EXPERIMENT MANUAL

AIR+WATER POWER PLUS

SUPER-CHARGED
PNEUMATIC-HYDRAULIC
VEHICLES & MACHINES

Renewable Energy

THAMES & KOSMOS

WARNING NOTICE

NOTE! Not suitable for children under 8 years of age. Use under adult supervision.
There is risk of choking due to small parts that may be swallowed or inhaled.
There is risk of strangulation if long hoses are wrapped around the neck.
Save the packaging and instructions, which contain important information.

NOTICE TO PARENTS AND CHILDREN

Dear Parents,
Before starting the experiments, read through the instructions along with your child and discuss the information on this page. Check to make sure that the models are assembled correctly and help your child with the experiments.

Dear Researchers,
When you first unpack this experiment kit, the best thing to do is to familiarize yourself with the materials inside it. Only use the materials contained in the kit for these models and experiments. Be sure to run the models on clean, cool tap water only. It is also important to pay attention to the proper way to operate the pump, pressure tank, and air+water motor. Handle the pressure tank carefully and only run it in good condition. If air is pumped into the empty pressure tank, operate the pump 25 times at most (Models 20 – 30). When the pressure tank is half-filled with water, do not pump more than 20 times (Models 1 – 19). Otherwise, the components may be put under too much pressure and they could get damaged. Do not unscrew the pressure tank while it is under pressure.

Ideally, conduct the experiments in a quiet place that can take a little abuse, and where the water will cause no harm. Wipe up any spilled water immediately.

Decide together with an adult where you should assemble your models and perform the experiments (outside or in the house).

For models used in water, note the following:
NOTE! Only use in calm water under adult supervision.
For all water gun models, note the following:
NOTE! Do not aim at eyes or face. Do not squirt the water spray at or near the face of people or animals.

After completing the experiment, use the switch to release any air remaining in the system. Dry off all components and return them to the box. That way, nothing will get lost.

And now: Have fun with the experiments!

1st Edition 2012

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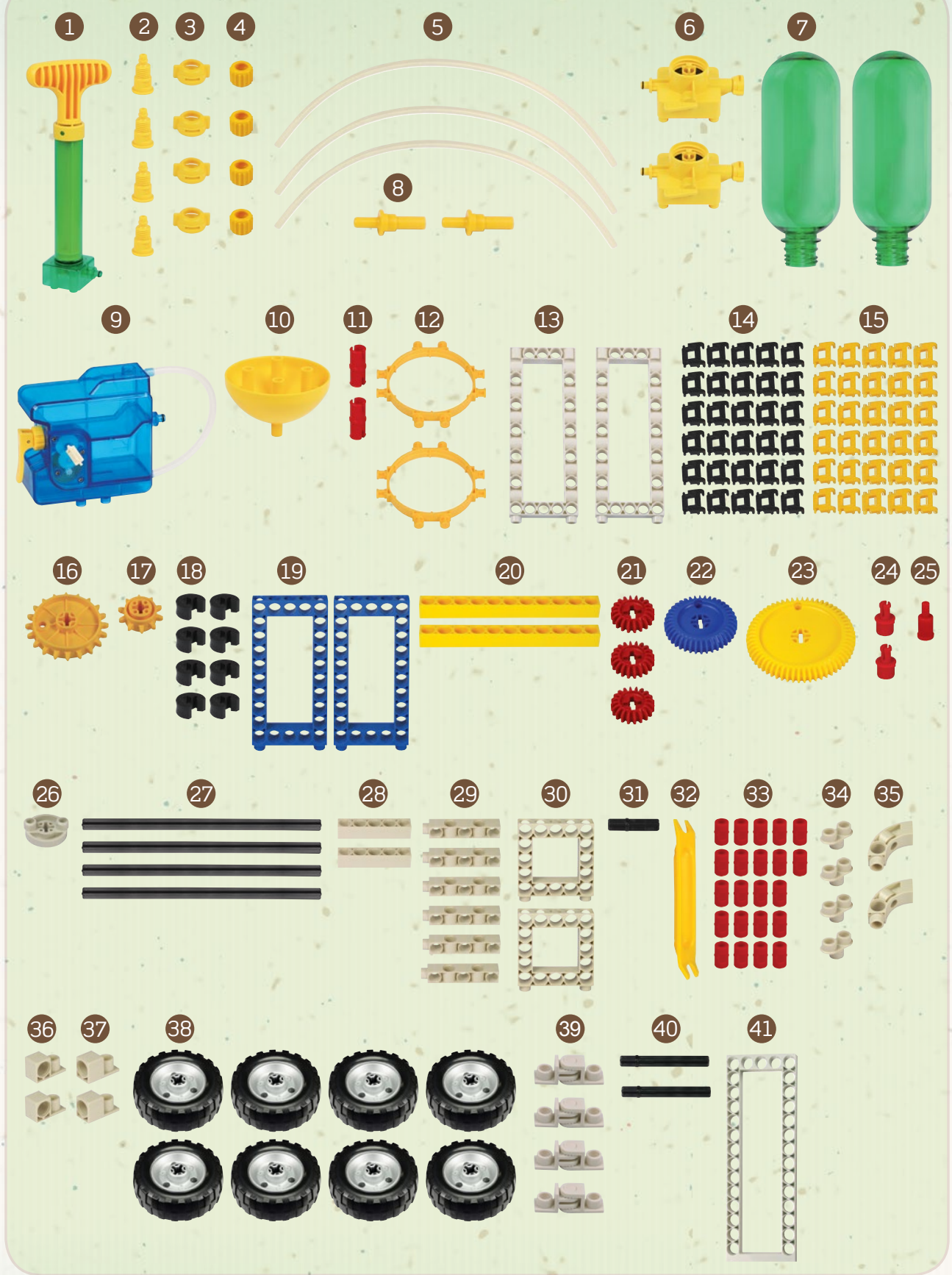
Editing: Ted McGuire; Additional Graphics and Layout: Dan Freitas
Distributed in North America by Thames & Kosmos, LLC. Providence, RI 02903
Phone: 800-587-2872; Email: support@thamesandkosmos.com

We reserve the right to make technical changes.
Printed in Taiwan / Imprimé en Taiwan

AIR+WATER POWER PLUS | Your kit's contents

No.	Description	Count	Art. No.
1	LARGE PUMP	1	712970
2	PLUG	4	712978
3	FASTENER	4	712979
4	THREADED CONNECTOR	4	710138
5	HOSE (30 CM)	3	712977
6	BASE	2	712975
7	PRESSURE TANK	2	712971
8	NOZZLE	2	712980
9	Air+water MOTOR	1	712974
10	FUNNEL	1	712981
11	JOINT PIN	2	702524
12	PRESSURE TANK RING	2	712982
13	CROSS-FRAME WITH HOLES	2	712992
14	CHAIN LINK (BLACK)	30	702510
15	CHAIN LINK (YELLOW)	30	712983
16	MEDIUM SPROCKET WHEEL	1	710133
17	SMALL SPROCKET WHEEL	1	710134
18	AXLE LOCK	8	702813
19	SHORT FRAME	2	710113
20	11-HOLE ROD	2	712986
21	SMALL GEAR WHEEL	3	710062

No.	Description	Count	Art. No.
22	MEDIUM GEAR WHEEL	1	710061
23	LARGE GEAR WHEEL	1	711100
24	SHAFT PLUG	2	702525
25	SHAFT PIN	1	702526
26	ROD CONNECTOR	1	710119
27	XL AXLE	4	703518
28	5-HOLE ROD	2	704063
29	5-HOLE DUAL ROD	6	705012
30	MINI-FRAME	2	705016
31	SHORT AXLE	1	703236
32	PART SEPARATOR TOOL	1	702590
33	ANCHOR PIN	22	702527
34	INSERTION BRIDGE (TWO-TO-ONE)	4	705010
35	¼-WHEEL SEGMENT	2	705013
36	CROSS-CONNECTOR	2	705017
37	LENGTHWISE CONNECTOR	2	704064
38	WHEEL	8	712336
39	JOINT	4	712991
40	MEDIUM AXLE	2	703238
41	LONG FRAME	1	703239
TOTAL		176	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HOW DO JET NOZZLE MODELS WORK

When you operate the pump, you push air into the pressure tank, which you already half-filled with water. Then you switch hoses and mount the pressure tank on your model. Open the switch and a stream of water and air hits the ground. Now the model zooms off!

In addition to these models for use on land, you can also build models for use in the water. They operate by the same principle, except the spray hits the water.

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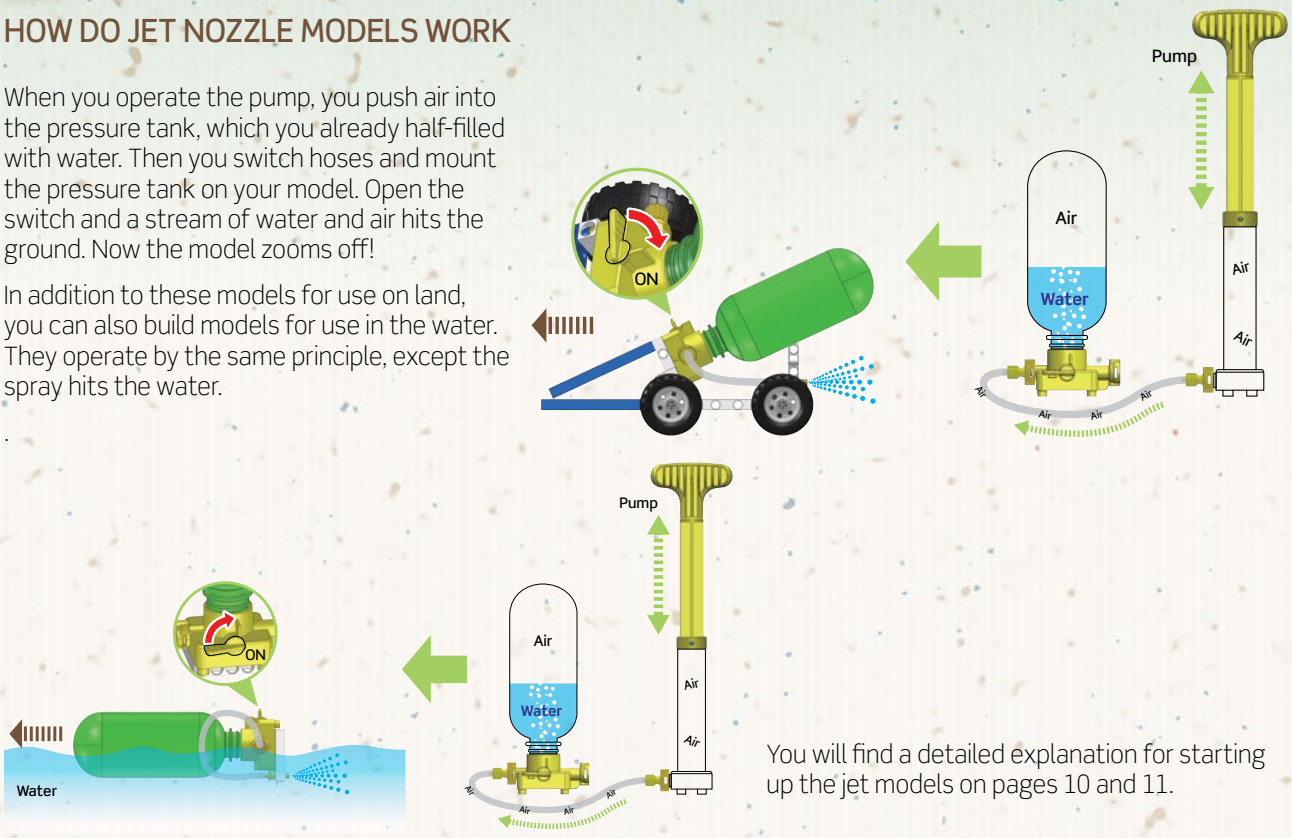


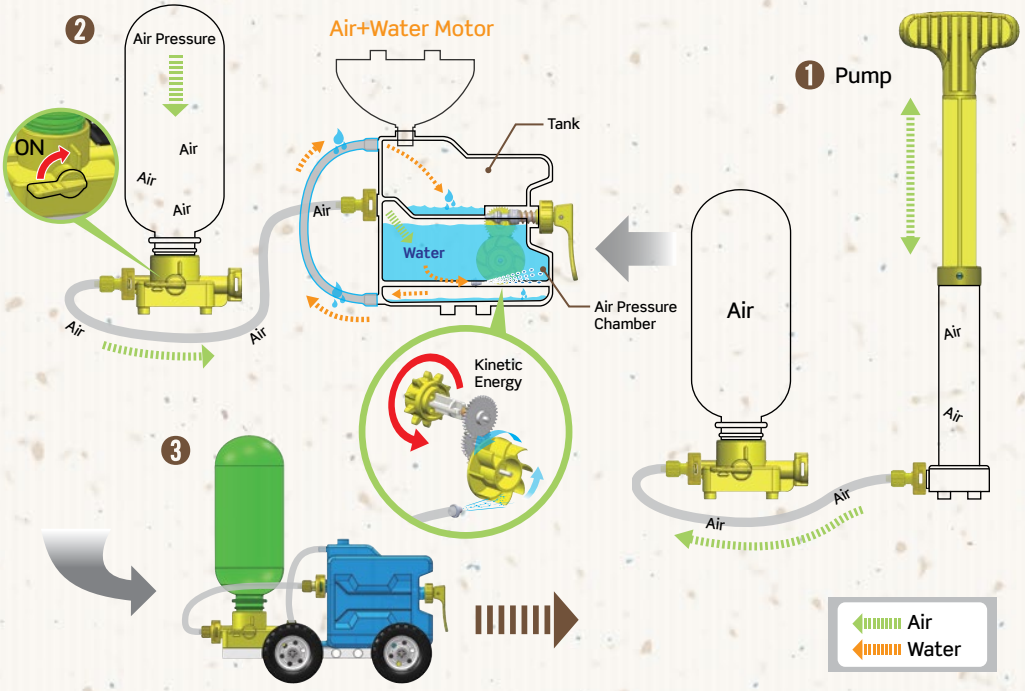
You will find a detailed explanation for starting up the jet models on pages 10 and 11.

HOW DO THE MODELS WITH THE AIR+WATER MOTOR WORK?

With these models, you also pump air into the pressure tank. The only difference is that the tank doesn't hold any water. Instead, you pour the water into the motor. Then, you mount the tank and the motor on your model. Open the switch!

The compressed air shoots out of the pressure tank through the hose into the motor's air pressure chamber, where it pushes the water through the turbine. Then, via interconnecting gears, shafts, sprockets, and a chain, the turbine drives the wheels and the model zooms off. The used water is led through a hose back into the tank. The remaining compressed air will continue to drive the turbine for a little while.

The path taken by air and water in the motor



You will find a detailed explanation for starting up the air+water motor models on pages 12 and 13.

WHAT LAWS OF PHYSICS ARE INVOLVED?

Your models are powered with two extremely environmentally friendly substances: **air** and **water**. When machines are powered by air or compressed air, we can also say that they work **pneumatically**. This word comes from a Greek word meaning "wind" or "breath."

If a liquid, such as water, is used as the means of propulsion, we call it a hydraulic system. This word also comes from Greek, with its first part meaning "water" and its second part meaning "tube."

So the power for your models comes from a combination of pneumatics and hydraulics. There are several principles of physics at work here:

1. Air can be compressed, water cannot

It's fun to use compressed air to power your models. You use the pump to push air into the pressure tank and then you continue compressing it even more as you keep pumping. We also talk about air as "compressible."

2. Boyle's law

When you compress air, its volume becomes smaller. But because you keep pumping more air and the space in the chamber is limited, the air pressure inside the container rises.

pressure (p) x volume (V) = constant (at a given temperature)

For the product to remain the same, the air pressure has to rise as the volume shrinks.

3. Pascal's law

The pressure in the pressure tank is exerted evenly against all the inner walls of the tank. If the air pressure rises, there is also an increase in the force with which the air (and/or water) presses against the container from inside.

pressure (p) = force (F) / area (A)

This also means that there is an increase in the pressure with which the air (and/or water) leaves the container. That translates into greater power for driving your models.

4. Newton's third law (action = reaction)

This law is particularly easy to see at work in the jet nozzle models. Your model accelerates forward with the same force with which the air and water mixture is expelled out the rear. You can also see this reaction principle at work when a rocket shoots off into space.

ASSEMBLING THE RODS AND FRAMES

Use the anchor pins to connect rods and frames (Fig. 1).

Some components can also be connected without anchor pins (Fig. 2).

Use end A of the part separator tool to release the anchor pin from a hole (Fig. 3).

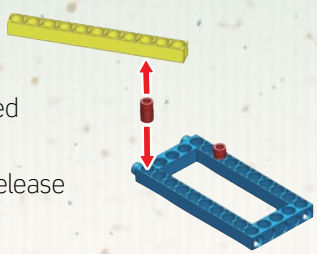


Fig. 1

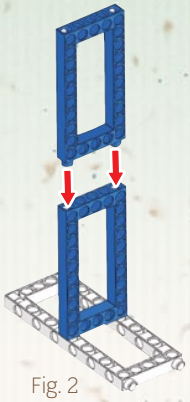


Fig. 2

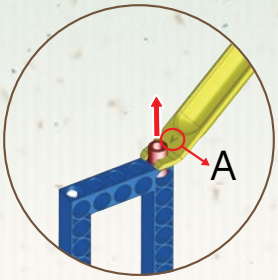


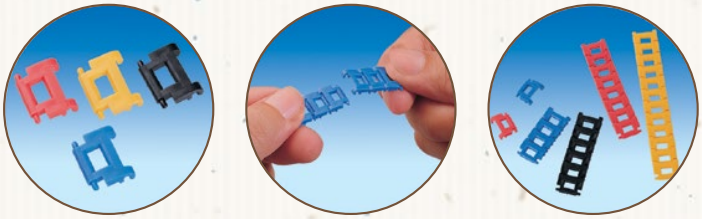
Fig. 3

AXLE LOCKS

Axle locks prevent sprockets and gears from slipping on an axle. They are easy to install without having to remove the sprockets or gears from the axles.

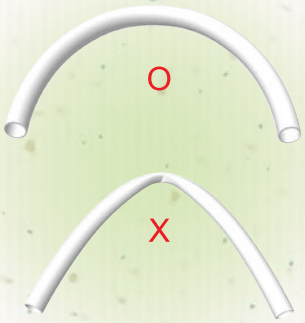
CONNECTING CHAIN LINKS

Always make sure to connect the links together with their smooth side up. That way, the chains will work smoothly and effectively.



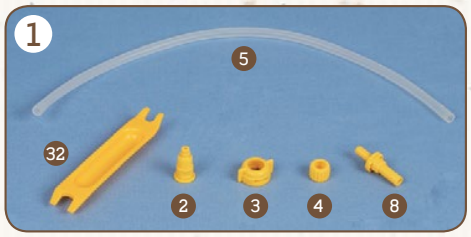
HOSES

Make sure that the hoses don't get pinched or kinked when operating the models. The water has to be able to flow through them without any hindrance.



ASSEMBLING THE HOSES

A Assemble 2 hoses with closures and nozzles.



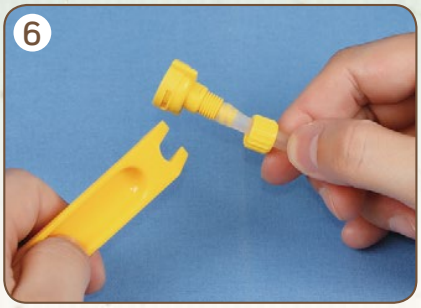
Find all the pieces shown in this illustration and place them in front of you.

First insert a plug into one end of the hose.

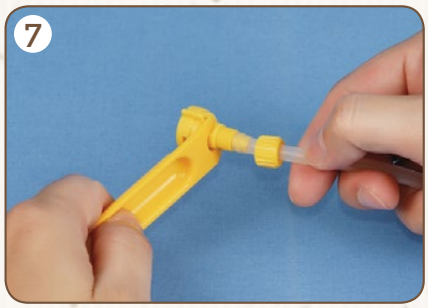
Then, from the other end, slide a fastener onto the hose. Be sure to insert the larger opening of the fastener onto the hose first.

Do the same thing with the large threaded connector.

Let both components slide down to the plug.

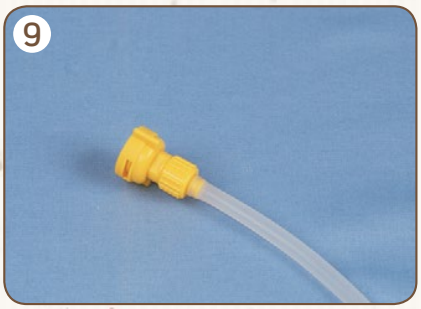


Push the fastener over the plug and take the part separator tool in your hand.

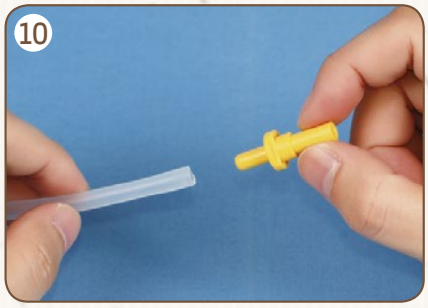


Slide end B of the part separator tool over the flattened part of the plug. That will let you hold it tight.

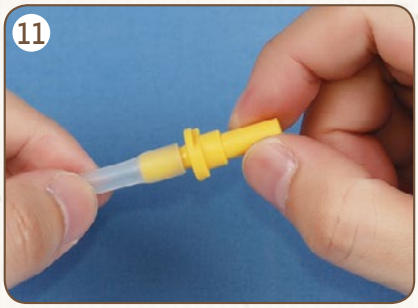
Now, tighten the threaded connector (in a clockwise direction) firmly onto the thread of the plug while holding the plug tight with the part separator tool.



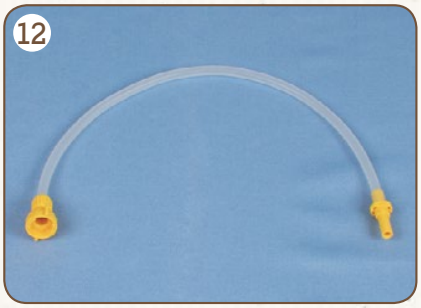
This is how the end of the hose should look now.



Take the nozzle in your stronger hand.

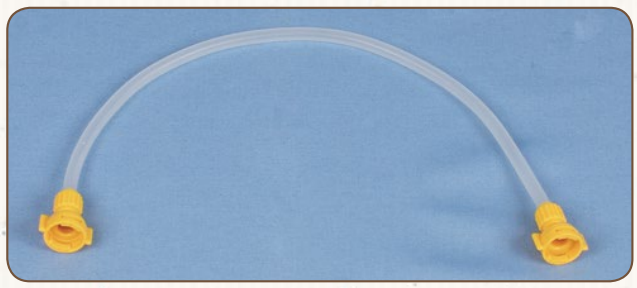


Firmly push the nozzle narrow-side-first into the free end of the hose.



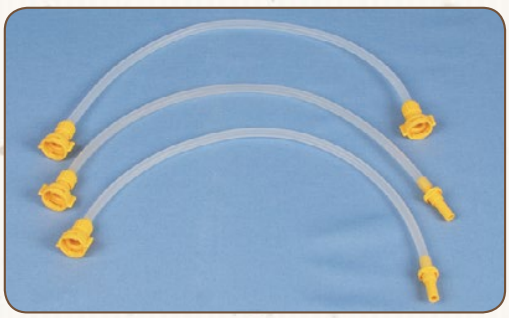
Now you have successfully assembled a hose.

B Assemble a hose with 2 fasteners



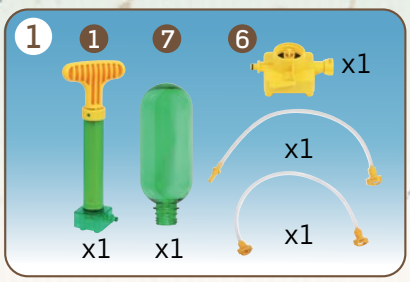
To make a hose with 2 fasteners, repeat steps 1 to 9 twice. The second time, though, you will have to first push on the threaded connector and then the fastener (in both cases, the end with the smaller opening goes first). Then, insert the plug in the hose and tighten the threaded connector.

C All three hoses are ready



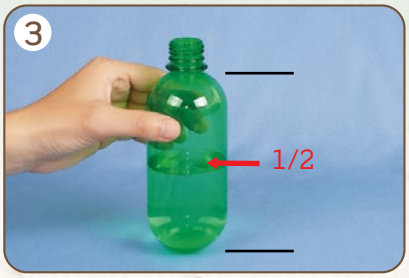
Here, you see all three hoses: one with 2 fasteners and two with fastener and nozzle.

WITH ONE PRESSURE TANK

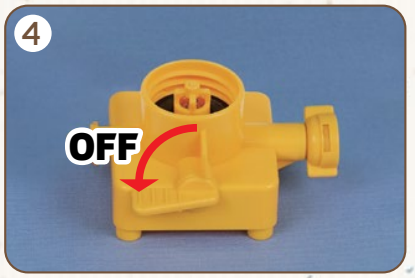


Find the following items in the box: pump, pressure tank, base, hose with fastener and nozzle, hose with 2 fasteners.

Fill the pressure tank halfway with water.



Hold the pressure tank upright so you can check the water level.

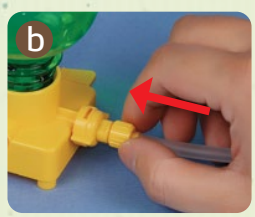


Take the base in your hand. Make sure that the switch is flipped down.

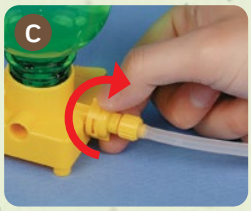
Screw the pressure tank onto the base.

Connect the end of the hose to the connection piece on the base.

Get the hose with the 2 fasteners ready.

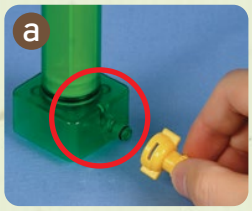


Push one of the plugs firmly onto the connection piece.

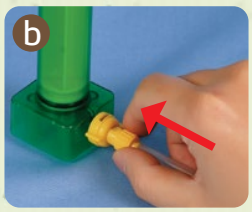


Turn the fastener to the right.

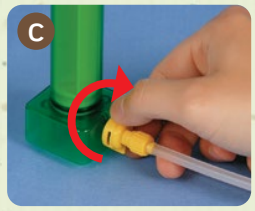
Now connect the other end of the hose to the pump's connection piece.



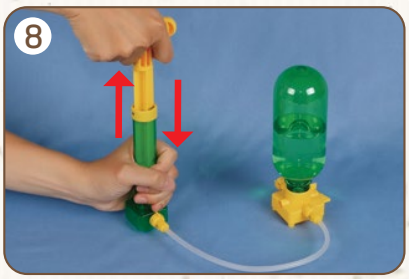
Get the free end of the hose ready.



Push the plug firmly onto the connection piece.



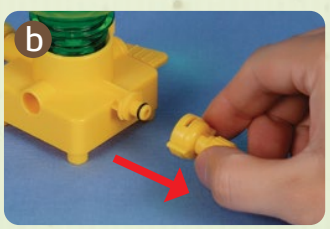
Turn the fastener to the right.



Pull up on the pump handle and then push it back down again. Pump 20 times at most.

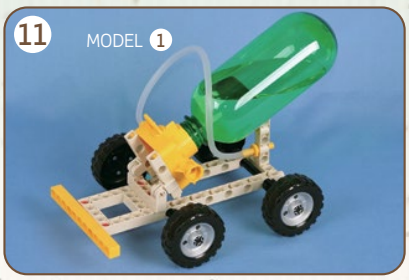
When you have finished pumping, remove the hose from the pressure tank.

Turn the fastener to the left.

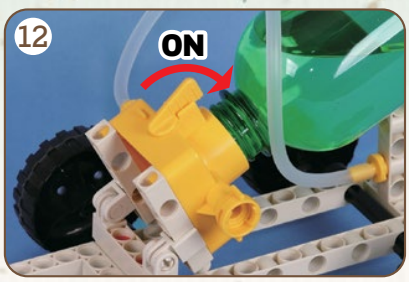


Remove the hose from the connection piece.

Get the hose with fastener and nozzle. Connect the end with the fastener to the connection piece on the base.

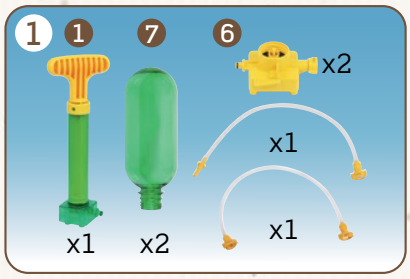


Mount the pressure tank on the model (here, Model 1).



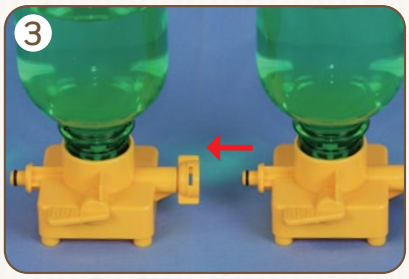
Turn on the switch and the model zooms away!

WITH TWO PRESSURE TANKS

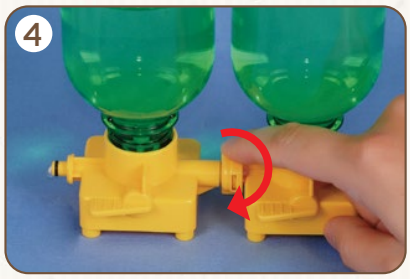


Find the following items in the box: pump, pressure tanks (2), bases (2), hose with fastener and nozzle, hose with 2 fasteners.

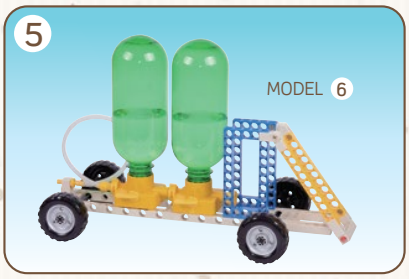
Prepare 2 pressure tanks filled with water and compressed air. Look at steps 2 to 9 on page 10 to see how to do it.



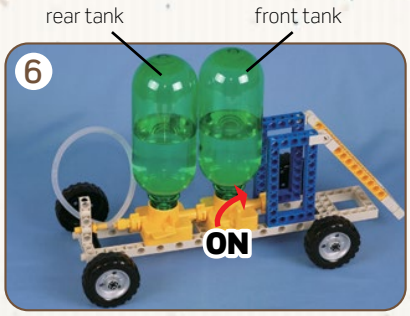
Connect the two pressure tanks to each other by pushing the two connection pieces firmly together...



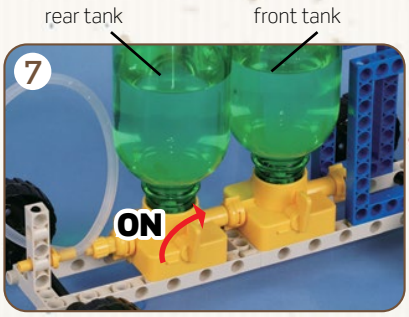
... and rotate the fastener..



Mount the pressure tanks on your model (Model 6 shown here).

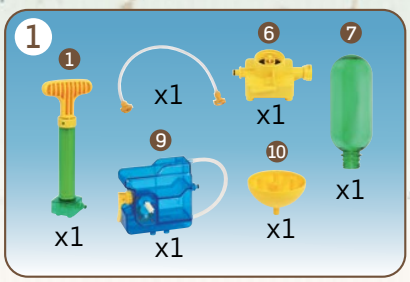


First open the front switch.



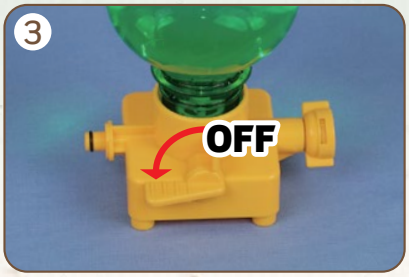
To start up the model, open the rear switch.

WITH ONE PRESSURE TANK



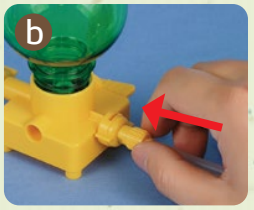
Find the following items in the box: pump, hose with 2 fasteners, air+water motor, base, funnel, pressure tank.

Screw the pressure tank into the base. Do not put any water into the pressure tank!



Be sure that the switch is flipped down.

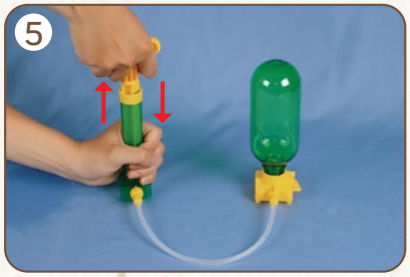
Get the hose with 2 fasteners ready.



Push one of the plugs firmly onto the connection piece.

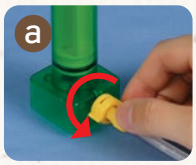
Turn the fastener to the right.

Now attach the other end of the hose to the pump's connection piece.



Pull up on the pump handle and then push it back down again. Pump 25 times at most.

When you have finished pumping, remove the hose from the pump.

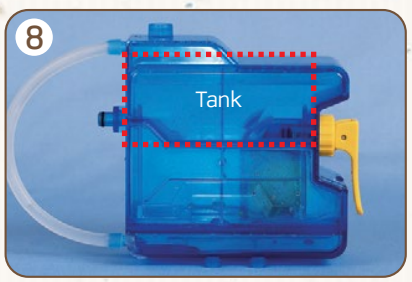


Turn the fastener to the left.

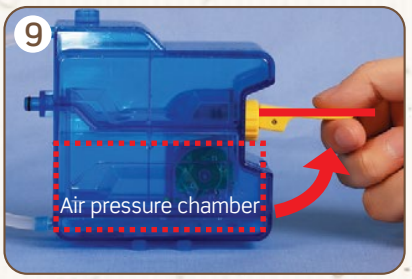
Remove the hose from the connection piece.

Push the funnel into the opening on top of the air+water motor. Pour water into the funnel. The water will flow into the upper tank of the air+water motor.

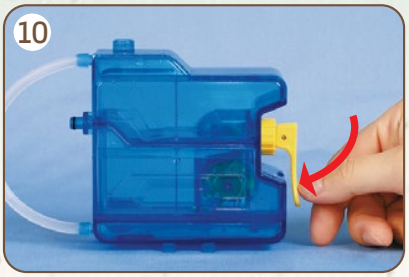
Tip: If an air bubble forms as you pour, tap a few times against the motor.



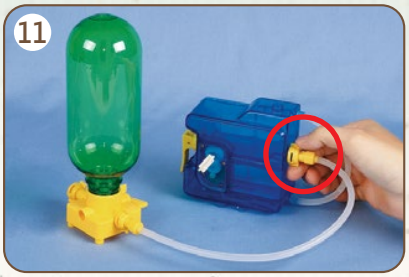
Check to make sure that the tank is 90% filled with water.



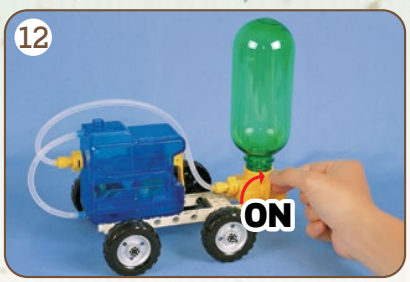
Raise the yellow lever to open the valve inside the motor. Now the water will flow down into the air pressure chamber.



As soon as all of the water has flowed down, flip the lever back down again. That will re-close the valve and seal off the air pressure chamber.

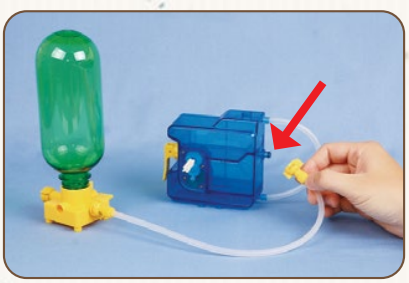


Attach the free end of the hose to the motor (push on and turn tightly). Mount the pressure tank and the motor on the model.



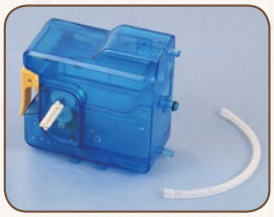
Turn on the switch and the model zooms away!

How to re-start the model:

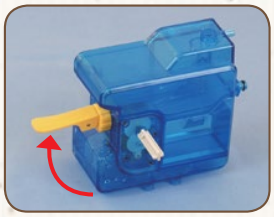


Remove the hose from the motor and repeat steps 4 to 6. Then complete steps 9 through 12. You can see how the water keeps cycling through the motor.

How to remove the water from the motor:



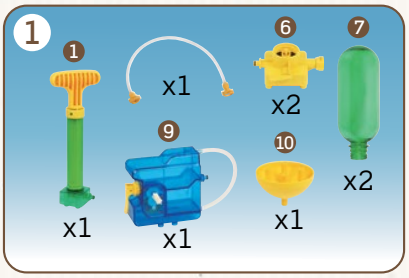
Detach the hose from the air+water motor.



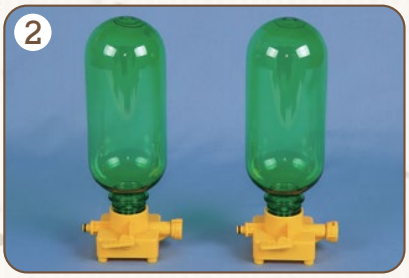
Flip up the yellow lever.

Let the water flow out of the openings in the motor.

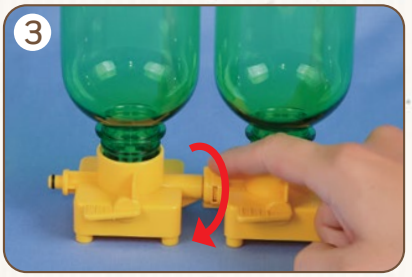
WITH TWO PRESSURE TANKS



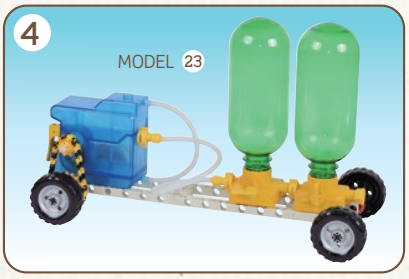
Find the following items in the box: pump, hose with 2 fasteners, air+water motor, bases (2), funnel, pressure tanks (2).



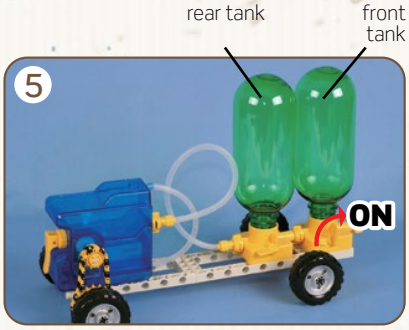
Prepare 2 pressure tanks filled with compressed air. Look at steps 2 to 6 on page 12 to see how to do it.



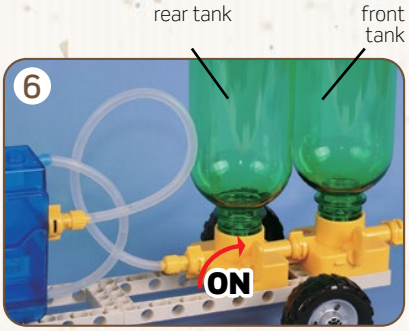
Connect the two pressure tanks to each other by pushing the two connection pieces firmly together and turning the fastener.



Mount the pressure tanks and the motor on your model (Model 23 shown here).



First open the front switch.



To start up the model, open the rear switch.

Note the safety information on page 2!

RACE

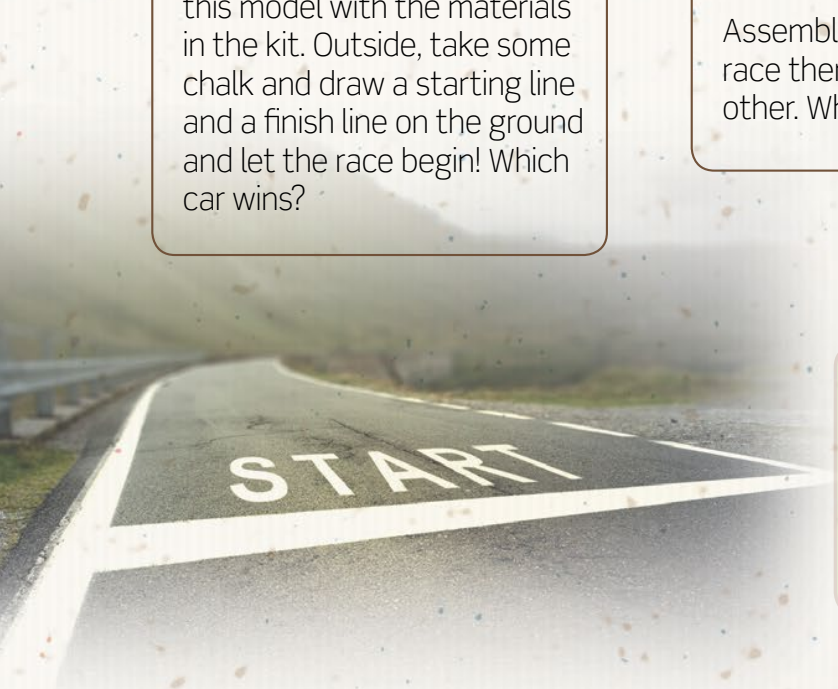
Build two models and race against your friends!

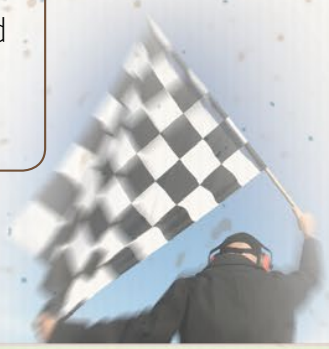
Model 8:
You will find material for two boats in the kit. Set both boats in the water and off you go!

Whose boat goes farther?

Model 1:
You can build two copies of this model with the materials in the kit. Outside, take some chalk and draw a starting line and a finish line on the ground and let the race begin! Which car wins?

Model 2 and 3:
Assemble both models and race them against each other. Which one is faster?





HOW MUCH POWER IS IN THE PRESSURE TANK?

Model 5: How far will the airplane fly with one pressure tank? How about two pressure tanks?

DRY RUNS: MODELS WITHOUT WATER

Will your models also work without water? Try the jet nozzle models without putting any water in the pressure tank. Test the air+water motor with just air.

How far will the models go with just air? Compare the distances against the distances covered by the same models with air and water.

With air alone, the models will not go as far. That's because air has less density than water. The force effect is directly related to density, which is why they have less power with air.

Note the safety information on page 2!

WHAT CAN YOUR CAR HANDLE?

Try driving your models on different surfaces (grass, smooth ground, gravel...). Or how about uphill and downhill?

HOW MUCH YOU PUMP

How far will your car or boat go if you pump only half the number of times?

SUMMER GAMES

Target and distance shooting (Models 15-18)

Can you shoot through a suspended tire? Try it from different distances!

Shoot at balloons attached to a string stretched between two trees. How good is your aim?

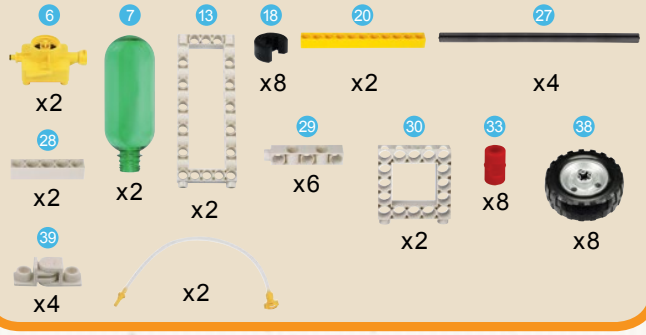
Take aim at a pyramid constructed out of food cans! How close do you have to get to make the pyramid collapse?

Use a piece of chalk to draw marks at 50 cm intervals on dry ground. Stand at the starting line. Which gun shoots the farthest?

The car of the future? This futuristic car is called AirPod, and it can go about 200 km on a tankful of compressed air.

Assemble two cars and hold a race with your friends!

Required Parts



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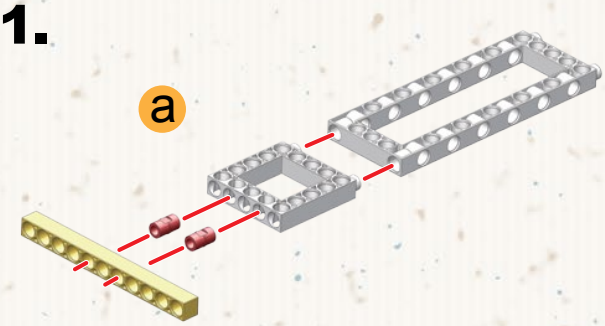

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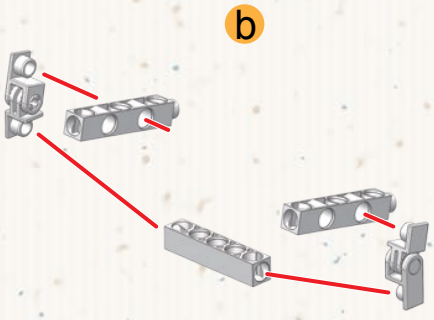

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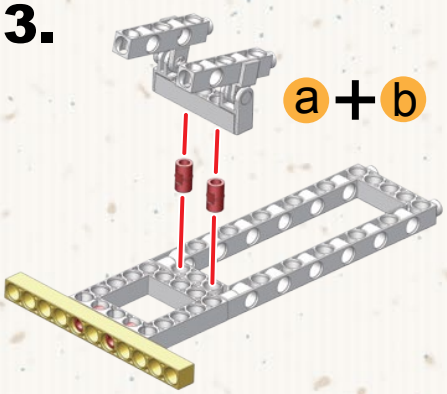

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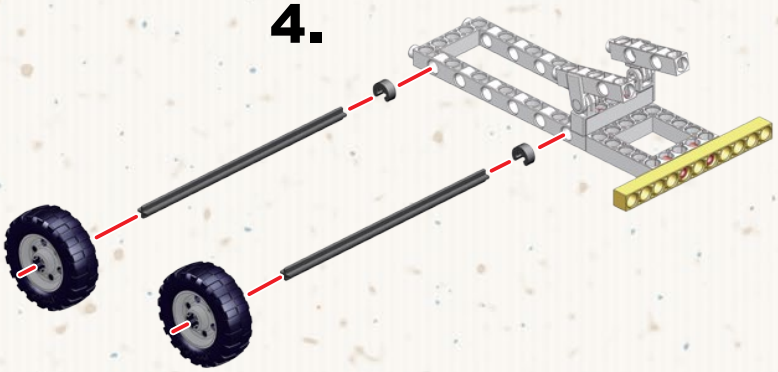

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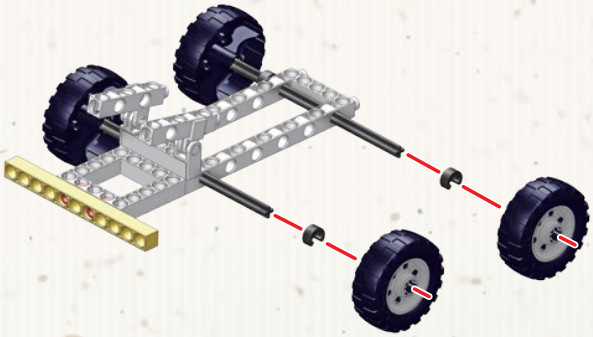
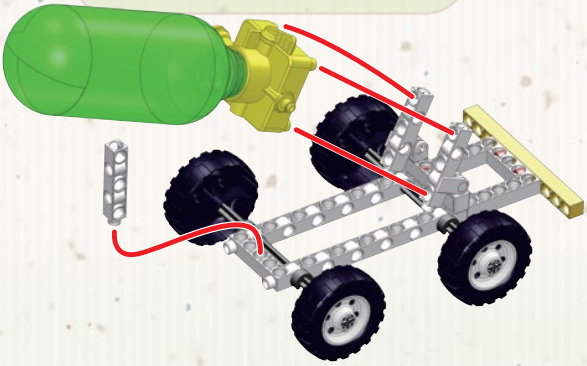


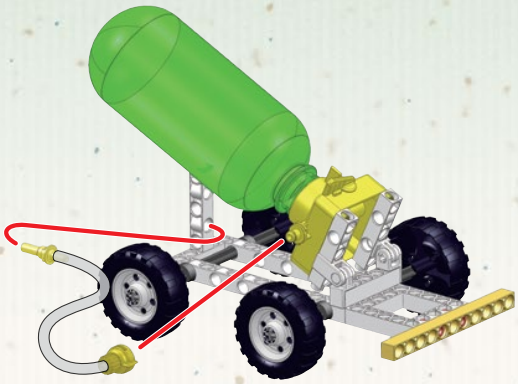
6.

You will find instructions for charging the pressure tank on page 10.



MODEL 1 Race car | AIR+WATER POWER PLUS

7.



Completed

x2

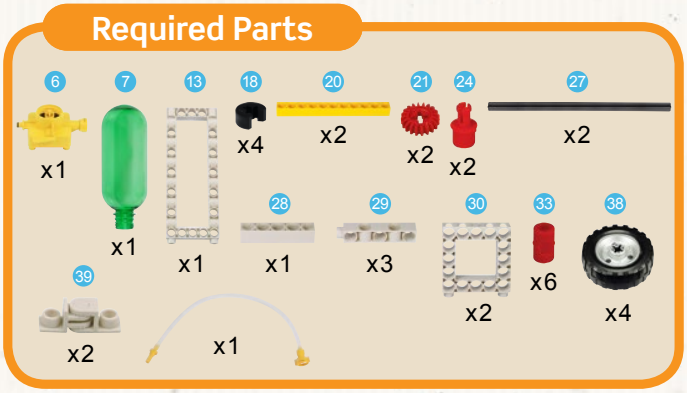
Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. Fill the pressure tank halfway with water and pump 20 times.
3. Open the switch and the model zooms off!

MODEL 2 Limousine | AIR+WATER POWER PLUS

Which car goes faster? The limousine or the sports car (Model 3)?

Required Parts



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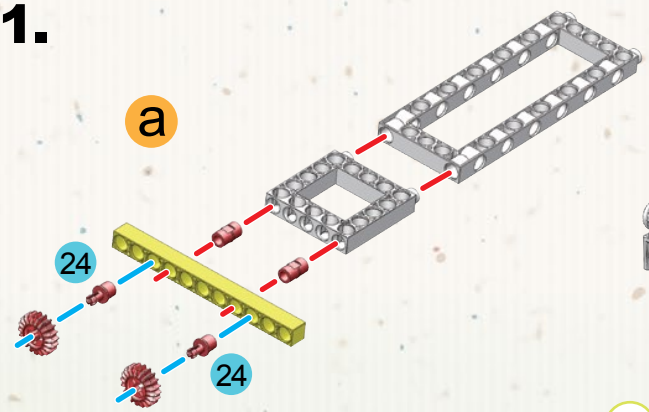
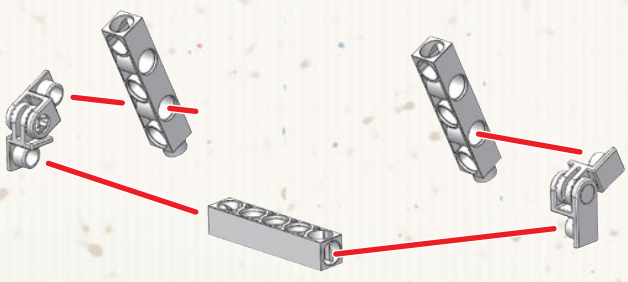


2. b



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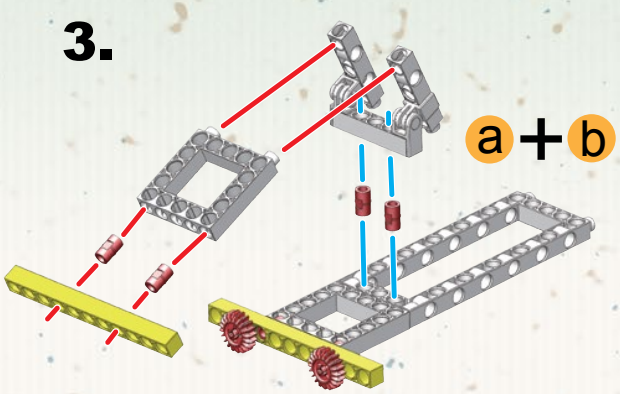

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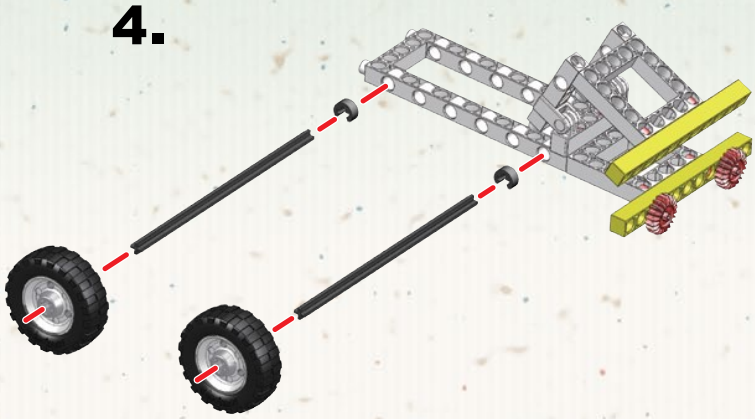

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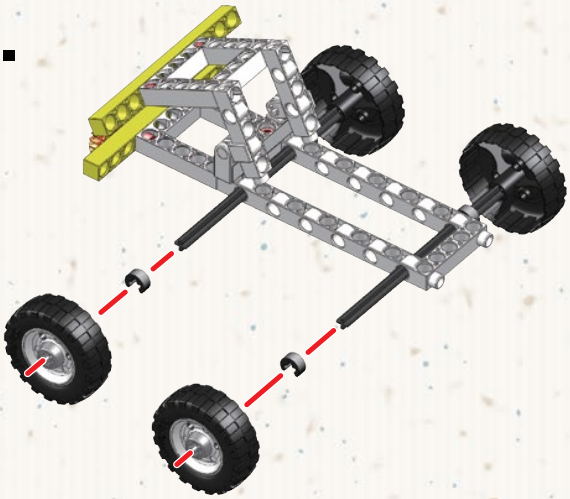

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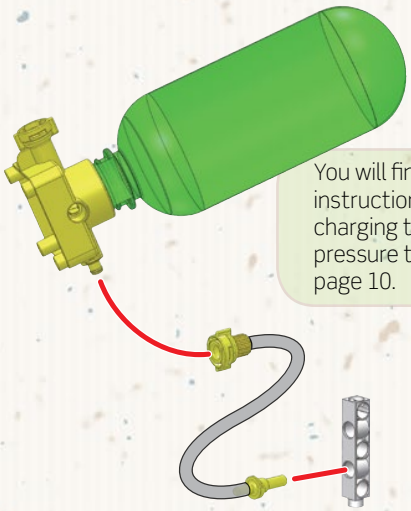
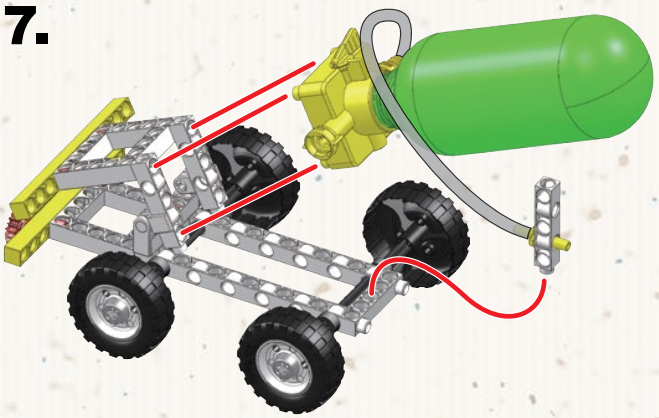


You will find instructions for charging the pressure tank on page 10.

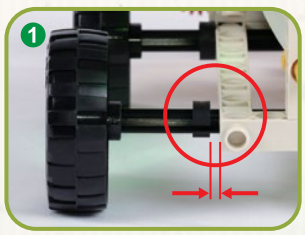
7.

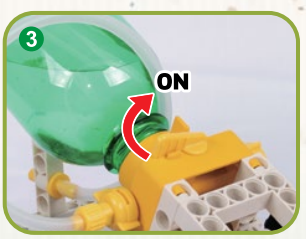


Completed

Assembly notes

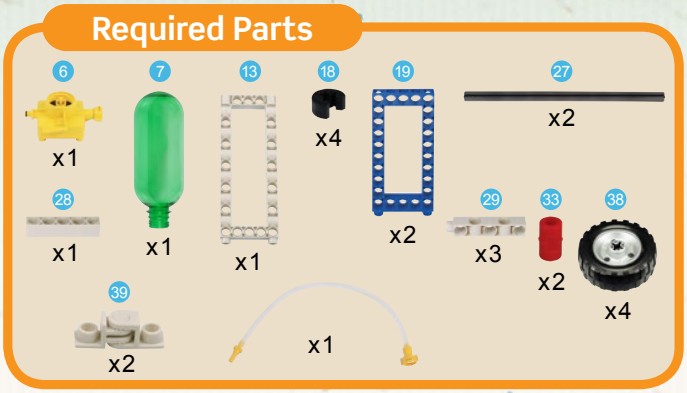
1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. Fill the pressure tank halfway with water and pump 20 times.
3. Open the switch and the model zooms off!





Which car goes faster? The sports car or the limousine (Model 2)?

Required Parts



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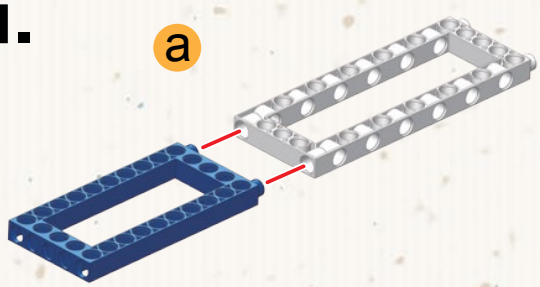

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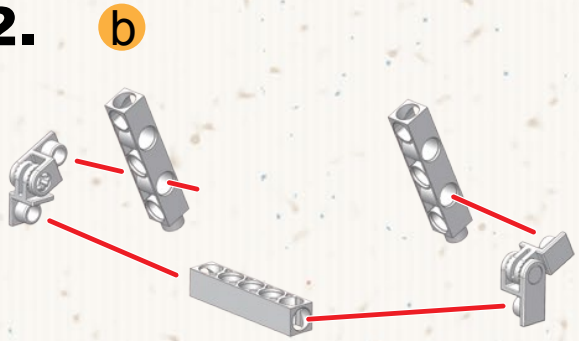

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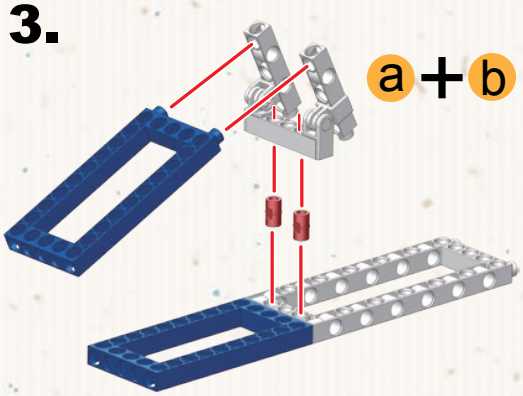

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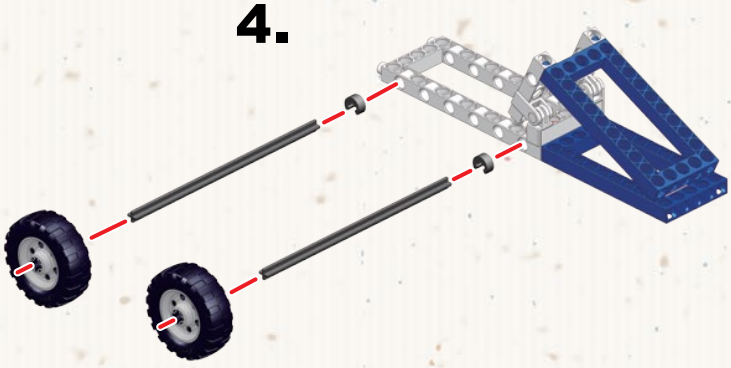

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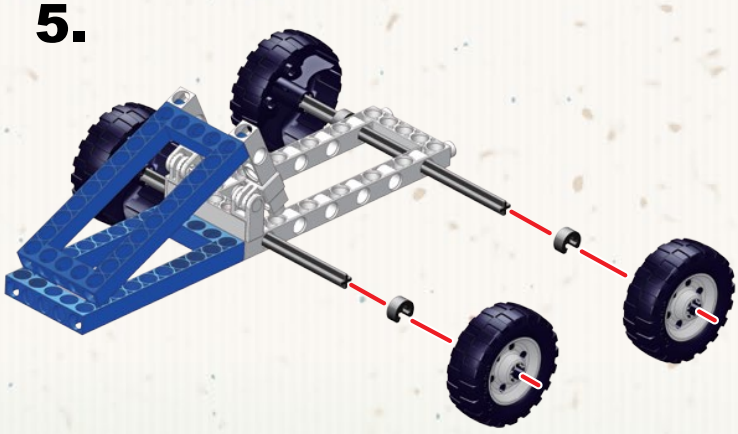

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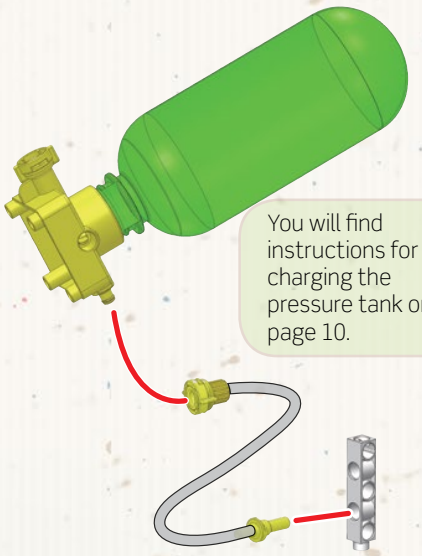
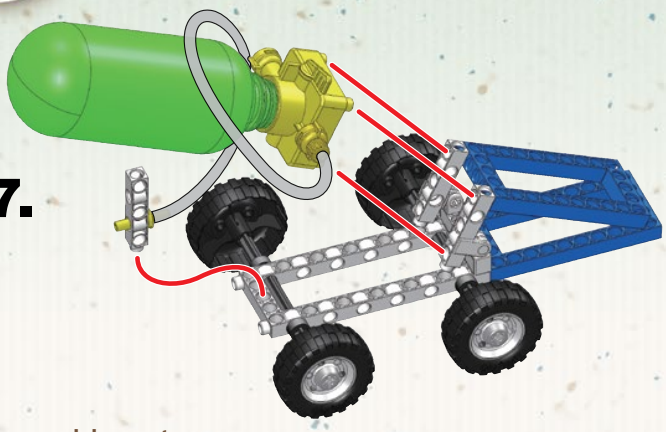


You will find instructions for charging the pressure tank on page 10.

AIR+WATER POWER PLUS | MODEL 3 Sports car

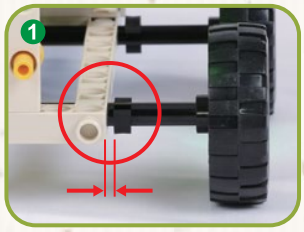
7.

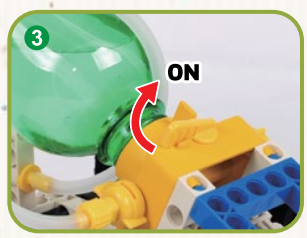


Completed

Assembly notes

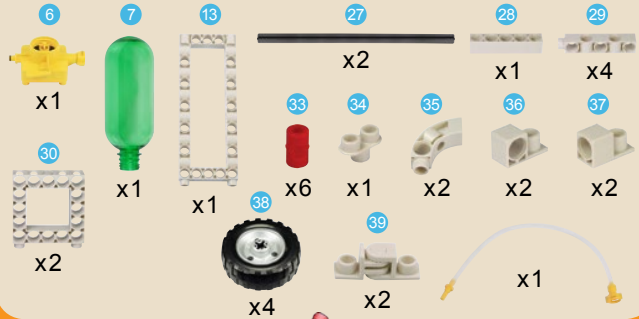
1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. Fill the pressure tank halfway with water and pump 20 times.
3. Open the switch and the model zooms off!





AIR+WATER POWER PLUS | MODEL 4 Rocket car

Required Parts



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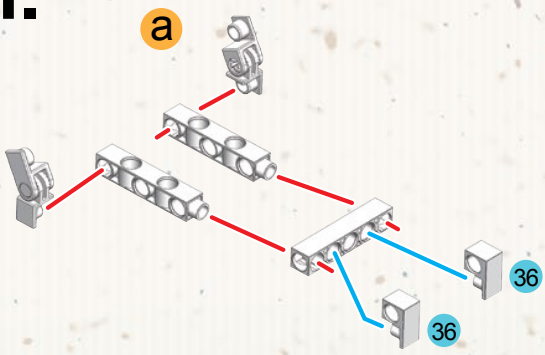

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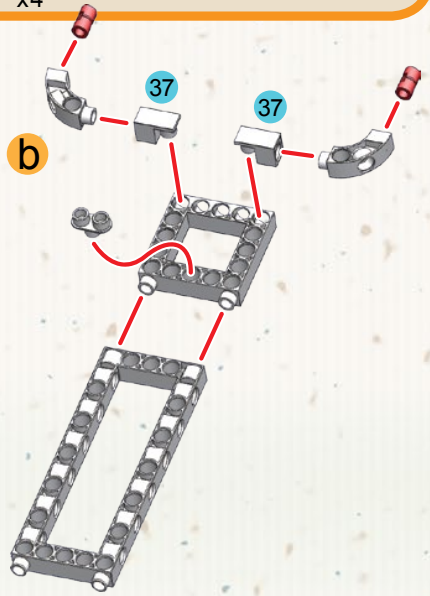
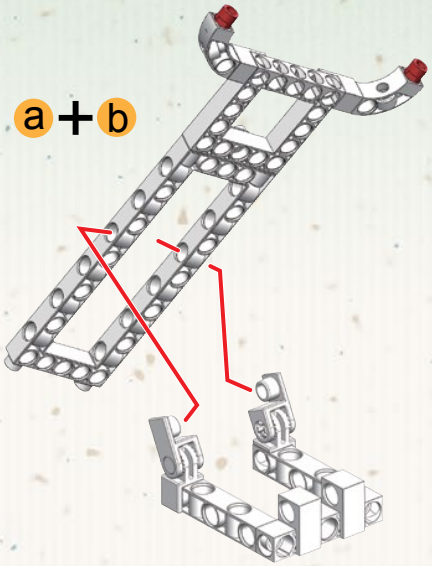


Renewable Energy

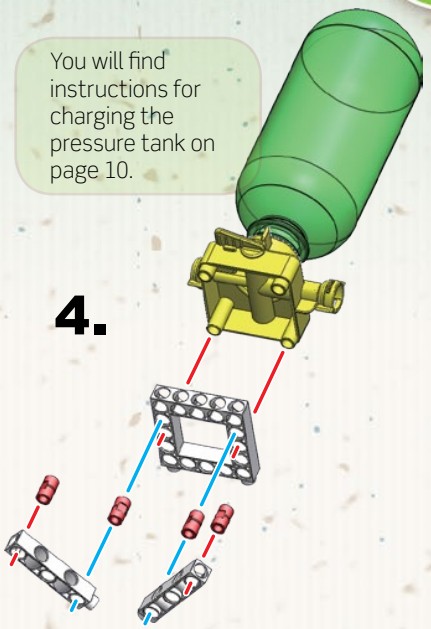
3.

a + b



You will find instructions for charging the pressure tank on page 10.

4.



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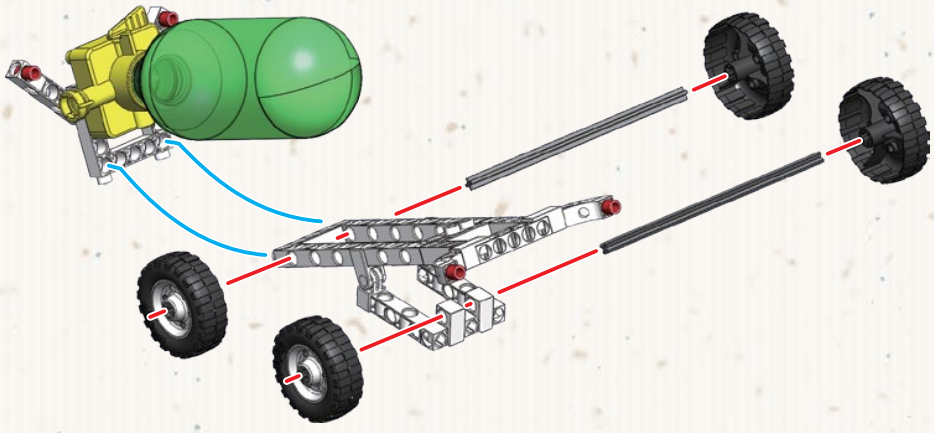

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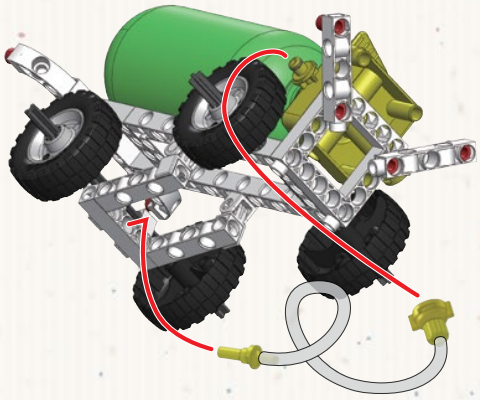
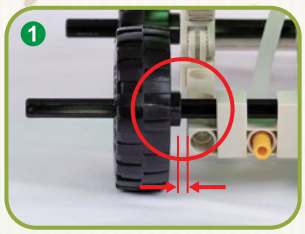


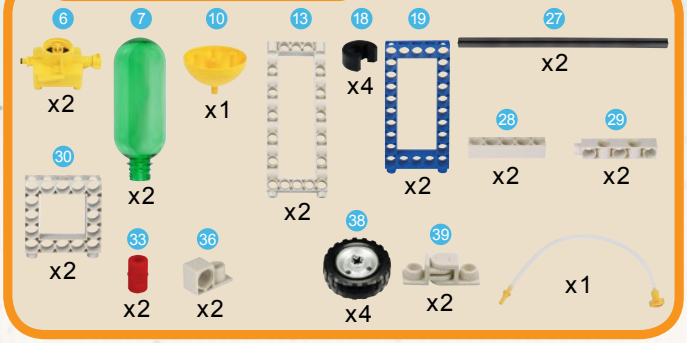
Completed

Assembly notes

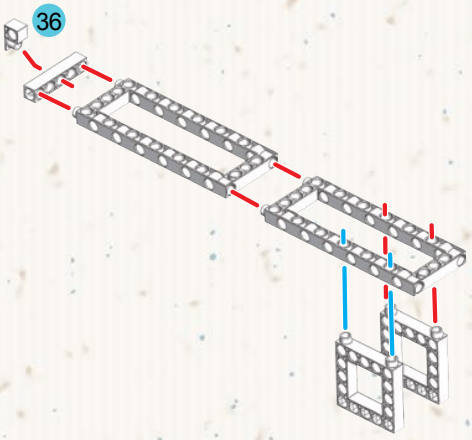
1. The model will run best if you leave a gap 1 mm wide between the wheel and the frame.
2. Fill the pressure tank halfway with water and pump 20 times.
3. Open the switch and the model zooms off!



Required Parts



1.



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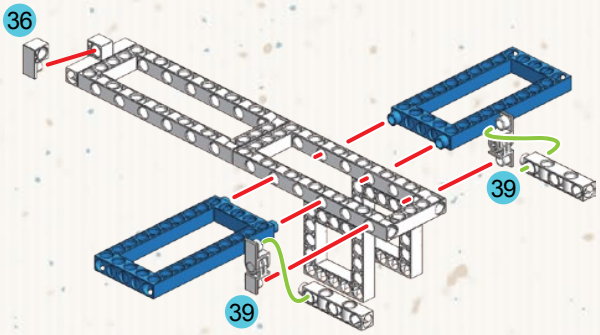

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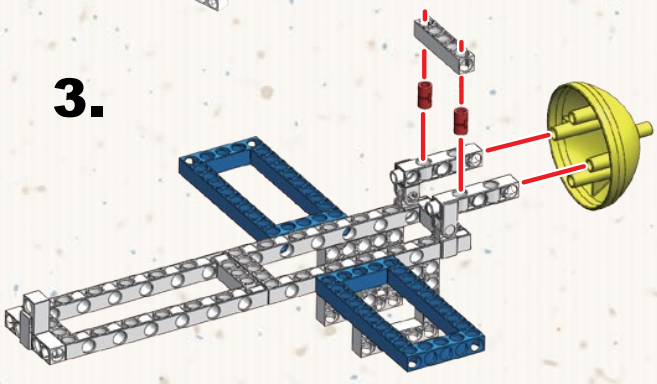
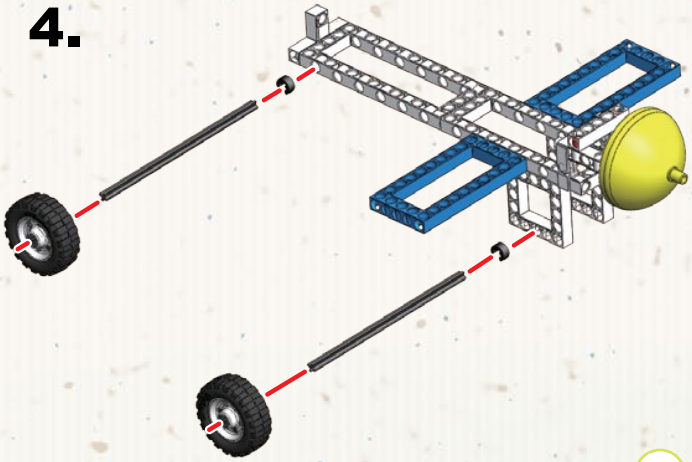


4.



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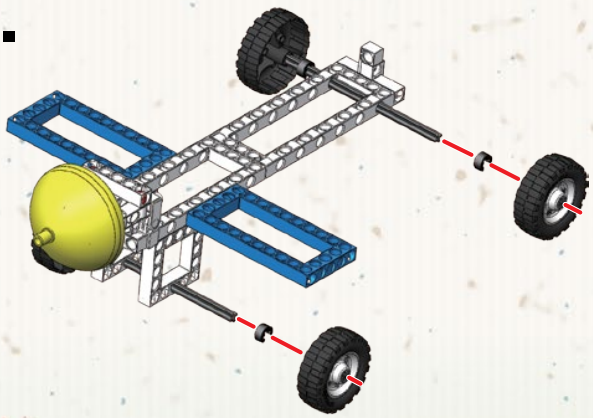
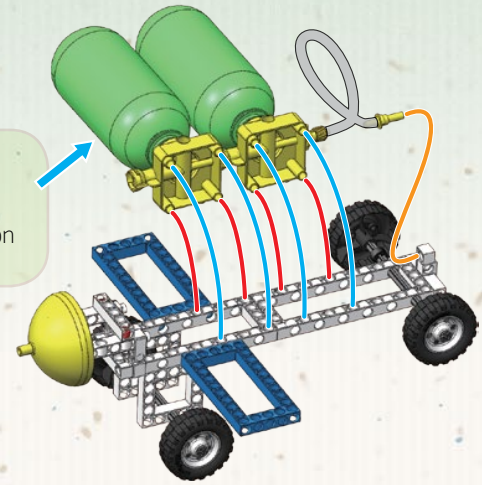


MODEL 5 Airplane | AIR+WATER POWER PLUS

6.

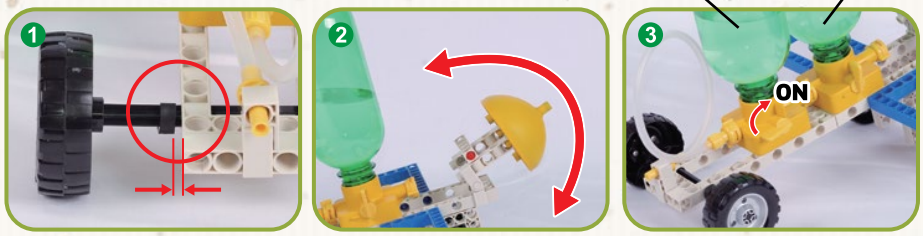
You will find instructions for charging the pressure tanks on page 11.



Completed

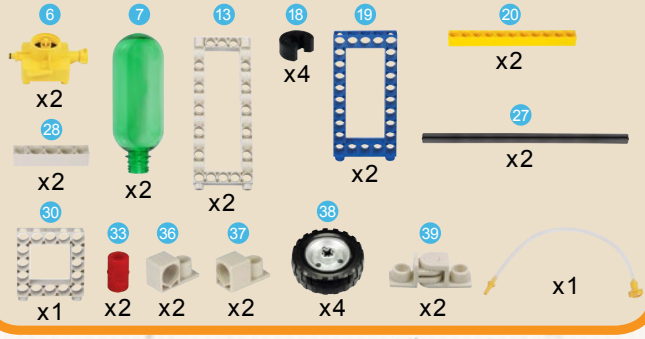
Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. It moves!
3. First open the front switch, and then the rear one when you're ready to go.



MODEL 6 Tanker truck | AIR+WATER POWER PLUS

Required Parts



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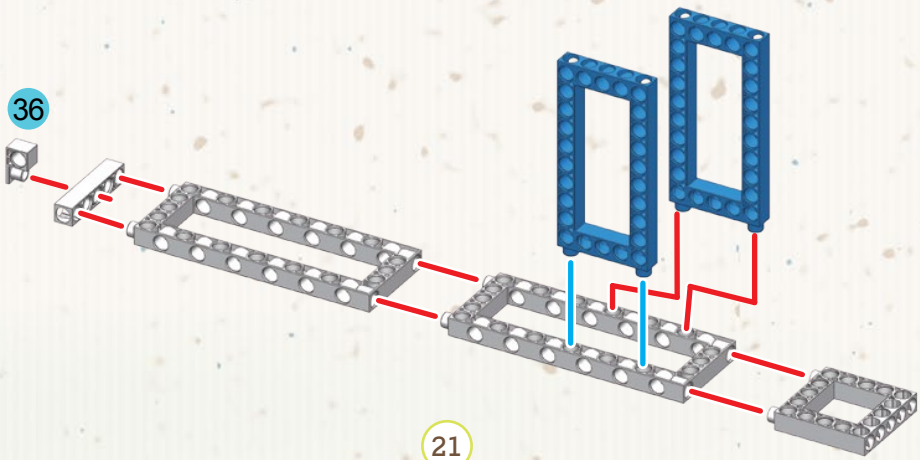

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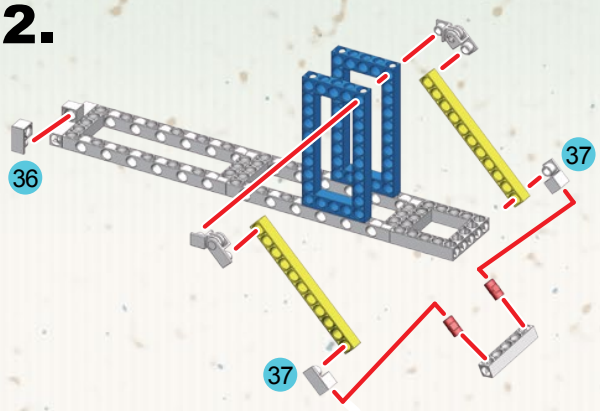

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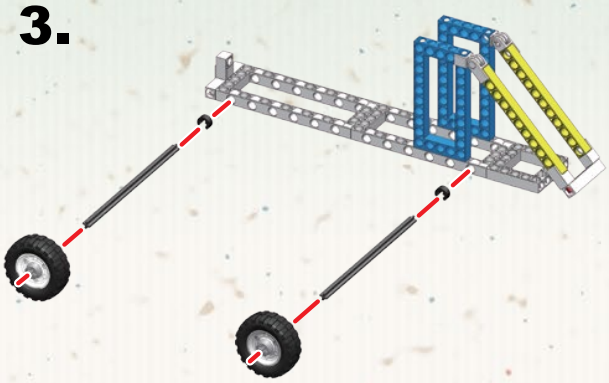

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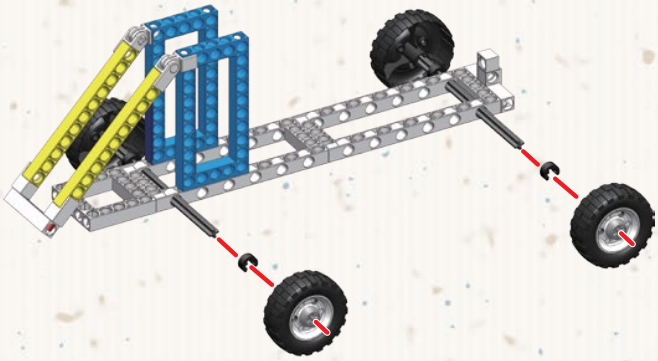
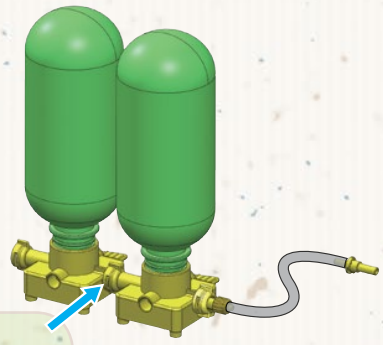
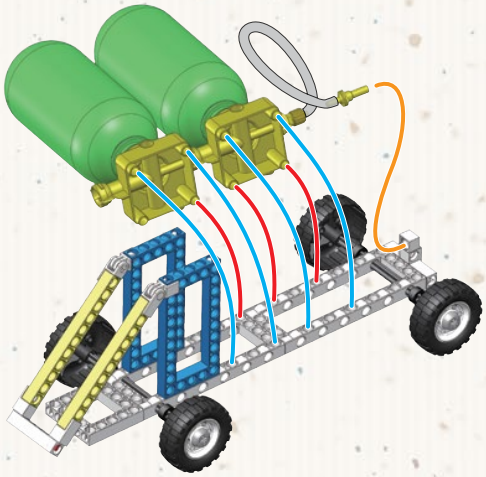


5.



You will find instructions for charging the pressure tanks on page 11.

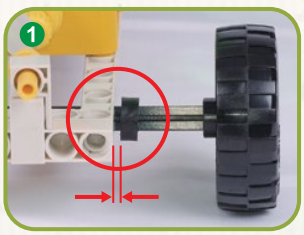
6.

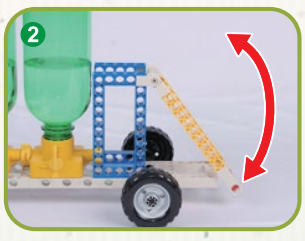


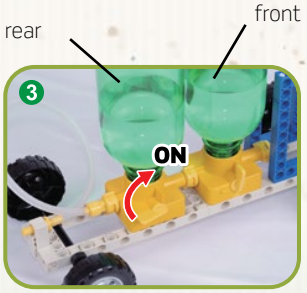
Completed

Assembly notes

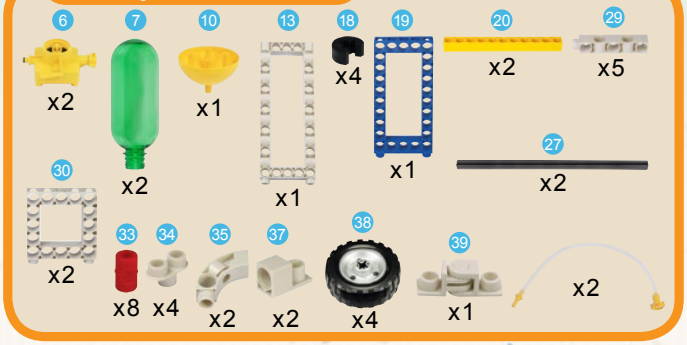
1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. It moves!
3. First open the front switch, and then the rear one when you're ready to go.







Required Parts



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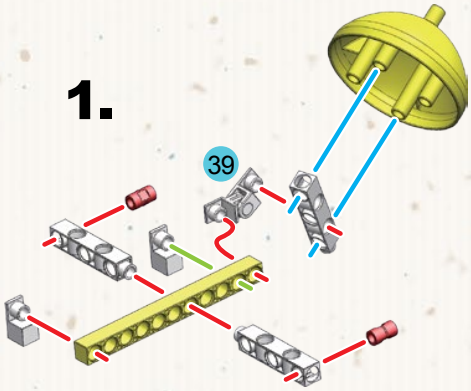

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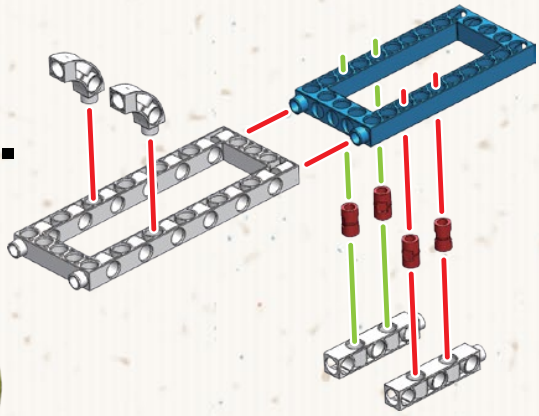

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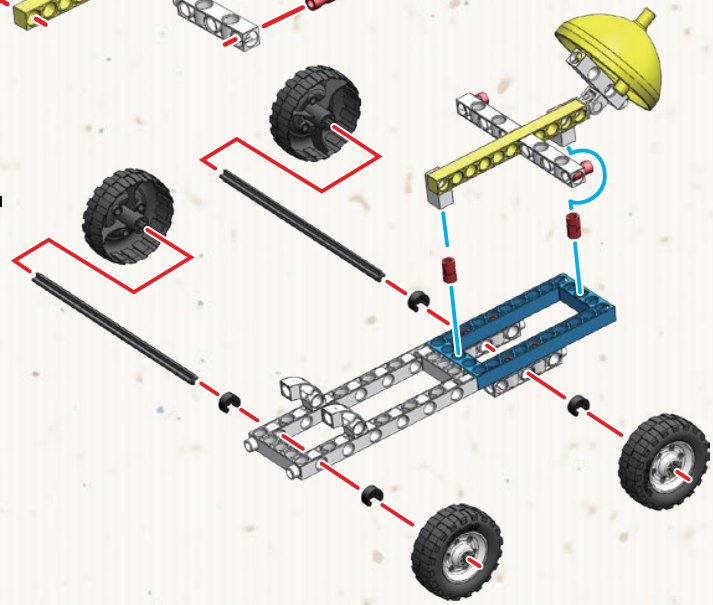

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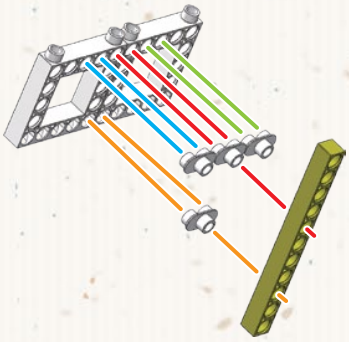
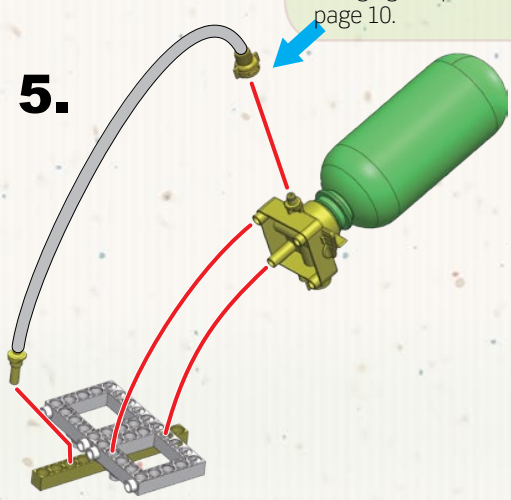


You will find instructions for charging the pressure tank on page 10.

5.



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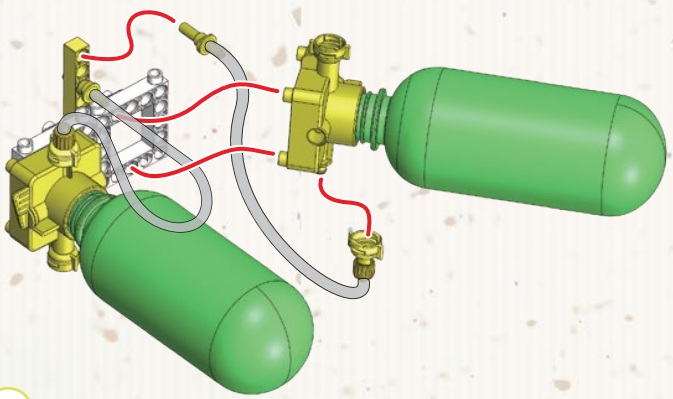
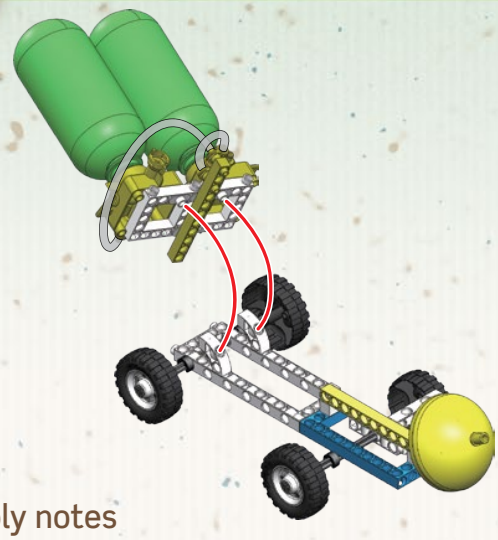


AIR+WATER POWER PLUS | MODEL 7 Pickup truck

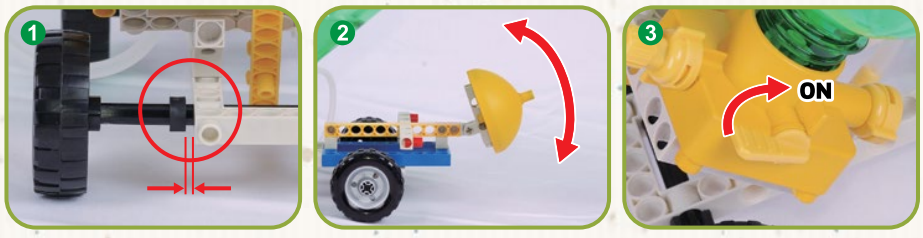
7.



Completed

Assembly notes

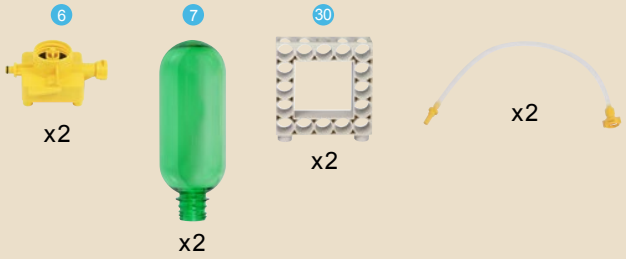
1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. It moves!
3. To start, open both switches at the same time!



AIR+WATER POWER PLUS | MODEL 8 Boat

Build two boats and hold a competition with your friends!

Required Parts



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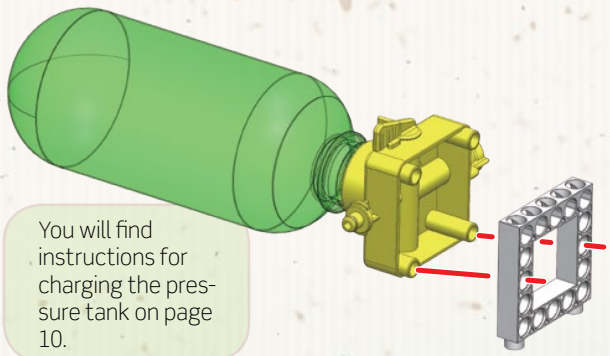
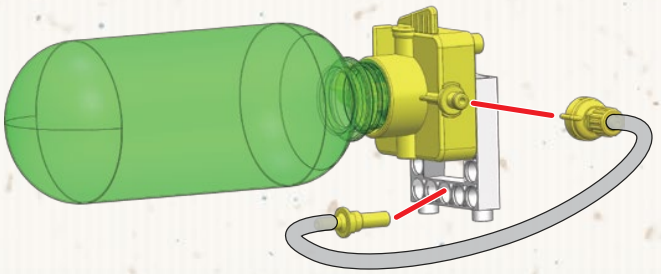


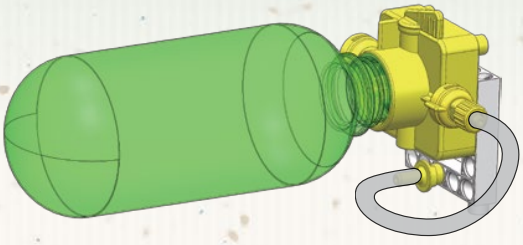
You will find instructions for charging the pressure tank on page 10.

2.



MODEL 8 Boat | AIR+WATER POWER PLUS

Completed



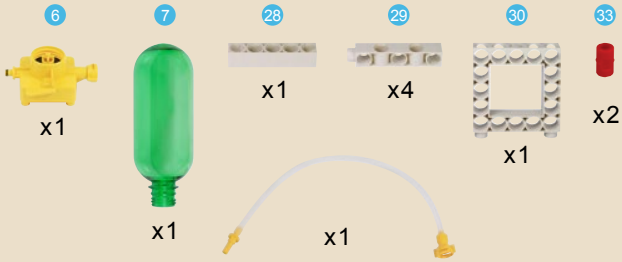
x2

Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. Open the switch and the model takes off!

MODEL 9 Speed boat | AIR+WATER POWER PLUS

Required Parts



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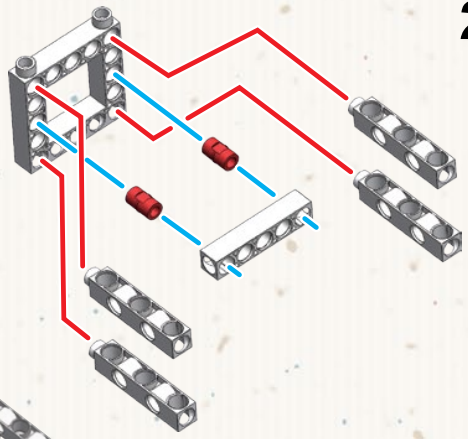
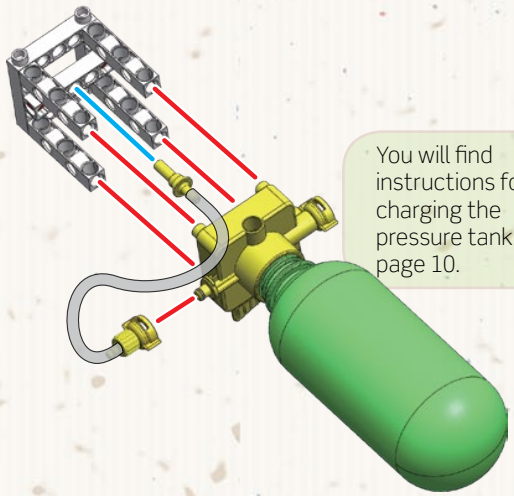


Completed

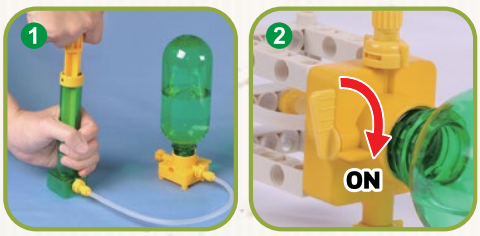
2.

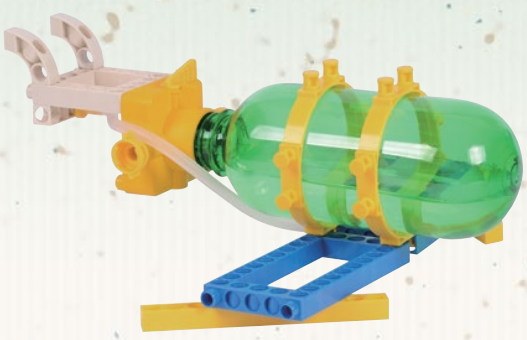


You will find instructions for charging the pressure tank on page 10.

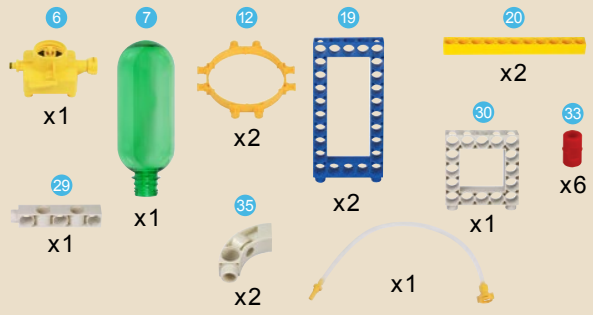
Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. Open the switch and the model zooms through the water!





Required Parts



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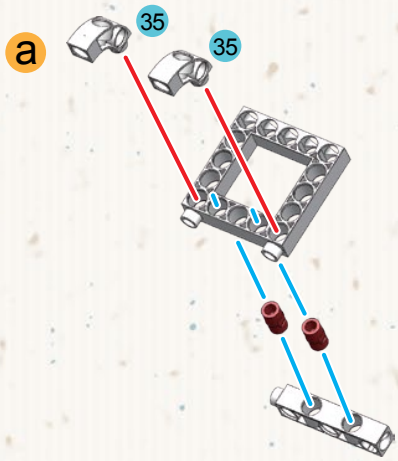

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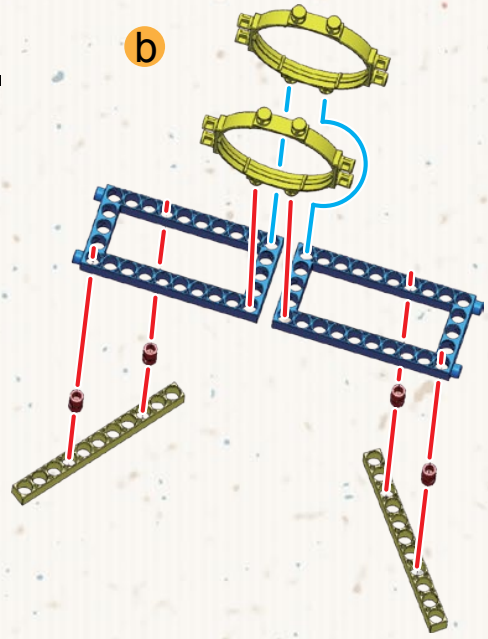
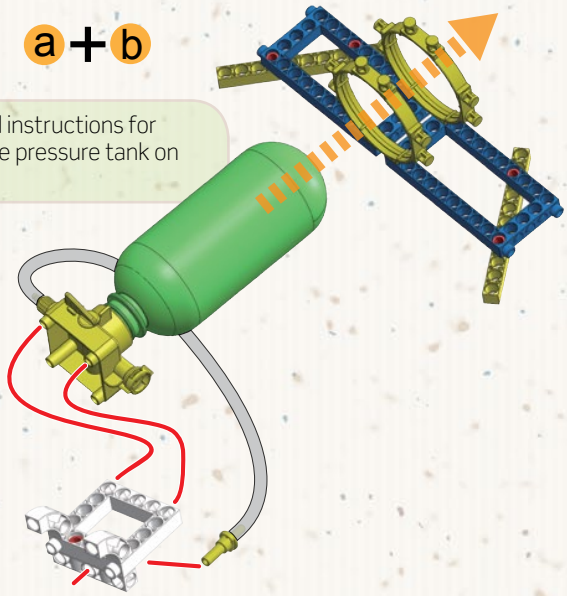
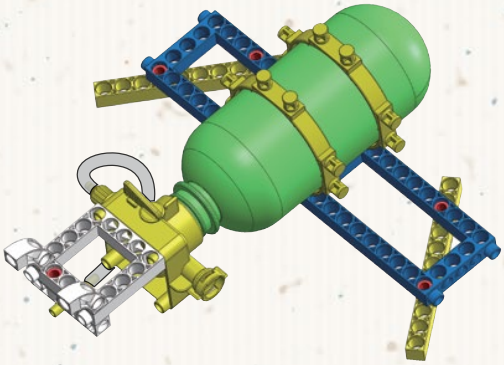


3. a+b

You will find instructions for charging the pressure tank on page 10.

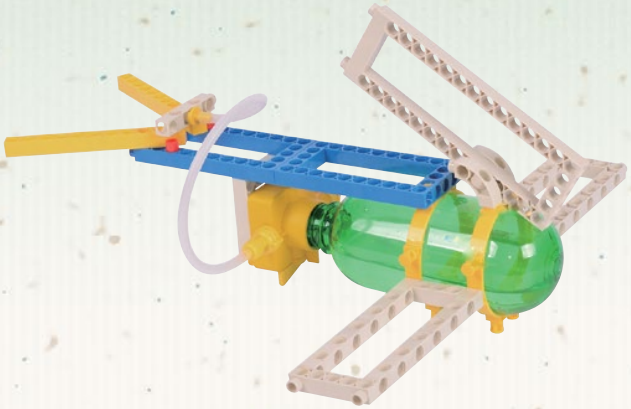


Completed

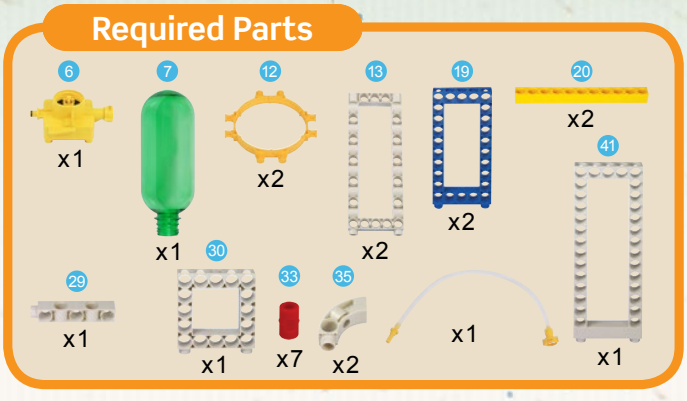


Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. Open the switch and the model starts!



Required Parts



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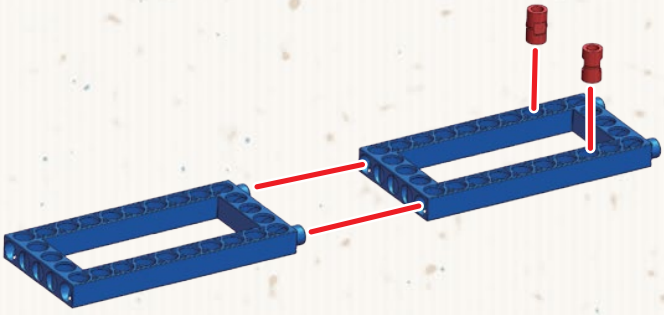

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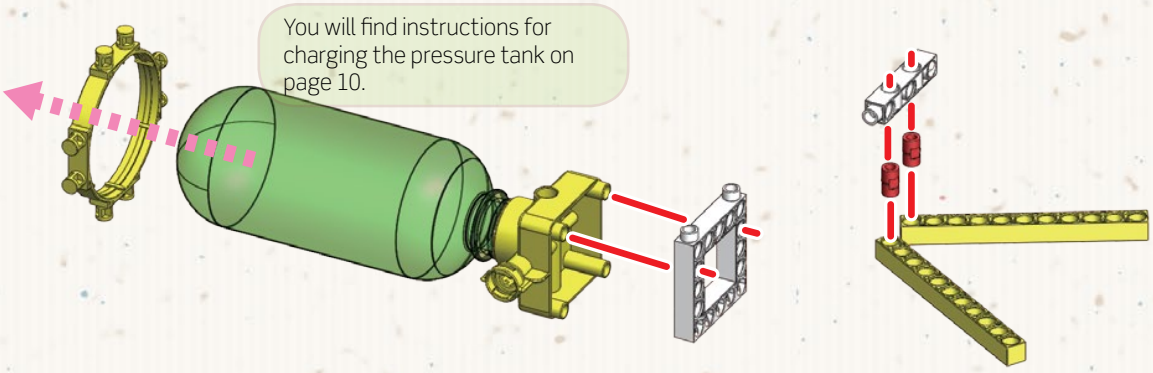
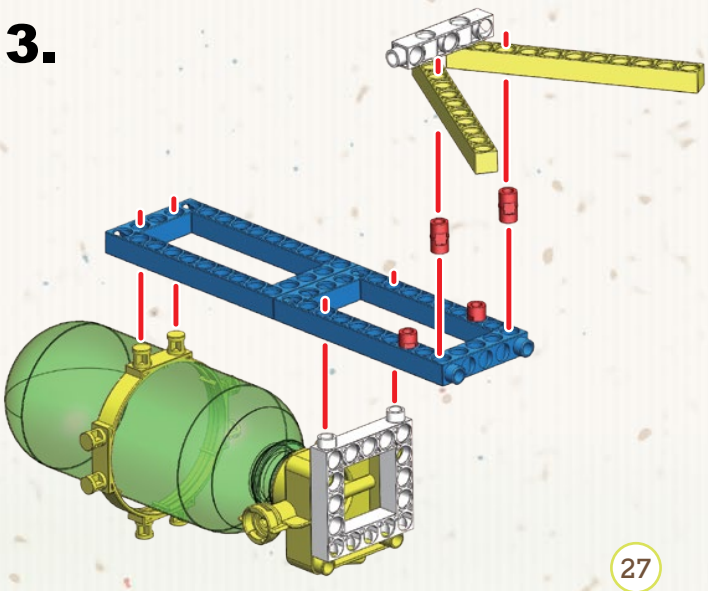
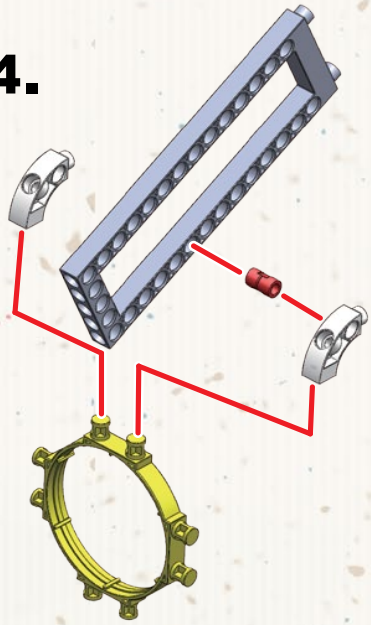


You will find instructions for charging the pressure tank on page 10.

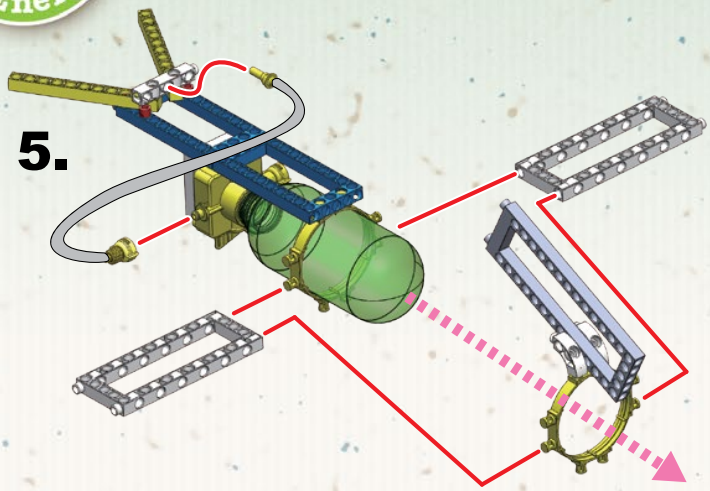
3.



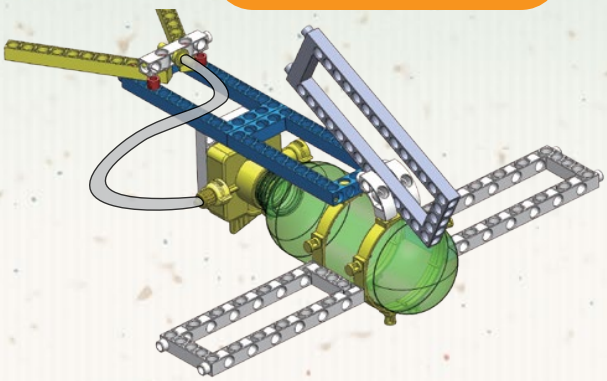
4.



AIR+WATER POWER PLUS | MODEL 11 Flying fish

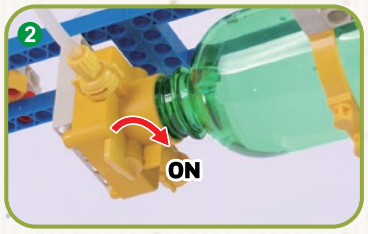


Completed

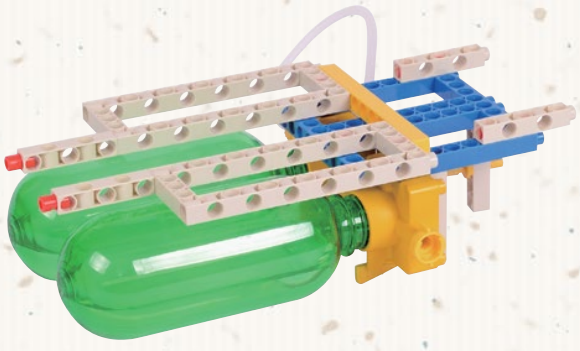


Assembly notes

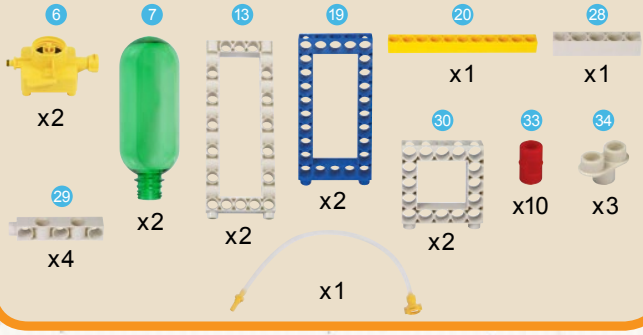
1. Fill the pressure tank halfway with water and pump 20 times.
2. Open the switch and the model takes off!



AIR+WATER POWER PLUS | MODEL 12 Aircraft carrier



Required Parts



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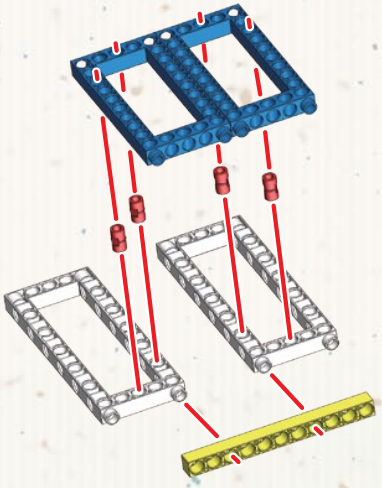

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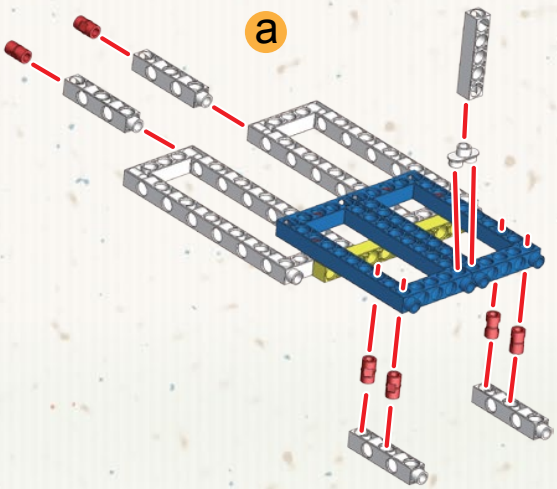
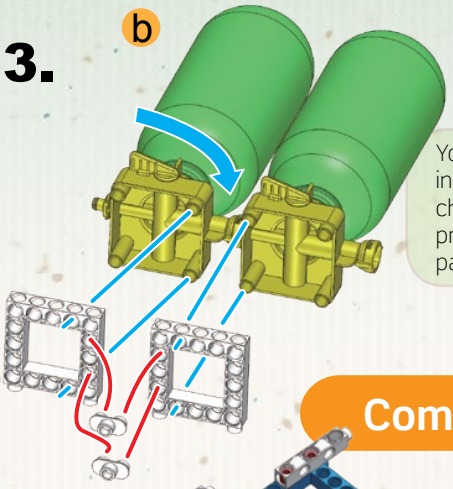


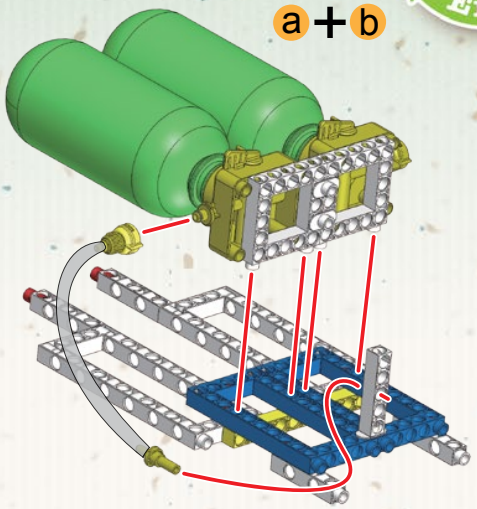
MODEL 12 Aircraft carrier | AIR+WATER POWER PLUS

3. b

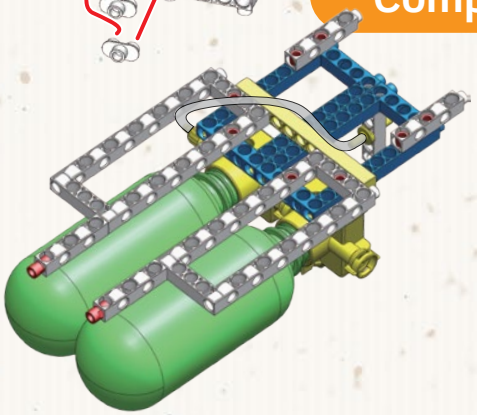


You will find instructions for charging the pressure tanks on page 11.

4. a + b

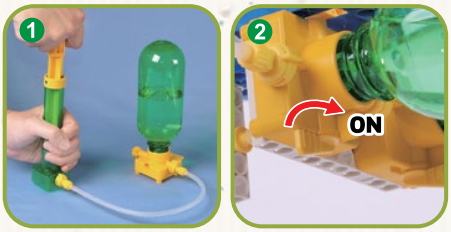


Completed



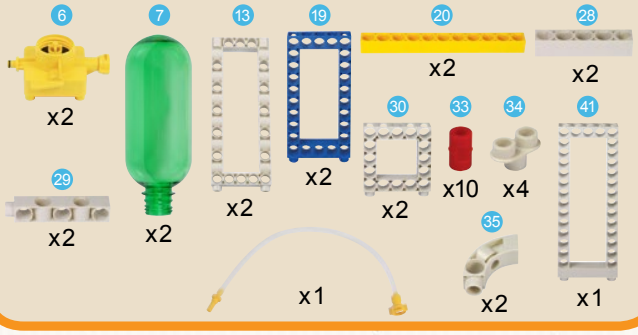
Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. First open the left switch (viewed in the direction of travel), and then open the right one when you are ready to start..

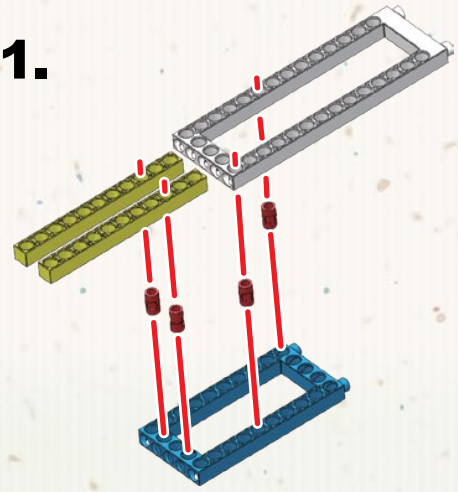


MODEL 13 Submarine | AIR+WATER POWER PLUS

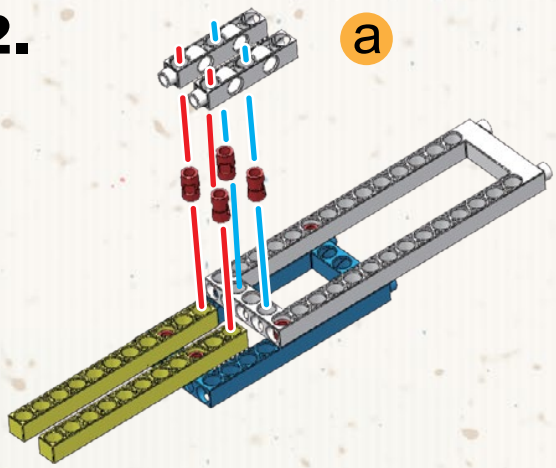
Required Parts



1.



2. a



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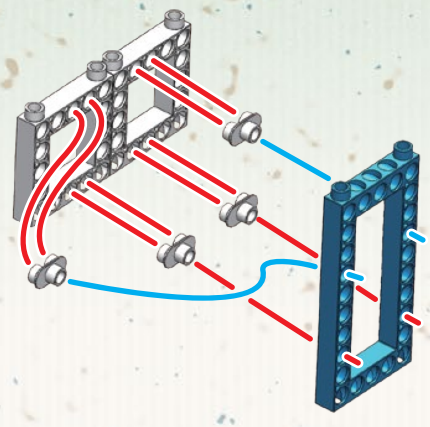

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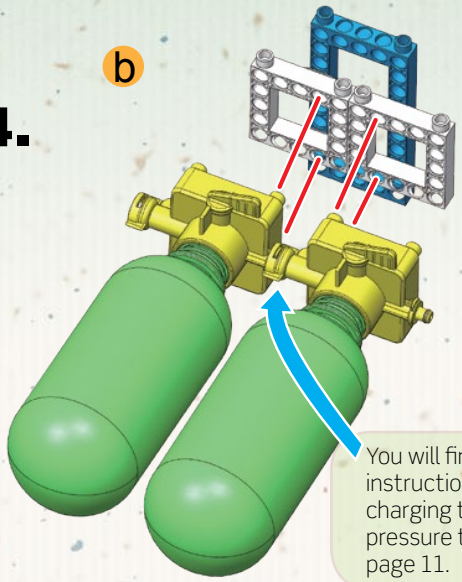
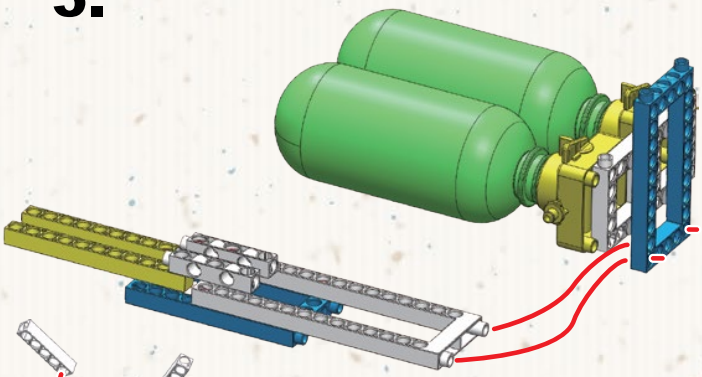


You will find instructions for charging the pressure tanks on page 11.

a + b

5.



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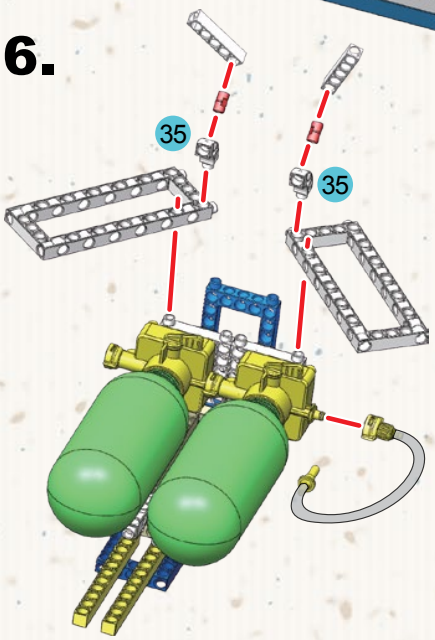
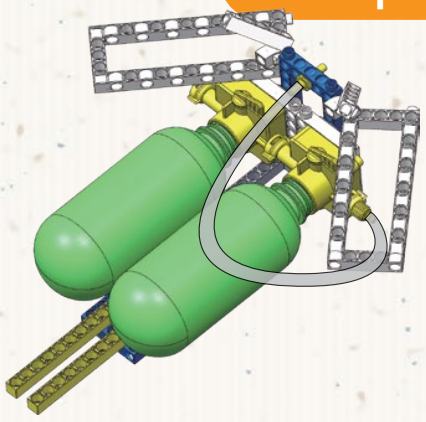
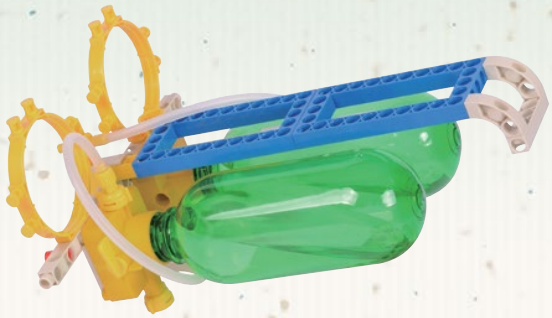


Completed

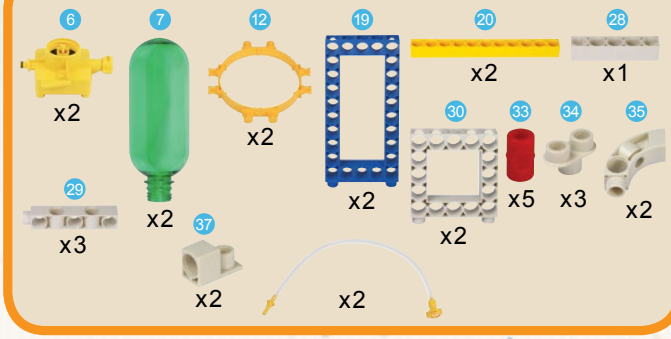


Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. First open the right switch (viewed in the direction of travel), and then open the left one when you are ready to start.



Required Parts



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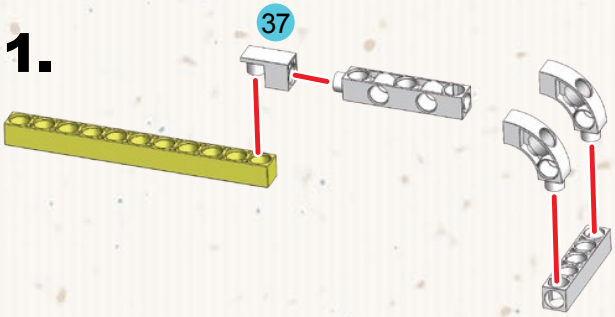

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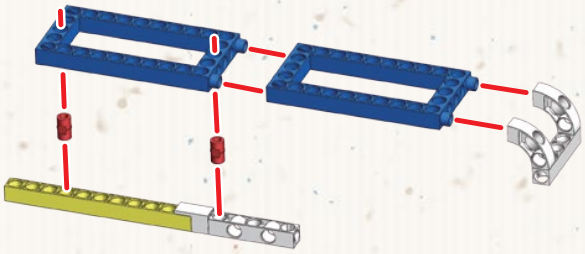

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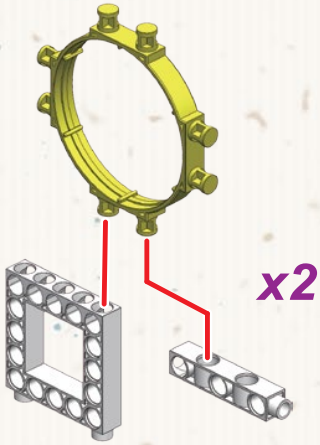

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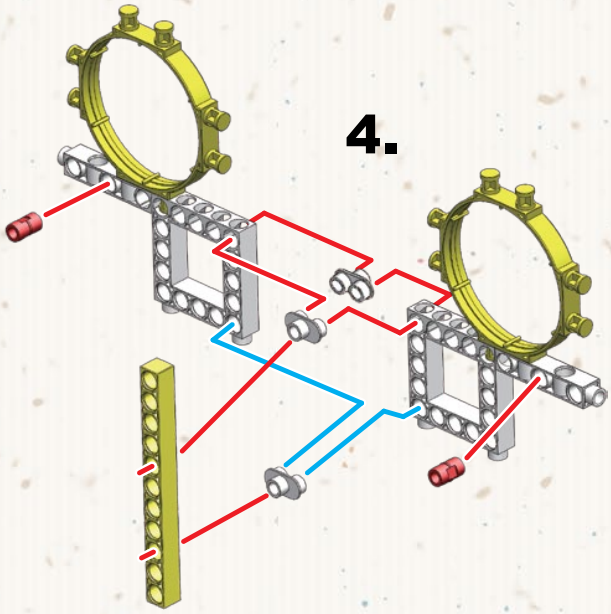

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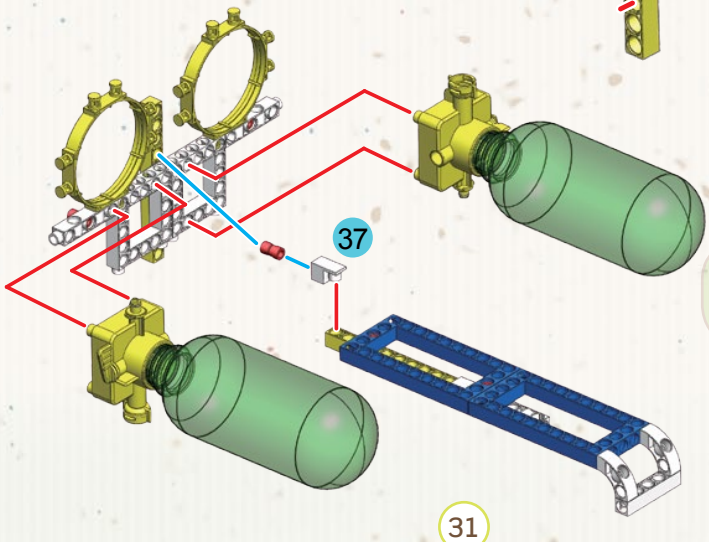
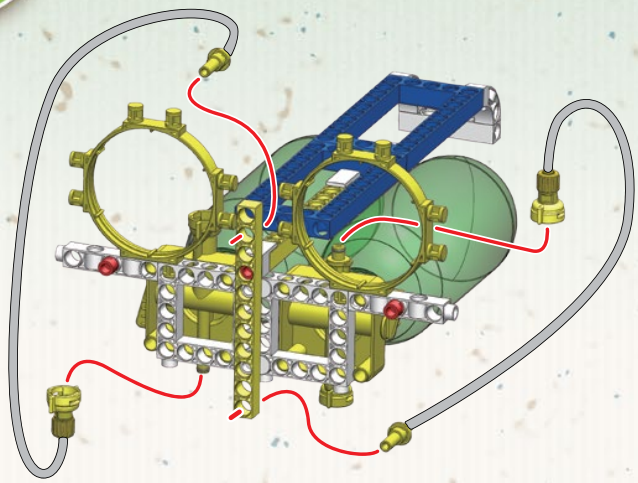


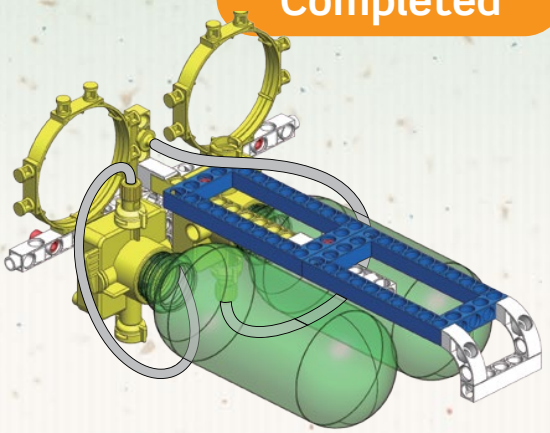
You will find instructions for charging the pressure tanks on page 11.

AIR+WATER POWER PLUS | MODEL 14 Underwater ship

6.

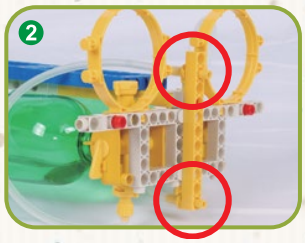


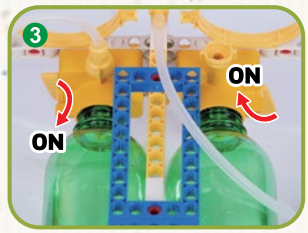
Completed



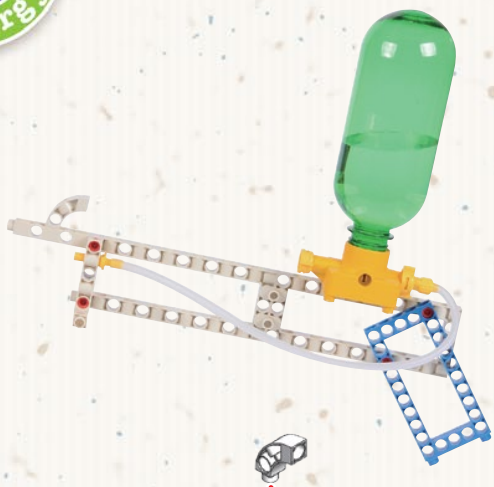
Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. The 2 thrust nozzles are projecting out here.
3. To start, open both switches at the same time!

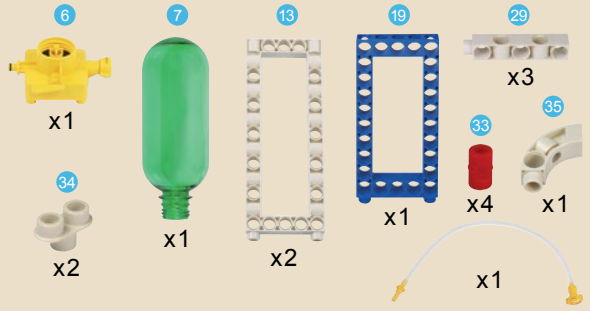




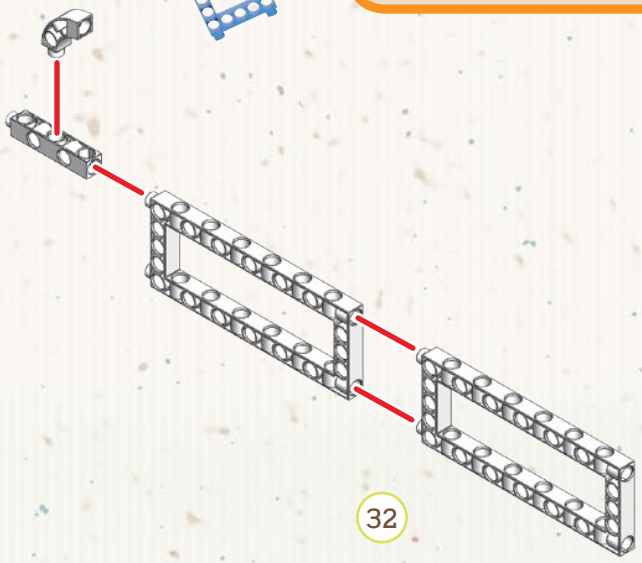
AIR+WATER POWER PLUS | MODEL 15 Water gun



Required Parts



1.



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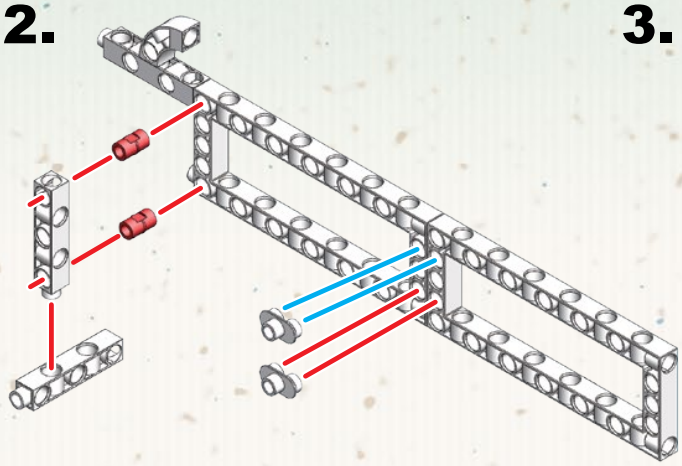

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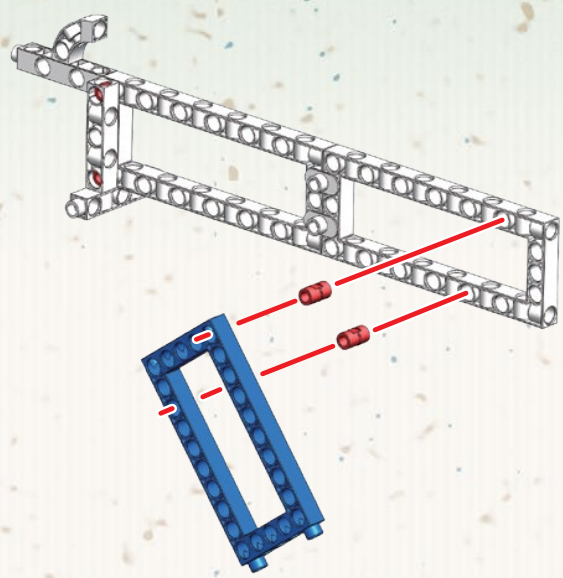

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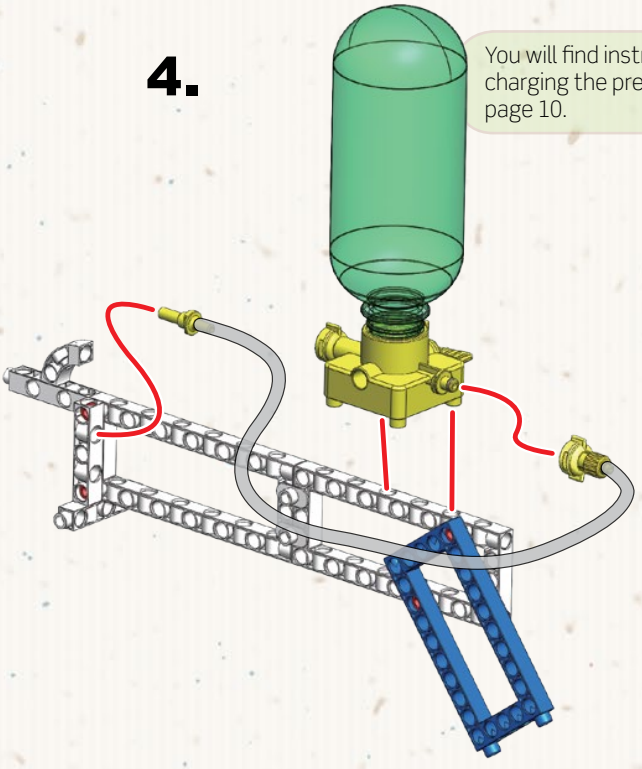
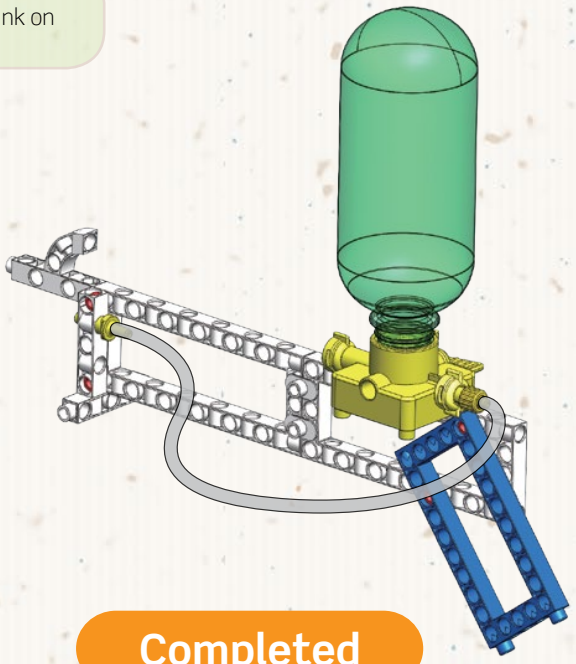


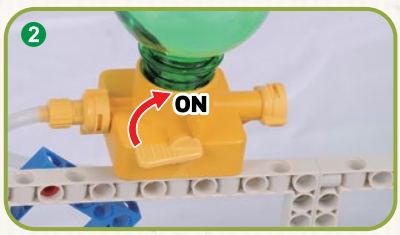
You will find instructions for charging the pressure tank on page 10.



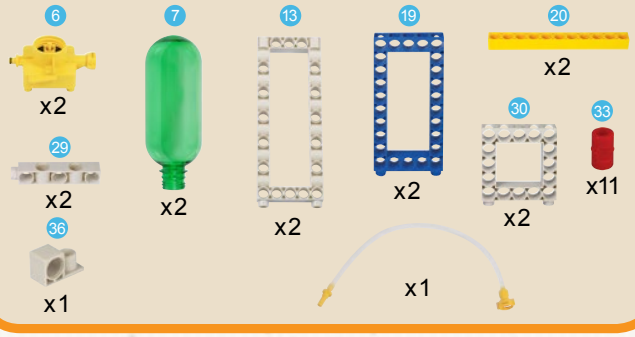
Completed

Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. Open the switch and the model zooms off!



Required Parts



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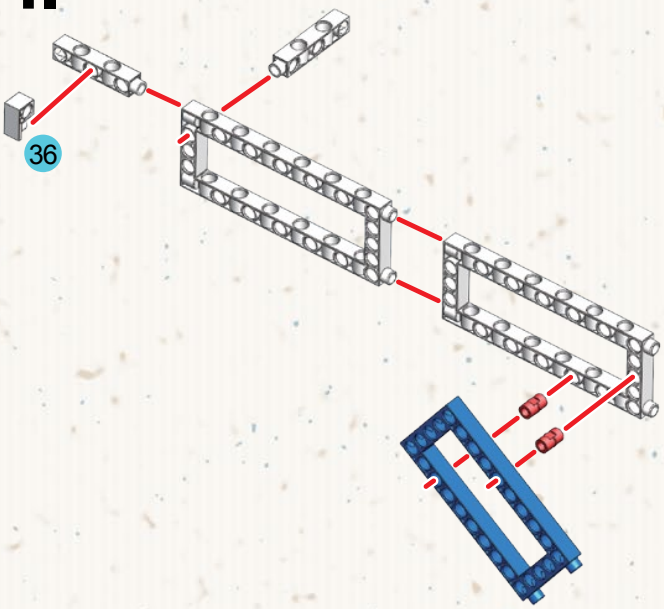
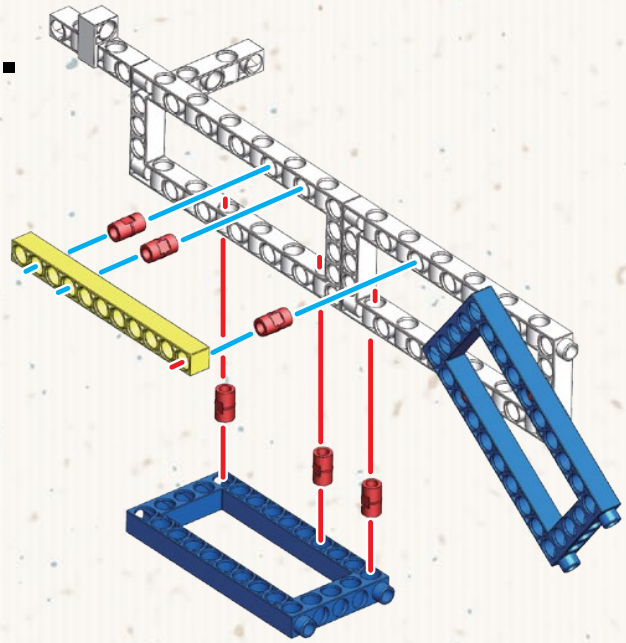


2.



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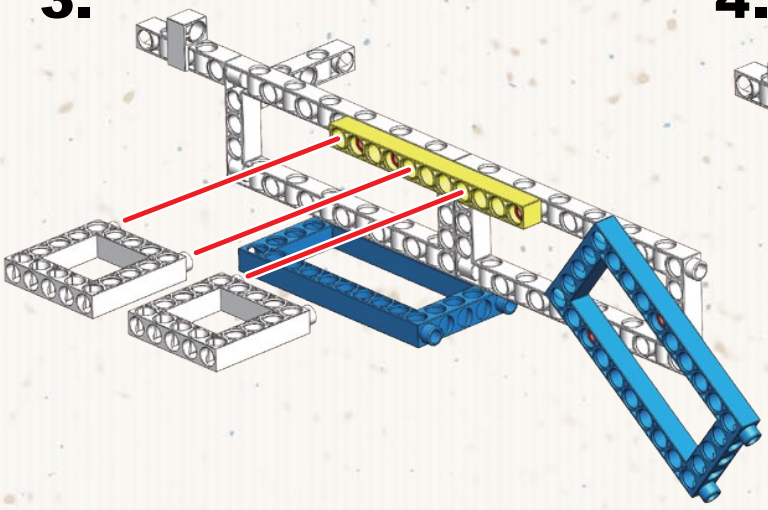

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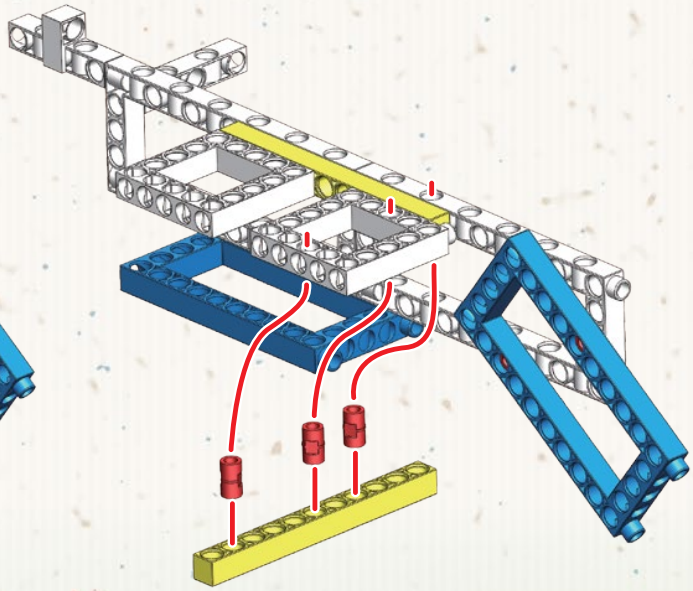
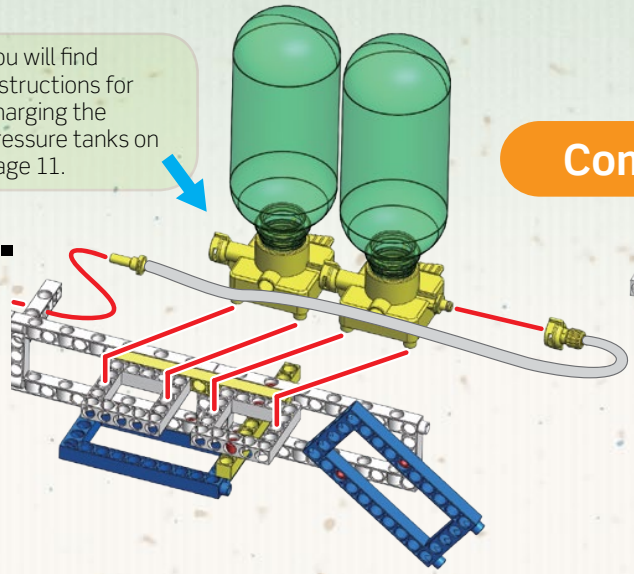


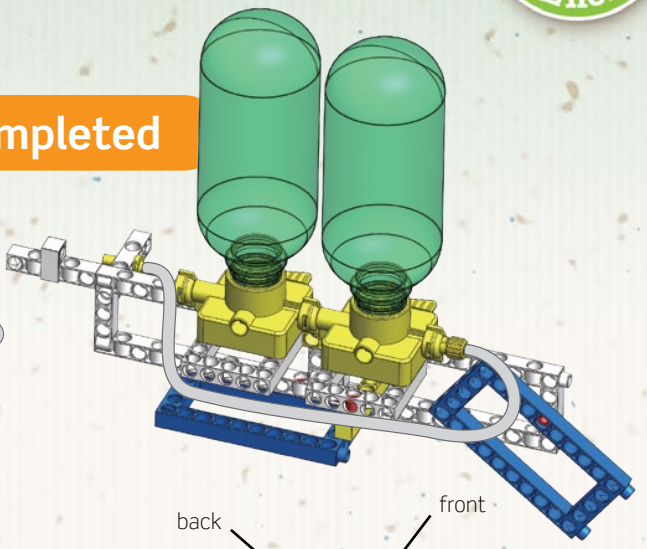
MODEL 16 Power water gun | AIR+WATER POWER PLUS

You will find instructions for charging the pressure tanks on page 11.

5.

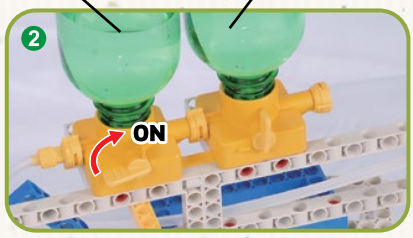


Completed

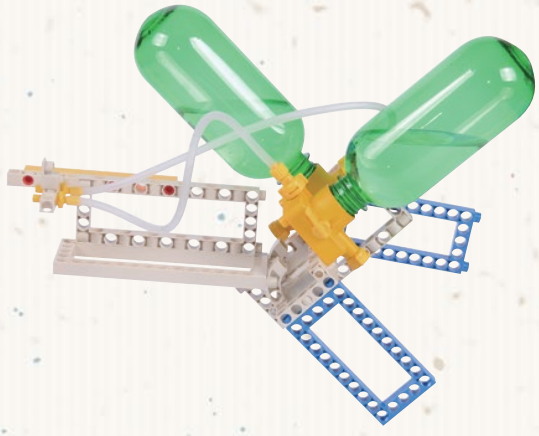


Assembly notes

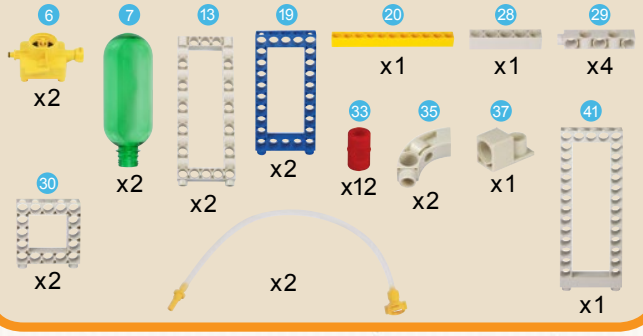
1. Fill the pressure tank halfway with water and pump 20 times.
2. First open the front switch, and then the rear one when you're ready to go.



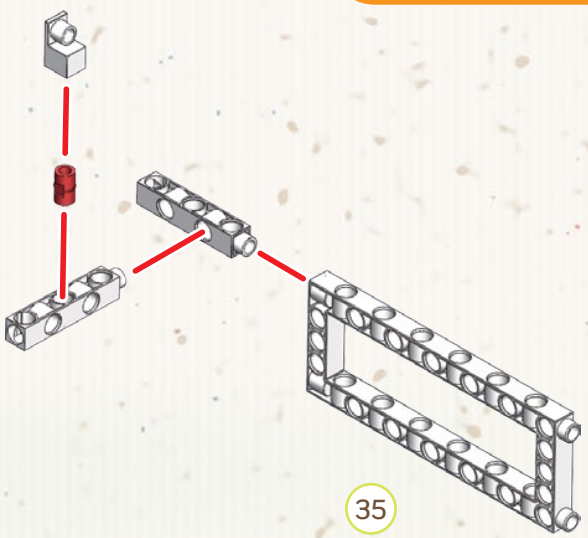
MODEL 17 Cross water gun | AIR+WATER POWER PLUS



Required Parts



1.



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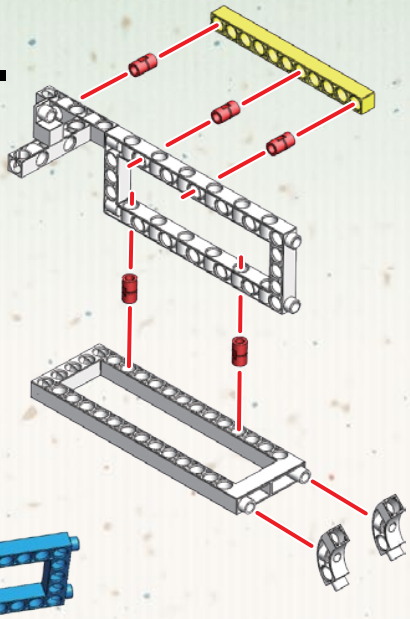

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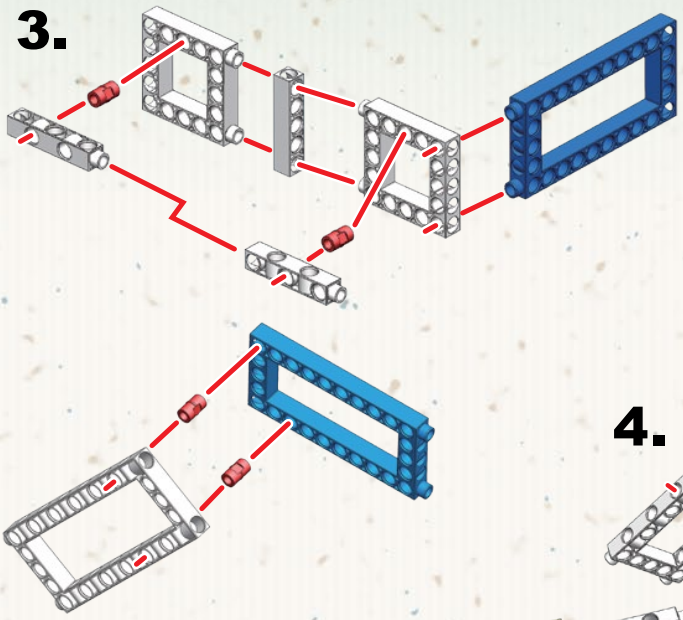

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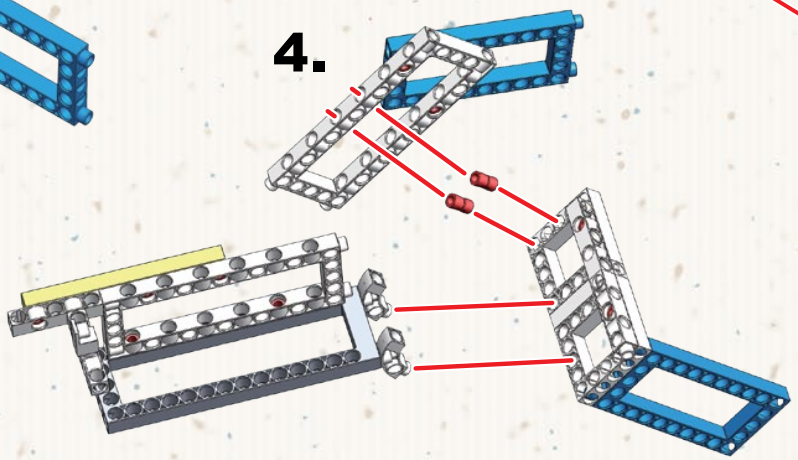
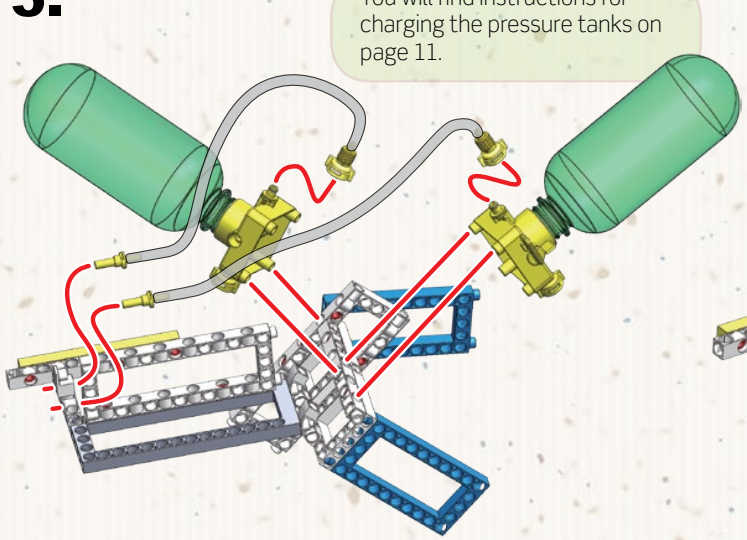
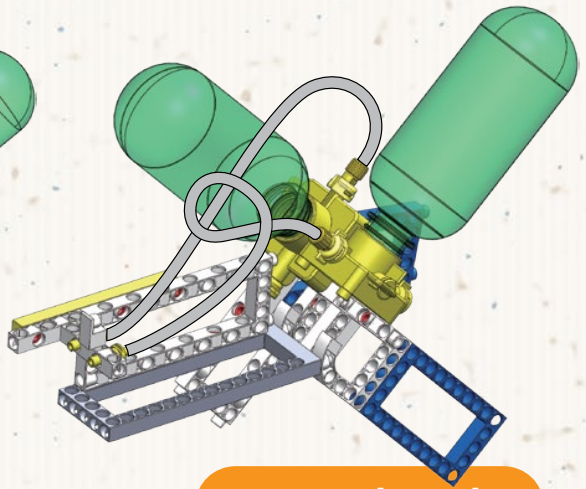


5.

You will find instructions for charging the pressure tanks on page 11.

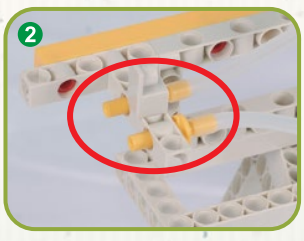


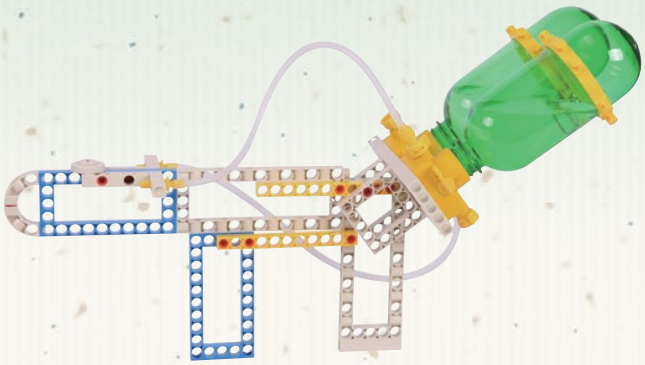


Completed

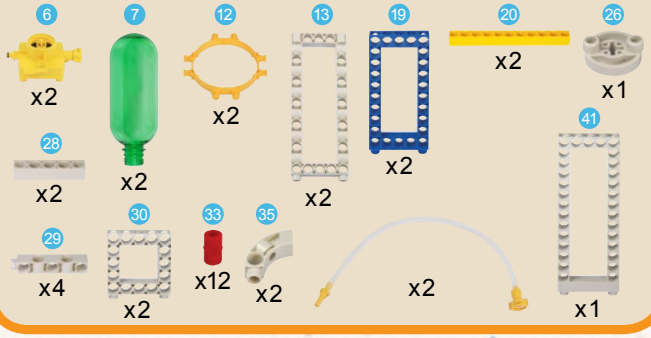
Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. The 2 thrust nozzles are projecting out here.
3. To start, you can open both switches at the same time. Or you can open just one, keeping the second in reserve.





Required Parts



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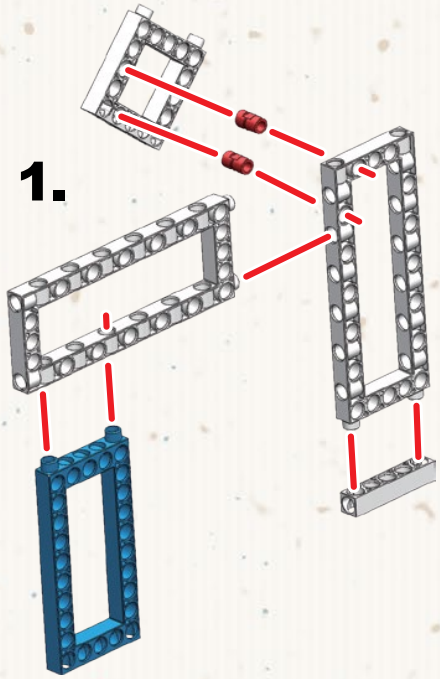

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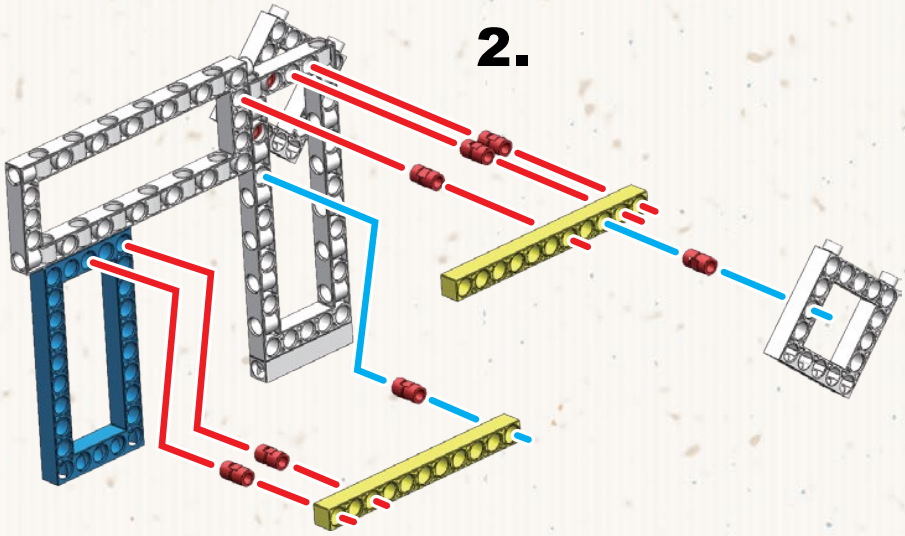

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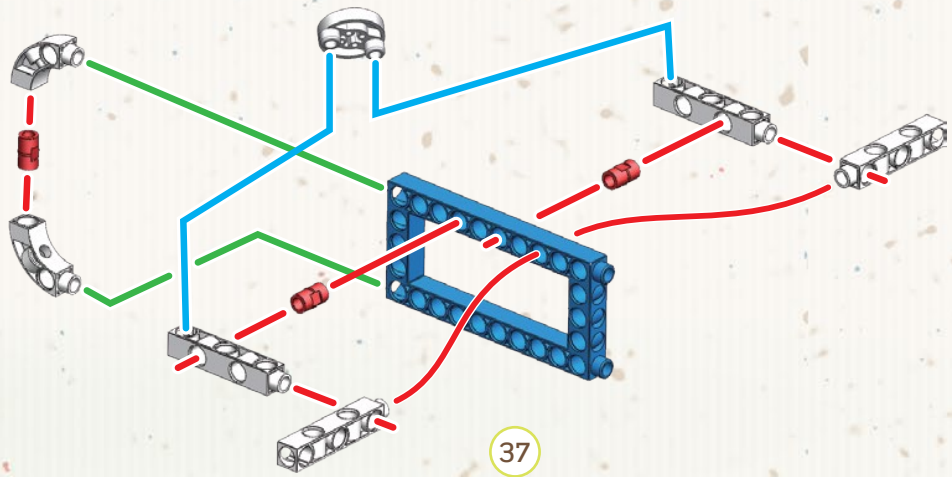

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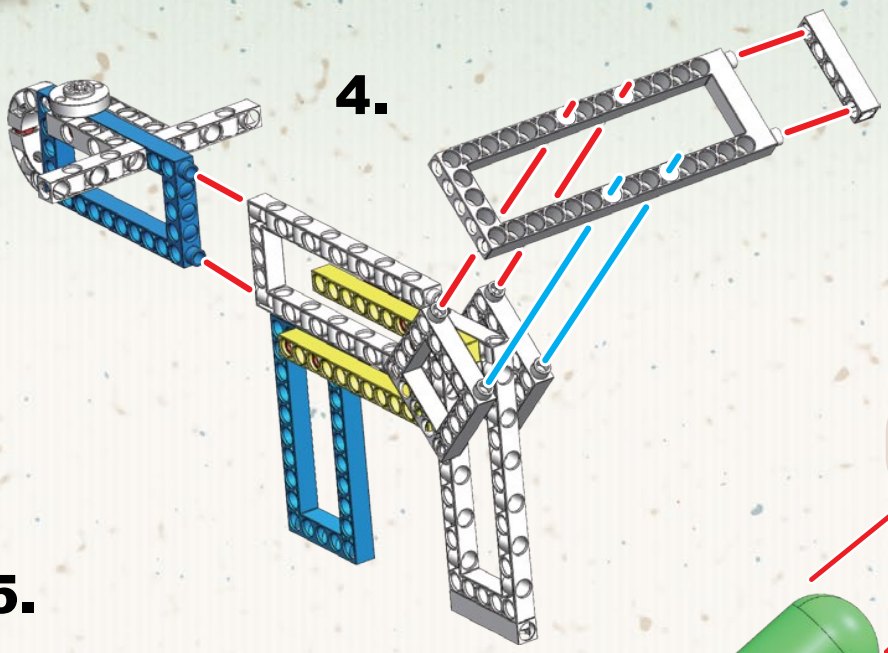
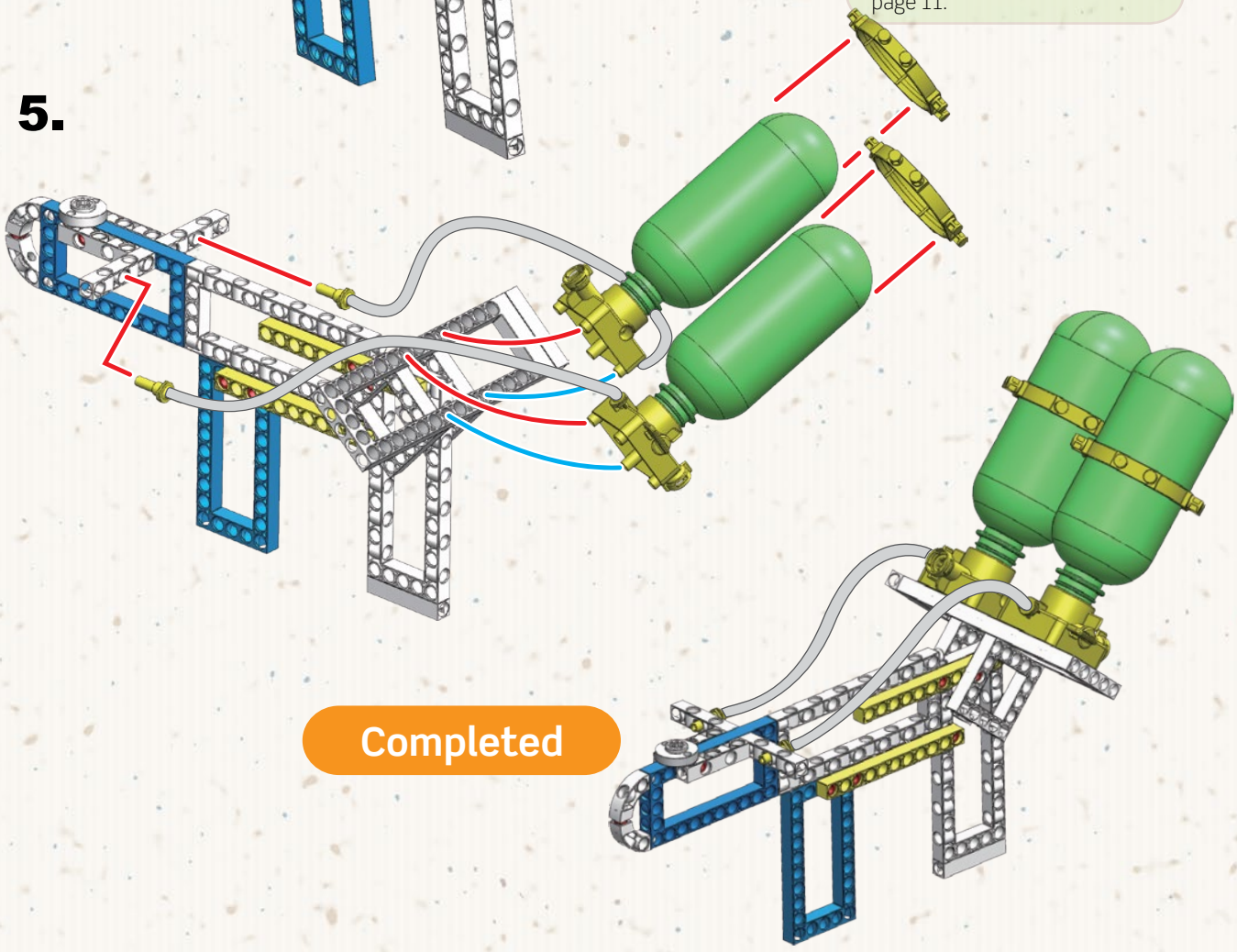


You will find instructions for charging the pressure tanks on page 11.

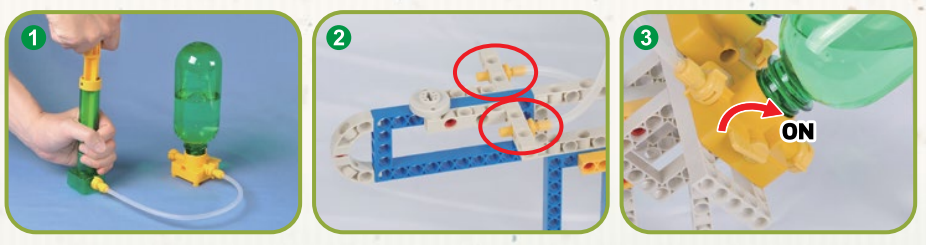
5.

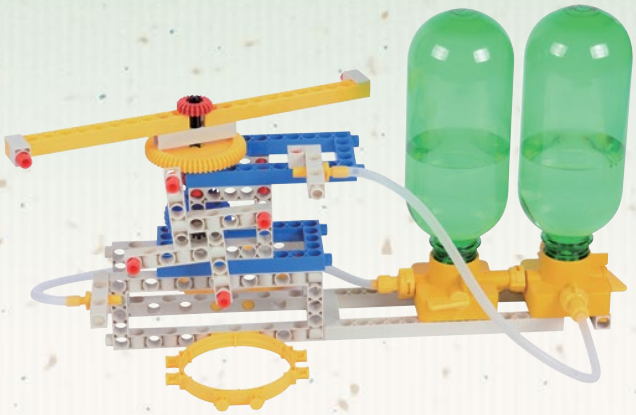


Completed

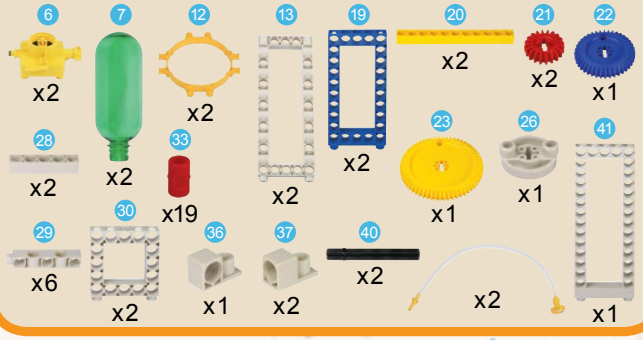
Assembly notes

1. Fill the pressure tank halfway with water and pump 20 times.
2. The 2 thrust nozzles are projecting out here.
3. To start, you can open both switches at the same time. Or you can open just one, keeping the second in reserve.

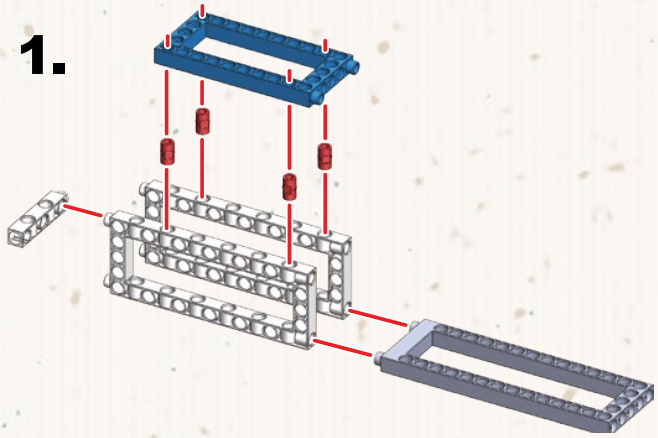




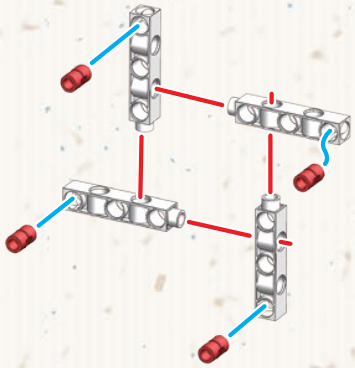
Required Parts



1.



2.



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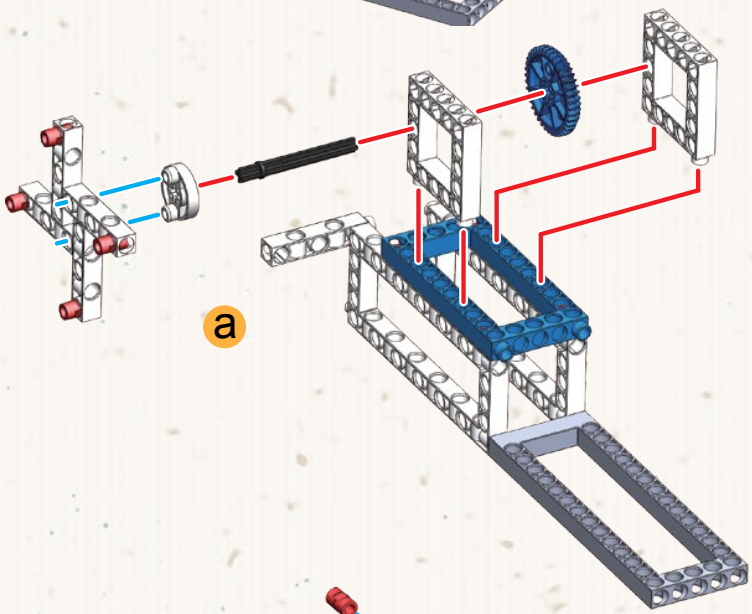

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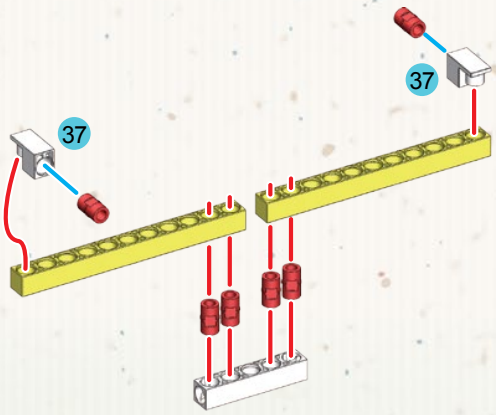

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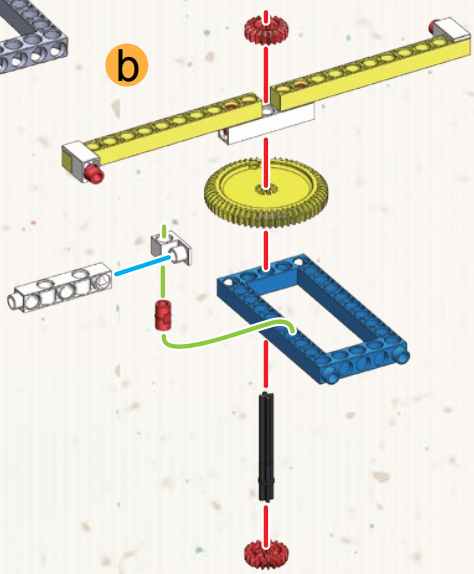
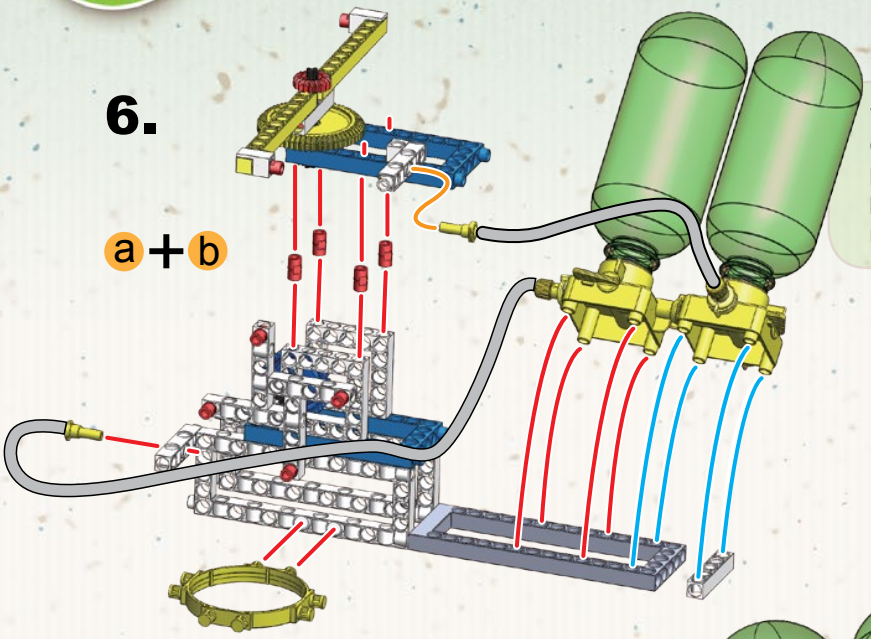


6.

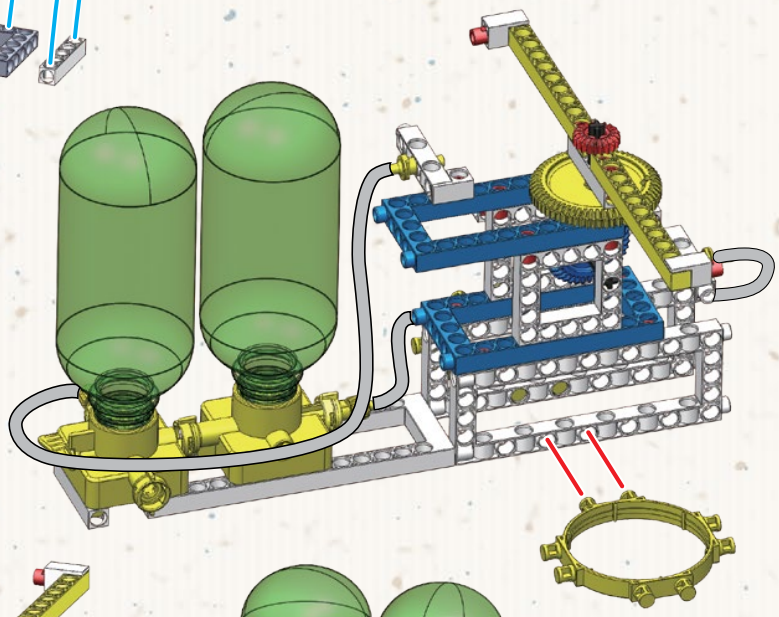
a + b



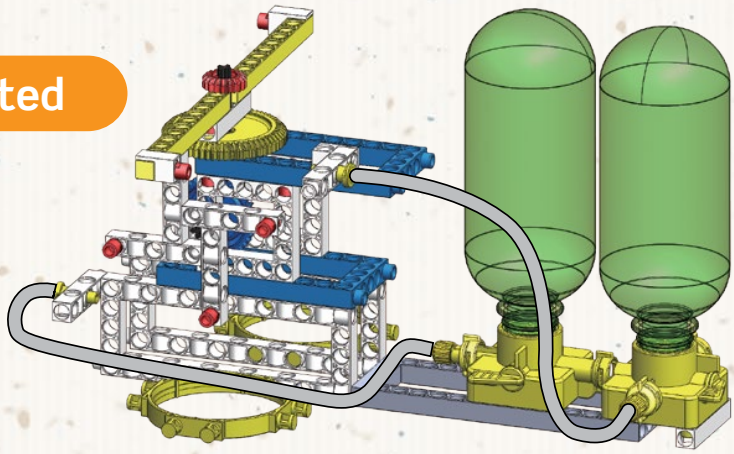
You will find instructions for charging the pressure tanks on page 11.

Note: The pressure tanks are not connected to each other.

7.

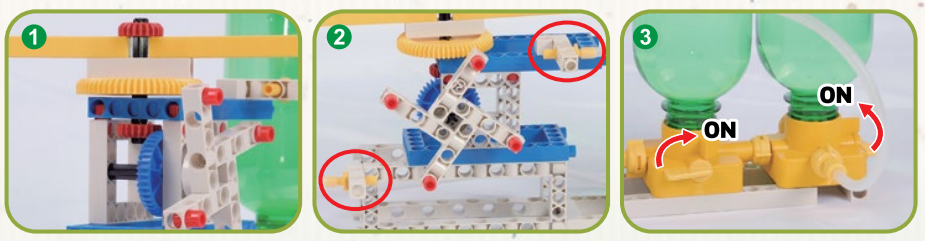


Completed

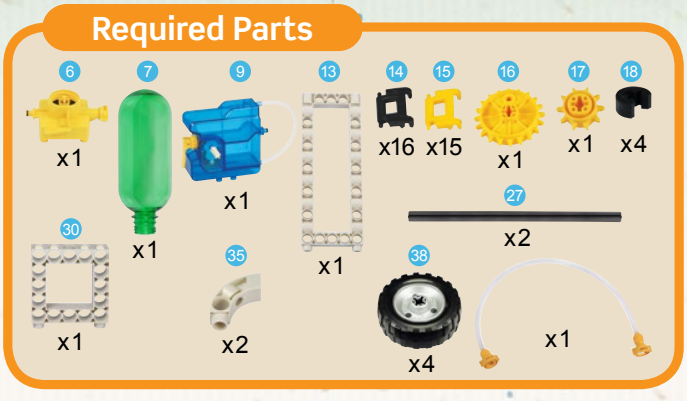


Assembly notes

1. Make sure that the red and blue gear wheels interlock properly. Leave a gap of 1 mm between the yellow gear and the frame.
2. The opposing thrust nozzles get the water wheel turning.
3. To start, you can open both switches at the same time. Or you can open just one, keeping the second in reserve.



Required Parts



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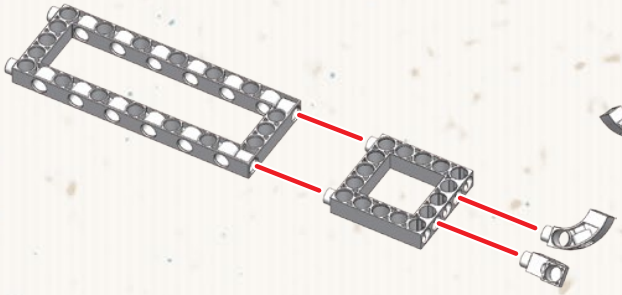

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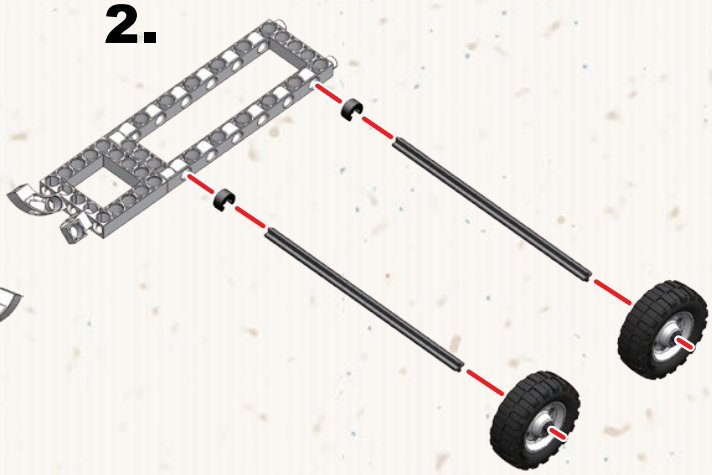

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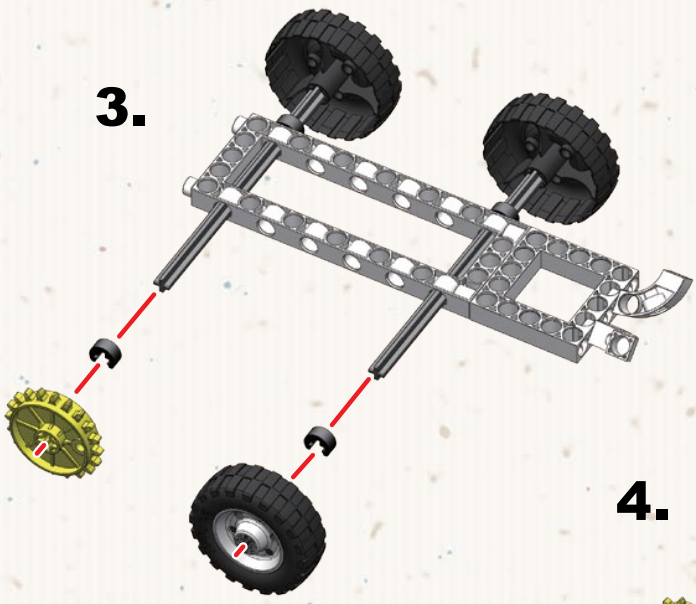
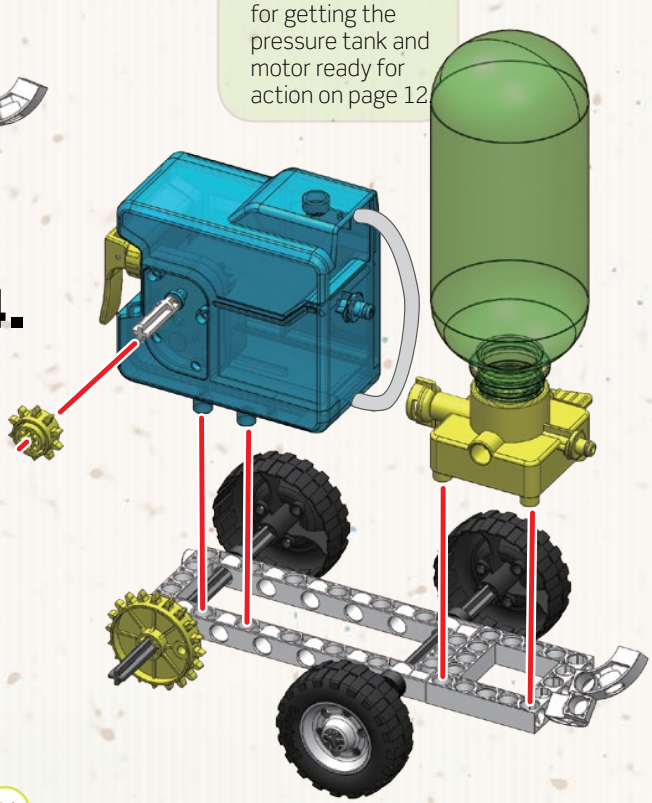


You will find instructions for getting the pressure tank and motor ready for action on page 12.

4.



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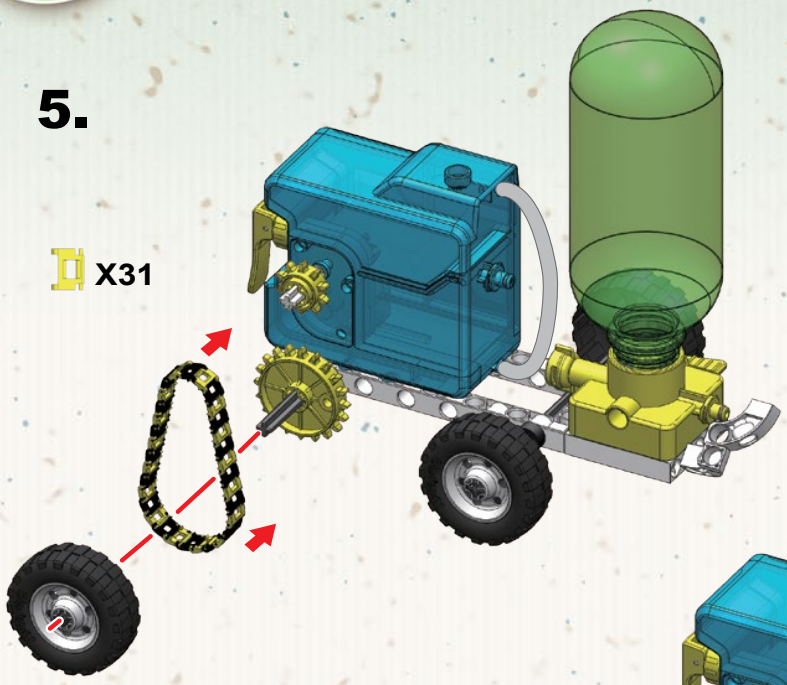
X31



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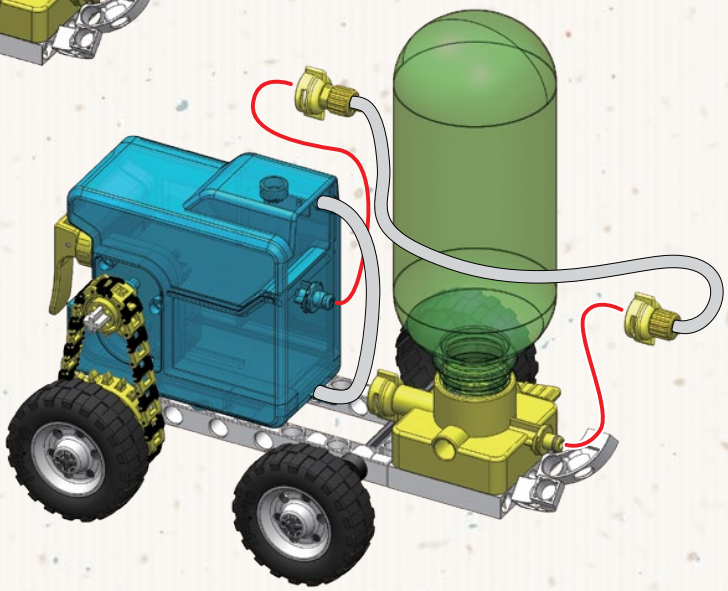
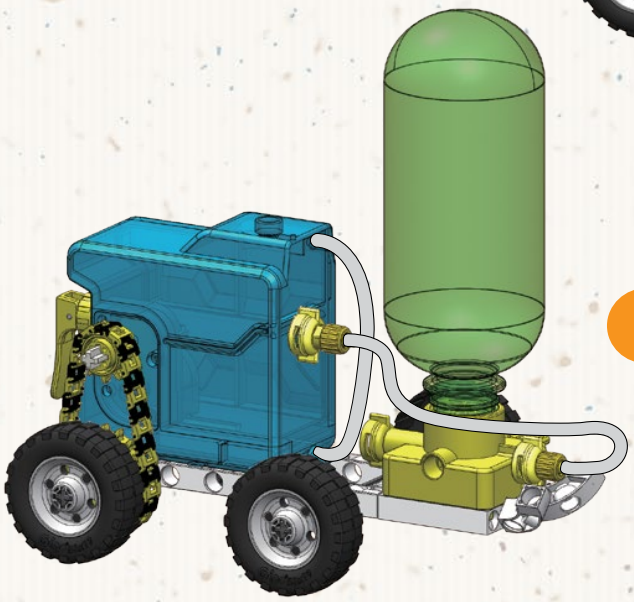
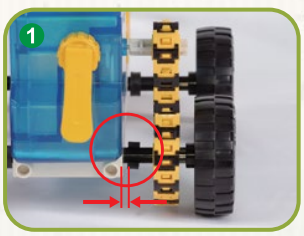


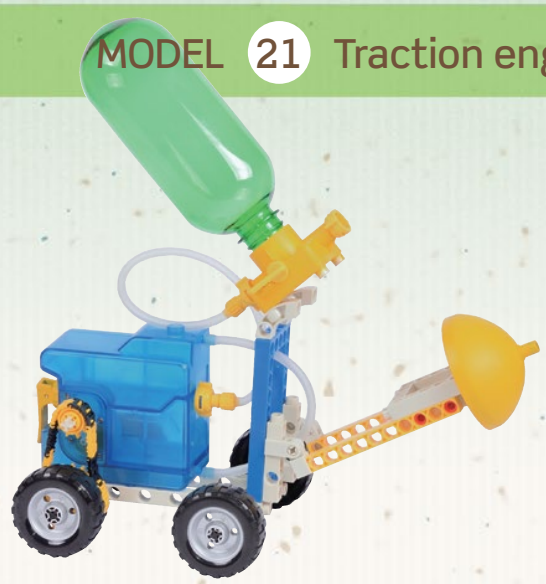


Completed

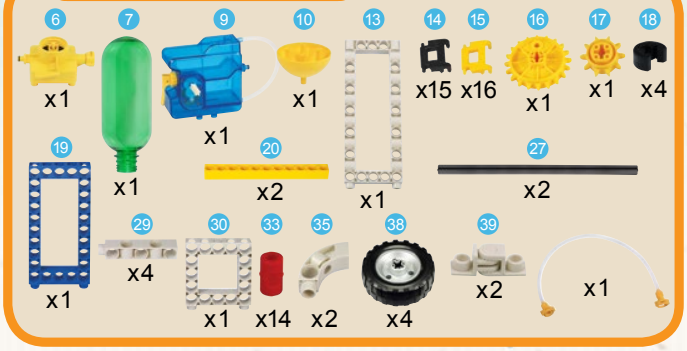
Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. Connect the pressure tank to the pump and pump 25 times.
3. Open the switch and the model zooms off!





Required Parts



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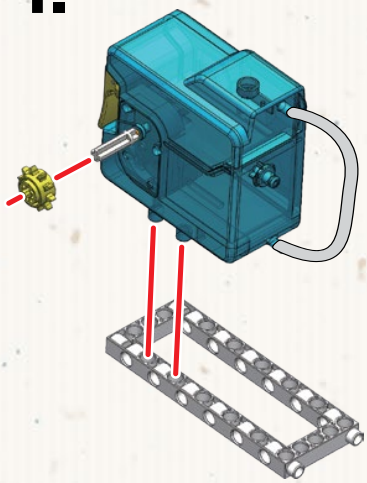

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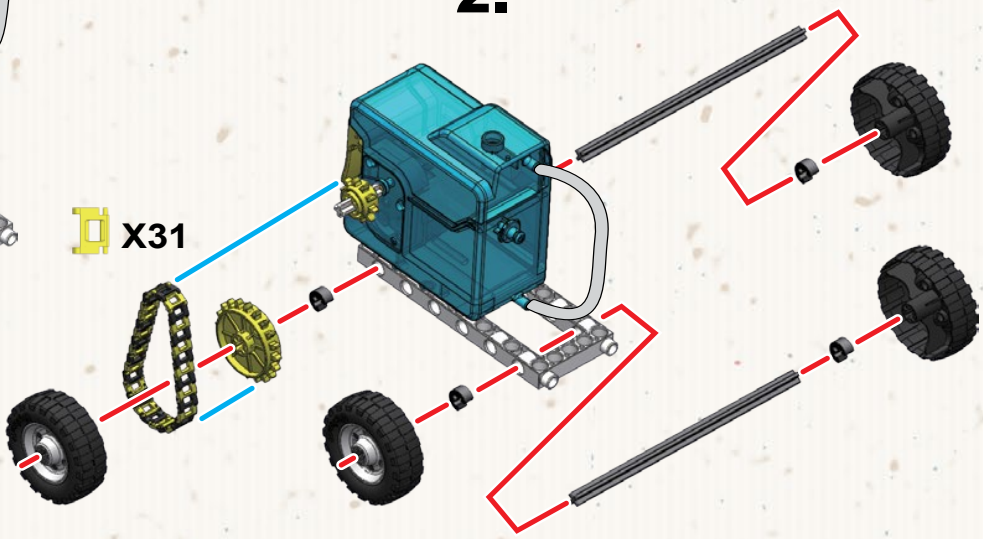

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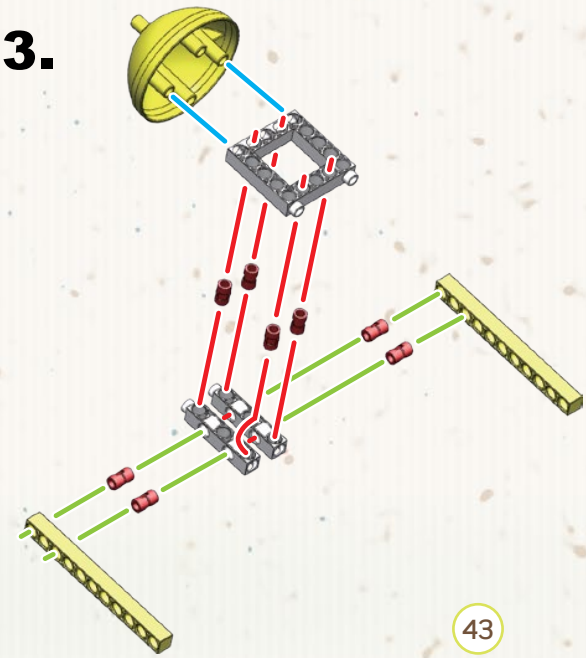

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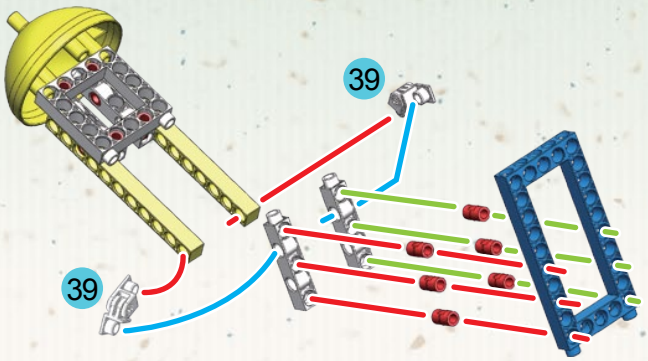

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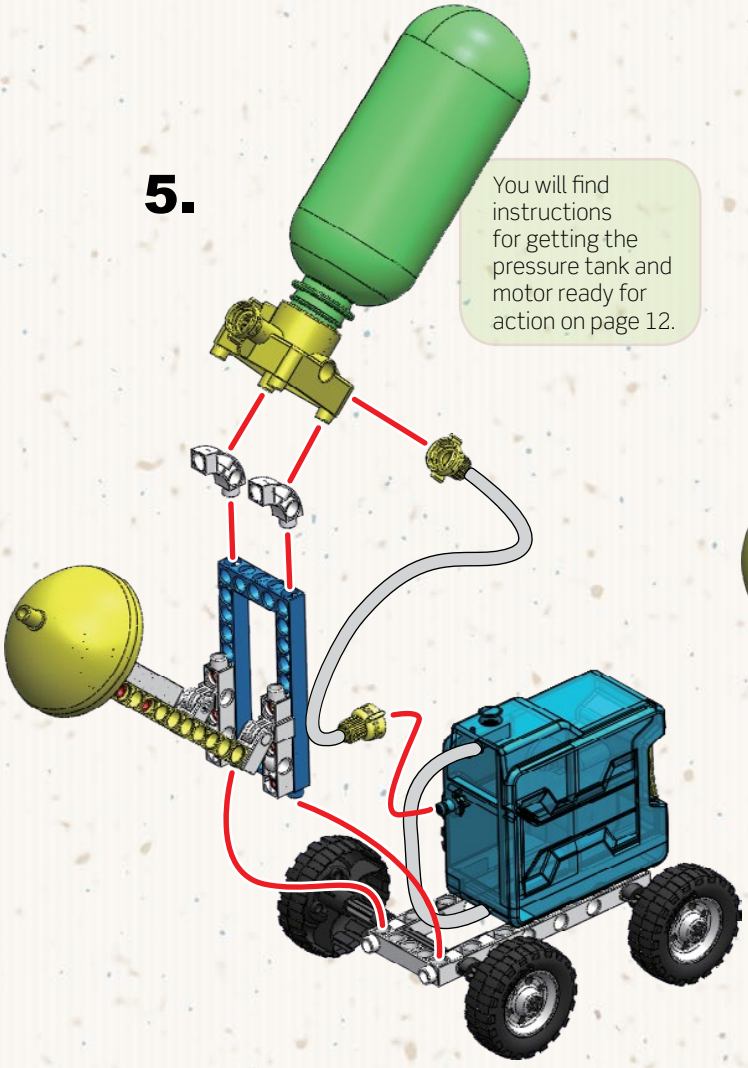
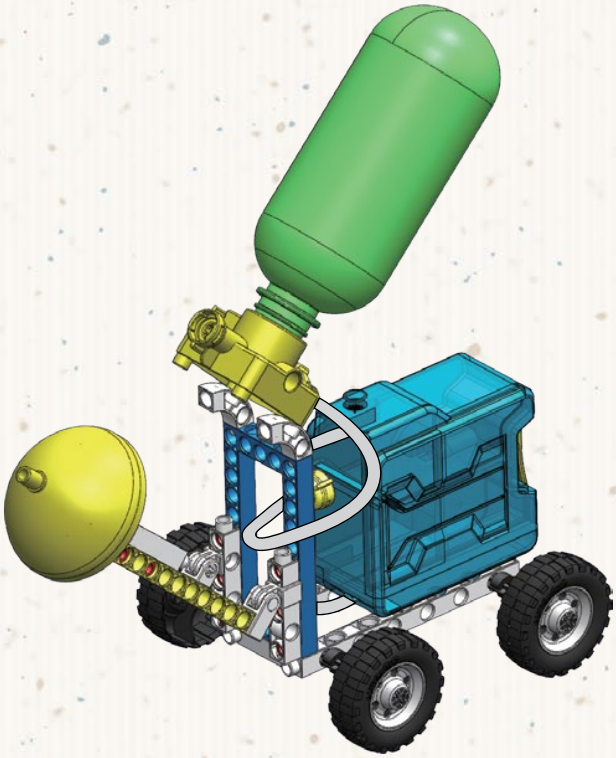


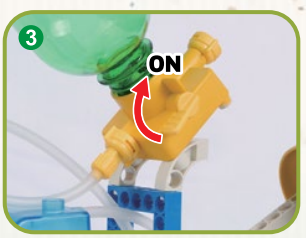
You will find instructions for getting the pressure tank and motor ready for action on page 12.



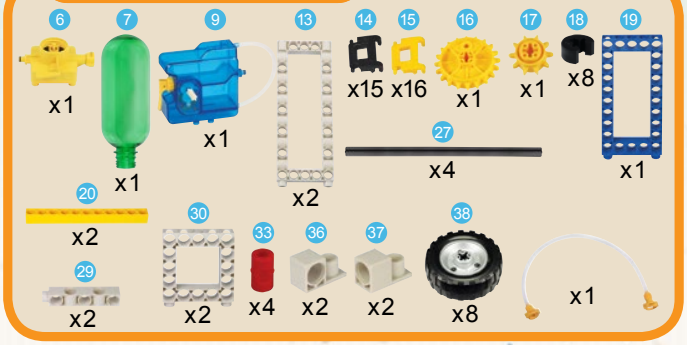
Completed

Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. It moves!
3. Open the switch and the model zooms off!



Required Parts



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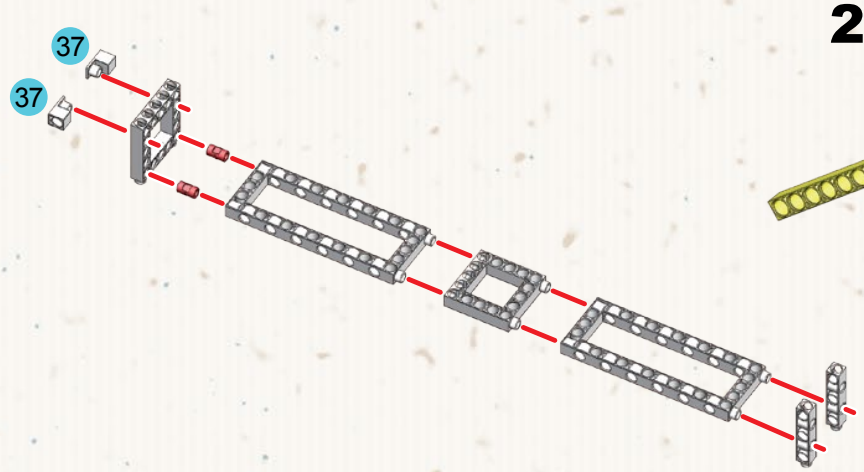

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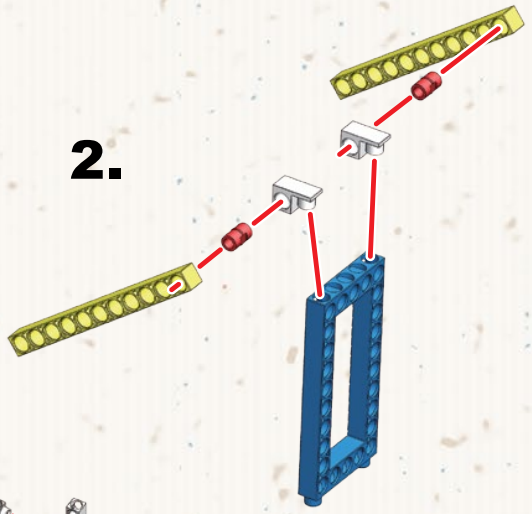

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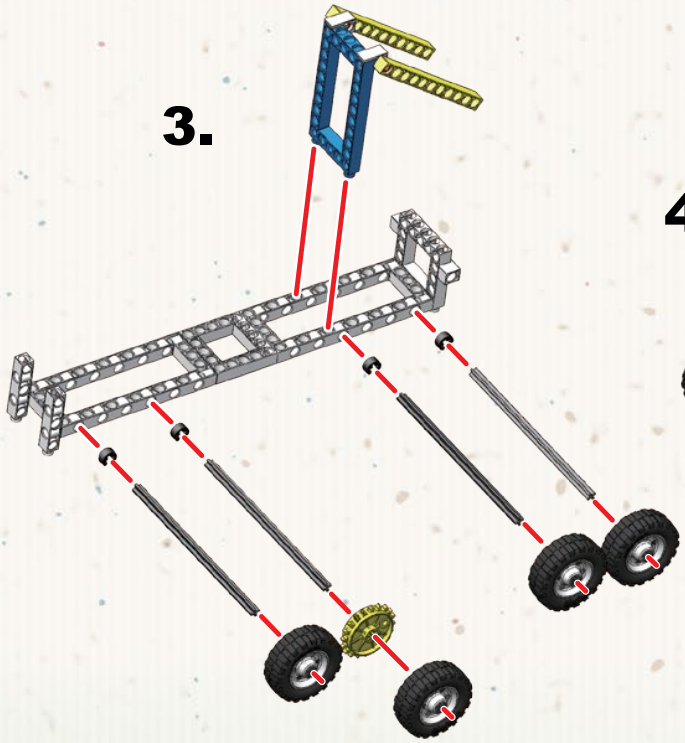

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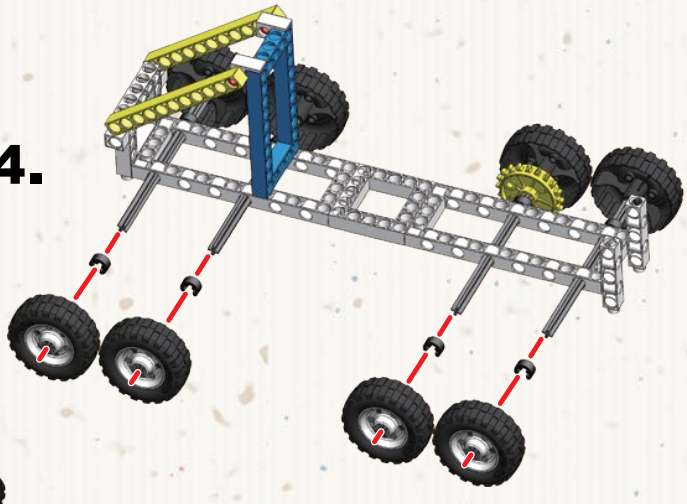

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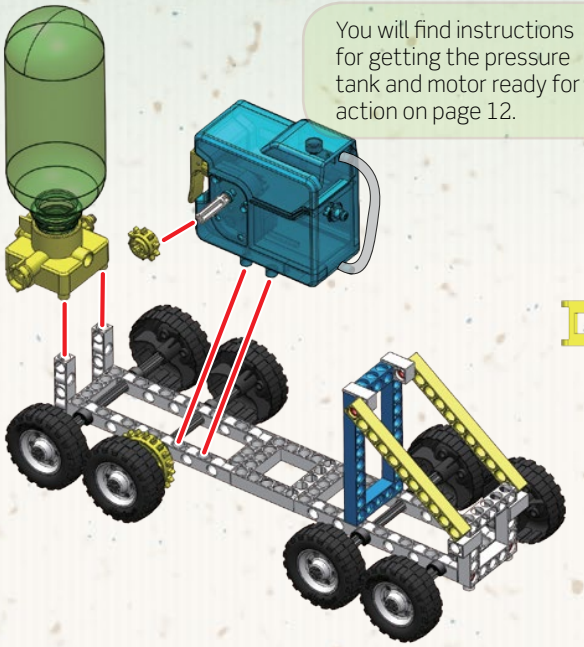
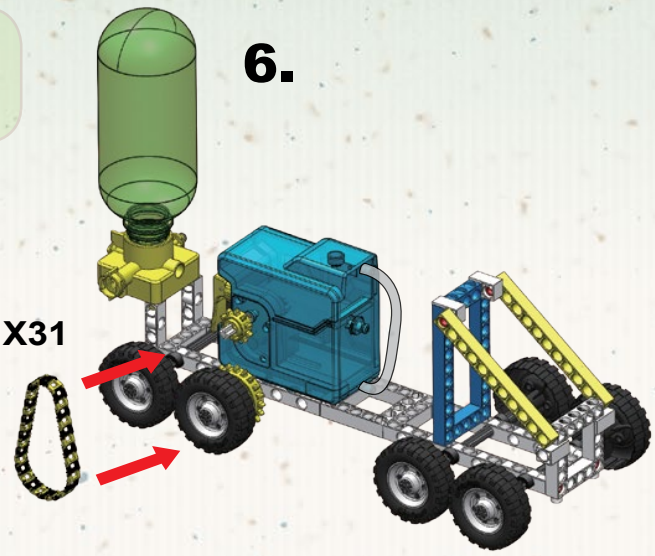


You will find instructions for getting the pressure tank and motor ready for action on page 12.

6.



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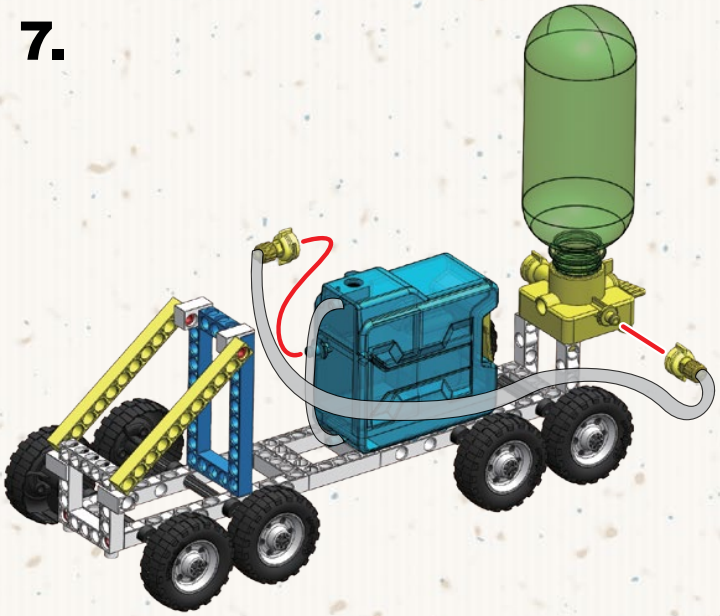
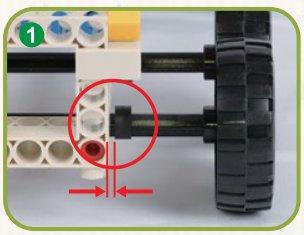
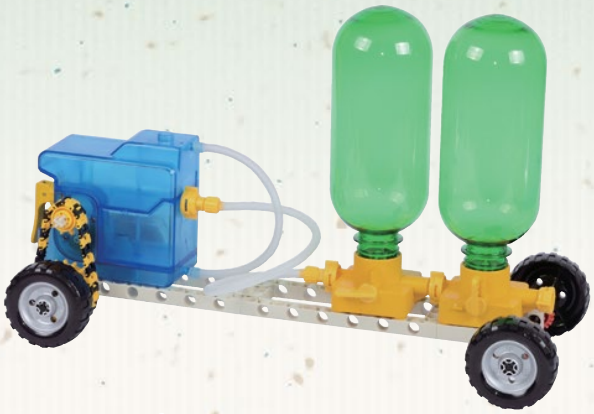


Completed

Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. Connect the pressure tank to the pump and pump 25 times.
3. Open the switch and the model zooms off!





Required Parts

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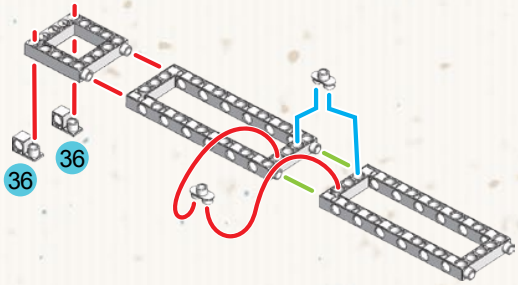

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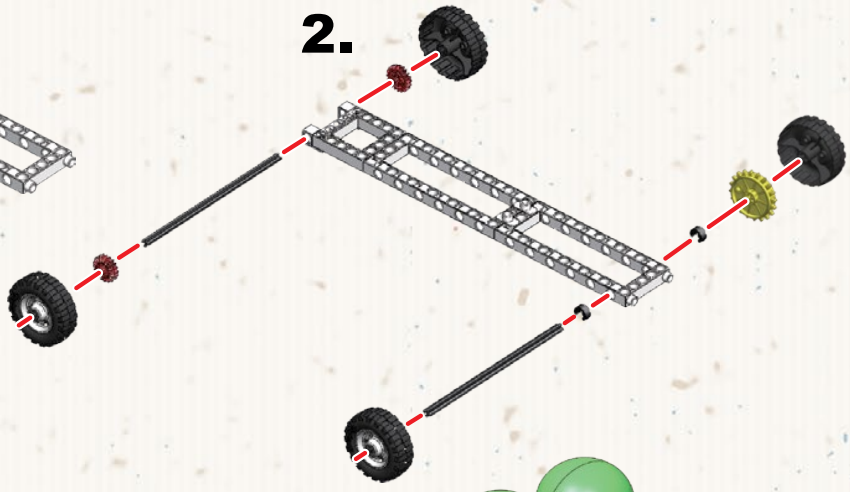
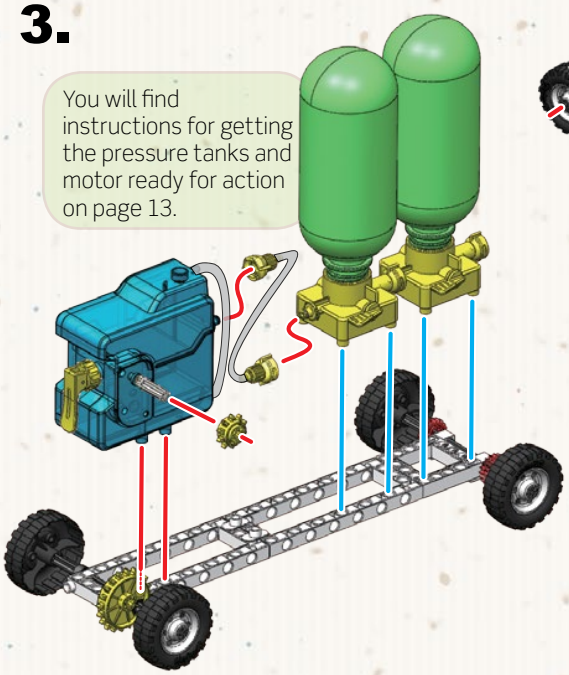


3.

You will find instructions for getting the pressure tanks and motor ready for action on page 13.



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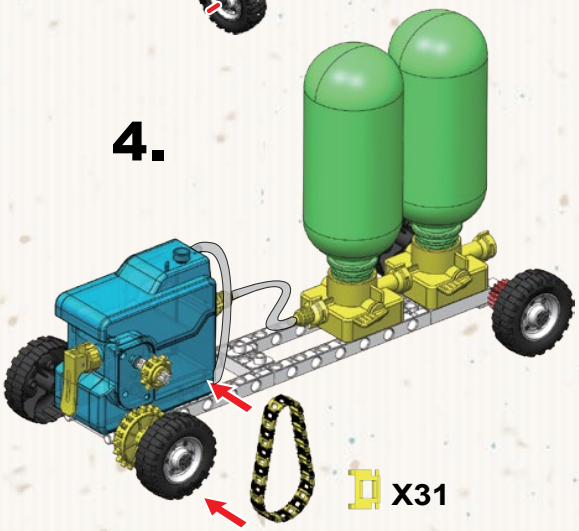
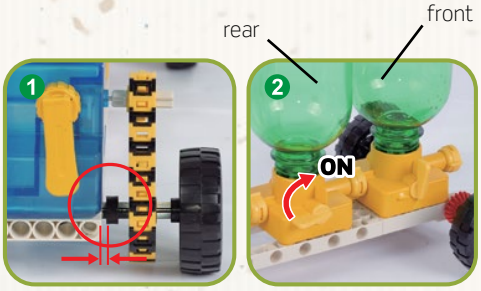


Completed

Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. First open the front switch, and then the rear one when you're ready to go.



Required Parts

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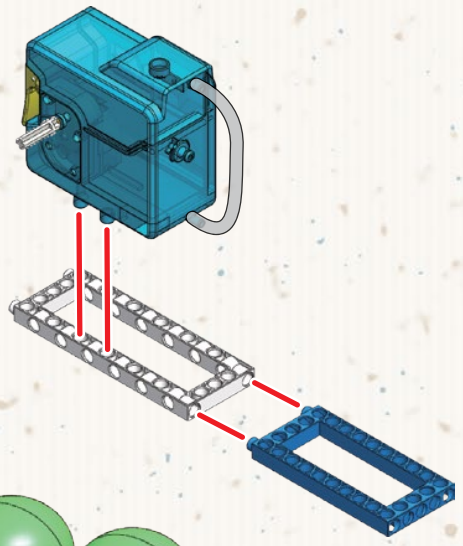

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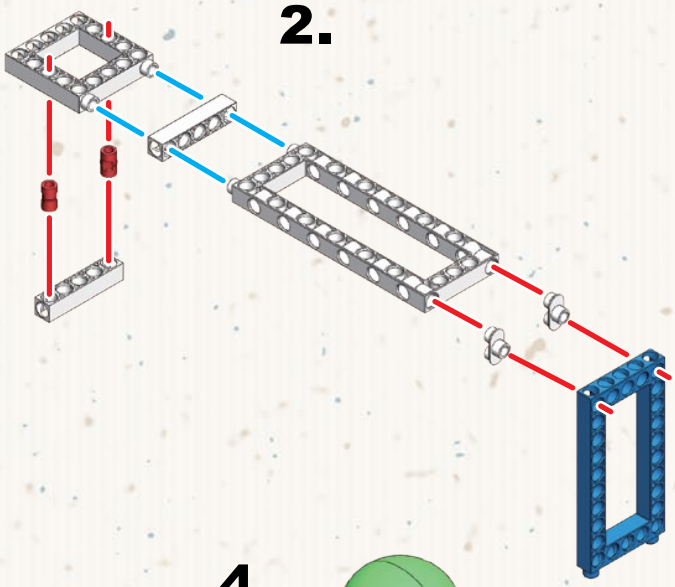

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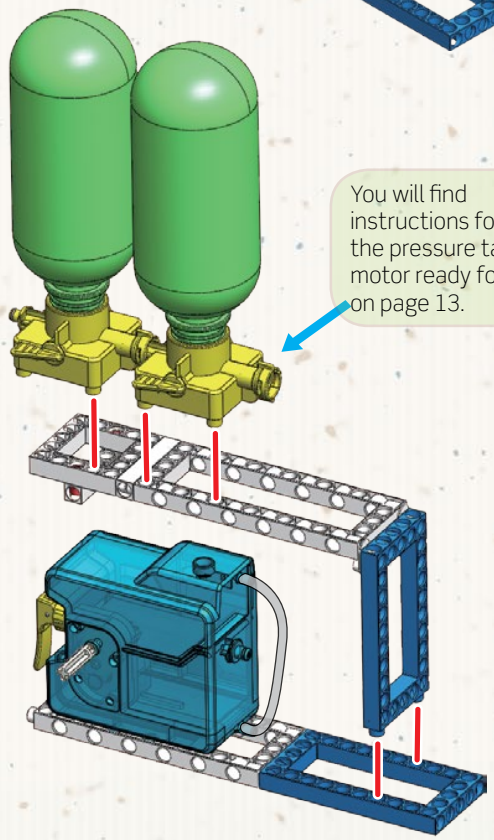
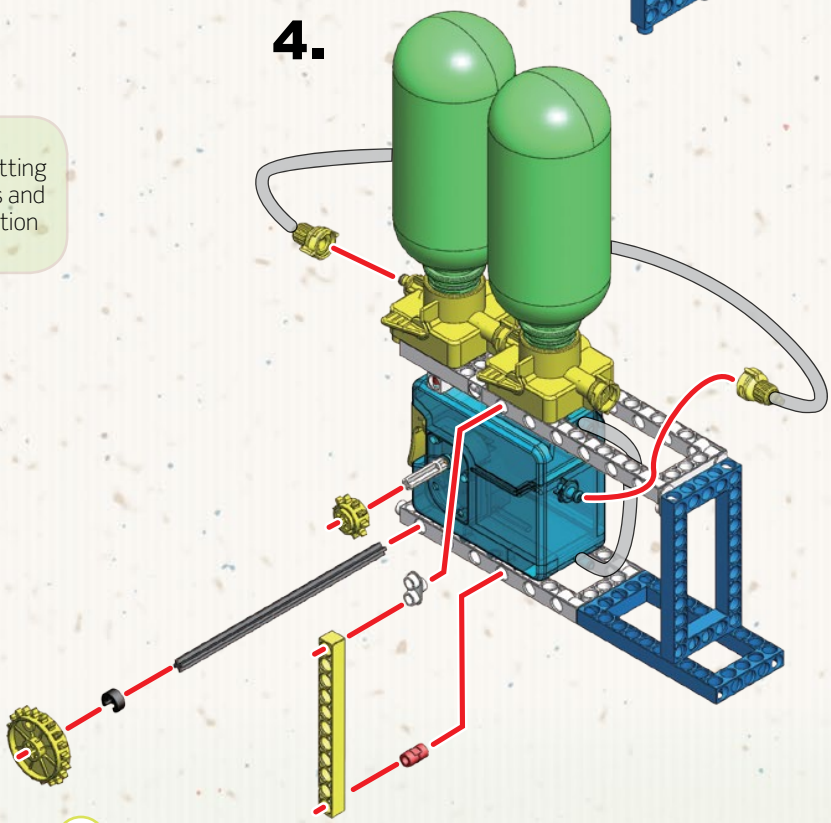


You will find instructions for getting the pressure tanks and motor ready for action on page 13.

4.



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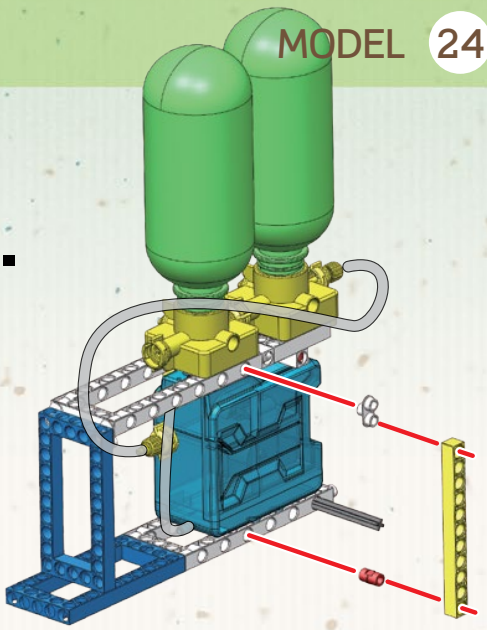

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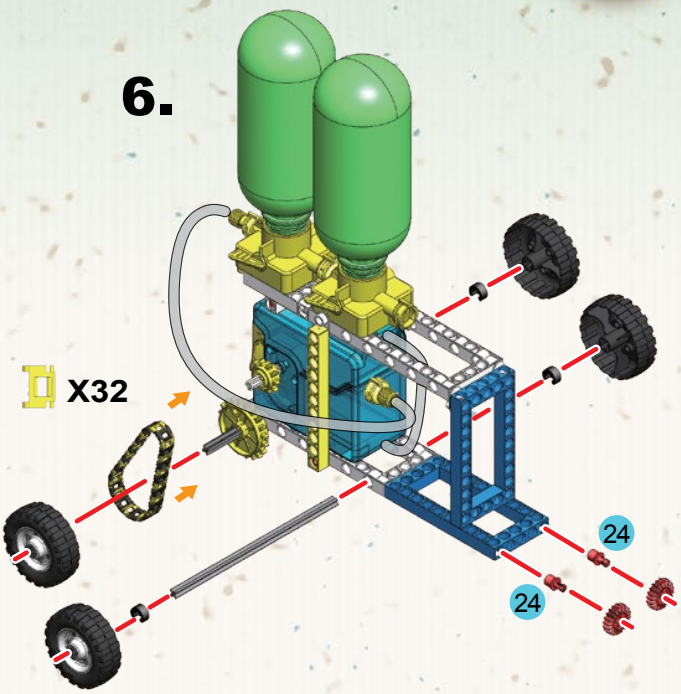

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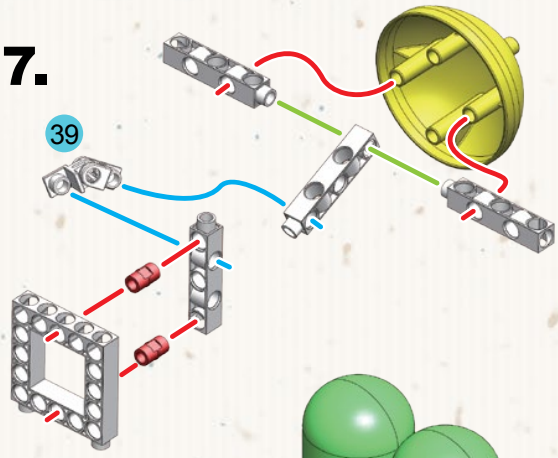

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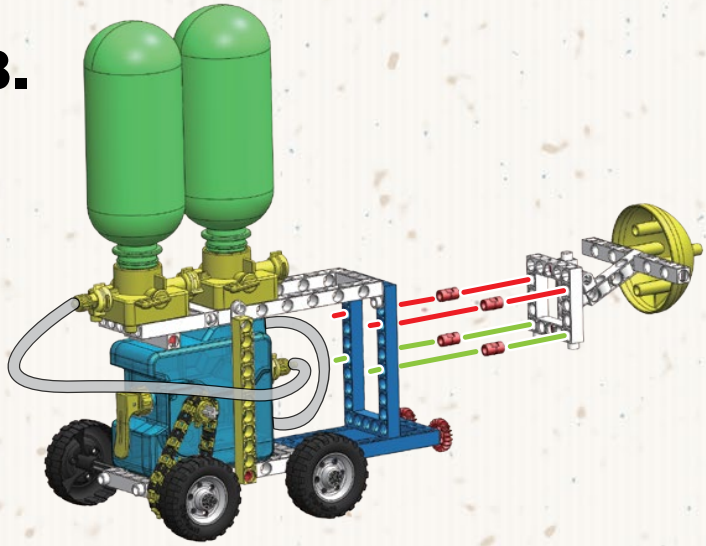

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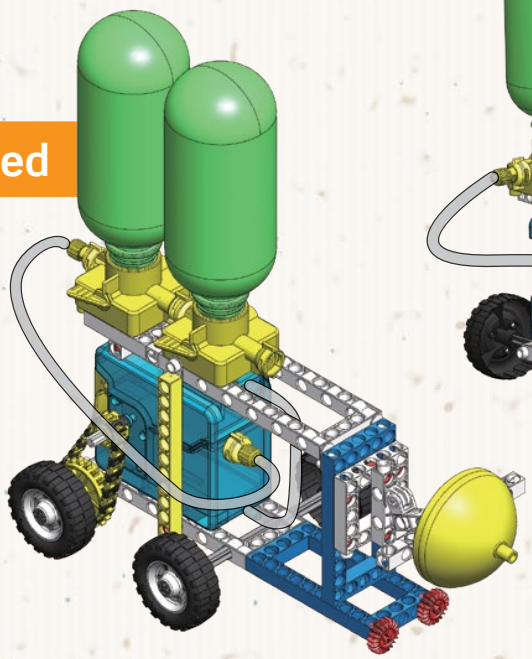
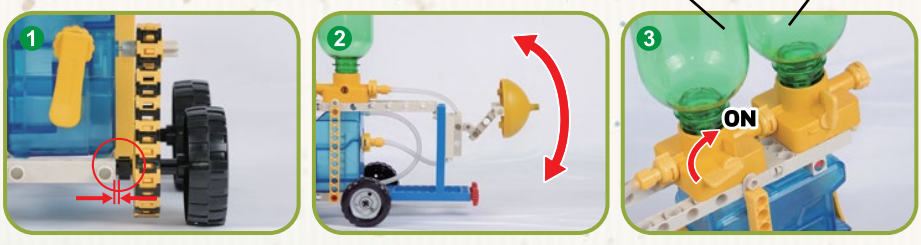
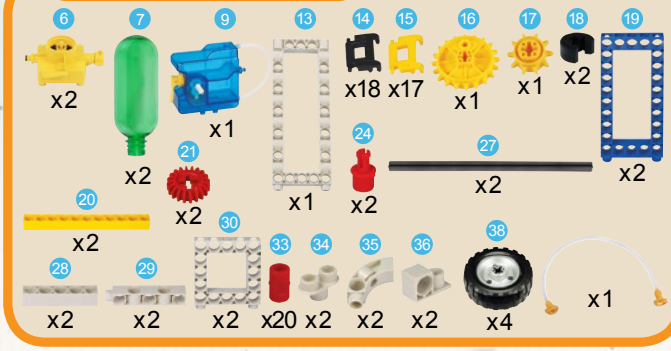


Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. It moves!
3. First open the rear switch, and then the front one when you're ready to go.



Required Parts



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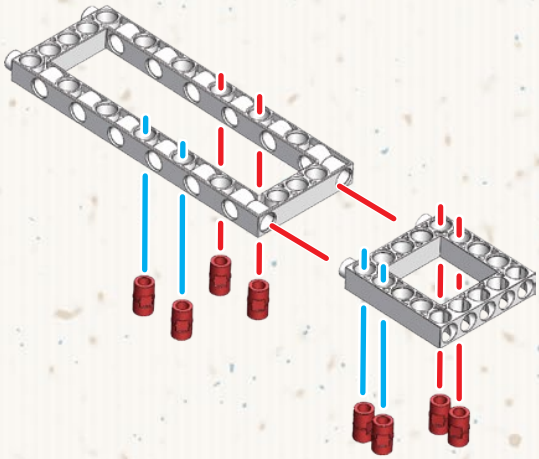

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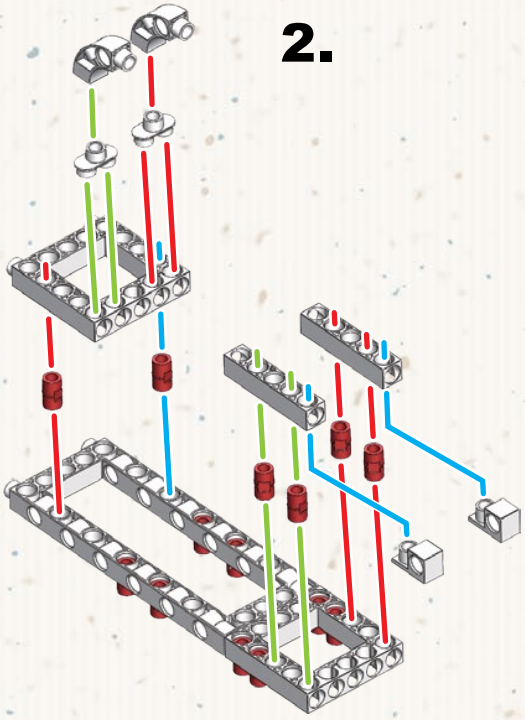

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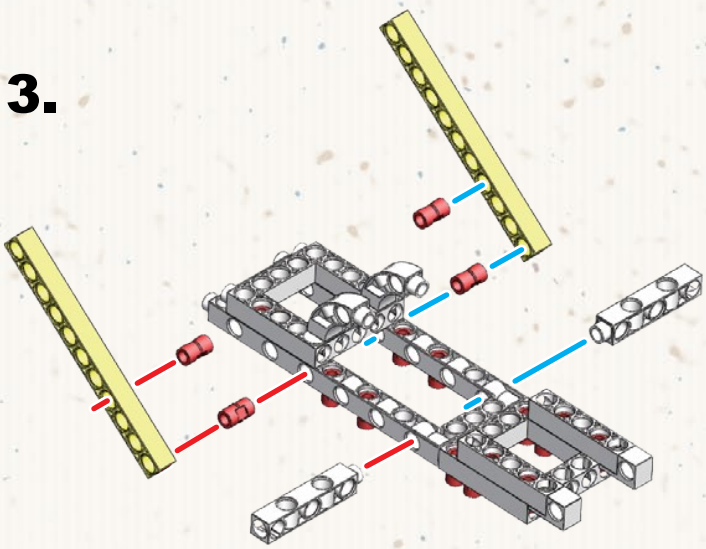

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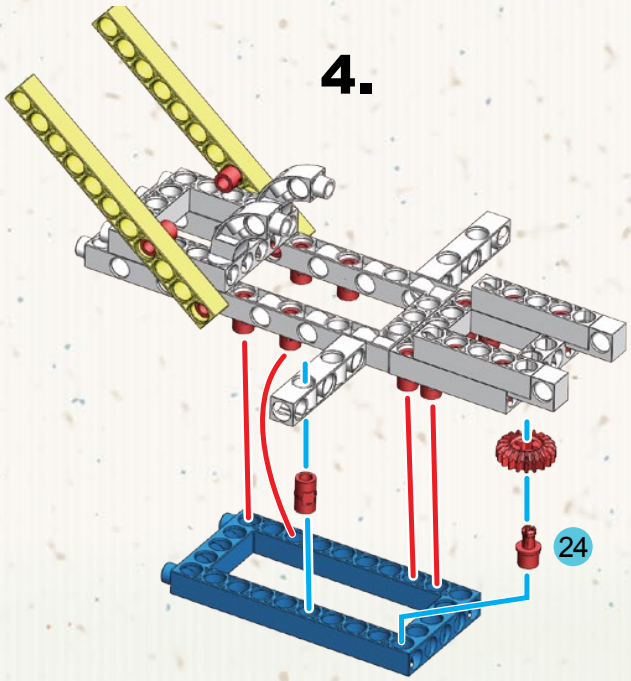
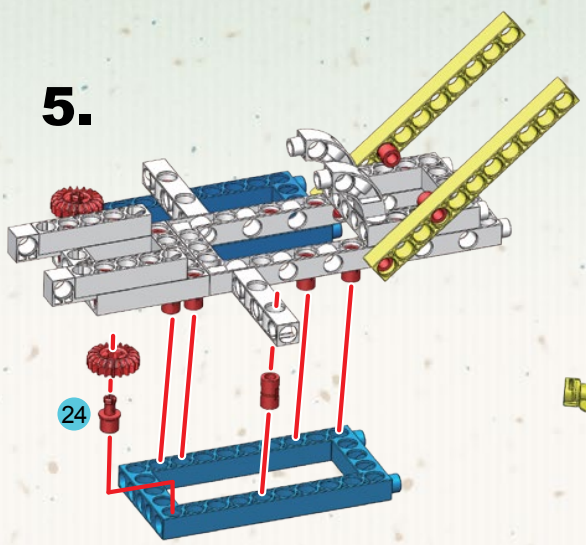
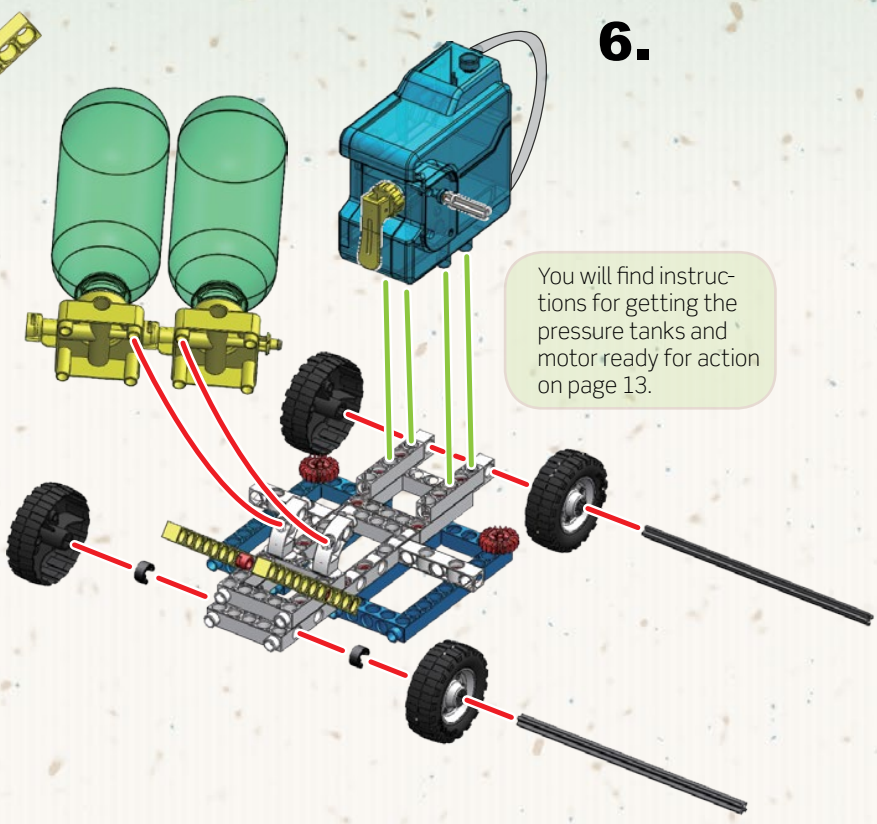
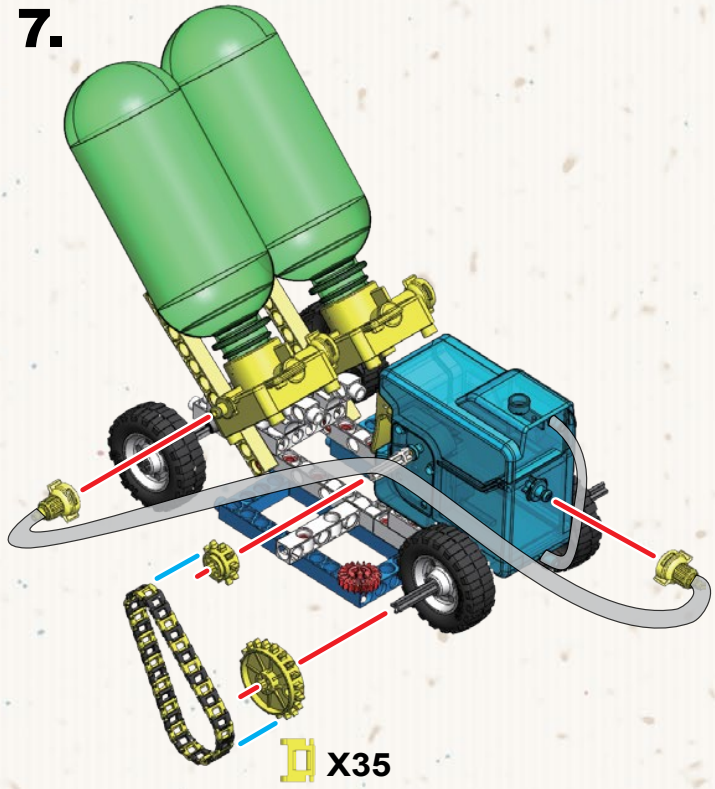




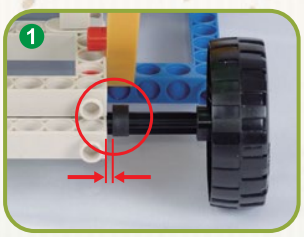


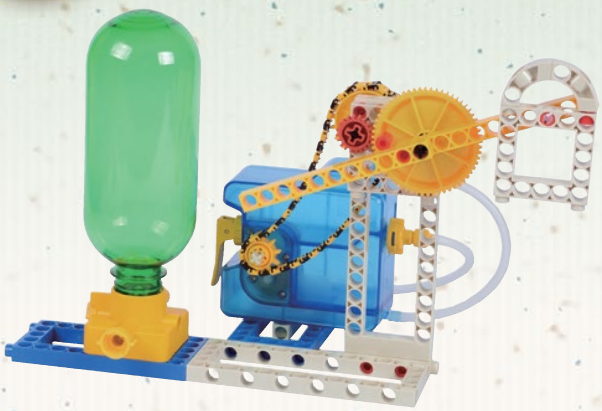
You will find instructions for getting the pressure tanks and motor ready for action on page 13.



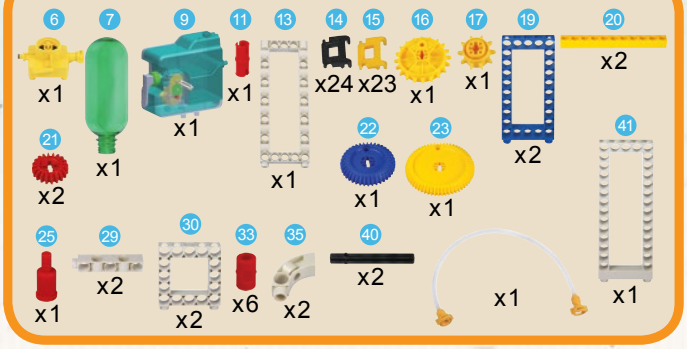
Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the axle lock and the frame.
2. Make sure that the sprocket wheels line up properly.
3. First open the left switch (viewed in the direction of travel), and then open the right one when you are ready to start.





Required Parts



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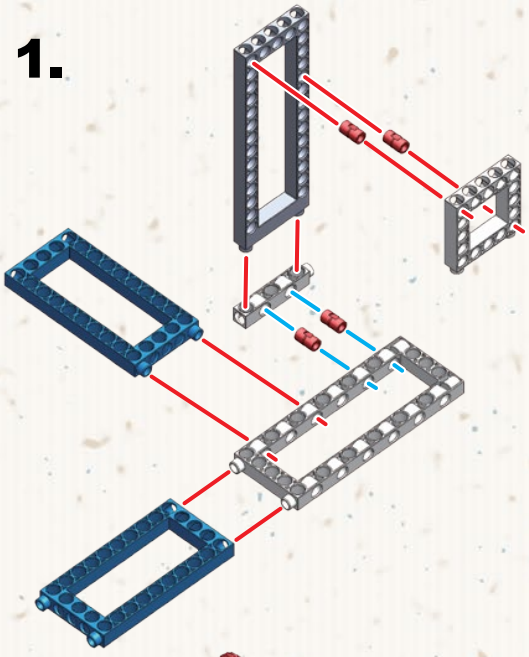

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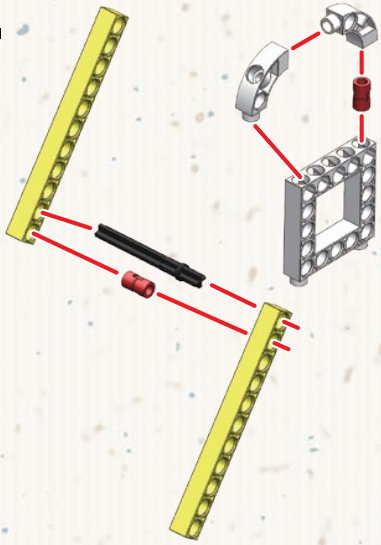

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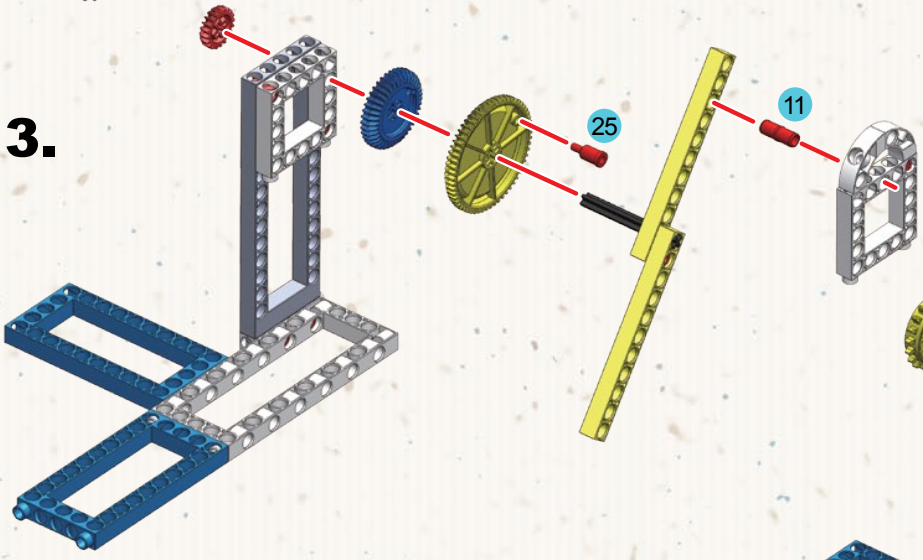

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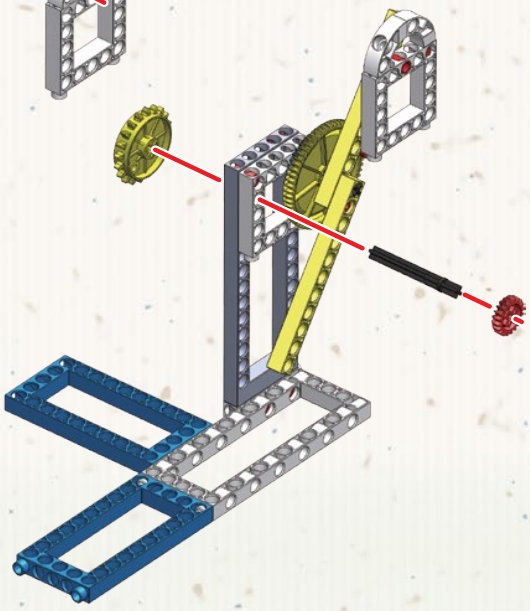
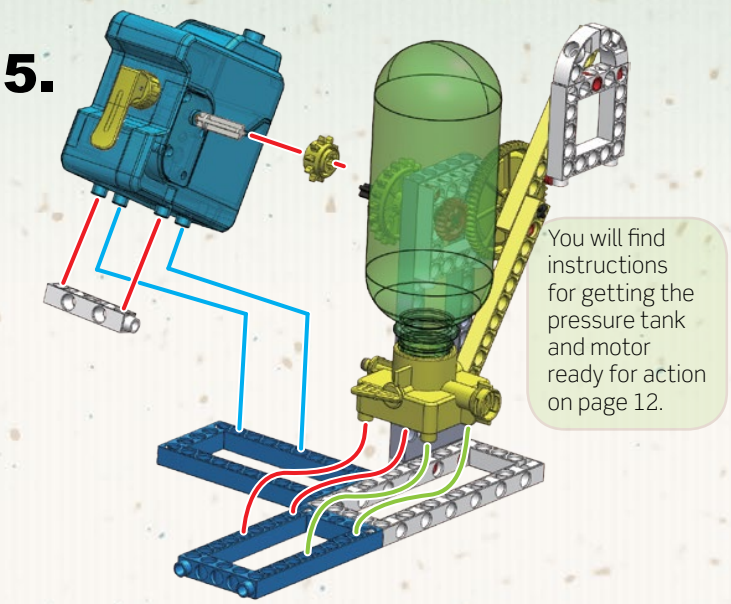
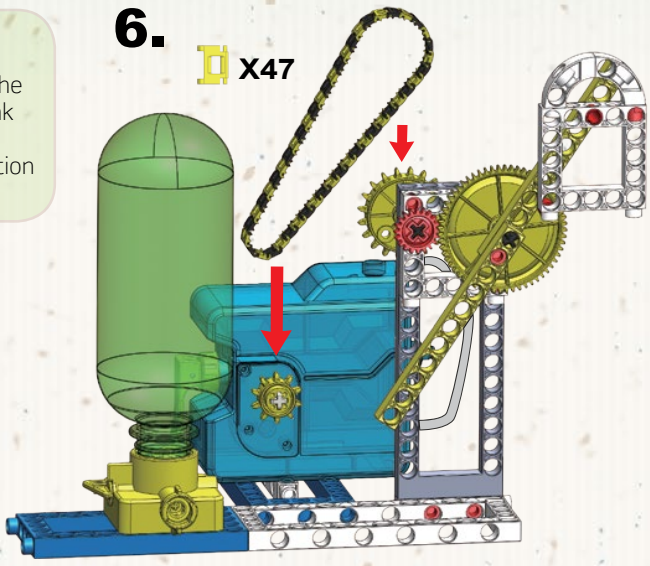
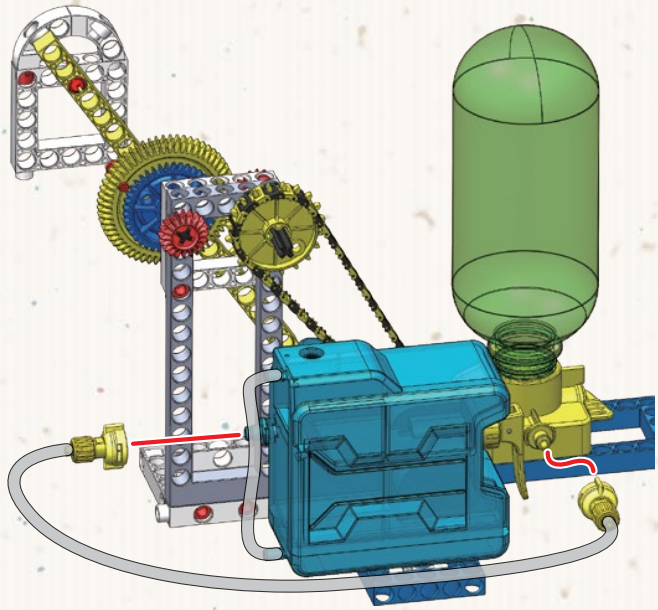




You will find instructions for getting the pressure tank and motor ready for action on page 12.





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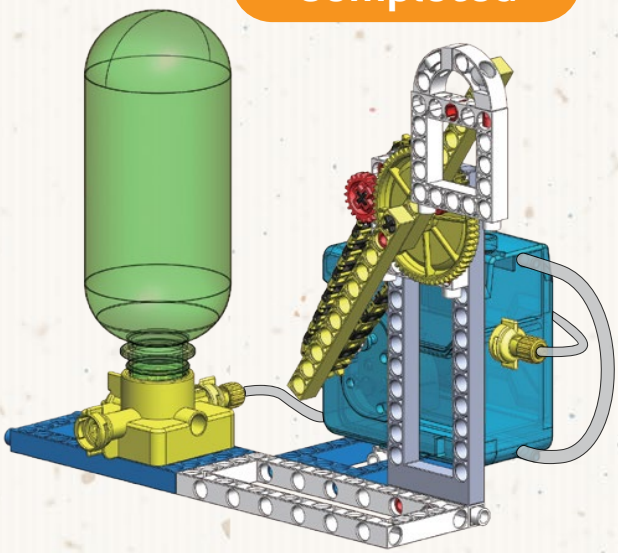
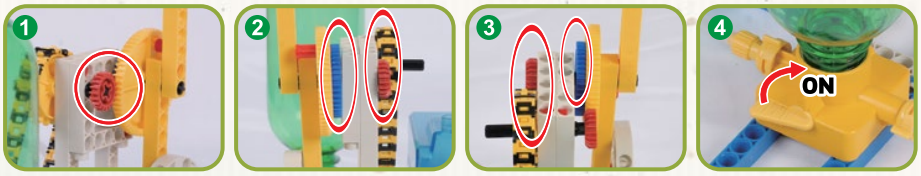
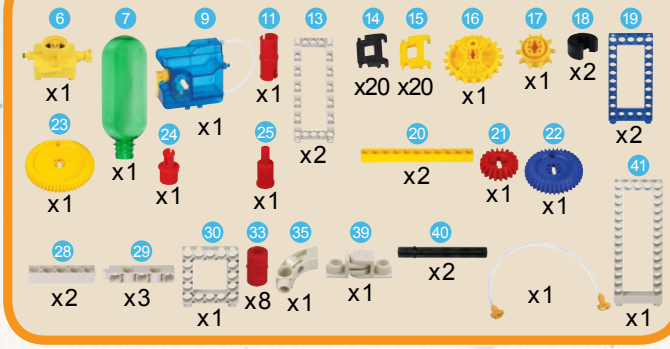


Assembly notes

1. Make sure that the yellow and red gear wheels interlock properly.
2. The model will run best if you leave a gap 1 mm wide between the gear wheels and the frame.
3. The model will run best if you leave a gap 1 mm wide between the gear wheels and the frame.
4. Open the switch and the model starts up!



Required Parts



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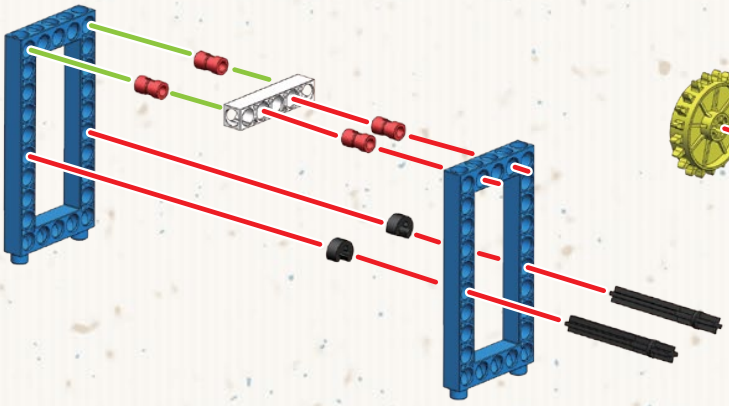

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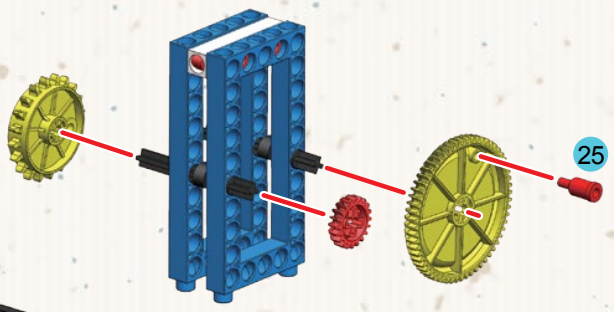

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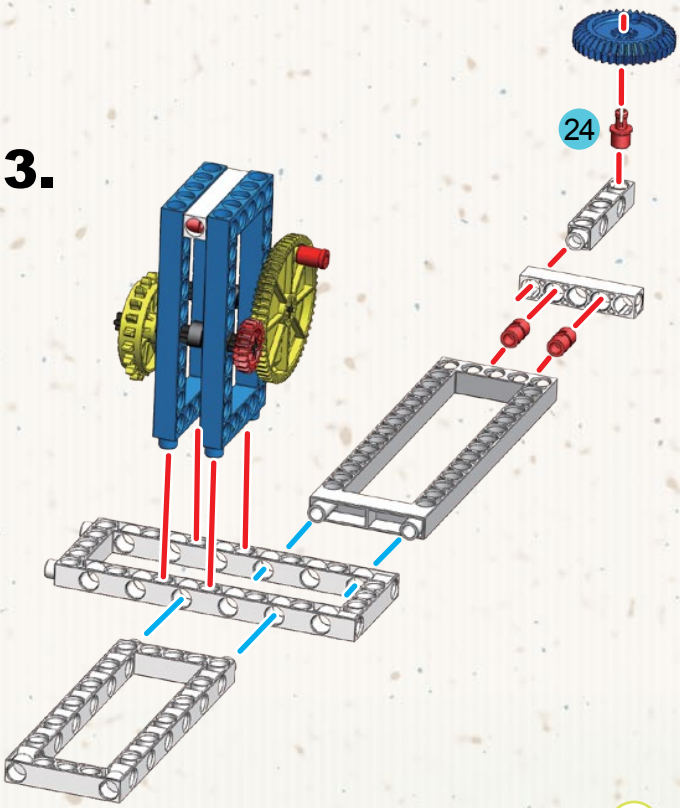

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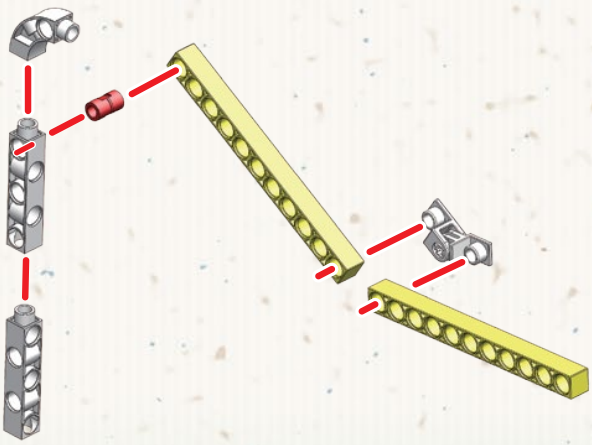

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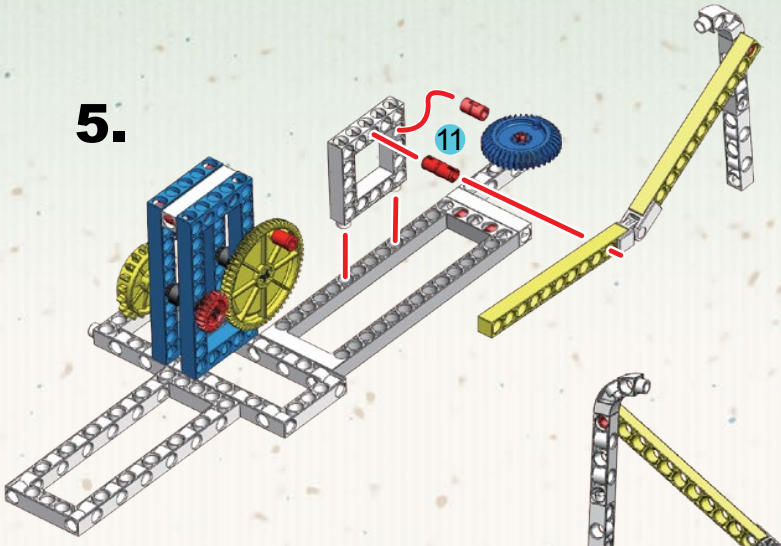

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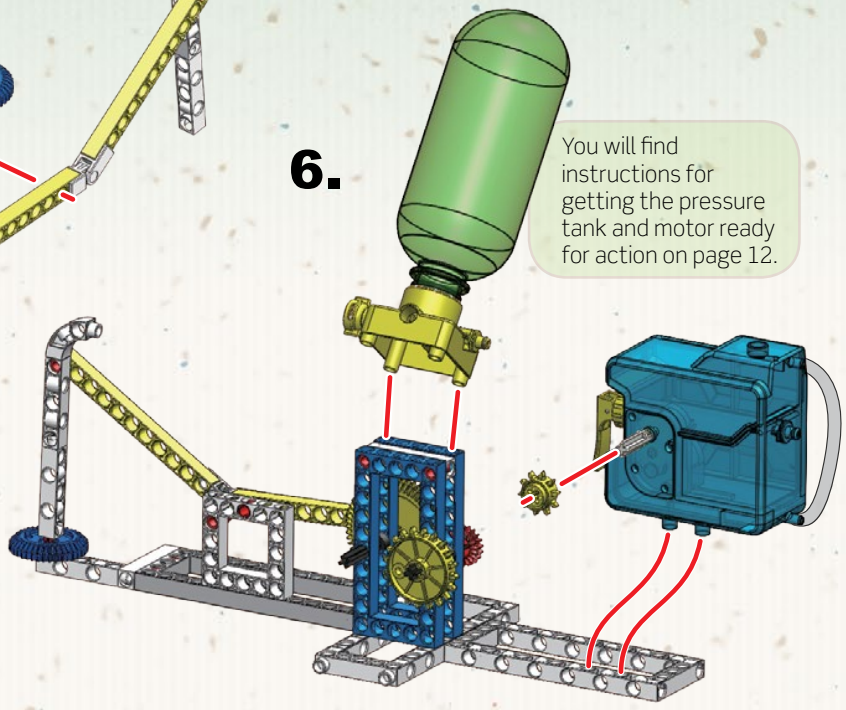
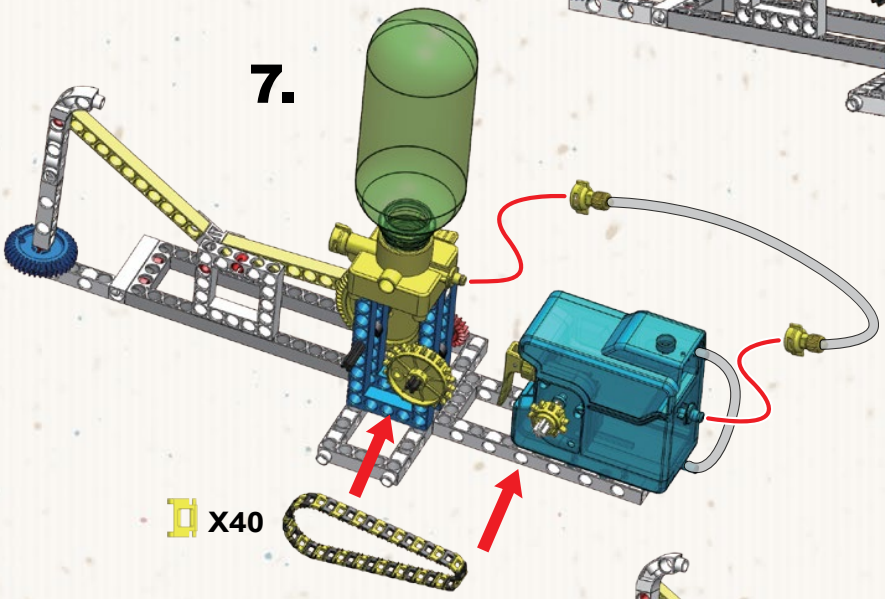


You will find instructions for getting the pressure tank and motor ready for action on page 12.

7.



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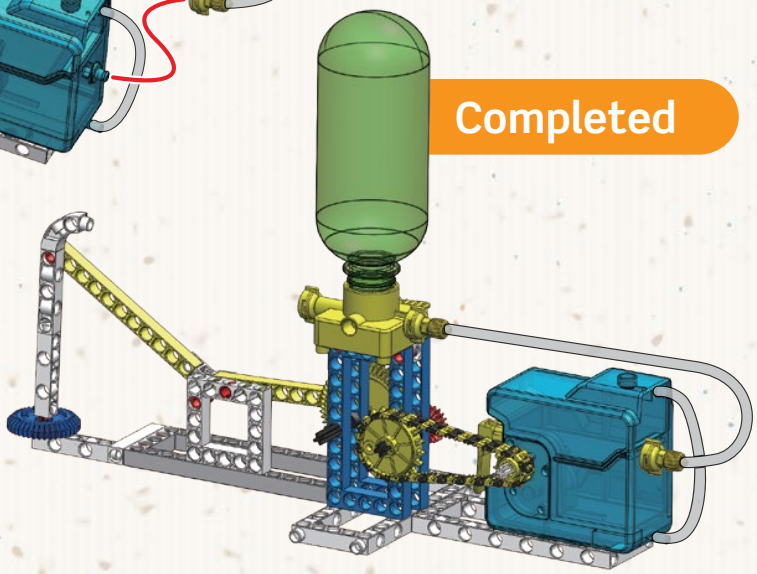
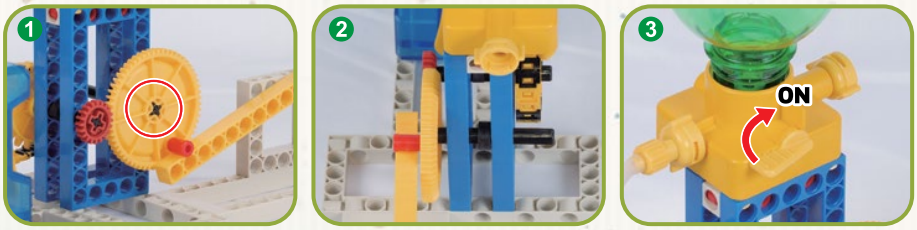


Assembly notes

1. Make sure that the shaft does not project beyond the gear wheel.
2. The model will run best if you leave a gap 1 mm wide between the gear wheels and the frame.
3. Open the switch and the model hammers away!



Required Parts

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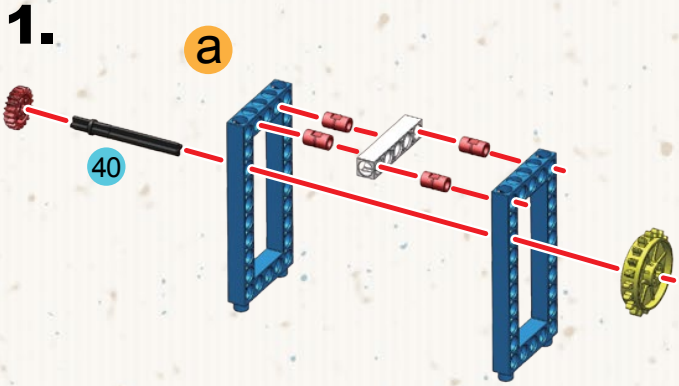

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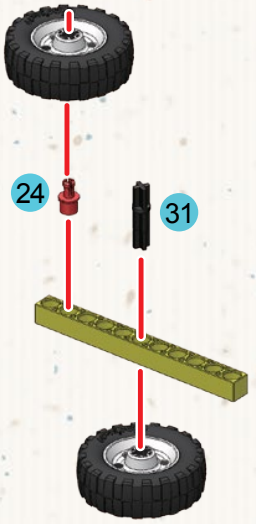

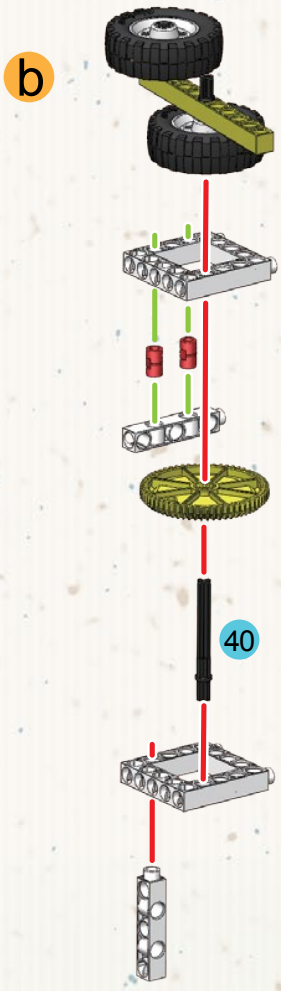

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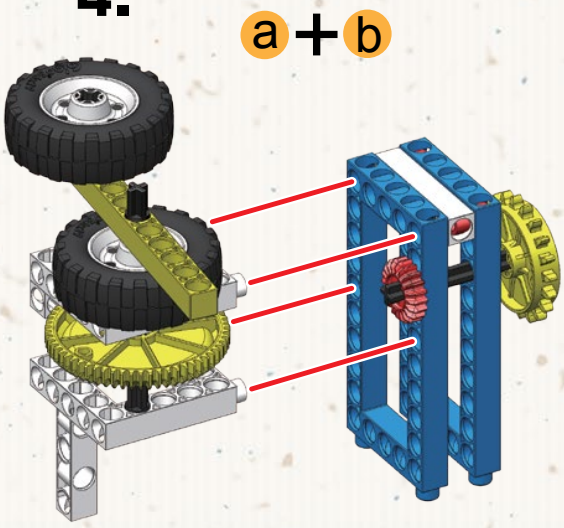

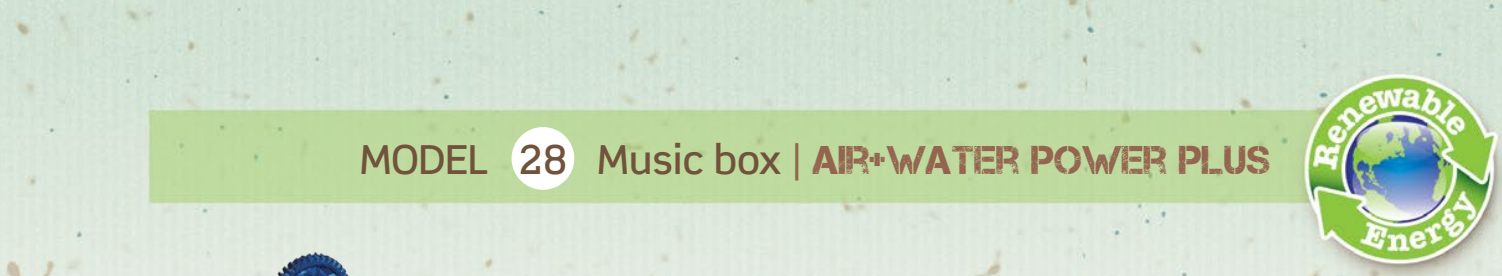

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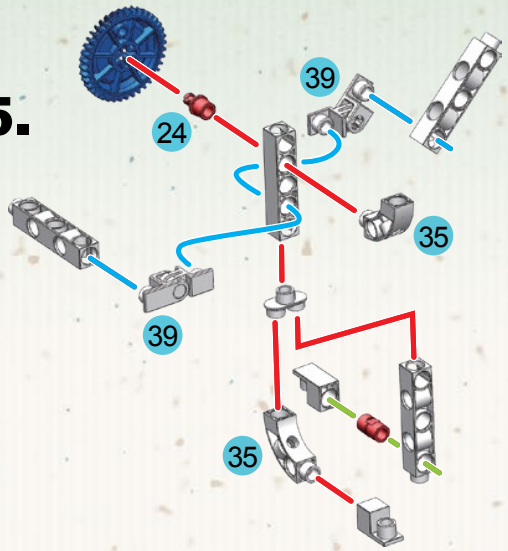

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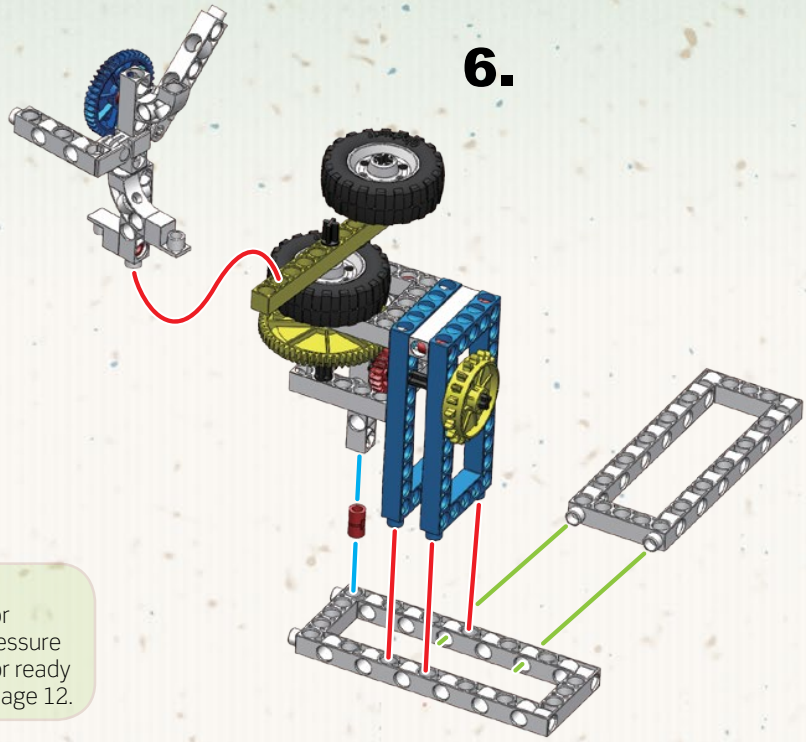

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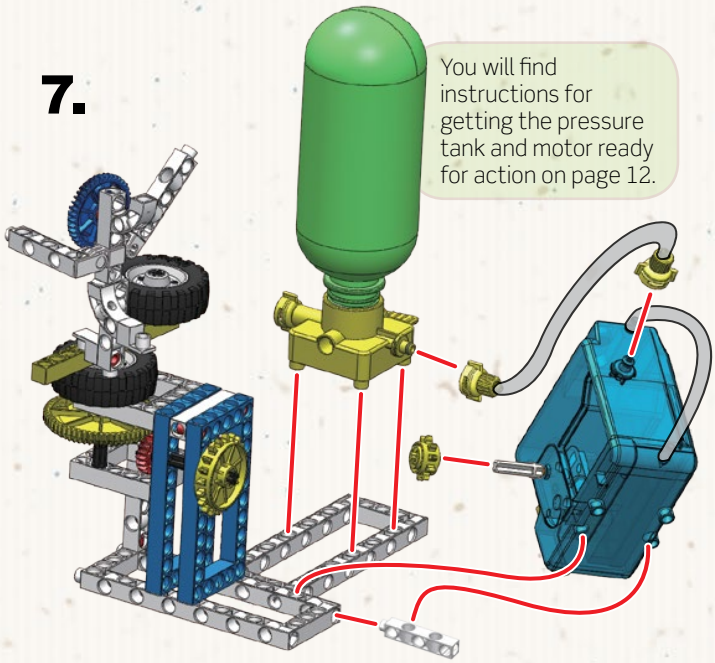
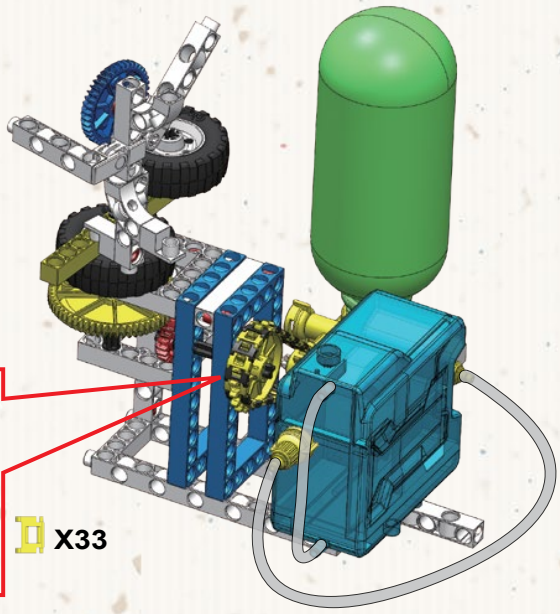
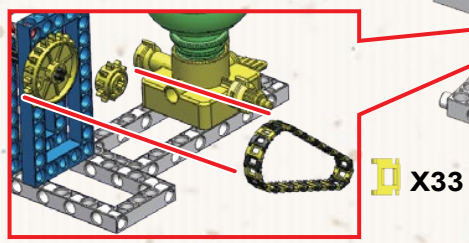


You will find instructions for getting the pressure tank and motor ready for action on page 12.

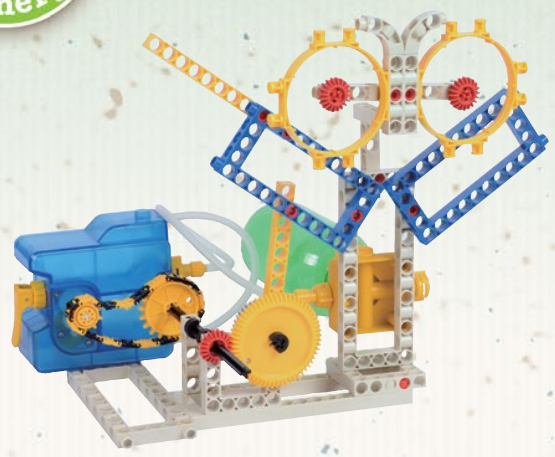
Completed



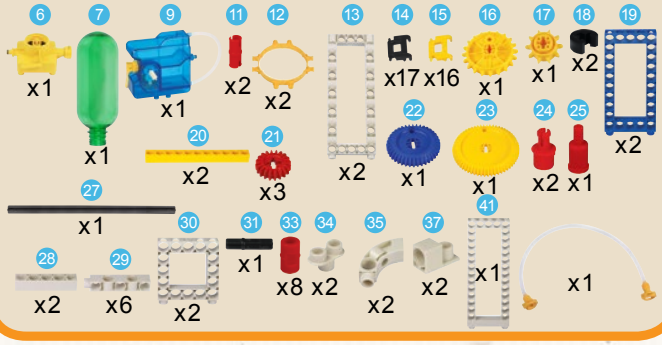


Assembly notes

1. Make sure that the yellow and red gear wheels interlock properly. Leave a gap of 1 mm between gear wheels and frame.
2. Connect the pressure tank to the pump and pump 25 times.
3. Open the switch and the model starts up!



Required Parts



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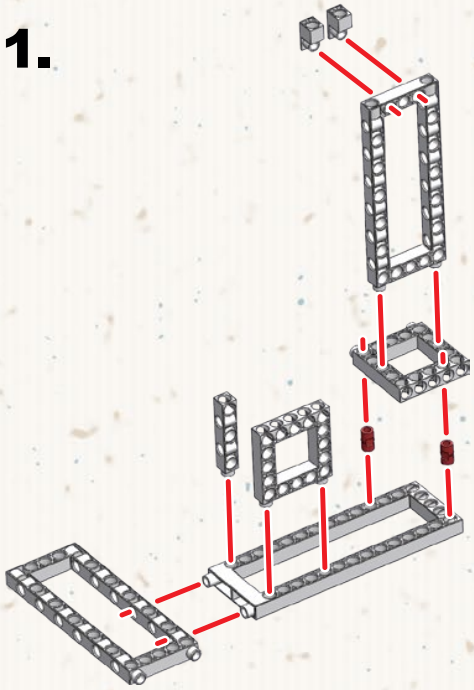

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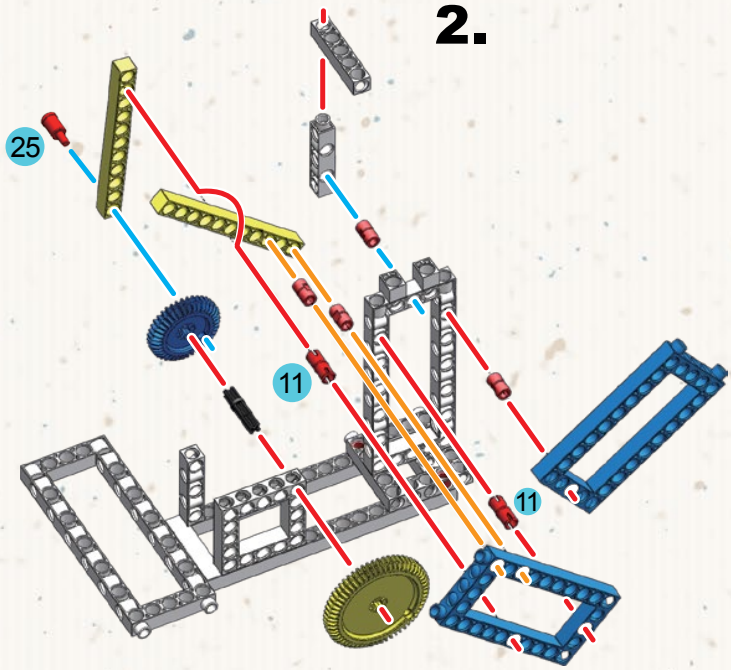

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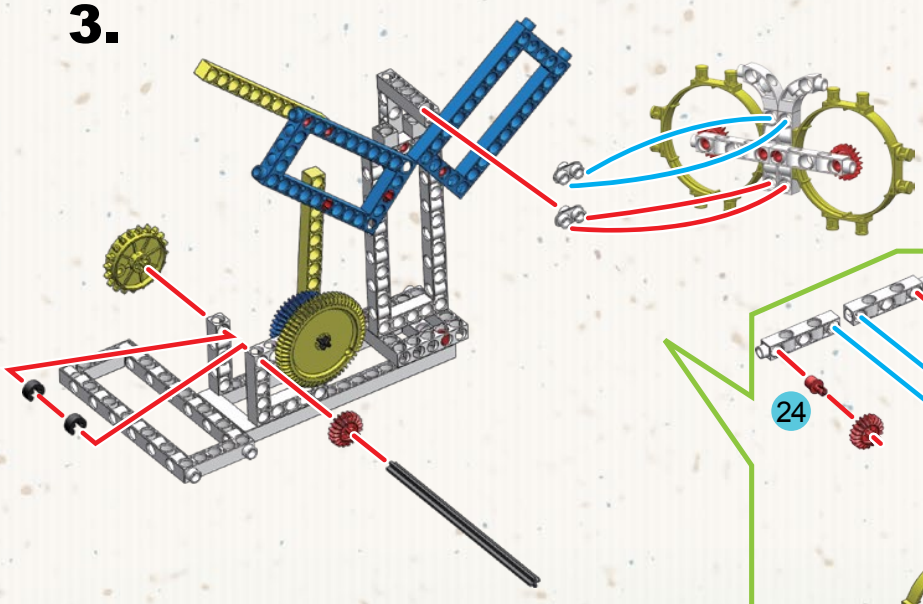

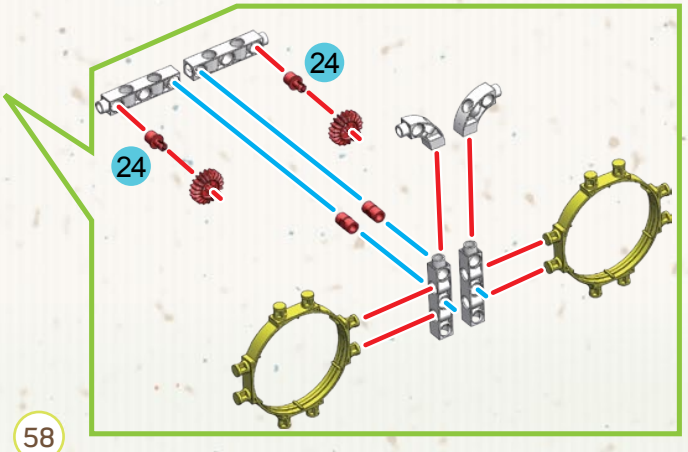

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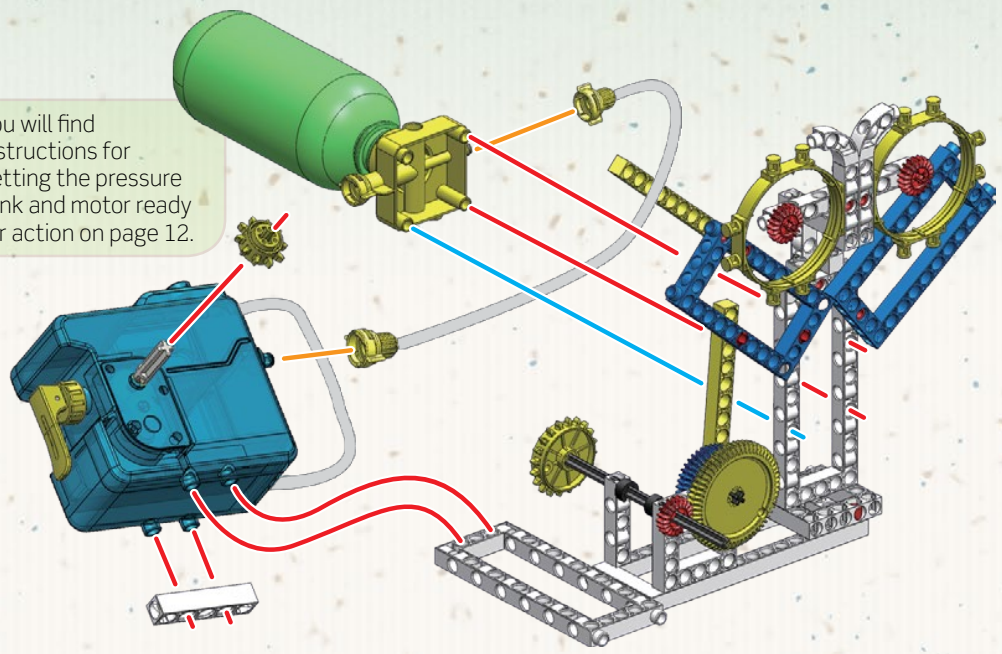
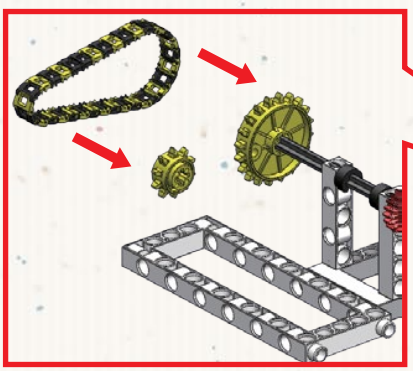


You will find instructions for getting the pressure tank and motor ready for action on page 12.

X33



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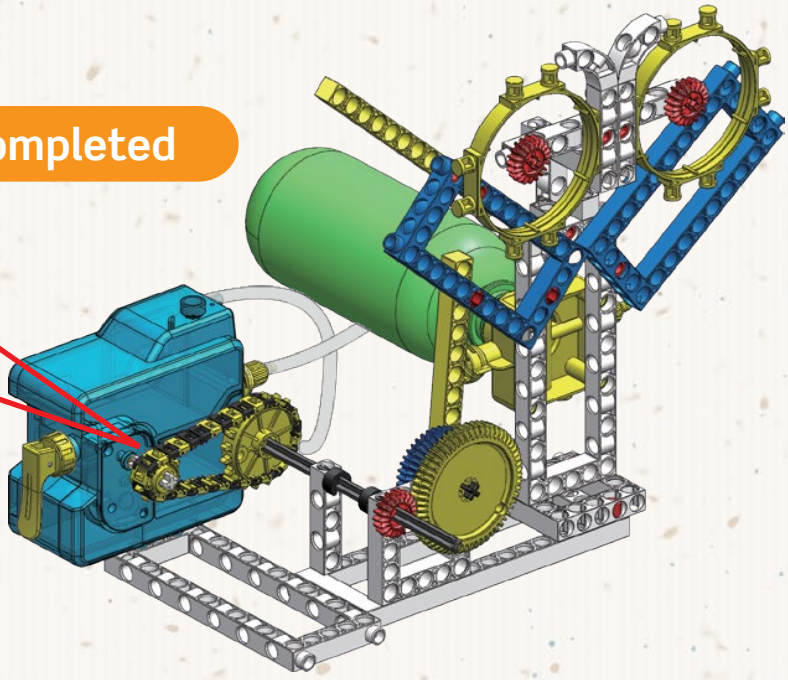
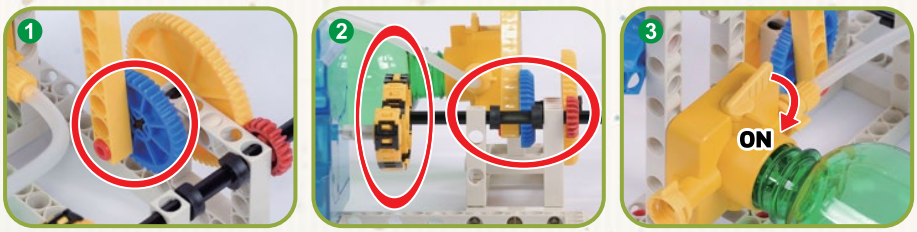
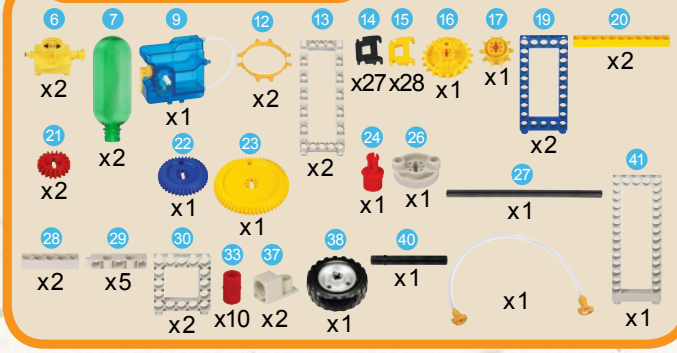


Assembly notes

1. Make sure that the shaft does not project beyond the blue gear wheel.
2. Make sure that the sprocket wheels line up straight. Leave a gap of 1 mm between axle locks and frame.
3. Open the switch and the model starts up!



Required Parts



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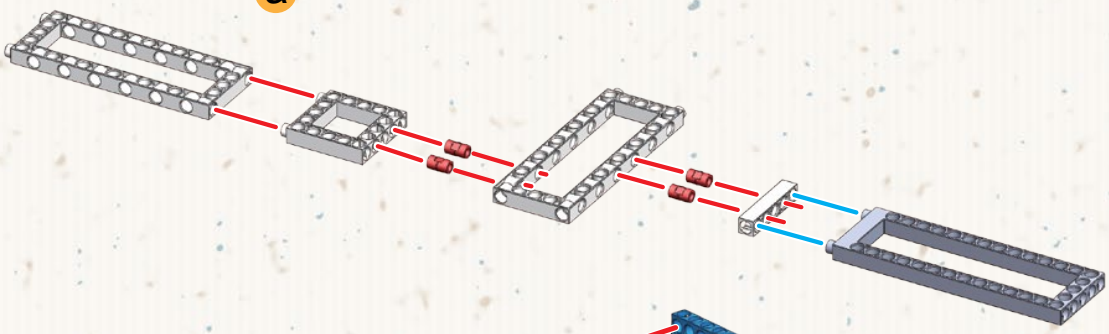
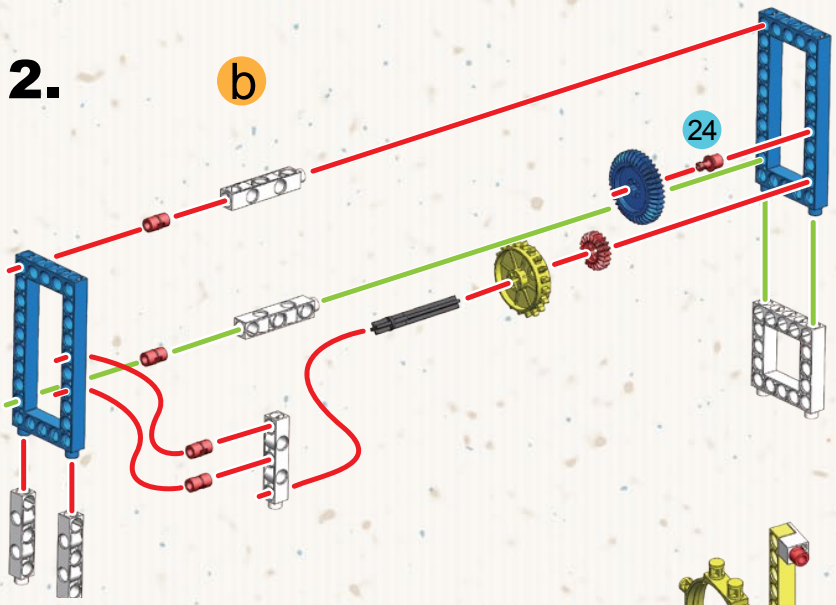
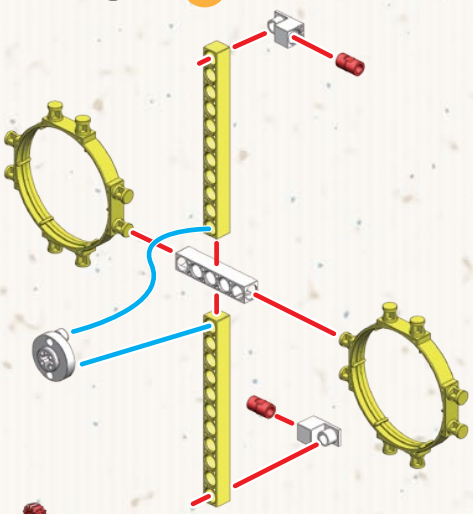


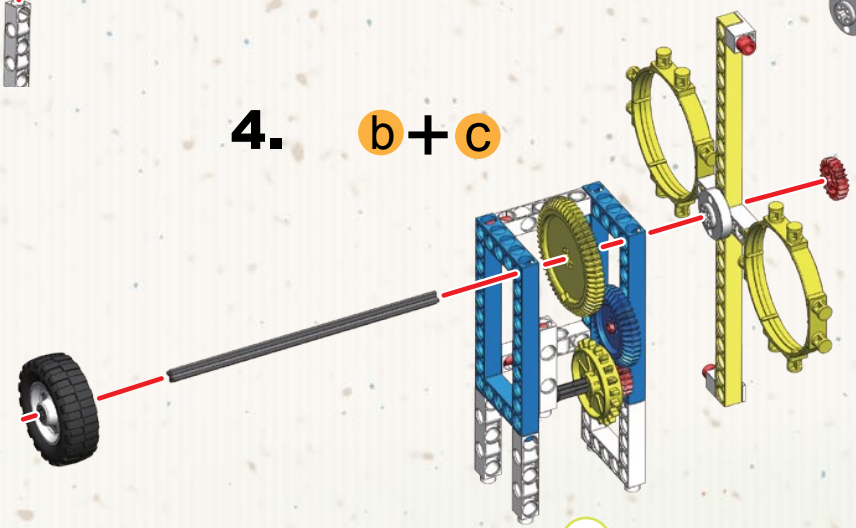
2. b



3. c

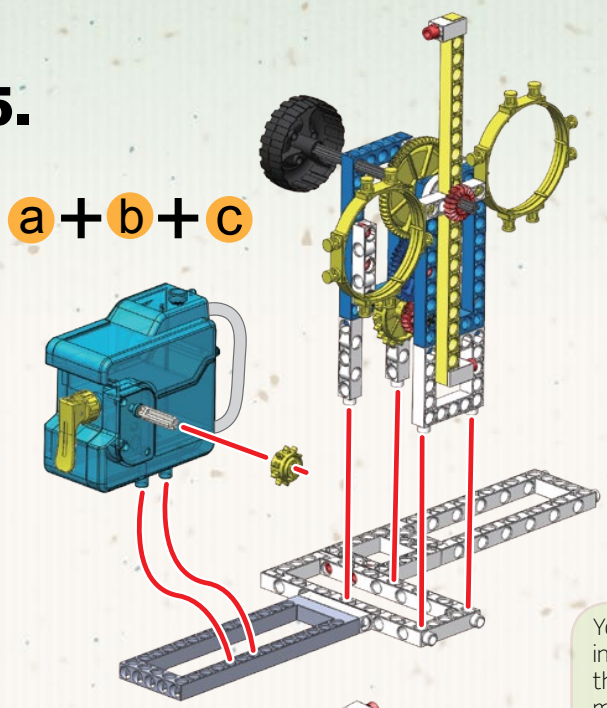


4. b + c



5.

a + b + c



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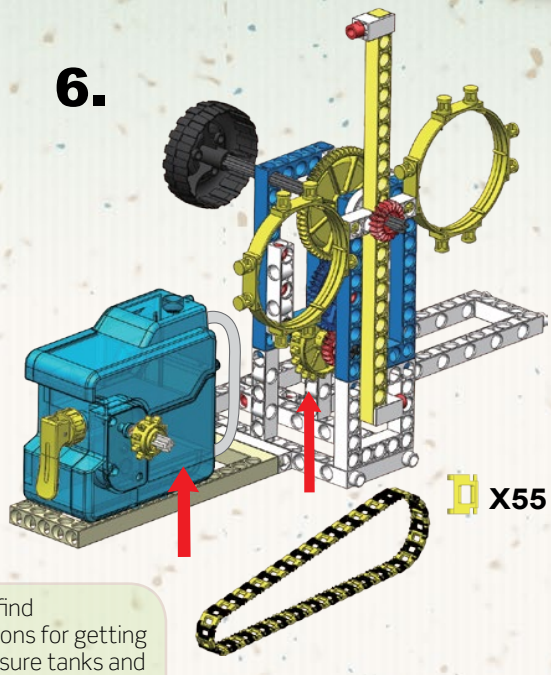
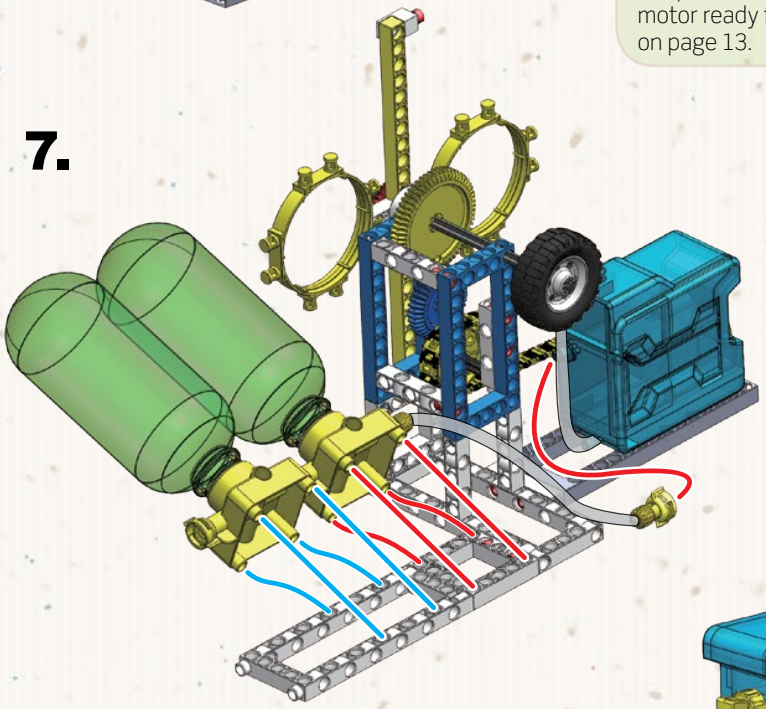


You will find instructions for getting the pressure tanks and motor ready for action on page 13.

7.



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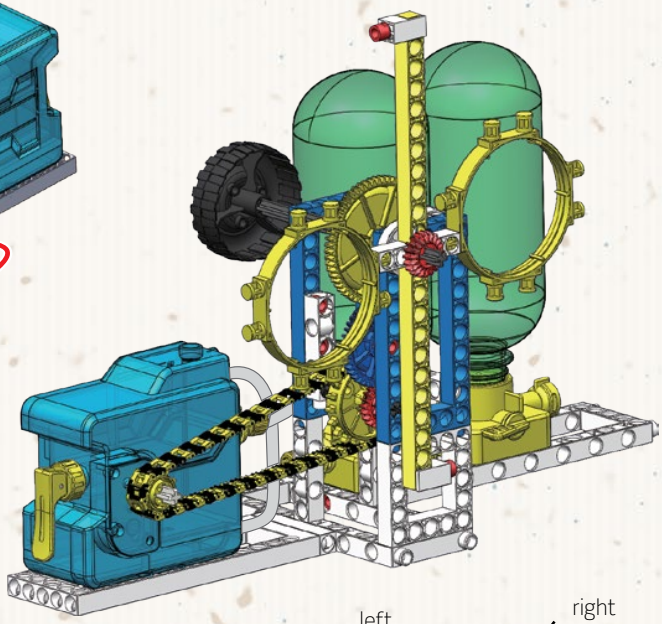
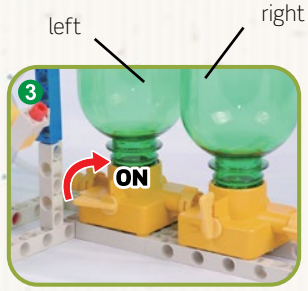


Assembly notes

1. The model will run best if you leave a gap 1 mm wide between the gear wheels and the frame.
2. Connect the pressure tank to the pump and pump 25 times.
3. First open the right switch and then open the left one when you want to start.



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