**What do Bouncy balls have to do with Chemistry?**

**Objectives:**

1. Define chemistry
2. Apply the scientific method to a chemistry lab

**Background:**

Chemistry is the study of matter and energy and the interactions between them. Chemistry tends to focus on the properties of substances and the interactions between different types of matter, particularly reactions that involve electrons. Studying chemistry is important because understanding chemistry helps you to understand the world around you. Cooking is chemistry. Everything you can touch or taste or smell is a chemical. When you study chemistry, you come to understand a bit about how things work. Chemistry isn't secret knowledge, useless to anyone but a scientist. It's the explanation for everyday things, like why laundry detergent works better in hot water or how concrete is formed or why our foods taste the way they do after they have been cooked. Chemistry is also involved with movement of water through adhesion and cohesion, as well as why our cells need to have movement of molecules.

Today you will be doing a short lab that shows chemistry in action and you will be applying the scientific method to the lab. Bouncy balls are made through a series of chemical reactions, various ingredients within your home interact with each other to create a polymer that will bounce. We will be using a few ingredients: Borax – which is a combination of the two elements Boron and Sodium, corn starch which is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Pre Lab Questions:**

1. Define chemistry
2. What are four examples of how chemistry impacts our lives?

**Materials:**

* borax
* cornstarch
* white glue
* warm water
* food coloring (optional)
* measuring spoons
* spoon or craft stick to stir the mixture
* 2 small plastic cups or other containers for mixing

**Procedures:**

1. Label one cup 'Borax Solution' and the other cup 'Ball Mixture'.
2. Pour 2 tablespoons warm water and 1/2 teaspoon borax powder into the cup labeled 'Borax Solution'.
3. Stir the mixture to dissolve the borax.
4. Have one student add 3 drops of food coloring, one add 5 drops of food coloring, one add 10 drops of food coloring and have one student act as a control with no food coloring.
5. Pour 1 tablespoon of glue into the cup labeled 'Ball Mixture'.
6. To the “Ball mixture cup” Add 1/2 teaspoon of the borax solution and 1 tablespoon of cornstarch.
   1. **Do not stir.** Allow the ingredients to interact on their own for 10-15 seconds and then stir them together to fully mix.
   2. Once the mixture becomes impossible to stir, take it out of the cup and start molding the ball with your hands.
   3. The ball will start out sticky and messy, but will solidify as you knead it.
7. Once the ball is less sticky, go ahead and bounce it!
   1. Don't eat the materials used to make the ball or the ball itself. Wash your work area, utensils, and hands when you have completed this activity.

**Variables:**

IV:

Qualitative DV:

Quantitative DV:

Constants:

Control:

**Hypothesis:**

IF: 4 bouncy balls are made from the same amount of borax, corn starch and water

AND each ball receives either: 0,3,5,10 drops of food coloring

THEN the ball with \_\_\_\_\_drops of food coloring will take the longest to form into a ball and bounce

BECAUSE:

**Data:**

|  |  |  |
| --- | --- | --- |
|  | Time it took to make into a ball (start timing when step 6b is beginning) | How many bounces before it became un-bouncy |
| 0 drops of food color |  |  |
| 3 drops of food color |  |  |
| 5 drops of food color |  |  |
| 10 drops of food color |  |  |

**Conclusion:**

Write a 6 step conclusion leaving off steps: 1, 5 and 6