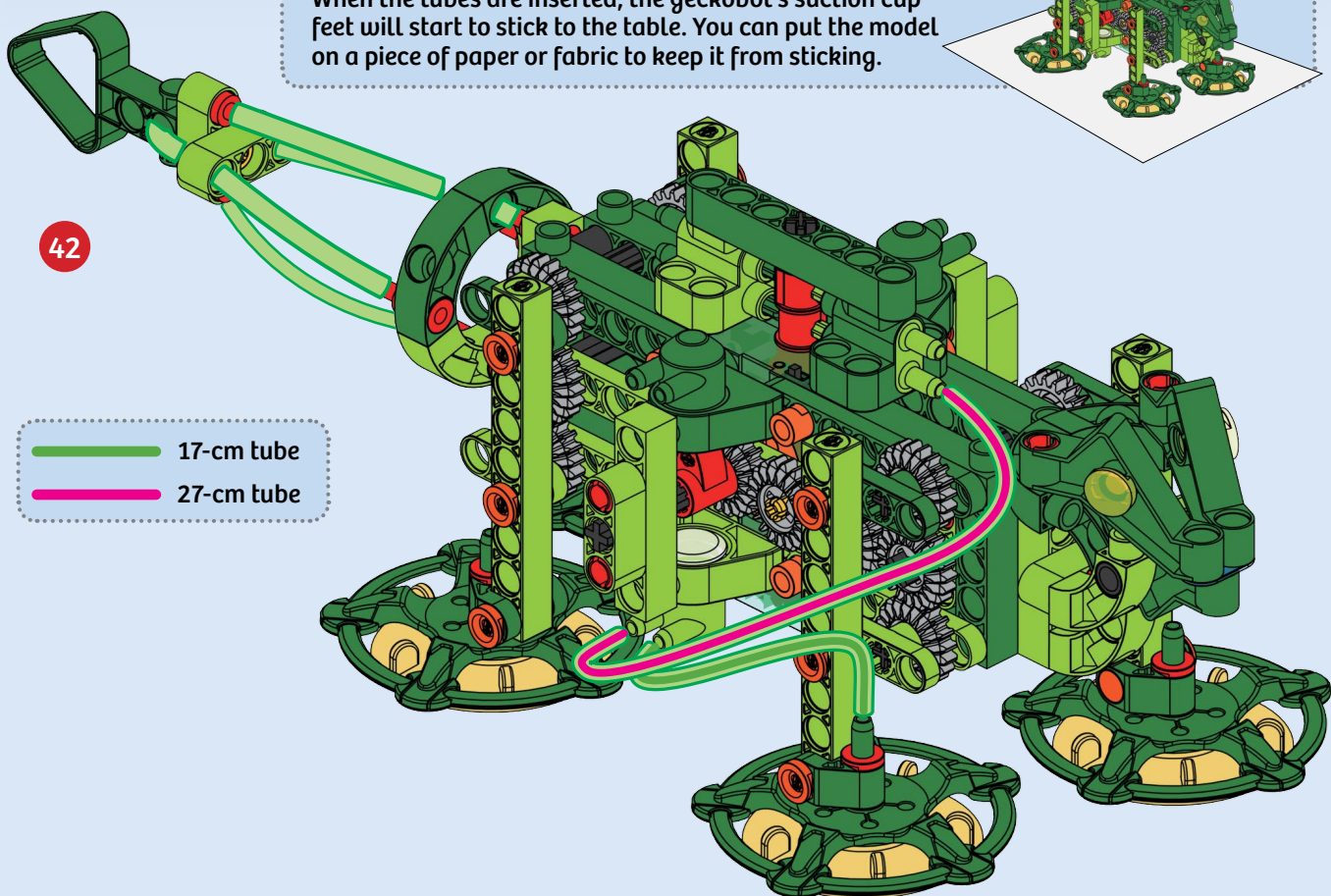


### Connecting the tubes: Steps 42 through 45

When the tubes are inserted, the geckobot's suction cup feet will start to stick to the table. You can put the model on a piece of paper or fabric to keep it from sticking.



42

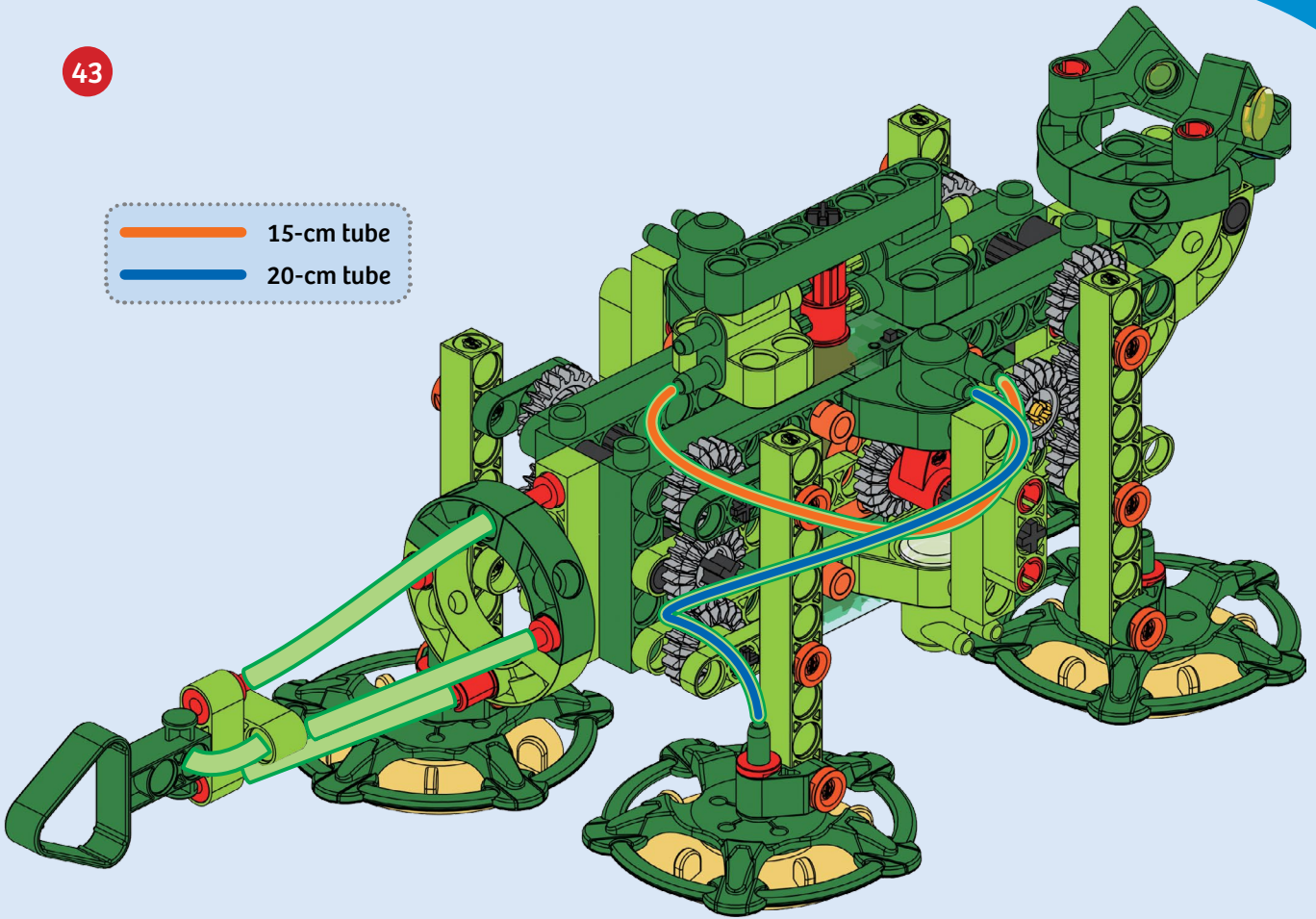


- 17-cm tube
- 27-cm tube



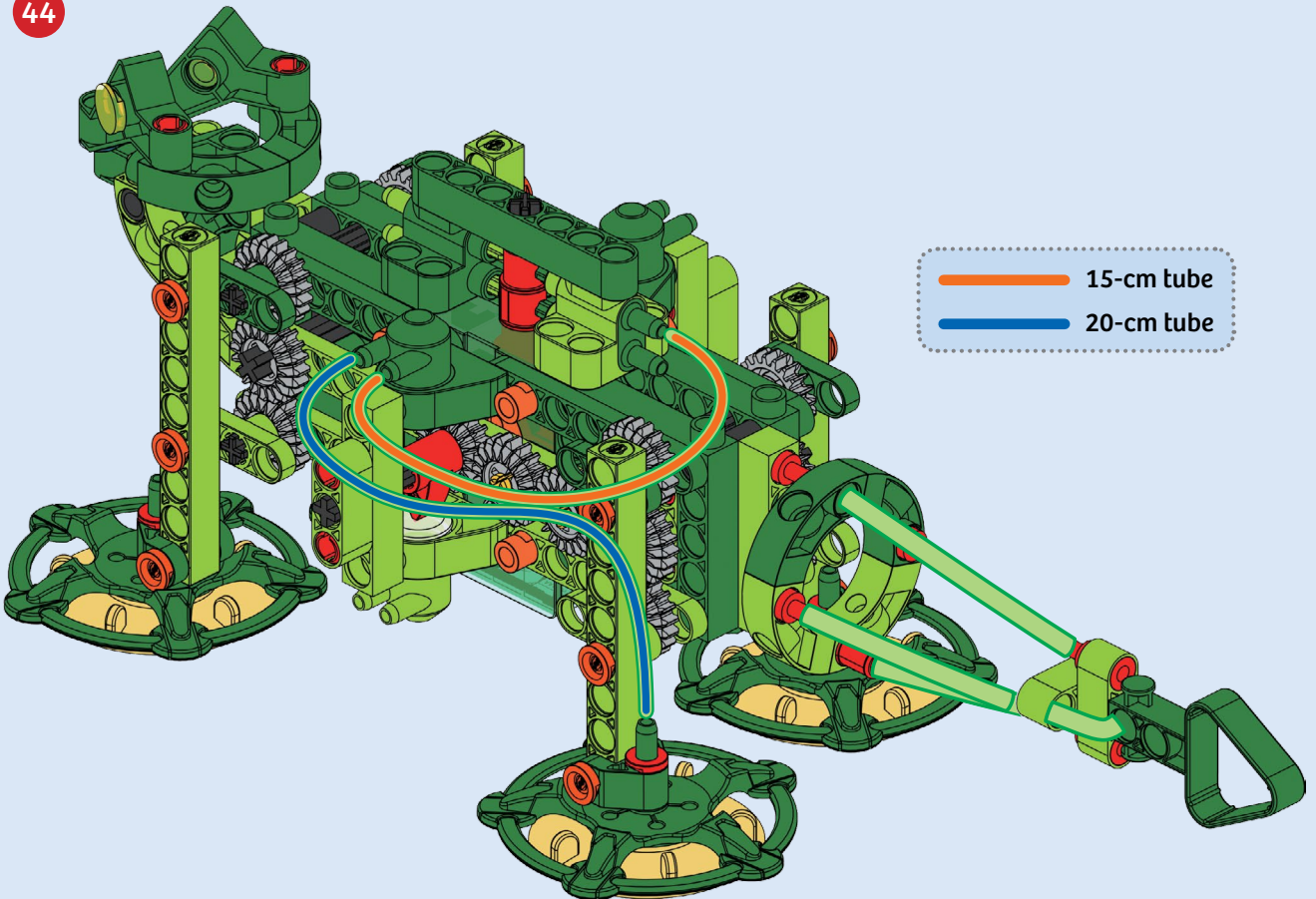
43

- 15-cm tube
- 20-cm tube



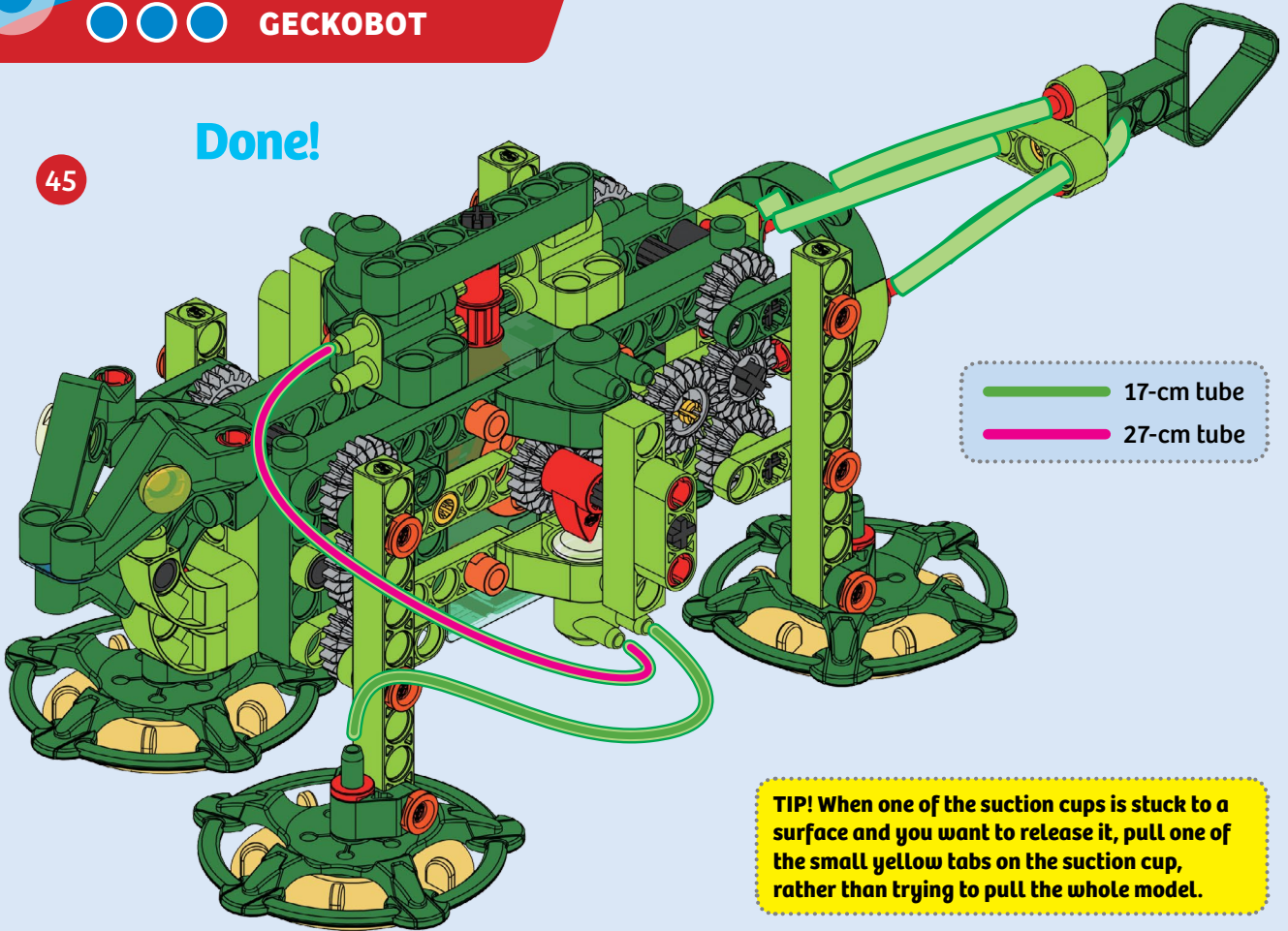
44

- 15-cm tube
- 20-cm tube



45

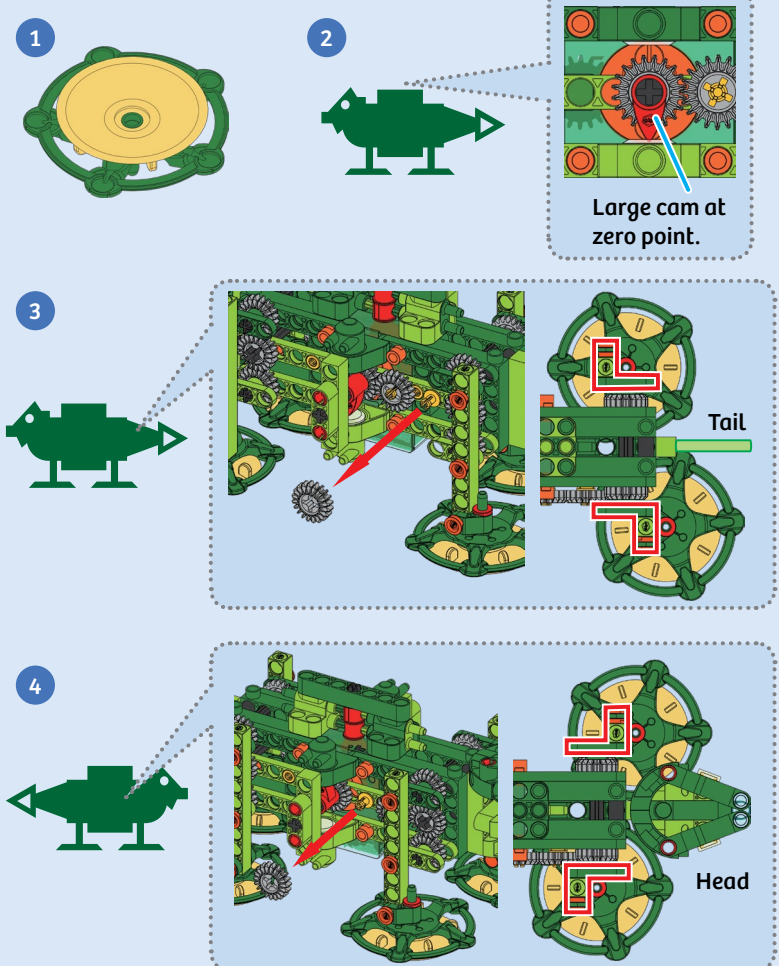
Done!



**TIP!** When one of the suction cups is stuck to a surface and you want to release it, pull one of the small yellow tabs on the suction cup, rather than trying to pull the whole model.

## How to operate the geckobot

- 1 Make sure the suction cups are clean. If the suction cups have dust on them, they will lose pressure. Clean them by wiping them with a wet towel. Using a dab of lotion to clean the suction cups will make them stick to smooth vertical surfaces better.
- 2 Make sure the large cams are at the zero points. Turn on the motor and try to stop it so that the large cams stop at the zero points. The cams on the two sides are rotated 180 degrees apart. At the zero point, the cam on the left side faces downward and the cam on the right side faces upward.
- 3 Make sure the left rear foot is as far back as it goes and flat on the table. If you need to, remove the small gear and adjust the rear feet. The feet need to be 180 degrees apart, forward and backward. Then reattach the small gear.
- 4 Make sure the right front foot is as far back as it goes and flat on the table. If you need to, adjust the front feet by removing the small gear as described in step 3.



**Be careful with the model! Handle your geckobot model delicately. Pick it up by the body — not the tubes, legs, tail, or head.**