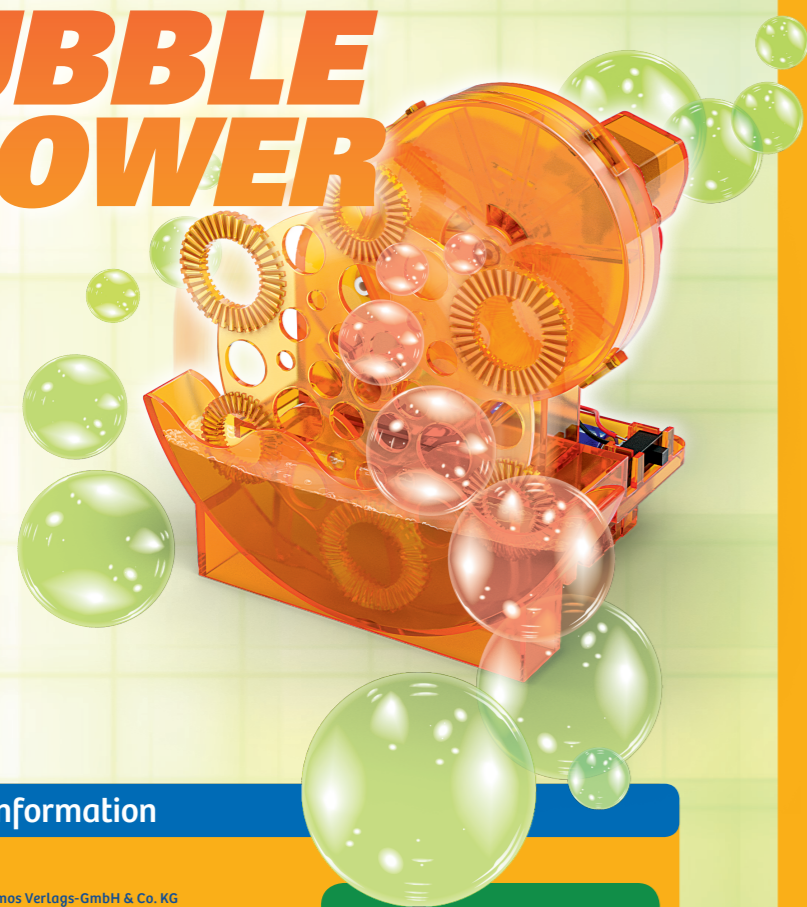


BUBBLE BLOWER



General Information

1st Edition 2013
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DEAR PARENTS!

Please help your child with assembly, and offer your support and assistance with the experiments. Before starting the experiments, read through the manual together and be sure to follow all of the steps described there. Please be careful not to let small kit parts get into the hands of small children. Encourage your child to repeat an experiment if it doesn't yield the desired result the first time. Above all, pay attention to the safety information.

Have fun with the experiments!

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Contents



You will also need:

- > Two AA batteries (1.5-volt, type AA/LR6/penlight)
- > Soap bubble liquid (purchased or made yourself, see back side)
- > Small Phillips-head screwdriver ("crosshead" screwdriver)

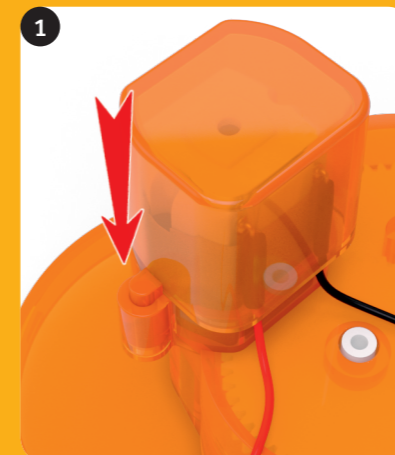
- | | |
|---|----------------------|
| 1 Chassis with battery compartment and soap solution holder | 6 Motor cover |
| 2 Gear box | 7 Motor |
| 3 Fan wheel | 8 Contact spring (3) |
| 4 Fan cover | 9 Sliding switch |
| 5 Soap bubble wheel | 10 Screw |



How to Assemble the Bubble Blower

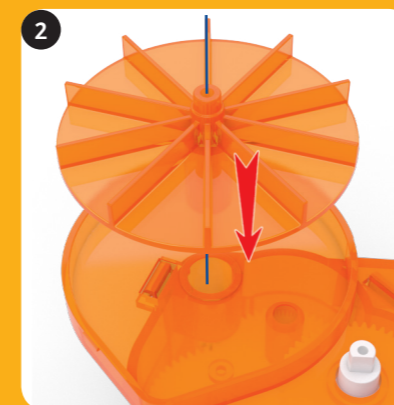
STEP 1

First, assemble the fan. Mount the motor on the gear box in such a way that the wires point toward the lower edge of the box. Place the cover over the motor.



STEP 2

Now turn the gear box over and insert the fan wheel onto the motor shaft.



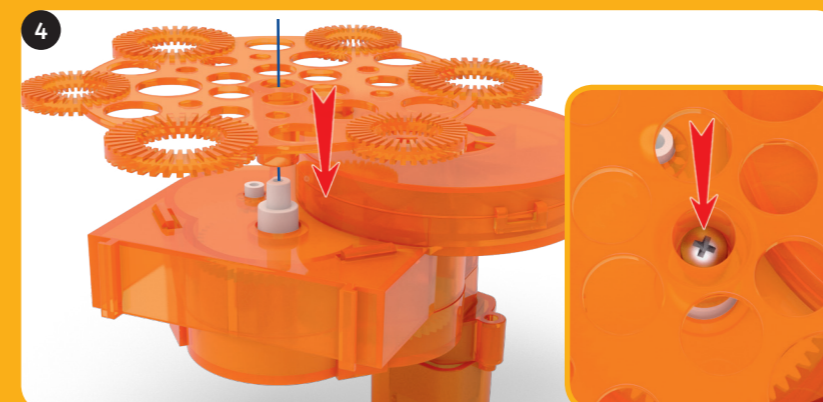
STEP 3

Securely clip on the fan cover.



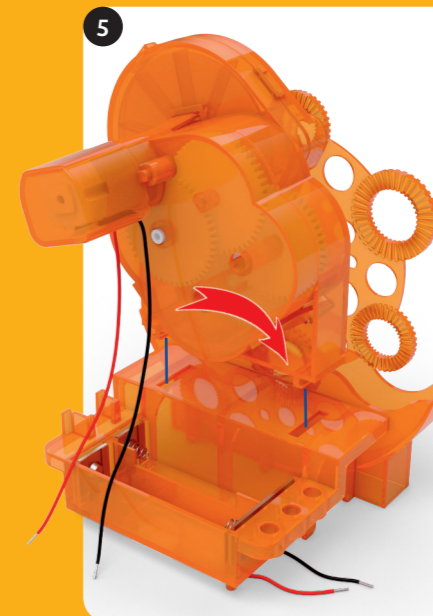
STEP 4

Attach the soap bubble wheel to the gear box. First place it on and then screw in the screw tightly.



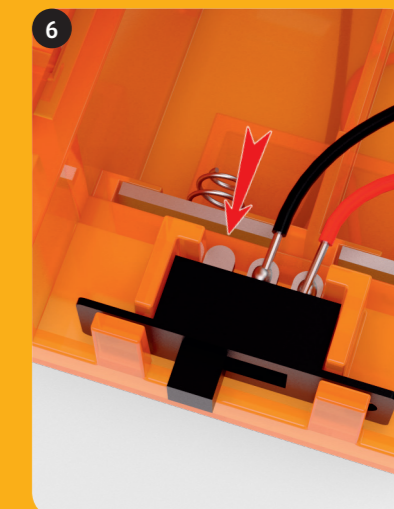
STEP 5

In this step, you will be installing the gear box on the chassis. To do that, first hook on the left side (from the perspective of the battery compartment) of the gear box, and then press down on the right side until it clicks into place.



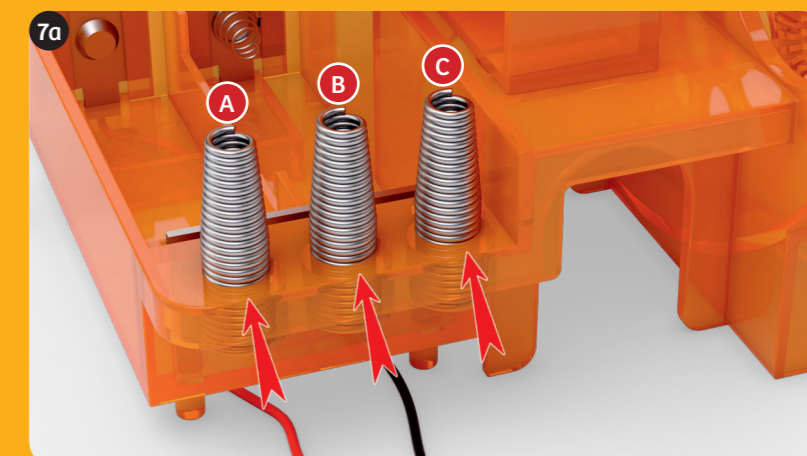
STEP 6

Attach the sliding switch to the chassis bracket. Important! Take a look at the terminals at the rear. The area where no wire is attached is the "off" position. Slide the switch to "off."



STEP 7

Now insert the contact springs into the chassis bracket holes, narrow end down. We are calling the contact springs "A," "B," and "C" from left to right.



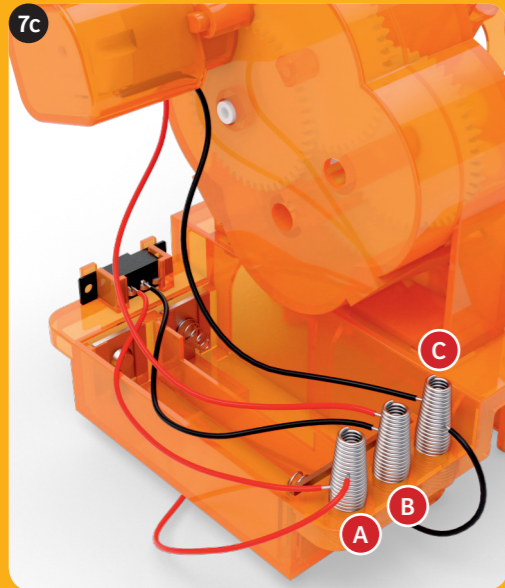
How to Assemble the Bubble Blower



Important: To attach the wires, the contact springs have to be bent far enough to create a slight gap into which you insert the wire.

Now you will connect up the electrical circuit:

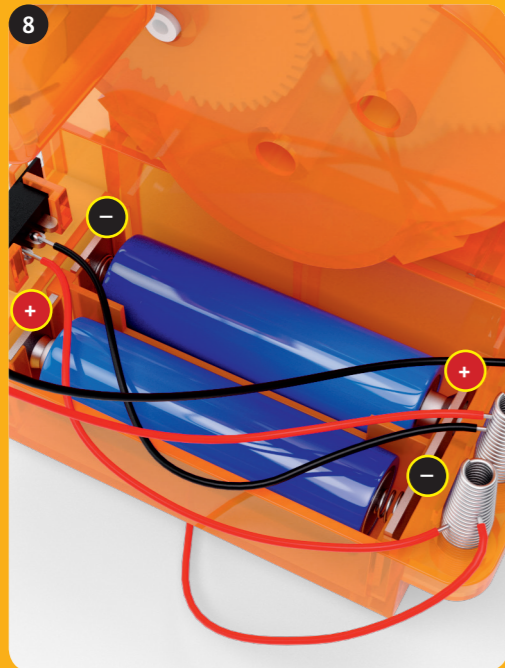
- Attach the black battery compartment wire to spring C.
- Attach the red battery compartment wire to spring A.
- The red motor wire goes to B.
- The black motor wire goes to C.
- The red sliding switch wire goes to A.
- The black sliding switch wire goes to B.



STEP 8

Insert the batteries into the compartment.

Note! Pay attention to the polarity. You will find tiny plus and minus signs on the battery. The same signs appear in the battery compartment. Insert the batteries in such a way that the plus sign on the battery lines up with the plus sign in the compartment, and the minus sign on the battery lines up with the minus sign in the compartment.

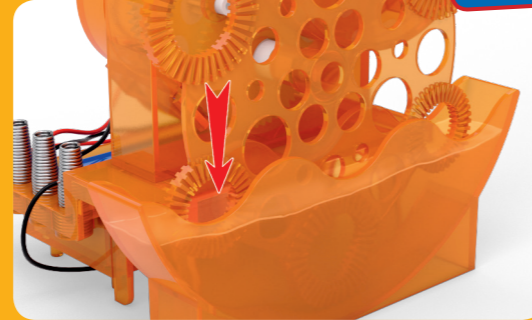


Your Blower Machine Blows Soap Bubbles

EXPERIMENT 1

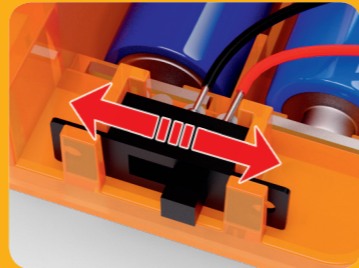
Fill the soap solution container in the chassis with soap bubble solution. Be careful not to spill any, and do not fill it higher than the marked line.

Note! Do not pour any liquid onto the batteries or the contact springs. Be careful not to let any soap solution get into your eyes. If this happens, rinse immediately with water!



The soap bubble blowing machine is turned on and off with the sliding switch. As soon as you switch it on, the soap bubble wheel will start to turn and the fan will blow lots of shimmering bubbles of varying sizes.

WHY The motor turns the soap bubble wheel. As the wheel turns, it dips into the soap bubble solution. The rings on the wheel take up the soap bubble solution. At the same time, the motor powers a small fan. The fan blows air into the rings. That is what creates the soap bubbles.



Making Your Own Soap Bubble Solution

EXPERIMENT 2

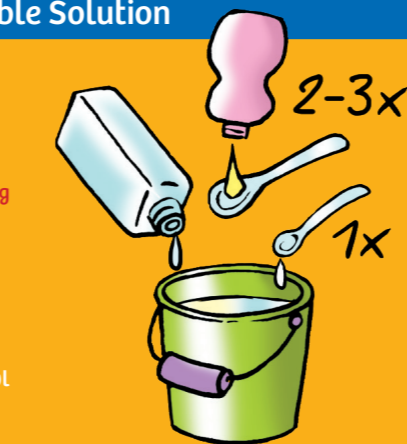
Of course, you can buy soap bubble solution almost anywhere. But it's much more exciting to make your own. It's more fun too!

YOU WILL NEED:

1 liter distilled water; 2-3 tablespoons of dishwashing liquid; 1 teaspoon glycerin (from the drug store); small bucket or bowl

HERE'S HOW:

1. Mix 2 to 3 tablespoons of dishwashing liquid (which contains a lot of soap or detergent) and one teaspoon of glycerin with one liter of distilled water.



2. Stir the ingredients together in a small bucket or a bowl and let the mixture sit for one or two days. As you will see, you can hardly get a better soap bubble solution than this!

Check It Out

? HOW LONG HAVE THERE BEEN SOAP BUBBLES??

Soap bubbles are an age-old amusement. Soap was invented by the ancient Sumerians over 5,000 years ago. Since that time, soap bubbles have been inspiring people the world over.



? IS THERE A RECIPE FOR SUPER-BIG BUBBLES?

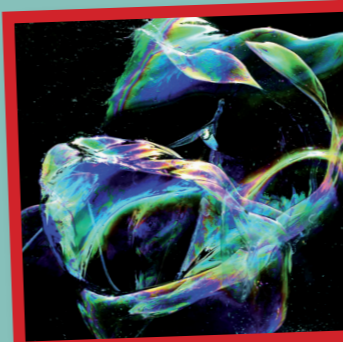
If you just mix soap and water, what you get is bubbles that burst quickly. To make a really good soap bubble solution, you have to add something to the mixture to make the soap bubbles last longer – glycerin. This alcohol-containing



liquid makes the bubbles tougher, more thick-skinned, and longer-lasting. Still, there is no single best recipe, because soap solutions always behave differently depending on the climate and time of year.



? HOW DO THE COLORS GET INTO THE SOAP BUBBLES?

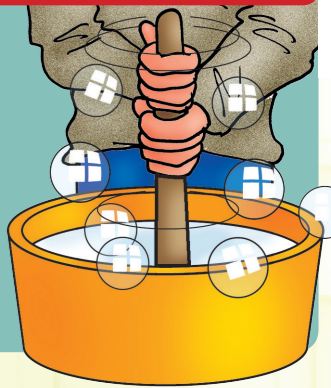


Colors come from white light, which contains a combination of all visible colors. Light moves in waves, and each wave has a different length. When light waves strike a film of soap, most of the light travels through the soap skin. A small portion, however, gets thrown back (reflected), like with a mirror. In this process, the light waves on the front wall of the soap bubble and the waves on the back wall become superimposed on each other, over and over. This phenomenon is known as interference (wave superposition). This kind of interference is the reason for the alternating pattern of different colors on a soap bubble.

Check It Out

? WHAT KIND OF WATER IS BEST FOR SOAP BUBBLES?

Ordinary tap water and spring water often contain minerals such as calcium, which makes them "hard." For soap bubbles, on the other hand, "soft" water (without calcium) is better, because the softer the water is, the longer the bubbles will last. The best thing to use is so-called "distilled water."



Safety Information

NOTE! Not suitable for children under 3 years of age. There is a danger of choking due to small parts that may be swallowed or inhaled.

NOTE! Only for use by children 8 years and older. Instructions are included for parents or other supervising individuals. Please follow them! Save the packaging and instructions. They contain important information.

- To operate the bubble blower, you will need two AA batteries (1.5-volt, type LR6/AA/penlight), which could not be included in the kit due to their limited shelf life.
- The supply terminals are not to be short-circuited. A short circuit can cause the wires to overheat and the batteries to explode.
- Different types of batteries or new and used batteries are not to be mixed.
- Do not mix old and new batteries.
- Do not mix alkaline, standard (carbon-zinc), or rechargeable (nickel-cadmium) batteries.
- Always insert batteries in the right polarity orientation, pressing them gently into the battery compartment.
- Do not recharge non-rechargeable batteries. They could explode!
- Rechargeable batteries are only to be charged under adult supervision.
- Rechargeable batteries are to be removed from the toy before being charged.
- Exhausted batteries are to be removed from the toy.
- Dispose of used batteries in accordance with environmental provisions.
- Be sure not to bring batteries into contact with coins, keys, or other metal objects.
- Avoid deforming the batteries.
- The wires are not to be inserted into socket-outlets.

Information about Environmental Protection

None of the electrical or electronic components in this kit should be disposed of in the regular household trash when you have finished using them; instead, they must be delivered to a collection location for the recycling of electrical and electronic devices. The symbol on the product, instructions for use, or packaging will indicate this.



The materials are reusable in accordance with their designation. By reusing or recycling used devices, you are making an important contribution to the protection of the environment. Please consult your local authorities for the appropriate disposal location.