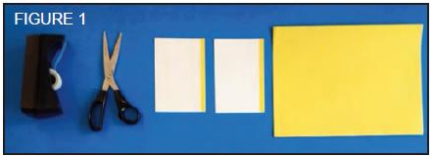


Wizards of Wright

Lesson: Stomp Rockets

Use WOW! Lesson Intro to begin.

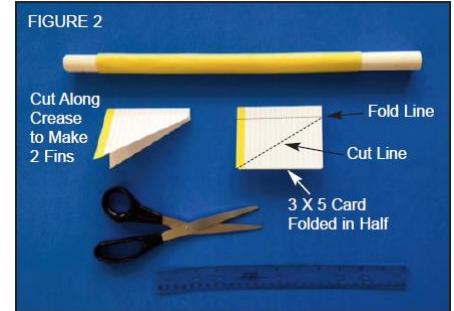
<p>Background Info for Wizards:</p>	<p>Students will build their own rocket, and then take it outside to launch it. The launching will be done outside in an open area (either grass or pavement will work).</p> <p>Safety rules must be followed! Students should stand at least 10' away from the launcher. When the student is ready to launch his/her rocket, they will stand next to the 2 liter plastic bottle.</p> <p>The rocket could propel up to 100', with 75' being a good average.</p> <p><i>In order to save time and for safety, I would have students wait and retrieve their rockets as one group, when everyone has launched.</i></p>
<p>Materials:</p>	<p><u>Rocket:</u> 8 1/2" X 11" piece of construction paper extra PVC pipes for rolling rockets 3" X 5" index cards scotch tape</p> <p>Wet wipes for disinfecting PVC tubes.</p> <p>Rocket Launchers 2 liter plastic bottles</p>
<p>Lesson Time: 70-80 minutes</p>	<p>Introduction: 5-7 minutes Guided Lesson: 3 minutes Student Activity #1: 20-30 minutes Student Activity #2: 20-30 minutes (including time to travel outside) Conclusion: 10 minutes</p>
<p>Learning Targets:</p>	<p>Students will be able to identify some historical facts about the development of rockets.</p> <p>Students will build and launch their own rockets.</p>
<p>Introduction for Students: 5-7 minutes</p>	<p><u>The History of Rocketry</u> In the first century AD the Chinese experimented with a simple explosives. Although these powders were used to create small explosions in religious festivals, they eventually ended up in weapons. The Chinese would fill bamboo tubes with this mixture and attach them to arrows. These were called "fire</p>

	<p>arrows” and were used when the Chinese repelled the Mongol invaders with a “rocket barrage” in 1232.</p> <p>Much later, in 1405, a German engineer devised a rocket that was propelled by gunpowder. A few years later, France used rockets in 1429 and again in 1449.</p> <p>During the 1600’s and 1700’s rockets weighing as much as 100 pounds were used. These exploded and sent small pieces of shrapnel in all directions.</p> <p>During the last part of the 17th century the scientific foundations for modern rocketry were laid by Sir Isaac Newton and his understanding of physical motion.</p> <p>During the 18th century a British artillery expert started standardizing the makeup for gunpowder explosives and then added flight-stabilizing guide sticks. He was able to increase the rocket's range from approximately 300 yards to over 3,000 yards.</p> <p>In the War of 1812 between Britain and the United States, the British used rockets against the U.S. troops. During a typical siege the rockets would light up the night sky and in the battle at Fort McHenry, in 1812, Francis Scott Key witnessed the display. This inspired him to write a poem which later became part of the Star Spangled Banner.</p>
<p>Guided Lesson: 3 minutes</p>	<p>Even with improvements in stabilization the rocket was never used as a major military weapon until the 1900’s. By the end of the 19th century, people were beginning to dream of traveling into space and reaching other planets. To accomplish this, it would require a machine that had great power and speed. At first, the scientific community laughed at the idea of space flight, but a few brave scientists continued to dream and even develop experiments using rocket power.</p> <p>Today we will build our own.</p>
<p>Student Activity #1: 20-30 minutes</p>	<p>Assembling the Rocket</p> <p>1. Gather all of the materials for the rocket. You will have to walk them through these directions.</p> <ul style="list-style-type: none"> - they will each need a piece of construction paper and 2 index cards - they will need a pipe to roll the construction paper with - they will need tape and scissors <div data-bbox="1096 1533 1523 1690" style="border: 1px solid black; padding: 5px;"> <p>FIGURE 1</p>  </div>

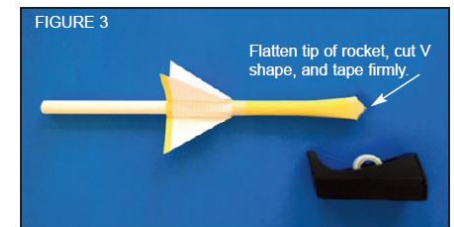
2. Making the **Body Tube** (see Fig. 2)
 - a. Wrap sheet of construction paper lengthwise around PVC pipe.
 - b. Tape the construction paper so that it is airtight, along the full tube.

(It is very important that you do not tape the tube too tight as it must be able to slide on the PVC).

3. Using 2 index cards (3 X 5 preferred) fold each one in half and cut triangles as **fins**.
(Diagram directions are not necessary.)
(Rockets may be constructed with either 3 or 4 fins).



4. Tape fins to the body tube. (Still using the PVC tube will help maintain rigidity while taping on fins. Fins should be evenly spaced and balanced around the rocket. (see Fig. 3).



6. Flatten the tip of the rocket to make the **nose cone**. Cut a V shape and tape the pieces together to be air tight. (See Fig 3, pictures, and sample rockets).



7. Write your name on your rocket.

NOTE: You can test the rocket by blowing on the PVC pipe with the rocket on it. If it shoots out, it's airtight. If it doesn't, check for leaks and add more tape. If too tight, re-roll the body tube.

For ease of assembly, this design uses a non-standard nose cone. If preferred, a conventional nose cone may be made. Always keep in mind the importance of maintaining an airtight seal.

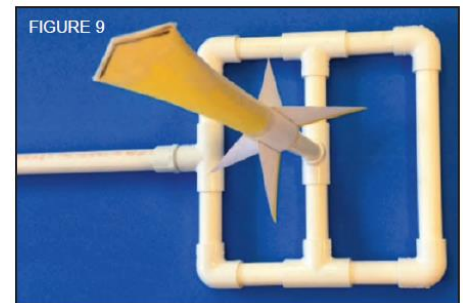
Have students disinfect the tube (wet wipe) before putting it in their mouth. They only have to do this once – at the beginning of the lesson – not every time.

Student Activity #2:
20-30 minutes
(including time to travel outside)

Set up launching stations, and split the class into small groups so launching can go quickly.

Launching the Rocket

1. Locate an open field or area and place rocket launcher on an even, firm surface (either grass or pavement will work).
2. Spectators should stand at least 10' away from the launcher. Participant will stand next to the 2 liter plastic bottle.
3. Place rocket onto vertical pipe (see Fig. 9); and insert bottle into the hose. (see below)
4. Participant will then "STOMP" on the bottle.
5. The rocket could propel up to 100', with 75' being a good average.
6. Stomped bottles may be reusable; however, after repeated use, they will become ineffective. To reuse the bottle, force in air under pressure to reestablish its original shape. Recycle worn out bottles and replace with fresh ones.



Have students wait and retrieve their rockets as one group, when everyone has launched. If they go get it as soon as it is launched, they could possibly be injured by someone else's rocket. If we wait for everyone to get their own right away, it will take a very long time to complete all launches.

<p>Conclusion: 10 minutes</p>	<p>Have students collect their rockets and turn in the PVC pipe to you. Review what was learned about the history of rockets. Ask students for feedback on the build and launch.</p>
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https://www.gocivilairpatrol.com/static/media/cms/Stomp_Rocket_Lesson_Plan_7C4C79B9351C7.pdf



