

# **LEAD: CAUSES, EFFECTS, AND PREVENTION**

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## **PROBLEM STATEMENT**

Throughout the course of time, lead poisoning has affected many children and families because of exposure to lead paint in older homes and school buildings. Up until 1978, lead was still being used in paints, which created a newer generation of children being diagnosed with lead poisoning, or exposure to lead. Lead poisoning does not discriminate, and affects everyone regardless of their race, or socio-economic status. It is well documented that most at risk populations are children who come from poor socio-economic homes, minority students, and children who live in homes or apartments that are not professionally maintained.

Children who are exposed to lead tend to experience developmental and behavioral issues, as well as permanent brain damage and possible death. The developmental and behavioral effects of lead can present itself as hyperactivity, irritability, off task, or inattentive in the classroom and home settings. Lead can be ingested, by coming into contact with someone who works in an industry with lead products, water consumption, or through skin absorption. It is well documented that lead has a sweet taste, which may be a reason children tend to eat lead chips.

In recent years, there has been a decline in the number of children in the United States (U.S.) who have been exposed to lead due to the Federal government banning lead in gas, the Clean Air Act, pipes in homes and buildings no longer using lead pipes, and lead paint being banned in 1978. However, not all areas of the country have seen the same levels of decline in blood lead levels. Older US cities continue to have higher rates of elevated blood lead levels among children from low income families of color.

To counteract the problem of lead poisoning or exposure, the Federal government, some State and Local Municipalities implemented mandatory laws for children to be tested at birth, or by the age of 6 for possible lead poisoning. The States with mandatory policies for children to be tested for lead in the blood are: Connecticut, Delaware, Massachusetts, Rhode Island, New York, Vermont, District of Columbia (D.C.), Iowa, Maryland, New Jersey, Louisiana (Rickman, 2017). The States with no formal lead testing policies are: Wyoming, Arkansas, Montana, North Dakota, and South Dakota. The States that have adopted preventive strategies has shown a decline in the elevated blood lead levels.

Other preventive measures regarding lead exposure lead to the 2008 Environmental Protection Agency Lead-Based Paint Renovation Repair, and Painting (RRRP) Rule that requires any worker renovating, repairing, or painting to have certification in the safety of lead (Dickman, 2017).

The Residential Lead-Based Paint Hazard Reduction Act of 1992 put in place preventive measures for property owners who owned housing that was built before 1978 to disclose if the property has any lead paint concerns if the property was leased or sold (Dickman, 2017). But, since lead is not biodegradable, it continues to be a source of lead poisoning in children unless it is properly removed or contained. Most children are exposed to lead or have lead poisoning in their own homes through exposure to lead dust or paint chips from deteriorated lead paint surfaces, or when lead painted surfaces are disturbed during home

renovation or repainting. The greatest risk is lead-contaminated dust generated from the friction of opening and closing windows and doors. Therefore, it is important for workers to have certification, and landlords provide renters or possible homeowners with certificates regarding lead so that parents can be aware when lead is present.

## **RATIONALE**

High lead levels in children is an ongoing health problem that affects children worldwide. Children are reported to have high levels of lead because they put things in their mouths, scoot around on floors, and tend to eat lead chips due to its supposedly sweet taste. If an adult has exposure to lead it is usually due to certain occupations such as industrial or chemical plants.

Exposure to lead in children can lead to cognitive impairment, behavioral disorders, developmental delays, iron deficiencies, as well as impaired hearing (Bardman, et al 2001). Research has shown that when elevated blood lead levels goes undetected in children, and they reach adulthood, there is an increase in criminal offenses (Beckley, et al 2017).

Lead poisoning or exposure goes unnoticed because it is not easily detected. It is not only found in paint, but also in water, spices, imported items such as clay pots, makeup, jewelry, candies, home remedies, homes built before 1986, and painted toys (CDC, 2017).

To detect lead levels in children a blood test to measure the level of lead in the blood has to be given. Parents should have a blood test done at or around the age of 12 months, and then again around 24 months. If a child has a blood lead level (bll) of 5 mcg/dl, a child's intelligence quotient (IQ) can be compromised (CDC, 2017). As the blood lead level increases, the effect on the IQ increases too. If a child has a blood lead level (bll) is 6 or higher the child can have permanent brain damage. From an educational aspect, when lead is detected in a child's blood, depending on the level the child can be diagnosed with learning disabilities, non-compliant behavior, hyperactivity, as well as exhibit behavioral problems which can lead to juvenile delinquency, and possible adulthood criminal activity.

## **OBJECTIVES**

In this unit the students will be able to identify environmental products that may contain lead, understand and grapple with how lead effects children physically, mentally, and behaviorally. Also, preventive measures to combat lead will be addressed. The unit will differentiate instruction, and assist students with improving upon their reading, writing, speaking, thinking, history and social skills.

## **SPECIFIC LEARNING OBJECTIVES:**

Students Will:

1. Describe how 5-10 micrograms per deciliter of lead in blood affects a student mentally and physically.
2. Learn preventive measures to combat lead poisoning
3. Complete the Lead Poisoning Assessment Questionnaire with a parent/guardian to determine if lead is in their home.

4. Test for possible lead in water and any peeling, chipping, or cracked paint in their school buildings.
5. Learn how nutrition and eating right can make it harder for lead to be absorbed into the body.

## **BACKGROUND**

### **Causes of Lead Poisoning**

Lead is described as a soft bluish-white lustrous **metal** that can be bent out of shape easily. It will not crack or break. It has been around since 4000 B.C. It was used for making water pipes, roofs, coffins, statues, and solder in colored glass church windows. According to Roberge (2019), During the Roman Empire era, it was used to flavor wines and foods due to its sweet, savory taste. It was known as “Sugar of Lead” during the Middle Ages, and “one fifth of the 450 recipes in the Roman Apician Cookbook had lead enhanced recipes” (Roberge, 2019). During this era, people were beginning to become ill, and lead was suspected as the cause, but was never founded. And, so the people continued to use lead in their food, wines, pipes, paintings, bullets, knuckle rings, coins, construction, dishes and cosmetics (Roberge, 2019). According to Wolley (1984) during the Roman Empire era lead was produced at 80,000 tons a year. A lead poisoning epidemic was inevitable!

As time moved forward, lead was continuously being used in large quantities. There was an increase in mental disorders and illnesses. Even though it was suspected, lead was not founded as the number one culprit. Great scholars such as Hippocrates described the effects of lead poisoning as having an upset stomach or similar to colic (Superfund Research Program, 2019). By 1909, France, Belgium, and Austria banned lead. Those countries begin to suspect lead was the cause for many health issues in children and adults. Even in the 1900’s lead caused many ailments and possible death depending on the toxicity levels in the human body. But, they did not stop the usage of lead.

From the very beginning of lead usage in environmental products, lead has created havoc on the health of people who was exposed to it by inhalation, indigestion or skin contact. This is a brief timeline of lead, and why it took so long to ban it from most consumer products:

- a) By 1922 lead was being used to fuel cars. It was known as “premium gas for high performing engines.
- b) In 1924 factory workers in a New Jersey plant went insane, and leaded gasoline was banned in New York City and Philadelphia.
- c) By 1930, companies and factories did not like being accused of creating health problems in children who ate lead paint chips. In fact, they accused the children of being abnormal.
- d) In 1970 President Nixon signed the Clean Air Act.
- e) In 1971, he signed the Lead-Based Paint Poisoning Prevention Act, which restricted lead paints in houses.
- f) In 1985, the Environmental Protection Agency banned leaded gasoline by 1988.

- g) In 1990, the Clean Air Act banned lead from gasoline.  
(Fowler, 2008)

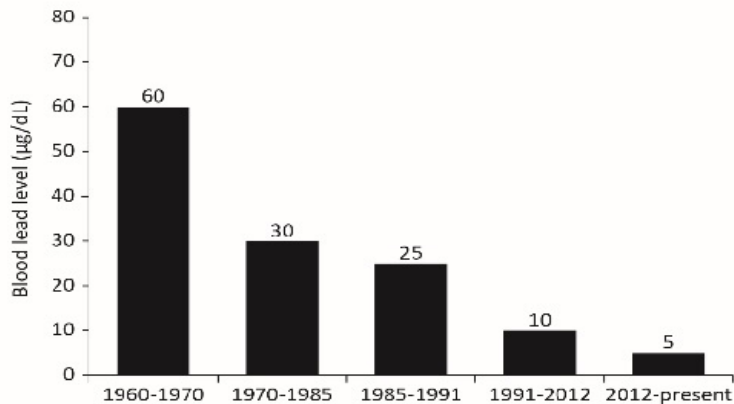
The problems with lead poisoning began in the years B.C to A.D, and it is still a concern in the 21<sup>st</sup> century. Schools across the nation have had their fair share of problems with lead in the water system, lead paint throughout the buildings, chipping paint, which created lead chips that children ate because of its sweetness. And, throughout all the history associated with lead, it took a lot of groundwork and protesting to get CEO's of major companies, school districts, landlords, factory workers, and homeowners to understand the neglect, abuse and health issues that has manifested due to lead poisoning because proactive and preventive measures were not adhered to.

According to an investigation in 1993 by the Environmental Protection Agency (EPA), the Philadelphia School District was aware of possible lead contamination in school buildings throughout the district. It took six years before the Philadelphia district was forced by the EPA to test lead levels in the water systems for almost 300 schools (Glenza, 2016). From May 2000 to January 2001, Bryant (2004) completed a study on the lead levels in the drinking water of 292 schools in Philadelphia's public school buildings. According to the study "a total of 57.4% of the school buildings had water lead levels exceeding the Environmental Protection Agencies (EPA) action level of 20 parts per billion (ppb), and 28.7% of the school buildings had water with mean lead levels in excess of 50 ppb."

As of 2017, 200 public schools in Philadelphia had water outlets that tested at or above the District's lead levels of "10 parts per billion (ppb). Of the 200 schools, 19% had one outlet above the level; 10% had two outlets above the level, and 23% had three or more outlets with high lead levels, or were shutoff due to high head levels (Windle, 2017).

In 2012, blood lead levels were reported as a level of concern if it exceeded 10 or more micrograms per deciliter of lead in blood (CDC, 2017). In 2012, experts who studied lead requested for the Center for Disease Control and Prevention to lower the level of concern for blood lead in children ages 1-5, in the United States, from 10 micrograms per deciliter to 5 micrograms per deciliter to better identify children and protect them from lead exposure (CDC, 2017). The table below demonstrates how acceptable levels of lead have gone down in recent years. In the 1960-70's era, it was acceptable to have blood lead level (BLL) of 60 mcg/dl (Figure 1). Based on an increasing body of research, it took almost 52 years for Federal guidelines by the CDC to reflect that blood lead levels of 5 mcg/dl have a significant impact on a child's development.

adverse health effects in children and adults at BLL <5 µg/dL [CDC 2012].



**Figure 1 Lowering of BLLs Considered Elevated by CDC Over Time.**

\*\*\*The National Toxicology Program [2012] concludes that there is sufficient evidence for adverse health effects in children and adults at BLL <5 µg/dL [CDC 2012].

### Effects of Lead Poisoning

The effects of lead can be detrimental. High lead levels is associated with brain damage, poor academics, behavioral problems, school dropout rates, and juvenile and adult trouble with the law. Studies have shown when students have lead exposure resulting in lead levels that are even “less than 10 micrograms per deciliter their IQ is lowered by 4-8 points. As the blood lead increases, there is more IQ loss and they can have mental retardation, coma, convulsion or death” (Velez & Reff, 2008).

In order to prevent high levels of lead, awareness is the key. You have to know the sign and symptoms for early prevention. The signs and symptoms of possible lead poisoning or exposure may not be visible symptoms. But, it can present as:

- Colic
- stomach ache
- irritable,
- do not have their usual appetite
- weight loss
- tired and do not know why.
- Constipation
- vomiting
- skin may be pale
- experience headaches
- confused or dazed
- anemia
- hair might start falling out

The only way to get an accurate diagnosis is to have a blood test for possible lead poisoning. Children are more susceptible to lead poisoning because their bodies absorb more lead than adults due putting their hands or objects in their mouths constantly. Also, children and families who live below the poverty line may experience more occurrences of lead poisoning due to landlords or homeowners who may not upkeep their house according to regulations.

They may have old windows that have cords or chains that rub when opened or closed. Peeling paint chips from the walls, ceiling, and window sills that children may tend to eat due to the sweet taste.

When adults have lead exposure or poisoning, it is usually from work. They may bring home lead dust on their clothes. They might work in any of the following industries: Painting, radiator repair, battery manufacturer, foundry work, pottery/ceramics manufacturer, scrap metal recycling, firearm shooting, etc. ((Velez & Reff, 2008). According to Velez and Reff (2008) lead exposure poisoning can also come from “Imported candies, spices, mini-blinds, toys, jewelry, or other non-traditional sources of lead”. Lead is found in low-levels in some drinking water because lead-based solder in water pipes may add lead to water.” In addition, thousands of lead service lines still bring water to homes. If drinking water companies do not appropriately treat water for corrosivity, lead can be leached from the pipes as it did in Flint, MI. Even though the focus of lead poisoning is more of a concern for children, adults with occupational exposures and pregnant women should be tested as well because lead poisoning or exposure in adults can have adverse negative affects.

## **Preventive Measures**

There are many steps to prevent lead poisoning and exposure. If you have small children the best way to prevent it is to make sure your child had been tested for lead twice by the age of 3, your home has recently been painted, paint is not chipping or peeling from the walls or windowsills, your children are not playing in dirt, or your children are not putting old toys in their mouths. Other preventive measures are to have people take off their shoes when they enter your house so they are not tracking dirt/soil into the house because you may have babies who may be crawling on the floor, and putting their hands in their mouth, which could possibly lead to lead exposure or poisoning. Hand washing is another preventive measure. Make sure proper procedures for hand washing is being followed, and you are washing your hands constantly throughout the day. It is also a good idea to use a HEPA vacuum, and constantly wet mop rather than sweep your floors, and wet dust if you have small children. Another preventive measure is to “Use an NSF-certified filter on your faucet for drinking water, food preparation and cooking, and be sure to change the filter cartridge by the date printed on the package” (Thayer, 2018).

According to Velez and Reff (2008) nutrition is very important to combat lead poisoning. Children who eat foods that are high in iron, calcium, vitamin C and low in fat are less likely to absorb lead. Although this is an important strategy, nutrition alone can not reduce lead exposure significantly in an environment that has multiple exposure sources. Each day kids need: 3 to 4 servings of foods high in iron, 3 to 4 servings of foods high in vitamin C, 3 to 4 servings of foods high in calcium (see figure 2a)

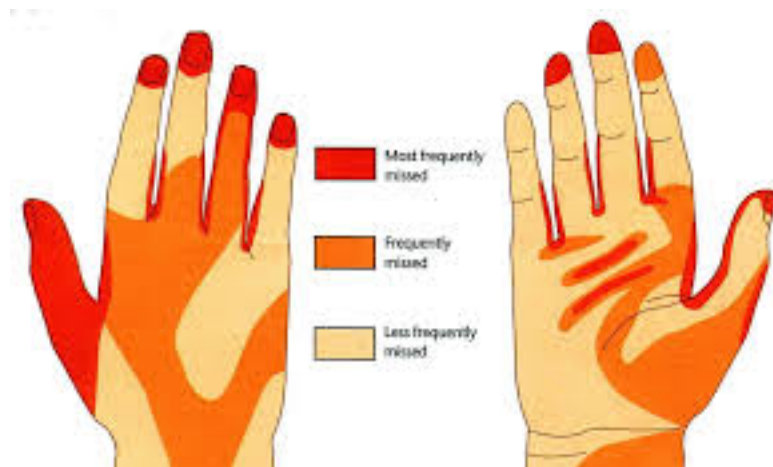


Figure 2a: City of San Diego

When foods high in calcium, iron and vitamin C, it makes it more difficult for lead to be absorbed in the body. Parents can be educated that if their child/children or even if they have lead, healthy eating (figure 2a) may be helpful.

Being informed and educated about lead poisoning is important to preventing it. Lead can affect children and adults cognitively, mentally, and behaviorally. But, preventive measures such as running water for several minutes before using it can reduce the ingestion of lead from lead pipes, solder and fixtures. When parents allow their child/children to go outside, they should be aware of the soil which could contain lead. This is why hand washing is so important. Figure 4 demonstrates which parts of the hand are not washed thoroughly. It is important for parents to ensure their child is washing their hands correctly, and not missing key areas such as the fingertips and under the fingernails. The red area shows areas most frequently missed. The Orange areas demonstrate areas frequently missed, and the beige/cream areas shows areas less frequently missed. Hand washing is crucial and important for the absorption and ingestion of lead as well as bacteria and viruses.

Figure 4: Tarragó, O. & Brown, M (2017)

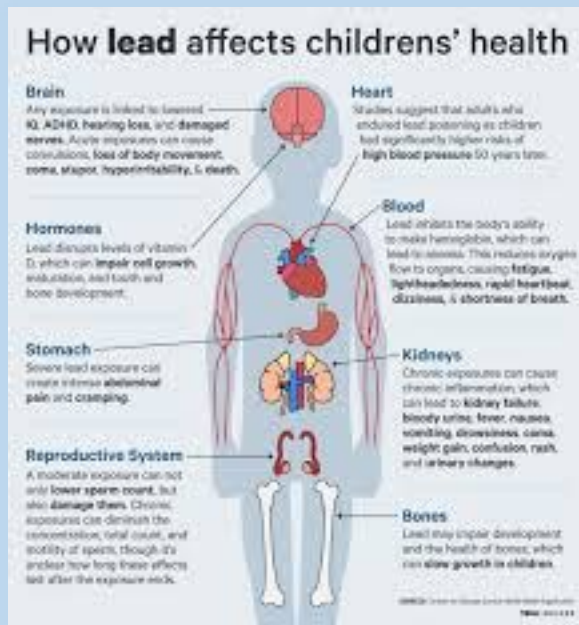


In 2018, the Philadelphia Inquirer posted an article on how safe is your school. The article was titled “*School Checkup*” (see link in Resources). Parents, students and staff were able to find out how safe was their school by clicking a drop down box, find the name of their school, press the search button, and information about any issues or concerns about the school were displayed. According to the article, there are more than 130,000 public school students. This includes students from 214 public schools, and 86 charter schools. The article discussed how students, and staff are at risk from hazards such as lead dust, asbestos, mold, roaches, and mouse urine and feces. Therefore, to combat lead from being ingested, inhaled or absorbed in the body preventive measures have to be in place and followed accordingly.

Lead exposure and poisoning is an ongoing issue even when preventive measure are in place. But, being proactive and educated is a part of the solution. The impact of lead on the body affects a person mentally, emotionally and physically. Figure 5 shows how lead affects the developmental delay of children even into their adulthood.

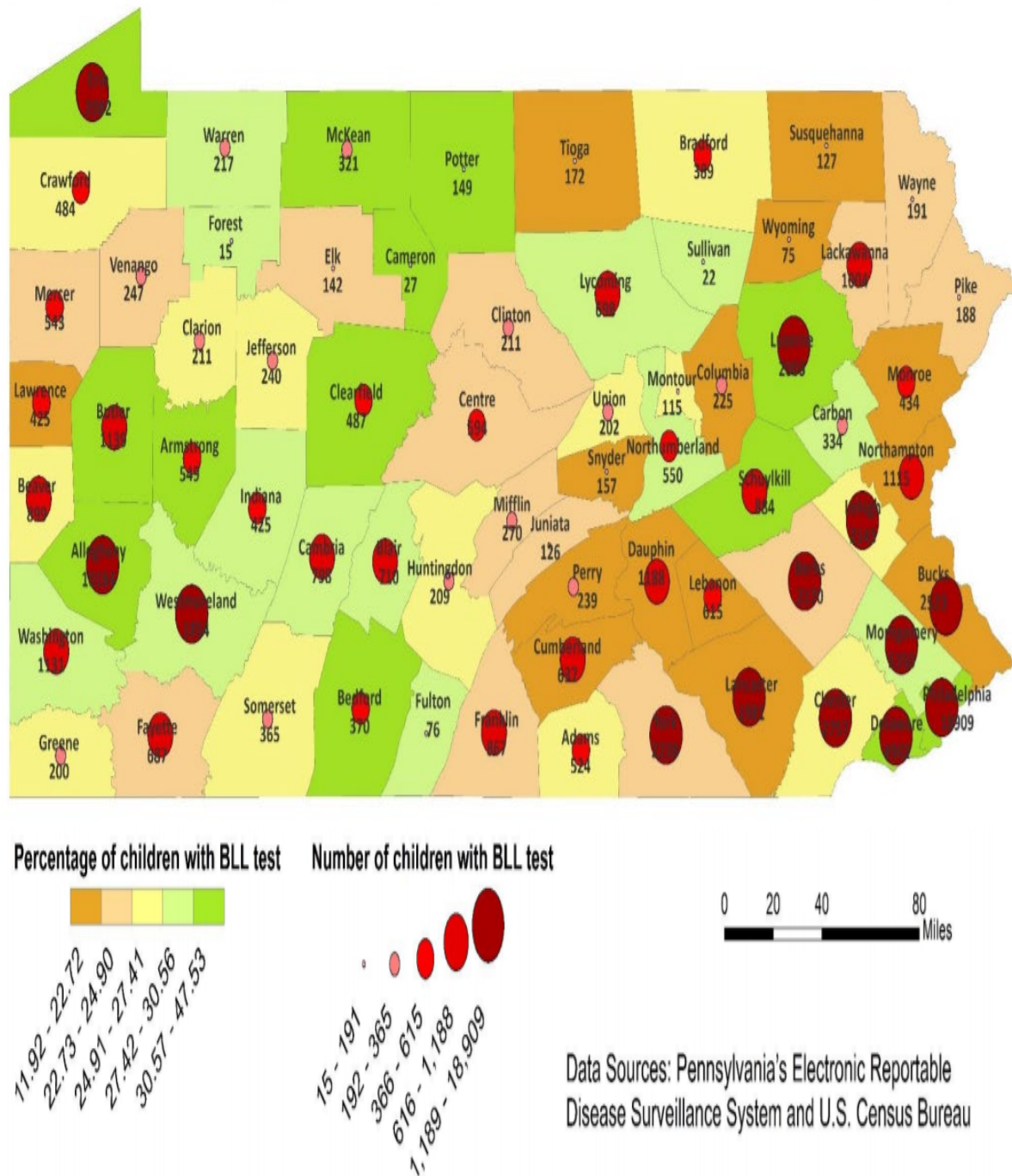
Figure 5: Calderon & Gould (2016)





Since lead can be found in dust, water, old painted toys, window sills, older pipes in the home, schools, or painted floors parents have to be proactive with getting their child, and perhaps themselves tested for possible lead poisoning or exposure. When parents are educated on the effects of lead, they can keep themselves and their children safe from possible lead poisoning and exposure. However, data has shown that even when mandated State testing is in effect, parents are not having children tested for lead exposure. In the State of Pennsylvania, it is NOT mandated to have children tested for lead (see figure 2). However, in Philadelphia, it is recommended that children be tested for lead at the age of 12 months and 24 months. If a child is not tested at these crucial stages of development, it is recommended for children to get tested between 36-72 months, if they have not had prior screening. According to Dignama, Pomales, et al (2018) the Philadelphia Department of Public Health and pediatric health care providers can routinely test children with elevated blood lead levels based upon the family's low income status, being Medicaid eligible and enrolled in Medicaid programs. However, even in Philadelphia where insurance covers blood lead testing for all children, fewer than half of children are tested. This means that there are children with elevated blood lead levels who are never identified.

Figure 2. Number and Percentage\* of Children Aged 0–23 Months Tested for Blood Lead Level, by County, 2017



Lastly, In Philadelphia, Pennsylvania, if a home or building was built before 1978, and if children under six years old will live in the home, the landlord has to give the tenant a “Certificate of Rental Suitability”, to say there are no possible problems with the property. If the tenant does not receive the certificate, they can report it to Licenses and Inspections (L&I) by

calling 311 or filling out a form online ([online form](#)). The landlord has 30 days to correct the problem or go to court for violating the ordinance (Garrow, 2018).

Standards: The Core Curriculum of the School District of Philadelphia is aligned to the Pennsylvania Department of Education Standards Aligned System. The standards include instruction on the following topics: literacy, social studies, math, history and technology.

## **ESSENTIAL QUESTIONS**

1. What are the causes of lead poisoning?
2. What are the effects of lead on the brain and body?
3. What are preventive measures for lead poisoning?
4. Can you identify possible signs of lead poisoning?
5. Do you suspect your house or school might have possible lead?
6. What are the best foods to eat if you are diagnosed with high blood lead levels?

## **STRATEGIES**

Strategies are important when planning lessons because it helps with differentiating instruction (DI) when you have a diverse classroom. When lessons are differentiated the students are allowed to process what is being taught to understand the content. It also enables students to check for understanding when the teacher provides technology, testing materials and projects to enhance student learning.

The strategies will offer cooperative learning, as well as individual and group learning. When group learning is incorporated, it allows the teacher to have time to meet the needs of students who are struggling, and who may need more assistance, as well as assist any student with academic needs. The strategies listed are appropriate for any age group because the groups can be heterogeneously or homogeneously set up to meet the needs of the students. The strategies will allow for the students to be more engaged, as well as experience a cooperative and dynamic environment conducive to learning.

### **Learning Stations**

The learning station can incorporate independent learning, technology and paper based to allow students to rotate and have movement in order to learn a specific skill or concept based upon the lesson that was taught. In the learning station students will be able to watch videos, do artwork, read articles pertaining to the learned subject, as well as engage in active listening. Once students have completed the activity in the learning station, they will be able to engage in a class discussion, or answer questions pertaining to what they have learned.

If the students are visual learners, a learning station can be set up for Nonlinguistic students. The station can offer teacher strategies that provide for students to recall what they learned from visual images. They can utilize graphic organizers and flow charts, as well as have a model of what was taught, and pictorial representations. The learning stations would address the needs of all learners linguistically, visually, audibly, and kinesthetically.

### **Think-Pair-Share**

This strategy incorporates three lessons into one. As students are completing the lesson, they can be monitored, and offered support to ensure they are comprehending what they are learning. When Think-Pair-Share is incorporated students will be engaged by having them think about a specific question or topic. The students will be paired with their peers to discuss what they think about the subject or topic. Then they will share their thoughts and findings with the class during an open forum discussion.

### **Socratic Strategy**

Socrates stated: "Let us examine the question together, my friend, and if you can contradict anything I say, do so and I will be persuaded." Incorporating the Socratic Strategy is important when teaching students how to effectively argue using dialogue, use higher order thinking skills (HOTS) to answer questions, make presumptions and assumptions about the topic, as well as have students listen, think, read, speak critically and understanding what is being taught to gain a deeper knowledge of the subject matter.

### **Journaling/Exit Ticket**

Journaling is an important strategy because it will allow the students the opportunity to reflect on the lesson that was taught. It will allow the students to write down their thoughts they may not have comfortable with sharing with the group. Journaling would be completed at the end of the day. Students will be given 15 minutes to summarize key points, figure out question that may have bothered them, but was afraid to ask, think about how the question relates to real life experiences, and it will give them the opportunity to process new information. The journals can be turned in daily, and it can be used as an exit ticket.

### **Behavior Management**

Behavior Management (BM) strategies are crucial when the classroom becomes too loud and perhaps disruptive. During times of unrest, an effective behavior management plan has to be in place. The plan will allow the teacher to "draw the students back to the task at hand" by offering points on Class Dojo for upper and lower grade students to get them to comply to the classroom rules and expectations, or have visual interactive reward charts for younger students. The students could also receive tickets for no homework, extra computer time, being the teacher assistant, having lunch with the teacher, or being the teacher helper.

### **Modeling- I Do, We Do, You Do**

Modeling is a great way to show students how enthused you are about the lesson you are teaching. If students see how important the lesson is to you they will be more apt to be inspired and fully participate. Modeling helps with introducing new concepts and content. It enables the teacher to check for understanding to ensure the students understand what is being taught. It also allows the students to ask questions before they complete the lesson. Once the "I Do and We Do" part has been addressed, the teacher can gradually release the students so they can complete the assignment (You Do).

### **Guided Practice**

Guided practice is important in the development of executive functioning skills in students. It allows the students to think about what they have learned, understand practice does make perfect if you do not understand something, and work hard at understanding it, allows the students to

follow through rather than give up on a task, and learn how to remain focus on the task at hand during their frustration or if they become bored. The teacher will guide the lesson to ensure the students have grasped the concepts, and they are able to work independently, and if needed with support from the teacher.

### **Check for Understanding (CFU)**

Checking for Understanding is crucial when teaching a lesson. If the students do not understand the lesson, they will not be able to move forward and answer questions, or complete assignments pertaining to the lesson. If the teacher knows the students do not understand, the teacher can make real time decisions to reteach the lesson, have students self-monitor or gauge where they need help. CFU's allows teachers to use Formative and Summative Assessments for a systematic approach to checks and balances.

CFU can be made into a fun and interactive strategy. The teacher can laminate colorful check marks, question marks, or hand prints with "I Understand" on one side, or "I Need Clarification" on the other side. The graphic can be placed on the student's desk, and when the teacher is circling the classroom, he/she would be able to know which students needs help, and which students understand the lesson.

### **Homework**

Homework is a great teaching strategy to allow students to proactive what they have learned. When students are given homework, it should be clear and concise so there is no confusion about the instructions. Homework should be differentiated, and it should create a positive attitude in students, rather than one of gloom. Homework should be given to instill good work habits in students, and for them to practice what they learned.

### **LESSON 1**

#### **Topic (Unit): Causes of Blood Lead Levels in the Body**

#### **Standards:**

##### **Reading/Literature**

CC.1.2.6. B, CC.1.2.6. G, CC.1.2.6. J, CC.1.2.6. K, CC.1.3.6. A, CC.1.3.6. G

##### **Writing**

CC.1.4.6 B, CC.1.4.6.C, CC.1.4.6. D, CC.1.4.6. E, CC.1.4.6 F, CC.1.4.6 H, CC.1.4.6. T, CC.1.4.6. U

##### **History and Social Studies**

CC.8.5.6-8. A, CC.8.5.6-8. B, CC.8.5.6-8. D, CC.8.5.6-8. G, CC.8.5.6-8.H, CC.8.5.6.6-8. B, CC.8.6.6-8.C, CC.8.6.6-8. D, CC.8.6.6-8. G

#### **Specific Learning Outcomes:**

##### **Students will:**

1. Learn the importance of having children tested for lead by certain ages based upon information from the videos.
2. Identify three **primary** sources of lead in the environment: paint, dust and soil.

3. Identify at least three behaviors in children that may be contributed to having high levels of blood lead poisoning.

#### **ASSESSMENT/EVALUATION OF SLO'S:**

**DIAGNOSTIC:** Lead poisoning and its affect physically, mentally and behaviorally

**FORMATIVE:** Class discussion on videos

**SUMMATIVE:** Lead Poisoning Risk Assessment Questionnaire (Figure 9).

#### **DIFFERENTIATED INSTRUCTION:**

1. Visual reinforcement and verbal communication
2. More time to complete assessment
3. Socratic Strategies, Check for Understanding
4. Think-Pair-Share
5. Behavior Management
6. Homework
7. Guided Practice

#### **MATERIAL AND RESOURCES:**

1. Videos about Lead and how it effects children
  - a. [https://youtu.be/Uf0x4JoH\\_mE](https://youtu.be/Uf0x4JoH_mE) 1:57  
**Avril Absalom Son Has Lead Poisoning**
  - b. <https://youtu.be/4Nlb47j5nAQ> 1:38  
**How Lead Poisoning Harms Children**
  - c. <https://youtu.be/lfA4Pwpft6k> 2:35  
**Symptoms, Cause and Cure of Lead Poisoning**
2. Notebook for journaling
3. KWL Chart
4. Lead Poisoning Risk Assessment Questionnaire

#### **ACTIVITIES AND PROCEDURES**

##### **WARM-UP:**

**TIME: 15 MINUTES**

Teacher will ask students what do they know about lead poisoning. Teacher or Teacher helper will write responses on a KWL chart on the board. Video C (2:35)) will be shown. Teacher will check for understanding and ask students what did they learn from the short clip. Responses will be written on the board. Teacher will ask students to write what they have learned about the symptoms and cause associated with lead, in the L section of the KWL chart. Students will turn in chart.

##### **ACTIVITY 1:**

**TIME: 15 MINUTES**

Teacher will discuss how different blood lead levels (BLL) affect your bodies depending on

age, and the amount of lead in your body. The teacher will show Videos A (1:57). Teacher will have students get into groups for 5 minutes (Think-Pair-Share). Students will discuss how lead affects the body. One student will be the recorder, and one students will be the reporter. Teacher will Check for Understanding (CFU) by asking the recorder what have they learned about how lead affects the body. Answers will be recorded on the board (15 minutes). Students will turn in group work.

## **ACTIVITY 2:**

**TIME: 15 MINUTES**

Teacher will inform the class that most States have laws in place that state it is mandatory to have children tested for lead by the age of 6 years old. Centers for Disease Control recommends that children be tested at 12 months an again at 24 months if they live in housing or are low income. Teacher will provide students with chart (Figure 10) to discuss what a child's blood level test means. Students will review Video B (1:38). Students will discuss the importance of being tested for lead.

**Homework:** Students will take home a Letter to The Parent (Appendice B) and a **Lead Poisoning Risk Assessment Questionnaire** (Figure 9) to complete with parent/guardian. Student will return questionnaire for a future activity. Students will relay information to parent/guardian what they have learned about lead poisoning and exposure.

## **LESSON 2**

**Topic (Unit): Lead and Water**

### **Standards:**

#### **Reading/Literature**

CC.1.2.6. B, CC.1.2.6. G, CC.1.2.6. J, CC.1.2.6. K, CC.1.3.6. A, CC.1.3.6. G

#### **Writing**

CC.1.4.6 B, CC.1.4.6.C, CC.1.4.6. D, CC.1.4.6. E, CC.1.4.6 F. CC.1.4.6 H, CC.1.4.6. T, CC.1.4.6. U

## **ASSESSMENT/EVALUATON OF SLO'S**

### **Students Will:**

1. Take a tour of school building and identify hydration stations in building.
2. Locate the hydrations station(s) and write in their journals whether the light is green for a clean filter or red for a filter that needs changing.
3. Document which hydration stations/water faucets were turned off.
4. Document which water faucets were not tested i.e. sign with a cup and "x", hand washing only at this sink, or if the sign stated the water has not been tested and do not drink from it



5. Ask building engineer when was the last time filters were changed on hydration stations.

**DIAGNOSTIC:** Students will learn how a hydration station works

**FORMATIVE:** Class discussion on video

**SUMMATIVE:** Lead Poisoning Risk Assessment Questionnaire

**DIFFERENTIATED INSTRUCTION:**

1. Visual reinforcement and verbal communication
2. More time to complete assessment.
3. Use of computer/IPad to complete lesson.
4. Learning Stations
5. Guided Practice
6. Modeling
7. Socratic Strategy
8. Think Pair Share
9. Technology
10. Journal Writing/Exit Ticket

**Materials and Resources:**

1. Videos about Lead and its effects on the brain  
<https://youtu.be/76RKSQgduVQ> (5:21)  
What Does Lead Poisoning Do to Your Brain?
2. Notebook/Journal for note taking and writing assignment
3. Return of Lead Poisoning Risk Assessment Questionnaire (figure 7)

**ACTIVITIES AND PROCEDURES**

**WARM-UP:**

**TIME: 15 MINUTES**

Teacher and students will discuss “Lead Poisoning Risk Assessment Questionnaire”. Students will get into groups and discuss what they learned from the “Lead Poisoning Risk Assessment Questionnaire”. Students will share out their findings. At end of share out, questionnaires will be collected. Students will also view video to learn about hydration stations [https://youtu.be/TOrxW\\_XF-y0](https://youtu.be/TOrxW_XF-y0) (2:23), and their importance to preventing lead poisoning. Students will discuss the importance of hydration stations.

**ACTIVITY 1:**

**TIME: 15 MINUTES**

Lesson will focus on what lead does to the body and brain. Video will be shown “What Does Lead Poisoning Do To Your Brain” (5:21), <https://youtu.be/76RKSQgduVQ>. Teacher will Check for Understanding (CFU) by asking questions about video, and what was learned. After discussion, students will get into groups of 3 or 4. Students will be given water test kits to test the water faucets in school for possible lead. Each group will receive a different water faucet to



test. Group will write down location of water faucet.

## **ACTIVITY 2:**

**TIME: 15 MINUTES**

Teacher and students will take a walk around the school building to count how many water faucets or in their school building. Students will observe and document how many have filtration systems, and how many does not. Students will gather water using a water test kit from the filtered systems and the unfiltered symptoms to later test for possible lead. Students will label which faucets the water was taken from (5 minutes). Students will return to class and write their findings in their journals about how many water faucets had filtration systems, and how many did not, and whether the light was green or red on the filtration systems. (10 minutes). Teacher will submit water samples from faucets for lead. Class will wait for results and discuss findings.

**HOMEWORK:** Students will answer questions 1-6 (Figure 11-  
<https://docs.google.com/document/d/1Ym409exoXz4jaOOsEiIsejvZTbWLQoMJoaoStYSYD0M/edit?usp=sharing>) on “Lead- Student Worksheet”. Students will use the links in the worksheets to answer the questions.

If student does not have a compute at home, student will be given worksheet packet with information from the links to complete assignments.

## **LESSON 3**

**Topic (Unit): Effects of Lead on the Body**

### **Standards:**

#### **Reading/Literature**

CC.1.2.6. B, CC.1.2.6. G, CC.1.2.6. J, CC.1.2.6. K, CC.1.3.6. A, CC.1.3.6. G

#### **Writing**

CC.1.4.6 B, CC.1.4.6.C, CC.1.4.6. D, CC.1.4.6. E, CC.1.4.6 F. CC.1.4.6 H, CC.1.4.6. T, CC.1.4.6. U

#### **History and Social Studies**

CC.8.5.6-8. A, CC.8.5.6-8. B, CC.8.5.6-8. D, CC.8.5.6-8. G, CC.8.5.6-8.H, CC.8.5.6-8. B, CC.8.6.6-8.C, CC.8.6.6-8. D, CC.8.6.6-8. G

## **ASSESSMENT/EVALUATON OF SLO’S:**

### **Students Will:**

1. Understand the importance of running faucet water for one minute before drinking or using for cooking.

2. Identify how lead in water affects the body/brain
3. Understand the importance of having 5 bll to 10 bll of lead in their body.

**DIAGNOSTIC:** The levels of lead in the body, and how it affects certain body parts

**FORMATIVE:** Class discussion on videos

**SUMMATIVE:** Answer questions 7-13 on Figure 11 “Lead-Student Worksheet “. (<https://docs.google.com/document/d/1Ym409exoXz4jaOOsEilsejvZTbWLQoMJoaoStYSYD0M/edit?usp=sharing>)

**DIFFERENTIATED INSTRUCTION:**

1. Visual reinforcement and verbal communication
2. More time to complete assessment.
3. Use of computer/IPad to complete lesson.
4. Learning Stations
5. Guided Practice
6. Modeling
7. Socratic Strategy
8. Think Pair Share
9. Technology
10. Journal Writing/Exit Ticket

**Materials and Resources:**

1. Video “Dirty Water: Danger from the Tap” | CNN Digital Documentary <https://youtu.be/1SrZQWvSEuw> (28.54).
2. Notebook for note taking and writing assignmen.t
3. Water bottles to fill with water from the faucets at school.

**ACTIVITIES AND PROCEDURES**

**WARM-UP:**

**TIME: 15 MINUTES**

Teacher and students will discuss importance of having clean drinking water. Students will get into groups of 3 or 4, and discuss why there drinking water should be lead free and odorless. Groups will share out what they discussed.

**ACTIVITY 1:**

**TIME: 30 MINUTES**

Lesson will focus the importance of drinking clean filtrated water. Students will view video ““Dirty Water: Danger from the Tap” | CNN Digital Documentary <https://youtu.be/1SrZQWvSEuw> (28.54). Students will discuss the importance of clean, lead free drinking water.

**HOMEWORK:** Students will answer questions 7-13 (Figure11

<https://docs.google.com/document/d/1Ym409exoXz4jaOOsEilsejvZTbWLQoMJoaoStYSYD0>

[M/edit?usp=sharing](#)) on “Lead- Student Worksheet”. Students will use the links in the worksheets to answer the questions.

If student does not have a compute at home, student will be given worksheet packet with information from the links to complete assignments.

## **LESSON 4**

### **Topic Unit: The Good, The Bad and The Ugly of Lead Poisoning in Consumer Products**

#### **Standards:**

##### **Reading/Literature**

CC.1.2.6. B, CC.1.2.6. G, CC.1.2.6. J, CC.1.2.6. K, CC.1.3.6. A, CC.1.3.6. G

##### **Writing**

CC.1.4.6 B, CC.1.4.6.C, CC.1.4.6. D, CC.1.4.6. E, CC.1.4.6 F. CC.1.4.6 H, CC.1.4.6. T, CC.1.4.6. U

##### **History and Social Studies**

CC.8.5.6-8. A, CC.8.5.6-8. B, CC.8.5.6-8. D, CC.8.5.6-8. G, CC.8.5.6-8.H, CC.8.5.6.6-8. B, CC.8.6.6-8.C, CC.8.6.6-8. D, CC.8.6.6-8. G

#### **ASSESSMENT/EVALUATON OF SLO’S:**

##### **Specific Learning Objectives:**

###### **Students Will:**

1. Identify consumer products that contain possible lead
2. Identify Countries consumer products are made in that possibly put lead in their products
3. Preventive measures for lead exposure or poison

**DIAGNOSTIC:** Consumer products that possibly still contain lead

**FORMATIVE:** Class discussion on video

**SUMMATIVE:** Worksheet on “What Do You Know About Lead” (Figure 7)

##### **DIFFERENTITATED INSTRUCTION:**

1. Visual reinforcement and verbal communication
2. More time to complete assessment.
3. Use of computer/IPad to complete lesson.
4. Learning Stations
5. Guided Practice
6. Modeling
7. Socratic Strategy

8. Think Pair Share
9. Technology
10. Journal Writing/Exit Ticket

**Materials and Resources:**

1. Videos and worksheet
2. Notebook for note taking and writing assignment
3. Water bottles to fill with water from the faucets at school.

**ACTIVITIES AND PROCEDURES**

**WARM-UP:**

**TIME: 15 MINUTES**

Students will view video <https://youtu.be/CM1u29BeqC0> (4:53) Lead: The Original Artificial Sweetener. Students will discuss the importance of being informed and educated about consumer products that possibly still contain lead.

**ACTIVITY 1:**

**TIME: 15 MINUTES**

Lesson recap on Figure 11 “Lead- Student Worksheet”. Students will discuss what they have learned about lead, its causes and effect on the human body. Students will be given the opportunity to share any stories they may know about someone being exposed to lead or possible lead poisoning.

**ACTIVITY 2:**

**TIME: 15 MINUTES**

Students will watch video <https://youtu.be/gjWUqy9371Y> “Many dollar store products reportedly contain lead, other hazardous chemicals” (2:18). Students will discuss if their families use, have used or are still using any of the products listed in the video. Students will write a 5 paragraph or more paper on why it is important to inform their family about the dangers of lead in certain consumer products.

**HOMEWORK:** Students will continue working on questions 14-17-Figure 11 “Lead-Student Worksheet”

(<https://docs.google.com/document/d/1Ym409exoXz4jaOOsEilsejvZTbWLQoMJoaoStYSYD0M/edit?usp=sharing>). Students will submit completed homework at end of school week for grade.

**LESSON 5**

**Topic Unit: Precautions and Preventive Measures for Lead Poisoning and Exposure**

**Standards:**

**Reading/Literature**

CC.1.2.6. B, CC.1.2.6. G, CC.1.2.6. J, CC.1.2.6. K, CC.1.3.6. A, CC.1.3.6. G

**Writing**

CC.1.4.6 B, CC.1.4.6.C, CC.1.4.6. D, CC.1.4.6. E, CC.1.4.6 F. CC.1.4.6 H, CC.1.4.6. T, CC.1.4.6. U

**ASSESSMENT/EVALUATION OF SLO'S:****Specific Learning Objectives:****Students Will:**

1. Identify preventive measure for lead poison and exposure
2. Identify one or two foods that are rich in calcium and iron which will help prevent their bodies from absorbing environmental lead.
3. Identify foods that are rich in calcium which will help prevent the body from absorbing lead.

**DIAGNOSTIC:** List of preventive measures to stop the spread of lead poison or exposure

**FORMATIVE:** Class discussion on video

**SUMMATIVE:** “To Lead or Not to Lead” (Figure 8)

**DIFFERENTIATED INSTRUCTION:**

1. Visual reinforcement and verbal communication
2. More time to complete assessment.
3. Use of computer/iPad to complete lesson.
4. Learning Stations
5. Guided Practice
6. Modeling
7. Socratic Strategy
8. Think Pair Share
9. Technology
10. Journal Writing/Exit Ticket

**Materials and Resources:**

1. Videos and worksheet
2. Notebook for note taking and writing assignment
3. Water bottles to fill with water from the faucets at school.

**ACTIVITIES AND PROCEDURES****WARM-UP:****TIME: 15 MINUTES**

Teacher will discuss the importance of eating the right foods to absorb lead in the body. Lesson will focus on importance of nutrition and preventive measures for lead poisoning.

**ACTIVITY 1:****TIME: 15 MINUTES**

Teacher will ask students which type of consumer products might have lead in it, and how would the lead effect them compared to a child under 6. After 5 minutes of individual thought, and discussing with peers, students will volunteer answers. Teacher will write list of items on the board. Teacher will present students with pictures or artifacts of items with possible lead in it. Teacher will ask students to write whether they would eat/use the item knowing it has lead in it. Why or Why Not?

## **ACTIVITY 2:**

**TIME: 15 MINUTES**

Students will watch video <https://youtu.be/4hubALpkQWw> “Lead Poisoning Prevention” (2:55). Students will get into groups. Students will choose a recorder and a speaker for the group. Recorder will record members of the group, and what is discussed. Students will discuss ways they can help their families prevent lead poisoning or exposure. Speaker of group will share what they have learned about the prevention of lead poisoning. Groups will submit paper with their documented information for grading.

## **HOMEWORK:**

Students will complete worksheet “To Lead or Not to Lead”

<https://drive.google.com/file/d/1ECyfbCXNO4iQCjeyRGhNY4YguGgshQIH/view?usp=sharing> to check for understanding of what they have learned about lead poison, contamination and exposure.

**EXTRA POINTS:** Students can read Ethan’s House Gets Healthier- Coloring Book about lead and its prevention [https://www.cdc.gov/nceh/lead/coloring\\_book/Coloring\\_Book.pdf](https://www.cdc.gov/nceh/lead/coloring_book/Coloring_Book.pdf). Student can turn in at anytime for extra points.

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**Key Words:** Lead, Lead exposure; Environmental Protection Agency (EPA); Lead poisoning. Pbb, Blood Lead Levels (BLL), deciliter of lead levels (DLL), Elevated Blood Lead Levels (EBLL), ordinance, percentages, Roman Empire, toxicity, Before Christ (B.C)., After Death {of Christ} (A.D.).

## ANNOTATED BIBLIOGRAPHY

Letter to Parent/Guardian about Lead Poisoning and Exposure

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<https://youtu.be/4Nlb47j5nAQ> (1:38) How Lead Poisoning Harms Children

<https://youtu.be/IfA4Pwpft6k> (2:35) Symptoms, Cause and Cure of Lead Poisoning

<https://youtu.be/76RKSQgduVQ> (5:21) What Does Lead Poisoning Do to Your Brain?

[https://youtu.be/TOrxW\\_XF-y0](https://youtu.be/TOrxW_XF-y0) (2:23). Hydration Stations and how they work.

<https://youtu.be/76RKSQgduVQ> (5:21) What Lead Poisoning Does To Your Brain”

<https://youtu.be/1SrZQWvSEuw> (28:54) Dirty Water: Danger from the Tap

<https://youtu.be/CM1u29BeqC0> (4:53) Lead: The Original Artificial Sweetener.



<https://youtu.be/gjWUqy9371Y> (2:18) Many dollar store products reportedly contain lead, other hazardous chemicals.

<https://youtu.be/4hubALpkQWw> (2:55) Lead Poisoning Prevention”.

## **TEACHING MATERIAL**

Exit Ticket  
KWL worksheets  
Lead Worksheet  
Socratic Strategy  
Lined paper/Dry Erase Board  
Markers  
Internet access to explore online resources  
Computer  
Smart board/Interactive Board  
Terminology relating to lead  
Venn Diagram

## **APPENDICES**

### **COMMON CORE STANDARDS**

Standards: The Core Curriculum of the School District of Philadelphia is aligned to the Pennsylvania Department of Education Standards Aligned System. The standards include instruction on the following topics: literacy, social studies, math, and technology.

### **ACADEMIC STANDARDS**

#### **READING/LITERATURE**

CC.1.2.6. B Cite textual evidence to support analysis of what the text says explicitly, as well as inferences and/or generalizations drawn from the text.

CC.1.2.6. F Determine the meaning of words and phrases as they are used in grade-level reading and content, including interpretation of figurative language in context.

CC.1.2.6. G Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

CC.1.2.6. I Examine how two authors present similar information in different types of text.

CC.1.2.6. J Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

CC.1.2.6. K Determine or clarify the meaning of unknown and multiple meaning words and phrases based on grade-level reading and content, choosing flexibly from a range of strategies and tools.

CC.1.3.6. A Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

CC.1.3.6. B Cite textual evidence to support analysis of what the text says explicitly, as well as inferences and/or generalizations drawn from the text.

CC.1.3.6. D Determine an author's purpose in a text and explain how it is conveyed in a text.

CC.1.3.6. F Determine the meaning of words and phrases as they are used in grade-level reading and content, including interpretation of figurative language in context.

CC.1.3.6. G Compare and contrast the experiences of reading a story, drama, or poem to listening to or viewing an audio, video, or live version of the text, including contrasting what is "seen" and "heard" when reading the text to what is perceived when listening or watching.

CC.1.3.6. I Determine or clarify the meaning of unknown and multiple meaning words and phrases based on grade-level reading and content, choosing flexibly from a range of strategies and tools.

## **WRITING**

CC.1.4.6. B Identify and introduce the topic for the intended audience.

CC.1.4.6. D Organize ideas, concepts, and information using strategies such as definition, classification, comparison/contrast, and cause/effect; use appropriate transitions to clarify the relationships among ideas and concepts; provide a concluding statement or section; include formatting when useful to aiding comprehension.

CC.1.4.6.C Develop and analyze the topic with relevant facts, definitions, concrete details, quotations, or other information and examples; include graphics and multimedia when useful to aiding comprehension.

CC.1.4.6. E Write with an awareness of the stylistic aspects of composition.

- Use precise language and domain-specific vocabulary to inform about or explain the topic.

- Use sentences of varying lengths and complexities.
- Develop and maintain a consistent voice.
- Establish and maintain a formal style.

CC.1.4.6. F Demonstrate a grade appropriate command of the conventions of standard English grammar, usage, capitalization, punctuation, and spelling.

CC.1.4.6.H Introduce and state an opinion on a topic.

CC.1.4.6. I Use clear reasons and relevant evidence to support claims, using credible sources and demonstrating an understanding of the topic.

CC.1.4.6.M Write narratives to develop real or imagined experiences or events.

CC.1.4.6. Q Write with an awareness of the stylistic aspects of writing. • Vary sentence patterns for meaning, reader/listener interest, and style. • Use precise language. • Develop and maintain a consistent voice.

CC.1.4.6. R Demonstrate a grade appropriate command of the conventions of standard English grammar, usage, capitalization, punctuation, and spelling.

CC.1.4.6. T with guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

CC.1.4.6. U Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.

## **HISTORY AND SOCIAL STUDIES**

Standard Area-CC.8.5: Reading Informational Text: Students read, understand and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.

Standard - CC.8.5.6-8. A- Cite specific textual evidence to support analysis of primary and secondary sources.

Standard - CC.8.5.6-8. B-Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

Standard - CC.8.5.6-8.C-Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).

Standard - CC.8.5.6-8. D-Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

Standard - CC.8.5.6-8. E-Describe how a text presents information (e.g., sequentially, comparatively, causally).

Standard - CC.8.5.6-8. F-Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).

Standard - CC.8.5.6-8. G-Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

Standard - CC.8.5.6-8.H-Distinguish among fact, opinion, and reasoned judgment in a text.

Standard - CC.8.5.6-8. I-Analyze the relationship between a primary and secondary source on the same topic.

Standard - CC.8.5.6-8. J-By the end of grade 8, read and comprehend history/social studies texts

Standard - CC.8.6.6-8. A-Write arguments focused on discipline-specific content. • Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. • Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. • Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. • Establish and maintain a formal style. • Provide a concluding statement or section that follows from and supports the argument presented.

Standard - CC.8.6.6-8. B-Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. • Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. • Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. • Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. • Use precise language and domain-specific vocabulary to inform about or explain the topic. • Establish and maintain a formal style and objective tone. • Provide a concluding statement or section that follows from and supports the information or explanation presented. Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historical import. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.

Standard - CC.8.6.6-8.C-Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Standard - CC.8.6.6-8. D-With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

Standard - CC.8.6.6-8. E-Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Standard - CC.8.6.6-8. F-Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

Standard - CC.8.6.6-8. G-Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Standard - CC.8.6.6-8.H-Draw evidence from informational texts to support analysis reflection, and research.

Standard - CC.8.6.6-8. I-Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

## **Appendice B**

### **THE SIGNS, SYMPTOMS, CAUSES AND PREVENTION OF LEAD EXPOSURE AND POISONING**

Dear Parent/Care giver:

This week our class is having a Curriculum Unit on the Signs, Symptoms, Causes and Prevention of Lead Exposure and Poisoning. Lead poisoning in children and adults is a serious disease. It can lead to:

- Children having lower IQ scores (4-5 points or more)
- Children being diagnosed as ADHD, Intellectual Disability, Mental Instability, Learning Disabilities
- In babies, it may be mistaken for Colic

- In adults, it may seem like a stomach ache
- Children can be affected for the rest of their lives depending on the amount of lead in their blood stream.

The classroom discussion will focus on:

- The many usages of lead in paints, foods, seasoning, dust, soil, water, imported candies
- Environmental signs to look for in the home for lead poisoning and/or exposure
- National information to help with getting lead out of the blood stream
- Preventive measures to take to stop the spread of lead poisoning and exposure.

### **We need your help to make our Curriculum Unit a Success!**

Your child will bring home important information about lead exposure and poisoning. Please read the information with your child. Talk to your child about what he or she is learning in class. Please assist your child with the homework that will be sent home. BEING A PART OF THE SOLUTION CAN TEACH YOU TO TEACH OTHERS ABOUT THE PREVENTION OF LEAD POISONING IN OUR SCHOOLS, HOMES, AND COMMUNITIES.

\*\*The Pennsylvania Department of Health provides a toll-free Lead Information Line (1-800-440-LEAD) to respond to caller questions and provide electronic (emails) materials about lead poisoning and other environmental hazards.

Sincerely,

### **RESOURCES**

ONLINE FORM TO REPORT LEAD PROBLEMS [online form](#).

Figure 1: Lead (Pb) Toxicity: What Are the U.S. Standards for Lead Levels...

[https://www.google.com/search?q=Figure+1+Lowering+of+BLLs+Considered+Elevated+by+CDC+Over+Time.&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi04feZjd3hAhVinuAKHZLxCicQ\\_AUIDigB&biw=867&bih=335#imgsrc=huaOddBza\\_OyEM:](https://www.google.com/search?q=Figure+1+Lowering+of+BLLs+Considered+Elevated+by+CDC+Over+Time.&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi04feZjd3hAhVinuAKHZLxCicQ_AUIDigB&biw=867&bih=335#imgsrc=huaOddBza_OyEM:)

Figure 2: Discover ideas about Heavy Metal Poisoning

[https://www.google.com/search?biw=867&bih=335&tbm=isch&sa=1&ei=-Ty6XPXoHZGm\\_Qb6oLzYAAQ&q=healthy+eating+for+lead+poisoning&oq=healthy+eating+for+lead+poisoning&gs\\_l=img.3...22950.26705..27457...1.0..0.72.976.15.....1....1..gws-wiz-img.CLXiEJkPAVM#imgsrc=ZNUZa6o4KWb\\_4M:](https://www.google.com/search?biw=867&bih=335&tbm=isch&sa=1&ei=-Ty6XPXoHZGm_Qb6oLzYAAQ&q=healthy+eating+for+lead+poisoning&oq=healthy+eating+for+lead+poisoning&gs_l=img.3...22950.26705..27457...1.0..0.72.976.15.....1....1..gws-wiz-img.CLXiEJkPAVM#imgsrc=ZNUZa6o4KWb_4M:)

Figure 2a: Preventing Childhood Lead Poisoning. City of San Diego.

<https://www.sandiego.gov/environmental-services/ep/leadsafety/leadprevent>

Figure 3: Philadelphia District School Check-Up

” <http://data.philly.com/toxic-city/lead-poisoning-paint-asbestos-mold-asthma-philadelphia-schools-map-search-tool.html#/>

Figure 4: Hand Hygiene Policy Policy Register

[https://www.google.com/search?q=handwashing+guidelines+for+lead&source=lnms&tbm=isch&sa=X&ved=0ahUKEwil8aOdlt3hAhWkmOAKHZJ5DtgQ\\_AUIDigB&biw=867&bih=335#imgrc=7O0WmKwO0AWHfM:](https://www.google.com/search?q=handwashing+guidelines+for+lead&source=lnms&tbm=isch&sa=X&ved=0ahUKEwil8aOdlt3hAhWkmOAKHZJ5DtgQ_AUIDigB&biw=867&bih=335#imgrc=7O0WmKwO0AWHfM:)

Figure 5: How lead affects children’s health

[https://www.google.com/search?q=how+lead+affects+children%27s+health&tbm=isch&source=iu&ictx=1&fir=G269GOF5XY0bgM%253A%252CkCQS6zqINgSPQM%252C\\_&vet=1&usg=AI4\\_kS7FCt9JwsazqBUgcwJrW8ZRrcMEA&sa=X&ved=2ahUKEwjJp7exm93hAhVpp1kKHTs8DfcQ9QEwAHoECAwQBg&biw=867&bih=335#imgrc=G269GOF5XY0bgM:](https://www.google.com/search?q=how+lead+affects+children%27s+health&tbm=isch&source=iu&ictx=1&fir=G269GOF5XY0bgM%253A%252CkCQS6zqINgSPQM%252C_&vet=1&usg=AI4_kS7FCt9JwsazqBUgcwJrW8ZRrcMEA&sa=X&ved=2ahUKEwjJp7exm93hAhVpp1kKHTs8DfcQ9QEwAHoECAwQBg&biw=867&bih=335#imgrc=G269GOF5XY0bgM:)

Ethan’s House Gets Healthier- Coloring Book about lead and its prevention

[https://www.cdc.gov/nceh/lead/coloring\\_book/Coloring\\_Book.pdf](https://www.cdc.gov/nceh/lead/coloring_book/Coloring_Book.pdf)

What Your Child Lead Levels Means.

<https://www.health.ny.gov/publications/2526/>

Figure 7

### WHAT DO YOU KNOW ABOUT LEAD?

Choose a word from the following list to fill in the blanks.

see	cold	frequently	paint	keep
under age 6	remove	hot	sometimes	under age 10

1. Children \_\_\_\_\_ should be tested for lead.
2. Peeling, chipping, cracking or flaking \_\_\_\_\_ is a sign that the paint is in bad condition.

3. If you see paint chips or dust on windowsill or floors you should \_\_\_\_\_ the area(s) by spraying water on area, wiping area with a damp rag, or mopping area.
4. To prevent the spread of lead poisoning in children, you should \_\_\_\_\_ wash their hands, toys, bottle and pacifiers.
5. You cannot taste, smell or \_\_\_\_\_ lead in water.
6. Always run the \_\_\_\_\_ water for a few minutes before using.
7. If you think you have come in contact with lead, you should \_\_\_\_\_ your work clothes and shoes upon entering your house.

### **BONUS QUESTION**

1. It is okay to vacuum or sweep paint chips? Why or Why Not?

**FIGURE 9: LEAD POISONING RISK ASSESSMENT**





A.K.A: Pro Star Pediatrics, PA

### Lead Poisoning Risk Assessment Questionnaire

**INSTRUCTIONS:** This questionnaire is for use with children under 6 years old. Please administer this questionnaire at every annual checkup.

A “yes” or “unknown” response to any question indicates the child is at risk for lead poisoning and should receive a blood test and appropriate follow-up. Every Medicaid patient requires a blood test at 12 and 24 months of age, and between the ages of 36 months and 72 months of age if they have not been previously screened for lead poisoning.

Question	Yes or No
1. Does your child live in or regularly visit (once a week or more) any house or building built before 1978?	
2. Does your child live in or regularly visit any house or building that has recently undergone renovation or contains vinyl mini blinds, lead pipes, pipes with lead solder joints, or had metal pipes replaced or repaired within the last five years?	
3. Does your child have a mother, sibling or playmate that has or did have lead poisoning? 4. Does your child frequently come into contact with an adult whose job or hobby involves exposure to lead?  <b>Occupations:</b> building renovation • battery factory or recycling • auto or radiator repair • highway bridge sandblasting or painting • welding metal structures • wire cable cutting  <b>Hobbies:</b> refinishing furniture • home renovation • casting bullets • auto battery or radiator repair • making stained glass, ceramics, toy soldiers, dive weights, or fishing weights	
5. Does your child eat food or drink fluids that were stored in leaded crystal, imported ceramic or pewter dishes?	
6. Does your child have contact with cosmetics, kohl, candies, spices, jewelry, ceramic dishware and home (or folk) remedies not made in the United States?	
7. Does your child play in loose soil, near a busy road or near any industrial sites such as a battery recycling plant, junk yard or lead smelter?	
8. Have you ever seen your child eat dirt or his mouth on painted surfaces, paint chips, toy jewelry, or vinyl mini blinds?	
9. Has your child recently visited another country for an extended period of time, lived in foster care home or in a country other than the United States?	

Patient Name: \_\_\_\_\_ DOB: \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Figure 10:

### What Your Child's Blood Lead Test Means

The blood lead test tells you how much lead is in your child's blood. Lead can harm a child's growth, behavior, and ability to learn. The lower the test result, the better. Most lead poisoning occurs when children lick, swallow, or breathe in dust from old lead paint. Most homes built before 1978 have old lead paint, often under newer paint. If paint peels, cracks, or is worn down, the chips and dust from the old lead paint can spread onto floors, windowsills and all around your home. Lead paint dust can then get onto children's hands and toys, and into their mouths. For children up to age six years, your doctor or nurse should ask you at every well child visit about ways your child may have had contact with lead. Children who have had contact with lead should be tested. A high test result using blood from a fingertip should be checked again with a second test using blood taken from a vein (often in the arm). If the second result is still high, you should follow the steps below.

0-4 • There is very little lead in your child's blood.

- The average lead test result for young children is about 2 mcg/dL.

5-9 • Your child has a little more lead than most children.

- Talk with your doctor and local health department to find out how your child might have come into contact with lead, and ways to protect your child.
- Your doctor might want to test your child again in 3 to 6 months.

10-14 • Your child's lead level is high. A result of 10 or higher requires action.

- Your doctor and local health department will talk with you to help you find sources of lead, and ways you can protect your child.
- Your child should be tested again in 1 to 3 months.

15-44 • Your child's lead level is quite high. You and your doctor should act quickly.

- Talk with your doctor or nurse about your child's diet, growth and development, and possible sources of lead.
- Talk with your local health department about how to protect your child. They may visit your home to help you find sources of lead.
- If the lead level is 15 to 24, your child should be tested again in 1 to 3 months.
- If the lead level is 25 to 44, your child should be tested again in 2 weeks to 1 month.

45 or higher

- Your child needs medical treatment right away.
- Your doctor or health department will call you as soon as they get the test result.
- Your child might have to stay in a hospital, especially if your home has lead.
- Your local health department will visit your home to help you find sources of lead.
- Your child should not go back home until the lead sources are removed or fixed.
- Your child needs to be tested again after treatment.

Child's Name:

Test Result:

mcg/dL

Date: