

Lead Education Lessons

Middle School

Unit: Lead
Lesson One

Grade Level: Middle School

Title: Is Your Pencil Poison?

What You Need to Know: Students will discuss uses of lead in a variety of occupations, weighing the value of use against the risk of poisoning. Students will also identify the age and maturity level of individuals most likely to become victims of lead poisoning.

Concepts

- Lead can be a valuable natural ore resource. Lead can also be a very hazardous environmental poison.
- Lead has the potential to poison you.
- Lead has the potential to poison your unborn child.
- Lead has the potential to poison unsuspecting children.
- Lead poisoning can be prevented.

Timeframe: One 50 minute class period:

Linkages: Social Studies (occupations); Health (human growth and development); Family Living (child development, housing)

Materials: Worksheets

Food For Thought

Procedure: Ask students to list the ways lead is evident in their lives (pencils, paint, pipes, lead shielding for x-rays, fishing sinkers, batteries, etc.). Ask students if they can think of any harmful effects of lead poisoning (anemia, central nervous system impairment, kidney damage, reproductive system damage, digestive problems, etc.)

Distribute the Food for Thought worksheet. Ask students to read the list and, on a different sheet of paper, lines numbered 1-20, decide for each use of lead if they think it is a SAFE use. Does the benefit of use outweigh the danger. Encourage them to consider who will come in contact with the specific form of lead being used.

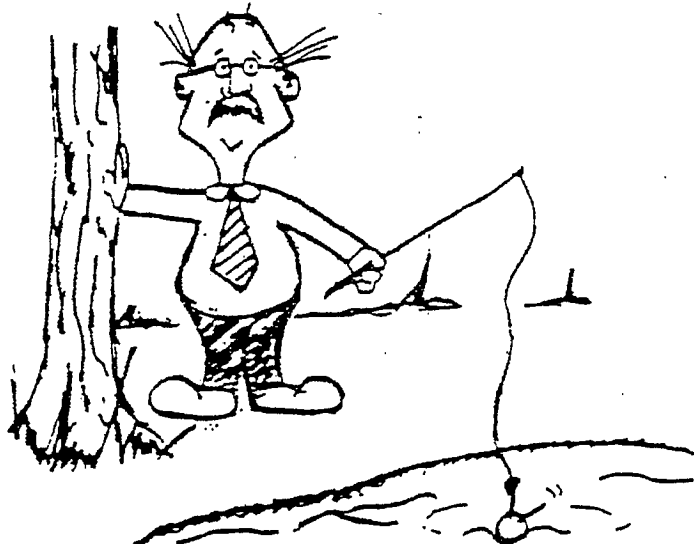
Discuss and debate the results for each list item.

Assignment: Ask students to, for homework, make a list of where they might encounter lead in their daily lives. Some discussion might be necessary regarding how to tell if lead is present.

Name _____

Food for Thought
(Topics to investigate and discuss)

1. lead shields for hazardous work in areas such as X-ray technology and nuclear equipment
2. lead crystal
3. stained glass
4. solder
5. electric storage batteries
6. drainpipes
7. covers for power and phone cables
8. sinkers for fishing
9. bullets
10. shot
11. weights to balance airplane propellers and automobile wheels
12. linings in equipment that uses corrosive materials such as acid
13. lead used in combinations as in $PbCO_3$ (lead used with calcium in roofing materials and maintenance-free batteries) or with other alloys in products such as bearings and type for printing
14. lead as an addition to plywood, plastic or plasterboard to make building materials that will control noise and vibration
15. lead used with arsenic to create pesticide
16. litharge, which is lead and oxygen, used as a glaze on china and in storage batteries
17. red lead - a lead/oxygen compound used in paint on steel structures (as in bridges) to prevent rust
18. foreign-made cans - some still use lead as a "joining" material
19. lead used in ink on some containers, e.g., food storage bags
20. lead used in the ink of colored newsprint



Unit: Lead
Lesson Two

Grade Level: Middle School

Title: Is THAT Lead Ok?

What You Need to Know: Students will review where lead is found in their daily life environments. They will also assess who is at risk for the specific locations of lead.

Timeframe: One 50 minute class.

Linkages: Health, Family Living (human growth and development).

Materials: Homework from Lesson One.
Chalk board/flip chart

Procedure: Ask students to report where they found lead in their daily environment (the homework assignment). Make a master list on the chalk board. Leave space next to each listing and create two columns next to the listing.

For each item on the list, ask students if the lead encountered is what they would consider "good" lead or "bad" lead. (Good lead might be lead used in the shield a dentist puts over the lap of someone getting teeth x-rayed; Bad lead might be lead paint chips on the window sill in their home). Record their responses in the first column.

In the second column, ask which age group of individuals is most likely to encounter this type of lead: unborn children, infants, toddlers, kids (elementary school children), teens, adults, senior citizens). The completed chart might look like—

Source	Good/Bad Use	Age Group
Dentist's lead apron	Good use.	Toddlers, kids, teens, adults, seniors
Paint chips on window sill	Bad use	Infants, toddlers, pregnant women.

At the conclusion of the chart, break students into groups of 3-4 students per group and ask each group to identify which findings of lead are most dangerous (based on location, use, and age group affected). Report findings by group and discuss differences of opinion.

Homework: Ask students to list examples of four different ways poison by lead can enter the body. Each of the four poison categories must be represented by one example. It may be necessary to list the four poisoning methods (injection, inhalation, absorption, and ingestion).

Unit: Lead
Lesson Three

Grade Level: Middle School

Title: But, I Don't Eat Lead!

What You Need to Know: Students may think they are not affected by lead poisoning because they never come in contact with it. This lesson is to clarify how people come in contact with "bad" lead throughout their lives, sometimes without even knowing about it. Students will also determine how they can tell if they or someone else might have lead poisoning and what can be done about it.

Timeframe: One 50 minute class period.

Linkages: Health and Family Living (human growth and development)

Materials:

How Can a Person Tell if He/She Has Lead Poisoning?
Are Children at a Greater Risk of Lead Poisoning?
Chalkboard

Procedure: Start with four column headers on the chalk board – Inhaled, Injected, Absorbed, Ingested. Ask students to suggest, from their homework, which lead encounters would fit into each category. For example:

<u>Inhaled</u>	<u>Injected</u>	<u>Absorbed</u>	<u>Ingested</u>
Dust from flaking paint is in the air due to ventilation system.	Getting stabbed with a pencil.	Playing in soil containing lead and getting dirt onto skin surfaces.	While looking out window, you rest hands on sill. Getting paint chips on finger, you lick fingers to clean them.
Working in dusty, unventilated environment.	Getting a finger splinter from wood painted with lead based paint.		Consuming folk remedies that contain lead.
Inhaling fumes from leaded gasoline while pumping gas.			Eating food stored in lead-containing containers.

For each type of lead poison on the chart, discuss/list how you can tell if a person has lead poisoning. Start with general symptoms of poisoning (environmental signs of presence of poison such as paint chips, dust in air, puncture wound where object is known

to contain lead, physical symptoms). and progress to specifics related to lead. Refer to the two symptomology handouts for specifics.

Ask students to consider their immediate and extended family members and list everyone who might be at risk for lead poisoning. List person, type of poison, and type of risk. Discuss why some people might be more at risk than others.

Homework: Ask students to decide which category of individual (unborn children, infants, toddlers, kids, teens, adults, or seniors) are at GREATEST risk for lead poisoning. Then, write a 3 paragraph essay, discussing—

- The specific age group and why the risk is greatest for that group.
- The specific ways lead poisoning occurs in that group.
- How lead poisoning can be prevented for that group.

HOW CAN A PERSON TELL IF HE/SHE HAS LEAD POISONING?

The only way to know for sure if a person has an elevated blood-lead level is to be tested for it. There are two tests to screen for lead levels and both methods require blood from a vein or from a pricked finger. The two tests are:

- * Blood-lead Test- measures the actual amount of lead in the blood
- * FEP or EP Test- measures a chemical that changes in response to lead exposure

The Centers for Disease Control recommends the Blood-lead Test as the first method of screening for lead levels. The CDC recommends that all children be tested at the age of 12 months and at 24 months. Screening should start at 6 months in children at-risk to lead exposure.

HOW TO INTERPRET BLOOD-LEAD LEVELS

To correctly interpret blood-lead levels, keep in mind the method used to draw the blood sample. Finger sampling tests can have surface skin contamination, making a higher level; a repeat test should be performed in a few months.

10-14 ug/dl. Even if the blood sample was drawn from a vein, it is difficult to interpret a single test result in the 10-14 ug/dl range. Many such test results will turn out to be false positives, and the test should be repeated in a few months. If the test results remains in this range, it indicates that your child has a higher blood-lead level than average. Obvious high dose sources of lead, such as peeling lead-based paint, should be addressed. However, the effect on the individual child of blood-lead levels in this range is very small.

15-19 ug/dl. If the test result is in the 15-19 ug/dl range and the sample was drawn from a finger, it is possible that surface skin contamination is making the level higher than average. A repeat test (preferably from a vein) should be performed within a month. Obvious high-dose sources, such as peeling lead-based paint, should be addressed. If the child's blood-lead level persists in this range over a three-month period, you may want to have an environmental assessment conducted to identify sources of exposure, if resources permit.

20-69 ug/dl. Children with blood-lead levels in this range should have a full medical evaluation. This includes a detailed environmental and behavioral history (asking about reading or other learning disabilities, language development, pica, etc.), a physical examination and tests for iron deficiency.

Over 70 ug/dl. Children with blood-lead levels this high are considered a medical emergency. Medical treatment and environmental action must begin immediately.

ARE CHILDREN AT A GREATER RISK OF LEAD POISONING?

Children are more susceptible to lead poisoning than adults.

- A child's rapidly growing body is greatly affected by lead levels, especially brain and nervous system.
- A child's hand-to-mouth behavior increases exposure to lead
- A child absorbs more nutrients than adults so their mineral uptake is greater.

LEAD IS THE # 1 CHILDREN'S ENVIRONMENTAL ILLNESS, AFFECTING 15 % OF ALL U.S. CHILDREN.

SYMPTOMS OF LEAD POISONING	
LEVELS OF LEAD	HEALTH EFFECTS
Low Levels 10 - 35 ug/dL in children 10 - 40 ug/dL in adults	Usually no symptoms
Moderate Levels 35 - 50 ug/dL in children 40 - 60 ug/dL in adults	There may be no symptoms General fatigue Irritability Difficulty in concentrating Tremors Headaches Abdominal pain Vomiting Weight loss Constipation
High Levels Over 50 ug/dL in children Over 60 ug/dL in adults	There may be no symptoms or the symptoms may be those mentioned Moderate Levels above. Convulsions Paralysis Coma Death

From: Hall, A., Martin, A., Zuccarini, A. (n.d.) *Let's Get the Lead Out*. Chicago, IL: University of Illinois-Chicago School of Public Health. *Used with permission.*

Unit: Lead
Lesson Four

Grade Level: Middle School

Title: Minimize the Risk

What You Need to Know: Unborn children, infants, and children are at greatest risk for lead poisoning, but EVERYONE is at some risk. Lead is an environmental poison and we can control our environment. There are resources available to detect lead poisoning. Early detection is very important. Environmental management of lead is EVERYONE'S responsibility.

Timeframe: One 50 minute class period:

Linkages: Health (human growth and development); Family Living (child development, housing), Science (environmental awareness), Social Studies (social issues).

Materials: Homework essays
Chalkboard

Procedure: Ask individual students to read/summarize their essays. Make a general list on the of each on the board. Ask the group as a whole to vote on which age population is at GREATEST risk. Allow some debate ahead of time. There will not be consensus. In discussion, bring out specifics of danger to unborn children, infants, and kids (as these affect learning and total functioning for the rest of an individual's life).

For major areas of risk, discuss how that risk can be avoided.

Following the vote, note to students THEY have clearly identified a risk to their own welfare, as well as the welfare of their current family, and their future children and grandchildren. As a culminating assessment, ask each student to, working independently, list the risk and what they need to do (as in themselves actually do), to see that no one in their immediate family, none of their yet to be born children or grand children, nor themselves, ever is affected by lead poisoning.

This should be a rubric graded essay. Look for—

- Consideration of all three categories of people (1 point for considering each) – total of 3 points.
- Consideration of at least 2 different risks for each category (1 point each per category) – total of 6 points.
- A behavior they can do to eliminate the risk (and which is not harmful) (1 point for each per category) – total of 6 points.
- Paragraph structure – essay written in at least 3 paragraphs (1 point each)
- Less than 3 spelling errors (1 point).

TOTAL 15-17/A, 13-14/B, 11-12/C, 9-10/D

Unit : Lead

Optional Lesson

Grade Level: Middle School

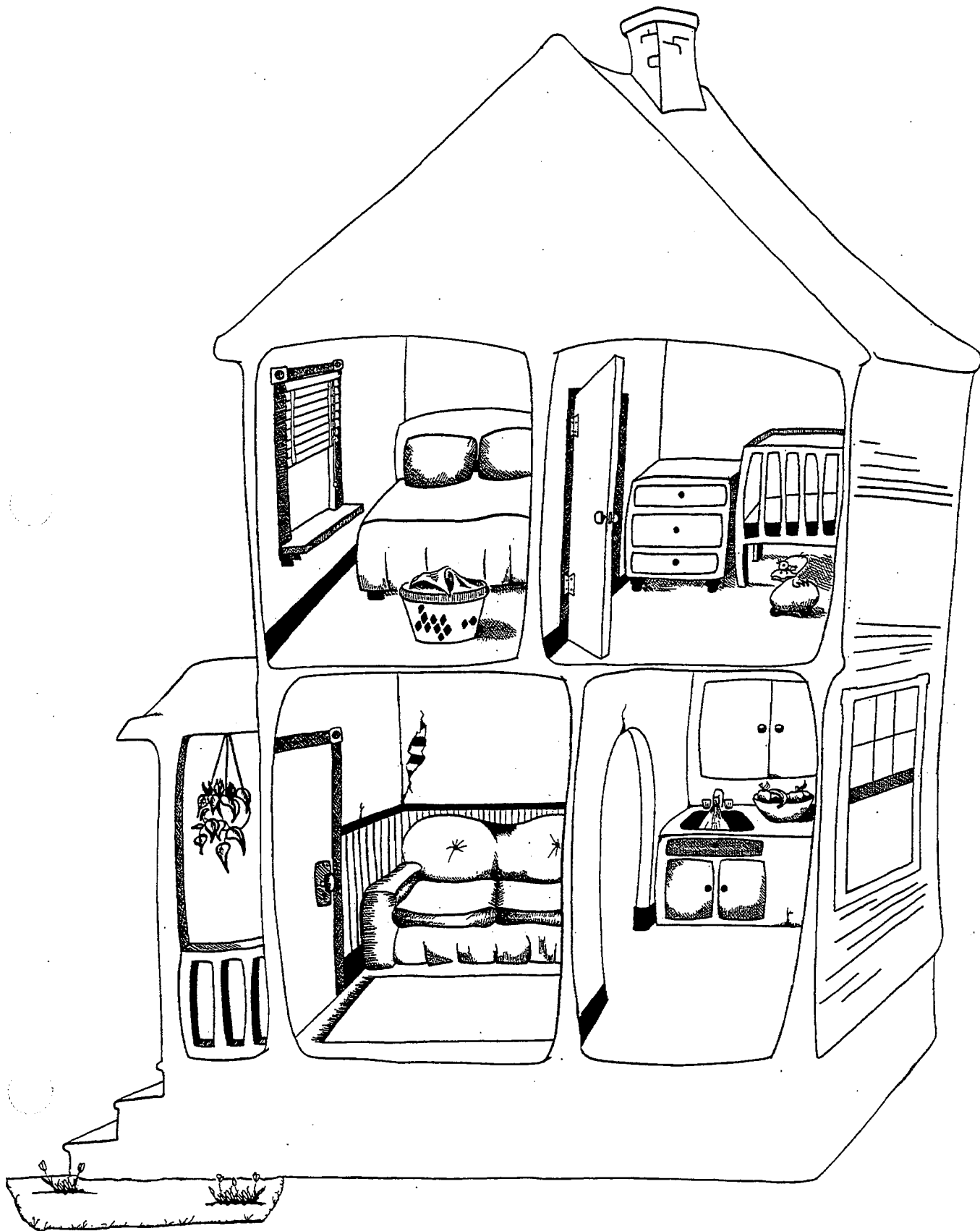
Title : Look Out for Lead

What You Need to Know: These papers from the Milwaukee Public Health Department can be used to help students locate potential sources of lead exposure. The word search can help to reinforce vocabulary.

Materials: student copies of Look Out for Lead sheets or overheads of the same

Procedure: These papers can be done as a class, individually or in small groups as a follow up activity.

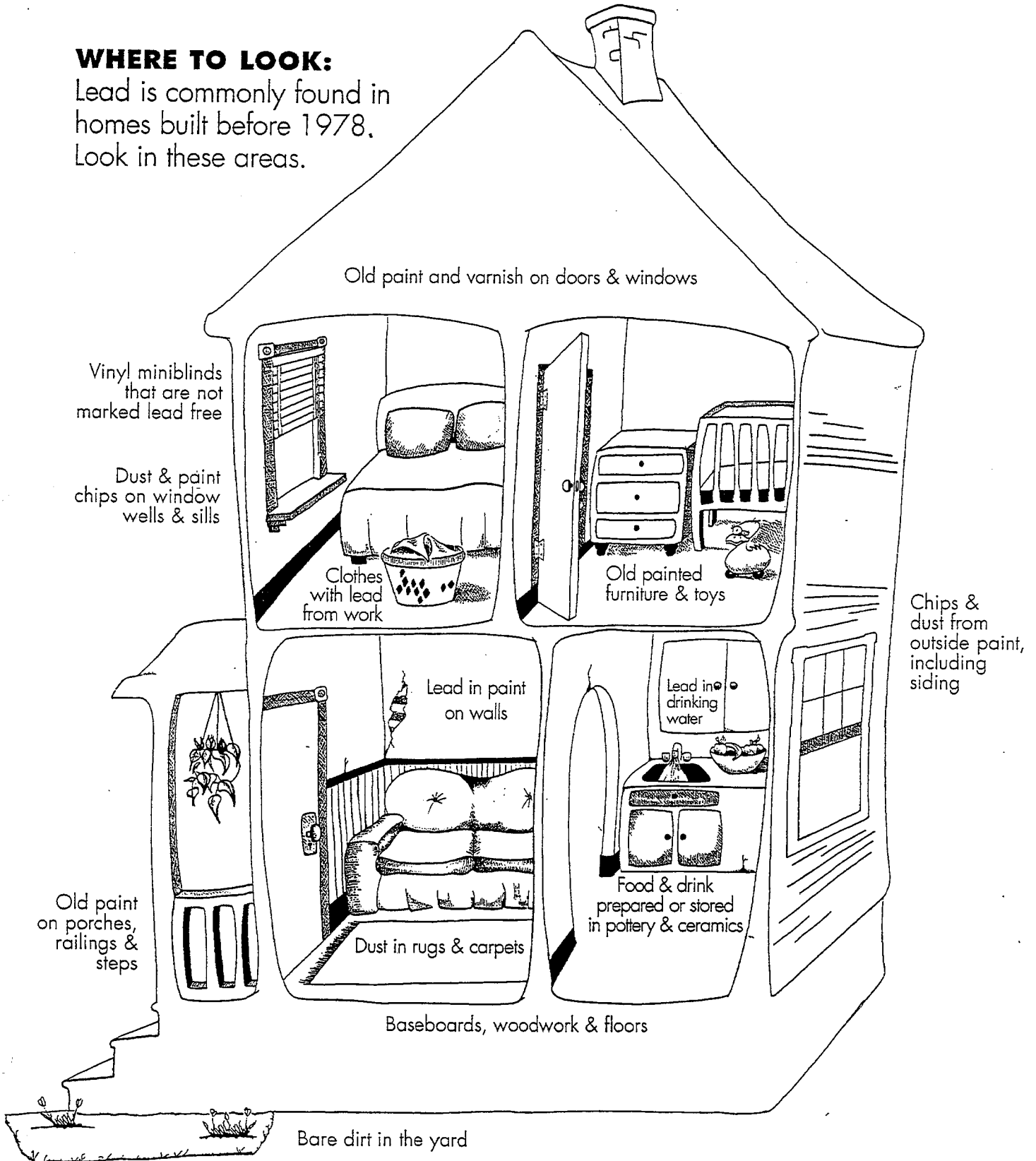
LOOK OUT FOR LEAD



LOOK OUT FOR LEAD

WHERE TO LOOK:

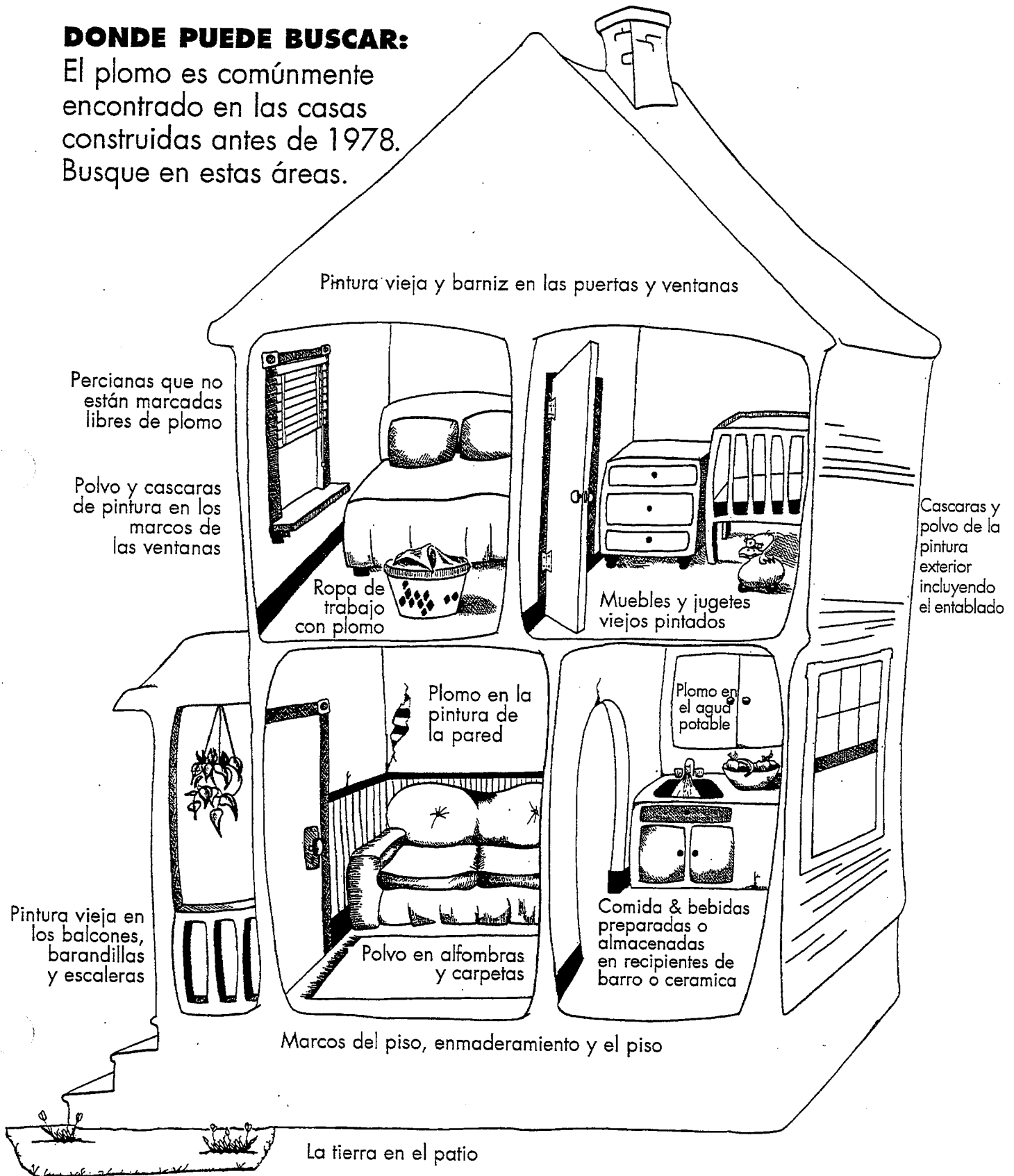
Lead is commonly found in homes built before 1978. Look in these areas.



TENGAN PRECAUCIÓN DEL PLOMO

DONDE PUEDE BUSCAR:

El plomo es comúnmente encontrado en las casas construidas antes de 1978. Busque en estas áreas.



WORD SEARCH

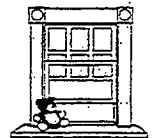
LOOK OUT FOR LEAD

U N E V E R Y O L D B T N
 E C A V A P E H C Y S N D
 T S A L B D N A S E L E O
 M C Z X V S Z B Y F E M L
 N H T G I X W L S R A E E
 O I U S R E M O V E D T A
 T L S R U P F O D W I A R
 H D S U E D Y D E N K B N
 T R I H M T O T M L I A I
 L E C H A M A M O L M W N
 A N K O T R E W O R W I G
 E Z T V D H Y R D L O O F
 H I M G A S D N A H P D E

WINDOW
 YES
 LEAD
 CHILDREN
 PLOMO
 WATER
 HEPAVAC
 SANDELAST
 BLOOD
 NEVER
 DUST
 WET
 LEARNING
 SICK
 HEALTH
 HANDS
 SUMMER
 REMOVE
 ABATEMENT
 DRY

Most common location of lead dust.
 Answer to: can you prevent lead poisoning?
 What to look out for.
 People up to age 6 most likely to get lead poisoning.
 Word for lead Spanish.
 Sometimes carries lead from old pipes or solder.
 High efficiency particulate air filter vacuum.
 Not a safe way to remove lead paint.
 What you test to see if a person has lead poisoning.
 Amount of time lead is a natural part of the body; opposite of always.
 Lead in this spreads throughout the house.
 Opposite of dry. You should use a _____ mop to clean up lead dust.
 School activity affected and by lead poisoning.
 Kids with lead poisoning don't always look this way.
 Local government department with information on lead poisoning.
 What kids often put in their mouths after they touch lead dust.
 Season where open windows contribute most to lead poisoning.
 To get rid of lead, cover it, enclose it, replace it or _____ it.
 A way to reduce lead. Look for certified _____ contractors.
 Opposite of wet. Do not sweep or use a regular vacuum to clean up lead paint in this condition.
 Opposite of new; type of house more likely to have lead.
 Answer to the question: is lead poisoning the same as food poisoning?

OLD
 NO



look out
 FOR LEAD

SUPER MASTER EXERT WORD SEARCH

LOOK OUT FOR LEAD

M G J U H J T V T Y T I P S L K M A W E H S Z X B G B E P K E T M
 J O M R F F H H O U U J G O H S E Z U V N W X B G B E P K E T M
 J N E W R U P Z E U M I D Y T F X S Y N T T O R M Z Q C S S P P
 C B N P D Z G N F A N T E C U C Y C O E H Y Y G A L I T C E J
 D L O D R L O A H E R E K A C Q W F A F L X R Y K A D O Q P I C E J
 C R V L S D Z S T R O I A C P H P E W C D D C E A H W U S L E M
 P F A N L S I O S P O L D A C I P H P E W C D D C E A H W U S L E M
 W K T V Q S X Y O L L C J Y K B E N K N A F A R E D I V P I E C T O
 N C I C U T S R O F I C N E F P I E W S R A F H S F S I T E O S
 Z L O F K D S M H I N F A G J B R I W N S P C S C O F N D E O S
 B C N C I E F M Y Y C O E R E A P O W A N S S C P S C R O W G D S I G
 L G E A R Q S L P R X L B Q L O P O W A N S S C P S C R O W G D S I G
 G B V S Q B K E I J F W W U T F F B E T S G R A D H P S J S I P
 S E E O F L V H R E J F W W U T F F B E T S G R A D H P S J S I P
 M O G I P A S S E S E M E N T D Y R R T A F F R I I C K S P X I E
 O R Y C G D S I S E S E M E N T D Y R R T A F F R I I C K S P X I E
 I P Y N D I N I M P O R T E D E C R E J P X H H I C F C N L
 L J A R I K I A E T U A T K D C A L C M V F F X H H I C F C N L
 M F R C K I A E T U A T K D C A L C M V F F X H H I C F C N L
 A G B T T L L N S U A R O R E A T G S C D M I H D N O I K O T I
 X N A I T L L N S U A R O R E A T G S C D M I H D N O I K O T I
 N C F H A L T I S U A R O R E A T G S C D M I H D N O I K O T I
 I Y U P C R Y X S D D A M L O O M I N T W O L E B P A U S E S
 W L G V G E O L S T P K R A L Q S T I O F T T A E L Z B R V K
 G Q A K F J R M P H Z K H J P K M A R P E H Y T P M Y N A I Q
 S J T A K F J R M P H Z K H J P K M A R P E H Y T P M Y N A I Q
 T B E H N K A Z O X O Q H J P K M A R P E H Y T P M Y N A I Q
 W R G H E C Y B U V R H Q W D P A W S I R D E T V P P L Q C N F I D Z
 A S T X S K Y C N E G R E M E Y G N R V S I Z R F F P N W C
 R G P T U E H C Q E R Q U T D A S I D G A I Y R C Q H A H W
 B E H N K A Z O X O Q H J P K M A R P E H Y T P M Y N A I Q
 T B E H N K A Z O X O Q H J P K M A R P E H Y T P M Y N A I Q
 W R G H E C Y B U V R H Q W D P A W S I R D E T V P P L Q C N F I D Z
 A S T X S K Y C N E G R E M E Y G N R V S I Z R F F P N W C

ESSMENT

b.c.d

BATTERIES

BELOW

BRAIN

BUREAU

CHALKING

CHILDREN

CHIPS

DANGEROUS

DECILITER

DONE

DUST

EASY

EAT

ELEVATED

EMERGENCY

ENCLOSE

FALSE

GASOLINE

HEPA

IMPORTED

INTERIM

LESS

ORDERS

PARTICULATE

PHOSPHATE

PROTECTIVE

RAILING

REMOVE

RENOVATION

SAFE

SANITARIAN

SCRAPE

SOIL

SOLDER

TEN

TITLE

TRUE

WOODWORK

A way to check to see if there is lead in a home. Dry sanding is a way to remove lead paint; opposite of good.

One source of lead is old car batteries.

Under, as in soil below a window covered with lead.

Ingestion of lead can affect this part of the body (the thinking part)

Location of the Wisconsin Childhood Lead Poisoning Prevention Program; the Wisconsin Department of Public Health.

Lead can be in paint that is peeling, flaking, chipping or cracking.

People most susceptible to lead poisoning; under the age of six.

Children sometimes eat little pieces of paint like these.

High-lead levels can be found in old paint.

A blood lead level of 10 micrograms per deciliter is significant.

Finished. The job is not done until everything is cleaned up.

Sometimes this is so fine that you can't see it.

We all want to make it (opposite of difficult) to prevent lead poisoning.

Children need to do this with certain kinds of foods that make it harder for lead to stay in their bodies.

When blood lead levels are this way, we should be concerned.

A blood lead level above 70 is considered to be a medical emergency. Don't wait for treatment.

One of the four key words for abating lead. If you can't remove the lead, you can encapsulate it, remove it, replace it or do this to it.

Little can be done to help tenants to prevent lead problems: true or false?

This fuel for cars used to be a major source of lead in soil.

The right kind of vacuum for lead dust removal.

Opposite of exported. Some bright colored ceramics from this source have lead in them.

Type of controls for lead poisoning that are short-term; for the time being.

We can all work together to make lead poisoning prevention more expensive.

It would be good if we never had to issue abatement commands like this.

Little bits of matter that float in the air. Can be removed with a HEPA vac.

The chemical in automatic dishwasher detergent that helps clean up lead.

This type of clothing or equipment keeps lead removal workers safe.

Peeling paint on banisters and this part of porches and stairs can have lead in it.

If you do this to old lead paint, use safe techniques.

The kind of home remodeling that can be hazardous if the house was built before 1980.

The type of housing (lead-free) that a child may have to stay in until his or her dangerously high blood lead level is lower.

A health professional whose job is to keep things clean and safe.

If you are going to remove old paint this way, do it wet rather than dry.

Dirt. When children play outside, lead in this can harm them.

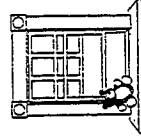
When you join together water pipes or make stained glass windows you use this.

Number of micrograms per deciliter that serves as a danger point for blood lead level.

Important law regarding lead poisoning prevention; Wisconsin X.

Answer to the question: True or False: Wisconsin is making progress on lead poisoning prevention.

Part of the house where lead paint and dust collect; can be cleaned with a wet cloth.



Look Out FOR LEAD