



Lead and exposure to it

Matt Young, RS
Sanitarian Program Specialist
Ohio Department of Health

What is lead?

Lead is a heavy, soft, malleable, blue-gray metal

Occurs in nature as an ore

Has been used since ancient times



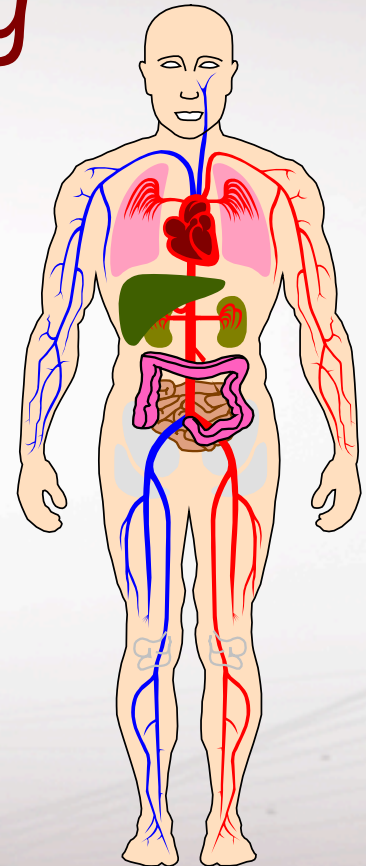
Health risks associated with lead poisoning

At Lower Levels

Reduced IQ
Learning Disabilities
Attention deficit disorders
Behavioral Problems

At Higher Levels

Anemia
Impaired hearing
Kidney Damage
Death



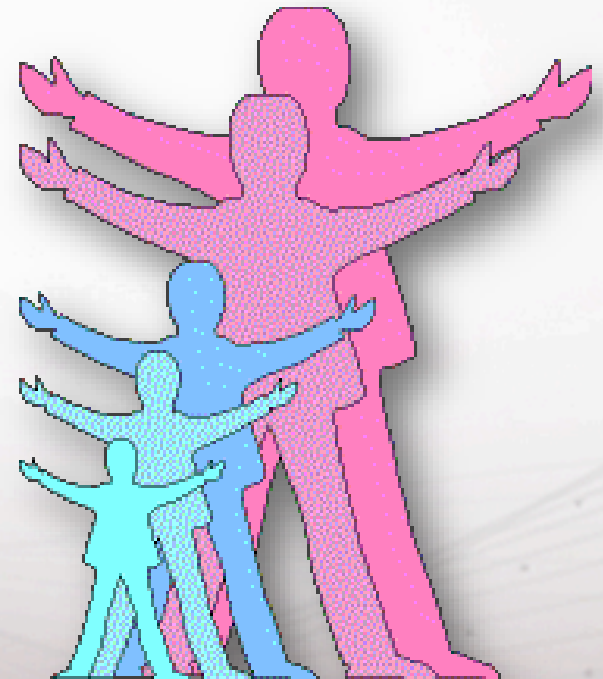
Signs of Lead Poisoning

- Tiredness
- Sleep problems
 - Dizziness
 - Irritability
- Nervousness
 - Headaches
- Difficulty concentrating
 - Depression
 - Forgetfulness
- Hyperactivity (children)
 - Numbness
- Wrist or foot drop
- Weakness
- Clumsiness
- Joint and muscle pain
- Vomiting
- Loss of Appetite
- Stomach aches
- Constipation
- Metal taste in mouth
- Problems having healthy children

Small children are at high risk because:

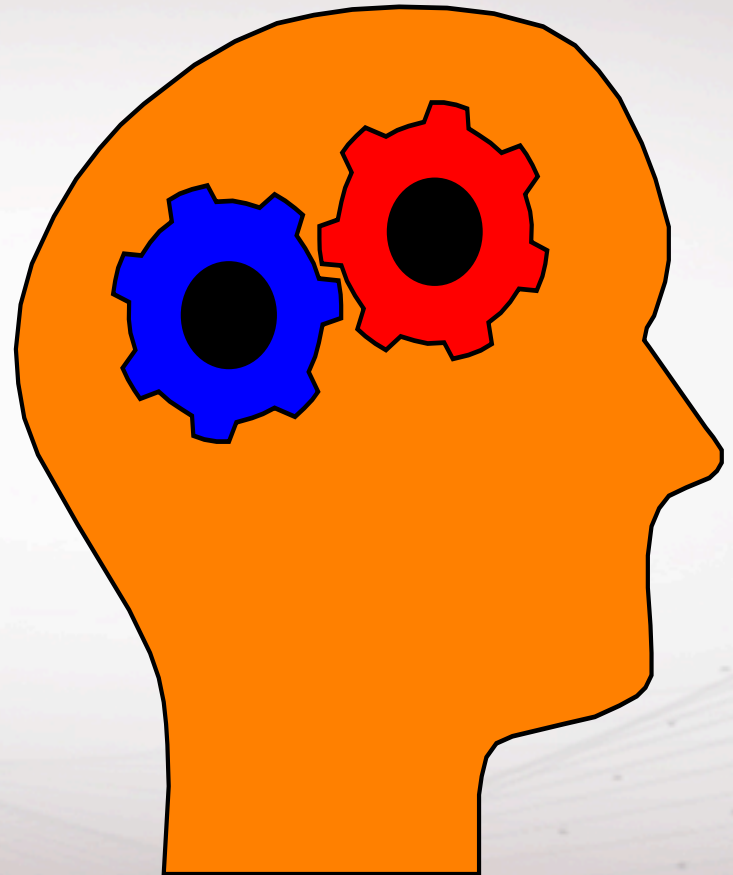
Small children crawl on the floor, touch a lot of things and frequently put their hands in their mouths.

Small children are developing rapidly; small disruptions become big problems during growth.



Lead Exposure and IQ

Each 2.5 $\mu\text{g}/\text{dL}$ increase in blood lead level yields a one point decrease in IQ.



Lead - Not just for kids anymore...

Hazardous to pregnant women.

- Damage to the fetus such as brain damage
- Miscarriages
- Low birth-weight babies

Also hazardous to workers and other adults.

- High Blood Pressure
- Fertility problems, loss of sex drive and/or capability
- Muscle and/or joint pain
- Nerve disorders
- Memory and concentration problems
- Digestive problems

CHILDREN

Blood Lead
(ug Pb/dl)

150

→ Swelling of brain;
seizures, coma, and
possible death

100

→ Colic, anemia,
destruction of red blood
cells, and brain damage

60

→ Poor bone and muscle
development, clumsiness, lack of
coordination, early anemia,
decreased red blood cells,
tiredness and drowsiness

40

30

→ Hyperactivity, poor attention span,
difficulty learning, language and speech
problems, and slower reflexes

20

→ Developmental Toxicity

→ IQ

→ Hearing
Growth

10

ADULTS

← Blue line on gums, uncontrollable shaking of
hands, wrist and foot drop, hallucinations,
brain damage, coma, and possible death

← Anemia, nerve damage, constipation,
stomach pains, irritability and fatigue,
memory and concentration problems,
clumsiness, sleep problems

← Kidney Damage, Damage to Blood Formation,
Infertility (MEN)

← Systolic Blood Pressure (MEN)
Hearing Acuity

← Joint and Muscle Aches

← Hypertension (?)

← Transplacental Transfer

- Low birth weight

- Miscarriages, Stillbirth, Premature birth

Where is lead found?

- Paint
- Dust
- Air
- Soil
- Water
- Gasoline
- Food
- Hobbies
- Occupational exposures
- Industrial Releases

Why was lead used?

- It prevents corrosion
- It kills mold and mildew
- It is easy to shape
- It is strong
- It blocks radiation
- It blocks sound
- It helps paint dry faster
- It adds color to and brightens paint

What is lead paint?

Lead-based paint is any paint or surface coatings that contain lead equal to or in excess of 1.0 milligram per square centimeter or more than 0.5 percent by weight.

Lead was added to paint to:

- Help paint dry faster
- Added color and brightened paint
- Increased durability



Housing and Lead Based Paint

Approximately 34 million pre-1978 housing units contain lead paint

Percentage of Houses with Lead Based Paint



What about water?

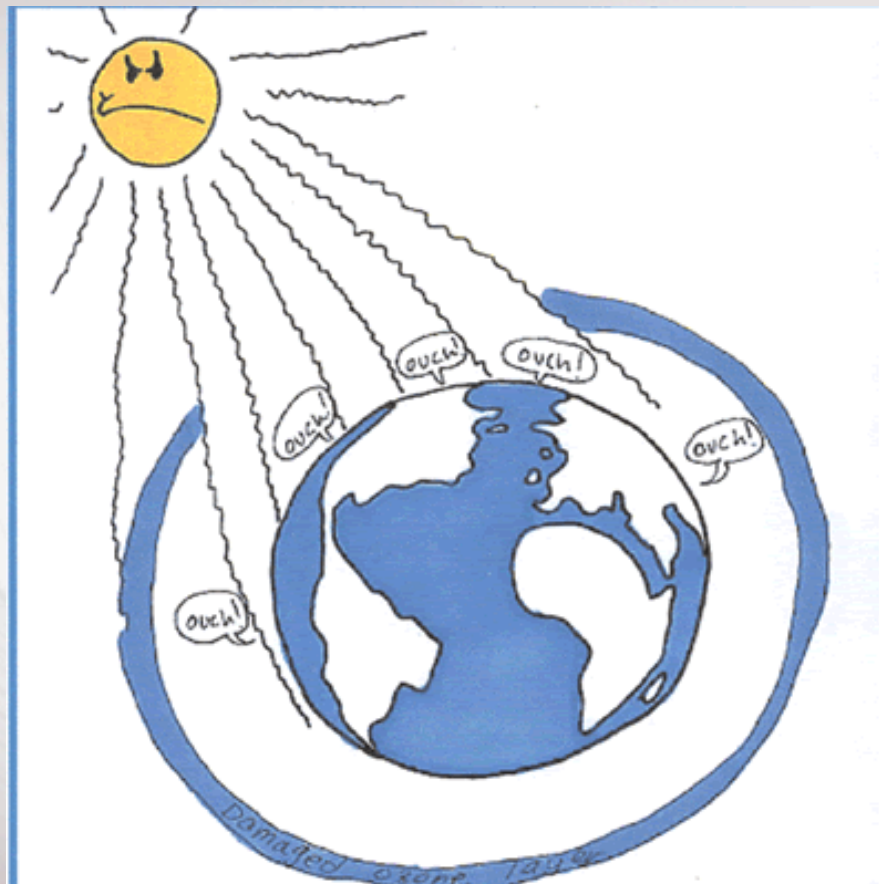




Thomas
Midgley, Jr.

First Chlorofluorocarbon "Freon"





Leaded Gasoline



THE OCTOBER SPECIAL ADVERT

WHAT A POWERFUL DIFFERENCE
THIS HIGH-OCTANE GASOLINE MAKES!



Nothing is more important to motorists than that a car they're full of power and pep... a promise to drive. And that's the big reason for using a high-octane gasoline. Because the amount of power produced in driving depends on its octane rating.

So, to secure that extra speed you want in your car, be sure to get a high-octane gasoline. "Ethyl" gasoline does it. "Ethyl" means you'll have the power to drive.

ETHYL CORPORATION
NEW YORK 22, N.Y.
Ethyl Corporation, U.S.A.



*Enjoy full power
use high-octane
"Ethyl" gasoline!*



ETHYL FLUID

STOPS KNOCK

...ADDS POWER



NEXT TIME GET



The Ethyl Disaster



1923 - 25 - Leaded gasoline introduced by GM, Standard Oil and DuPont, forming corporation called "Ethyl"

1923 - 25 DuPont NJ plant -- 11 die from severe industrial lead poisoning

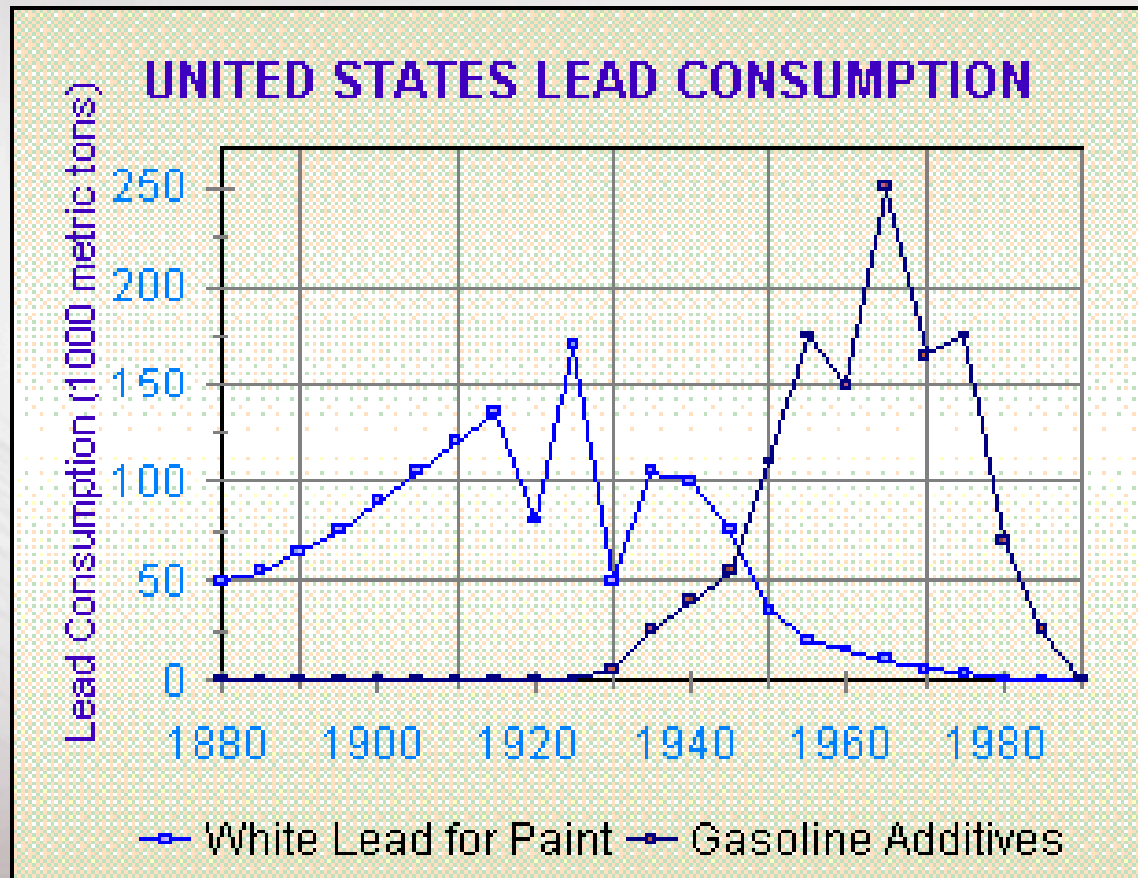
April 1924 -- GM Dayton labs 2 killed

Oct. 1924 -- Standard Oil NY refinery 6 killed, 50 or more disabled

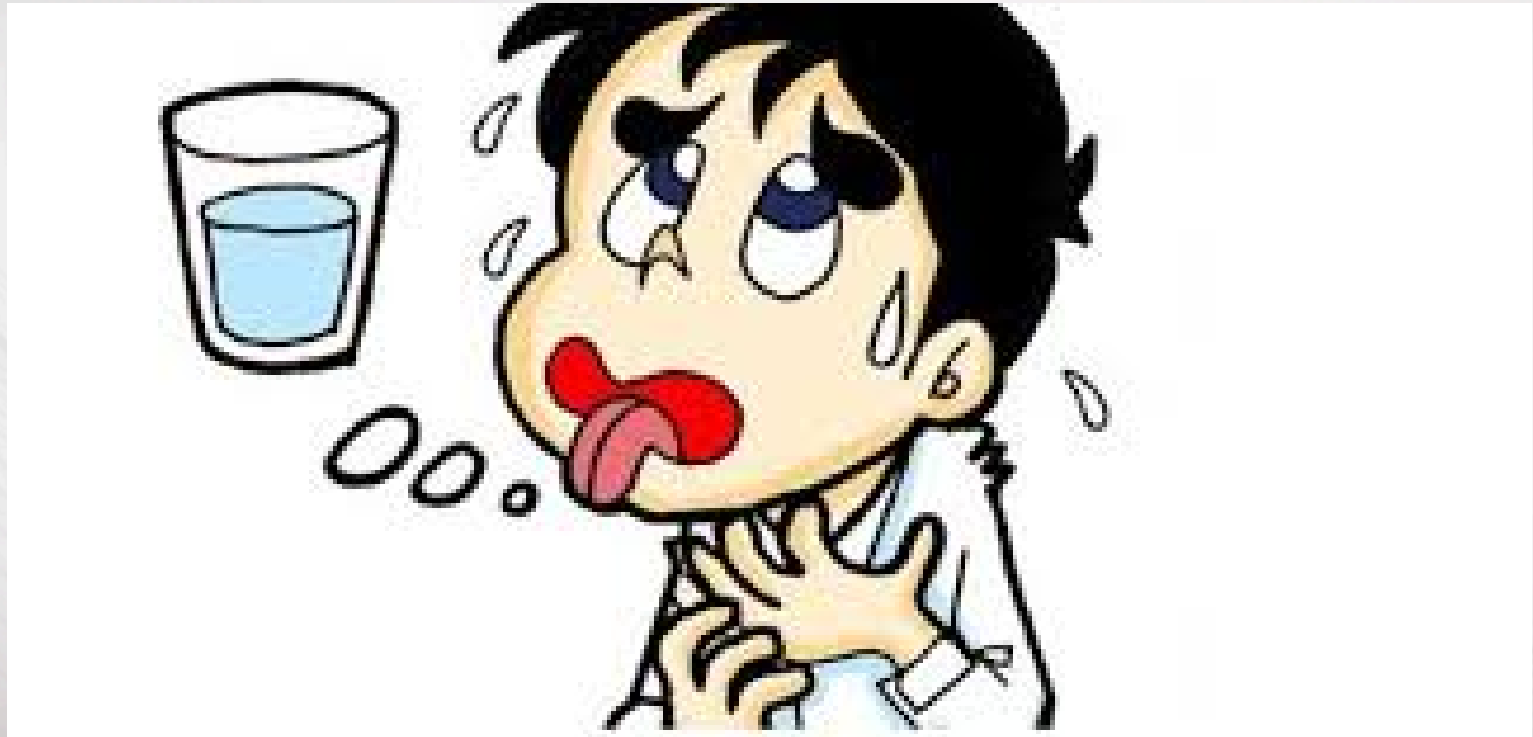
May 1925 -- Public Health Service hearings in Washington DC

Jan. 1925 -- Half baked report provides Ethyl with a "clean bill of health."

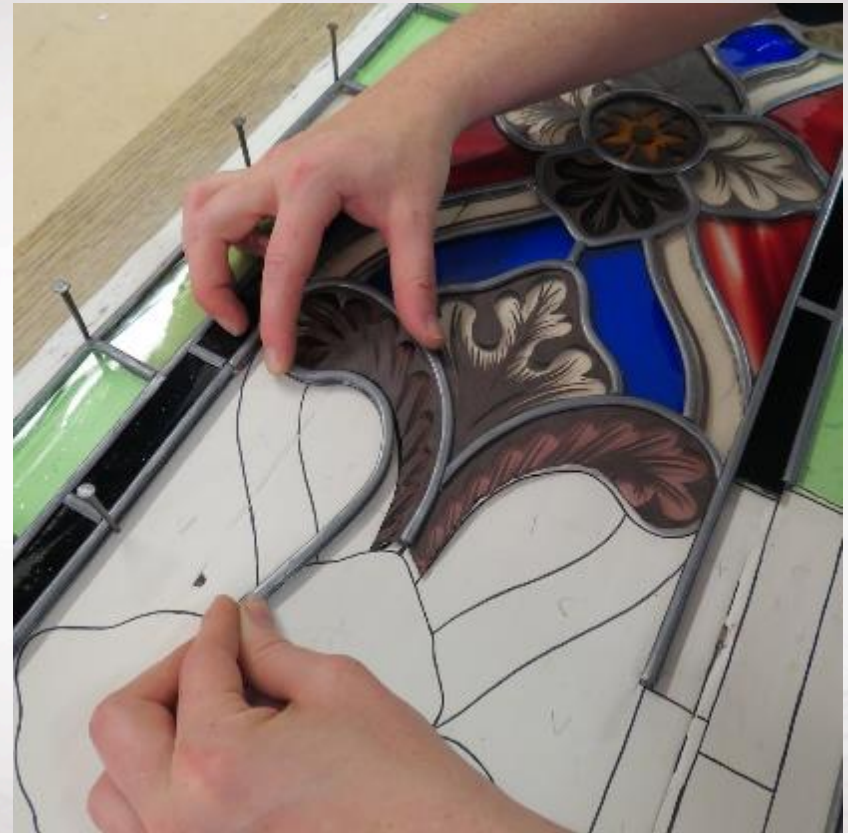
U.S. Lead consumption combined



What about water?



Occupational/ Recreational







Lead containing products







Lead-acid batteries



Lead in food



What about water?!?!

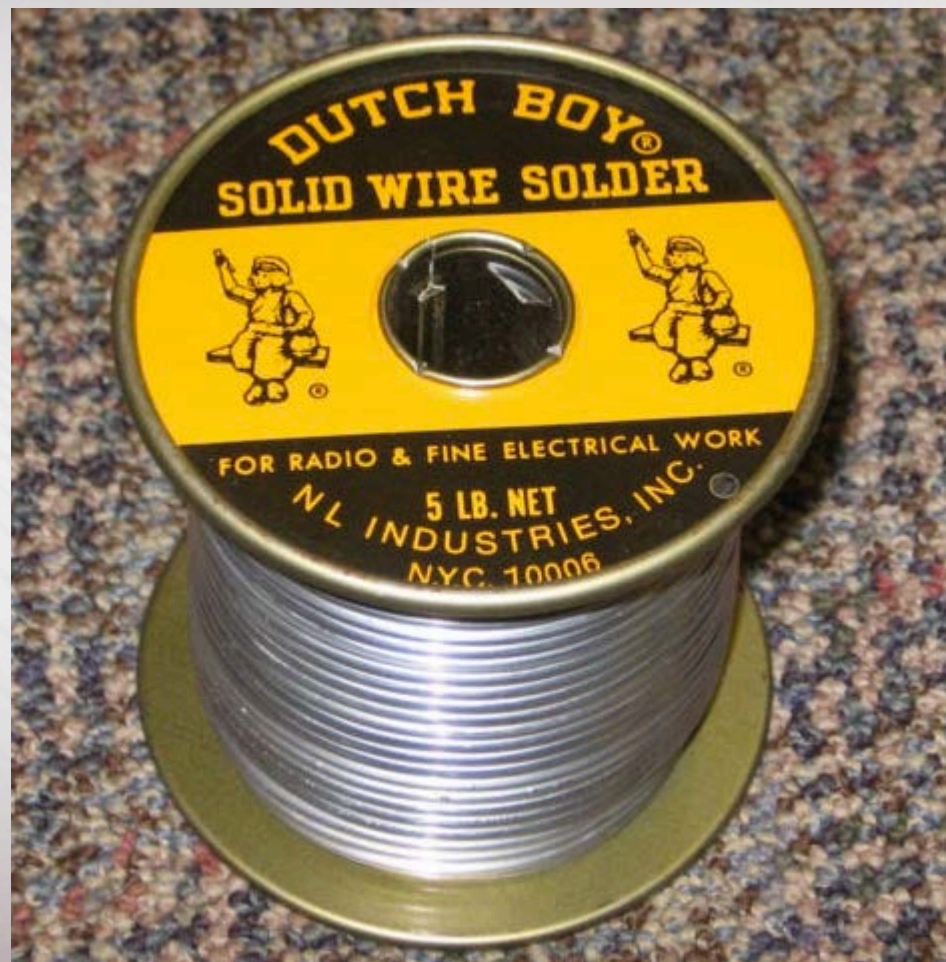


Let's talk about water

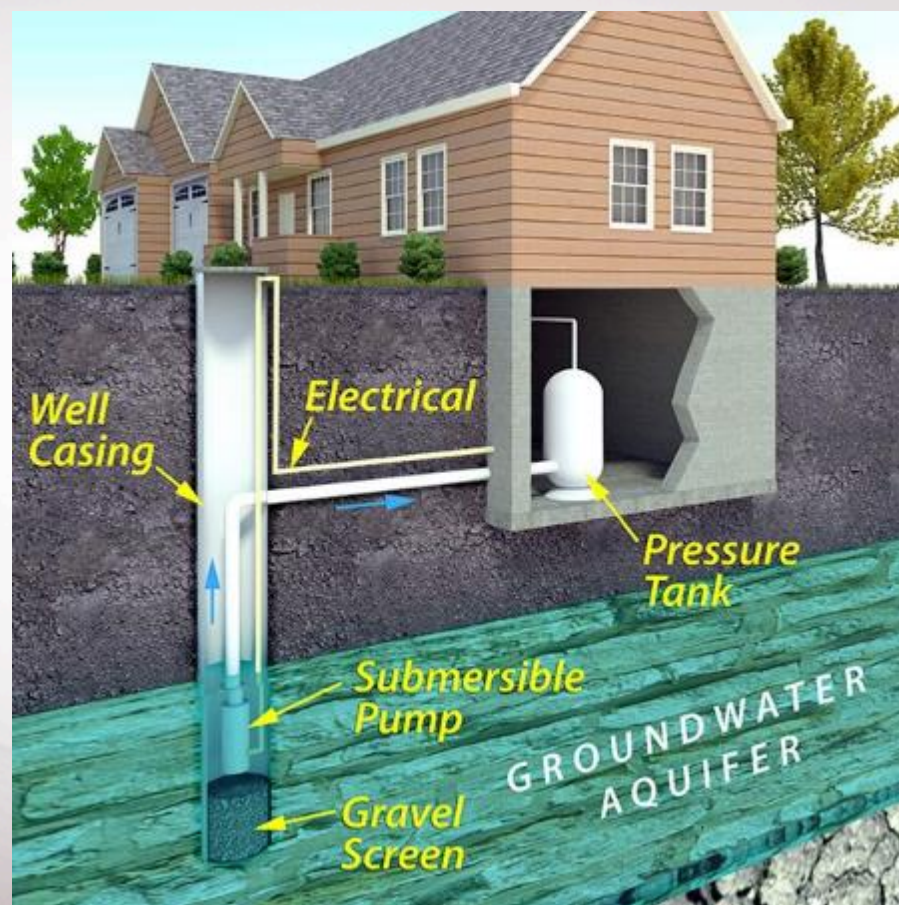
Roman water pipes







What are we sampling?







Sampling for Lead



Numbers to know

Paint

1.0 mg/cm², 0.5% weight, 5000 ppm

Dust

40µg/ft² floors, 250µg/ft² window sills,
400µg/ft² window troughs

Water

15 ppb/L liter sample, 20 ppb/250 mL sample

Soil

400 ppm play area, 1200 non-play area

Contact Information

Matt Young
Sanitarian Program Specialist
Ohio Department of Health
(614) 466-1450
lead@odh.ohio.gov