Science Fair Research Paper

	Points Possible	Points Earned
Introduction *Must set the tone for the paper and include some info from your purpose.*	10	
Project Overview *Must explain how the project is to be conducted and lead into the research topics.*	10	
Research *Must use 3-5 clearly defined paragraphs focusing on the important topics of your project.*	20	
Conclusion *Must bring closure to your paper and contain your hypothesis.*	10	
Scientifically based	10	
Third Person *Cannot include "I" or "you" or "my" in any form.*	10	
Spelling / Sentence Structure *Be sure you proofread and use a variety of sentence structure.*	10	
Grammar / Punctuation	10	
Sufficient Information *Must be 2-4 typed pages, double spaced, 12-14 pt. font.*	10	
	Total Points	

Research

The purpose of this experiment will be to determine if the amount of glycerin in a bubble affects the amount of time a bubble last before it pops. Many external factors impact the evaporation time which causes a bubble of soap to pop- including gravity, wind, dry air, surface contact, and the sun. However, in a controlled testing environment, this experiment will test the impact of glycerin on the soap film wall of the bubble and the air trapped inside.

The three main ingredients needed for this experiment will be water, detergent and glycerin. The independent variable of different levels of glycerin will be added to detergent and water to measure the dependent variable of the amount of time the bubble lasts before it pops. Variables that will be kept constant for each trial include the amounts of detergent and water. To determine how long the bubble of soap will last, variable amounts of glycerin will be manipulated through a bubble blowing device and the response will be measured with a stopwatch as the bubble burst. Once the glycerin is added, will the chemical properties speed up the evaporation process of the bubble, causing the soap bubble wall to “thin” faster and burst? Or will the “syrupy and pasty” qualities of the glycerin actually “thicken” the soap bubble wall, allowing the bubble to last much longer than the controlled bubble of detergent and water? The hypothesis from the experiment will conclude that if

different amounts of glycerin are added to liquid detergent and water, then the plastic cup with the most glycerin will produce the longest lasting bubble. Research was conducted on glycerin, detergent, and bubbles. This information formed the basis for the experiment.

Glycerin is a syrupy alcohol. It is also color-less, and has a sweet taste. Glycerin is often referred to as glycerol. It dissolves quickly in alcohol and water and is also insoluble in ether benzene, and ethyl acetate. Glycerin, being the main ingredient in soap, is used in making clear soap. When a lot of glycerin is added to clear soap it contains about 15% - 20% pure glycerin clear soap can also be know as 'Melt or Pour 'soaps. This type of soap is very easy for hobbyist to use, because it melts at about 160 degrees Fahrenheit and solidifies rapidly. Soaps that have more glycerin in them dissolve faster than those with less. Soaps made this way are good to use for children with tender skin.

Large amounts of glycerin are made by the chemical reaction of chlorine and propylene, followed by hydrolosis. Glycerin has a high boiling point and also freezes to a paste. Glycerin is not only used in soap but is used in tobacco, drugs, foods, cosmetics, gaskets, papers, and adhesives to keep them from drying out. It is a humectant, which absorbs ambient water. Glycerin's ability to absorb water from the air means that it is hydroscopic. If glycerin was put on your tongue, your tongue would blister because glycerin has dehydrating properties. Glycerin also adds

flexibility to certain plastic material. Another thing glycerin is used in is alkyd resins which is used in paint and varnishes. Last but not least glycerin is used in the manufacturing of nitroglycerin, which is the chief ingredient of dynamite.

Both animal fats and vegetable fats contain from 7% - 13% glycerin. Glycerin can also be used for conserving preserved fruit , prevent freezing in hydraulic jacks, printing ink, in cake and candy making, and in preserving scientific specimen's in jars in high school biology lab. It is used for this because of its antiseptic quality.

Bubbles are a phenomenon of nature because they have not always been around. Playing with bubbles didn't exist before soap. But in the 19th century, the Pear Shop Company made paying with bubbles wildly popular. And bubble pipes were used in the 20th century, because bubble blowing toys were largely limited. How are bubbles made? Bubbles are made when air is trapped inside a wall of soap and water. The soap film encloses the air and keeps it from escaping. But when a bubble comes in contact with another surface, it breaks the soap film wall. Wet surfaces usually don't pop a bubble, while dry surfaces do. Bubbles pop when water evaporates from the surface. The film wall becomes thin enough so the air can escape. Why do bubbles pop from the top? Gravity pulls water toward the bottom of the bubble, making the top thinner, causing it to pop.

Detergents are a substance that cleans soiled surfaces. Soap is a type of detergent. Detergents can also be known as synthetic detergents. And both soap

and detergents are made in bars, flakes, granules (grains), liquids, and tables. Detergents can be used for shampoo, to brush teeth, and to clean wounds and germs that cause infections. They are also used to wash dishes and laundry, clean floors, and windows and also as lubricants, cleaners, softeners, and polishers. When they are being used as cleaners, detergents in motor oil break down soot, dust, and other particles that can harm engine parts. When being used as polishers, detergents can polish jewelry and soften leather.

After completing the research on glycerin, detergent, and bubbles, an experiment was designed to determine if glycerin has an affect on the amount of time a bubble lasts before popping. The hypothesis from the experiment will conclude that if different amounts of glycerin are added to liquid detergent and water, then the plastic cup with the most glycerin will produce the longest lasting bubble.