**Mentos Experiment**

Mentos + Soda Pop = Fun. Words cannot begin to describe the awesome eruption that is created from adding Mentos candies to a 2-liter bottle of soda. The eruption is enormous... and so is the learning if you consider the chemistry.

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**Materials:**
- Safety glasses
- 2 Liter bottle of Soda Pop (diet is best because it is easier to clean up)
- 13 Mentos (one roll)
- Mentos loading tube, see below

**Directions:**
This activity is probably best done outside in the middle of an abandoned field, or better yet, on a huge lawn.

Carefully open the bottle of soda. Position the bottle on the ground so that it will not tip over.

Unwrap the whole roll of Mentos. The goal is to drop all of the Mentos into the bottle of soda at the same time (which is trickier than it looks). One method for doing this is to roll a piece of paper into a tube just big enough to hold the loose Mentos. You’ll want to be able to position the tube directly over the mouth of the bottle so that all of the candies drop into the bottle at the same time.

Don’t drop them into the bottle just yet! Warn the spectators to stand back. Okay, you’re going to drop all of the Mentos into the bottle at the same time and then move out of the way quickly. It’s just like fireworks on the 4th of July. The spectators erupt, of course, in a chorus of ooohs and ahhhs. Someone yells out, “Do it again” and you do.

**How does it work?**
This is the question of the day... Why do Mentos mixed with soda produce this incredible eruption? There is considerable debate over how and why this works. While we offer the most probable explanations below, we also understand and admit that other explanation could be possible... and we welcome your thoughts.

Soda pop is basically sugar (or diet sweetener), flavoring, water, carbon dioxide (CO₂) gas, and preservatives. The thing that makes soda bubbly is invisible carbon dioxide gas, which is pumped into bottles at the bottling factory using tons of pressure. Until you open the bottle and pour a glass of soda, the gas mostly stays suspended in the liquid and cannot expand to form more bubbles, which gases naturally do.

But there's more... If you shake the bottle and then open it, the gas is released from the protective hold of the water molecules and escapes with a whoosh, taking some of the soda along with it. What other ways can you cause the gas to escape? Just drop something into a glass of soda and notice how...
bubbles immediately form on the surface of the object.

For example, adding salt to soda causes it to foam up because thousands of little bubbles form on the surface of each grain of salt. Many scientists, including Lee Marek, claim that the Mentos phenomenon is a physical reaction, not a chemical one.

Water molecules strongly attract each other, linking together to form a tight mesh around each bubble of carbon dioxide gas in the soda. In order to form a new bubble, or even to expand a bubble that has already formed, water molecules must push away from each other. It takes extra energy to break this "surface tension." In other words, water "resists" the expansion of bubbles in the soda.

When you drop the Mentos into the soda, the gelatin and gum arabic from the dissolving candy break the surface tension. This disrupts the water mesh, so that it takes less work to expand and form new bubbles. Each Mentos candy has thousands of tiny pits all over the surface. These tiny pits are called nucleation sites - perfect places for carbon dioxide bubbles to form. As soon as the Mentos hit the soda, bubbles form all over the surface of the candy.

Couple this with the fact that the Mentos candies are heavy and sink to the bottom of the bottle and you've got a double-whammy. When all this gas is released, it literally pushes all of the liquid up and out of the bottle in an incredible soda blast. You can see a similar effect when cooking potatoes or pasta are lowered into a pot of boiling water. The water will sometimes boil over because organic materials that leach out of the cooking potatoes or pasta disrupt the tight mesh of water molecules at the surface of the water, making it easier for bubbles and foam to form.

When a scoop of ice cream is added to root beer, the float foams over for essentially the same reason. The surface tension of the root beer is lowered by gums and proteins from the melting ice cream, and the CO₂ bubbles expand and release easily, creating a beautiful foam on top.

Why diet soda? The simple answer is that diet soda just works better than regular soda. Some people speculate that it has something to do with the artificial sweetener, but the verdict is still out. More importantly, diet soda does not leave a sticky mess to have to clean up. Hey, that's important.

What's the record for the biggest Mentos fountain? My official record is a 18 foot blast that shot up and almost took out a half million dollar, high-definition television camera.