

LAB: Speeding Up a Reaction

Safety: Always use caution with glassware and any hot liquids. Stand back when the cannon goes off, and be careful to point it away from people. Wear goggles.

Purpose To identify ways to speed up the reaction in the “Alka-Seltzer® cannon”

Instructions – Day One

- Observe the “Alka Seltzer Cannon.” Write your observations on a piece of paper (you will hand this in).
- Brainstorm ways to make the cannon go faster (make the lid pop off quicker). Share lists as a class to form a master list.
- Your dependent variable will be the time it takes for the cannon to go off. Choose an independent variable from the class master list.
- Write the beginning of the lab report:
 - Title
 - Background information about the Alka-Seltzer® cannon and how/why it works
 - Variables and constants—list the dependent and independent variables and as many constants as you can think of.
 - Hypothesis
 - Purpose/problem
 - Materials used

Possible materials Water, beaker, graduated cylinder, balance, mortar and pestle (for crushing), hot plate/Bunsen burner setup, ice, stopwatch, film canister, Alka-Seltzer® (a maximum of four tablets per group)
- Write your step by step, numbered procedure. Be detailed so that anyone could duplicate your experiment.
- Create a data table – you must do three trials each time you change the independent variable.
- Have your teacher check to make sure your procedure is safe.

Instructions – Day Two

- Perform your lab. Fill in the data table as you go and record any observations. Be sure to note in writing if you make any changes to your procedure as you go.
- Finish your lab write-up:
 - Complete your calculations/results
 - Write a brief conclusion: restate the purpose/problem and your hypothesis. Give your results. Do your results support the hypothesis? If not, do you have a new hypothesis? Give at least two possible sources of error. (Remember, “calculations” doesn’t count, and “human error” is too vague!) What other questions would you like to investigate, or what other types of experiments could be done with Alka-Seltzer® or the cannon?
- Check the rubric on the back of this paper to make sure you included everything you need for the lab. Make sure that you can answer “yes” to every question in the rubric concerning your lab report. A no check from the instructor results in the loss of 1 point. **STAPLE THE RUBRIC TO THE TOP OF YOUR LAB REPORT!**

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- Make sure you can answer “yes” to these items concerning your lab report.
- Every “yes” check from your instructor = 1 point for a total of 20 points.

Lab Rubric		Yes	No
Title (1pt)	Do you have a title at the beginning of your report?		
Background (4pts)	Is the independent variable stated?		
	Is the dependent variable stated?		
	Are the constants in the experiment identified?		
	Is a basic description of the “cannon” included?		
Hypothesis (1pt)	Did you predict what the results of your experiment would be?		
Materials (1pt)	Are all the materials needed for the experiment listed?		
Purpose (1pt)	A clear and concise purpose statement is present in the report.		
Procedure (4pts)	Is the procedure divided into steps?		
	Does the procedure have specific measurements?		
	Is the procedure made so that anyone can recreate the experiment?		
	Does the procedure include specific materials that are used?		
Results/Data Table (2pts)	Is the data table easy to read and include units?		
	Was the average for the 3 trials calculated?		
Conclusion (4pts)	Did you restate the purpose and your hypothesis?		
	Are the results of your experiment stated and did you state whether they support your hypothesis?		
	What are two sources of error? (human error is too vague!)		
	What would you do if you had to do the experiment again or perform another experiment?		
Format (2pts)	Is the report easy to read, divided into appropriate sections and ordered like the rubric?		
	Is the report free of spelling and grammatical errors?		
SCORE:		/20	