

Lead Content in New York City Pipes



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INTRODUCTION I:

- Lead is an extremely toxic metal that is highly resistant to corrosion
- Lead was used in NYC piping until the 70's and early 80's because it worked so well at making the pipes resistant to decay.
- Lead has been shown to have very serious health effects, especially on children and pregnant women.



INTRODUCTION II:

- It is almost impossible to avoid at least some minor exposure to lead. It is everywhere, and especially living in the city, it is on many surfaces (dirt, pipes, toys, water, paint ect.)
- Typically the body is able to absorb little amounts of lead and the person will have no knowledge that they have ingested a toxic metal.
- If the amount of exposure causes the blood lead level to rise to 10µg/dl, then there are serious potential health risks. The CDC has even recently stated that ANY exposure, regardless of the level could have serious health risks.
- Diseases resulting from lead exposure can range anywhere from minor learning disabilities to central nervous system damage and even organ failure.

HYPOTHESIS

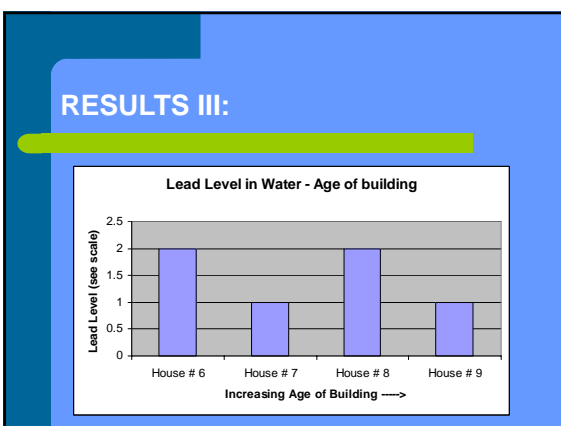
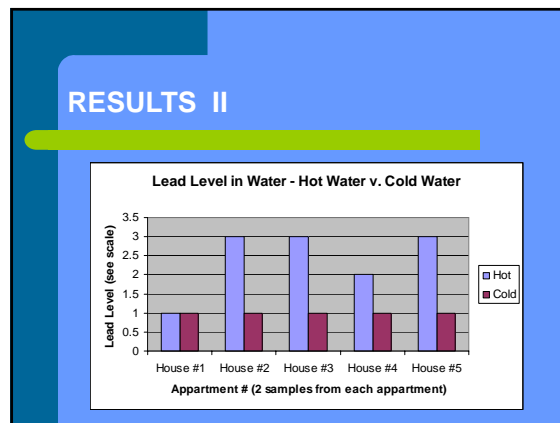
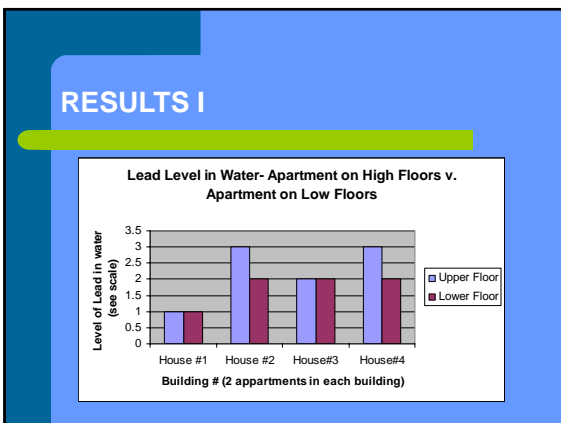
- Lead concentration in water will increase with increased time water is exposed to pipes.
- Lead content will be greater in hotter water than in colder water, on higher floors than lower floors, and in older buildings than newer buildings.

METHODS I:

- In 5 buildings of varying ages, 10 apartments were tested for lead levels (one on a higher floor and one on a lower floor)
- The water was left off for at least 6 hours and then the first 2000mL of water was collected in a pot
- Then, the water was left running for 3 minutes and then another sample of 2000mL was collected in a pot
- The water samples were boiled separately until only 50mL remained of each sample. The lead concentration level was tested using the test kits.
- The lead test kits used an indicator solution that is applied to a Q-Tip and then the Q-Tip gets placed into a supplied test tube along with a sample of water and inverted once. The color change in swab was observed.

METHODS II:

- This procedure was repeated for the other 9 apartments- a total of 20 samples were collected for this part of the study.
- Then, in a second data set, the water from one apartment in each building was tested. A sample of cold water that was running through the pipes was tested following the same procedure as before. Then, a sample of hot water that was sitting in the hot water heater was tested following the same procedure. The results were analyzed in the same way.
- In a separate study, the water from 2 houses built after 1986 was compared with the water in 2 houses that were built before WWII. The same procedure was followed as with the previous experiment (the water was left in the pipes overnight).



EVIDENCE:

Water being taken from sink

Water being boiled

Samples of Concentrated water

Sample of water being tested

Lead Test Kit

CONCLUSION I:

- Lead was found, in extremely low levels, in NYC apartments. There was more lead in water from apartments on higher floors than there was in the water from lower floors.
- Lead was also found (at higher concentrations) in hot water than in cold water.
- Older buildings and new buildings both had concentrations that did not necessarily follow a trend, and it is therefore difficult to draw conclusions about age of house and level of lead in water.

FUTURE STUDIES:

- In the future, if I had a more accurate a precise tool for measuring lead level in water I would like to repeat the experiment.
- I would also like to use houses that might be empty for a week or so, so that i could actually get a level of lead that is measurable (because the water would have been sitting in the pipes for longer and would have collected more lead).
- I would like to test water from other cities to see if NYC water or pipes are better than the water in other cities.