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The following terms form a legal agreement between you ("Consumer") and AntiGravity Research Corporation ("AntiGravity"). By using this product and/or its documentation (hereinafter referred to as "product") as provided or in any subsequent form, you acknowledge that you have read, understood, and agree, to be bound by these terms and to comply with all applicable laws and regulations. If you do not agree to these terms, do not use this product and return it, for a full refund, to the original place of purchase.

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AntiGravity shall not be liable for any consequential or incidental damages, injury, loss or expenses arising from the use or inability to use this product for any purposes whatsoever, or for any willful or accidental misuse of the product. By using the product, the consumer acknowledges that the product is intended for specific educational and recreational purposes and that adult supervision, caution and reasonable care should be exercised in its use. Unacceptable uses include but are not limited to, launching the product into the flight path of aircraft, launching the product toward people or vehicles, or using the product to create an explosive device or using the product in any way which may cause injury to self or others. The consumer agrees to release AntiGravity, its owners, employees, heirs, assigns, officers, agents and associates from any and all liability, claims, demands or actions or causes of actions arising from or blame whatever arising out of any damage, injury, loss or death resulting from any cause whatever, whether the result of misuse, the fault of the user, a defect in the product or from any other cause whatever, regardless of intention. No action or representation written or verbal on the part of AntiGravity or any other can amend, make void, or alter this product liability limitation in any way at all. The consumer agrees to all of the terms of this limitation when using the product. If you do not agree to these terms, then do NOT use the product and return it, for a full refund, to the original place of purchase.

DISCLAIMERS

AntiGravity explicitly states that this product is not meant for use by unsupervised children and is not meant for use with any air pump other than a standard low pressure hand-powered bicycle air pump, nor is it meant for use with any bottle other than a plastic bottle that previously contained fizzy pop. Using any air pump capable of applying more than 80 pounds per square inch of pressure or using anything other than a pop bottle is strongly DISCOURAGED.

JURISDICTION

AntiGravity is located in and operates from Chilliwack in the province of British Columbia, Canada and no other location. The laws of the province of British Columbia shall govern these terms and conditions and any dispute related thereto without regard to choice of law rules. Consumer hereby consents and agrees to exclusive jurisdiction and venue of courts in New Westminster, British Columbia, Canada. Use of this product is unauthorized in any jurisdiction that does not give effect to all of these terms including, without limitation, this paragraph.

SEVERABILITY

If any part of this agreement is deemed to be invalid or unenforceable for any reason, then such invalid or unenforceable provision shall be deemed superceded by a valid and enforceable provision that most closely matches the intent of the original provision and the remainder of the agreement shall remain in effect.

www.antigravityresearch.com email: sales@antigravityresearch.com toll-free: 1-866-546-8633
phone 604-824-9021 fax 604-648-8192



Also included with your High Altitude Pro Edition kit:

Filling Hose / Launcher

Lets you pump up the rocket from a safe distance away. Releases automatically when you stop pumping.



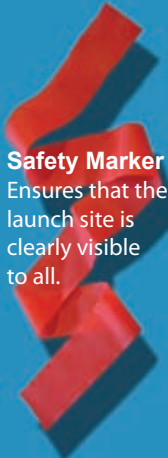
Guide Rod

Keeps your rocket pointed up until it's going fast enough to continue on straight up.



Safety Marker

Ensures that the launch site is clearly visible to all.



Clear pictorial instructions

Makes the rocket easy to assemble, a breeze to launch.



Requirements:

- 1 - Bicycle air pump
- 1 - Plastic pop bottle
- 100 ml water
- 1 - 1000' wide open field

Closed-cell foam bumper pad for a safe, soft touch-down every time.

Designed to fit on any plastic pop bottle you choose.

Super-light expanded polymer struts instantly fold out and click into place.

Fluted tubular polypropylene struts lock ring fin in position for aerodynamically superior performance.

Circular fin profile exhibits almost invisible aerodynamic drag characteristics.

High Altitude Pro Edition

Water Rocket Kit To 250 feet

Entire rocket weighs only 60 grams, maximizing both altitude and safety.

Shock-absorbing mounting system for maximum reusability.

Reduction-type nozzle for long-lasting thrust, impressive vapor trail, and higher altitude.

Low-friction guide tube keeps the rocket pointed up during liftoff.

Reasonably priced spacecraft for the home, school or office.



Preparing the Rocket Bottle

Unless you bought one of our brand new bottles or stretched bottles for your rocket, you'll need to find an empty, used pop bottle. Make sure to only use a plastic bottle that used to hold fizzy pop. Don't use a water bottle, as it is not strong enough to hold the required pressure. Never use a bottle that has been damaged in any way, or that has any visible flaws.

1

Use a pair of snippers or a nail clipper to remove the retaining ring from the mouth of the bottle. If you don't remove it, the retaining ring can interfere with the positioning of the fins.

2

Remove the label from the bottle by gently heating the glue with a hair dryer. The label should then peel off easily. The rocket will fly higher without the extra unnecessary weight of the label.

**3**

This is what the finished bottle should look like. Now you are ready to begin assembling the rocket.



Bumper Installation

The bumper is important because it softens the impact when the rocket lands. Always make sure the bumper is properly attached and centered on top of your rocket before launching. It not only protects what (or who) it hits, it makes the rocket last longer.



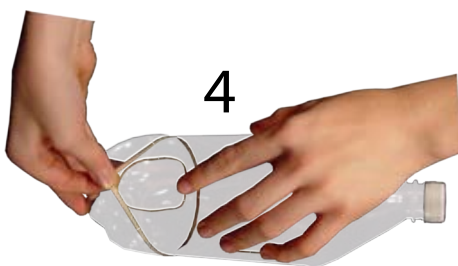
Start with a bottle, a bumper pad, a fat elastic band and a long elastic band.



Stretch the fat elastic band and put it over the bottom of the bottle.



This is what it looks like with the fat elastic band in place.



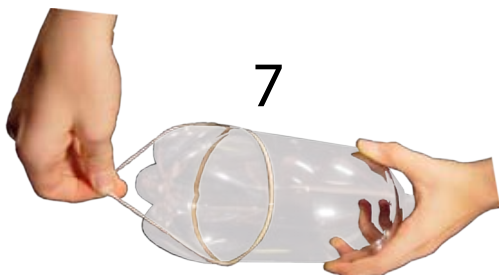
Lift the fat elastic and slide the long elastic underneath it.



The long elastic now passes beneath the fat elastic, making two loops.



Pass both thumbs through both loops in the long elastic and slide your thumbs to opposite sides of the bottle.



Pull the long elastic's loops up over the end of the bottle, high enough to slide the bumper under.



Slide the bumper pad under the long elastic and let go of the elastic.

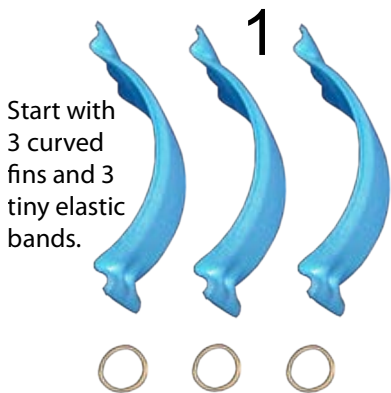


This is exactly what the bumper pad should look like on your rocket.

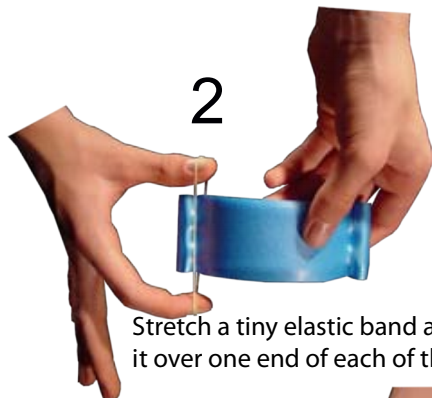


Assembling the Ring Fin

The ring fin is a very light, low friction system for keeping your rocket stable. It is useful for two-stage rockets, high altitude single-stage rockets, double fin rockets and just about any type of rocket your imagination can create.



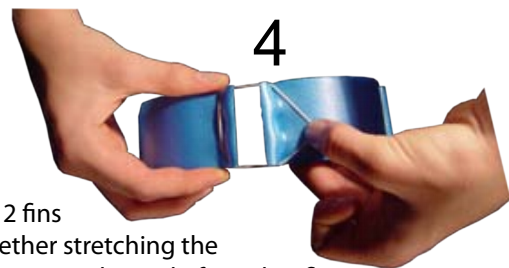
Start with 3 curved fins and 3 tiny elastic bands.



Stretch a tiny elastic band and put it over one end of each of the fins.



See how all 3 fins have an elastic on one end?

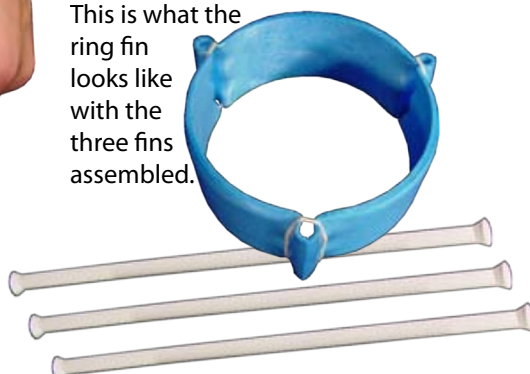


Put 2 fins together stretching the elastic over the end of another fin.



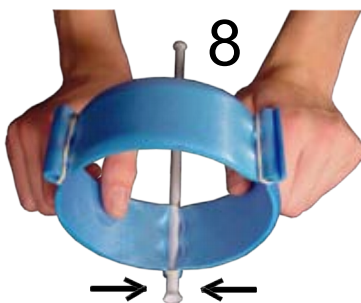
Put 2 fins together 3 times. Now the fins make a ring.

This is what the ring fin looks like with the three fins assembled.



Now you will need three white flared posts. Don't kink or bend them or they get weaker.

Now, let's install the posts. The ring fin will hold onto the posts like a clamp.

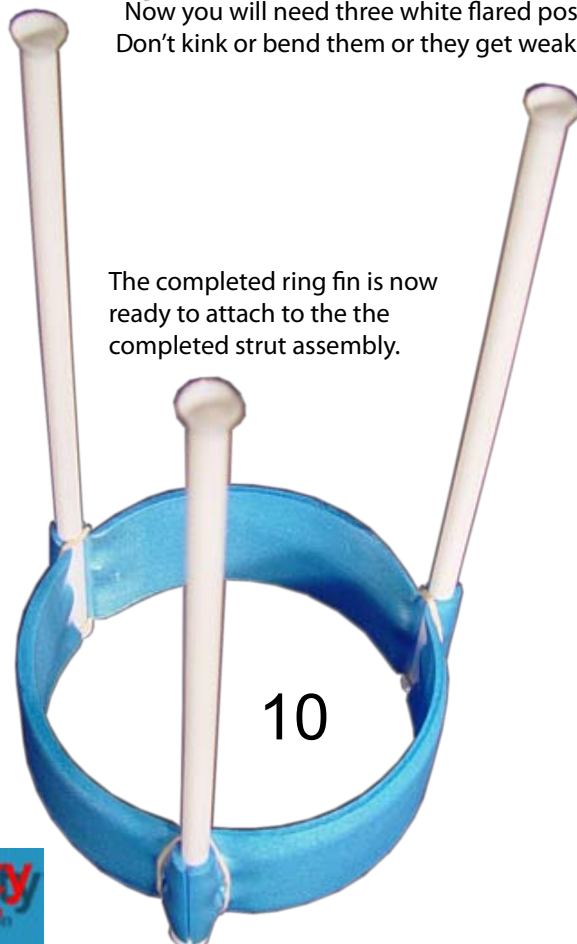


With the post resting on a table, pull apart 2 of the fins and allow them to close around the post. Repeat this for all 3 posts.



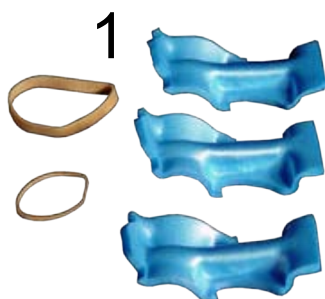
Push each post in until it stops at the flared end.

The completed ring fin is now ready to attach to the the completed strut assembly.



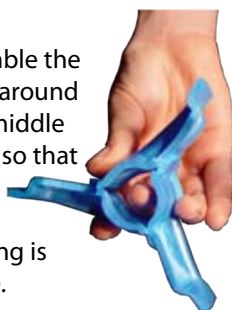
Assembling the Struts

The struts are used to hold the ring fin assembly onto the bottle. They are part of the 2-stage rockets or the High Altitude Pro rocket.



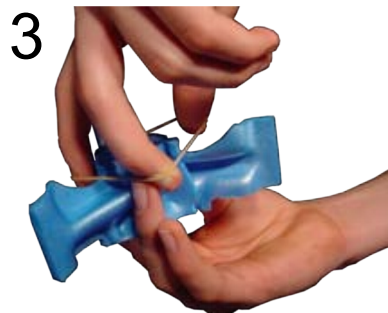
1 Start with 3 struts and 2 elastic bands.

Assemble the struts around your middle finger so that the small opening is visible.



2

Use your thumb and 2 fingers to stretch the small elastic into a triangle shape.



3 Install the small elastic on the small opening.



4 This is what the properly installed small elastic looks like.



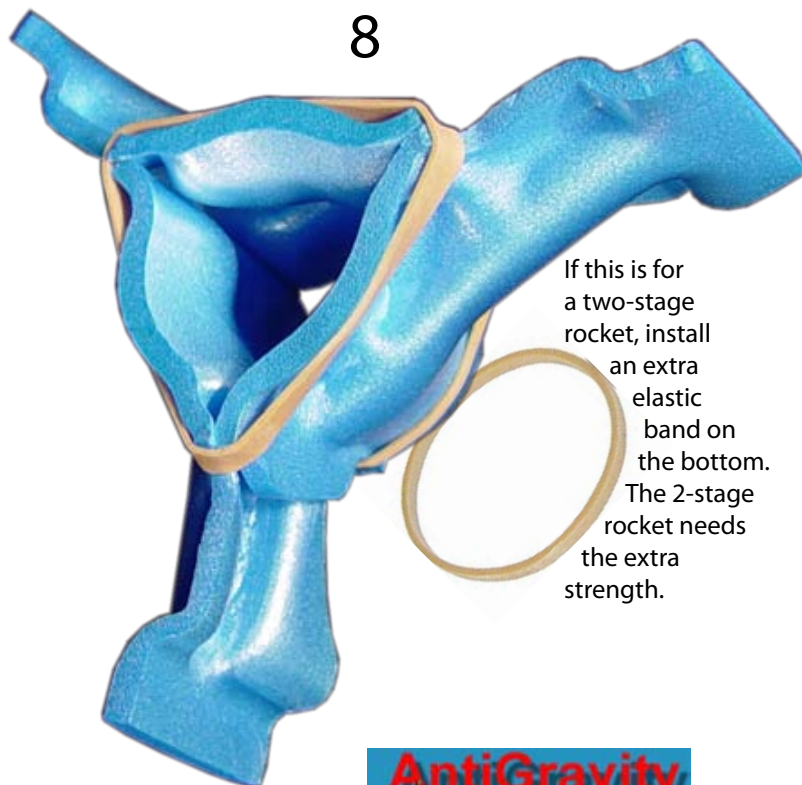
5 Transfer the assembly to your other hand.



6 Use your thumb and 2 fingers to make a triangle of the fat elastic band and place it over the large opening.



7 This is what the properly installed fat elastic band looks like.

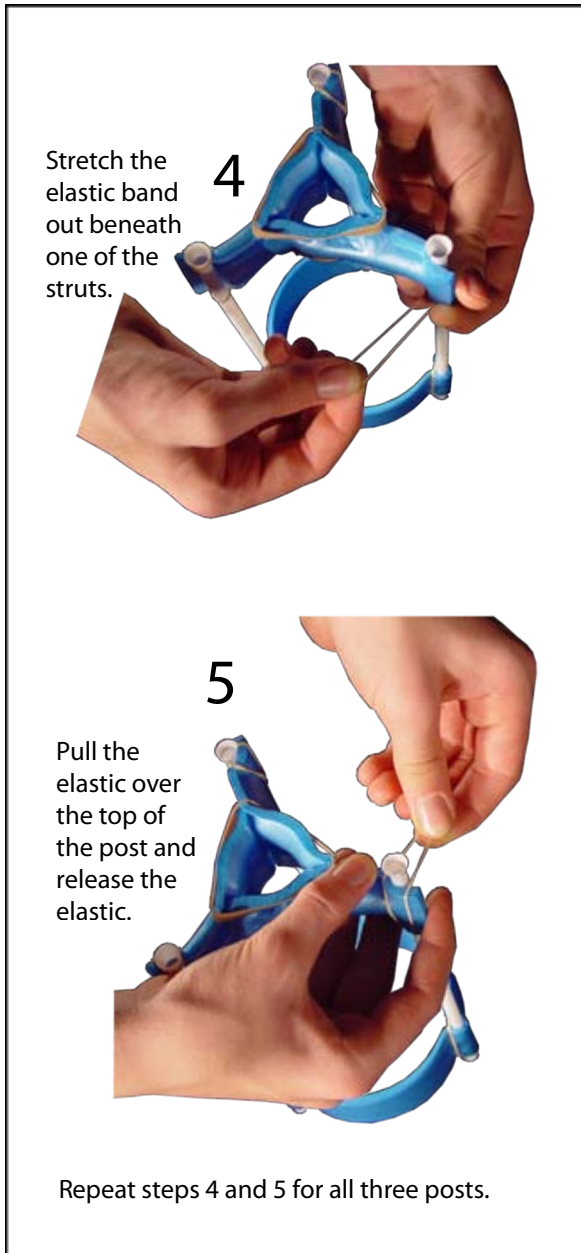
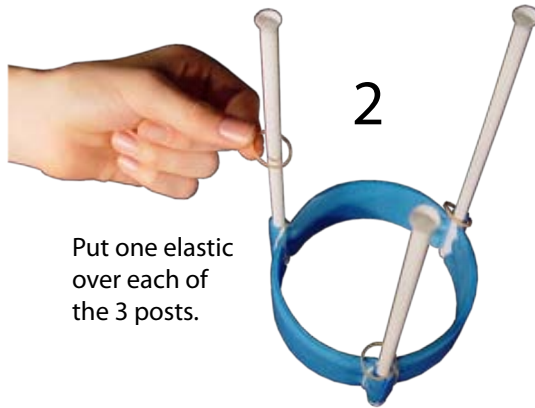
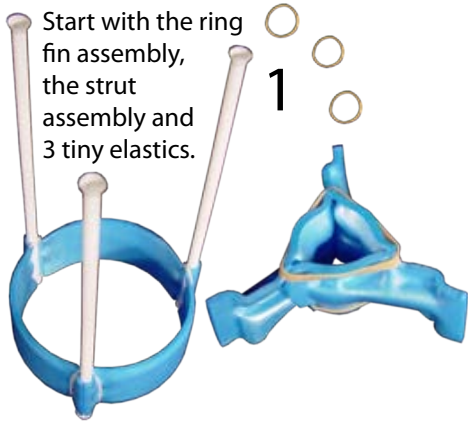


8 If this is for a two-stage rocket, install an extra elastic band on the bottom. The 2-stage rocket needs the extra strength.



Combining the Upper Struts with the Ring Fin

These are the fins that are usually used on the upper stage of the 2-stage rockets, or on the Pro Edition.



Rocket Fuel

When you head out to the field with your water rocket, it is important that you bring a supply of water with you. A 2-liter pop bottle works well as a container for that supply. Two liters should give you about twenty single-stage rocket flights, or ten 2-stage rocket flights. If the weather is below the freezing point of water, add some salt to the fuel to keep it from freezing.

For extra altitude and an impressive vapor trail, add about 10% to 25% non-toxic hand-wash dish soap to your water. The soapy exhaust will leave a brown spot on the lawn where the rocket lifts off, so make sure this is okay before using soap. You can run the rockets without any water, but they won't fly as high.

1



Plain ordinary water works very well as a rocket fuel. Don't forget to put the cap back on after each use, or your supply of water will all spill out.

Or

1



For a soap mixture, first add 200 ml to 500 ml of non-toxic hand-wash dish soap into a 2-liter bottle.

2

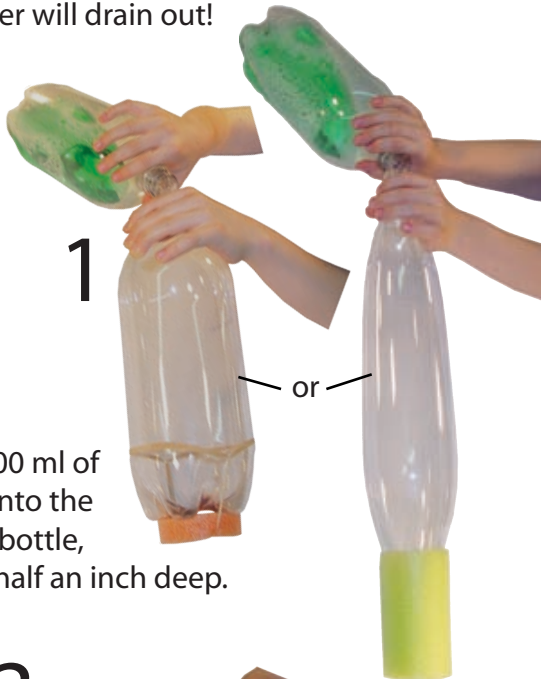


Then fill the rest of the bottle with water, put the cap on and gently shake until mixed.



High Altitude Pro or Extreme Screamer: Adding water and Connecting the Launcher

Once you put water in, keep the rocket on its side until you have completed step 4, otherwise the water will drain out!



1

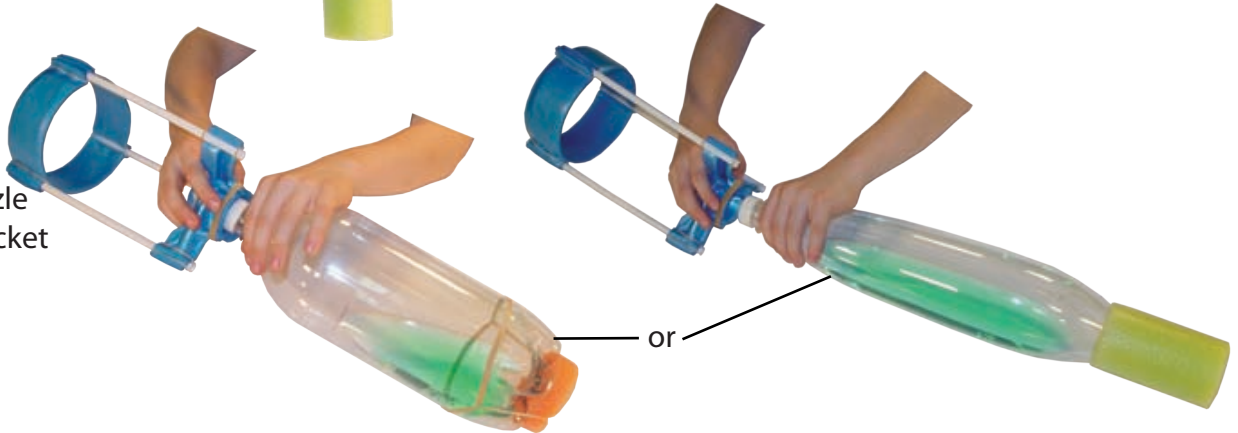
Pour 100 ml of water into the rocket bottle, about half an inch deep.

2 Screw on the nozzle firmly.



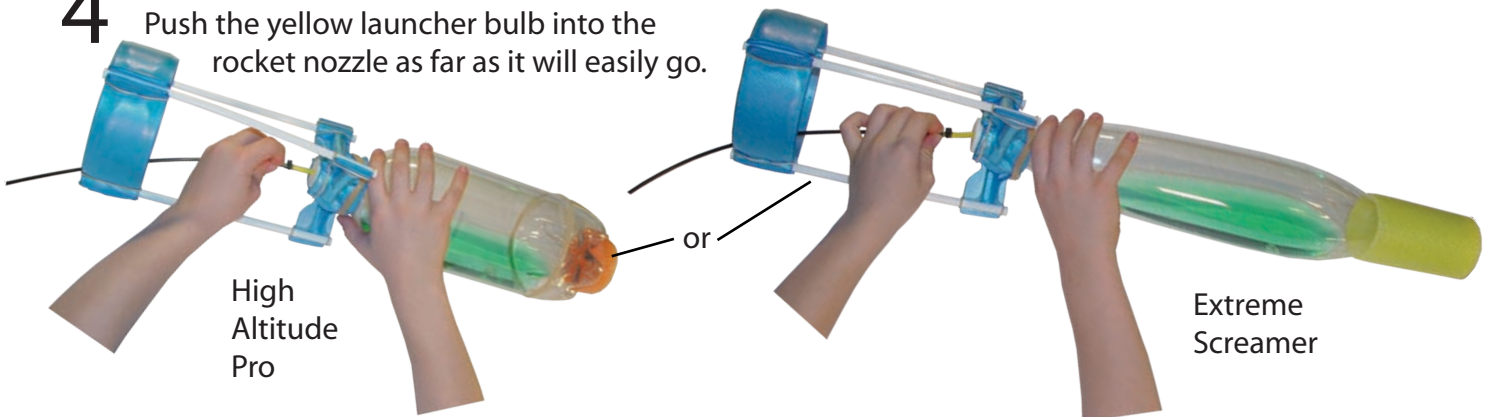
3

Push the ring fin assembly onto the nozzle end of the rocket until it clicks.



4

Push the yellow launcher bulb into the rocket nozzle as far as it will easily go.



High Altitude Pro

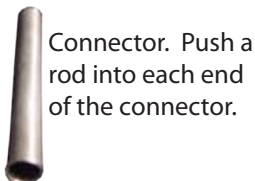
Extreme Screamer

Now the rocket is ready to slide onto the guide rod!



The Guide Rod

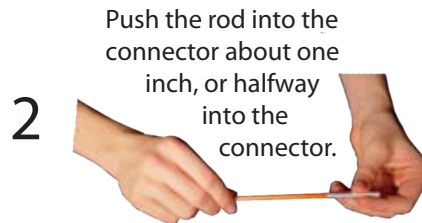
The guide rod keeps the rocket pointed straight up until it is going fast enough to be stable. The longer the guide rod, the more vertical the flight. The rocket should have water in it and be connected to the filling hose already. If your guide rod is a 12-inch single stick, go directly to step 4. For a 3-foot rod or 6-foot rod, start at step 1.



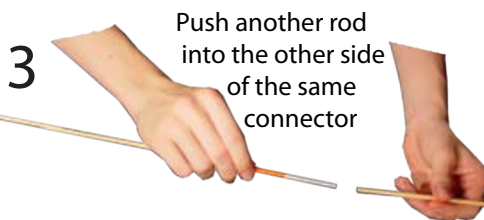
The safety marker prevents you from tripping over the guide rod by making it easy to see.



1 Push a metal connector onto a rod.



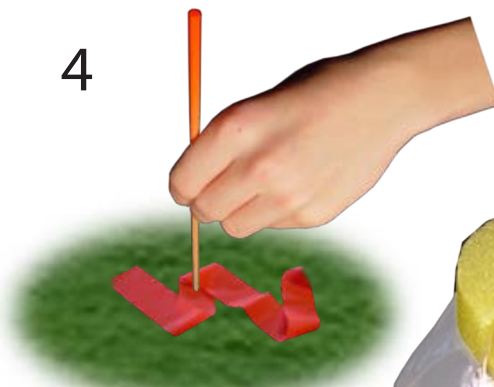
2 Push the rod into the connector about one inch, or halfway into the connector.



3 Push another rod into the other side of the same connector

Repeat steps 1, 2 and 3 until the rod is as long as you need. Don't make it longer than 6 sections or it's too high to reach over the rocket.

4



Making sure the rod points straight up, push it through the red safety marker into the ground about 2 inches, or until it is firmly planted.

6-foot rod

3-foot rod

5

Lift the rocket to the top of the rod and slide the guide tube over the rod. Slide the rocket down until it rests firmly on its fins on the ground.



6

Ready to fill with air! The rocket's fins rest firmly on the ground and the guide tube is ready to slide up the rod when the rocket takes off.



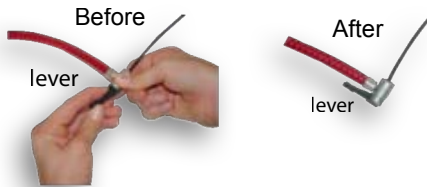
Launching your Rocket

Though you can use any similar air pump, AntiGravity's Rocket Pump is specially designed to easily handle the rigorous conditions involved in water rocket launching. The secret is the pressure reservoir canister, which dissipates heat and absorbs pressure peaks. Always use a hand powered pump to pressurize your rockets, never a compressed air tank or electric or automatic pump. With a hand-powered pump, you stop pumping when the rocket launches, so the little yellow bulb at the end of the launcher doesn't stretch and burst. You also stop pumping if your cell phone rings or if someone interrupts you but an automatic pump keeps on pumping. Plus it's great exercise to pump up a rocket! Always stay at least 20 feet away from the pressurized rocket, and keep everyone else 20 feet away from it, just in case it explodes.

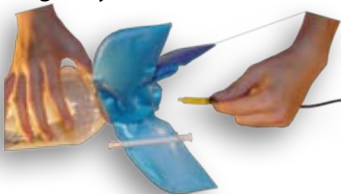
- 1 Push the launcher hose connector into the rocket pump connector.



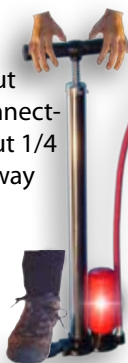
- 2 Push the lever down by holding the metal rocket pump connector, not the hose.



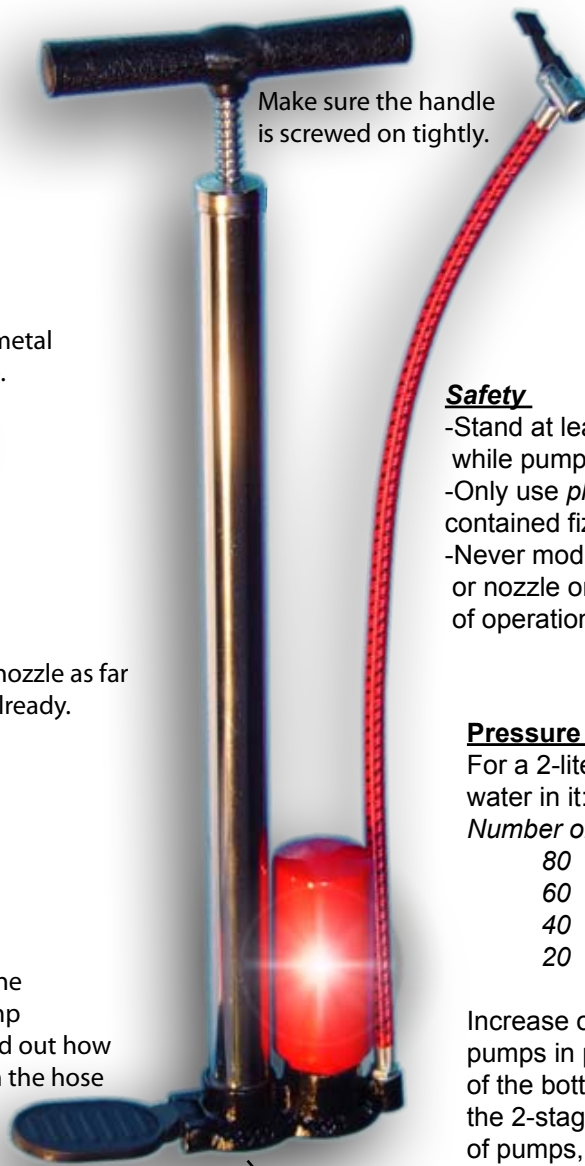
- 3 Push the yellow bulb into the rocket nozzle as far as it will go, if you haven't done this already.



- 4 Place both hands on the handle and one foot on the foot rest, and begin to pump (See pressure guide on this page to find out how much to pump). If no air goes through the hose to the rocket, back out the connector about 1/4 of the way and try again.



- 5 If rocket doesn't launch on it's own, just stop pumping. If it still doesn't launch (usually at lower pressure) disconnect the pump from the launcher hose.



When not in use, keep the pump indoors, away from sunshine and water.

Safety

- Stand at least 20 feet away from the rocket while pumping.
- Only use *plastic* bottles that previously contained fizzy pop.
- Never modify an AntiGravity launcher hose or nozzle or it may adversely affect safety of operation.

Pressure Guide

For a 2-liter plastic bottle with 100 ml water in it:

Number of Pumps	Air Pressure (psi)
80	80
60	60
40	40
20	20

Increase or decrease the number of pumps in proportion to the volume of the bottle you are pressurizing. For the 2-stage rocket, double the number of pumps, because it has 2 bottles to fill.

If you add more water, use fewer pumps.

Pumping faster allows the rocket to hold on longer and fill to a higher pressure.

