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## **Environmental Racism and the Urban School Child**

Curriculum Unit 96.02.01  
by Patricia Augustine-Reaves and Pamela Augustine-Jefferson

### **INTRODUCTION**

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In 1987 The United Church of Christ Commission for Racial Justice conducted a landmark study with startling results. Memphis, Chicago, Atlanta, St. Louis, Houston and other urban areas were found to contain the greatest concentrations of hazardous waste sites. Susan Moffat noted in a 1995 *Los Angeles Times* article, relative to a study at Occidental College, that non-whites in the Los Angeles area are three times more likely than whites to live within half a mile of hazardous waste treatment sites or dumping centers. What's even more disturbing is that "some populations are in a one-mile radius of six or seven hazardous waste sites." (1) The researchers at Occidental College also concluded that "race was even more important than income in determining whether a neighborhood had a toxic waste dump." (2) The Environmental Protection Agency of California, of course, denies that race is a factor in the permitting process.

Nearly halfway across the country another urban wasteland was created. It is a city that is populated by practically 100% peoples of African descent. This city has no obstetric services and no garbage removal. Jobs are scarce. Raw sewage backs up into homes and schools regularly. And this city, East St. Louis, has the highest rate of children's death related to asthma. East St. Louis sits directly next to Monsanto Chemical, Pfizer Chemical, Aluminum Ore, Big River Zinc and other industrial plants. It was noted at the New England Environmental Law Society, Harvard University (Nov, 1992) that "Most of these plants have their own incorporated townships, where no one lives and are no more than legal fiction to provide shelters and immunity from the jurisdiction of East St. Louis." (3) This is a city where "lead is found in playgrounds at an astonishing 10,000 parts per million." (4) The fact that children play directly downstream from chemical and metal processing plants has resulted in "the highest rate of childhood asthma in the nation." (5) Children also play in what is known as Dead Creek "which received toxic discharges in the past and now smokes by day and glows on moonlit nights. It gained notoriety for instances of spontaneous combustion created by friction when children ride their bicycles." (6) East St. Louis has been aptly described as "America Soweto." Jonathan Kozol in *Savage Inequalities*, further details the atrocities in East St. Louis and their effects on the urban school children there.

Lead poisoning affects an alarming 49% of African American children residing in the inner city. That figure leaps to 68% for those with an income of less than \$6,000. The implications and ramifications of widespread lead poisoning on the lives and intellectual potential of urban school children are far reaching. (7)

The purpose of this unit will be to explore environmental racism, the resulting environmental hazards, (specifically air pollution and lead poisoning) and their affects on urban school children.

Lessons and workshops geared towards elementary school children, parents and other community members will be developed. The focus of these workshops and lessons will be to educate all concerned about these environmental perils that threaten our communities and the the underlying racial implications.

### **What is Environmental Racism?**

Environmental racism is racial discrimination in environmental policymaking. It is racial discrimination in the enforcement of regulations and laws. It is racial discrimination in the deliberate targeting of communities of color for toxic waste disposal and the siting of polluting industries. It is racial discrimination in the official sanctioning of the life-threatening presence of poisons and pollutants in communities of color. And, it is racial discrimination in the history of excluding people of color from the mainstream environmental groups, decision making boards, commissions, and regulatory bodies.

Benjamin Chavis, *Confronting Environmental Racism: Voices from the Grassroots*

Environmental racism, or sometimes called environmental injustice, is a modern term used to describe a age-old phenomenon where as people of color are subjected to environmental and health risks in disproportionately higher numbers than other groups in society. It is a result of five hundred years of colonial oppression where the exploitation of people of color, the land and natural resources are interwoven. In communities where people of color reside and work, there is an increased chance for exposure to toxic landfills, incinerators, industrial dumping and other environmentally hazardous undertakings. Many can be said to live in “disposable communities to be thrown away when the population they hold have outlived their usefulness”. (7a) People of color are disproportionately found in industries with “high levels of occupational health risks, and in the most hazardous jobs within those and other industries.”(8) This results in significantly increased occupational disease and mortality rates. In homes, children of color are exposed to lead at alarming rates. This is partly due to the age and condition of the housing stock, which was once painted with lead based paint. These children are often trapped in the segregated communities in which living conditions are substandard. Air pollution has given rise to to an epidemic of childhood asthma and other respiratory diseases.(9) Jonathan Kozol writes in *Amazing Grace*, “Asthma is the most common illness among children here. Many struggle to take in a good deep breath. Some mothers keep oxygen tanks, which children describe as ‘breathing machines’, next to their children’s beds.”(9a) Native American reservations and Third World nations suffer a similar fate. These nations often targeted as dumping grounds for hazardous waste, uranium mining and nuclear testing.

The concept of “social pollution” has assisted in segregating people of color, particularly people of African descent, from the majority of people in society because they “appear as a threats to the structure and organizing principles of social order”.(10) The central characteristic of this concept is the attribution, by the majority culture, of socially unacceptable behaviors (which the majority culture actually exhibits) to a particular group of people. In the U.S people of African descent are often viewed as less civilized than whites, engaging in pursuits designed specifically for physical and emotional gratification. During slavery black males were perceived as sexual competition for white males and a threat to the “purity” of white females and the white race for that matter. In part, because interracial sex between black males and white females was strictly taboo, though white males were allowed to exploit black females at will, segregation of the races was perpetuated and is still perpetuated to this day. This results in what Robert Bullard refers to as “residential

apartheid". He maintains that "apartheid-type housing, and urban development policies limit mobility, reduce neighborhood options, and diminish job opportunities for millions of Americans"(11), particularly African-Americans who are more likely to live in racially segregated communities regardless of income. "In 1990, more than 57% of African Americans lived in central cities, the highest concentration of any racial and ethnic group".(12)

Robert Bullard writes that African Americans, regardless of income, education or professional achievement

are exposed to higher crime rates, less effective educational systems, high mortality risks, more dilapidated surroundings and greater environmental threats because of their race. Institutional barriers make it difficult for many households to buy their way out of health-threatening physical environments. The development of spatially differentiated metropolitan areas where African Americans are segregated from other Americans have resulted from governmental policies and marketing practices of the housing industry and lending institutions. Millions of African Americans are geographically isolated in economically depressed and polluted urban neighborhoods away from the expanding suburban job centers. (13)

These communities are perceived as "appropriately polluted space"(14) because the people who reside in these communities are perceived by the larger culture as socially polluted. The pollution here is less visible and poses very little risk to the white community. Therefore it is not by coincidence that people of color are subjected to such environmental ills but that it is a matter of public policy.

### **What About These Children?**

Depression is common among children in Mott Haven Many cry a great deal but cannot explain exactly why. Fear and anxiety are common. Many cannot sleep . . . The houses in which these children live, two thirds owned by the City of New York, are often as squalid as the houses of the poorest children I have visited in rural Mississippi, but there is none of the greenness and healing sweetness of the Mississippi countryside outside their windows, which are often barred and bolted as protection against thieves.

Jonathan Kozol, *Amazing Grace*

One cannot help but wonder (with a great amount of dread) what psychological affect this type of environment has on its tiny victims. The physical affects (which have been previously mentioned) are well documented and devastating enough. These children cannot help but compare their environment to "resplendent images" portrayed on television as typical American landscape. The contrast must be striking, shocking and confusing. They must wonder why they are subjected to such squalor, pollution, disease, hopelessness and violence. This must have a profound affect on their social, educational and physical development. They cannot help but feel they are not valued in this society because to many they are not our society has developed a very effective system which will trap many of them in a state of confusion, hopelessness, rage and sickness well into adulthood. This is the tragedy of environmental racism. Children are essentially sentenced to life imprisonment without the possibility of parole not because they have committed any crime, but because their skin color, brands them as subhumans not deserving of the same rights as the larger culture in our society. And this society which preys on small children, considers itself the epitome of civilization.

### **The Environmental Justice Movement, from a historical perspective.**

During the 1970's higher educational institutions and civil rights groups noted the inconsistencies in

environmental health protection. Mohai and Bryant cited nine studies during this period that identified inequities from air and hazardous waste pollution. (17) But most of their concerns fell on death ears until 1982 when residents of Warren County North Carolina successfully blocked a landfill marked for the disposal of soil contaminated by PCB. The governor selected an alternative site for the landfill, Afton, which was 84% black. Warren County was 64% black and the state of North Carolina was only 24% black. In addition to this many scientist noted that the Afton site was problematic because the water table was close to the ground surface and many residents relied on wells as their source of water. The potential for contamination was high. Opposition by grassroots organizations followed. During this nonviolent protest four hundred people were arrested.

This incident influenced Walter Fauntroy, District of Columbia's Congressional Delegate to call for the investigations of hazardous waste facilities in EPA Region IV. It was found that "while blacks represented twenty percent of Region IV's population, in communities surrounding three of the four commercial landfills in region IV, blacks comprised more than fifty percent of the population."(18)

During the 1980's other researchers investigated this issue of inequity in environmental protection. Robert Bullard, a sociologist and a leader in this field, authored "Dumping in Dixie" which investigated the issue of waste facilities in five southern black communities and how the residents addressed this problem. He and other researchers were instrumental in stirring interest in this subject and putting environmental injustice on the national agenda.

In 1986 the United Church of Christ conducted a study of the correlation of race and income to the location of hazardous waste sites. It concluded that race was "the most significant variable in determining the location of a commercial hazardous waste facility." (19)

In January of 1990, a "Conference on Race and the Incidence of Environmental Hazards" was held at the University of Michigan, sponsored by the civil rights organizations and the academic community. One group of presenters referred to as the "Michigan Coalition" wrote to a number of government agencies and congressman demanding action on this issue.

In July of the same year, EPA Administrator William Reilly formulated the Environmental Equity Workgroup to ascertain the extent of the problem and to recommend possible solutions. Because the EPA had not collected data regarding environmental protection in regards to race and income it was difficult for this group to get substantial data regarding this issue. It however did indicate there were trends which supported arguments by earlier researchers. The work group recommended that the EPA do the following.: collect data based on race and socioeconomic status and take this information into consideration when making risk assessment and risk management decisions, target high risk communities and institute measures to reduce environmental risks, "promote the use of equity considerations in the rule making process as well as all agency permit, grant, and compliance monitoring and enforcement procedures", enhance communication with people of color and impoverished communities as well as including these entities in the decision making process, finally the EPA needed to " address equity in its long-term strategic plan." (20)

In 1991 the First National People of Color Environmental Leadership Summit was held in Washington D.C. This resulted in the adoption of the Principles of Environmental Justice. Some key concepts included but are not limited to "respect for the earth, freedom from environmental discrimination, right to a balanced and ethical use of land, self determination, accountability for the production and handling of hazardous materials, right to participation in the decision making about one's environment, the right to a safe and secure workplace, compensation for damage, restoration of cities in balance with nature, honoring the cultural integrity of the

neighborhoods, and providing access to a full range of resources, informed consent, and education based on appreciation of diverse cultural perspectives.”(21) It was crystal clear to many participants that the link between environmental justice and the urban environment required immediate attention and action.

The main thrust of the environmental justice movement is towards urban reconstruction. Cities must be valued as distinct centers for racial and cultural diversity and exchange. Rebuilding urban centers presents employment opportunities and other opportunities for economic development. This economic development must include the inner city communities, organizations and enterprises in every aspect of the planning and decision making process. More energy efficient, non-polluting forms of transportation must be promoted. Urban centers must develop links to each other becoming politically more powerful thus allowing them to set their own environmental policy agendas.

There are numerous environmental justice organizations in the U.S. Below is a list of some organizations located in the New York area.

Concerned Citizens for the Environment

Rhahaway, NJ 07065

(201) 388-8823

Hunter College

425 East 25th St., Box 596, New York, NY

Toxic Avengers

211 s. 4th St., New York, NY 11211

(718)387-0404

United Church of Christ, Commission on Racial Justice

475 Riverside Drive. #1948, New York, NY 10115

(212) 870-2077

West Harlem Environmental Action

529 West 145th St., New York, NY 10031

(212) 234-5096

### **What is the potential compensation criterion?**

The potential compensation criterion, presupposes that “everyone has their price”. It is based on what is called the substitutability assumption, which states that “individuals knowing their preferences, can substitute one set of preferences for others”.(15) In this case it refers to the trade off of reduced public health in exchange for increased economic gains by allowing polluting industries to locate in a particular community. This concept is rejected by the environmental justice movement and has been labeled by Robert Bullard as

“environmental blackmail”.(16) The environmental blackmail concept challenges the potential compensation criterion because its proponents believe that it is unjust to submit people of color and impoverished groups to pollution regardless of the level of compensation.

### **What is the NIMBY syndrome?**

The NIMBY syndrome (Not In My Back Yard) is a term used to describe the organized efforts to prevent industries and activities which a particular community perceives as detrimental from locating there. This is accomplished in several ways. Restrictive zoning laws in suburban areas protect these communities from many “unwelcome development” (22). Urban areas on the contrary are zoned for just about anything. Massive letter writing campaigns, political lobbying and public demonstrations have been successful in blocking the sittings of environmentally detrimental facilities in suburban areas.

Three arguments are used to against such sittings. First oppositional groups argue that this entity will threaten property values. Second it will reduce residential security. And thirdly, the entity will result in the decline of the quality of the neighborhood. (23)

The NIMBY syndrome has been used effectively by white middle class and affluent communities often to the detriment of people of color residing in urban areas. Urban communities in general have been unable to utilize the NIMBY syndrome to their benefit. In essence the NIMBY syndrome contributes greatly to environmental racism.

### **What Can You Do?**

***Become informed When a potentially hazardous facility is seeking to locate in your community find out specifically what the parameters of the facility and owners are. Find out what products and byproducts will be manufactured, what potentially harmful effects it will have on the community and what it intends to do with its waste products. Research zoning ordinances and the legal and political rights of your community.***

***Organize Grassroots organizational efforts can be instrumental in preventing hazardous industries from locating in your area. Public protest, petitions, rallies, lobbying political officials, hearings and public debate have been proven to be effective methods. Keeping the community informed via workshops and neighborhood forums is desirable. The key to mounting a successful effort is timing and intensity. The members of the group must act swiftly and intensely to ensure that others are swayed to support them.***

***Political Involvement Targeting local, state and or federal officials is essential to the oppositional process. Making the issue an election issue also can be instrumental in gaining support.***

***Litigation If all efforts fail, the community can use the court system to bring legal proceedings against the facility.***

### **Conclusion**

Environmental racism has existed in the country since that fateful day that Christopher Columbus “discovered” America in 1492. The exploitation of the indigenous populations, land and natural resources began then and has continued to this day. The native inhabitants, people of color, were subjected to genocidal attacks by the settlers which almost entirely wiped out their population. The survivors, segregated from the

white population were forced to live on “Indian” reservations. These modern day reservations are often targeted as repositories for hazardous waste and uranium mining.

Africans were kidnapped from their homeland, subjected to torture, rape and murder as they traversed across the “middle passage” to a land of opportunity, “for whites only”. It was on the backs of these slaves that America climbed, all the while beating, violating and murdering their uplifters. These people of color segregated by white society after their “freedom” from slavery because of white paranoia and hatred, were forced to live under deplorable conditions. These human beings were easy targets for the those who were bent on inflicting misery and death upon them, for no other reason than because of the color of their skin.

Many will say that was in the past and they cannot be held responsible for the atrocities that their ancestors committed. So lets look to the present. Who is responsible for the polluted segregated, impoverished communities that many urban children are forced to live under in. Many would like to blame the victims for their position in society but this paper has demonstrated that this is simply not true. This society has a very complex system in place to keep people of color “in their place”. The fact that many people in this country see little wrong with poisoning small children is deplorable. Though more insidious, is this any less cruel than the KKK night riders of the reconstruction period. When will these viscous attacks on people of color end?

And what will you do? Will you read this paper and dismiss it as pure fiction or propaganda. Or will take some responsibility in ending this legacy. Who will save the children?

Prior to beginning this unit, a workshop will be presented to the parents advising them of the basic tenets of environmental racism and developing a community response to it.

## **Lesson #1**

***Objective Children will gain an understanding of environmental racism by engaging in a simulations, discussions and by implementing their own ideas.***

### ***Materials trash can***

***Procedure Divide the children into four groups. Draw a square on the rug and place each group in each corner (or use a rug). Have the children imagine that this trash can is filled with poisons that can harm them if it gets close to them. Tell the children the trash can can be placed any where on the rug. Also tell them that everyone will get a chance to suggest where the trash can should go except group four. Solicit suggestions and encourage children to give their reasons for choosing a particular location. Record responses. Ask the children if they think that it was fair that group four didn't get a chance to participate. Explain to the children that many times in urban communities the people who live there are not included in the decision making process. Ask them what do they think about this. Do they think it is fair? Do they think it is good for the people who live in urban areas? Record their responses. Introduce the concept of environmental racism to children. Advise them that it involves the practice of targeting a particular community, usually populated people of color, as site for polluting industries. Encourage children to express their feelings about this.***

***Follow Up Ask children what they think they can do to stop environmental racism. List their ideas. Solicit parent volunteers to come in and help children to implement their ideas. Display them throughout the school and community.***

## Lesson #2

**Objective** Students will be able to recognize that air is everywhere even

## Lesson #3

**Objective** Students will be able to define air pollution and recognize it as harmful.

Students will be able to identify at least one source of air pollution.

**Materials** *The air we breathe.* by Enid Bloom

paper, pencils, crayons or markers

**Procedure** In advance plan a trip to the top of East Rock. Review what we learned about air in the previous lesson. Introduce the word pollution. Ask children if they know what that word means. List their responses. Read pages 9-29. Ask children what air pollution is. Ask children to recall some of the sources of air pollution from the book. List and count them. Tell children that we are going to become pollution detectives. Take a walk around the neighborhood to look for sources of air pollution. Return to class list and discuss what they saw. Discuss with children that polluted air can cause asthma and other respiratory illnesses.

The next day take them on a trip to the top of East Rock (or another location where they can get an aerial view of the city). Have the children locate sources of pollution and illustrate pictures of polluting sources. Collect the pictures to form a class mural to be displayed in the Library Media Center. Discuss what plants and animals could be harmed by these polluting sources.

**Follow up** Have children look through magazines and cut out pictures of sources of air pollution. Have the children classify the pictures into groups. Then glue them on to paper to form a class collage.

Visit the Library Media center or the public library to get other books on the topic of air pollution.

For homework, have children ask their parents to name one source of air pollution. Share and graph responses in class. Though they can not see it.

**Materials** *The air we breathe* , by Enid Bloom, large balloons, liquid detergent, measuring cup, measuring spoon, container, uncoated hangers, straws, paper cups with the bottom cut off, funnels, chart paper.

**Procedure** Show children the cover of the book *The air we breathe.* by Enid Bloom. Ask them to predict what the book is about. Accept all responses. Read the two sentences on page 9 (which is the first page with text in the book). Ask children to look around the room and tell you what they see. List their responses on chart paper. Continue reading the book through page 11. Page 11 tell the children that air is everywhere but they can't see it.

Advise the children that air can be fun to play with even though it is invisible. Distribute large balloons. Have the children practice inflating and deflating them. While deflating them have the children put the balloon close to their face so that they can feel the air escaping. Ask the children what is in the balloon. Ask them can they see it when it is released.

Tell the children we are going to have even more fun with air. Ask them to raise their hand if they like to blow bubbles. Distribute soap mixture (2 teaspoons of liquid detergent to 1 cup of warm water) hangers, straws,



funnels, cups etc. Have children practice making bubbles. Ask the children what is in the bubbles. Ask them can the see it once the bubble pops.

***Follow Up Learn a song about air.***

**WHERE IS AIR?**

Where is air? Where is Air?

Here I am. Here I am.

You can't see me but I'm here.

You can't see me but I'm here.

Air, Air, Air.

Brainstorm other things that you can't see but know are there. Visit an incinerator in your area.

Contact a public health official to come speak to your class about air pollution.

**Lesson #4**

***Objective Students will be able to give at least one reason why cities have more air pollution than many rural or suburban towns.***

***Materials The air we breathe, by Enid Bloom, pictures of rural, suburban and urban settings, glass slides, Vaseline, microscope.***

***Procedure Show children various pictures of suburban, rural and urban towns including the photographs in the book The air we breath. Ask them to identify sources of pollution. Have children compare the pictures. Ask the children which pictures appear to have more sources of pollution. Ask them why they think this is so. List their responses.***

***Follow up Discuss the scientific method with the children: purpose, hypothesis, materials, procedure, conclusion and extension. Perform an experiment. Cover several glass microscope slides with Vaseline. Select several places to place them. rural area, suburban residential area, urban residential area and an urban industrial area. Leave your slides in the areas for at least 24 hours (don't place them right after a rainfall because rain washes away pollutants from the air and into the ground). Collect your specimens. Predict which will have more dirt on them. Look at the slides under the microscope. Record and discuss the results.***

**Lesson #5**

***Objective Students will be able to identify one way in which they can help stop air pollution.***

**Materials** *The air we breathe*, by Enid Bloom, poster board, paints, markers, pencils, paper, crayons, tape recorder, cassette tape.

**Procedure** *In advance solicit parent volunteers to assist with centers. Prepare activities for the following centers: Computer Center, Advertisement Center, Radio Commercial Center, Video Commercial Center.*

At the computer center have children write/dictate letters to the local board of alderman urging them to fight against air pollution.

At the advertisement center children will develop posters with anti air pollution messages, to be displayed in and around the school and community.

At the radio commercial center have children create and record a song with an anti air pollution message. Contact local radio stations to request it be played over the air.

At the video commercial center children will develop a video commercial with an anti air pollution message. Contact the local public television stations regarding filming and television exposure.

Rotate activities so that children have the opportunity to engage in as many of activities as they desire.

## Reading List

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Cars: An Environmental Challenge, Terri Willis & Wallace Black, 1992 Childrens Press.

Managing Toxic Wastes, Michael Kronenwetter, The Westport Publishing Group, 1989.

The air we breathe., Enid Bloom, Double Day & Company Inc. New York 1971.

Simple Science Experiments With Everyday Materials, Muriel Mandell, Sterling Publishing Co. Inc., New York, 1990.

Caring For Our Air, Carol Greene, Enslow Publisher Inc., 1991.

## Bibliography-Environmental Racism

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Terri Willis & Wallace Black, Cars: An Environmental Challenge, 1992 Childrens Press.

Michael Kronenwetter, Managing Toxic Wastes, The Westport Publishing Group, 1989.

Enid Bloom, The air we breathe, Double Day & Company Inc. New York 1971.

Muriel Mandell, Simple Science Experiments With Everyday Materials, Sterling Publishing Co. Inc., New York, 1990.

Carol Greene, Caring For Our Air, Enslow Publisher Inc., 1991.

Jonathan Kozol, *Savage Inequalities*.

Robert R Higgins, *Race, Pollution and the Mastery of Nature*, *Environmental Ethics*, Vol 16 Fall 1994 Pgs 251-263.

Troy W. Hartley, *Environmental Justice: An Environmental Civil Rights Value Acceptable to All World Views*, *Environmental Ethics* Vol. 17 Fall 1995 Pg 277-289.

Robert Bullard, *Residential Apartheid In Urban America, Race Poverty & Environment*, Vol 3&4, #1 Winter/Spring 1993.

Tom Meersman, "Coalition Lambastes NSP record. It's accused of 'nuclear racism'", *Star Tribune: Newspaper of the Twin Cities*, September 12, 1995, pp 1B.

Simmons Buntin, *Environmental Liberty and Social Justice for All: How Advocacy Planning Can Help Combat Environmental Racism*, November 1995

Benjamin F. Jr. Chavis, *Confronting Environmental Racism: Voices from the Grassroots*, 1993, Boston South End Press.

From Los Angeles, East St. Louis And Matamoros: *Developing Working Definitions Of Urban Environmental Justice, Race, Poverty & The Environment*, *Urban Issues—Issue 11*.

Janet Phoenix, *Get The Lead Out, Race, Poverty & The Environment*, *Urban Issues*, Issue 11.

Susan Moffat, "Minorities Found More Likely To Live Near Toxic Sites, Environment: Study finds race is more important than income in determining whether a neighborhood has such a hazard.", *Los Angeles Times*, August 30, 1995, pp. B1.

## Notes

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### *Environmental Racism*

1. Susan Moffat, "Minorities Found More Likely To Live Near Toxic Sites, Environment: Study finds race is more important than income in determining whether a neighborhood has such a hazard.", *Los Angeles Times*, August 30, 1995, pp. B1.
2. Ibid.
3. From Los Angeles, East St. Louis And Matamoros: *Developing Working Definitions Of Urban Environmental Justice, Race, Poverty & The Environment*, *Urban Issues—Issue 11*.
4. Ibid.
5. Ibid.
6. Ibid.
7. Janet Phoenix, *Get The Lead Out, Race, Poverty & The Environment*, *Urban Issues*, Issue 11.
- 7a. From Los Angeles, East St. Louis And Matamoros: *Developing Working Definitions Of Urban*

- Environmental Justice, Race, Poverty & The Environment, Urban Issues—Issue 11.
8. Robert R Higgins, Race, Pollution and the Mastery of Nature, Environmental Ethics, Vol 16 Fall 1994 Pgs 253.
  9. From Los Angeles, East St. Louis And Matamoros: Developing Working Definitions Of Urban Environmental Justice, Race, Poverty & The Environment, Urban Issues—Issue 11.
  - 9a. Jonathan Kozol, Amazing Grace, Crown Publishers Inc., New York, 1995
  10. Robert R Higgins, Race, Pollution and the Mastery of Nature, Environmental Ethics, Vol 16 Fall 1994 Pgs 251-252.
  11. Robert Bullard, Residential Apartheid In Urban America, Race Poverty & Environment, Vol 3&4, #1 Winter/Spring 1993.
  12. Ibid.
  13. Ibid.
  14. Robert R Higgins, Race, Pollution and the Mastery of Nature, Environmental Ethics, Vol 16 Fall 1994 Pgs 252.
  15. Troy W. Hartley, Environmental Justice: An Environmental Civil Rights Value Acceptable to All World Views, Environmental Ethics Vol. 17 Fall 1995 pp. 283
  16. Ibid.
  17. Ibid. 279.
  18. Ibid.
  19. Ibid.
  20. Ibid. 281.
  21. From Los Angeles, East St. Louis And Matamoros: Developing Working Definitions Of Urban Environmental Justice, Race, Poverty & The Environment, Urban Issues—Issue 11.
  22. Simmons Buntin, Environmental Liberty and Social Justice for All: How Advocacy Planning Can Help Combat Environmental Racism” November 1995.
  23. Ibid.

## **LEAD POISONING The Silent Plague Stalking The Innocent**

The Environmental Protection Agency and the Department of Health and Human Services insist that lead poisoning is the number one “environmental disease of children, affecting at least ten percent of preschoolers.”(1) The Center for Disease Control in Atlanta, Georgia deems lead poisoning the “most common and societally devastating environmental disease of young children.” (2) Of those children affected an overwhelming number are black or otherwise non-white. 90% of poor black children aged three to five living in American inner cities have elevated blood lead levels. It is a problem that warrants the concern, compassion, energy, outrage and activism from all sectors of the community. It is also a problem that demands we, as teachers, educate ourselves, our students, our parents and all others in the school community about this threat to the health, quality of life and intellect of our young treasures. This unit will hopefully aid you in this endeavor.

### **Lead—A Bittersweet History**

Lead has enjoyed a long, if bittersweet, intimacy with man. During pre-dynastic Egypt lead was reportedly added to cosmetics and eye salves. In ancient Rome it was prescribed as a cure for a rash, fever, indigestion and lust. Roman nobility had a habit of drinking potions sweetened with sugar of lead. This is rumored to have contributed to the fall of the Roman empire.

During the Age of Industrialization lead took on many new faces as the mass production of lead pipe, lead solder and lead laced pigments for glazes and the infamous lead paints. Because of its versatility it was seemingly perfect for use in bullets and other shot as well as typeface.

Well into the twentieth century new uses for lead continued to be developed. They included lead coverings for electrical wires, lead tubes for toothpaste, lead shields for X-ray machines, lead plates for batteries and even more lead in paint which found its way on to most everything including baby carriages. By the 1930s severe lead poisoning had become a common childhood disease characterized by convulsions, coma, brain damage and death. In the 1940s the paint industry began to reduce the amount of lead in its products. But, the emergence of tetra-ethyl lead which was used as an anti-knock additive for gasoline increased lead mining throughout the world. Through the 1960s the sale of leaded gasoline continuously rose. And, as the sale of leaded gasoline continued to increase so did the incidence of lead poisoning which led to the creation of more than 150 clinics nationwide to deal with this health hazard.

In the past twenty-five years there has been a crusade to send lead packing in some circles. In 1978 Congress banned the residential use of lead-based paint. But, as will be discussed in a subsequent section, bans such as this one were not uniformly enforced. In 1979 Dr. Herbert L. Needleman published a study which continues, along with his more recent study, to impact public policies in relation to lead. In this study Needleman analyzed the amount of lead in the teeth of children and determined that children with higher residues of lead in their teeth did not do as well on IQ and developmental tests compared to other children. Largely due to the efforts of Dr. Herbert L. Needleman the amount of lead in gasoline had dropped 99.8% from what it had been in the mid-1970s. Dr. Needleman, the former chairman of the board of the Alliance to End Childhood Lead Poisoning and professor of pediatrics and psychiatry at the University of Pittsburgh, is touted as the government’s top adviser on lead.

Also, by 1990 lead pipes were no longer standard in plumbing. They had been replaced by plastic or copper pipes. Cans with lead seams were no longer being manufactured in this country and accounted for less than 1% of cans on the market. Lead solder had been banned. Industries that used lead and lead smelters were

required to sharply limit their emissions.

In 1991 the Center for Disease Control (CDC) reduced the acceptable blood lead level from 25 micrograms of lead per deciliter of whole blood (ug per dl) to 10 ug per dl. The CDC defended its decision to reduce what it deemed an acceptable blood lead level by citing “scientific evidence [that] some adverse effects occur at blood-lead levels at least as low as 10 micrograms per deciliter in children, [and evidence is] so overwhelming and compelling that it must be major force in determining how we approach childhood lead exposure”(3)

The Residential Lead-Based Paint Hazard Reduction Act or “Title X” was passed by Congress in 1992. Its purpose is to “mobilize national resources to support expanded prevention efforts on a broad scale.”(4) This act instructs the Environmental Protection Agency to develop regulations for the removal of lead paint. It gives states the authority to administer and enforce these regulations. It also mandates that starting in 1996 that owners of homes built prior to 1978 must inform prospective buyers or renters of the presence of lead paint and provide them with leadhazard information. Real estate agents must also adhere to this policy or be liable for civil and criminal damages.

### **Lead Poisoning and the Inner-City Child:A Tale Of Two Cities**

It could be said it is the “best of times and the worst of times” when discussing the lead situation in this country. There are those who laud the efforts to make the horrors of lead poisoning a bad dream that has long passed. And in many circles that has indeed been accomplished to a large extent. But, for many poor children living in the inner-cities lead poison is indeed a demon of present and likely the future. As stated earlier 90% of poor black children from age three to five have elevated blood-lead levels. This is due in part because poor children are more likely to live in homes built before 1980. The CDC estimates that about 3,000,000 tons of lead are still in approximately 57,000,000 occupied homes. 14,000,000 of these units are believed to contain lead paint.

A number of these older homes also transport their water through lead or copper pipes with lead solder. An EPA study determined that 130 water supplies throughout the nation which serve more than 32,000,000 people have unhealthy lead levels. This problem also applies to schools, office and other public buildings.

Contaminated soil is also a primary source of lead exposure. It is estimated that as much as 4-5,000,000 tons of lead from the years when leaded gasoline was rampant remain in soil near heavily traveled intersections. Urban areas normally have higher traffic patterns than nonurban areas. Lead in the soil usually is found in the upper inch or two of soil. But, since soil in urban areas is turned over at a high rate the contamination is much deeper.

Also, Blue collar workers who work around lead may carry lead particles home on their clothing and person. These particles can be transferred to other family members through direct contact or through the washing machine when this clothing is laundered.

There is also the issue of nutrition. Poor inner-city children may be more likely to have diets deficient in calcium and iron which inhibit lead absorption. Their diets may also be higher in fat which speeds of lead absorption.

There are also issues which concern the unequal enforcement of bans and other measures in impoverished inner-city areas. Jonathon Kozol writes of such a situation in the South Bronx in New York City in his book *Amazing Grace The Lives Of Children And The Conscience Of A Nation*:

It is also recognized that many children in poor neighborhoods such as Mott Haven have been neurologically impaired . . . many from lead poisoning in their homes and also, shockingly enough, within their schools. Although New York officially banned the use of lead in residential paint in 1960, this prohibition was unevenly enforced in ghetto neighborhoods and never energetically enforced in city-owned apartments. And, notes the Times, the city “continued to apply ‘industrial grade’ lead paint” in public classrooms until 1980. John Rosen, a well-known pediatrician and leadpoison specialist at Montefiore Medical Center in the Bronx, warned the city as long ago as 1987 that schools in the area were “dangerously loaded with lead.”(4)

USA today reports in its July, 1995 issue that:

Since the CDC lowered the acceptable blood-lead level from 25 to 10 ug per dl. the Federal government has required all states to screen young children covered under Medicaid for lead poisoning. Washington, though, is not requiring that the most accurate test be used. Since the EP costs about \$2.50, compared to over \$60 for more sensitive screening, most states are utilizing the former. Thus, many cases of dangerous blood-lead levels will go undetected. (5)

These conditions speak to the irreverence for the life of those assigned by way of their color and socioeconomic status to what are known as the “ghettos” in this nation. The issue of environmental racism and the theory of “social pollution” are examined thoroughly in the preceding unit.

### **Consequences of Lead Poisoning**

When lead enters the body it gets into the bloodstream and soft tissue, liver, kidneys and brain. It eventually settles in the teeth and bones. As the amount of lead increases poisoning occurs. Little lead is needed to cause poisoning. Lead can affect every biological system. With lead poisoning symptoms may not be apparent until toxicity reaches a high level. Symptoms may also be mistaken for other conditions such as colic in the very young or attention deficit disorder in older children.

When blood lead levels exceed 40 ug per dl symptoms may include abdominal cramps, diarrhea, constipation, vomiting, change in sleeping patterns or activity level and irritability. Some infants may refrain from eating. In persons with high blood lead levels there may be symptoms of mental confusion, stumbling and difficulty with speech. With very high blood lead levels, 70-100 ug per dl, seizures, deafness, nerve paralysis, swelling of the brain and death may result.

It is estimated by the U.S. Department of Health and Human Services that millions of children have blood lead levels high enough to cause nervous system damage. The brain and nervous systems of fetuses and infants are particularly susceptible and easily damaged by lead poisoning. Recent studies by Dr. Needleman and David Bellinger, a Harvard Medical school psychologist, indicate that very low blood lead levels in toddlers at age two are very much related to intelligence and well being later in life. One study determined that an approximately 6 point IQ deficit at age ten for each 10 ug per dl at age two.

Recently studies have indicated that there is a connection between lead poisoning and delinquent behavior. D.W. Denno published a study of 987 African-American youths in which 487 were male and 500 were female. This study concluded that lead poisoning in the male participants was the most significant predictor of disciplinary problems and was also a very significant predictor of adult criminal behavior. Dr. Needleman and several others published a study in the Feb. 7, 1996 edition of the Journal of the American Medical Association which determined that there is a definite relationship between bone lead levels and delinquent behavior. Needleman studied 301 boys in the public school community. They were studied from the age of 7 to 11. Bone

lead levels were measured. The relationship between bone lead levels and anti-social behavior was examined. Information relative to anti-social behavior was gathered from three sources: teachers, parents and the participants themselves. Attentional function, neurobehavioral and academic performance as they relate to bone lead levels was also evaluated. The study concluded that "Lead exposure is associated with increased risk for antisocial and delinquent behavior . . ." (6)

Adults too are at risk for negative health effects from exposure to low levels of lead. Recent studies indicate that low lead levels in adult males may impair kidney function.

### **What Is Lead And How Does It Get In Our Bodies?**

Lead is a gray, soft metal found in the earth. It has no useful purpose in the human body and is not found there naturally. Lead does not decompose.

Lead usually enters the body through the mouth and is absorbed in the body through the digestive system. But, lead particles may also be breathed in through the lungs. A fetus can be affected by lead if the mother's blood contains lead.

Lead is eaten by children normally in the form of paint chips from window sills or walls or by ingesting lead contaminated soil. Eating paint chips can cause dangerously high blood lead levels. Contaminated soil may also find its way into children's mouths. Children may be playing in an area right next to a house where the soil was contaminated from the use of lead paint on the house. The lead paint finds its way into the soil thus contaminating it. Soil in play areas near highways or heavily trafficked streets may have lead in it due to lead from gasoline exhaust deposited from a time when leaded gasoline was the norm. Sand in sandboxes may contain lead if the sand has been taken from a contaminated area like a firing range or if it is right next to a home that has lead paint on it.

Lead particles also can be breathed in. Peeling lead paint can break down into small particles and eventually become particles of dust. Lead dust can also be carried on the clothing and shoes of construction workers, auto mechanics and others who work around lead. House renovations which entail the sanding, blasting or burning of lead paint creates lead dust. In fact, in the 1991 issue of *Pediatrics* Yona Amitai, a doctor at the Children's Hospital Medical Center reported that "deleading resulted in significant, albeit transient, increase in blood lead levels." (7)

Water is also a source of lead contamination. As water sits in plumbing systems lead can dissolve in the water from lead-based solder which is used to join copper pipes and unfortunately it is a substance that melts easily. When water, particularly hot water, moves through the pipes it gathers lead. There are minerals in some water that may coat and contain the lead within a 3-5 year period. By 1990 lead solder had been banned. There is also the problem of lead pipes which still exist in some older homes. A few of these lead pipes remain underground coming from the main water pipe under the street into homes. Fortunately, plastic plastic or copper pipes are now standard in plumbing.

Lead can also be ingested by eating foods stored in cans that have been sealed with solder (cans in the U.S. are no longer manufactured using lead based solder but imported foods may be) or dishes that contain lead paint or glaze. Some foods can also contain lead because the soil in which they were grown contained lead.

Children's playthings may also be a source of lead. Older playthings may have been painted with a lead-based paint. Also, children play with objects such as batteries, curtain weights and fishing sinkers that contain lead.



Toys can also be coated with lead from dust inside the home or from contaminated soil.

There are other sources of lead exposure. They include antique pewter dishes, dyes on some newspapers, magazines and comic books (those containing red, yellow or orange ink), lead based insecticides, folk remedies and cosmetics such as surma, kohl, azarcon and greta, and hobbies that include stained glass making, jewelry making and ceramics. Also if you live near an industrial plant such as lead smelters or battery manufacturers the lead processing pollutes the air and soil.

**Note: Use information from the section entitled What Is Lead And How Does It Get Into Our Bodies? for lessons #1-5.**

## **Lesson # 1—How Does Lead Dust Contaminate Our Living Space?**

### **Objective(s) Children will:**

- \*identify how lead from dust can contaminate our living area and get on our bodies and objects such as playthings.
- \*think critically and logically to make the relationships between evidence and explanations (NRC Standard).
- \*employ simple equipment and tools to gather data and extend the senses (NRC Standard).

### **Materials**

Flour

Containers

Magnifying Glasses

### **Procedure**

- 1) Teacher will build background knowledge by reading aloud and discussing *Healthy Earth Healthy Bodies* by Jill C. Wheeler.
- 2) Children will break into small groups.
- 3) Children will blow the flour they have into the air. Children will use magnifying glasses to inspect the area where the flour landed.
- 4) Children will record, report and draw conclusions based on what they discovered.
- 5) Children will discuss how this lead dust can get into their bodies. Chart their responses.

**Lesson #2—How does lead from soil get on our bodies and into our homes? Caution: If you suspect the soil on your playground is contaminated with lead do not do this activity and contact your local Health Department.**

***Objective(s) Children will***

- \*identify how lead from soil gets on our bodies and into our homes.
- \*think critically and logically to make the relationships between evidence and explanations (NRC Standards).
- \*employ simple equipment and tools to gather data and extend the senses ( Project 2061 Benchmarks).

***Materials***

Playground Toys

Magnifying Glasses

***Procedure***

- 1) Provide children with play things and let them loose on the playground.
- 2) When the children return to the classroom instruct them that they will become dirt detectives. Ask if and how dirt from the playground gets on them (and their playthings) and back into the classroom. List their responses. Instruct the children that they will become dirt detectives. Their mission, if they choose to accept it, will be to work in small groups to track down all signs of dirt tracked in from the playground.
- 3) Children will record, report and draw conclusions based on what they discovered.
- 4) Ask children: How can this soil end up in our bodies? Chart and discuss children's responses.

**Lesson #3—How Can Lead From Gasoline Get Into The Plants We Eat?**

***Objective(s) Children will demonstrate:***

- \*how lead from gasoline can contaminate the plants we eat.
- \*scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world (NRC Standards).
- \*simple instruments, such as magnifiers, thermometers, and/rulers, provide more information than scientists obtain using only their senses (NRC Standards).

**Materials**

Celery

Clear Containers

Food Coloring

Magnifying Glasses

**Procedure**

- 1) Read and sing aloud *Inch by Inch The Garden Song* by David Mallett (1975). Discuss and chart what plants need to grow.
- 2) Discuss how pollutants such as lead based gasoline can contaminate soil and ground water and thereby end up in the plants we eat.
- 2) Place water and food coloring in clear container.
- 3) Place celery, stem side down, into the container and let sit overnight.
- 4) Use magnifying glasses to observe what happened to the celery. Children examine the exterior and interior of the celery stalk.
- 5) Children record, report and draw conclusions about what they observed.

**Lesson #4—Head, Shoulders, Knees And Toes, Eyes, Ears, Mouth And Nose****Objective(s) Children will:**

- \*observe that through hand to mouth activity lead can get into our bodies.
- \*construct, read and interpret tables, charts, and *graphs* . (NCTM Standards).

**Materials**

Brightly Colored Chalk

**Procedure**

- 1) Read aloud *Those Mean Nasty Dirty Downright Disgusting But Invisible Germs* by Judith Rice and discuss how germs get into the body.
- 2) Extend the concept of germs entering the body to include that lead can enter the body through

hand to mouth activity when hands come in contact with toys and such contaminated by lead dust or soil or by playing in such.

3) Children, working in pairs, heavily color their hands with brightly colored chalk.

4) Children resume the normal routine of their day.

5) In four 15 minute intervals partners check each other for signs of chalk on other areas of their person. Children record their observations.

6) Graph and discuss results. Draw conclusions based on results/observations.

## **Lesson #5—Cold Is better For You!**

### ***Objective(s) Children will:***

\*observe that ice cubes or sugar cubes melt faster in hot water than cold water.

\*Draw conclusions about whether lead based solder melts quicker in hot water or cold water.

### ***Materials***

Clear Containers

Hot and Cold Water

Ice Cubes or Sugar Cubes

### ***Procedure***

1) Review and discuss information about lead in the water supply.

2) Children place ice cubes or sugar cubes in hot and cold water.

3) Children observe, record and report on what happened to the ice cubes or sugar cubes.

4) Ask children if they think lead based solder will melt quicker in cold water or hot water and why.

## How Children Can Be Protected From Lead Poisoning

\*Children's hands and faces should be washed with soap and water and dried thoroughly (lead clings to wetness) after playing outside and before eating anything.

\*Children's toys and pacifiers should be washed with soap and water frequently and dried thoroughly.

\*Children shouldn't play in areas directly next to the house because of possible lead contamination in the soil. Children should play in grassy areas away from the house. Babies should play on a blanket or in a play yard.

\*If your home contains lead paint remove paint chips found on the floor with a wet cloth. Wet wipe floors and surfaces, particularly window sills and where the walls meet the floor, at least twice a week. Dry sweeping, dry wiping and vacuuming can spread lead dust. Use rubber gloves and a detergent that contains 5-8% phosphate such as Trisodium Phosphate, Spic and Span and some automatic dishwashing liquids (check the labels). Do not use these rags for any other purpose and wash them separately. Wipe window sills with a wet cloth before opening and closing and keep opening and closing to a minimum.

\*If you suspect your home contains lead contact your local health department and have your home professionally inspected for lead. Do-it-yourself kits are also available-Lead Check Swabs 1-800-262-LEAD. If you use a do-it-yourself kit please also have home professionally inspected. Have abatement professionally done. If renting contact landlord about lead abatement. Remove all personal belongings during abatement and clean up. Well cover anything that cannot be cleaned after lead abatement process. After the abatement and clean up using a phosphate solution have the home re-inspected before anyone moves back in. All residents of the home should be clear of the home while the abatement and clean up process are ongoing.

\*Children should be well supervised to stop them from eating lead paint or contaminated soil.

\*If you have peeling paint in your house cover the area with contact or place furniture in front of the spot as a temporary measure. Never try to remove lead paint by burning, sanding or scraping when the home is occupied. This is especially important for pregnant women and children. Great amounts of lead dust and fumes will be dispersed into the air which is very dangerous. Call your local or state Health Department for professional help.

\*Don't bring lead contaminated clothing and shoes into the house. Check to see if your work or hobbies are a source of lead exposure.

Check for lead sources in other places your child spends time such as daycare centers and schools.

\*Always use cold tap water for cooking, drinking and for mixing baby formulas. Hot water will contain more lead than cold water. If you haven't used water for five or six hours flush out the water that has been sitting in the pipes by running the cold water for a few minutes.

\*Since calcium and iron decrease the absorption of lead in the body make sure children's diet are rich in foods that contain calcium such as: milk, cheese, ice cream, yogurt, dark green leafy vegetables such as collard and turnip greens, broccoli, salmon or sardines with bones, molasses and cooked rhubarb. Foods that contain iron include meats and poultry, canned tuna fish, dried beans such as black, kidney and pinto, peanut butter, iron fortified cereals, egg yolks and dark green leafy vegetables.

## **\*MAKE SURE CHILDREN ARE TESTED FOR LEAD FROM 6 MONTHS TO 6 YEARS OF AGE!**

### **\*Lesson/Activity #6-**

Lesson/Activity #6 will involve a speaker from the Health Department or the Yale New Haven Lead Program speaking to parents and children about lead, how lead poisoning occurs, how to help prevent it and what to do if poisoning occurs. Subsequent to this discussion teacher, parents and students will plan a Lead Poisoning Health Fair.

In preparation for the Lead Poisoning Health Fair children will do the following:

- \*Create lead prevention posters to be displayed in the school community.
- \*Create a public service announcement about lead poisoning prevention and as an advertisement for the health fair.
- \*Create calcium and iron rich snacks such as ice cream and raisin/nut trail mix. Recipes will be written and distributed at the health fair.
- \*Create books, songs, skits and puppet shows.
- \*Involve parents and other members of the community in a letter writing campaign expressing concerns about lead poisoning and encouraging continued legislation and the enforcement of current legislation.

### **What If A Child Has Lead Poisoning?**

- \*Check for the lead source. If a child's lead level is above a certain level (25 ug/dl) the health department will inspect the home for lead sources.
- \*Make sure child's diet is rich in calcium and iron. Also, make sure tummies aren't empty. Lead won't be absorbed as much if food is in the stomach.
- \*Make sure a child is tested regularly. Have other children living in the home tested as well since they are at a high risk for lead poisoning also.
- \*A child may have to be removed from the lead contaminated environment .
- \*A child may have to take certain medicines to rid the body of lead(at blood lead levels 20-44 ug/dl). There may be side effects to these drugs so it is important to make sure the child is watched carefully and medical appointments are kept. Chelation therapy is indicated when blood lead levels reach 45-69 ug/dl. It is important that a child be in a lead free environment when on medication to remove lead.
- \*The child must be tested frequently because lead that has settled into bones comes out into the blood.

\*Growth and development of the child should be closely monitored and the child may need extra help from the education and health community

## Lead Information Resources

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\*National Lead Information Clearing House

1-800-424-Lead

\*National Lead Information Center

1-800-LEAD FYI

\*EPA Safe Drinking Water Hot line

1-800-426-4791

\*State Dept. of Public Health and Addiction Services Environmental Health Services Division

150 Washington Street

Hartford, CT 06106

203-566-4955

\* Cooperative Extension System

1800 Asylum Avenue

West Hartford, CT 06117

860-241-4955

\*New Haven Health Department Bureau of Environmental Health

1 State Street

New Haven, CT 06511

203-946-8174

\*Lead Program Children's Hospital At Yale New Haven 203-764-9106

\*Public Affairs Division South Central Connecticut Regional Water Authority 9 Sargent Drive

New Haven, CT 06511

203-624-6671

## Children's Books (Environmental)

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Healthy Earth Healthy Bodies by Jill C. Wheeler (1991)

Environmental Diseases by Madeline Klein Anderson (1987)

## Children's Books (Biological)

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My First Body Book a Darling Kinder sly Book (1995)

You Breathe In You Breathe Out by David A. Adler (1991)

Those Mean Nasty Dirty Downright Disgusting But Invisible Germs by Judith Rice (1989)

## Books for Parents and Teachers

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*(See bibliography for additional sources)*

Raising Children Toxic Free: How To keep Your Child Safe From Lead, Asbestos, Pesticides, and Other Environmental hazards by Herbert L. Needleman (1994)

Lead Poisoning Is Your Family At Risk? (Pamphlet), Public Affairs Division South Central Connecticut Regional Water Authority, New Haven, CT(1993)

## BIBLIOGRAPHY—LEAD POISONING

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*(Chronological)*

1. Journal of the American Medical Association (JAMA) *A Longitudinal Study of Low-Level Exposure and Impairment of Renal Function: Narrative Aging Study* , April 17, 1996, v275, n15, p1177-1181.
2. The New York Times, *Unexpected Dangers Found in Low Levels of Lead* April 17, 1996, v145, pB7.
3. JAMA *Bone Lead Levels And Delinquent Behavior* , Feb 7, 1996, v275, n5, p363-369.
4. JAMA, *Measuring Children's Antisocial Behaviors* Feb 7, 1996, v275, n5, p403-404.
5. Parents Magazine *"It Happened To Us" Lead Poisoning Hazards.*
6. Consumer Reports *How To Find Out* , July 95, v60, p469.



7. USA Today (Magazine), *Lead Poisoning: The Plague of America's Inner Cities* July 95, v 124, n2602, p88-89.
8. Vegetarian Times *Getting the Lead Out*, June 95, n214, p26-27.
9. American Paint & Coating Journal *NPCA Sparks Coalition to Reduce Lead Risk in Urban Children* May 22, 1995, v79, n28, p35-38.
10. Parents Magazine, *How to Protect Your Baby from Lead Poisoning*, May 95, v70,n5, p46-48.
11. JAMA *Lead Poisonings Deaths in the United States* , 1979 through 1988, March 15, 1995, v14, n11, p847-848.
12. Journal of Products and Toxics Liability, *Lead and Litigation* Wintr 95, p1-29.
13. McCall's *Secrets for a Healthy Home* , Jan 95, v122, n4, p54.
14. Toxic Substance Mechanism, *Lead: A Continuing Threat to Children* Jan-March 95, v14, n 1, p61-63.
15. Kozol, Jonathon. *Amazing Grace* . New York:. Crown Publishers, 1995.
16. JAMA *Childhood Lead Poisoning in 1994* , Feb 8, 1995, v 273, n6, p458-459.
17. Jet, *Milwaukee Boy harmed by Lead Gets \$1.5 Million Settlement* May 23, 1994, v86, n3, p22.
18. Country Side & Small Stock Journal *Warnings about Sewage, Sludge . . . and Well Water* Nov-Dec 93, v77, n6, p74.
19. NEA Today, *What Lead Does to Kids* Nov 93, v12, n4, p13.
20. JAMA *Lead Poisoning Associated with Use of Traditional Ethnic Remedies—California 1991-92* , August 18, 1993, v270, n7 p808.
21. Park & Recreation, *Poison on the Range* August 93, v28, n8, p56-59.
22. JAMA, *Lead Poisoning among Low-income Children in Orange County, California Need for Regionally Differentiated Policy* , July 7, 1993, v270, n2, p69-71.
23. ENR, *OSHA Rushes to Set New Lead Limit* , may 10, 1993. v230, n19, p7.
24. JAMA *State Activities for Prevention of Lead Poisoning among Children-United States, 1992* , April 7, 1993, v269, n13, p1614-1615.
25. JAMA, *Lead-Contaminated Soil Abatement and Urban Children's Blood Lead Levels* April 7, 1993, v269, n13, p1647-1654.
26. Boat's Review—Property-Casualty Insurance Edition *Deflecting Liability in Lead Poisoning Suits* , Feb 93, v93, n10, p62-63.
27. RN, *Lead: Still Poisoning Our Children* Feb 93, v56, n2, p28-33.
28. Public Affairs Division South Central Connecticut Regional Water Authority *Lead Poisoning Is Your Family at Risk?* , 1993.

## NOTES

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### LEAD POISONING

1. The Atlantic Monthly, *An element of Doubt* , Dec 95, v276, p26.
2. Ibid.
3. Ibid.
4. Jonathon Kozol, *Amazing Grace* NY, Crown Publishers, 1995, p155-156.
5. USA Today *Lead Poisoning The plague of America's Inner Cities* , July 95, v124, p89.
6. Journal of the American Medical Association, *Bone Lead Levels and Delinquent Behavior* Feb7, 1996, vol 275, No. 5.
7. The Atlantic Monthly *An Element of Doubt* , Dec 95, v 276, p38.

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