Unit 5:
HAZARDOUS MATERIALS IN THE HOME

In this unit, you will learn about:

- **Common household hazardous materials; their effects on people and the environment; safe alternatives to these products; and their proper use, storage, and disposal**
- **What to do in the event of accidental poisoning from household hazardous materials, including the role of a poison control center and first aid techniques**
- **Hazardous waste disposal. the results of incorrect " disposal, and suggestions for improving local hazardous waste disposal programs and policies**

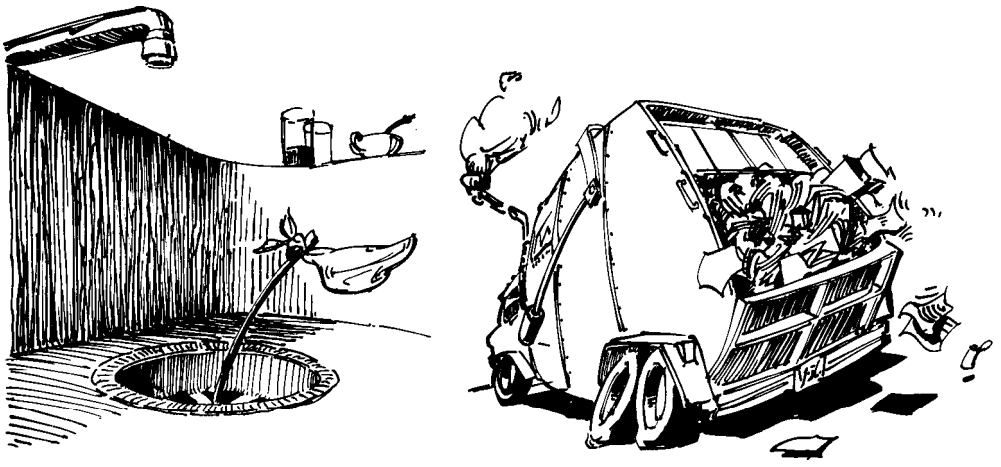
Disposal of household wastes has been a persistent problem throughout history. Solutions to many aspects of this problem are surprisingly recent: for example, sewage treatment plants were first constructed only 100 years ago. This lag time between problem and solution has intensified as technology produces more and more household products whose use and disposal constitutes a hazard.

In an average city of 100,000 residents, 23.5 tons of toilet bowl cleaner, 13.5 tons of liquid household cleaners, and 3.5 tons of motor oil are discharged into city drains each month, according to the Environmental Hazards Management Institute. These figures do ***not*** reflect the large quantities of household hazardous wastes disposed of in backyards.

We rely on the drain and the garbage truck for disposing of our wastes. Increasingly, however, these methods are becoming inadequate for disposing of materials we no longer want. We must learn how to ***manage*** our household hazardous materials: their use, storage, and ultimate disposal.

COMMON HOUSEHOLD HAZARDOUS MATERIALS

Toxic chemicals are stored in almost every room of a typical American home: cleansers in the kitchen, fresheners in the bathroom, and hobby supplies in the workroom, to name but a few. Incorrect use of these products mav create unnecessary health risks for you and your 'family. In addition, improper disposal of hazardous waste from these household products can contaminate our land, water, and air.

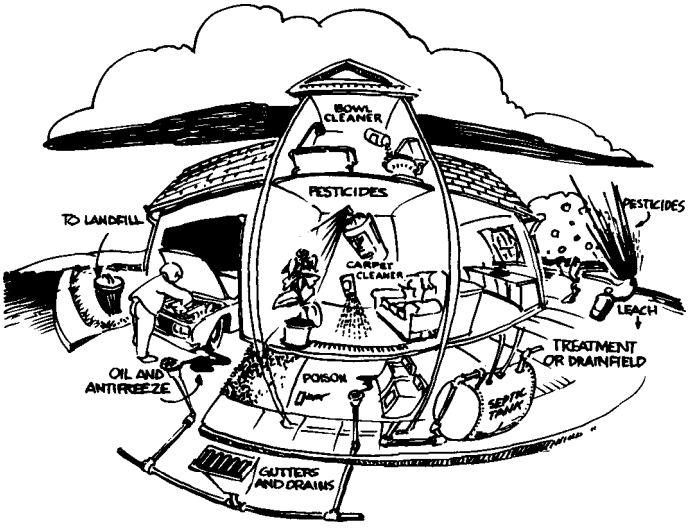


The drain and the garbage truck are increasingly becoming inadequate for disposing of materials we no longer want.

Understanding the nature of products that contain hazardous materials is the first step toward learning how to use them appropriately. This section provides basic information on some of the most common household hazardous materials.

Lead

Lead—which can cause anemia, brain damage, and damage to the digestive, neuromuscular, and central nervous systems—may be found in home plumbing systems. Lead contaminates tap water through ***leaching-*** either from lead water pipes or from the lead solder used to join sections of copper plumbing.



Hazardous materials are used throughout the house, eventually reaching the environment.

The amount of lead that leaches into the water you drink depends on the materials used in your plumbing system, the age of the plumbing, and the amount of time that water stands in the pipes. The longer water is in the pipes before it is used, the more lead it absorbs.

New copper plumbing installed with lead solder may leach high levels of lead into tap water for three or more years. Lead contamination is more likely if the plumbing was not installed by a professional plumber, since amateurs tend to use too much solder when attempting to join the pipes.

Many homes built before World War II have lead service pipes which may corrode and add lead to the tap water. A service pipe brings water into the house through the basement wall or floor, and connects to your water meter. Your service line is probably made of lead if:

- It is grey
- It will not attract a magnet
- It can be easily gouged with a key
- It does not have a sharp bend or elbow

Two precautions will help lessen the amount of lead in household water:

1. If the water has not been used for several hours, let the faucet run until the water temperature changes (usually three to five minutes). This ensures that you are getting fresh water rather than water that has been standing in the pipes.

2. Do not drink water from the hot water faucet or use it in cooking. Hot water remains stationary in the tank and pipes for a longer time; also, the higher temperatures increase the amount of lead that the water absorbs.

Lead can also be a problem in paint in older homes, particularly if peeling paint is ingested by children.

Asbestos

Exposure to asbestos causes no immediate symptoms; however, there is a high correlation between asbestos exposure and the eventual development of chest and abdominal cancers and lung disease. Smokers have a greater chance of developing asbestos-induced lung cancer.

Since the mid-1 960s, asbestos has been recognized as a cancer risk. Consequently, Environmental Protection Agency (EPA) programs address its containment and removal, especially in school environments. The Occupational Safety and Health Administration (OSHA) also has strict rules concerning worker exposure to asbestos.

Asbestos is now being phased out of all commercial uses. Because of its excellent capabilities for insulation and fire protection, however, asbestos has been used extensively in a wide variety of products. These include household and building materials such as appliances, ceilings, wall and pipe coverings, floor tiles, and some roofing materials. Contact the product manufacturer or an asbestos handler (e.g., plumber, building or heating contractor, etc.) to determine if a specific material or product in your home contains asbestos.

Usually, asbestos is not a serious threat to health until it is damaged or disturbed. Once it is disturbed, even slightly, the fibers give off toxic dust. Given the dangers associated with asbestos, removal of asbestos should be handled only by trained and qualified contractors.

Formaldehyde

Exposure to formaldehyde typically produces eye, nose, and throat irritation; wheezing and coughing; fatigue; skin rash; and severe allergic reactions. Other immediate reactions may include nausea and a loss of coordination. Long-term effects from exposure may include liver, kidney, and central nervous system damage. In addition, formaldehyde is a suspected carcinogen.

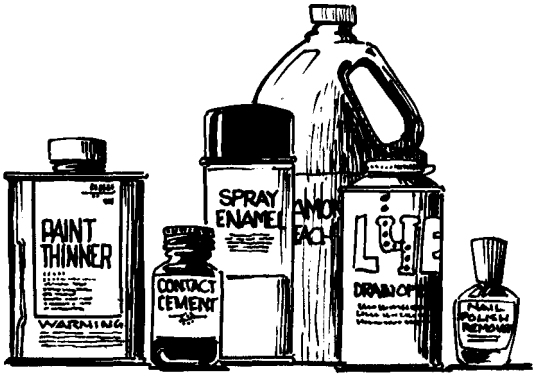
Although its use is regulated by both EPA and the Department of Housing and Urban Development (HUD), formaldehyde is still widely used in the makeup of such building materials as plywood, particle board, and urea-formaldehyde foam insulation (UFFI). It can be found in carpeting and furniture made with pressed wood products, permanent press drapes, and some glues. Also, like asbestos, formaldehyde has been extensively used in insulation.

To reduce exposure to formaldehyde, use "exterior grade" pressed wood products which release less of the chemical. Also, use air conditioning and dehumidifiers to maintain moderate temperatures and reduce humidity levels. Finally, increase ventilation, particularly after bringing new sources of formaldehyde into your home.

Organic Solvents

Solvents—fluids that dissolve other substances-can cause a variety of irritations, injuries, and diseases if used improperly. Inhaling these substances can irritate the mucous membranes of the throat and lungs, and can also produce nausea, headaches, muscular weakness, drowsiness, and impaired motor response. Eye irritation or injury can result from absorption. Certain solvents can even cause liver damage.

Water, the most familiar and universal of solvents, is often used as a base for other solvents. Most household solvents, however, are petroleum-based. Because of their ability to dissolve oily materials (including skin oils), many organic solvents can easily enter the body. Solvents are found in paints, paint thinners and strippers, floor polish, cleansers and disinfectants, spot removers, and rug cleaners. In addition to emitting toxic vapors, many of these products are highly flammable, requiring careful attention to storage instructions.



Many household organic so/vents can damage the skin as well as emit harmful vapors. Some acids and bases with corrosive properties can cause severe internal damage or death if ingested in even ***small*** *quantities.*

Most cleaners and strippers can harm the skin, and emit harmful organic vapors. Phenol and cresol (cresylic acid) are particularly harmful ingredients that exist in some of these products. Both can cause extremely painful burning if spilled on the skin, and can be readily absorbed into the bloodstream, harming vital organs. Neither chemical can be removed from leather and other organic products. If leather shoes or similar articles were to become contaminated, they would have to be discarded.

To reduce exposure to solvents, wear protective clothing, including solvent-resistant gloves, when using these products. Protective goggles may also be required (check the product's label for specific instructions). For all organic solvents, it is important to avoid touching your eyes when your hands are contaminated.

Even though solvents dry quickly, the vapors linger in the air. Work outside with solvents whenever possible, or use in well-ventilated areas. All organic solvents, at ***any*** level of exposure, are considered dangerous to pregnant women at ***any*** stage of the pregnancy.

If an accident occurs involving organic solvents, the victim must be immediately moved to receive fresh air and emergency medical care. Eyes must be rinsed continually with clear water for at least 15 minutes after contact with a solvent; any exposed skin must be washed with soap and water and rinsed thoroughly.

Pesticides

Pesticides are ***poisons,*** whether used in the flea collars of pets, on lawns, in gardens, or sprayed indoors to combat vermin and

rodents. In sufficient quantity, pesticides can be injurious or even fatal if ingested, absorbed through the skin, or inhaled. In California alone, there are an estimated 14,000 incidents of pesticide exposure per year which result in requests for medical assistance. Most of these involve children and occur in the home or garden.

Pesticide poisoning is sometimes mistaken for the flu: symptoms may include headaches, nausea, dizziness, and overall aches. Some pesticides remain in the environment for a long time, resisting natural means of breakdown and decomposition. Besides destroying harmful insects, some pesticides can also destroy plants, pets, ***beneficial*** insects, and other wildlife. Some authorities believe that as many as 50 percent of all pesticides have not been adequately tested for their ability to cause cancer or birth defects.

Public interest has spurred research on alternatives to pesticides and increased public use of these alternatives. Examples include:

- Importing known, natural predators such as praying mantises and ladybugs to help control pests; these beneficial insects may be purchased from some retailers.

- "Comparison planting"—for example, nasturtiums and rue are repellant to many insects.

- Insecticidal soap for plants.

Additionally, removing plant debris and wood from a garden will make it less attractive to insects.

There are also various homemade, nonpolluting alternatives to pesticides-e. g., pepper (the taste of which repels many insects), beer (to attract and kill slugs and snails), and salt (to kill crabgrass). Additional alternatives may be found in a number of commonly available books and pamphlets on organic gardening.

Acids and Bases

Acids and bases are common chemicals found in both household and work environments, which can often cause severe burns or even permanent destruction to organic tissue. Certain acids and bases can also cause death.

Household acids are found in many tub and tile cleaners and toilet bowl cleaners, and are also found (in much stronger concentrations) in car batteries.

Bases are the chemical opposites of acids, and frequently have chemical names that end in hydroxide, oxide, or -amine. Bases often contain lye or sodium hydroxide, which is highly corrosive to body tissue and can also cause burns. The degree of the burn depends on the amount of chemical exposure as well as an

individual's sensitivity to the chemical. Lye is most commonly found in drain openers and oven cleaners; most drain opener accidents involve children whose mouth, face, esophagus, or stomach is burned by the lye.

When an acid is mixed with a base, the substances react—often violently. While a waste treatment facility can combine these substances in proportions that will render the mixture harmless, a chance encounter in a garbage can could cause an accident. Small quantities of acids and bases can be diluted and safely disposed of in the drain, but larger quantities should be taken to hazardous waste disposal facilities or drop-off locations designated by the local government. Acids and bases should also be stored separately.

HAZARDOUS CHEMICALS IN COMMON HOUSEHOLD PRODUCTS

CHEMICAL	CONSUMER PRODUCTS	HEALTH EFFECTS
Carbon tetrachloride	Paint/varnish remover, liquid degreasers, spot removers, old fire extingulshers	Suspected carcinogen; liver and kidney damage
Trichloroethylene	Cleaning fluid, strippers, upholstery cleaner	Suspected carcinogen; CNS and organ damage
Toluene	Spray paint, paint thinners, glue, cosmetics, gasoline	Possible reproductive hazard, liver and kidney damage
Tetrachloroeth ylene (PERC)	Stain remover, paint stripper, contact cement, degreasers, wax removers, shoe polish, pesticides, rug cleaner	Suspected carcinogen and mutagen; liver and blood damage
M-xylene	Spray paint, paint removers, degreasers, gasoline	Possbile reproductive hazard; liver and kidney damage
Naphthalene	Bathroom deodorant, insecticides, moth repellant, rug cleaners	Liver damage; blood disorders
Benzenes	Spot removers, gasoline	Carcinogen
Chloroform	Cough medicine, liniments	CNS depression; liver and kidney damage
O-phenylphenol	Disinfectants, preservatives	CNS depression; irritant
Phenol	Disinfectants, deodorants, furniture polish	May cause severe burns upon skin contact; CNS depression
Chlorobenzenes	Deodorizers, dyes, metal polish, moth repellents, disinfectants	Irritant; possible liver and kidney damage
2,4, 5-T	Pesticides	Suspected animal carcinogen, may contain dioxin
Pentachlorophenol	Wood preservatives	Toxic to liver, kidney, and CNS; contains hexachlorobenzene, which is carcinogenic in rats and mice; may contain dioxin
Methylene chloride (dichloromethane)	Pain relievers, degreasers, refrigerants	Respiratory irritant; CNS depression; alters ability of blood to carry oxygen to body tissue

The most commonly used consumer products are not without hazardous side effects.

USING AND STORING HOUSEHOLD HAZARDOUS MATERIALS

Understanding Product Labels

Product labels for hazardous materials provide much useful information concerning dangers and precautions for use and disposal. For example, the signal word—required to be prominently displayed on the label—indicates the degree of danger that may be created by the chemicals in the product:

- **DANGER—the *highest*** degree of hazard
- **WARNING—*intermediate*** degree of hazard
- CAUTION—the ***lowest*** degree of hazard

Additionally, if the danger is due to ingestion, inhalation, or dermal contact, ***the label may have a picture of a skull and crossbones.*** Children can be attracted by this picture, however, so the American National Standards Institute (ANSI) has developed a system that uses words instead of symbols. These ANSI labels also warn of short- and long-range

hazards, including any chronic health effects, reproductive disorders, or cancer-causing properties associated with the product. At right is an example of an ANSI label.

PINE AWAY CLEANER AND DISINFECTANT

Pine Oil: 30% **Isopropanol: 9%**
Soap: 11% **Inert Ingredients: 50%**

CAUTION! Harmful if swallowed. Do not get in eyes. May cause severe eye irritation. Avoid contamination of food.

FIRST AID: In case of eye contact, immediately flush with water. If swallowed, do not induce vomiting. Promptly drink a large quantity of milk or egg whites. Call a physician.

A sample label for a product containing hazardous ingredients, in the format recommended by the American National Standards Institute (ANSI).

Reducing Risks From Household Products

Household hazardous materials should be stored and used carefully and appropriately. The following suggestions will help you reduce your family's risk of harmful exposure to household hazardous materials:

1. Read the label before purchasing a product containing hazardous materials. If you decide to buy the product, take the responsibility for using and disposing of it properly.

2. Buy only the amount you will use in the near future. Except for medicines and certain pesticides, give any "leftovers" to someone who can use them ***properly***.

3. Always keep substances in their ***original*** containers, and make sure that the labels are securely attached. Label information is vital in the event of adverse reactions from the product.

4. Consider keeping a list of any hazardous products you store in your home. Include the name of the product, date of purchase, and emergency care information.

5. Keep all household products in a cool, dry place, securely out of the reach of children and pets. Check containers periodically for deterioration, and ensure that lids are kept tightly closed. Dispose of products immediately and appropriately when they reach their stated expiration date.

6. Incompatible chemical products should be stored separately. To find out which chemicals in your household are incompatible, check with your local or State office of public health.

7. Carefully read and follow directions for product use. Use products only at their recommended strength (dilution). Never mix chemical substances. If you are using several substances one after another, rinse all traces of the first away before using the second. Wear appropriate protective clothing, goggles, or gloves. Prevent splashing, and work only in well-ventilated areas.

ALTERNATIVES TO HOUSEHOLD HAZARDOUS MATERIALS

HOUSEHOLD:	
Drain cleanser	Pour boiling water down the drain. To clean pipes and avoid clogging, use two handfuls of salt followed by boiling water.
Sink de-clogger	One or two handfuls of baking soda, followed by 1/2 cup vinegar; let set for an hour before running water through,
Laundry detergent	Use a non-detergent, natural laundry soap, To brighten colors, add 1/2 to 1 cup vinegar,
Brass cleaner	Mix equal parts of salt and flour. Add enough vinegar to make a stiff paste. Cover surface and allow to dry, then quickly rinse off.
Silver polish	Combine 1 quart water, 1 teaspoon baking soda, and 1 teaspoon salt. Add a piece of aluminum foil to this solution; soak silver until shiny.
Furniture polish	Mix 1/2 cup vinegar, 1/2 cup rubbing alcohol, and 1 cup linseed oil. Shake well before using,
Oven cleaner	Line oven with aluminum foil. Sprinkle salt on spills while still warm, Scrub with baking soda and water.
DEODORIZERS:	
Air freshener	Set out a dish filled with warm vinegar, or add cloves and cinnamon to boiling water and allow to simmer.
Bathroom odors	Quickly eliminate noxious odors in bathroom by lighting a match; this literally burns off gases.
HOME INSECT CONTROL:	
Cockroaches and ants	Sprinkle equal parts of confectioners sugar and borax (i.e., boric acid) in dry areas where these pests are found. (Use extreme caution, because boric acid is toxic.)
Flies	Repel with mint plants in windowsills.
Other houseplant pests	Wash leaves with soapy water (I lb. non-detergent soap to 5 gallons water); rinse.
GARDEN:	
Aphids	Repel with garlic, chives, petunias, and nasturtiums,
Other pests	Many insects are repelled by the smell and taste of pepper.
Slugs and snails	Pour beer in a flat receptacle and place below ground level in the infested area.
Crabgrass	Place a teaspoon (or less) of salt in the center of each offending plant.

Adapted from Environmental Health Watch, "Citizen Fact Sheet #3: Alternatives to Hazardous Household Chemicals" (Cleveland: Environmental Health Watch) and David Robertson, et al,, "Liquid Household Hazardous Wastes in the United States: Identification, Disposal, and Management Plan," ***Environmental Management,*** Vol. 11, No, 6.

These simple alternatives can eliminate the need for many hazardous materials commonly found in the home.

8. Use natural, less toxic products or alternatives whenever possible. A list of several common alternatives appears at left.

9. Place the phone number of the poison control center and your local emergency medical service on or beside your telephone.

10. Be prepared to provide first aid' during chemical-related and other emergencies by taking a First Aid and CPR course (such as those offered by your local Red Cross chapter).

Improving Household Ventilation and Air Quality

When there is a low ***air exchange*** **rate** (the rate at which outside air replaces indoor air), the pollutant levels created by household products containing hazardous chemicals can increase.

Usually, the most effective way to improve indoor air quality is to eliminate individual sources of pollution. Some sources, like those containing asbestos, can be sealed or enclosed. New carpeting that contains sufficient quantities of formaldehyde or other volatile organic compounds may cause sickness and have to be removed. Workrooms where substances with toxic vapors are used must be adequately ventilated.

Another approach to lowering the concentrations of hazardous air in the home is to increase the amount of outside air allowed indoors. Opening windows and doors, when the weather permits, increases the natural ventilation rate. Similarly, turning on bathroom or kitchen exhaust fans, if they are vented to the outdoors, can lower

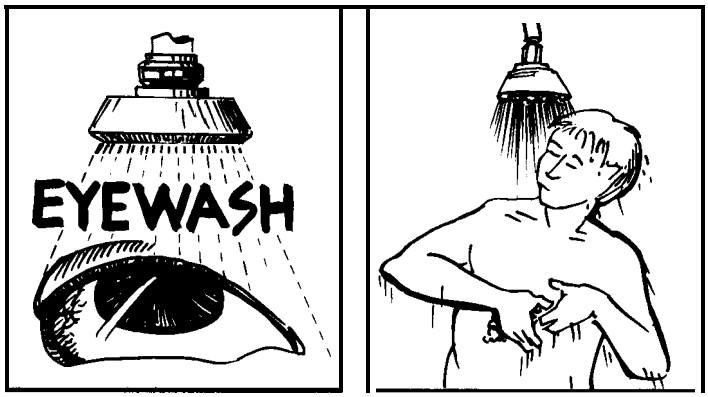
pollution levels by removing contaminants from the room where the fan is located.

Another way to increase the air exchange rate is to install heat recovery ventilators to filter pollutants from the air. Your local utility company or heating/air conditioning contractor is a good source for more information on this option.

It is particularly important to take as many of these steps as possible while you are involved in short-term activities that can generate high levels of pollutants—for example, painting or paint stripping, or maintenance and hobby activities such as welding, soldering, or sanding. If practical, you might choose to do some of these activities outside. In addition, you should remain alert to signs of inadequate airflow, such as stuffy air, moisture condensation on cold surfaces, or mold or mildew growth.

FIRST **AID**

If someone shows symptoms of toxic effects from household products, they should be treated ***immediately***. The steps to be performed will vary depending on the toxic substance, how the victim was exposed to the substance (swallowed, inhaled, or contact with skin), and the specific first aid procedures recommended by the Poison Control Center or professional medical personnel.



*In cases of eye contact with a hazardous substance, **flush** the* eye *with clear water for at/east 15 minutes and get medical attention. /n cases of skin contact, toxic contaminants may removed by thorough washing.*

First Aid Measures You Can Take Immediately

First, if the rescuer can do so without endangering his or her safety, the victim should be removed from further contact with the hazardous material or its by-products. For instance, if the vapors of the chemical are toxic, the person should be moved outside.

Next, call the Poison Control Center for directions. They will tell you what you can do to help the victim. if the incident requires it you will also notify your local Emergency Medical Services (EMS). Many toxic product labels list first aid measures to be taken in case of exposure, but the directions are not always reliable. Although exposure symptoms may be similar for some chemicals, first aid treatments could still be different. Therefore, your actions should be guided by the Poison Control Center or the EMS.

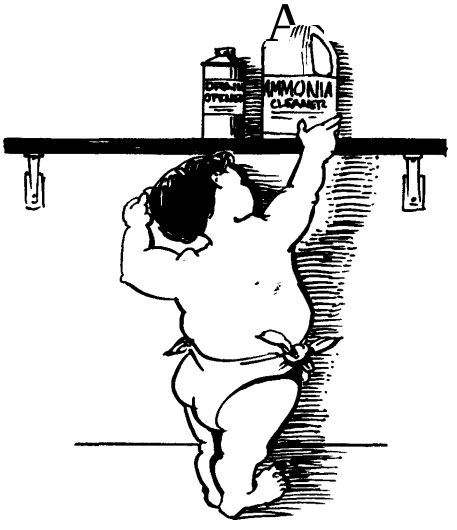
if an eye should contact a hazardous substance, immediately flush the eye with clear water for at least 15 minutes and get ***medical attention***. A few seconds' delay can greatly increase the extent of the injury.

Finally, when the victim is transported for further medical attention,

have the product container and any vomit or excretions from the victim sent with the EMS.

The Poison Control Center

Poison Control Centers are located throughout the country, and are dedicated to handling calls relating to medical emergencies involving poisons. On an average day, a center may handle over 200 calls. Keep the telephone number for the poison control center nearest your home on the inside front cover of your local telephone bo0k and on the phone itself.



Roughly half of all calls to Poison Control Centers are about *accidents involving children.*

When you call a Poison Control Center, you will need to have the hazardous material's container close at hand. You will most likely be asked to provide information on the product's name and manufacturer, which will be keyed into a computer database to provide an immediate readout of ingredients,toxic effects, and recommended first aid procedures. You will be "talked through" any steps that require immediate action. The Poison Control Center operator may also be able to directly notify your local rescue personnel.

HAZARDOUS WASTE DISPOSAL

It has been estimated that the average U.S. resident discards approximately one ton of waste each year. It is not known how much of this is hazardous waste. What is becoming increasingly obvious, however, is that the standard approaches to waste disposal are generally inadequate and frequently inappropriate for household hazardous waste. The following section describes current methods of disposing of waste, and some of the associated problems and issues.

Landfills

Landfills currently receive 80 percent of the Nation's total waste. Here, organic items—such as food wastes, leaves and grass—usually decompose quickly. This garbage, however, contains contaminants that can pollute groundwater. The most common form of contamination at a landfill site is ***toxic leachate.*** Formed as rainwater percolates down through a landfill, leachate carries soluble toxic and hazardous materials absorbed from the garbage downward through the soil.

Landfills must be properly situated to protect groundwater supplies. While technologies exist that can prevent toxic leachate from reaching and contaminating water supplies, the best and newest technologies are often too expensive for a local government's budget. As existing landfills near capacity and fewer new landfills are developed due to public pressure, communities are increasingly challenged by the question of what to do with their refuse. It has been estimated that one-third of the Nation's landfills will be full by 1991.

Incinerators

Incinerators are used by some communities to burn trash and therebyreducethe volumeofgarbage; however, landfills must still be used forthe large quantities ofresulting ash. Although volume reduction is a positive step, incineration raises issues concerning air pollution and the toxicity of the remaining ash. These issues must be addressed before incineration can be considered the best alternative.

Other methods for community waste disposal, especially for toxic wastes, are currently being studied. However, at the time of this writing none have proven satisfactory on a large scale.

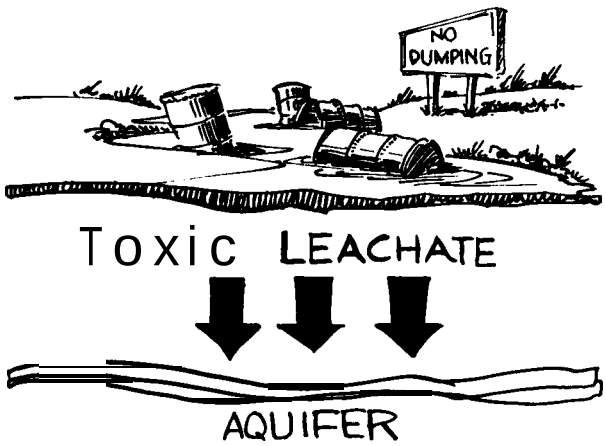
Sewer Systems

When poured into the sink, hazardous substances in liquid form may corrode plumbing, collect in the sinks trap and release fumes, and/or cause septic system malfunctions. These toxic substances may also contaminate groundwater supplies.

In most cities and suburban areas, wastes travel through the pipes of individual buildings and directly into the common sewers. The ***sewers*** are a system of underground pipes that carry liquid wastes from each house, store, and office building, and collect it as sewage in pipes or ***trunk lines.***

For decades, sewage was routinely dumped directly into rivers, lakes, and oceans. Many waterways still serve as dumping grounds for millions of gallons of raw sewage each day. Much of this sewage is contaminated; this in turn contaminates the food chain, which means that fish living in a toxic environment absorb or ingest the poisons and pass them onto people who eat the fish.

To keep toxic substances out of the water, most cities and towns have some type of sewage treatment plant. Again, however, developing the most up-to-date facilities for treating wastes before they are dumped in waterways is considered by some communities to be prohibitively expensive.



Landfills must be properly situated to *prevent the contamination of groundwater supplies.*

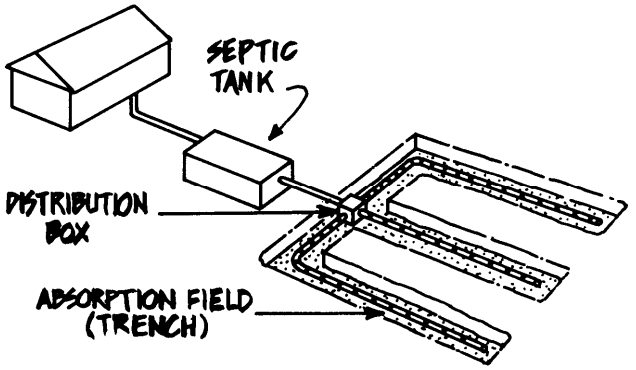
Septic Tanks and Drainfields

In rural areas, buildings are not connected to a sewer system, but rather make use of a ***septic tank***—that is, a large underground concrete container through which most sewage eventually drains into the soil.

While the waste water is in the septic tank, heavier solids (called ***sludge)*** settle to the bottom. Bacteria in the tank gradually break

down nontoxic wastes. Lighter solids and liquids are discharged into a ***drainfield,*** a large area of gravel and soil.

As the liquid ***percolates*** (filters) down through the soil, some pollutants will be slowly decomposed by microorganisms. However, many household toxic wastes will not be broken down by this process, resulting in contamination of the land and local wells. Of particular concern is the hazardous practice of using septic tank "conditioners" such as trichlorethylene (possibly the most common groundwater contaminant). All of these solvents are toxic, some are carcinogenic, and most are sufficiently water soluble to enter and travel considerable distances in groundwater. To avoid potential contamination of drinking water, avoid the use of conditioners and do not dispose of significant quantities of hazardous wastes by flushing.



In rural areas, buildings often make use of a septic tank rather than a sewer system for waste disposal. Some toxic wastes flushed into the tank will not break down when they enter the drain field, polluting the soil and possibly the groundwater as well.

Injuries from Household Garbage

Another concern related to proper disposal of household hazardous wastes is that sanitation workers may be seriously injured when handling these substances. In a few cases, sanitation workers have died from exposure to hazardous chemicals placed for routine trash pickup.

Most garbage trucks use automated compactors to increase the amount of trash collected in each trip. When a household hazardous waste, such as a partially used container of furniture stripper, is compacted, the container can explode, causing the released substance to injure the skin or eyes of a sanitation worker.

The inadequacies of these waste disposal methods illustrate the need for better public understanding of safe disposal methods to minimize the risk to sanitation workers, the environment, and the drinking water supply.

Safe Disposal of Household Hazardous Wastes

A large part of the household hazardous waste disposal problem stems from the fact that these wastes are generated on an individual basis, and are likely to be disposed of individually as well. One discarded can of furniture spray, the used motor oil from a single car, or a jar of old prescription medicine do not seem able to threaten an entire waterway-but accumulating in quantity, they can. Ironically, such household waste is easier to handle in ***larger*** quantities: commercial hazardous waste disposal facilities will not accept household hazardous wastes unless they are collected and combined.

How should you dispose of your household waste? How can you help your community tackle its hazardous waste problem?

The safest way to get rid of hazardous household products is to use them until they are gone. If this is not possible, give the product (in its original container) to someone who can use it up appropriately and legally. Try ***to recycle the material, if possible.*** If your community has no recycling program appropriate for the material, refer to the product's label for any directions on disposal.

In general, when disposing of ***hazardous*** household products, do ***Not:***

- Pour them into storm sewers
- Pour them into septic tanks
- Bury chemicals or containers in the yard or garden
- Burn chemicals or containers
- Mix chemicals together

In addition, significant quantities of a hazardous substance should not be thrown in the trash or poured down the drain. Some household products should not ever be disposed of in this way. Consult the product label for disposal directions.

In many jurisdictions, it is illegal as well as unsafe to dispose of hazardous products improperly. Product labels for hazardous household substances normally list safe disposal methods for the specific product; in addition, the table on the following page provides a number of proven methods for the safe disposal of specific household hazardous materials.

Community Collection Days

Concern over household hazardous waste has prompted more than 600 communities across the country to hold hazardous waste collection day programs. Held once or twice a year, these days offer residents an opportunity to safely dispose of their hazardous wastes. Collection days (sometimes sponsored in their entirety by government agencies, at other times a combination of private and public sector resources) have been increasingly popular across the country. Besides allowing for safe disposal of toxic wastes, these collection days offer opportunities for public education about the dangers and proper use and disposal of hazardous wastes. After collection, communities usually transport their household hazardous wastes to specially designed landfills; in some communities, these wastes are recycled. Several commercial companies dealing with hazardous waste disposal are researching disposal alternatives such as using chemicals to detoxify wastes, since many of the special landfills are becoming full. Moreover, some areas are devising creative options for reuse: Rhode Island, for instance, collects motor oil and uses it in the State's maintenance garages.

The most significant achievement of the community collection day is the ability to treat household wastes innovatively and efficiently by consolidating the waste. However, considerable time, money,

SAFE DISPOSAL OF HOUSEHOLD HAZARDOUS MATERIALS

AUTOMOTIVE PRODUCTS:	
Usad motor oil, transmission/brake fluid	Recycl+take to area auto center or service station.
Batteries	Recycle+take to battery retailer.
Antifreeze	Pour amounts of less than 4 gallons down drain, or mix with cat box filler orsawdust and discard in trash. DO NOT pour into septic tank.
Gasoline	Allow small quantifies to evaporate outdoors, away from children and pets,
Battery acid	Add small amounts of acid to water to dilute; mix with baking soda to neutralize, and flush down drain.
PESTICIDES:	
Toxic pesticides	Avoid use of extremely toxic pesticides. If use is unavoidable, never discard by dumping down the drain or on the ground. Deliver unused pesticides to a hazardous waste collection program.
Insecticides, herbicides, rodent bait	Use up; follow container disposal instructions, or rinse container three times and use rinse water as a pesticide. Wrap empty container in newspaper; discard with trash.
CLEANERS:	
Bleach, disinfectant, drain and toilet cleaners	Use up, if possible; if this cannot be done, dilute with large amounts of water and flush down drain. Do not flush into septic tank.
Polish and powdered cleansers	Discard in trash.
Oven cleaner	Solidify by mixing with cat box filler or sawdust; discard in trash.
Spot remover	Allow to evaporate outdoors, away from children and pets; discard empty container in trash.
PAINTS AND SOLVENTS:	
Paint and varnish	Use up if not possible, allow to evaporate outdoors in its original container until solidified, away from children and pets; discard container in trash.
Turpentine, thinner, and stripper	Allow paint particles to settle in closed container, then strain off liquid for re-use. Wrap sludge in newspaperand discard in trash.
MISCELLANEOUS:	
Photographic chemicals	Flush small amounts down drain, or solidify with cat box filler or sawdust and discard in trash.
Smoke detectors	Return to the manufacturer.
Gas cylinders	Return to the retailer.
Old medicines	Flush down drain.

Adapted from Environmental Health Watch, "Citizen Fact Sheet #4: A Guide to Safe Disposal" (Cleveland: Environmental Health Watch).

It is often illegal, as well as unsafe, to dispose of hazardous materials improperly. While product labels are the best source of safe disposal methods for a particular substance, a number of more general methods have been proven to be safe and effective.

and publicity are required to make it work. Also, if collections do not occur with sufficient frequency, hazardous wastes can accumulate to undesirably high levels in the home.

Permanent Drop-Off Facilities

A more efficient and convenient method of community household waste disposal is to establish ***permanent*** facilities for hazardous waste storage and transfer. Residents would not have to store materials in their homes for six months or more between community collection days, and long lines would be eliminated. Some areas of the country—like San Bernadino County, California, and Martha's Vineyard, Massachusetts—have taken this step and established permanent drop-off facilities.

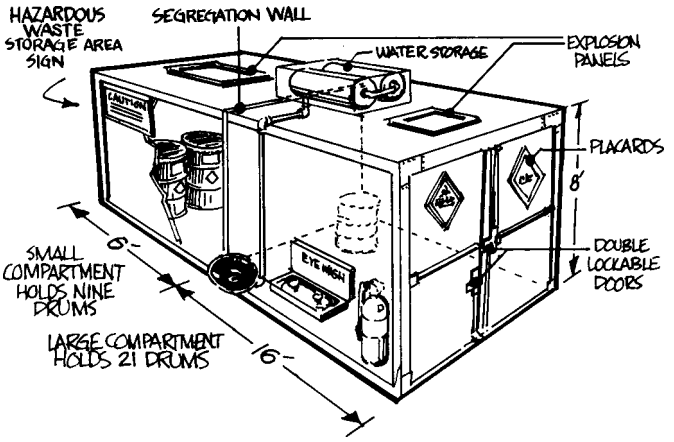
Commercial development of such permanent sites has been considered, but has not yet proven viable. If a company were to establish such a drop-off point, some means of paying for the handling and disposal of the waste must be devised. Although the idea of a user fee (to be paid by the disposing homeowner) is attractive, it may be so high that it would discourage participation. Surveys have shown that people are willing to spend $10 to $25 per carload/per year to dispose of household hazardous wastes. Hiring employees, obtaining liability insurance, and building the facility must also be considered. At present, these facilities are not economically attractive enough to stimulate unsubsidized private development.

What Communities Are Doing

The following paragraphs describe recent or ongoing community waste disposal programs. These are included to help you determine if similar programs are or can be implemented in your community.

- ***Florida's*** "Amnesty Day" program, the first collection program in the country to be funded and operated entirely by the State, was financed through Florida's Water Quality Assurance Trust Fund. The program served not only homeowners but also small businesses, farms, and institutions. Over the past two years, 7,000 residents disposed of 351 tons of hazardous waste.

- ***Rhode Island*** provides innovative recycling opportunities through its collection program. Funding for the program, which has been operational for several years, comes from a special bond authorization which was voted into effect by the general public.



Some areas of the country have established permanent drop-off facilities for hazardous waste. This drawing depicts the storage area designed by San Bernadino County, California, for its permanent drop-off site.

- The ***Massachusetts*** Household Hazardous Waste program, "Operation Clean Sweep," has a matching grant program which pays 50 percent of the cost of collection while individual towns supply matching funds.

- In ***Iowa***, retailers selling products designated as household hazardous wastes must apply for a permit each year. Revenues generated by the permit fees go toward funding household hazardous waste collection days. Retailers must also label the area where hazardous products are displayed, and must provide the public with consumer information booklets on the use and disposal of household hazardous wastes.

- ***The San Bernadino County, California,*** Health Department has two permanent collection facilities, one at the county agricultural center and one at a fire department. Although the issue of liability has been discussed, the county is self-insured. Employees of the health and fire department unload, sort, and package the wastes, and a hazardous waste contractor picks up the material on a regular basis.

Suggestions like the ones just described can be modified to meet the needs of your community's volume of hazardous wastes and the funds available to spend on the problem.

What You Can Do

If your community currently has no educational or collection

programs for hazardous wastes, you may want to take some aggressive action to fill the gap. Citizens can work toward having their communities set up a hazardous waste collection day or a permanent facility through persistence and effective organization. Steps in this process include:

1. Discover all you can about the disposal problem in general and in your community in particular.

2. Decide who else to include in your campaign. If your local government officials tend to be responsive, a direct approach may work. If not, you may need to organize local groups or individuals to help your cause.

3. You can lobby directly for government funding, changes in State and local ordinances to obtain funding through bonds or user permits, or changes to State and local laws that will protect against toxic wastes. For example, promote ***source reduction***—fewer toxic constituents in products mean less toxic waste to dispose of.

SUMMARY

While we often attribute our Nation's problems with hazardous materials to industry, we forget that as consumers we voluntarily buy and store materials with harmful properties in our own homes, contributing to our community's collective exposure as we use and dispose of them. Among materials commonly found in homes are lead, asbestos, formaldehyde, organic solvents, pesticides, and acides and bases. It is important for us as consumers to lower household exposures to toxic chemicals by using non-toxic substitutes where we can and ensuring adequate ventilation. Further, by keeping the number of the Poison Control Center on the phone, we can be prepared to assist someone in our home who is injured by a toxic product. Always read the label of chemicals you bring into your home so you know what harmful effects they might have and how to use them properly.

Toxic products are disposed of at landfills and incinerators, and at the home level through flushing them into the sewer system or septic tank. This can be dangerous for many toxic products. Disposal in the trash can also injure sanitation workers. The safest way to dispose of significant quantities of hazardous waste is through community collection programs which can treat the waste properly. Many communities have active programs to provide for safe disposal of potentially harmful products. ■

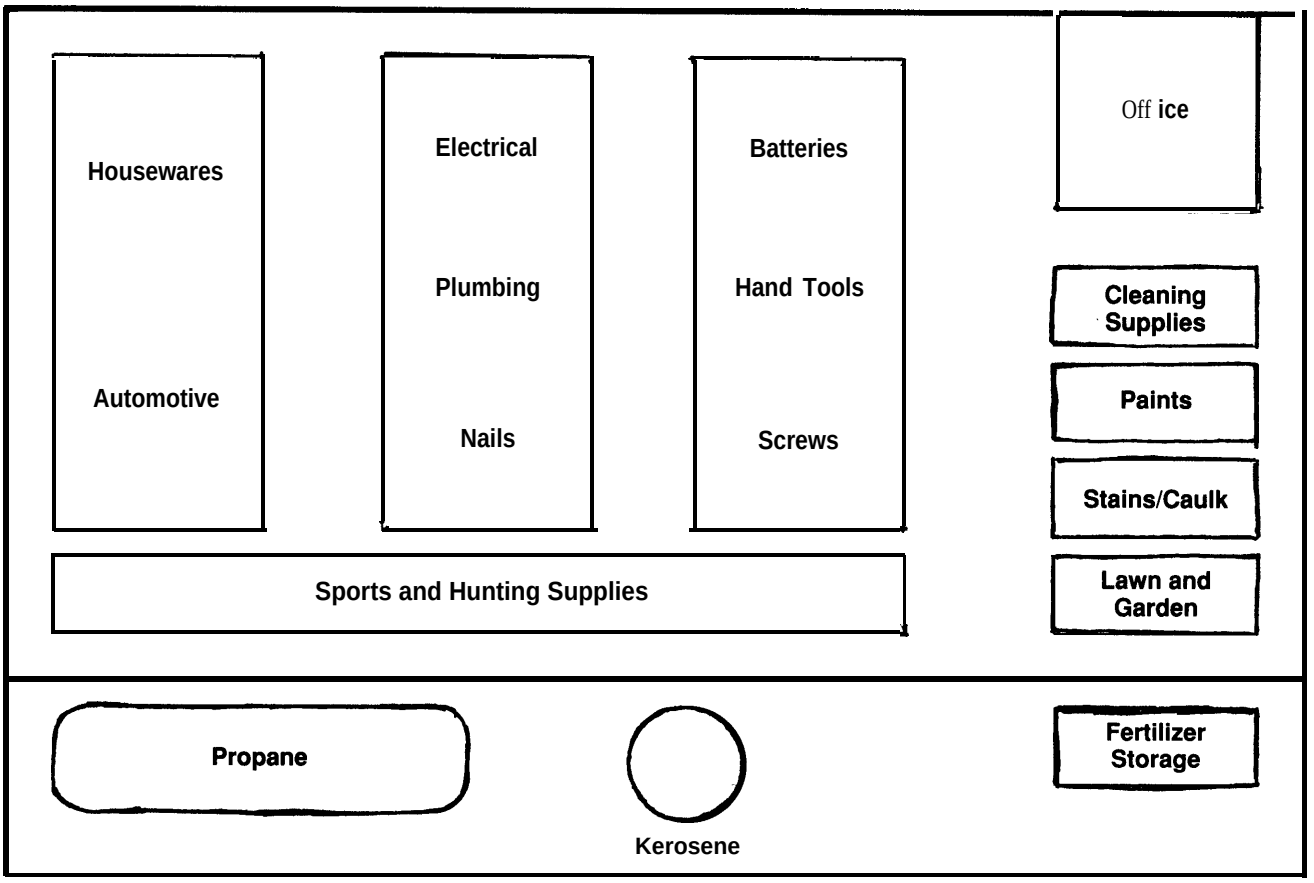


Diagram of
BOB'S HARDWARE STORE

HAZ MAT TEASER

(answers on page A-3)

Hazardous materials can be found in a variety of places, often where you least expect them. For example, the average hardware store in your community offers a variety of commonly used household products containing hazardous materials. If these products are used according to their label directions, most can be considered safe; however, if they should break, spill, or become involved in a fire, they have the potential to become deadly. Mark the numbers corresponding to the hazardous materials shown below on the diagram of Bob's Hardware Store pictured above, to indicate the store department(s) where each hazardous material might be found. Note: Some numbers may be used more than once.

In which department(s) of the hardware store might you find:

1. Acids and bases
2. Flammables
3. Formaldehyde
4. Solvents
5. Phenols
6. Poisons
7. Pesticides

As you walk through the store, your child accidentally knocks a bottle of caustic drain cleaner off a shelf. Part of its contents splash onto your leg. What first aid steps would you immediately take? Who would you call for additional first aid information?

CHECK YOUR MEMORY

(answers on page A-4)

1. If you discover that loose asbestos was used as a pipe covering in your basement, you should:

   a. Not worry about it, because there is insufficient evidence that it is a hazard
   b. Shake it loose with gardening or cleaning tools and throw it away
   c. Remove it only if it is damaged or deteriorated
   d. Call a qualified contractor to remove it

2. Phenol and cresol are particularly harmful ingredients that can be found in some_____

   a. Cleaners and strippers
   b. Paints
   c. Glues
   d. Carpets

3. Which of the following is ***not*** typically an organic solvent?

   a. Paint thinner and stripper
   b. Floor polish
   c. Drain cleaner
   d. Rug cleaner

4. Which of the following warning labels indicates the ***highest*** degree of hazard?

   a. Danger
   b. Warning
   c. Caution

5. If someone in your house gets a toxic substance in the eye, you should ***FIRST***:

   a. Take him/her to the emergency room
   b. Telephone the doctor for instructions
   c. Begin flushing the eye with clear water
   d. Take him/her outside to fresh air

6. When you wish to dispose of a hazardous household substance and you cannot find anyone to use it up, the best option is to:

   a. Throw it in the trash
   b. Pour it down the drain
   c. Take it to a legally designated drop-off site
   d. Bury it in your yard

7. The following is an example of a successful approach to collecting hazardous waste:

   a. Community collection days
   b. A permanent drop-off point
   c. An open landfill
   d. Both a and b