The Canister Rocket

Grade Level: 6
Strand: Understanding Matter and Energy
Topic: Properties of Air and Characteristics of Flight

Specific Expectation:
- demonstrate an understanding that gases expand to fill a space
- describe the sources of propulsion for flying devices

Materials Needed
- Empty film canisters with lids that snap on inwards
- Alka-seltzer tablets
- Water
- Option: a rocket "casing" could be constructed out of paper, cardstock etc. (students would also like to decorate their "rockets"-markers etc.)

Procedure
- Fill canister with water one-quarter full.
- Add half a tablet of Alka Seltzer to the film canister and quickly snap on the lid.
- Place the rocket on the ground, lid down. Stand back and count down while you are waiting for launch!

Scientific Principle

When a seltzer tablet dissolves in water, a chemical change takes place and carbon dioxide gas (CO_2) is formed. Most seltzer tablets contain a base called sodium bicarbonate (baking soda) and dehydrated citric acid. When the tablet is place in contact with the water, the citric acid combines with the baking soda. Acids and bases undergo a chemical reaction when they mix, producing a gas and salt. In the closed container, the newly created gas has no place to go since the closed container is already full of air. This is like trying to add more air to a balloon that is already full. The pressure inside the container eventually escapes by blowing up the balloon, blowing out the cork, or blowing off the lid. This is the same thing that happens when you open a can of soda. You notice the fizz that it makes. The carbon dioxide rushes out, making a woosh sound.

References

http://www.iit.edu/~smart/scavjoh1/lesson2.htm

Opportunities and Other Considerations

- Safety!! Keep the students back or emphasize safety. Goggles could be a consideration.
- Perfect as an outdoor activity, both for safety considerations as well as the opportunity to allow "rocket" to go as high as it will.
- Rocket containers can be made (examples provided in class) using scissors, paper, tape and markers.
- You can use hot water versus cold water, change amounts of water, use vinegar and baking soda instead of alka-seltzer, have your students take measurements of height and launch times and have them graph the results. In other words, a whole lesson could be based around this one activity in many grades!