

Diet Coke and Mentos Lab

When Mentos candy is added to Diet Coke, the Diet Coke whooshes out of the bottle in a large explosion. Being that most people love to watch explosions occur, we want to find out if there is a way to increase the size of this explosion. At the same time, we are going to model the steps in the scientific method.

Making Observations

From prior experience, we know that Diet Coke contains carbon dioxide gas. We also know, from observing what happens to a balloon placed over ice and then over hot water, that gases will expand, when heated. From this prior knowledge and prior observations, we want to test to see if increasing the temperature of the Diet Coke will create a larger explosion.

Hypothesis

While we have defined a hypothesis as a statement that can be tested, it is also a prediction. Often predictions follow the format of “if” and “then”.

Write a hypothesis for our exploration on the effects of temperate on the size of the Diet Coke and Mentos Explosion: If then

Experimentation

Now that you have written a hypothesis, we are going to perform an experiment to test the hypothesis.

Materials

- Six 2-Liter Diet Coke Bottles
- 6 Rolls of Mentos Candy
- Playing Card
- Meter Ruler
- Sheet of clear, heavy plastic
- Hot Water Bath

Procedure

1. Place two 2-liter Diet Coke bottle in refrigerator over-night. (Cold Diet Coke)
2. Place two 2-liter Diet Coke bottle on a counter over-night. (Room Temperature Diet Coke)
3. Place two 2-Liter Diet Coke bottle in a hot water bath for about one-half hour prior to the experiment. (Hot Diet Coke)
4. Roll a sheet of clear, heavy plastic into a tube that it just a little larger than the Mentos candy. Use tape to secure the tube shape of the plastic.
5. Open a packet of Mentos candy and place them in the rolled up tube of plastic.
6. Place the playing card at one end of the tube and turn the tube so that it is vertical and the playing card is at the bottom of the tube.
7. Carefully, test that the candy slides easily out of the tube onto a soft surface.
8. Go outside, by a brick wall and place a cold Diet Coke against the brick wall.
9. Have one person hold onto the bottle of cold Diet Coke. DO NOT open the bottle of Cold Diet Coke yet.
10. Have another person get a roll of Mentos candy ready in the plastic tube, using the playing card to hold the candy in the tube.
11. Practice placing the tube over the lid of the cold Diet Coke with the playing card holding the candy in place. But DO NOT remove the playing card, yet. (We just want to make sure we know what to do).
12. Three observers should be ready to watch how high the explosion goes on the brick wall.
13. Once everyone feels comfortable with what they are supposed to do, the person, holding onto the cold Diet Coke bottle, should now remove the lid of bottle, while still holding onto the bottle.
14. The person with the tube of candy should place the candy over the open lid of the bottle, with the playing card still in place.
15. After this next step, BOTH students should step back, being careful not to drop the candy or knock over the bottle.

16. Once the tube of candy is positioned correctly and the three observers are ready, quickly slide back the playing card and step back.
17. The three observers should count the number of brick layers to the height at which the explosion occurred.
18. Use the metric ruler to measure the height, in centimeters, of one brick layer, including the layer of mortar.
19. Multiply the number of brick layers to the height of the explosion by the number of centimeters for one brick and mortar layer. This should give you the height of the explosion.
20. Record the data in the data table.
21. Repeat the same process for all six Diet Coke bottles.

Data Table

Temperature of Diet Coke	Height (cm)	Average Height (cm)
Cold Diet Coke		
Cold Diet Coke		
Room Temperature Diet Coke		
Room Temperature Diet Coke		
Hot Diet Coke		
Hot Diet Coke		

Graphing and Analyzing the Data

In order to graph the data, you will first need to determine that the independent and dependent variables are for this experiment.

Independent variable: _____

Dependent variable: _____

Next, you will need to decide which type of graph will best illustrate the data. To help decide, answer the following questions:

Line graph – Was the data collected over a repeated length of time? _____

Bar graph – Does the data compare measured quantities? _____

Circle graph – Does the data represent percentages? _____

Which graph, should be used? _____

Place the collected data on the graph paper.

- Write a title that describes what was being tested, at the top of the graph.
- Place the independent variable on the X axis and give it a descriptive title.
- Place the dependent variable on the Y axis and give it a descriptive title.
- Decide on your scale for the data points and write the numbers along the Y axis.

Draw a Conclusion

Decide if your hypothesis was supported and not.

Write a conclusion, restating your hypothesis and referencing the collected data to support your conclusion.

For example: My hypothesis was After performing the experiment, the explosion for the Diet Coke was centimeters more than theDiet Coke and centimeters more than the Diet Coke. Therefore, my hypothesis was supported.

