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East Bay Academy for Young Scientists



UC Berkeley - Lawrence Hall of Science

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STEM: A Useful Tool for Community Growth & Development



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- Provide experiences unavailable elsewhere that aid participants in developing deeper understandings of and appreciation for scientific inquiry
- Include air, soil and water quality research activities to provide opportunities for participants to apply acquired understandings to addressing relevant issues

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Inquiry Skills
Development
Through
Hands-on
Investigations



Student Research
(Guided &
Student Led)



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Partnerships



- Mainstream schools in small through large school districts
- School district-based Charter Schools
- Community-based organizations
- Faith based organizations



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Student Research

Correlation between Surface Area and Dissolving Properties of Lead: A Step in the Investigation of Higher than Standard Lead Concentration in Drinking Water in Washington D.C.

Madeline Hua, Lakisha Gardulo, Jaime Mondragon, and Kevin Cuff
Lawrence Hall of Science, University of California at Berkeley

Introduction

The introduction of leaded gasoline in the 1920s led to a significant increase in lead levels in the environment. This research aims to investigate the correlation between the surface area of lead and its dissolving properties in water, which is a step in the investigation of higher than standard lead concentration in drinking water in Washington D.C.

Methods


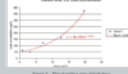
The experiment was conducted in a laboratory setting. Lead was dissolved in water, and the concentration of lead in the solution was measured using a lead ion selective electrode. The surface area of the lead was varied by using different sizes of lead particles.

Results and Discussion

The results show that the concentration of lead in the solution increases with the surface area of the lead. This is because a larger surface area provides more lead atoms that can be dissolved into the water.

Conclusion

The experiment demonstrates that the surface area of lead has a significant effect on its dissolving properties in water. This finding is important for understanding the lead contamination in drinking water.

Soil-gas Radon Emanation in Active Hydrothermal Areas at Lassen Volcanic Center, Northern California

Tao Chen, Iskander Anwar, Fred Vones, Vijay Swamy, Jordan Drexler, Elizabeth Bartelt, and Kevin Cuff
Lawrence Hall of Science, University of California at Berkeley

Introduction

Radon is a naturally occurring radioactive gas that is produced from the decay of uranium and thorium in the earth's crust. It is a potential health hazard when inhaled. This research aims to investigate soil-gas radon emanation in active hydrothermal areas at Lassen Volcanic Center, Northern California.

Methods





The experiment was conducted in a laboratory setting. Soil samples were collected from active hydrothermal areas and analyzed for radon concentration using a radon detector.

Results and Discussion

The results show that soil-gas radon emanation is significantly higher in active hydrothermal areas compared to non-hydrothermal areas. This is because the heat and pressure in hydrothermal areas increase the rate of radon production and its escape from the soil.

Conclusion

The experiment demonstrates that soil-gas radon emanation is a significant indicator of active hydrothermal activity. This finding is important for understanding the geology and hydrology of the Lassen Volcanic Center.

Drinking Water Contamination Due to Lead-based Solder

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Lawrence Hall of Science, University of California, Berkeley

Background Info

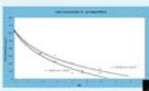

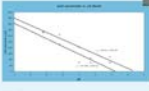



It is known that lead is toxic and can cause serious health problems. Lead-based solder is commonly used in plumbing and electrical wiring. This research aims to investigate drinking water contamination due to lead-based solder.

Methods

The experiment was conducted in a laboratory setting. Lead-based solder was dissolved in water, and the concentration of lead in the solution was measured using a lead ion selective electrode.

Conclusion

The experiment demonstrates that lead-based solder can cause drinking water contamination. This finding is important for understanding the lead contamination in drinking water.

Guided Inquiry

- Present students with research questions, and then engage them in specified research tasks that provide opportunities for them to explore/become familiar with research tools they will be use later
- Engage students in activities such as discussions of their findings that also encourage them to reflect on their research experiences
- Provide opportunities for students to design new investigations, create research proposals, and conduct new studies

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Students as Community Educators

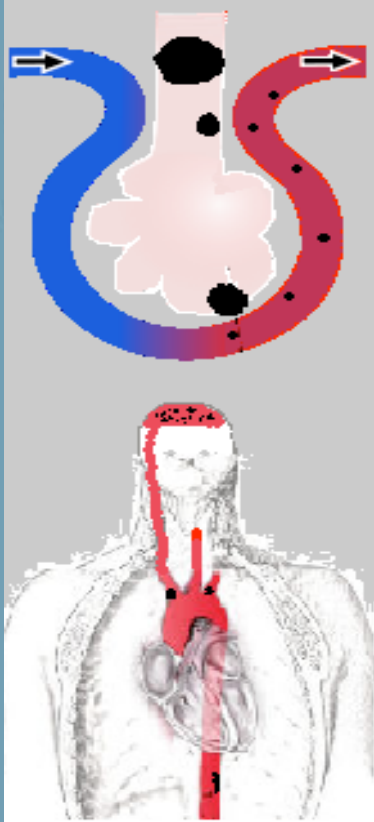
Lawrence Hall of Science's
East Bay Academy for
Young Scientists
proudly presents:
Bay Area Air and
Water Assessments



@ the Cesar Chavez library
meeting room in Fruitvale Village
Saturday, January 24th
3:00-5:00 PM

The Oakland Public Library does not advocate or endorse the viewpoints of meetings or meeting room users.

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This is what happens when you inhale particulate matter. The particles go into your blood stream from your lungs.

Introduction

This school year we have been studying particulate matter in our community. Particulate matter is small particles that come from cars, dirt and fossil fuels (crude oil, coal). Many of the health problems that can happen to you when you breathe in particulate matter are asthma, cancer and heart problems.

One of the dirtiest fuels is wood and diesel. Why do we use these fuels??? One of the reasons is because they are cheaper and because they are efficient. Some times a lot of people use fast cars, but it is bad because then you have to get more gas.

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Evaluation

- (1) Changes in Attitude about the Relevance of Science
(CARS) survey (M.S. Siegel, M.A. Raney, 2003)*
- (2) Q-sort for Scientific Behaviors
(K.D. Peterson, R. Ponzio, 2003)*
- (3) Embedded assessment questions to measure content
understanding*
- (4) Small group interviews*
- (5) Student journals*
- (6) Power Point and poster presentations*

Efficacy

Participants develop a greater understanding of the process of scientific inquiry

“If I’m doing a project, I’ll write down my hypothesis, conclusion, the procedure.”

[Why?] “It’s important to keep all that information.

Because you don’t know what you might need or what you might not need.”

“A lot of scientists do charts to help them organize everything.”

Interest in STEM increases

“So, in this program, even though we don’t get a grade, it feels like we are earning a grade and we’re really learning a lot of stuff.”

Participants ability to relate EBAYS STEM-related experiences to their own lives increases

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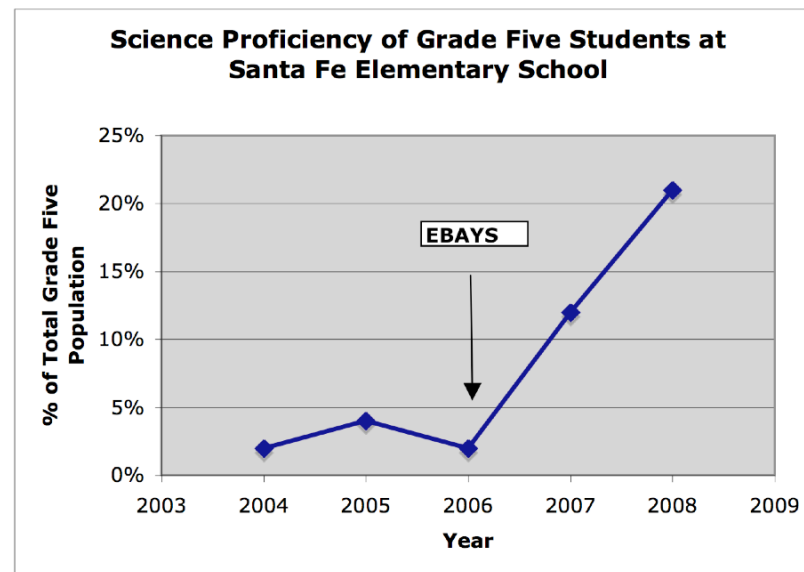
Efficacy

70% of students developed a greater understanding of the process of scientific inquiry.

63% of students enrolled in more advanced STEM courses (including AP).

65% of students have been accepted to four-year colleges.

60% of these students have elected to major in one of the major science disciplines.



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Climate Change ?



- Do not lead with global warming
- Communicate positive messages
- Connect to other themes, e.g., energy production & use
- Link to relevant issues like pollution and families' health