activity three

Wan-Hu — First to Blast Off!

OBJECTIVE – To introduce younger children to a story of history's first "space traveler", Wan Hu. The second objective is to let the children build a simple rocket that is powered by the chemical reaction of an antacid tablet and water. By mounting Saundra Carmical's cartoon, Wan-Hu, on top of the rocket, children will enjoy the moment and remember the history of a first in aerospace.

Illustration by Saundra Carmical

NATIONAL STANDARDS

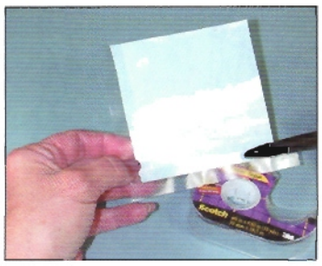
Science Standards:

- Standard A: Science as Inquiry
  - Abilities necessary to do scientific inquiry
  - Understanding about scientific inquiry
- Standard B: Physical Science
  - Properties of objects and materials
  - Position and motion of objects
- Unifying Concepts and Processes
  - Evidence, models, and explanation

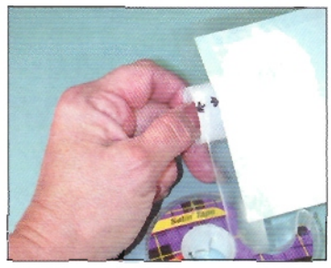
BACKGROUND

– In the 16th Century, a Chinese nobleman by the name of Wan-Hu had his helpers attach numerous solid fuel rockets to a throne. On his signal, they were all lit and in a massive explosion, he took off, never to be found again. This was the first recorded evidence in history of an attempt to actually fly to the stars.

Would you believe that this is all it takes to build a powered rocket? Read on! Be sure film canister top fits inside canister (like Fuji canisters).



A sheet of paper is cut to 4 x 4 inches. Tape is applied to two edges as shown.



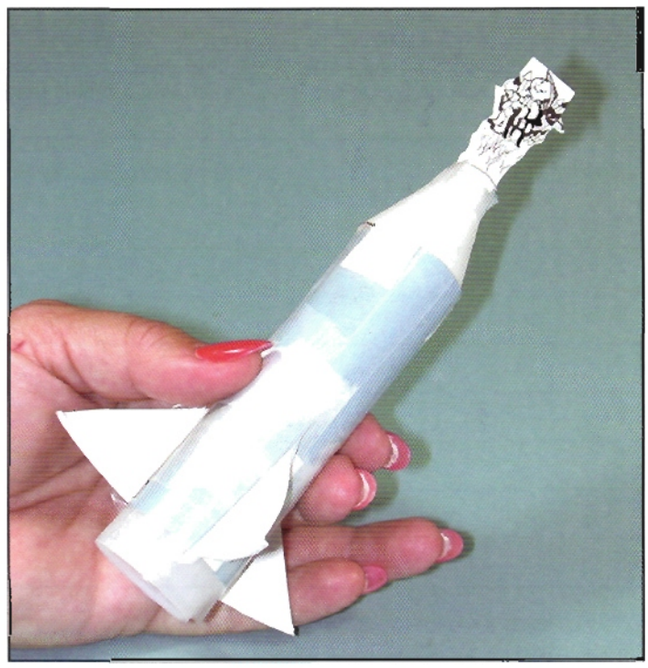
One edge is taped to the open end of the film can about 1/2 inch up. This will act as a seal against water damage after repeated launchings.

The paper is carefully wrapped around the film can and formed into a tube. The remaining edge with tape is pressed to seal the tube.

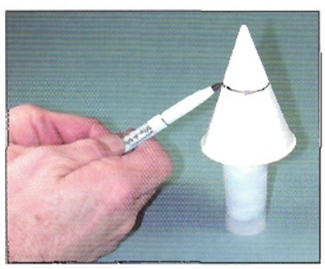
ROCKET SCIENCE 101

Teaching children about stored energy as rocket fuel

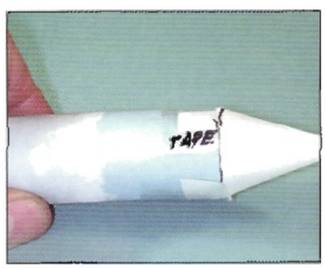
- A real rocket has fuel that gives it energy.
- The fuel for Wan Hu's rocket is a common antacid tablet.
- When the tablet is mixed with water, in an enclosed "chamber," a chemical reaction occurs and a gas, carbon dioxide, is released.
- When this gas (energy) is released, it occurs quickly. A small film can, with a cap, can only contain the gases for so long until the cap is blown off. This releases the built up pressure inside the can.
- When this pressure is released, it creates an "action."
- The rocket moving in the opposite direction, becomes the "reaction." This is a good example of Newton's third law of motion - "for every action, there is an equal and opposite reaction."



Here's Wan Hu, ready to blast off!



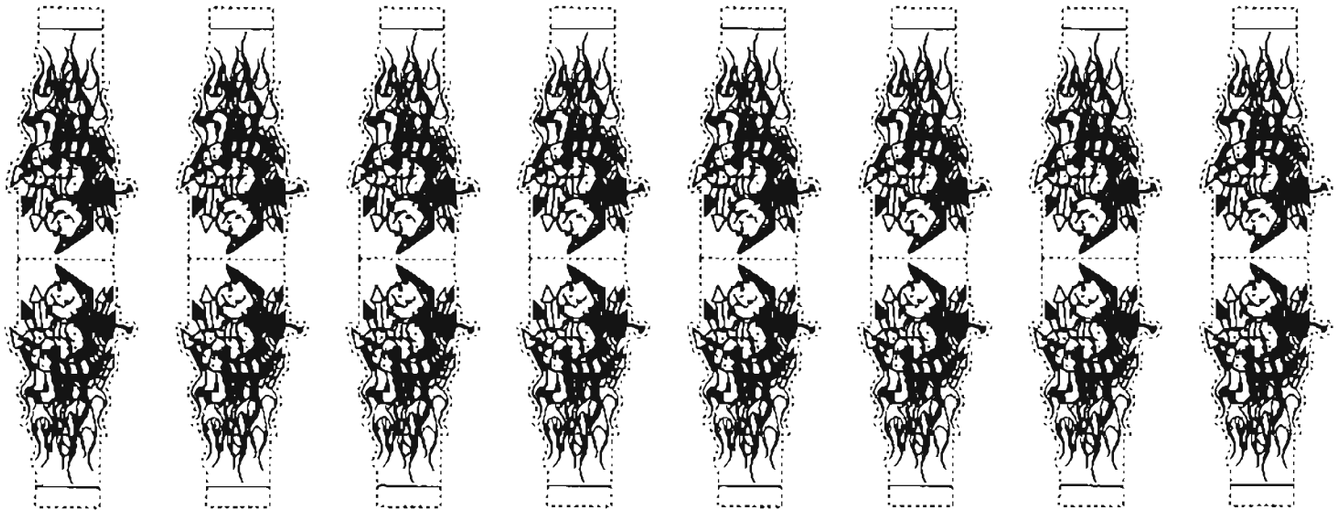
A common cone-drinking cup is placed on top of the tube and marked as shown. By holding the cone and tube up to a light you will be able to see the top of the tube inside the cone.



The drinking cup now becomes the rocket's nose cone. To attach the nose cone, leave little tabs so that you can tape it to the rocket's tubular body (with the tabs inserted inside the rocket body.)

You can make little fins from the remains of the drinking cup, or from the paper that was used to cut the body tube.The fins are taped as shown so they can be attached to the bottom of the tube next to the opening of the film can.

Here you can see a fin, this one cut from the drinking cup, attached to the rocket's body. Three fins make it more stable.



Run off a class set using light card stock, and then cut out one figure for each student. Using scissors, the child cuts out Wan-Ho and then tapes him on top of the little rocket. When fuel is loaded and water applied, the rocket will take off and so will Wan Ho!

Rocket Name	Time before rocket lifted off
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

Which rocket took the shortest time?_____

Which rocket took the longest time? _____

What is the difference between the shortest time and the longest time? _____

_____

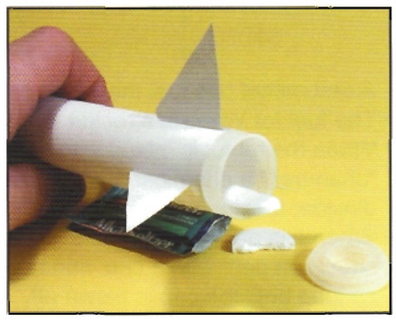
What is the average time?_____

Graph your results.

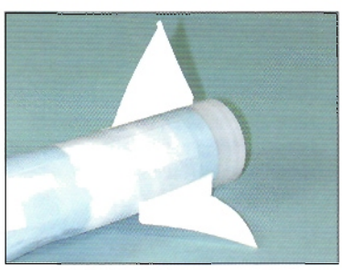
Why do you think your rocket acted as it did?_____

_____

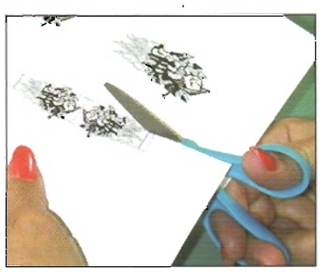
_____



The "fuel" is now loaded. It usually takes only a half of a tablet. A teaspoon of water usually works well. When you're ready to launch: (1) hold the rocket nose down, (2) pour in the water, (3) drop in the Alka Seltzer™, (4) press on the cap and (5) position the rocket on a table. A trash bag makes a good launch pad. This keeps the water and seltzer mess contained in a small area. Countdowns are fun, but it's a little difficult to tell when the rocket is going to take off. But that's part of the fun. Tell Wan Hu to hang on ...it's time for lift off!



Three fins make it more stable.



The little Wan Hu figure is cut from the template.

Wan Hu is taped to the nose cone.

*Students can name their rockets and record the time it takes for the rocket to "take off." They can then graph the results or figure the average of all rockets.

Fizzy Flyer – AlkaFuji Rocket