Monday Morning Science Blast
SODA GEYSER

Root beer is a dangerous substance. It can quickly overfill any container it is poured into by producing a tremendous volume of tiny bubbles. This “foam” may spill onto the floor, onto a table or onto someone’s lap. In your younger days, you may have passed a can of agitated soda to an unsuspecting friend and watched with gleeful anticipation as the can was opened, releasing a geyser of soda into the air. A new type of soda geyser has received attention lately because of videos showing experiments with various sodas and breath mints and the amazing geysers that are produced. One video even shows a “ballet” of sorts with the timed release of soda geysers.

The soda geyser is one of those events guaranteed to catch students’ attention, especially if they are the ones creating the geysers. This activity extends the soda geyser beyond just watching the show to asking questions and conducting an experiment designed to find the answer. Two questions are investigated here. The first question is “What kind of soda makes the best geyser?” The second is “Which breath mint works best?” ***WHEN YOU DO THIS ACTIVITY, BE SURE TO DO IT OUTSIDE IN AN AREA WHERE SPILLED SODA IS NOT GOING TO CREATE A CLEAN-UP PROBLEM.***

For this activity you will need two 2L bottles of Coke, Diet Coke, generic lemon/lime soda and generic root beer; a supply of Mentos mints and Life Savers mints; and a 100 mL graduated cylinder for each group of students. To start the activity, go outside. Set a bottle of Diet Coke down so it will not tip over and spill. Carefully remove the bottle cap so that no soda escapes. Once the bottle cap is removed, quickly drop in two Mentos. Observe the geyser created and measure the amount of soda (mL) released by this reaction. Repeat this step with the Life Savers mints and then with the other types of soda.

Before we started the experiment, I asked the students which combination they thought would work the best; i.e. produce the biggest geyser. One of the difficulties that arose was how to determine quantitatively which geyser was the largest. We decided that the amount of soda left in the bottle could be easily measured and quantified, and that the less soda remaining in the bottle, the bigger the geyser (excluding any spills).

This was one of the greatest activities I did with my students. They were very excited to get involved since many of them had seen some of the videos on the web and on TV. After the activity, there was considerable discussion about what sodas might work better, what the effect of other mints might be, and how temperature might be involved. The students suggested other investigations we could do to study this event further. It was exciting to hear the many new questions the students came up with to investigate.

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QUESTION: What variables affect a soda geyser?

MATERIALS:

Coke – two 2 L bottles
Diet Coke – two 2 L bottles
Mentos mints – 12
Soda (assorted) – two 2 L bottles of each
Wintergreen Life Savers - 8

PROCEDURE:

1. Place the Diet Coke bottle on the ground and carefully remove the cap so as to not lose any of the soda as it expands when the pressure is released.
2. Place 2 of the Mentos mints into the open bottle of soda and allow the reactions to take place. In the data table, record the total amount of soda released in the reactions. ***(subtract the volume of soda remaining in the bottle from the original volume)***
3. Repeat step 2 with two Life Saver mints and record the result.
4. Repeat steps 2 and 3 with each of the other sodas available.
5. Repeat steps 1 – 4 with the wintergreen Life Savers.
6. Create a color bar graph of the data you have collected

DATA:

VARIABLE	AMOUNT OF SODA RELEASED (mL)
Diet Coke + 2 Mentos	
Diet Coke + 2 Wintergreen Life Savers	
Coke + 2 Mentos	
Coke + 2 Wintergreen Life Savers	
Lemon/Lime + 2 Mentos	
Lemon/Lime + 2 Wintergreen Life Savers	
Rootbeer + 2 Mentos	
Rootbeer + 2 Wintergreen Life Savers	

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QUESTIONS:

1. Which of the variables produced the greatest release of soda? Which produced the smallest release of soda?

2. Look over each of the variables in the table below and describe how you think it would affect the result of the reactions and explain why.

VARIABLE	AFFECT	EXPLANATION
Cold Soda		
Warm Soda		
Cold Mints		
Warm Mints		