



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Brent W. Merrill	Project Number J1425
Project Title Lead Poisoning: From Lead Paint to Cigarettes	
Objectives/Goals For hundreds of years, man has used a heavy metal called lead in many products and objects. When absorbed into the body, it is highly toxic to human organs and systems and seriously hinders the body's physical, intellectual, and neurological development. Lead is a natural element that does not break down in the environment. Once lead has been dispersed into the environment, it will remain to poison generations of children unless it is controlled or eliminated. Even very limited exposures to lead are hazardous to children and can even cause death. After reading an article about kids with learning disabilities due to lead poisoning, I was curious to find what exactly did the lead do to the cells reproduction known as mitosis	
Abstract To find the answer I decided to test a strain of cells under different concentrations. Onion cells are one of the easiest cells to grow and observe so I placed one bulb in a test tube and filled it with diluted water and different concentrations of lead, 1cc, 10 cc, 20 cc, and 50 cc. I then did a second set where I allowed the onion roots to begin growing for 3 days before I exposed them to the lead. After measuring root growth after 3, 7, and 14 days of exposure (with a centimeter ruler), I took a slide sample of each root tip and observed them under high power. I then counted all the cells in 1/4 of the view in the microscope and how many were going through mitosis.	
Methods/Materials To find the answer I decided to test a strain of cells under different concentrations. Onion cells are one of the easiest cells to grow and observe so I placed one bulb in a test tube and filled it with diluted water and different concentrations of lead, 1cc, 10 cc, 20 cc, and 50 cc. I then did a second set where I allowed the onion roots to begin growing for 3 days before I exposed them to the lead. After measuring root growth after 3, 7, and 14 days of exposure (with a centimeter ruler), I took a slide sample of each root tip and observed them under high power. I then counted all the cells in 1/4 of the view in the microscope and how many were going through mitosis.	
Results The results were conclusive; lead has a profound toxic affect on the mitotic process of the onion root tips. The 7.5% cc lead solution froze the most cells during Interphase, preventing further mitosis from taking place. The 1.5% and 3.0% solutions affected the cells; some roots were able to grow normally but at a greatly reduced rate. Set A had more devastating results because many onion bulbs couldn't even begin to grow roots. Set B however, had a greater amount of cells going through the regular mitotic cycle. Set A had a much larger kill rate of 8 dead bulbs. Set B had only 3.	
Conclusions/Discussion Lead is a harmful, dangerous substance that should not be taken lightly. It has numerous affects on cells. This project taught me the importance of proper lead removal, and how lead is still a pervasive element in today's modern world that could poison future generations.	
Summary Statement By exposing diffrent cocntrations of lead to ce	
Help Received	