



MENTOS FOUNTAINS

MATERIALS:

Assorted 2 Liter and 1 Liter Sodas
Index Cards
Clear Tape
Paper Towels
Mentos Geyser Tube (optional)

VOCABULARY:

Physical Change
Reaction
Liquid
Pressure
Nucleation Site
Surface Tension

Chemical Change
Matter
Gas
Density
Chemical Bond
Eruption

Chemistry
Solid
Carbon Dioxide
Experiment
Bubbles

DIRECTIONS:

1. Set your soda on a flat surface outside. This experiment should not be done indoors.
2. Open the soda.
3. Drop a Mentos into the open soda.
4. Quickly back away and watch the eruption!



PAPER GEYSER TUBE DIRECTIONS:

5. Roll an index card into a tube big enough for a Mentos to slide through. Secure the tube with tape.
6. Set your soda on a flat surface outside. This experiment should not be done indoors.
7. Open the soda.
8. Lay a flat index card over the opening of the bottle.
9. Set the tube upright on top of the index card over the opening of the bottle.
10. Insert several Mentos candies into the tube.
11. Hold the tube with one hand and the index card with the other.
12. Quickly pull out the flat index card allowing the Mentos to drop through the tube into the soda.
13. Quickly back away and watch the eruption!



OPTIONAL: USE A GEYSER TUBE INSTEAD. THESE CAN BE PURCHASED ON AMAZON AND COME WITH DIRECTIONS. YOU WILL GET THE HIGHEST ERUPTION WITH THESE TUBES.

THE STEAM BEHIND THE EXPERIMENT:

You might think that there is some ingredient in a Mentos candy that causes a chemical reaction with the soda pop, like the way baking soda reacts with vinegar. But the amazing eruption that takes place when Mentos are dropped into Diet Coke or other brands of diet soda pop is not a chemical reaction at all! Instead it is a physical reaction. A physical reaction is when you change how something looks, but do not change its chemical form. A chemical reaction is when you make something new.



A carbonated beverage is packed full of dissolved carbon dioxide gas, which forms bonds with water. While the soda is in the bottle, the gas is kept in solution by the bottle's pressurized conditions. When you pour some soda into a glass, some gas escapes and forms foam, but most stays trapped by the surface tension of the water. But all those gas bubbles want to escape, making it no wonder that soda makes you burp!

To create bubbles, the carbon dioxide needs to interact with itself, which means that the carbon dioxide's bonds with water in the soda must be broken. A Mentos candy can help with this. Although the candy may look smooth, if you looked at it under a microscope you'd see tiny bumps coating its entire surface. These are called nucleation sites. This rough surface allows the bonds between the carbon dioxide gas and the water to more easily break, helping to create carbon dioxide bubbles and cause the classic eruption. As the Mentos candy sinks in the bottle, the candy causes the production of more and more carbon dioxide bubbles, and the rising bubbles react with carbon dioxide that is still dissolved in the soda to cause more carbon dioxide to be freed and create even more bubbles, resulting in the eruption. Because Mentos candies are rather dense, they sink rapidly through the liquid, causing a fast, large eruption. The speed at which the Mentos falls through the soda can affect how large the eruption is, and this can be tested by comparing whole with crushed Mentos, the latter of which are less dense.

Does Diet Coke work the best in this experiment? Measurements have shown that the surface tension in water containing the sweetener aspartame is lower than in sugary water, explaining why diet soda creates more dramatic fountains than regular sugary soda. Another factor is that the coatings of Mentos contain gum arabic, a surfactant that further reduces surface tension in the liquid. This means that Diet Coke will work better than regular Coke- but that also means other diet colas will work, too.

MAKE IT AWESOME:

Try using different types of soda. How does that effect the eruption?

EXTENSIONS:

1. Try using different sizes of soda. Does a small soda work just a well?
2. Try using sodas at different temperatures. How does that effect the eruption?
3. Try crushing the Mentos into small pieces. How does that effect the eruption?
4. What other changes can you come up with for this experiment?

WEBSITES AND VIDEOS:

1. Video: Mythbusters Explore Mentos and Diet Coke: <https://youtu.be/LjBJELjLgZg>
2. Website: Steve Spangler Experiment: <https://www.stevespanglerscience.com/lab/experiments/original-mentos-diet-coke-geyser/>

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