

HIGH ALTITUDE ROCKET



**INSTRUCTIONS
& LEARNING GUIDE**

SAFETY INFORMATION

⚠ WARNING: Not suitable for children under 14 years of age.

⚠ CAUTION: Keep away from obstacles and electrical hazards. For outdoor use only. Adult supervision advised.

IMPORTANT: Read instructions carefully before each use. Retain this information and address for future reference.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

INSTRUCTIONS FOR SAFE USE

- Never look down the extension tubes.
- Never place any body parts or animals on the extension tubes or air exits.
- Never fire your rocket indoors.
- DO NOT attempt to catch the rockets.
- DO NOT launch rockets near people or animals.
- Follow the National Association of Rocketry (NAR) Safety Code (enclosed).

PRE-LAUNCH SAFETY CHECK

- Always launch in clear conditions. Never launch on windy days.
- Always ensure you have a large, clear area to fire the rocket.
- Always make sure the launcher base is stable and level before using.
- Before your first launch of the day, pull the air pressure release valve a few times to release any pressurized air that may have remained in the tank after your previous launch.
- Check rockets carefully for damage before each launch. NEVER LAUNCH A DAMAGED ROCKET.
- Always keep a good distance (10–20 feet [3–6 m]) from the base to get the best view of the rocket.

POST-LAUNCH SAFETY CHECK

- After you are done launching for the day, pull the air pressure release valve a few times before storage to remove any pressure in the tank.
- Discard damaged rockets.

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MAINTAINING YOUR LAUNCHER

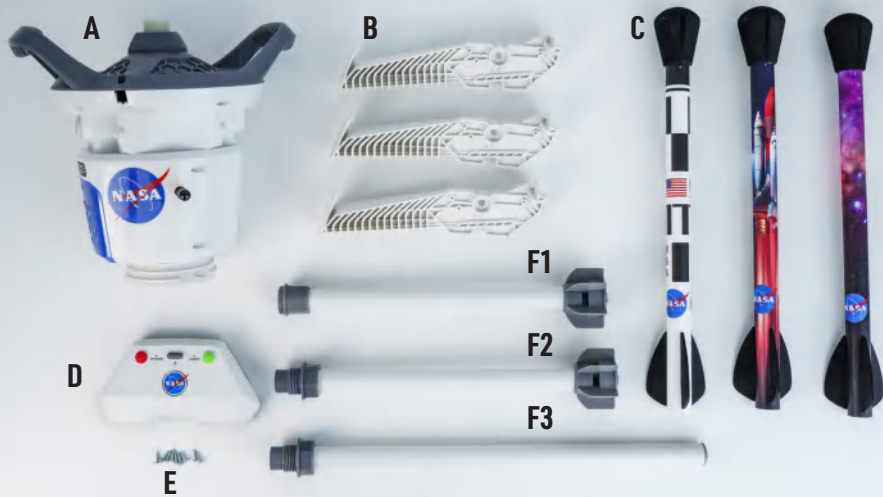
- Always carry the launch base by the handles.
- Never place anything other than the rocket on the extension tubes.
- Never put liquids in the extension tubes or base.
- Never pressurize the tank without the extension tubes installed, the legs installed, and the remote and launch base turned on.
- Always protect the base and remote electronics from moisture.

Note: *This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

INSTRUCTIONS



KIT INCLUDES

A: Launch base

Requires one 9V battery, not included

B: Launch base legs (x3)

C: Rockets (x3)

D: Remote

Requires 4 AAA batteries, not included

E: Screws (x9)

F: Extension tubes (1, 2, 3)

The tube that screws directly into the base is #1, the middle extension tube is #2, and the launch tube is #3—an image will be helpful in identifying the extension tubes.

NEED TO GET

- Air pump

You may use a variety of air pumps with this rocket including hand pumps, bike tire pumps, electric pumps, or floor pumps. Your air pump will need to use a Schrader valve and have a maximum 150 psi.

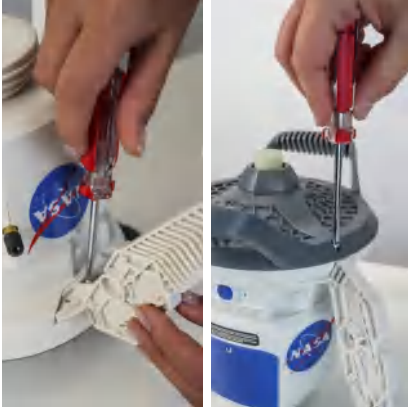
- Phillips head screwdriver

- 9V battery

- 4 AAA batteries

ASSEMBLY

1. Attach each of the three launch base legs to the launch base using the included screws and a Phillips head screwdriver. Each leg requires 3 screws, two on the bottom and one on top.



2. Remove the battery cover on the launch base with the Phillips head screwdriver and install one 9V battery. Reattach the battery cover.



3. Screw extension tube #1 directly into the launch base.



4. Screw extension tube #2 into extension tube #1.



5. Screw extension tube #3 into extension tube #2. Ensure all connections are secure.

6. Remove the battery compartment cover on the remote control and install 4 AAA batteries. Reinstall the battery compartment cover.



LAUNCH INSTRUCTIONS

Note: Before any launch, refer to the safety information section at the beginning of this booklet to ensure safe, successful launches. Your launch base must be stable and level to launch.

1. Prior to your first launch, pull the air pressure release valve loop a few times to depressurize the tank inside and to ensure its properly functioning. This is a metal ring found underneath and inside the launch base. **Note:** The spring should pull back to its original position.



2. Turn on the launch base by pressing the power button. The LED light to the right of the power button will be a solid red when the base is powered on and level.



3. Turn on the remote by pressing the power button in the center. The left LED light will flash red, the right LED light will be off.



4. Place your rocket on the launch tube and ensure it's pushed as far down as it will go. Ensure your launch site is free of any hazards, people, or animals.



5. Attach the air pump to the valve on the side of the launch base. You may leave the air pump attached to the rocket base if you're performing multiple launches.



6. Add air pressure to the launch base. You may launch at any pressure, but we recommend between 100 and 120 psi for the most impressive launches. **Note:** *There is a safety valve on the bottom of the tank set at 125 psi. It will automatically release any pressure above this setting.*

7. Step back 10-20 feet (3-6 m) from the rocket base for the best viewing of your launch. If your remote begins to flash both LED lights, you've lost connectivity to the base and will need to move closer.

8. Press and hold the left button. The red LED light on your remote will turn solid and you will hear "Ignition Activated."

9. Continue holding the left button until the right LED flashes green and you hear "Ready to Launch." Once you've heard "Ready to Launch" press the right button to launch your rocket.

Note: *The remote will say "Ready to Launch" three times. If you do not press the right button to launch in that time, the launch will be canceled. If the launch cancels, return to Step 9 and try again.*

10. Stay clear of your rocket as it returns to the ground. Retrieve your rocket, and then return to Step 4 to launch again.

11. Once you're done launching for the day, detach the air pump from the launch base. Then pull the air pressure release valve ring a few times to release any residual pressurized air from the tank.

TROUBLESHOOTING

I'm experiencing a "Tilt Fault" error.

- The launch base has an angle sensor inside to ensure the rocket only fires upward. If the base is not vertical the rocket will not launch, and you will experience a "Tilt Fault" error. You will know you're experiencing a "Tilt Fault" error in two ways:

1. The base LED light to the right of the power button will flash.

2. The remote will say "Tilt Fault" when you press any button.

- If you're experiencing a "Tilt Fault" error try moving your launch base to a more stable, level position.
- If the base is level and you still get a "Tilt Fault" error, pick up the launch base by the handles and pull the air pressure release valve ring to release any pressure from the tank. With the pressure released, turn the launch base upside down then right side up a few times to reset the tilt sensor then try your launch sequence again.

My remote is not making sounds.

- Check that the batteries are installed correctly in your remote and in the launch base and ensure none of the batteries have expired.
- Check that the launch base is turned on and the LED light on the launch base is solid.
- If both LED lights on the face of the remote are flashing, you are too far from the launch base. Move closer to reestablish the connection between the remote and the launch base.

My air tank won't hold pressure.

- In the event your air tank won't hold pressure, you may hear air coming out of the launch tube.
- In this case, lift the launch base by the handles and release any air pressure still in the tank by pulling the air pressure release valve ring.
- With the pressure released, turn the launch base upside down then right side up a few times and try your launch sequence again.

My rocket will not fire.

- Ensure you're following the ignition and launch sequence properly, remembering to keep the left button pressed through the entire sequence.
- Check that the batteries in your launch base and remote are installed correctly and have not expired.

***If any parts or pieces break or don't work,
contact our customer service department for assistance.***

LEARNING GUIDE

WHAT IS A ROCKET?

Have you ever blown up a balloon and then let go of it without tying it off? The balloon moves forward as the air escapes, right? Well, rockets work in the same way. In its most basic form, a rocket is a device that contains pressurized gas that, when released through a small opening, pushes the device in the opposite direction. The amount of force that moves the object forward is called *thrust*. When you stomp on the air bladder attached to your rocket launcher, you are pressurizing the air by forcing it into the much smaller space of the hose. As that air escapes beneath the rocket, it creates thrust, and your rocket zooms into the air!

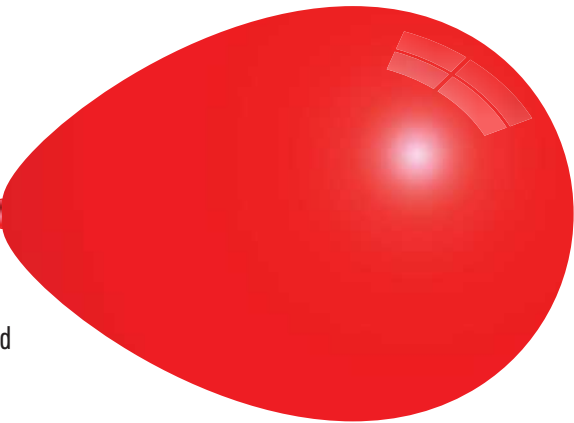
Action

Air is pushed out the back of the balloon



Reaction

The balloon is pushed forward



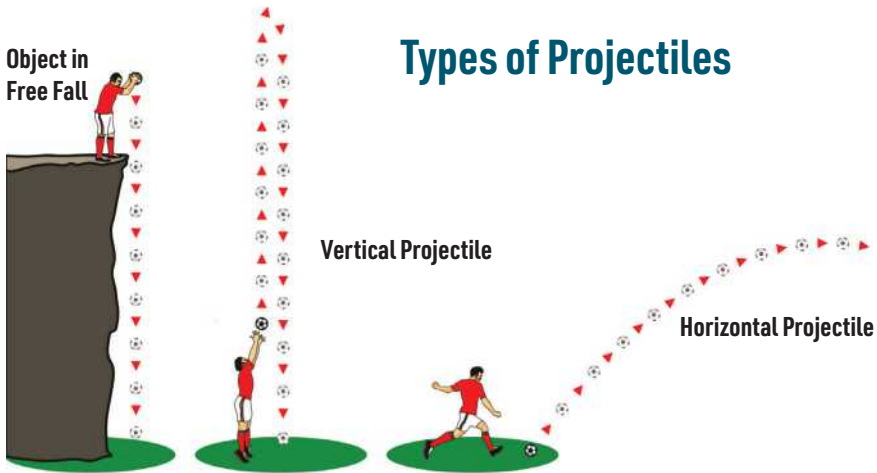
COOL SCIENCE FACT:

The physics of launching a rocket or releasing a balloon can be described by Sir Isaac Newton's third law of motion: "For every action, there is an equal and opposite reaction."

PROJECTILE PHYSICS

Scientists call things that fly through the air (like rockets) *projectiles*, and they study the physics of projectiles to figure out where rockets will go when they blast off. Some of the important questions they have to answer are:

- What kind of force does it take to start the motion of an object?
- How does that force interact with the mass of the object to affect its speed?
- How does gravity act upon the object to affect its downward motion?
- What effect does air resistance have on the object?



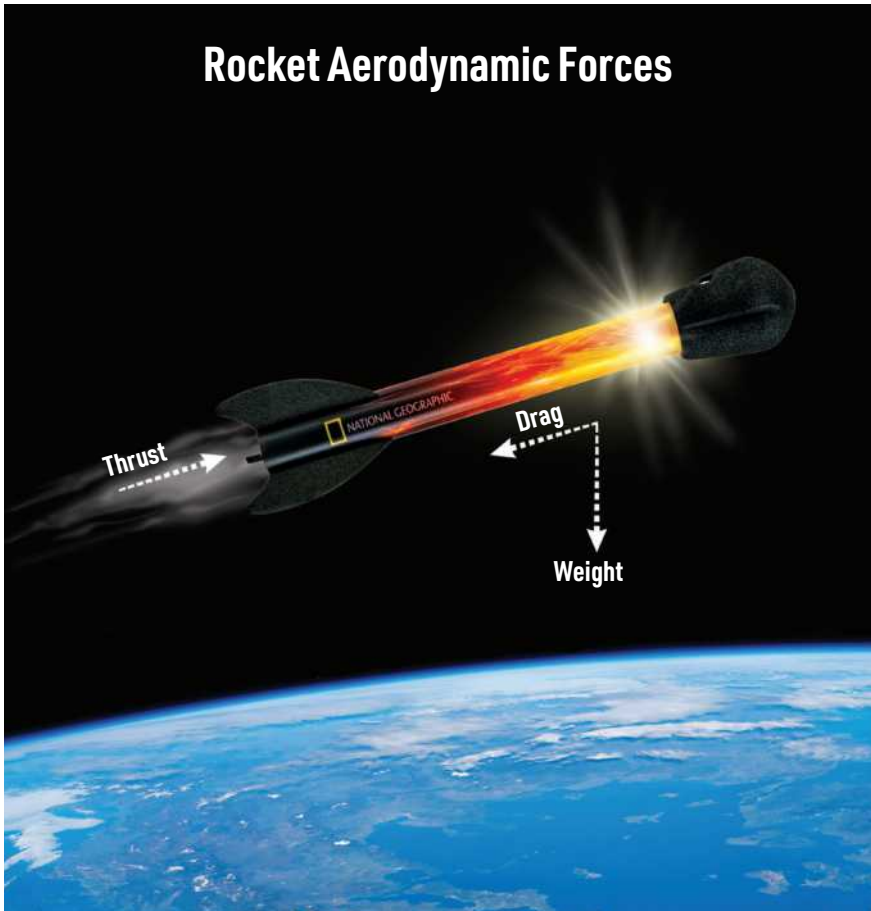
COOL SCIENCE FACT:

Mass is the amount of matter that an object contains, which is not the same thing as weight, which is how much force that mass experiences in a certain amount of gravity. Even though your mass doesn't change, your weight on the moon would be much less than your weight on Earth because the moon exerts a smaller gravitational force.

AERODYNAMICS

The science of *aerodynamics* studies the motion of air and the forces that act on flying objects. Even though we can't see them, the molecules in our air can slow down a rocket by creating friction that scientists call *drag*. Also, the force of air molecules can change where a rocket flies by pushing more on one side than the other. Rocket designers use different shapes to reduce drag and make their rockets fly farther and more accurately.

Rocket Aerodynamic Forces



DID YOU KNOW . . .

SHAPE DOESN'T MATTER IN SPACE?

Science fiction movies and TV shows like to show spaceships with sleek pointy shapes, but since space is a vacuum, friction no longer matters. Once a rocket gets past our planet's atmosphere (about 600 miles / 960 km above the Earth's surface), there are no more air molecules to worry about, and objects in outer space can be any shape at all. What shape would you design?



Getting a rocket past the Earth's atmosphere is no easy job! It takes lots of fuel, and the fuel tanks are the heaviest things on a rocket when it is launched. But as that fuel is burned up, the rocket gets lighter and lighter. Check out a video of a rocket launch and you'll see the rocket accelerating slowly at first and then gaining speed.



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Read all warnings and follow all directions carefully. Adult supervision required. Retain this information, addresses, and phone numbers for future reference. JMW Sales, Inc. shall not be liable for any direct or indirect damages whatsoever arising out of or in connection with the use or misuse of any of their manufactured products. By continuing this experiment/activity you agree and acknowledge that this product should be used as intended and at your own risk.

