The History

The "Cola Wars," a slogan created in the 1980's as a satirical response to the "Cold War", between Pepsi and Coca Cola originally began in 1975 with the introduction of the first Pepsi Challenge. The Pepsi Challenge is a blind taste test held to determine if customers preferred the taste and flavor of Pepsi over Coca Cola. A Pepsi representative would pour the colas into two unmarked cups for the consumer to drink. After trying both colas, the representative would then reveal the two bottles to the consumer so they can see whether they preferred Coca Cola or Pepsi. The results of this challenge showed that most consumers preferred the taste of Pepsi over Coca Cola.

Statistical Connection

A **binomial experiment** is a probability experiment that satisfies the following requirements:

- There must be a fixed number of trials.
- Each trial can have only two outcomes that can be reduced to two outcomes. These outcomes can be considered as either success or failure.
- The outcomes of each trial must be independent of one another.
- The probability of a success must remain the same for each trial.

Create Your Own Experiment

Coke vs. Pepsi can be considered a binomial experiment, as long as all the requirements are met. Work with a partner, or 2 other people to create your own experiment. Carefully explain below how your experiment will address each need.
(If you choose not to use something other than Coke and Pepsi, clearly define what you will be taste testing.)

- There must be a fixed number of trials.

- Each trial can have only two outcomes that can be reduced to two outcomes. These outcomes can be considered as either success or failure.

- The outcomes of each trial must be independent of one another. *(i.e., How will you make sure the taste from the previous drink affects the taste of the next?)*

- The probability of a success must remain the same for each trial.

What will your group be taste testing? _____

Who will be the taste tester for your group? _____

Who will pour the samples for the taste tester? _____

Based on your experiment, find the binomial probability of guessing all trials correctly.
Think about:

- *What would the probability of success be?*
- *How many trials are there?*
- *Should you use binomial pdf or binomial cdf?*

Think about your experiment.

1. Do you feel that the way that you set up the experiment truly led to a binomial distribution?

2. Can you think of anything that you change if you had to re-run the experiment? Explain why.

3. What did you think of the number of trials you had? too many? too few? just right? Explain why.

4. Record your results here: (Please record the trial number and whether they were successful or not.)

5. What was your taster's probability of success?

6. Let X = the number of successful tastings that your taster had. Find the binomial probability of getting exactly that number correct. Do you think this probability is too high? too low? just right? Explain why.

7. How likely do you think it is that a person would pick the beverage they thought they liked more before the test? Explain.