Launch the

Fizzy Rocket

Lift your students' spirits and send handmade rockets soaring with an FMA Live! Fizzy Rocket. This demo shows students how rockets liftoff—via a wild combo of water and effervescent antacid—illustrating Newton's Laws of Motion in a fun and exciting way.

Let the countdown to learning begin!

Here's how it works…

THE OBJECTIVE

- To show students how rocket liftoff illustrates Newton's Laws of Motion.

ACTIVITY DESCRIPTION

- Students build a rocket fueled by a combo of water and antacid (of all things) which creates enough pressure for a fast and furious blast off.

SCIENCE STANDARDS COVERED

- Physical Science: Position and motion of objects
- Science & Technology: Abilities of technological design

PROCESS SKILLS INCLUDED

- Observing
- Communicating
- Making Models
- Inferring

SOME IMPORTANT NOTES

- Teamwork and timing is key in this experiment. For best results, students should work in pairs allowing approximately 40 to 45 minutes for completion.
- Also, it's not a bad idea to make up a few samples of rockets in various stages of construction so students can visualize the concept before they begin.
- All you need is one single sheet of paper per rocket. But make sure to tell students to plan how they are going to use the paper before they start. Let them pick whether or not to cut the paper width-wise or length-wise to build the body of the rocket as it will add variety to the rockets' performance for flight comparisons.
- Avoid the following most common mistakes made by students when constructing rockets:
  - Forgetting to tape the film canister to the rocket.
  - Failing to make sure the lid end of the film canister is down.
  - Not placing the film canister close enough toward the end of the paper tube to make snapping the lid simple.
  - Forming the cone at the top of the rocket can also be a challenge. The best method is to cut a circle and then cut out a pie slice from the circle. Next "curl" it into any size cone and tape it to the top of the bottle rocket cylinder body (see the pattern on page 6).

MUST HAVE MATERIALS

- Heavy paper (60-110 index stock or construction paper)
- Plastic 35 mm film canister*
- Student sheets
- Cellophane tape
- Scissors
- Effervescing antacid tablet (ooh…ahh)
- Paper towels
- Water
- Eye protection

** If you need to find film canisters in this digital age, stop by a camera shop and see if they can donate a handful to your cause. But make sure these canisters have an internal sealing lid (most of the translucent ones are perfect). The black or gray canisters with external lids (the lids that wrap around the canister rim) will NOT work. So be choosy.*

EVALUATION

- During in class discussion, ask students to explain how Newton's Laws of Motion apply to the Fizzy Rocket. Compare the individual rockets side by side for skill in construction. Rockets that use excessive paper and tape are likely to be less efficient fliers because they carry additional weight and are less aerodynamic.

FURTHER DISCOVERY

- Try holding an altitude contest to see which rockets fly the highest. You'll want to launch the rockets near a wall in a room with a high ceiling. Stick a tape measure to the wall and stand back to observe how high the rockets travel upward along the wall. Let all students take turns measuring rocket altitudes.
- Ask your students to point out geometric shapes used to build the rocket.

FMA Live! Fizzy Rocket

NEWTON'S LAWS AT WORK

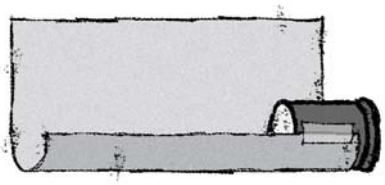
The FMA Live! Fizzy Rocket is a simple way to demonstrate Newton's Laws of Motion and the effervescing effects and zippy liftoff add a lot of excitement to your typical class period.

- Law #1(Inertia): The rocket lifts off due to an outside force acting upon it.
- Law #2 (F=ma): The amount of force created is directly proportional to the acceleration and mass of water and gas expelled from the canister.
- Law #3 (Action/Reaction): The lid blows off the canister due to the force produced by the fizzy gas. The gas is formed in the canister causing the rocket to shoot upward with a force that is equal and opposite to the downward force of the propelling water, gas and lid.

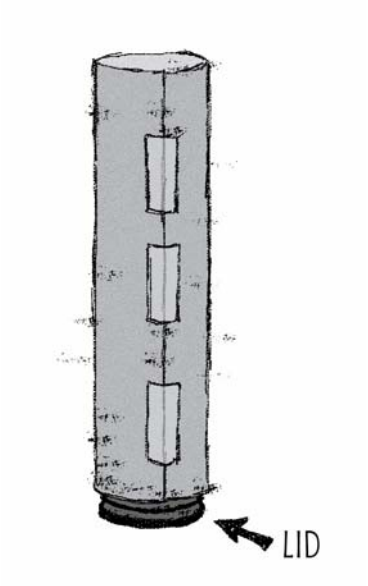
Phew! There's a whole lotta science in that crazy-fast blast off!

BUILDING THE ROCKET

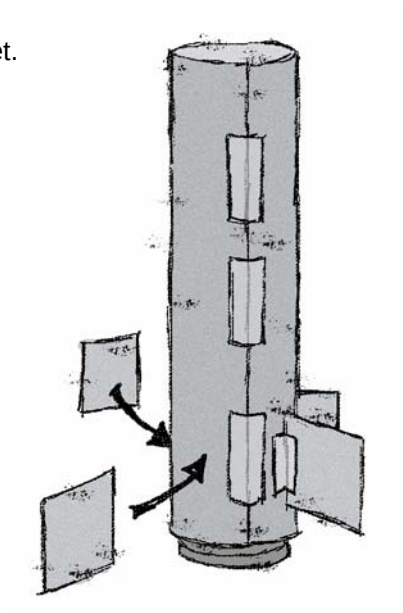
1. First wrap and tape a tube of paper around the film canister.



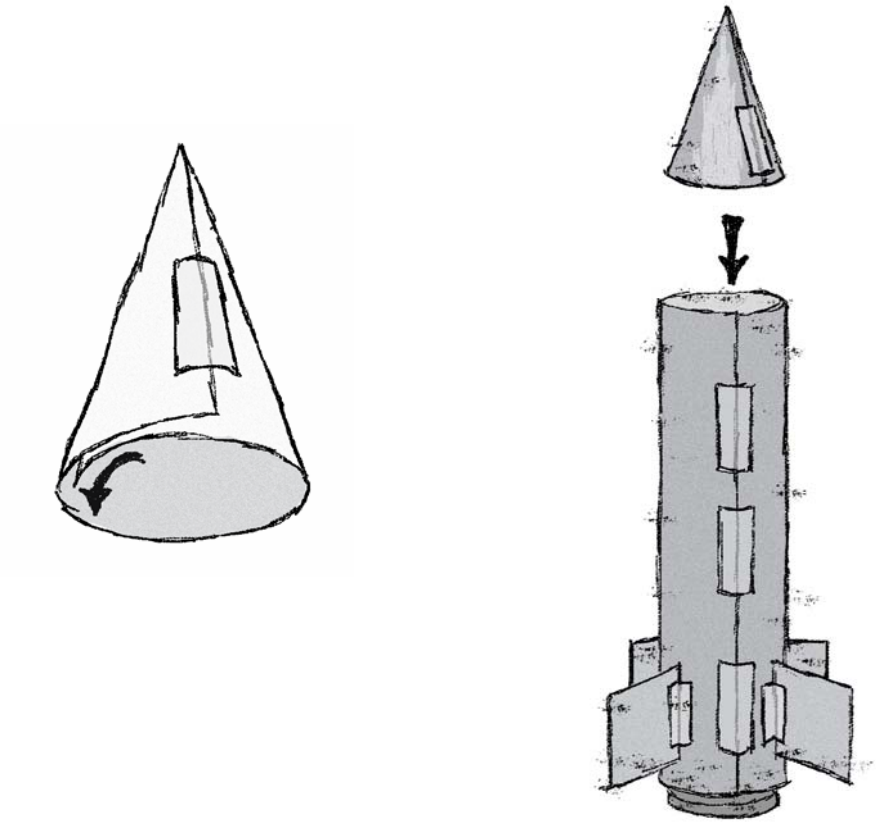
2. Then, make sure the lid end of the canister faces down (very important).



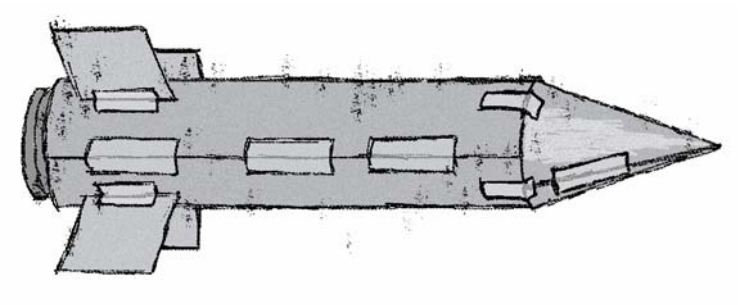
3. Tape some fins to your rocket.



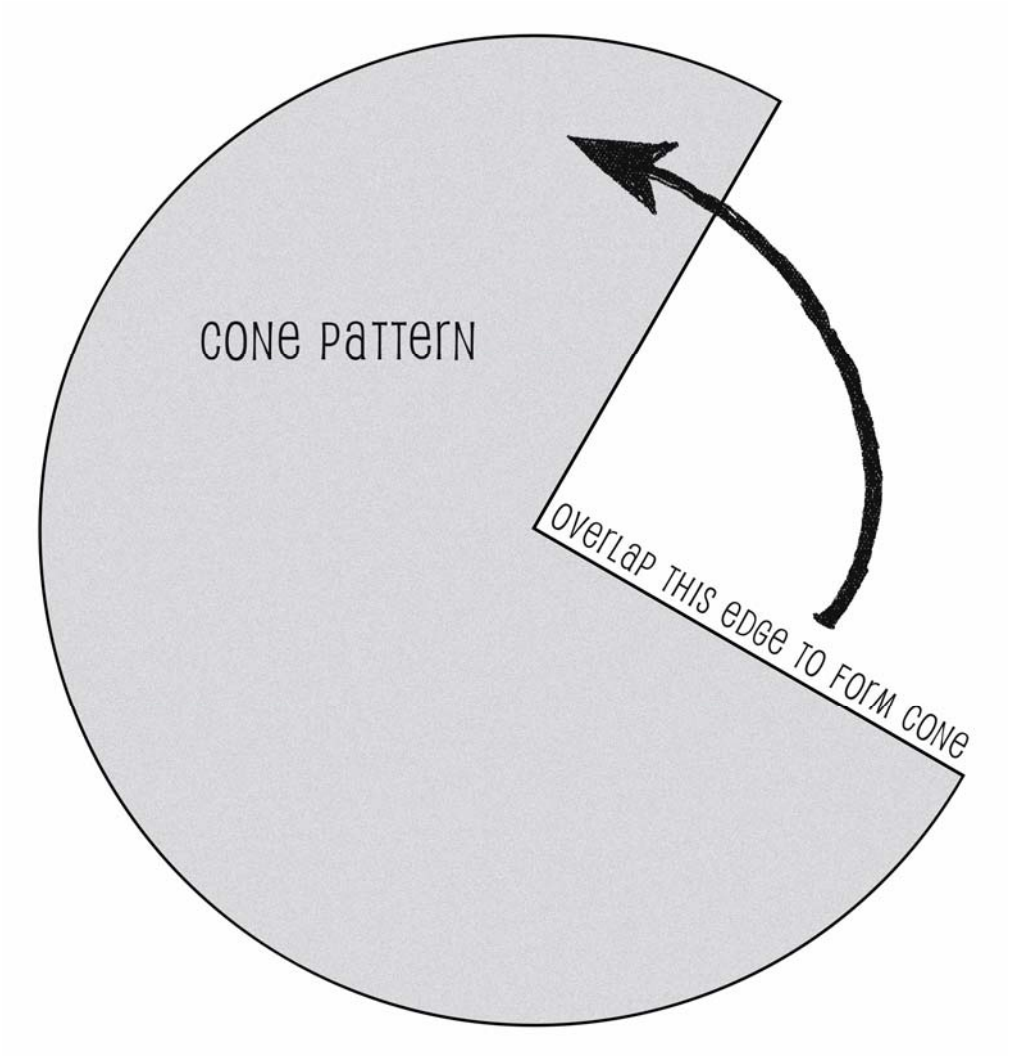
4. Roll a cone of paper and tape it to the rocket's top end.



5. Then, get ready for blast off!



CONE PATTERN (CONES CAN BE ANY SIZE!)



The Fizzy Rocket Blast Off Work Sheet

Student Name: _____ Date: _____

THE BIG LAUNCH

1. First, don your eye protection.
2. Then turn the rocket upside down and fill the canister one-third full of water.

Note: Work VERY quickly on these next steps!

3. Drop in 1/2 of the antacid tablet.
4. Snap the lid on tight.
5. Stand the rocket on the launch platform.
6. Then, STAND BACK! **3-2-1 BLAST OFF!!!**

Now that you've got your first blast off under your belt, what are a few ways can make your Fizzy Rocket soar higher, soar more smoothly or simply soar at all?

1. _____

2. _____

3. _____

FOOD FOR THOUGHT

1. Does the amount of water placed in the cylinder affect how high the rocket will fly? If so, why?

   _____

   _____

2. Do you think that the temperature of the water affects how high the rocket will fly? If so, why?

   _____

   _____

3. And what about the antacid tablet, does the amount of effervescence affect how high the rocket will fly? If so, why?

   _____

   _____

4. Do you think the length or empty weight of the rocket affects how high the rocket will fly? If so, why?_____

   _____