



## OVERVIEW

### BIG IDEA

Childhood lead poisoning is entirely preventable, but requires a careful assessment and removal of hazards from children's environment.

### OBJECTIVE

**10.6:** Explain common sources and prevention methods for childhood lead poisoning.

### AGENDA

1. Trends
2. Preventing Lead Exposure
3. Parental Knowledge Discussion
4. Case Study & Debrief

### HOMEWORK

Gather information about possible lead hazards in your own home.

# LESSON 10.6

## Lead Poisoning

### SUMMARY:

This lesson will equip students with a strong foundational understanding of the health hazards of lead--both where it originates and how to prevent it. Students will begin by analyzing trends in blood lead level testing and results since 1997. Then they will read the CDC website information on lead poisoning prevention and answer reading comprehension questions. Next they will discuss the role of lack of knowledge as a risk factor. Finally, students will read a tragic case study of a child who died from acute lead poisoning and debrief the details of the case.

### STANDARDS:

**NHES 1.12.3:** Analyze how environment and personal health are interrelated.

**IL Learning Standard 22.C:** Explain how the environment can affect health.



MODULE 10: ENVIRONMENTAL HEALTH LESSON 10.6

## Lead Poisoning

Obj. 10.6: Explain common sources and prevention methods for childhood lead poisoning.

**DO NOW** Trends in Elevated Blood Lead Levels Among Children  
Examine the graph below and use it to answer the questions that follow.

**U.S. Totals Blood Lead Surveillance Report 1997 - 2012**

Year	Number of Children Tested	Confirmed Elevated Blood Lead Levels (% of Children Tested)
1997	1,600,000	7.5%
1998	1,700,000	6.5%
1999	1,800,000	5.5%
2000	2,000,000	4.5%
2001	2,100,000	3.5%
2002	2,200,000	3.0%
2003	2,300,000	2.5%
2004	2,400,000	2.4%
2005	2,500,000	2.3%
2006	2,600,000	2.2%
2007	2,700,000	2.1%
2008	2,800,000	2.0%
2009	2,900,000	1.9%
2010	2,800,000	1.8%
2011	2,700,000	1.7%
2012	2,600,000	1.5%

Source: CDC <[http://www.cdc.gov/nceh/lead/data/StateConfirmedByYear\\_1997\\_2012.pdf](http://www.cdc.gov/nceh/lead/data/StateConfirmedByYear_1997_2012.pdf)>

1. How has testing for elevated blood lead levels changed over the 15 years represented in this graph?
2. How have the percentage of confirmed elevated blood lead levels changed over the 15 years represented in this graph?
3. During what 5-year period did percentage of elevated blood lead levels drop the most?
4. Name some factors that might be responsible for these trends.

**DO NOW: Answers:**

1. The number of children tested increased steadily between 1997 and 2009, then dropped between 2009 and 2012.
2. The percentages of confirmed elevated blood lead levels decreased significantly (from 7.5% to 2.5% from 1997 to 2003. Then it has continued to decrease, but more gradually from 2003 to 2012).
3. The biggest drop occurred from 1997 to 2002.
4. Increasing testing may have happened because of increasing awareness, public health education campaigns, or changing guidelines for schools and pediatricians in terms of what data they must gather from children. Decreases in elevated levels may be due to the decrease in homes with lead based paint (as more time passes, fewer homes will have the old lead-based paint present). It may also be due to increasing awareness and preventative measures taken by parents, schools, health care providers, and communities, as well as changing regulations for consumer products, especially those that target children.



**Preventing Lead Exposure**

According to the CDC, "Today at least 4 million households have children living in them that are being exposed to high levels of lead. There are approximately half a million U.S. children ages 1-5 with blood lead levels above 5 micrograms per deciliter (µg/dL), the reference level at which CDC recommends public health actions be initiated. Lead exposure can affect nearly every system in the body. Because lead exposure often occurs with no obvious symptoms, it frequently goes unrecognized."

Use the following CDC website to answer the questions below:

<http://www.cdc.gov/nceh/lead/tips.htm>

How are children exposed to lead?	
Who is at risk?	
What can be done to prevent exposure to lead? (List 4 examples)	
What are some thing that can be done to further reduce a child's exposure from non-residential paint sources?	



**What Do Parents Know?**

- Do you think most parents are know the information you just read?
- Which parts of the information might be more or less understood by the general public?
- How do you think knowledge on this topic acquired by parents and guardians?
- Should further efforts to educate parents and guardians take place? If so, how?

**NEW INFO:** If laptops, computers, or tablets are not available for students to go online to read the full resource, copies of the PDF handout can be used.

**DISCUSS:** Ask students to share answers to the last question. Barriers such as poverty, lack of accessibility to services to help inspect or adjust home to meet standards, etc. are a big factor!



 **Case Study**  
 Read the case study "Death of a Child After Ingestion of a Metallic Charm --- Minnesota, 2006" from the CDC MMWR report  
 (Source: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5512a6.htm>)

 **Case Study Debrief**  
 Answer the following questions based on the case study.

1. What blood lead levels (BLL) are considered elevated for children?
2. What are some possible sources of exposure to lead besides paint that were mentioned?
3. How did the child in the case study die?
4. What was the child's BLL at death?
5. What were the results of the inspection of the boy's home?
6. What did CDC scientists find when they purchased and tested charms like the one the boy ingested?

 **Lead Poisoning**  
 Fill in the table below with information about lead poisoning.

Sources	Effects	Prevention

 **Assess Your Home**  
 Gather information about possible lead hazards in your own home by talking with your parents and doing any further research. Make a list of the possible hazards and prevention strategies already being used in your home.

**READ:** Since one big takeaway of the previous reading is that lead-based paint in older homes is the biggest contributing factor, this case study will help students understand that there are many other potential lead-based hazards children may come be exposed to.

**THINK: ANSWERS:**

1. 10 ug/dl
2. Candy, folk & traditional meds, ceramic dinnerware, metallic toys and trinkets, jewelry
3. The child ingested a metal heart locket which had an exceptionally high level of lead
4. He had a BLL of 180 ug/dl
5. There were no lead-paint hazards in the home and only one slightly elevated lead-dust level on a windowsill
6. They found a great deal of variation in the lead contents of the various lockets.

**HOMEWORK:** The purpose of this homework assignment is to help students translate their learning into practical assessment of the risks and hazards in their own environment. This will help equip them to talk to parents about changing potential sources of hazards and also prime them to be smart about their environmental health once they have their own residence (and possibly children).