An Experiment to Determine the Reactivity of Various Liquids and Powders

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Period 1

Physical science

Introduction to Research

In Mr. Casey's class on March 18th, 2013 my group will be testing the reactivity of various liquids and powders. We will be mixing five different powders with four different liquids. We will be doing this by applying each type of liquid to each powder. We will also apply the five powders to a flame. The purpose of this experiment is to find out the reactions each powder has when mixed with a flame or liquid. They can have none, one, or two reactions.

Hypothesis

If we mix each type of powder with each liquid, then we will find that about 50% of the treatments have a reaction. I think this because based on previous knowledge; I know that certain liquids and powders form different reactions. For example, when baking soda and vinegar combine, I know that a reaction is formed. I think about half will have a reaction because when certain solvents are combined various reactions are formed.

Materials

Materials:	Quantity:
1. Petri dish	1
2. Tea light candles	1
3. Tongue depressors	1
4. Stainless steel bowl	1
5. Salt (NaCl)	1 gram
6. Sucrose/sugar	1 gram
7. Baking Soda	1 gram
8. Corn starch	1 gram
9. Chalk/limestone	I gram
10. Oil	1 ml
11. Isopropyl alcohol	1 ml
12. Vinegar/acetic acid	1 ml
13. Water	1 ml
14. Beakers	3
15. Tinfoil	1 piece
16. Lighter	1

Procedures

1. Gather materials
2. Place 1 to 2 grams of powders in petri dish
3. Return to your desk
4. Apply each type of solvent to each type of powder
5. Make observations and record
6. Using fresh powders, apply each powder individually to the flame
7. Make observations and record
8. Clean up

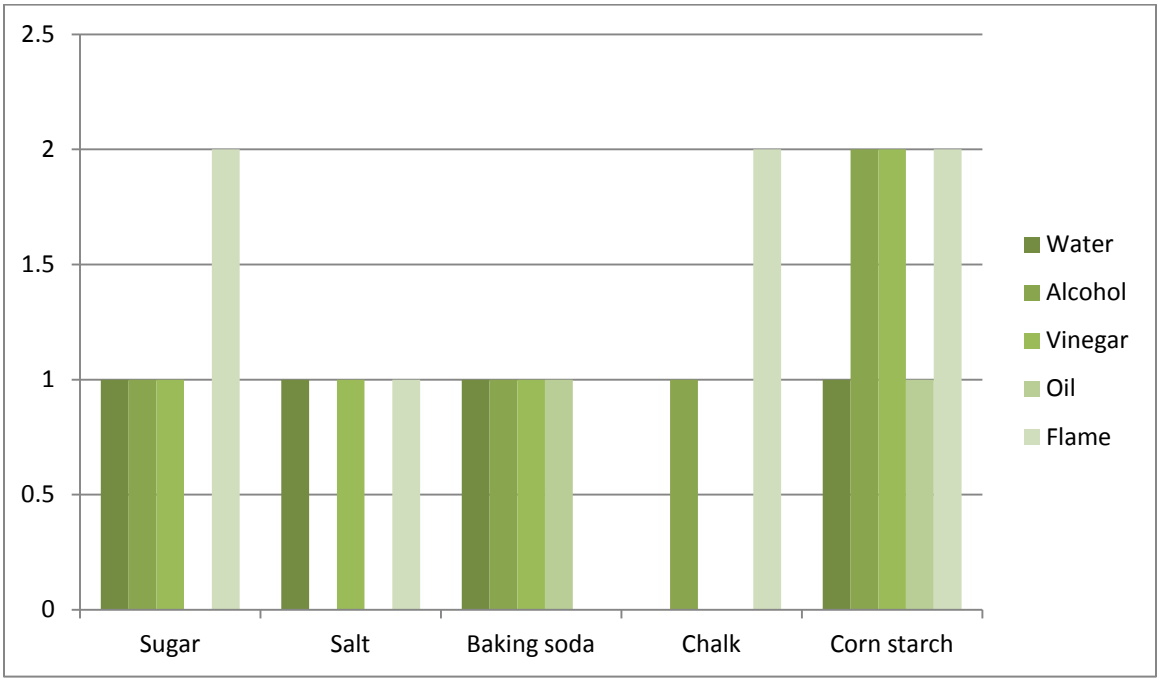
Results and Analysis

Raw Data:

	Water	Alcohol	Vinegar	Oil	Flame
Sugar	Dissolved and gathered together	Clumped together	Dissolved	No reaction	Melted, carmelization, change of color and odor
Salt	The water soaked into the salt	No reaction	Dissolved	No reaction	Change of odor
Baking Soda	Absorbed	Absorbed	Fizzed	Denied the liquid	No reaction
Chalk	No reaction	Soaked in	No reaction	No reaction	Change of odor. Began to smoke and steam
Corn Starch	Turned into white liquid	A change of state and texture	Changed state and texture	Denied the liquid	Change of odor, began to turn black and steam

Key:

Number of Reactions When Liquids and Powders Mix



The first chart represents the number of reactions after each treatment. It also shows what happened when each powder was mixed with the different liquids.

The second chart has all of the same information, but it is displayed in various shades to show how many reactions each liquid has.

Conclusion

The purpose of our experiment was to find out which liquids and powders mix together and create a reaction. My hypothesis was that about 50% of each treatment would have a reaction, I was incorrect. It was actually an astonishing 72% that had a reaction. We proved our hypothesis by testing each liquid with each powder then waiting a couple of minutes for a reaction. The amount of reactions was much more than I expected.

Once the data was collected, I came to conclusion that it did not match my original hypothesis. Although, there were a few things that I stated before that was true. In my hypothesis, I stated that I believed that many powders and liquids had reactions. I thought about 50% was a large number for a reactant, but I was proven wrong. We found out that different liquids can react in various ways and all of their reactions are different. I learned the different way powders can act and respond to various liquids.

Although it was hard to make errors in this experiment, I believe a few were made. One thing I think my group and I could have done better is wait longer for a reaction. We only waited about two minutes, then tested the new liquids and powders. I think if we waited a little longer then we would have seen more reactions than what we found at first. To do further research, we could have tested the same powder and liquid for different times. We would find whether or not the reaction is the same.

I believe this data is connected to real life in one important way. Mixing different liquids and powders to create a reaction can be dangerous. It is important for people to know the hazards that mixing unknown substances together can do. Without knowing the reaction, mixing these things together can put you in danger. For example, imagine you are trying to fix a lawn mower. The lawn mower isn't working properly, so you put different chemicals or liquids in it, trying to get it to start up. Then all of a sudden it explodes. This dangerous explosion could put you in the hospital for months. It is important that everyone knows the danger of chemical reactions. We should care, because it may put our lives in risk. Another connection to real life would be while cooking. When you cook, you mix different liquids all of the time. You would need to know what they are to create the right recipes. Knowing about liquids, chemicals, and various powders can really help your everyday life.