



Is it Science or Magic?

The Stars Challenge at Monmouth University 2011

Dear Students,

We have finished our ten weeks together but really we have only begun our journey. Where has our adventure taken us? Together we examined the chemistry of atoms and molecules, density, bonding, solutions, gases, bubbles, and electrical conductivity. We have worked hard but for the most part, we had FUN. As a cohort of learners we left each week chatting about our experiences.

We all remained enthusiastic while we safely—observed, examined, questioned, defined, modified and discovered. You are great collaborators and through this experience together we used creative approaches to explain scientific laws and theories. Anuja and I had a wonderful time sharing our magic with you. Thanks to cell phone cameras you were able to wow your family and friends with some of your new chemistry “magic”.

What does the future have in store for you? Your high school teachers and college professors will continue the journey but you must continue to bring your questions, interests, knowledge and motivation along for the ride. I expect great accomplishments—doctors, researchers, pharmacists, professors, teachers - the list is endless. Your enthusiasm for learning is contagious. Science, in all its divisions, will benefit from you because you seek the truth. The world is secure with you as its future.

Chemically yours, Mrs. McCarthy (aka Mrs. McChem)



Novice chemists looking for the magic.



Drag racing water droplets and dancing kaleidoscopes.



How can we move the water up and down a straw? It got to be a "heated" discussion.



Cool water 2 inches, warm water 4 inches—ah ha!!! Moments all around.



We remained in "hot water" the entire evening. It was "cool" watching it move when food dye was added.



We were amazed at the weight of our inflated volleyball.



We thought our water bottle was empty. A little soap on the top and a hot water bath gave us surprising results.



Why does the temperature of an object change when it is placed in hot water?



We warmed water with hot washers and cooled water with cold washers. It's called "conduction". The molecules were rotating, translating and vibrating slowly at first, quick in the middle, then slowing down again.



Dry ice can change the pH of water—how do we know? We put the dry ice in room temperature water with a pH indication and watched, and watched, and watched. It looked really "hot" but actually it was super "cool".



Dry ice does not melt. It sublimates. We were able to catch the CO_2 in a soap bubble. Our bubble resembled a gypsy's crystal ball—all smoky.



How come some soda cans float while some sink? The mystery is really inside the can.



We were able to dye one liquid in our bottle without affecting the other. For a while we had the dye sandwiched between the layers. This seemed like a cool trick until we added the alka-seltzer and mad lava lamps.



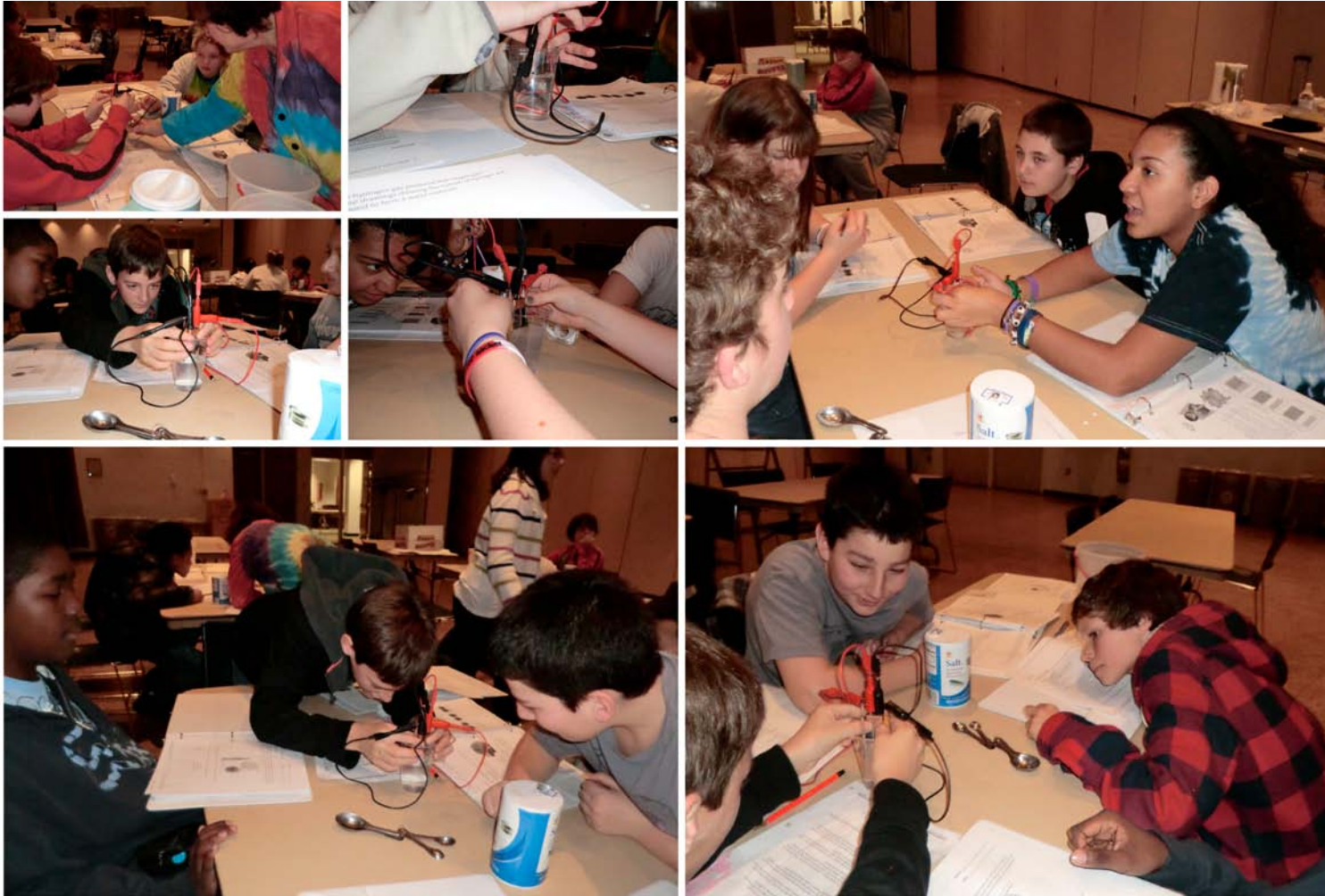
We were challenged to separate three kinds of plastic beads using salt, water, and our knowledge of density. No manual separation for our scientists.



We took our beads and predicted the percent composition of the mixture. Calculators were very helpful in our analysis.



How much paper can you move with the electrons from your hair? We collected electrons on a balloon and picked up confetti—we had our own ticker-tape celebration.



Decomposing water requires more energy than we could generate from the electrons in our hair. 9 volt batteries, pencils, and salt water made lots of bubbles —what a gas!!



Can we limit the volcano reaction? We varied the amounts of baking soda and vinegar to produce the optimum amount of bubbles in our graduated cylinder.



We woke up the genie in the bottle. He wanted to join in the fun on Monday nights.



We'd never been vacuum packed before!







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