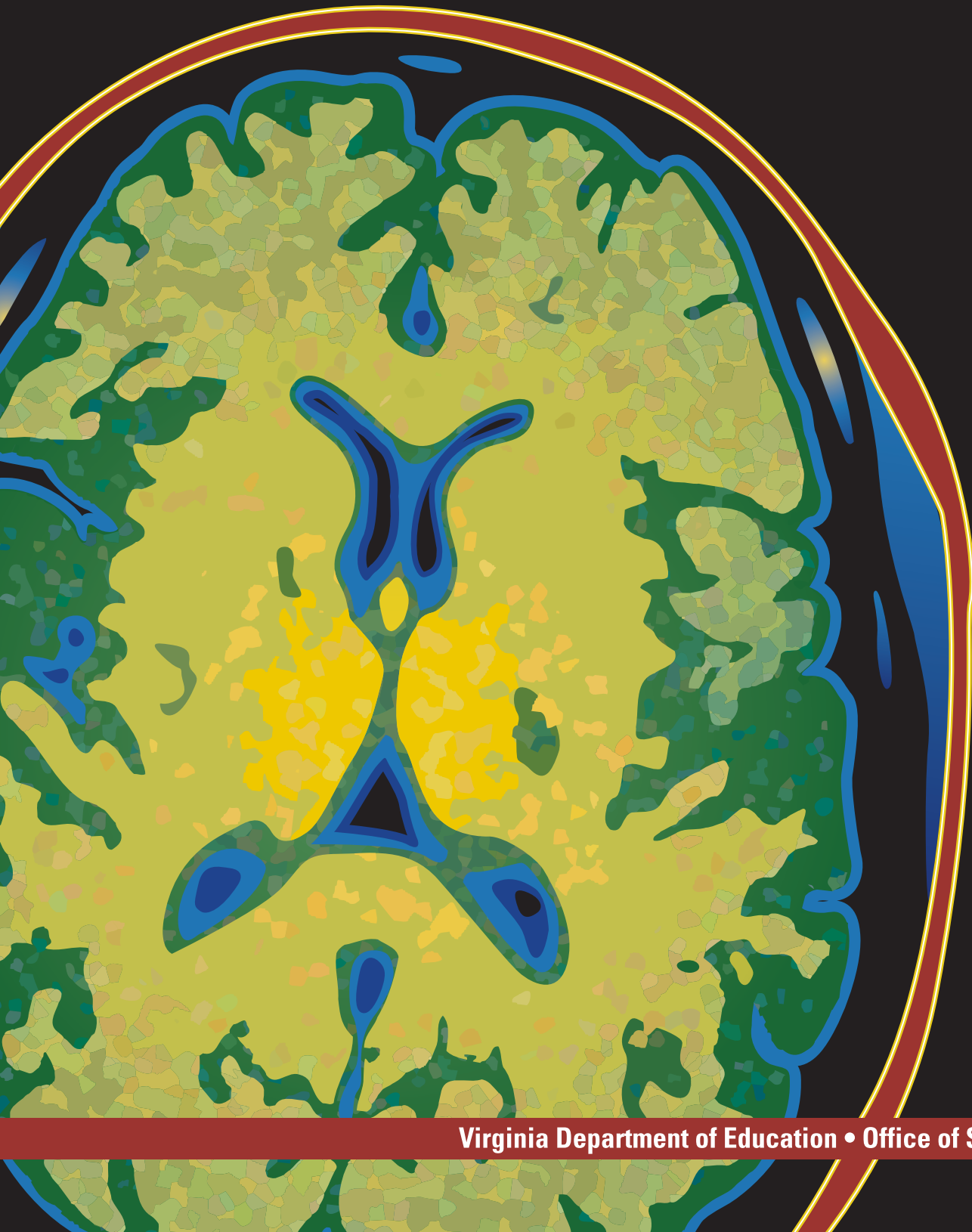


Inhalant Abuse Prevention:

Staff Education and Student Curriculum



Inhalant Abuse Prevention:

Staff Education and Student Curriculum

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Revised and expanded from the first edition
Inhalant Prevention Resource Guide 2000
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COMMONWEALTH of VIRGINIA

DEPARTMENT OF EDUCATION

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RICHMOND, VA 23218-2120

September 2007

Dear Virginia Educators:

The original **Inhalant Prevention Resource Guide**, printed in 2000, was developed in direct response to a need expressed by the 135 school division coordinators for Virginia's Safe and Drug-Free Schools (SDFS) program. Based on the lack of readily-accessible information, they expressed a need for resource materials about inhalant abuse prevention.

The original guide developed by the Virginia Department of Education met that expressed need for basic information, but the reality of inhalant abuse has never gone away. Inhalant abuse continues to be described as a "silent epidemic." Reliable national surveys report that by the eighth grade, almost one out of every five children has abused a common, everyday product that can be inhaled.

Inhalant abuse can be prevented. It requires education for both adults and children. This new publication, **Inhalant Abuse Prevention: Staff Education and Student Curriculum**, has the original guide as its foundation, but represents an entirely new focus on the issue of inhalant abuse.

The information provided in the guide provides information about inhalant abuse prevention for educators and lessons for students, K-12. National reports continue to indicate that inhalants are most commonly abused among preteens and young teens. The age of use for inhalants appears to peak around the eighth grade (12-15 years old).

Our Virginia schools are among the very safest in the country. The loss of one Virginia student to inhalant abuse would be considered one too many. Thank you for your continuing efforts to ensure the continued health and safety of our children.

Sincerely,

A handwritten signature in black ink, appearing to read "Billy K. Cannaday, Jr.", written in a cursive style.

Billy K. Cannaday, Jr.

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Many thanks to the professionals whose time and expertise helped shape this document.

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Introduction

The deliberate inhalation of fumes, vapors and gases for their drug-like effects poses a serious threat to the health and safety of children. Products that can be inhaled are readily found at home and at school. They include such items as correction fluid, markers, computer air duster, fingernail polish remover, gasoline, butane lighters, paint thinner and anything in an aerosol can. Researchers have documented inhalant abuse problems for more than a century, although the public is generally not aware of the extent of the problem. Reliable national surveys report that by eighth grade, close to one out of five children has abused a common product that can be inhaled.

Why should educators be concerned about inhalant abuse? Inhalant abuse can result in significant damage to the brain that can affect a student's ability to learn. It is a behavior that peaks around the eighth and ninth grades, affecting children during some of their most vulnerable years. In addition, it is extremely dangerous behavior. A child can die from inhalants the first time or any time they use. Inhalant abuse is a major risk factor for the later development of other drug abuse problems. An unacceptable number of young people are putting their lives and their physical, emotional and cognitive health at risk by using inhalants.

Fortunately, inhalant abuse can be prevented through education of both adults and children. This manual provides information about inhalants for educators and lessons for students. It also addresses the need for school policy on inhalants and for school environments that limit the availability of and monitor products that can be abused.

Prevention efforts should be carefully planned and implemented. In the school setting, they should utilize a comprehensive approach to the problem, including educating school administrators, teachers and support staff as well as students. This includes paying attention to the environment at school: substituting nonabusable products when available and careful supervision and monitoring of abusable products. Policies should be in place to address the consequences of inhalant use. Schools should also have procedures concerning specific actions to take if a student is suspected of or discovered using inhalants.

The educational materials in this manual have been developed for use with students in grades K-12. The materials and concepts can be adapted for special needs students. This manual provides a framework for inhalant abuse prevention, sample lessons, materials and resources. The lessons can be augmented with other curricula and activities and integrated with a variety of subject areas.

Educators should always be looking for teachable moments to discuss inhalant-related issues with students. For example, if an inhalable product is used in the classroom, the teacher can read and discuss the warnings on the product label with students. A section of this manual provides information about how every teacher can help prevent inhalant abuse, whether or not they implement the curriculum. The educational materials in this manual can also be used outside the classroom, such as youth organizations or after-school programs.

Key Approaches to Inhalant Abuse Prevention

Because abusable products are so easily accessible, education about inhalant abuse, when not approached correctly, can increase the likelihood of abuse. Therefore, it is imperative that educators use prevention approaches that have been shown to be effective in decreasing use while not stimulating curiosity or experimentation.

Start Early

Inhalant abuse prevention should start in kindergarten. Prevention approaches for young children are designed to “inoculate” children to protect them from abusing products later. This is done by clearly associating abusable products with poisons, fire hazards and body pollutants when they are not used safely and according to directions. In this way, children understand the potential danger of these products so that when they are older and a friend suggests breathing concentrated fumes because it is fun, they will have a built-in alert system that automatically suggests *danger* and other negative consequences. This approach provides children with underlying peer resistance skills that help protect them from participating in this risky behavior.

Children in school are routinely taught the dangers of products that are poisonous when ingested. However, most children (and adults) do not associate the term poisons with gases, fumes and vapors that are harmful when breathed in concentrated form. Inhalant abuse prevention expands the teaching about poisons to substances that can be harmful when breathed.

As children mature, some will become aware of the misuse of products for their mind-altering effects. The goal then is to keep from exposing naïve children to the abuse of these products while acknowledging the reality of misuse to the initiated. However, educators should avoid discussing specific products that are abused, how they are abused and their drug-like effects. Suggestions for how to talk with students who are aware that some people abuse inhalants for their drug-like effects are included in the curriculum section of this manual.

Key Approaches

- Discuss inhalable products as poisons, fire hazards and body pollutants when not used as directed.
- Discuss the damaging effects of inhalants on the brain and body.
- Discuss safe use of inhalable products by following product directions and always demonstrate safe use when inhalable products are used in the classroom.

Approaches to Avoid

- Do not discuss specific products that are abused.
- Do not inform students that these products can get you high. This will make them associate inhalable products with drugs.
- Never explain or demonstrate techniques for inhaling products.

Important Terms

Inhalants

Inhalants are common products containing chemical substances that, when breathed in concentrated form, produce mind-altering effects. *Inhalant abuse* refers to the deliberate concentration and inhalation of these fumes, vapors or gases for their drug-like effects.

Inhalants are not drugs; they are legal products with legitimate uses. When these products are misused, they can produce a drug-like high. However, inhalants are actually *poisons*, *pollutants* and *fire hazards*. The drug-like effects users experience are the results of the toxic chemicals being inhaled and reaching the brain, unfiltered, within seconds. When adults speak of the effects inhalants produce, it is important to refer to them as *toxic effects* rather than *highs*, because inhalants are poisons and the effects are the results of those poisons on the brain and body. Using this terminology also prevents students who are unaware that these products can be abused from associating them with drug use.

Several terms for inhalant abuse are used in this document:

Huffing

Breathing in fumes or vapors through the mouth

Sniffing

Breathing in fumes or vapors through the nose

Dusting

Breathing in fumes from computer air duster cleaners through the nose or mouth, usually using the extension tube provided with the product

Bagging

Huffing gases that are inside a plastic or paper bag

Inhalant abusers tend to both huff and sniff, depending on the product and technique of abuse. In this guide, the terms will be used interchangeably and should be understood to denote both practices. There are a myriad of slang terms for inhalant abuse, and terms are constantly changing. When talking with students about inhalants, teachers should be sure that students are not confusing inhaling with smoking or using an inhaler for asthma.

Abusable Products

This term is used to represent any materials that may be selected for abuse. See the section *Abusable Products* on page 15 for information and lists of products that are often abused.

Prevention

Prevention is not simply education. Prevention incorporates a variety of strategies, including education, skill building, environmental changes and policy development. In the school setting prevention should involve everyone: students, teachers, teacher aides, administrators, school nurses, guidance counselors, student assistance coordinators, school social workers, school psychologists, librarians, parent volunteers, school police or safety officers, coaches, clerical staff, cafeteria workers, custodians and bus drivers.

Scope of the Problem

Who Abuses Inhalants?

Most adults are not well informed about inhalant abuse. They may acknowledge there is a problem, but think it is not a problem with the young people in their community and certainly not with their own kids.

According to the 2005 Partnership Attitude Tracking Study, a national survey of teens and parents sponsored by the Partnership for a Drug-Free America, only 5 percent of parents of children in grades six to eight believed their child had ever used an inhalant. However, 20 percent of children in those grades reported having sniffed or huffed things like glue, gas or sprays to get high. Almost 75 percent of those parents said they had discussed alcohol, cigarettes, marijuana and other drug use “a lot” with their child, but only 50 percent had discussed inhalants “a lot.” Yet inhalants are the third most commonly used substance by eighth-grade students, behind alcohol and cigarettes.

Although most youth do not abuse inhalants, the majority of persons who do are young, some as young as seven or eight years old. Most inhalant users are between 11 and 15 years old, with eighth and ninth grades being the peak years of use. Unlike the use of drugs such as marijuana, which increases as students get older, the percentage of students using inhalants declines after the ninth grade. Nevertheless, inhalants remain the fourth most abused drug in high school, after alcohol, tobacco and marijuana.

Inhalant abuse is a problem among both boys and girls, and use by girls is growing. The 2005 Monitoring the Future survey found that 19 percent of eighth-grade girls had used an inhalant compared to 15 percent of boys. It also found that the southern and western sections of the United States have higher rates of inhalant use than the northeast or north central sections. In terms of race, youth who identify themselves as black are significantly less likely to huff or sniff than whites or Hispanics.

Teens who abuse inhalants are also much more likely to use other drugs. According to data from the 2004 National Survey on Drug Use and Health, youth aged 12 or 13 who used inhalants in their lifetime were five times more likely to have used another illicit drug than youth aged 12 or 13 who had never used an inhalant. Several studies have also found a strong association between early inhalant use and later use of heroin.

Regional and local demographic data can help communities recognize the characteristics of inhalant abusers and plan prevention programs targeted to specific at-risk populations.

Who uses?

Girls slightly more than boys.

Whites and Hispanics more than blacks.

Middle school students more than high school students.

All children are at risk.

National Survey Data

Several surveys have tracked drug use patterns of school-age youth. Because of unique sampling techniques, survey questions, research methods and reporting protocols, the results are not directly comparable. However, trends and patterns emerge quite clearly: inhalant abuse is a major problem among young people.

Monitoring the Future Survey. The University of Michigan has been administering the Monitoring the Future student survey since 1975. The annual survey involves thousands of students in grades 8, 10 and 12 in a random sampling of schools around the country. The 2006 survey results showed that nearly 1 out of 10 eighth-graders had used an inhalant in the previous year.

Monitoring the Future Survey, 2006

GRADE	Ever used inhalants	Used inhalants in past 12 months	Used inhalants in past 30 days
8	16.1%	9.1%	4.1%
10	13.3%	6.5%	2.3%
12	11.1%	4.5%	1.5%

PRIDE (Parents Resource Institute on Drug Education) Survey. PRIDE has surveyed students since 1982. Individual schools or school districts can purchase survey services from PRIDE, so the national sample is not random and may not be a representative profile. Typically over 100,000 students from grades 6 to 12 are surveyed. The 2005-06 survey shows that a significant number of sixth-graders have already started using inhalants.

PRIDE Survey, 2005-06

GRADE	Used inhalants in past 12 months	Used inhalants in past 30 days
6	4.9%	2.6%
7	5.0%	2.1%
8	5.8%	2.7%
9	6.5%	3.3%
10	5.4%	3.0%
11	5.8%	3.3%
12	5.5%	3.4%

PRIDE also surveys students in grades four and five. The 2005-06 survey results indicate that 3.0 percent of fourth-grade students surveyed said they used inhalants within the past year, and 2.9 percent of fifth-grade students reported past year use. These numbers provide evidence that inhalant use can begin in

elementary school. Of the fourth and fifth graders who reported using an inhalant, half of them reported using at least once at school.

Partnership Attitude Tracking Study. The Partnership Attitude Tracking Study has tracked drug-related attitudes since 1987. The findings of this annual survey are used by the Partnership for a Drug-Free America to help shape media campaigns. Over 7,000 teens from grades 7-12 and 1,200 parents with children under the age of 19 participated in the 2005 survey.

Partnership Attitude Tracking Study, Grades 7-12

	2002	2003	2004	2005
Ever used inhalants	19%	18%	19%	20%
Past year use	10%	11%	12%	12%
Past 30 day use	6%	7%	7%	7%

Youth Risk Behavior Survey. The national Youth Risk Behavior Survey is conducted by the Centers for Disease Control and Prevention as part of the Youth Risk Behavior Surveillance System. Nearly 14,000 students in grades 9-12 participated in the 2005 survey. Analysis of the Youth Risk Behavior Survey national sample reveals that white (13.4 percent) and Hispanic (13.0 percent) students were significantly more likely than black students (6.8 percent) to have used inhalants. A higher percentage of white and Hispanic females used than their male counterparts.

Youth Risk Behavior Survey, 2005

GRADE	Ever used inhalants
9	14.1%
10	13.2%
11	11.4%
12	10.1%

National Survey on Drug Use and Health. Administered by the United States Department of Health and Human Services, this survey tracks drug use in the U.S. population ages 12 and older. The National Survey on Drug Use and Health cannot be directly compared to school surveys because of its unique methodologies. Data is collected by administering questionnaires to a representative sample of the population through face-to-face interviews at their place of residence. The 2005 survey was administered in over 68,000 households. Survey results for 2005 show that a total of 5 percent of 12-17 year olds had used an inhalant in the past year.

Inhalant Abuse in Virginia

The 2005 Virginia Community Youth Survey was conducted by Virginia Commonwealth University's Survey and Evaluation Research Laboratory for the Virginia Department of Mental Health, Mental Retardation and Substance Abuse Services. It was administered to 12,907 students in grades 8, 10 and 12 in 62 school districts.

Survey data showed that Virginia students were at the national average for lifetime use of inhalants (as compared to the Monitoring the Future survey), but were at least twice the national average for past 30-day use, a cause for great concern. This means in an eighth-grade classroom of 30 children, about five will have used an inhalant at some point and two or three may be using regularly.

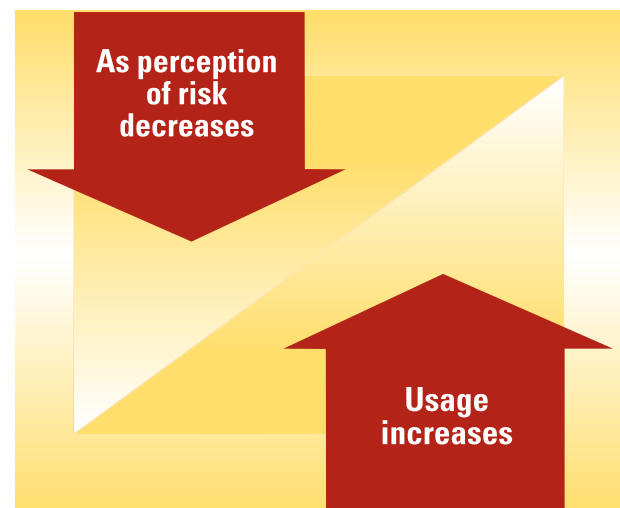
Virginia Community Youth Survey, 2005

GRADE	Ever used inhalants	Used inhalants in past 30 days
8	17%	8%
10	14%	6%
12	11%	4%
Grades 8-12	14.5%	6.1%

Perception of Risk or Harm

The 2006 Monitoring the Future survey shows that the perception of great risk or harm from using inhalants has been declining since 2002, while perception of great risk for most other drugs has remained level or increased. Similar patterns were found by the Partnership Attitude Tracking Study. Perception of risk or harm is important, as attitudes are precursors of behaviors. When perception of risk decreases, usage increases. Fortunately, prevention education can change students' perceptions of risk.

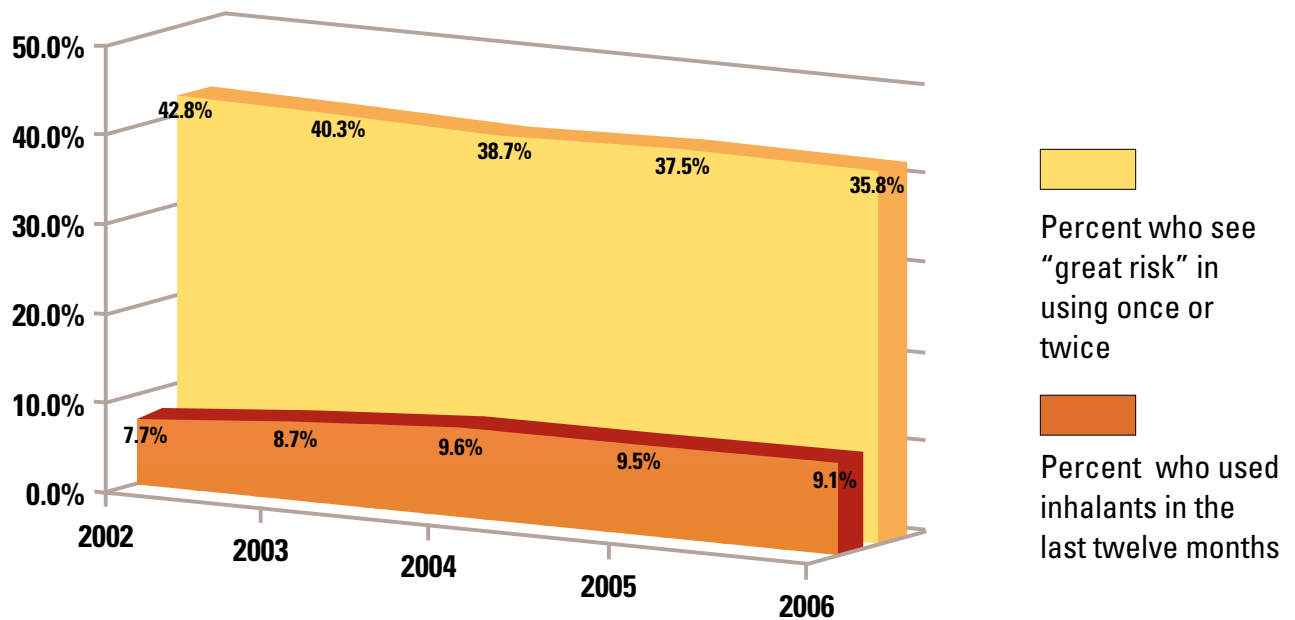
The 2005-06 PRIDE survey revealed that older students are more likely to perceive using inhalants as very harmful. In sixth grade, only 6 out of 10 students think using inhalants is very harmful, compared to 7 out of 10 high school seniors. However, 7 out of 10 is still not high enough; the need for education about the dangers of inhalants remains even at the high school level. Information from all three surveys clearly demonstrates that students are underestimating the dangers of inhalant use.



Only 6 out of 10 sixth-grade students think that using inhalants is very harmful.

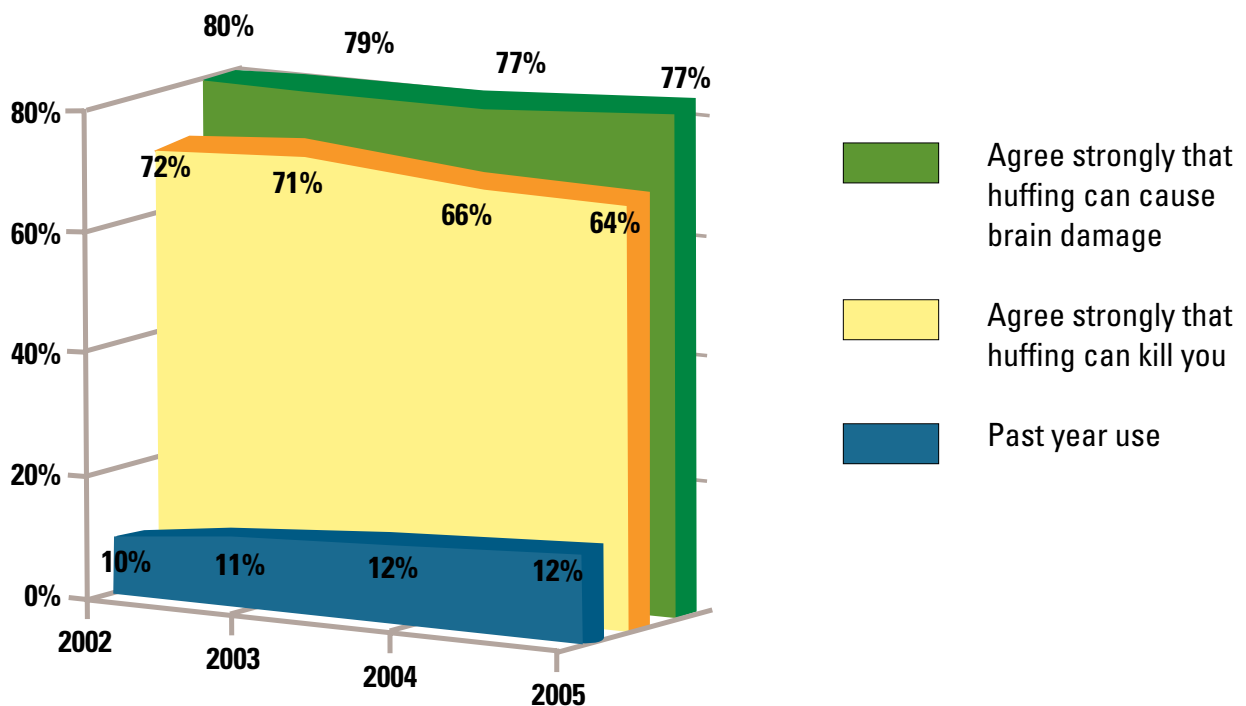
Monitoring the Future 2002-2006

Comparison of Eighth-grade Usage Rates With Perception of Risk



Partnership Attitude Tracking Survey, 2002-05

Eighth-grade Past Year Use of Inhalants and Perception of Risk and Harm



Abusable Products

More than 1,000 everyday products have the potential to be abused. These products are not designed to be inhaled or used inside the body and most carry warning labels for appropriate usage and safety. Many also warn against deliberate concentration and inhalation of vapors. These products can be found at home, in the garage or workshop, at school, in the office and in work settings.

The availability of products containing chemicals that are toxic when inhaled presents a problem because it is difficult to limit access to inhalants. Using products for their intended purpose is legal, but in most states it is illegal to misuse or abuse products for intoxication. Inhaling drugs or other noxious chemical substances or convincing others to do so is a crime in Virginia under §18.2-264 of the *Code of Virginia* (see page 35).

News about inhalants travels from student to student, often unnoticed by adults. Choices of products to abuse are often regional, although several products are reported in common use in all areas of the country. Some products are used briefly, only to be replaced by the next fad product.

According to an analysis of the 2002-2005 National Surveys on Drug Use and Health, the most common products abused are glues, shoe polish or toluene (35 percent), gasoline or lighter fluid (25 percent), nitrous oxide or whippets (24 percent), spray paints (21 percent), other aerosol sprays (20 percent) and correction fluid, degreaser or cleaning fluids (19 percent). Currently, popular products of abuse include dusting sprays for cleaning computer keyboards and other electronics and a body deodorant spray for men.

Girls and boys tend to use different products. Girls are more likely to use glue, spray shoe polish or toluene (found in items such as nail polish remover and paint thinner), spray paints, other aerosol sprays and correction fluid. Boys are more likely to use gasoline, butane, propane, lighter fluid, and nitrous oxide/whippets.

Products of choice:

Boys - gasoline, butane, whippets

Girls - glue, correction fluid, aerosol sprays, products containing toluene (such as nail polish remover)

THIS IS FOR YOUR INFORMATION ONLY. DO NOT DISTRIBUTE TO STUDENTS!

Solvents/Volatile Products and Chemicals*

Gasoline	Shellac
Permanent markers	Liquid furniture polish
Nail polish	Paint stripper
Correction fluid	Household cleaners
Nail polish remover	Liquid lighter fluid
Whiteboard cleaner	Toluene
Model glue	Dry erase markers
Spot remover	Solvent-based paint

*Products such as ammonia and bleach, though solvents, are not classified as inhalants because they do not produce a euphoric effect. However, some children may unknowingly try to abuse these products. They are poisonous when inhaled.

Gases*

Butane— Fuel for lighters; sold as lighter fluid
Freon® — Gas used in air conditioners and some computer dusters
Nitrous oxide— Whipped cream propellant, *laughing gas*
Propane— Gas used for cooking, heating

*Helium is not classified as an inhalant, as it is an inert gas and does not contain toxic chemicals. However, inhaling helium from a balloon or tank has dangers. See the section *Effects of Abuse* on page 23 for more information.

Aerosols

Any product dispensed in an aerosol can is an inhalant. Users primarily seek the propellant gas, although some products also contain solvents, such as fabric protector spray, hair spray and spray paint and are abused for both the propellant and the product formulation. Just a sampling:

Spray air freshener	Cooking spray
Hair spray	Deodorant spray
Furniture wax	WD-40
Spray paint	Insecticide spray
Computer dusters	Oven cleaner
Fabric protector spray	Spray lacquer

Nitrites

Nitrites are not commonly used by adolescents under 17. Amyl nitrite (also known as *poppers* or *snappers*) is a legitimate medication once prescribed for circulatory problems, but not used commonly today. Amyl nitrite capsules are broken to release the fumes. Butyl nitrite (also known as *rush*, *climax* or *locker room*) is often packaged in small brown vials. Older abusers purchase butyl at clubs; younger ones buy through friends or at disreputable convenience stores. Butyl nitrite is illegal to buy, sell or possess. Nitrites are primarily used as sexual enhancers, and some are being sold on the Internet as room odorizers.

Abusable Products in the School Setting

General Supplies

- Cements and glues
- Solvent-based correction fluid
- Solvent-based markers
- Solvent-based dry erase markers

Cleaning Supplies

- Aerosol cleaners
- Aerosol air fresheners
- Computer/electronic cleaners (dusters)

Art Supplies

- Rubber cement
- Printing inks
- Spray paints
- Spray adhesives

Wood Shop

- Solvent-based paints, paint thinners
- Solvent-based varnishes
- Solvent-based stains
- Solvent-based contact cement

Auto Shop

- Degreasers
- Spray lubricants
- Tire repair (such as Fix a Flat)
- Laquers/laquer thinner
- Gasoline

Health & Beauty

- Nail polish
- Nail polish remover
- Hair spray
- Spray deodorants

Cooking Supplies

- Cooking spray
- Whipping cream in aerosol cans
- Whipping cream cartridges (whippets)

Chemical Ingredients in Inhalants

Solvents and volatile products contain many different chemicals. The following table summarizes the effects of some of the chemicals found in commonly abused products.

Hazards of Chemicals Found in Commonly Abused Inhalants

benzene (*found in gasoline*)

bone marrow injury, impaired immunologic function, increased risk of leukemia, reproductive system toxicity

butane, propane (*found in lighter fluid, hair and paint sprays*)

sudden sniffing death syndrome via cardiac effects, serious burn injuries (because of flammability)

freon (*used as a refrigerant and aerosol propellant*)

sudden sniffing death syndrome, respiratory obstruction and death (from sudden cooling/cold injury to airways), liver damage

methylene chloride (*found in paint thinners and removers, degreasers*)

reduction of oxygen-carrying capacity of blood, changes to the heart muscle and heartbeat

nitrous oxide (*"laughing gas"*), **hexane**

death from lack of oxygen to the brain, altered perception and motor coordination, loss of sensation, limb spasms, blackouts caused by blood pressure changes, depression of heart muscle functioning

toluene (*found in gasoline, paint thinners and removers, correction fluid*)

brain damage (loss of brain tissue mass, impaired cognition, gait disturbance, loss of coordination, loss of equilibrium, limb spasms, hearing and vision loss), liver and kidney damage

trichloroethylene (*found in spot removers, degreasers, correction fluid*)

sudden sniffing death syndrome, cirrhosis of the liver, reproductive complications, hearing and vision damage

Source: NIDA Community Drug Alert Bulletin: Inhalants, January 2005.

Reasons for Abuse

Available

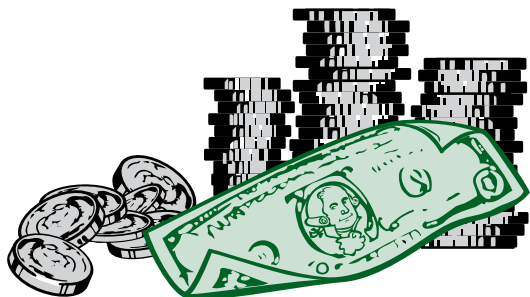
Availability leads the list of reasons for selecting and using inhalants. Products are available at home and at school and can be easily purchased or shoplifted at grocery stores, convenience stores, home improvement centers, gas stations and elsewhere.

Legal

While abuse of inhalable chemicals is against the law, the products themselves are easy to obtain because they are sold legally. Most merchants are unaware of the potential for abuse of the chemicals in these products and do not question quantity sales or restrict access to products. In addition, because they are legal, kids may think it is okay to use them. After all, they aren't buying from a drug dealer.

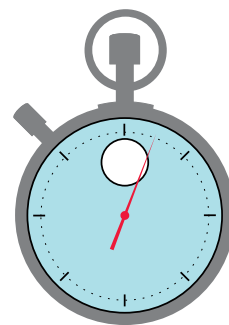
Inexpensive

Inhalable products are quite inexpensive. For example, correction fluid, nail polish remover and butane lighters cost only a dollar or two. But youngsters usually don't even have to buy the products. They often use what they find in the kitchen, bathroom, home office, basement or workshop or at school or friends' homes.



Quick Acting

Inhalants' effects are felt immediately, in contrast to substances such as pills or alcohol which can take up to a half-hour for the effects to be felt. Inhalants move quickly from the lungs to the bloodstream to the brain. Inhalants particularly appeal to younger students: no waiting, instant gratification.



Short-lived Effects

Effects do not last long, typically 60 seconds to 5 minutes after inhalation. This suits the younger abuser, who may huff between classes, in the bathroom or on the school bus. Experienced abusers try to control the dose by repeated use (bingeing). Because the effects are short-lived, parents and teachers may not see obvious signs of intoxication, another reason inhalants appeal to younger abusers.

Easy to Use

Inhalant abuse does not require paraphernalia such as hypodermic needles or crack pipes, which are beyond the reach of most children. Huffers utilize plastic bags, rags, bandanas and clothing, all of which are easily available to children of all ages - and virtually unrecognized by adults as inhalant paraphernalia.

Easy to Conceal

Many abusable products can be carried and hidden very easily. For instance, butane lighters are so small that students say they have concealed two or three of them in their socks. Limited quantities of chemicals can be decanted into small containers to put in pockets or backpacks.

Hard to Detect

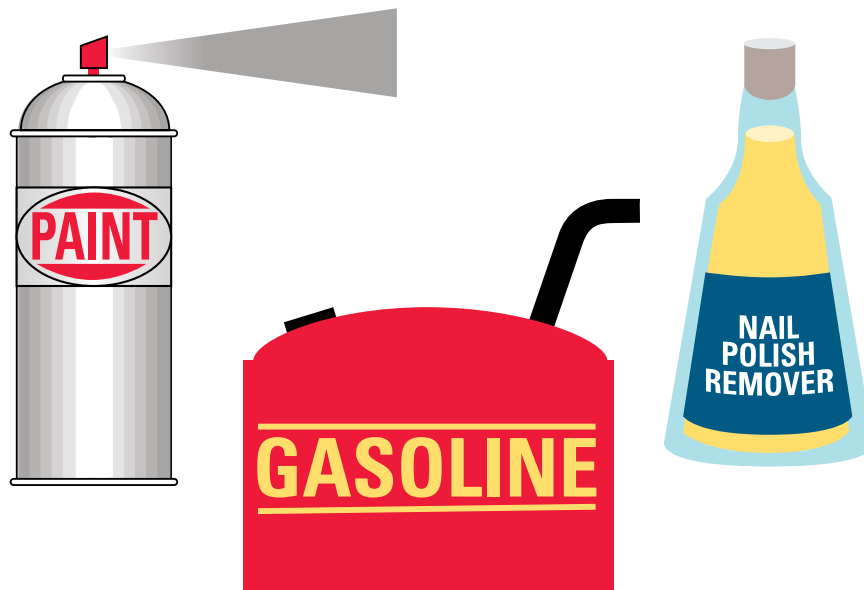
Inhalant chemicals can be very difficult to identify. Drug-sniffing dogs do not search for inhalants. Standard urine screening and standard blood tests cannot detect their presence. Special blood-gas tests can be run, but they must be administered within a few hours after inhalation. This is not a timely solution and can be quite expensive.

Social Activity

Youngsters learn how to huff from each other and from the Internet, television and movies. They often gather in groups to abuse inhalants, sharing products, paraphernalia and methods of use. In fact, abusers report that they often get together for the express purpose of huffing. Older siblings show younger ones how to huff; upper graders initiate young students. After beginning to use in groups, some youngsters continue to use alone.

Unrecognized Hazards

Children who abuse inhalants are generally unaware of the dangers involved. The products are legal, and parents and other adults are less likely to have talked to their children about inhalants than about other drugs. According to the parent survey in the Partnership Attitude Tracking Study, about 7 out of 10 parents discussed alcohol, cigarette and marijuana use “a lot” with their child, but only 5 in 10 parents talked about inhalants. Some children huff precisely because they believe it is a safer alternative to drugs, and their friends are doing it. For example, they may think that computer dusters are just canned air, not realizing they contain compressed, and very cold, toxic gases. They are unaware of the damage the toxic effects of inhalants can cause to the body and brain. Inhalant deaths are rarely recognized or publicized, so most young people don’t know the potentially fatal consequences.



Methods of Abuse

Individuals who abuse inhalants use a wide array of techniques. Methods vary from region to region and also depend on age, resource availability, product and experience. **Educators should never discuss specific products or methods of abuse or show students how products are abused.**

THIS IS FOR YOUR INFORMATION ONLY. DO NOT DISTRIBUTE TO STUDENTS!

Some widely-reported methods of abuse are:

- Sniffing or huffing directly from the container or source (such as markers or glue)
- Painting fingernails with the product (such as correction fluid or markers) and bringing nails to nose or mouth to breath fumes
- Pouring product onto collar, cuffs, sleeves or other parts of clothing, then raising clothing to the face to huff or sniff or placing face down on arms on desk to sniff (student could appear to be resting/sleeping)
- Holding butane lighter to the nostril and releasing the gas only (A student could do this in class by hiding the lighter in a tissue or handkerchief and pretending to wipe his or her nose.)
- Soaking cotton balls/swabs in product and stuffing up nostrils
- Decanting the product into an empty container such as a soft drink can or 35 mm film canister and then huffing or sniffing
- Soaking a cloth in the product and inserting it into the mouth
- Decanting the product onto a rag, scarf, bandanna, cloth, sock or baby diaper, then holding or tying the cloth over the face
- Spraying directly from the container into the mouth or using the slim plastic straw provided with some products and spraying into the mouth (popular with computer dusting products and nitrites)
- Spraying or pouring the product into a plastic bag and holding the bag over the nose or mouth and breathing
- Spraying propellant gas into a plastic bag and holding the bag over the head and breathing
- Filling a plastic bag with Freon® from an air conditioner unit and huffing from the bag
- Huffing directly from the valve on an air conditioner unit
- Inverting an aerosol can and spraying only the gas propellant into the mouth
- Sniffing or huffing the product in a small enclosed space, such as a cardboard shipping carton, car or closet
- Filling a heavyweight balloon with nitrous oxide or butane and huffing from the balloon

Paraphernalia

Inhalant abusers employ a variety of items when they huff or sniff. No exhaustive list can be compiled because of the ever-changing patterns of abuse. The following items are often utilized:

Rags
Cotton balls or swabs
Plastic bags - from sandwich to garbage bags
Cloth baby diapers
Paper bags
Fertilizer bags
Scarves or bandannas
Soda/juice cans
Items of clothing such as socks or hair scrunchies
Balloons

DANGER

**DEATH CAN RESULT
the first time or any time
someone uses an inhalant.
The techniques and methods
of administration can be
just as deadly as the toxic products
themselves.**

Death could result from:

- ✗ cardiac arrest from heart arrhythmia (Sudden Sniffing Death).*
- ✗ suffocation when a plastic bag covers the face or head.
- ✗ asphyxiation when vapors displace oxygen in the lung.
- ✗ lack of oxygen from saturation of lung tissue with solvent products.
- ✗ choking on vomit (particularly if unconscious).
- ✗ choking on small plastic bags that are accidentally inhaled while huffing from them.
- ✗ explosion or combustion of volatile fumes (for example, lighting a cigarette while fumes are still in the air).
- ✗ fatal injury (falling, drowning, motor vehicle crashes) when individuals are under the influence.

Sudden Sniffing Death is death due to an irregular heart rhythm. It can result from inhaling vapors during a single session of abuse. As the brain is deprived of oxygen, adrenaline is released in an attempt to increase blood flow to the brain. This causes the heart to beat more rapidly, potentially resulting in cardiac arrhythmia and cardiac arrest within a few minutes. Cardiac arrhythmia can also be caused by the toxic effect of the inhalant. **It is particularly important not to startle a person who is inhaling, as this increases the risk of Sudden Sniffing Death. About half of deaths from inhalants are ascribed to Sudden Sniffing Death.*

Effects of Abuse

Effects may begin within two seconds of inhalation and may last for a few seconds to several minutes or longer. The effects can be prolonged by choice of paraphernalia, repeated dosing and methods of abuse.

The immediate effects are much like being intoxicated except that they occur rapidly instead of gradually. Imagine becoming almost instantly drunk. Users experience euphoria and distorted perception and lose coordination. Their speech slurs or deepens, and they may get giddy and disoriented. In social situations, adolescents think the effects are funny, and there may be much giggling and laughing.

Although adults may recognize the danger of these effects, children and adolescents may not perceive them as a problem. Youngsters find many ways to become dizzy and disoriented: riding a merry-go-round, rolling down a hill, riding a roller coaster or other amusement park rides. These effects are not dangerous, but the intoxicating effects of inhalants are the result of chemical effects on the brain.

Inhalant chemicals vary widely in composition. However, most abusable products produce similar effects, which can be intensified depending on the method of use. Some of the dangerous consequences of inhalant use follow.

Passing Out

Sometimes young people huffing in groups compete to see who can become unconscious first. Adults know this is dangerous, but some children may not realize the danger involved.

Burns

Those who huff or sniff face the additional hazards of burns from fire or explosion. Flammable products in small, enclosed spaces may be ignited accidentally. Smokers who light up directly after huffing or sniffing can ignite any remaining fumes.



Frostbite

If inhaled directly from a pressurized container, a gas (such as nitrous oxide and refrigerants) can cause frostbite because of its extremely low temperature. Freezing can damage tissues in the mouth, tongue, nose and throat. Computer air dusters contain refrigerant and can cause frostbite. Pressurized gas from a container or balloon can damage delicate lung tissues as well.

To adults, inhaling helium from a balloon may seem to be harmless behavior, causing only high-pitched speech. However, helium displaces oxygen, so it can cause unconsciousness and death, including Sudden Sniffing Death. In children it can damage lung tissue. When the helium is inhaled directly from the tank, frostbite is also a possibility. Children who have seen adults inhale helium may also be more likely to inhale other gases from balloons, not realizing their toxicity.

Injuries

Inhalant use can cause crashes and other injuries if an individual drives a vehicle or operates machinery while under the influence. Physical coordination, reaction time, vision and cognitive abilities are severely impaired by huffing, with resulting danger to self and others. Injuries from falling and drowning are also possibilities.

Death

Any instance of inhalant use carries the potential for death from Sudden Sniffing Death Syndrome (cardiac arrest), suffocation, choking, explosions and accidents. The use of butane, propane, toluene (found in correction fluid, nail polish remover, rubber cement, paint thinner, spray paint and many other products), gasoline, computer dusting products and Freon® are particularly associated with sudden sniffing death. According to an annual study of deaths from inhalant abuse in the United Kingdom, 33 percent of persons who died from inhalants during the years 2000 to 2004 were first-time users.

Immediate Effects

The immediate effects of inhalants may last only a minute or two, possibly up to five minutes. They are similar to alcohol intoxication (euphoria followed by lethargy from central nervous system depression). These effects are temporary.

- Dizziness
- Excitation
- Disorientation
- Emotional volatility
- Loss of coordination
- Distortion of perception
- Cognitive impairment
- Hallucinations
- Tremors
- Lightheadedness
- Diminished sensitivity to pain
- Slurred speech
- Loss of inhibitions

Real Stories

A police officer in Cleveland owned a retired drug dog, gave drug prevention talks in schools, and he and his wife (a nurse) talked with their children frequently about the dangers of drugs and alcohol. But they didn't know about inhalants. Officer Williams and his son Kyle worked on computers together. His father noticed that the computer dusting spray was used up rapidly, so he bought a jumbo-sized can. The next morning, his wife went to wake Kyle for school and found him sitting in bed, eyes open, with the extension tube from the dusting can in his mouth. Dead.

A mother from Florida lost her son to huffing Freon®. He was found dead beside her next-door neighbor's air-conditioning unit. He was only 15.

An 18-year-old Virginia teen died after huffing spray out of an aerosol can. It was the first time he had tried inhaling.

A family in Washington lost their son, Brady, to butane. Brady's girlfriend said that he had passed out while huffing; it scared him and he decided never to huff again. But he was with friends who bought some butane to huff, one of them for the first time. His friend wasn't feeling the effects and asked Brady to demonstrate how to use it. In an instant, Brady was dead.

A mother in Texas found her daughter dead in the bathtub. She'd been inhaling computer keyboard cleaner in the bathtub when she passed out and drowned.

Effects on the Brain, Circulatory and Respiratory Systems

The following physiological effects are commonly experienced during the abuse of inhalant substances. Some effects may persist for an extended period after abuse has ceased.

- Depressed central nervous system functions
- Inefficient respiratory process
- Lower volume of inhaled oxygen
- Severe headaches
- Decrease in circulating oxygen
- Impairment of hippocampus, resulting in memory loss
- Irregular heart rhythm
- Reduced cognitive abilities

Real Stories

On an Internet site, a teenager describes how she started sniffing nail polish remover every night when she was about 13. She'd soak tissues in the solvent and hold them up to her nose. She said it made her fingers and toes tingly and made her feel lightheaded and giddy and as if she were moving very slowly. She got into the pattern of sniffing every night until she passed out – an easy way to fall asleep. She stopped when her mother began to question why her room always smelled like nail polish remover. But she didn't quit using mind-altering substances; she just moved on to other types of drugs. Progressing to other drug use is a common pattern for inhalant abusers.

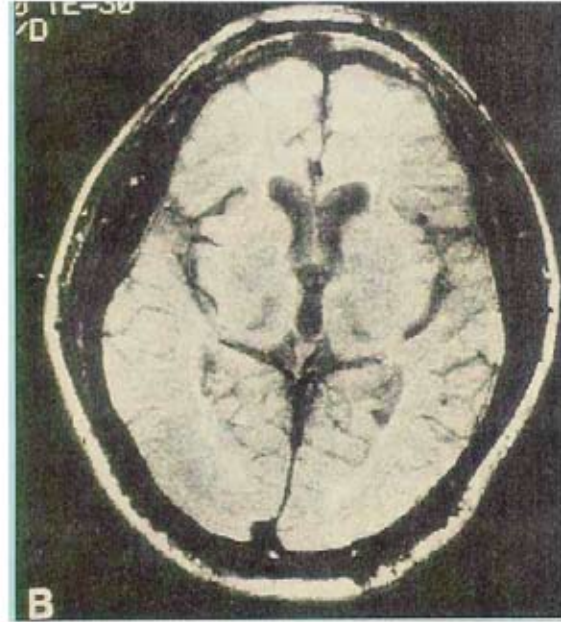
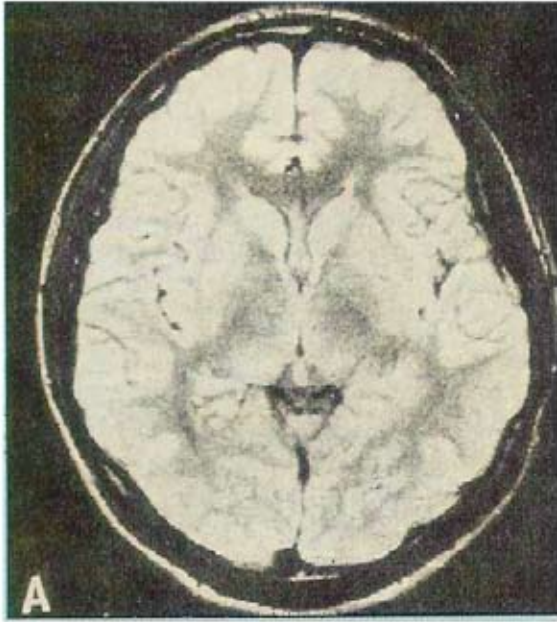
For those who do not abuse often or on a long-term basis, it is possible to reverse short-term brain damage by abstaining from use.

Long-term Effects

Long-term effects may present after prolonged exposure. The following list represents a range of consequences that may result from chemical exposure. Some of the neurological effects may be reversible with time and appropriate medical and rehabilitative services.

- Brain damage
- Impaired motor coordination
- Loss of or impaired vision
- Loss of or impaired hearing
- Destruction of liver tissue
- Leukemia, anemia
- Reduced kidney function
- Damage to muscles of the heart
- Damage to lungs
- Damage to neurons' myelin sheath
- Muscle tremor
- Numbness in extremities
- Slurred speech
- Decreased sensory capacities
- Memory loss
- Dementia
- Depression and other mental illness
- Progression to other drug abuse

Brain Damage in a Toluene User



Brain image A is from a healthy male teenager who has never abused inhalants. Brain image B shows shrinkage of brain tissue in a teenage toluene abuser. Note the smaller size and the larger, empty (dark) space within the toluene abuser's brain.

*National Institute on Drug Abuse Research Report Series: Inhalant Abuse.
Images courtesy of Neil Rosenberg, M.D.*

Signs and Symptoms of Abuse

Early intervention is critical for the health and safety of the inhalant abuser. Students who huff or sniff regularly tend to exhibit characteristics typical of drug abusers: acting out, change in peer group, withdrawal, mood swings, drop in grades, unexplained weight loss and depression. A youngster whose behavior, attitude, physical appearance or scholastic achievement changes noticeably should be referred for assistance, whether or not inhalant abuse is the suspected cause. Parents and caregivers, as well as school staff, should always be alert to these shifts and look for the causes.

All school-related personnel should be made aware of the range of products and paraphernalia that may denote inhalant abuse. Finding these items will alert staff to be on the lookout for students who are abusing inhalants at school.

Products and/or Paraphernalia

Because some students huff and sniff in and around school grounds, school staff can find evidence if they know what to look for. Sites that students most frequently choose for abusing inhalants include locker rooms, bathrooms, the roof or basement, school buses, far corners of the schoolyard or athletic field and the cafeteria. Look for these materials on the ground, in lockers or in wastebaskets:

- Plastic bags with chemical stains or smell
- Empty product containers
- Rags, clothes, cotton balls with chemical odor
- Empty whippets (nitrous oxide cream chargers) and/or balloons

Physical Symptoms

Because effects come and go so quickly, it is rare to observe students under the influence of inhalants. However, a student who exhibits any of the following indicators should be closely observed and referred for further evaluation:

- Disorientation
- Giddiness
- Dazed appearance
- Paint or chemical stains on face or hands
- Chemical odor on breath
- Chemical odor on clothing
- Red, pimply rash around the nose and/or mouth (contact dermatitis)
- Slurred speech
- Increase in quantity and intensity of headaches
- Excitability or volatility
- Sore tongue

When Someone Is Huffing

There may be occasions when an individual is interrupted in the act of huffing or sniffing. Due to the nature of the adverse consequences of inhalant poisons on the body and the potential for sudden sniffing death, this situation must be handled with extreme caution. The person who discovers someone abusing inhalants should remain calm, because agitating or scaring the abuser may increase risk of sudden sniffing death. All school personnel who come in contact with students should be aware of the following guidelines.

What to do when someone is huffing

- ✓ Remain calm and keep the student calm.
- ✓ Remove any source of chemicals from around the nose and mouth.
- ✓ If the student is unconscious, call 911. Turn student on side to prevent aspiration of vomit.
- ✓ If the student is not breathing, administer CPR.
- ✓ Do not excite, scare, shock, upset or chase the individual.
- ✓ Do not leave the student alone.
- ✓ Contact the administrator in charge and the school nurse or other school health professional.
- ✓ Ventilate the area.
- ✓ Move student only if he or she is in danger remaining in the current setting.
- ✓ Contact the poison center at 1-800-222-1222 for instructions.
- ✓ Check the area for products and paraphernalia and save.

Treatment for Abuse

Are Inhalants Addictive?

Recent scientific research has demonstrated that inhalants produce many of the characteristics common to addiction. For example, it has been found that toluene, a solvent in many inhalants, promotes euphoria in the brain in much the same way that cocaine, methamphetamine, PCP and nicotine do. Some studies have reported that inhalant abusers can build up tolerance, requiring increased amounts of the product to achieve the same effects, and some inhalant abusers have developed cravings, symptoms of addiction. Heavy users may show withdrawal symptoms, such as sweating, rapid pulse, hand tremors, nausea and anxiety, within several hours to a few days after use. According to the director of the National Institute for Drug Abuse, "Taken together, these and similar observations strongly suggest that inhalant abuse can progress into the chronic and relapsing disease of addiction" (Volkow, *Counselor*, May 2006). The American Psychiatric Society classifies inhalant dependence as a specific diagnosis.

Habitual inhalant users rarely confine their use to inhalants and are much more likely to also use alcohol and other drugs and to become dependent on them. According to the 2005 National Survey on Drug Use and Health, 35 percent of adults who first started inhalant abuse at age 13 or younger were classified as dependent on or abusers of alcohol or an illicit drug in the past year. Among adults who had never abused inhalants, only 10 percent were dependent on or abusers of alcohol or another illicit drug. Inhalant abuse can be considered a clue to a person's vulnerability to other substance abuse problems.

Treatment for Inhalant Abuse

According to the Center for Substance Abuse Treatment, chronic abusers will need a thorough medical evaluation to determine neuro-psychological or other damage to the brain and body in addition to a substance abuse evaluation. Medical treatment of physical conditions may be necessary. Ridding the body of poisons from the inhaled products can take two to six weeks, and therapy is not as effective before detoxification is complete. Abstaining is difficult for heavy inhalant abusers, and, as with other drug abuse problems, relapse is common. Inhalant abusers may have difficulty participating in group therapy sessions due to shortened attention spans and cognitive deficiencies resulting from brain damage. Individual or group sessions may initially need to be as short as 15-20 minutes. Most treatment centers with programs for adolescent substance abusers should be able to provide help; however, there is little research addressing successful treatment models specific to chronic inhalant abusers.

Intervention for inhalant abusers should occur as early as possible. Sometimes an adult may have suspicions a child is abusing, but fear to act on them. It is important that the person take action, such as referring the student to the student assistance team or to the school nurse, even if he or she may be mistaken. Preventing a youth from continuing to abuse inhalants may save his or her life or prevent long-term problems. The person intervening should follow school procedures for reporting (see *School Drug Policy and Inhalants* on page 32).

Safeguarding the School Environment

Schools may be an unwitting source of abusable products. Are products missing from storage areas, closets, drawers? Have staff members noticed their supplies being depleted quickly? Such discoveries may indicate that the school has become a source for inhalant users. In the school setting, dry erase markers, computer cleaners (dusters), aerosol cleaning products and air fresheners are frequent items abused. Because of the availability of solvent products in the school setting, school personnel must plan ahead to reduce the risk of abuse.

One of the first practical steps school administrators can take to reduce the risk of inhalant use by students is to perform an environmental inventory of abusable products that are already being used. Special attention should be paid to art, shop, science and computer classrooms and, in schools that have them, automotive, cosmetology, culinary arts and horticulture classrooms. Supplies that have strong smells may contain solvents. Read the labels, as many products will contain a warning about the dangers of intentionally breathing the product's fumes, vapors or gases. Art supplies that have an "AP Non-toxic" label may still contain solvents, since these products are not evaluated for potential inhalant abuse. Contact the manufacturer or your poison center at 1-800-222-1222 if you're not sure.

After cataloging products that can be abused, water-based products should be substituted for solvent-based products when possible. School personnel should examine supply lists, catalogues and vendor offerings for sources of water-based products. If the division puts out a list of bids, water-based products should be

specified whenever possible. Use products such as water-based paint, glue sticks and white glues, correction tape and low odor dry erase markers. Do not use scented markers even if they are labeled non-toxic. Smelling pleasantly scented markers sets up a pattern of behavior that makes it easier for children to sniff markers that contain toxic solvents.

Some products have no alternative formulation. Eliminate these products if possible, or limit access to them and closely supervise student use. Maintain inventory control by storing products in locked closets or in other places that are not accessible to students.

Some schools have banned students from bringing products such as correction fluid to school. They may prohibit solvent-based markers, rubber cement or other abusable glues. If children question why these products are banned, teachers should explain that the school is protecting students from products whose fumes can be poisonous when breathed. Teachers should not refer to these products as drugs that can produce a high, as this may stimulate experimentation. Most schools also prohibit carrying cigarette lighters. However, many abusable items are easily hidden, so school staff must be alert to notice them.

All school personnel must be aware of the potential for abuse of products that can be inhaled. Staff members should be reminded to report suspicious quantities of missing products or products that are being used up too quickly or aerosol products that still contain product but won't spray, indicating that the propellant has been used.

THIS CHART IS FOR ADULT USE ONLY. DO NOT DISTRIBUTE TO STUDENTS!

School Site	Product category	Substitute water-based products	Supervise use of solvent-based products	Other Alternatives
Vocational/ Shop	Solvents		Yes	
	Glazes		Yes	
	Refrigerant		Yes	
	Gasoline		Yes	
	Lacquers/Thinners		Yes	
	Varnish	Yes	Yes	
	Paints	Yes	Yes	
	Spray adhesive		Yes	
	Spray paint		Yes	
	Contact cement	Yes	Yes	
Cosmetology/ Hygiene	Nail polish		Yes	
	Nail polish, polish remover		Yes	
	Hair spray		Yes	Use hand pump
	Deodorant		Yes	Use stick deodorants
Culinary Arts	Whip cream spray; cream chargers (whippets)		Yes	Use from a tub or make from scratch
	Non-stick vegetable sprays		Yes	Use oil in a spray pump
Art Supplies	Markers	Yes	Yes	Don't use scented markers
	Dry erase/whiteboard markers	Yes	Yes	
	Whiteboard cleaning fluid	Yes	Yes	
	Rubber cement		Yes	
	Glue	Yes	Yes	
Office Supplies	Correction fluid	Yes	Yes	
	Computer dusters	Yes	Yes	
Janitorial	Cleaners	Yes	Yes	
	Solvents		Yes	

Adapted from *A Breath Away: A Campaign to Prevent Inhalant Abuse*, Massachusetts Department of Public Health

School Drug Policy and Inhalants

Because the effects of inhalants are short-lived, they can be used anywhere and at any time adults are not around or are not paying attention. Since most schools already have alcohol and other drug policies, these policies can be an efficient means of prevention and early intervention of inhalant use at school.

Huffing, sniffing, dusting, bagging and breathing gas from a balloon are learned skills transferred from individual to individual. School policies can help to confine these dangerous practices by limiting the ability of students to abuse inhalant substances on school grounds.

Without clear, consistent and current policies and procedures, staff members will not know what actions to take if they find students huffing or suspect they may be. Moreover, if inhalants are not specifically mentioned, it may be difficult for administrators to deal with such incidents without exposing the school to legal liability.

Review and Update Current Policies

School officials should evaluate current school policies on alcohol and other drugs to make sure inhalant substances and related paraphernalia are addressed. Policies often mention alcohol, scheduled narcotics and illicit drugs, but fail to name inhalants.

In Virginia it is a crime to misuse or abuse chemicals for intoxication. As specified in §18.2-264 of the *Code of Virginia* (see page 35), it is unlawful to deliberately inhale products with the intent to become intoxicated, inebriated, excited, stupefied or to dull the brain or nervous system, or to invite or induce any person to inhale substance. School policies must reflect these regulations.

The following sample school policy statement developed by Isabel Burk, director of the Health Network, specifically includes substances that can be inhaled.

No person may possess, use, manufacture, sell or distribute alcohol or other substances, nor use or possess paraphernalia for the purpose of illicit/ inappropriate drug use, at any time, on school property, building and grounds, in school-sponsored vehicles or at school-sponsored events at other sites. The terms "alcohol, drugs and other substances" shall be construed to refer to all substances in all forms, including, but not limited to: alcohol and alcohol-containing beverages, all forms of tobacco, inhalable substances (including gases, solvents and solvent-based products, butane, propane, adhesives and similar products), marijuana, cocaine/crack, LSD, PCP, amphetamines, heroin, methadone, scheduled narcotics, steroids, herbal stimulants, herbal/"natural" euphorants, look-a-like products and any substances commonly referred to as "designer drugs." The inappropriate and/or illegal use of prescription and over-the counter preparations is prohibited. Prescription medication or over-the-counter preparations for personal use shall be allowed only as per district medication policy, under the supervision of school medical personnel, with written orders from a physician. Federal, state and local laws shall apply to students and employees alike.

Establish and Communicate Procedures

What should a staff member do if he/she finds a box of whippets? How should a hall monitor deal with a student who smells of gasoline? What happens if the assistant principal sees a fourth grader breathing out of a plastic bag? How should it be handled? Who should be told? What should be done with the evidence? How will parents be notified?

These types of incidents fall under the jurisdiction of the school division's drug policy, which should spell out how they are to be managed.

Schools must be sure to institute procedures for such situations, especially in light of the possibility of legal liability. All staff members need to know precisely how to deal with these issues and what actions they are authorized to take. Clear procedures increase the likelihood that situations and incidents will be reported and handled appropriately.

Disseminate and Publicize Policy

Policies work best when students, parents and staff know the rules and understand their responsibilities. Distribute written policies at least once a year. Make sure that all staff members are trained to implement the policy and fully understand procedures for reporting suspected inhalant abuse and handling inhalant substances and paraphernalia.

Document and Retain Records

Each school system has its own procedures and policies regarding suspicion of students involved in dangerous activities. Student assistance programs and school policies vary on the appropriate way to handle these concerns. Some policies require a formal referral to student assistance or other counseling; some encourage

a conference with health services personnel; still others provide a specific process for intervention or referral. Because of the health-related risks, the school nurse or other health services representative should be involved in planning appropriate procedures in case inhalant abuse is suspected.

It may be feasible for a teacher to approach a student privately and express concern or willingness to listen if the teacher is concerned but not sure that the student is abusing inhalable products. However, staff members must be cognizant of their responsibilities under school policy to report and document incidents that may involve substance abuse. If in doubt, consult the appropriate administrator.

In all cases, keeping accurate records can aid in identification and early intervention for problems with inhalants or other substances. Any staff member who is concerned about a student should keep written records to establish patterns of behavior and share them with the appropriate persons as defined in school policy. In some cases, written records may be used to evaluate specific allegations or to verify times, dates and places. Records of this sort should not be public information and should be considered sensitive. They should be stored in a secure area, accessible only by staff with a need to know. School divisions should be careful to follow federal confidentiality laws as they develop their policies regarding documentation and record-keeping procedures, as well as access to records.

For example, if a math teacher notes that a tenth-grade student has silver-colored spray paint in his hair, on his hands and on his forehead, this is an important observation that should be put in writing. If a student's attitude or demeanor has suddenly changed, it should be noted. These observations may lead to a discipline referral or a referral to the student assistance team, according to the school policy. When keeping records, be

sure to include the following:

- Date and time of incident
- A full description of the specific issues or concern
- Frequency. Has this happened before? If so, how many times?
- Names of others present (if any)
- Action taken (if any)

It is important that schools have a procedure in place for alcohol and other drug abuse screenings or assessments, including assessment for inhalant use. Do your school administrators know where to refer a student for assessment or treatment services? Are the providers familiar with inhalant issues? As a school implements a comprehensive approach to preventing inhalant use, it is likely that students will be referred for suspected use. It is essential for the school to be prepared to handle these cases through school policy, including how and where to refer for help.

Other Policy Approaches to Prevention

Enact Legislation

Using products for their intended purpose is legal, but it is illegal in most states to misuse or abuse products for purposes of intoxication. Inhaling drugs or other noxious chemical substances or causing others to do so is a crime in Virginia, under Section 18.2-264 of the *Code of Virginia*. The statute states that

- A. *It shall be unlawful, except under the direction of a practitioner as defined in §54.1-3401, for any person deliberately to smell or inhale any drugs or any other noxious chemical substances including but not limited to fingernail polish or model airplane glue, containing any ketones, aldehydes, organic acetates, ether, chlorinated hydrocarbons or vapors, with the intent to become intoxicated, inebriated, excited, stupefied or to dull the brain or nervous system. (Class 1 misdemeanor)*
- B. *It shall be unlawful for any person, other than one duly licensed, deliberately to cause, invite or induce any person to smell or inhale any drugs or any other noxious substances or chemicals containing any ketone, aldehydes, organic acetates, ether, chlorinated hydrocarbons or vapors with the intent to intoxicate, inebriate, excite, stupefy or to dull the brain or nervous system of such person. (Class 2 misdemeanor)*

A criminal statute, though essential, is only one tool for dealing with inhalant abuse. A number of approaches have been used by businesses, federal and state governments and school systems to reduce inhalant abuse. These policies and procedures can be effective, depending upon the degree to which they are publicized or enforced.

This guide has suggested a variety of ways to prevent student abuse of inhalants in the school setting, including educating staff as well as students and minimizing the availability of abusable substances by changing product purchasing patterns and securing storage areas at the school site. It has also stressed the importance of school policy and procedures that address inhalant abuse.

In addition, schools can join forces with local, state or national coalitions that are concerned about inhalant abuse and are taking action to protect children. (See *Resources* on page 156 for names of organizations addressing inhalant issues.) The following are approaches being utilized to help reduce abuse of inhalants.

Change Product Formulations

One method of addressing inhalant abuse is at the manufacturing and product development level through voluntary change on the part of the manufacturer or through government policy or regulations. For example:

- Reformulation of products to remove or minimize abusable substances
- Ban on abusable chemicals (from legitimate products)

- Regulation and limitations on types and quantities of abusable substances in legitimate products
- Addition of irritants (stinging vapors) or bittering agents to products with potential for abuse. For example, Falcon Safety Products, manufacturer of Dust-Off, added a bittering agent to this product in 2006 to discourage misuse in the aftermath of several deaths caused by inhaling the product.

Restrict Access

- Penalize or criminalize abuse of inhalable products and inducing others to abuse (see Virginia statute on previous page)
- Regulate minimum age for purchase of certain products such as model airplane glue. Some states and localities have such statutes. However, enforcement can be difficult. Some companies have voluntarily restricted the purchase of some abusable products to children under a certain age. For example, OfficeMax, Office Depot and Staples require identification for purchases of electronic dusting products and prohibit their sale to anyone younger than 18.

Increase Awareness

- Warning labels on all products
- Warning symbols on products such as the poison symbol (skull and crossbones)
- Media messages with warnings from manufacturers. For example, AXE body deodorant has been a popular product among inhalant abusers. The makers of AXE developed a television/Internet ad targeting teens that encourages them to use their product responsibly.
- Awareness/education programs for students
- Awareness/education for school system personnel (including administrators, teachers, aides, parent volunteers, clerical staff, librarians, school police officers, school nurses, guidance counselors, social workers, psychologists, coaches, cafeteria workers, custodians and bus drivers)
- Awareness/education for parents and other caregivers
- Awareness/education for personnel in youth-serving agencies
- Awareness/education for retailers
- Awareness/education for law enforcement/legal system personnel
- Awareness/education for medical personnel and first responders

Principles for Inhalant Abuse Prevention

The most successful inhalant prevention programs are included as a component of comprehensive school health education. Research has found that one-time lessons or activities have minimal effect in keeping students safe and healthy. Prevention must be age appropriate, culturally sensitive, congruent and consistent with other school curricula. The National Institute on Drug Abuse defines an effective school-based prevention program as one which includes:

- Multiple years of programming
- Interactive methods of instruction
- Development and practice of social skills, decision-making skills, communication skills, stress management, assertiveness, peer resistance, media literacy and health and safety skills
- School and community anti-drug social norms
- Peer-to-peer activities
- Elements to decrease risk factors and increase protective factors

Staff training is critical. A program can be successful only when educators understand the topic and have the skills needed to present information effectively.

Inhalants are vapors, gases and fumes that are poisonous when inhaled in concentrated form. They are not drugs but are misused for their euphoric effects. Lessons on inhalants are appropriate for the following units:

- Poisons
- Fire safety
- The environment and environmental pollutants
- Personal health and safety
- Substance abuse prevention
- First aid
- Brain science - how toxic substances can effect the brain
- Decision-making and problem-solving skills

These lessons could be taught by school nurses, fire safety educators, poison center educators, prevention specialists, student assistance coordinators, child safety officers and health educators as well as classroom teachers.

All teachers should be alert for teachable moments, those natural situations that provide an opportunity to reinforce the importance of safety when using products that can be dangerous. They can teach by example, reading aloud and following product instructions when an abusable product is used in the classroom.

In classes where volatile solvents are more commonly used (for example, art, science and vocational classes), teachers should routinely

review safe use of these products and the consequences of misuse.

In all classes, teachers should review, repeat, reinforce and practice skills and behaviors as often as possible, at least several times each school year. This builds students' abilities and reinforces attitudes and values for personal health and safety.

The following main concepts should be included when teaching inhalant abuse prevention at all grade levels.

Knowledge/Information Concepts

- Oxygen is necessary to sustain human life.
- Oxygen has a vital role in the creation of energy for the human body.
- Inhaling gases other than oxygen deprives the brain of oxygen.
- Inhaling gases other than oxygen damages cells in the brain and other organs.
- Many household substances are toxic (poisonous) when not used according to directions.
- Although invisible, some vapors, fumes and gases are poisonous.
- Individuals should never taste, touch or inhale unidentified substances. Children should be supervised by parents or a responsible adult whenever toxic household products or chemicals are being used.

- Products with toxic vapors should only be used in well-ventilated areas.
- Exposure to concentrated toxic chemicals or vapors damages the brain, heart, circulatory system, vital organs, muscles and central nervous system.
- Chemical fumes pollute the atmosphere of our earth, the atmosphere in our immediate surroundings and our bodies.

Attitudes/Values

- Individuals are responsible for their health and wellness.
- Unsafe actions have consequences.
- The toxicity of chemicals and poisons must be respected.
- Adults must be consulted when unknown products are found.
- Chemicals should be handled with caution and used under adult supervision.
- Reading labels and following product directions promote personal safety.
- The human body should not be polluted by toxic substances or poisons in any form.

Skills

- Recognizing substances that may be toxic or poisonous
- Reading and interpreting product labels
- Taking appropriate safety precautions when using chemicals, toxic substances and poisonous products

- Using decision-making and problem-solving skills to promote health and safety
- Understanding normal brain and body functions
- Being aware of peer resistance techniques that can be used when pressured to huff or sniff
- Knowing how to access help when needed

Behaviors

- Using senses of smell, touch and taste appropriately
- Following directions on household products
- Taking appropriate precautions when using household products
- Alerting an adult when products containing chemicals are found
- Resisting peer pressure to huff or sniff
- Seeking help for friends when needed

The Role of Parents

This manual is designed for the school setting, but parents are critical partners in protecting children from the dangers of inhalant abuse. Schools can offer workshops for parents on preventing inhalant abuse or distribute literature to parents (see the resource section on page 157 for available materials). However, literature about inhalants should be mailed to parents, not sent home with students, since it is likely to contain information about products that are abused and other information inappropriate for students.

Because parent workshops do not reach the majority of parents, schools are encouraged to publicize a parent education resource that is available at no cost through the Internet. The site provides a good overview for parents of children of all ages about inhalants, how to prevent abuse, signs of abuse and what to do if a child is inhaling. The interactive training only takes 20-30 minutes to complete. There is a special section on the site for Virginia parents. The Web site address can be published in the school's parent newsletter, on the school Web site or sent to parents by automatic parent notification systems that many school systems have implemented. The Web site is

www.inhalantabusetraining.org

Guidelines for Selecting Materials

Educators will often receive information from marketers about videos and other materials dealing with inhalants. The following are helpful guidelines for selecting materials.

Criteria for Screening Videos and Print Materials for Children

Inhalant prevention messages (whether in the form of videos, brochures, flip charts, classroom lessons or Web sites) for children (elementary and middle school aged) should not teach children how to abuse inhalants or even entice their curiosity.

Current guidelines would discourage the use of materials that:

- Talk about the “high” or “head rush”
- Identify specific products as inhalable for a high
- Show how products are misused

Today’s prevailing expert consensus about best practices recommends disconnecting inhalant abuse prevention from substance abuse prevention. Instead, education about inhalants should stress their poisonous, toxic, polluting and combustible/explosive nature and should emphasize product safety. When targeting young children who have had little or no exposure to the nature of inhalants, there is no reason to make the association for them that inhalants are like drugs that create euphoria, thereby giving them an easily accessible way to get high.

Preferred messages reframe the issue of inhalants into a public safety approach.

Choose videos and materials that:

- Equate inhalants with poisons, pollutants, fire hazards
- Stress using products as they were intended to be used
- Are careful not to group inhalants in with other drugs
- Are careful not to exaggerate negative effects on the body

New England Inhalant Abuse Prevention Coalition, April 2005

What Every Teacher Can Do to Prevent Inhalant Abuse

Become Aware

- Learn about inhalants, how they are harmful and signs of abuse.
- Learn what products are likely to be abused in the school setting.
- Learn techniques that students might use to abuse products in the school setting.
- Learn what to do if you come upon a student who is inhaling.
- Be alert to slang students may use for inhalant use, such as dusting or air blast. If you are uncertain of the meaning of words you hear students using, do an Internet search.
- Be aware of how much of an abusable item is being used by students.

Use Appropriate Vocabulary

- Always refer to inhalants as *poisons*, *fire hazards* and *pollutants*, not as *drugs*.
- Always refer to the effects of inhalants as *toxic effects*, not as a *high*.
- Encourage avoiding body pollution, the effects of air, water and environmental pollution on our bodies.

Avoid Telling Too Much

- Do not discuss specific products that are abused.
- Do not share specific methods of abuse.
- Never tell or demonstrate how products are abused.

Set a Good Example

- Avoid using products that can be easily abused, such as correction fluid and solvent-based dry erase and permanent markers, in your classroom. Substitute with water-based products.
- Discuss safe use of abusable products by reading aloud product labels and safety precautions.
- Demonstrate safe use of products if you use abusable products in the classroom.
- Monitor student use of abusable products.

Avoid Using Scare Tactics

- Do not exaggerate. When inhalable products are used, we will breathe some of their fumes, gases or vapors. Smelling fresh paint or getting a whiff of gasoline when the car tank is being filled is not dangerous. When used as directed, the vapors quickly dissipate and are not harmful.
- The dangers of breathing concentrated toxic fumes, gases and vapors are real and deadly. Be certain students understand the difference.

Know Your School's Policy and Procedures

- Learn what you should do if you suspect or come in contact with a student abusing an inhalant.
- Follow up if you are suspicious. Inhalant use is too dangerous to ignore.

Information about each of these topics is contained in this manual.

Student Curriculum

Primary goals of the Inhalant Abuse Prevention Student Curriculum are:

- ✓ To teach students about the potential dangers associated with common household products that can be inhaled.
- ✓ To teach students the importance of using those products safely.
- ✓ To teach students about the structures and functions of the brain.
- ✓ To teach students about the impact of brain health on body functions.
- ✓ To teach students about the adverse effects inhalants have on the brain and the body.

Teachers and staff using this curriculum are encouraged to adapt components of the lessons as necessary to suit the needs of students receiving instruction. Vocabulary and concepts may require further development. Activities are designed to be flexible so that learning styles of all students may be honored during instruction.

This curriculum corresponds to the 2001 Virginia Department of Education's Health Education, Physical Education and Driver Education Standards of Learning.

GRADES K-2

Safe or Unsafe?

Safe, Not Sorry

Brain Basics

Pollution-free, That's Me!

Grades K-2 Lesson Introduction

The following section contains sequential lessons for students from kindergarten through grade 2. Included in each lesson are objectives, materials needed, vocabulary and suggested activities. The black line masters may be used for class hand outs, overhead transparencies or as projected slides. For an electronic copy of Inhalant Abuse Prevention: Staff Education and Student Curriculum, visit the Virginia Department of Education's Web site at www.doe.virginia.gov.

A sample letter for parents and guardians located before the lessons introduces the inhalant abuse prevention unit of study, defines inhalants, refers parents to an online training opportunity and includes Poison Center contact information. It may be personalized and altered to meet your needs. The parent/guardian letter and all student worksheets in the K-2 unit may be sent home in student backpacks. Distribute sensitive information regarding inhalants to parents through e-mails or direct mail, since it is imperative to avoid putting specific information about product abuse in the hands of children.

National Inhalants and Poison Awareness Week is the third week in March each year. This is an ideal time to review concepts taught and to implement educational activities and sponsor events which reinforce poison prevention and the proper use of common, readily available household products.

For kindergarten through second grade, the Virginia Inhalant Abuse Prevention Student Curriculum includes these components:

- Define poisons
- List possible pathways of poisons into the body:

Inhaling (breathing in) or smelling substances

Touching or absorbing substances through skin

Tasting substances

- Recognize that breathing in or smelling concentrated vapors/fumes is dangerous
- Review and practice appropriate rules for safety and poison prevention
- Brain structure and function
- Define, identify and discuss examples of pollution
- Body pollution

Teachers should carefully consider their choice of vocabulary and responses when talking about inhalants with their students.

- Substitute *poisons* or *chemicals* for *inhalants*.
- Substitute *toxic effects* for *high* and *experiencing toxic effects* for *getting high*.
- Emphasize that *body pollution* is the result of air/water/environmental pollution and of choosing to introduce harmful substances into your body.
- Always express serious concern for the health and safety of someone who inhales toxic fumes or vapors, whether accidentally or deliberately, especially if the fumes are concentrated.

Never discuss specific products or methods of abuse or show students how products are abused.

Teachers and staff using this curriculum are encouraged to adapt components of the lessons as necessary to suit the needs of students receiving instruction. Vocabulary and concepts may require further development. Activities are designed to be flexible so that learning styles of all students may be honored during instruction.

This curriculum corresponds to the 2001 Virginia Department of Education's *Health Education, Physical Education and Driver Education Standards of Learning for Grades K-2* as follows:

The student will:

- K.1** explain that the body is a living and growing organism. (b,c)
- K.2** explain the importance of being healthy. (b)
- K.3** explain the concept of being safe. (a,c)
- K.4** identify sources of health and safety information.
- K.5** explain the importance of seeking guidance from parents/guardians, trusted adults. (b)
- 1.1** identify the major body systems and their connection to personal health. (a,e)
- 1.2** explain that good health is related to health-promoting decisions. (b,c)
- 2.1** identify the basic components and functions of the systems of the human body. (a,c)
- 2.2** explain that personal health decisions and health habits influence health and well-being throughout life. (b,d)

Sample Letter to Parents and Guardians of Students in Grades K-2

Dear _____,

Today our class is beginning a unit of study on inhalant abuse prevention. Inhalants are legal, everyday products that can be found on grocery store and hardware shelves and in the kitchen, bathroom, office and storage areas of your home. When used properly, these products help us perform necessary tasks at and around our homes and schools. When used improperly, these products can cause health and safety problems for everyone, especially children and teens. The products contain chemicals that are toxic when used in violation of package directions. For this reason, inhalants will be referred to as poisons and toxic substances during our class discussions.

Your child's health and safety is of primary concern to each of us. Two lessons will focus on safety issues regarding known and unknown products. Additional lessons will introduce basic information about the brain - the body's command center - and body pollution. When you ask your child to share what he or she has learned from these lessons, you will be assisting in reviewing important information and practicing valuable skills.

If you would like to learn more about inhalants and about how to talk to your child about them, visit www.inhalantabusetraining.org on the Internet. This site provides an overview on inhalants that has proven very helpful to concerned adults.

Please feel free to call me with any questions or concerns you may have. Thank you for your interest in this topic.

Sincerely,

P.S. All poison centers in the United States can be reached by calling the nationwide toll-free number. Calls are answered by the U.S. Poison Center that serves the individual making the call, based on his or her area code and exchange.

For poison emergencies and information, call:

**1-800-222-1222
24 Hours a Day, 7 Days a Week**

Safe or Unsafe?

GRADES

K-2

OBJECTIVES

- Students will define poisons.
- Students will list the negative consequences of touching, eating or breathing poisonous substances.
- Students will differentiate between poisonous substances and substances which are safe to touch, eat and breathe.
- Students will learn that unknown substances may be poisonous.

MATERIALS AND PREPARATION

- Mounted pictures, described below
- Pair of tongs or thin latex gloves
- Paper grocery bag filled with prepared pictures
- Manila file folder, labeled in large letters: SAFE TO EAT, BREATHE OR TOUCH?
- Inside the open file, label one side YES and the other side NO

- From magazines or newspaper advertisements, cut out colorful pictures of a variety of products: food, beverages, over-the-counter medicines, cleaning products, insecticides, glues, cement glue. Mount them on stock paper and laminate for long-term use. Another option is to mount these on lids of small gift boxes and secure the box lid to the box, making it easier to pick them up.
- Place pictures in the grocery bag.
- Prepare universal symbol for poisons, the skull and crossbones.

VOCABULARY

- *Poison* - A chemical substance that harms, injures or kills a person, animal, plant or the environment.

ACTIVITY

Tell the class that today you will be discussing poisons. Display the skull and crossbones. Lead a discussion about poisons and emphasize that a poison is any substance that can harm a person's body. Ask students to brainstorm ways a poison might hurt someone. They may say such things as causing a stomachache and burning the nose, tongue or throat. Reinforce the concept that poisons can hurt when swallowed, absorbed through the skin or breathed through the mouth and nose.

Invite student volunteers to help with a sorting game. As each student comes forward, give him or her tongs or help the student put on gloves. This will remind students to take proper precautions when handling unknown substances. Invite students to reach into the bag with tongs or gloved hands and pick out one picture. They should hold the picture up and name the object if they can. Be prepared to help.

Then, depending on the object named, ask one of these questions:

- *Is it safe to eat?*
- *Is it safe to breathe?*
- *Is it safe to touch?*

The student will answer the question and place the picture on the appropriate side of the file folder. Encourage the group to discuss any products they don't recognize. Help them identify and sort products, if necessary. Ask students if they have noticed adults at home using gloves or tongs when handling certain products. Discuss their responses. Remind students that children should consult a parent or teacher whenever they encounter an unknown product or substance before tasting, smelling or handling it.

WRAP UP

Store the sorting game on a shelf in the classroom and periodically invite pairs of students to practice their skills in identifying safe and unsafe products. Check for accuracy. Add new pictures to the game periodically and challenge students to decide if these new products are safe to eat, breathe or touch. Spot check to be sure students are sorting correctly.



Safe, Not Sorry

GRADES

K-2

OBJECTIVES

- Students will describe how poisons and pollutants enter the body.
- Students will discriminate between items that are safe and those that may not be safe to smell.
- Students will develop a list of safety procedures to guide their handling of unknown things.

MATERIALS

- Hand outs: *Is It Safe?* and *Safe to Smell?*
- Green and red crayons

VOCABULARY

- *Organ* - part of a living thing, different from its other parts and having a special job.
- *Inhale* - breathe in; to draw air into the lungs.
- *Pollutant* - any substance that harms the air, soil, water or body or makes them unclean.

ACTIVITY

Tell the class that today they will be discussing how to protect their bodies and keep themselves safe. Introduce or review the term *organ*. Ask students: What is the largest organ in the body? (It is the skin.) Ask the students what jobs the skin might have. Add to their answers that the skin is designed to protect their other organs and the inside of their body from being exposed to harm. Guide the students in brainstorming a list of ways the skin protects people. Possible responses are protecting from extreme temperatures, sharp objects, germs, poisons, dust and dirt.

Ask students where these elements could still enter the body. They can enter through cuts and wounds in the skin and through the eyes, ears, nose and mouth. Remind the group that the skin has small openings such as cracks, cuts and pores, so it's important to keep anything that might be harmful off the skin and to keep the skin clean.

Distribute *Is It Safe?* Read the statements to them or have the students read them independently. Ask them to color the circle green if the behavior described is a safe thing to do. Ask them to color the circle red if the behavior is not safe. Discuss each situation.

Invite students to help develop a list of rules that will keep their skin and organs safe. Guide them in refining ideas so that the class creates a final product of several basic rules, such as the following:

- Do not taste, touch or smell unfamiliar things unless a parent or trusted adult says they are safe.

- Do not put a product on your skin unless a parent or trusted adult says it is safe.
- Protect your skin. Wash hands often and keep your body clean.

Distribute *Safe to Smell?* work sheet. Have students identify the pictures and discuss how the products are used. Talk with them about the difference between getting a whiff of the products and having prolonged exposure to them. Ask if adults or teens they know use fingernail polish and fingernail polish remover. Have students ever smelled those strong fumes? Ask if they've ever stood outside the car while an adult or teen has pumped gasoline into the car. Have students ever smelled strong gasoline fumes then? Share that strong fumes such as those send us a signal. Products with very strong fumes may be poisons or pollutants. Those products are not safe to be breathed for long periods of time or breathed in closed spaces. Share the importance of getting fresh air when students are exposed to strong fumes.

Make the important point that some odorless products are also not meant to be breathed for long periods or in closed spaces. Children should never handle products alone and should always get the help of a trusted adult when they find cans, bottles or other containers anywhere.

Share that there are some things which are perfectly safe to smell over and over again. The aromas from some things are very pleasant and are not harmful at all. Other products should not

be intentionally breathed in, although getting a whiff of them will not hurt us.

Draw students' attention to *Safe to Smell?* Ask students to circle the items which are pleasant and safe to smell. Ask students to put an X over the items which must be used only by an adult or with adult supervision. Check student work. Discuss the possible consequences of breathing in poisons or pollutants. Emphasize that these could have negative consequences, especially if we inhale them in large quantities or over long periods of time. For example, getting too many fumes from an insecticide might make a person nauseous or dizzy. It may even raise their heart rate. Getting too many fumes from paint may cause a headache, stomachache or dizziness. Getting too many fumes from household cleaners could result in nausea, dizziness, vomiting, headaches or other illnesses. Getting too many fumes from any poison or pollutant can cause serious problems.

WRAP UP

Ask students to review how poisons or pollutants can enter the body with a classmate. Remind them of the safety procedures they developed that can help keep their skin and other organs safe from poisons or pollutants.

Send *Is It Safe?* and *Safe to Smell?* home with students. Encourage them to share what they learned or reviewed today with their families.

Is It Safe?

Read each sentence.

Color the circle **GREEN** if it is **SAFE**.

Color the circle **RED** if it is **UNSAFE**.

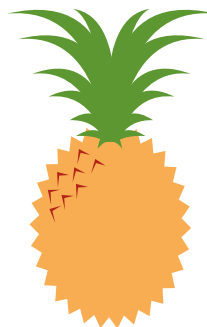
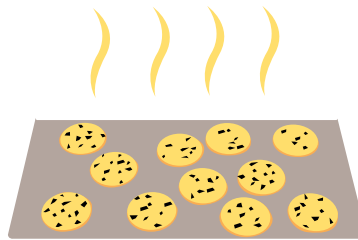
- Is it safe to smell the juice in your cup?
- Is it safe to eat a wild berry from the woods?
- Is it safe to touch the fur on your cat's back?
- Is it safe to eat the peaches from a can someone at home just opened?
- Is it safe to breathe the paint fumes in a closed room for a long time?
- Is it safe to color your hands with permanent markers?
- Is it safe to eat green powder from the floor?
- Is it safe to touch the sand in your backyard sandbox?
- Is it safe to breathe in from a spray can you have found?

Safe to Smell?

Look carefully at each picture.

Circle the items that have a pleasant aroma
and are safe to smell.

Put an X on the items that must be used only by an adult.



Is It Safe? Answer Key

- Is it safe to smell the juice in your cup? **Green**
- Is it safe to eat a wild berry from the woods? **Red**
- Is it safe to touch the fur on your cat's back? **Green**
- Is it safe to eat the peaches from a can someone at home just opened? **Green**
- Is it safe to breathe the paint fumes in a closed room for a long time? **Red**
- Is it safe to color your hands with permanent markers? **Red**
- Is it safe to eat green powder from the floor? **Red**
- Is it safe to touch the sand in your backyard sandbox? **Green**
- Is it safe to breathe in from a spray can you have found? **Red**

Safe to Smell? Answer Key



Brain Basics

GRADES

K-2

OBJECTIVES

- Students will learn that all body functions are controlled by the brain.
- Students will learn that all body functions are influenced by how well the brain works.
- Students will identify three major regions of the brain.
- Students will learn that oxygen helps provide the brain with energy.

MATERIALS

- *Your Command Center*
- Three cutout sections of the brain: cerebral cortex, cerebellum, brain stem prepared from *Your Command Center* (pg. 58)
- Easel, whiteboard or chalkboard
- Appropriate water-based, non-toxic, unscented markers

VOCABULARY

- *Command center* - the brain, for purposes of these lessons.
- *Cerebral cortex* - wrinkly outer layer of the brain that helps us see, hear, taste, feel things, talk, think, solve problems, learn and remember things.
- *Cerebellum* - lower back part of the brain that helps control balance and movement.
- *Brainstem* - base of the brain that continues into the spinal cord and controls body functions such as breathing, heart rate, blood pressure and digestion.

Vocabulary will be introduced to clarify information later in the lesson. These words should not be discussed prior to the lesson.

ACTIVITY

Tell the class that today you want them to get to know their own personal *command center*. Briefly discuss the term *command* with them and conclude that *command* means an issue of orders, giving directions or being in charge of something. Ask students to name some very important organs of the body and list their responses. Possible responses include eyes, ears, heart, lungs, stomach, intestines, liver and brain. Ask students to tell you what jobs these organs do for the body. List the job each organ performs beside its name on the chart. Ask the students what part of the body might be in charge of all of the organs, making certain that they do their jobs well.

Display the outline of the brain and introduce this as the *command center* of the body. Ask: *Did you know there is a special part of the brain that commands our eyes to see colors and shapes? This same part also commands our ears, nose and tongue to do their jobs. It helps us talk, think, solve problems and remember things!* Introduce the *cerebral cortex*, have the class repeat the term in unison and ask a volunteer to place that cutout in its proper location on the larger brain outline. Guide the class into a discussion about how hard the brain must have to work to command the body to do so many things.

Ask: *What are some favorite things you like to do outdoors?* Possible responses are to take walks, run a race, ride bikes, skip rope, play hopscotch and play sports. Ask: *Did you know there is a special part of the brain that commands our bodies to move as we run around? It also helps us keep our balance as we move in all sorts of ways.* Introduce the *cerebellum*, ask the class to repeat the term in unison and ask a volunteer to place that cutout in its proper location. Continue to emphasize how hard the brain must have to work to oversee all these jobs.

Now ask: *Did you know there is a special part of the brain that commands us to do all the things we don't even think about?* The brain makes sure those jobs get done. Introduce the *brainstem*, have the class repeat the term in unison and ask a final volunteer to place the cutout in its appropriate location on the outline. Ask the class about things their bodies do that they don't have to think about. Possible answers are eyes blinking, heart beating, lungs taking in air and stomach digesting food. Conclude this discussion by stating that the brain is working very hard all of the time to make certain that the body is functioning well.

Ask students what they need to do after they have run, played or worked in class a very long time. Possible responses are to rest, get a drink of water, get some fresh air or eat a snack or meal. Explain that when we have worked or played for a long time, we have expended a lot of energy. That fresh air, meal or snack helps reenergize us. Just as we need energy for our bodies, our brains also need energy. Oxygen helps create that energy. Without energy, our brains can't function.

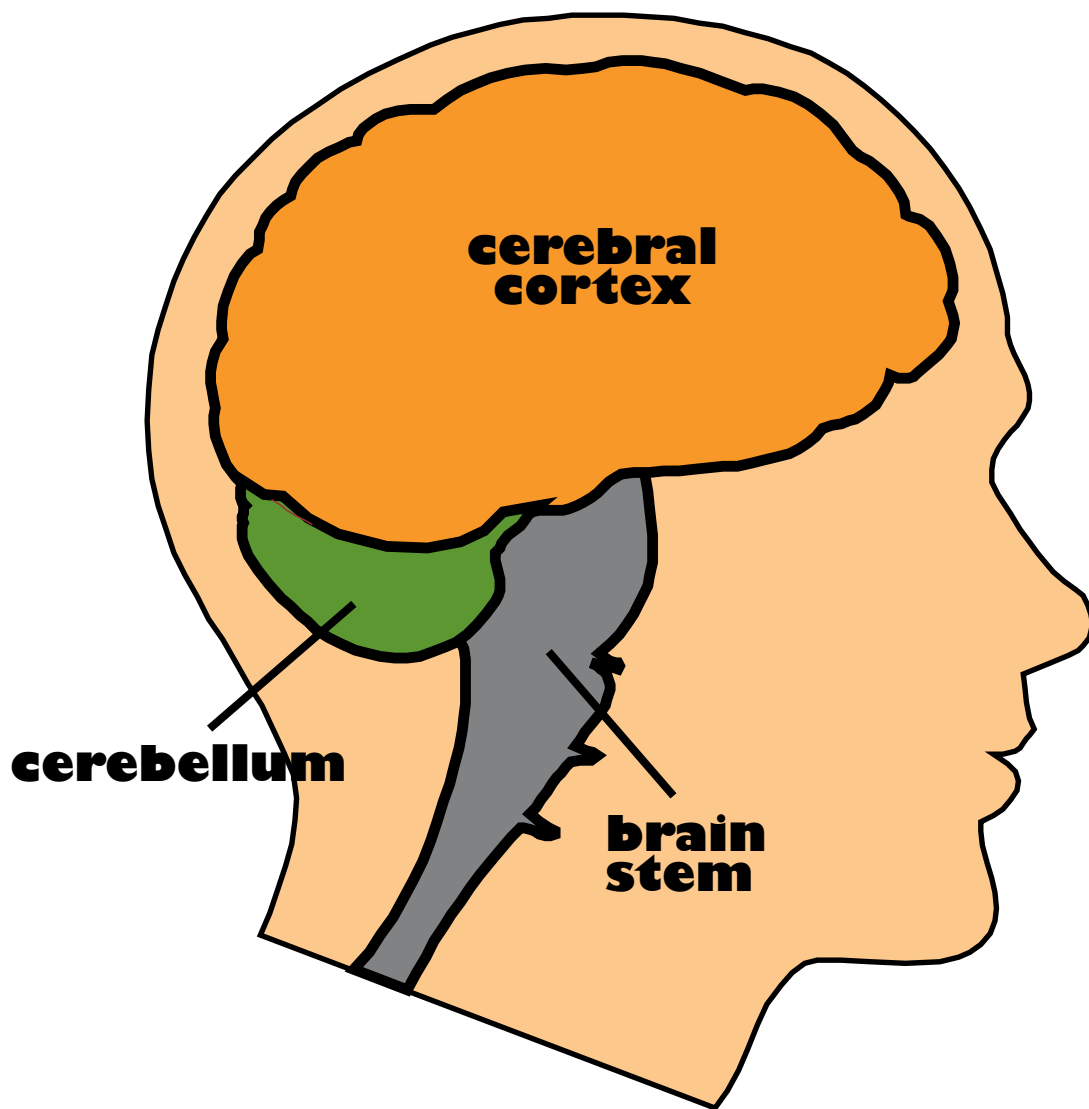
Remind students that if their brains don't function well, their bodies won't function well. Ask students why they think it is important to have brains and bodies that function well. Possible responses include that students enjoy specific physical activity such as playing softball or dancing, they enjoy learning and they enjoy solving problems. Remind students that they can enjoy all of these things because their brains and bodies are healthy and functioning well. Handle this response carefully if you have children with physical or mental disabilities in your classroom.

WRAP UP

Ask your class to join you in a quick exercise. *You've worked hard today and learned a lot. Let's review. Before we do, let's reenergize our brains for fresh thinking. Take a slow, deep breath with me.* Take one or two breaths together as a class.

Review the major regions of the brain and some of the jobs each region of the brain helps us perform. Have students give examples of why it is important to love and care for their brains. Ask students to give a few ideas on how to best care for their brains. Possible answers are eating well, getting enough sleep, not tasting or touching poisons and wearing helmets when riding bicycles, motorcycles or ATVs.

YOUR Command Center



Pollution-free, That's Me!

GRADES

K-2

OBJECTIVES

- Students will discuss the concept of body pollution.
- Students will create a list of ways to avoid body pollution.

MATERIALS

- *Pollution-free, That's Me!* work sheet
- Easel, whiteboard or chalkboard
- Appropriate water-based, non-toxic, unscented markers

VOCABULARY

- *Body pollution*- harming the body by introducing poisons or pollutants

ACTIVITY

Discuss the types of pollution the class is familiar with: air, water and soil pollution. Ask students how the air, water and soil become polluted. Get examples from several volunteers. Ask: *What are some things adults and children can do differently to keep from further polluting our air, water and soil?* Ask volunteers for answers. Possible

answers include that children can avoid littering by putting waste in its proper place and adults can avoid driving large cars, trucks and SUVs.

Ask: *What are some ways in which our body can become polluted?* Discuss our need for clean air, our need to eat foods that are not tainted and our need to avoid breathing chemicals with strong fumes. We need to stay away from poisons and pollutants. Share with the class that we should get plenty of fresh air in order for our brains and our bodies to function well.

List and review concepts from past classes that will help children avoid body pollution:

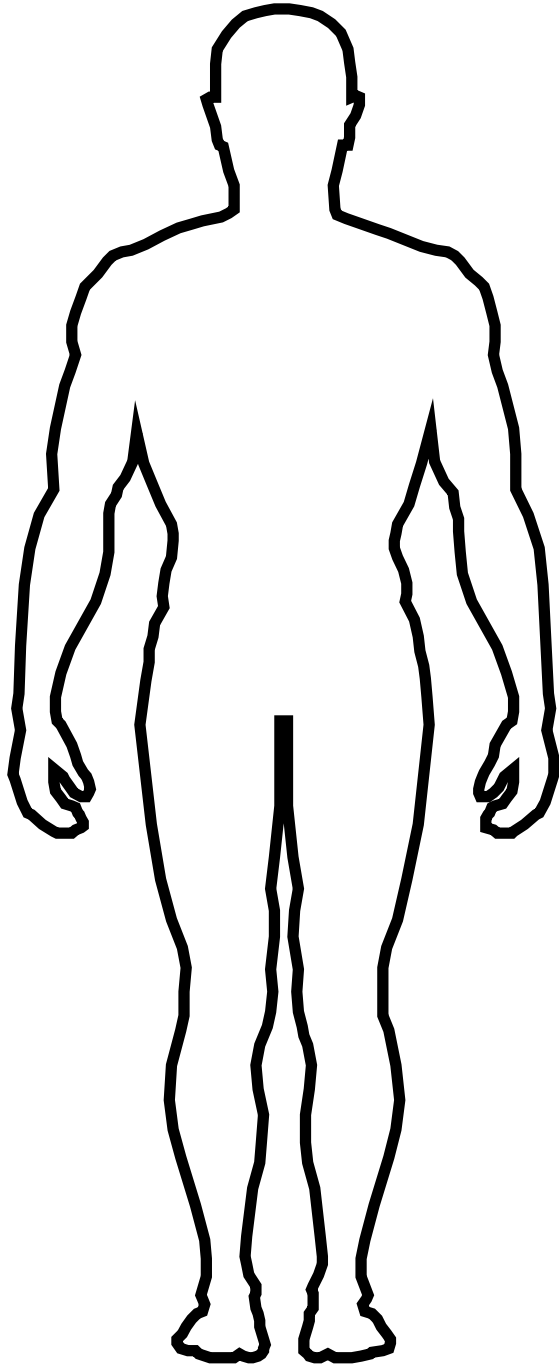
- Always get the help of a trusted adult when dealing with chemical products.
- Follow all safety precautions on products.
- Avoid breathing of strong chemical fumes.
- Avoid staying in confined spaces or closed rooms when you are exposed to strong fumes.

WRAP UP

Distribute the *Pollution-free, That's Me!* work sheet to each student. Inside or around the black line body form, students can draw pictures or symbols that represent ways they can remain pollution-free.

Underneath the body, older students can write one or two sentences summarizing steps they can take to remain pollution-free.

Pollution-free, That's Me!



**Draw pictures or symbols
or write one or two sentences
that represent ways you can
remain pollution-free.**

Grades 3-5

What Do We Need to Live?

Breathe In, Breathe Out

Brainworks

What You Can't See Can Hurt You

•

Supplemental Activities

Guidance for Teachers

Grades 3-5 Lesson Introduction

The following section contains sequential lessons for students from grades three through five. Included in each lesson are objectives, materials needed, vocabulary and suggested activities. The 3-5 unit is followed by *Fast Facts*[™], a review of essential information which may be used separately to instruct key concepts in this manual. The Supplemental Activities section includes quick discussion topics for lesson reinforcement, exercises concerning health and safety issues relating to inhalants, *Amazing Brain Facts* and *Healthy Brain Tips*. All supplemental activities may be used to reinforce inhalant abuse prevention topics taught throughout the school year. The black line masters may be used for class hand outs, overhead transparencies or as projected slides. For an electronic copy of *Inhalant Abuse Prevention: Staff Education and Student Curriculum*, visit the Virginia Department of Education's Web site at www.doe.virginia.gov.

A sample letter for parents and guardians located before the lessons introduces the inhalant abuse prevention unit of study, defines inhalants, refers parents to an online training opportunity and includes Poison Center contact information. It may be personalized and altered to meet your needs. The parent/guardian letter and student worksheets in the 3-5 unit may be sent home in student backpacks. Distribute sensitive information regarding inhalants to parents through e-mails or direct mail, since it is imperative to avoid putting specific information about product abuse in the hands of children.

National Inhalants and Poison Awareness Week is the third week in March each year. This is an ideal time to review concepts taught and to implement educational activities and sponsor events which reinforce poison prevention and the proper use of common, readily available household products.

For grades three through five, the Virginia Inhalant Abuse Prevention Student Curriculum includes these components:

- Function of the respiratory system
- Importance of oxygen to life and body functions
- Deprivation of oxygen, negative effects and survival time
- Structure and function of brain
- Importance of hemoglobin to respiration
- Impact of body pollution
- Importance of safety skills related to use of toxic substances:
 - Reading labels
 - Following directions
 - Taking proper precautions

The following section contains sample lessons that may be included as part of an inhalant abuse prevention unit. These lessons complement educational activities related to health, safety or the environment. The black line masters may be used for class hand outs, overhead transparencies or as projected slides. For an electronic copy of *Inhalant Abuse Prevention: Staff Education and Student Curriculum*, visit the Virginia Department of Education's Web site at www.doe.virginia.gov.

Teachers should carefully consider their choice of vocabulary and responses when talking about inhalants with their students.

- Substitute poisons or chemicals for inhalants.

- Substitute *toxic effects* for *high* and *experiencing toxic effects for getting high*.
- Emphasize that *body pollution* is the result of air/water/environmental pollution and of choosing to introduce harmful substances into your body.
- Always express serious concern for the health and safety of someone who inhales toxic fumes or vapors, whether accidentally or deliberately, especially if the fumes are concentrated.

Never discuss specific products or methods of abuse or show students how products are abused.

Teachers and staff using this curriculum are encouraged to adapt components of the lessons as necessary to suit the needs of students receiving instruction. Vocabulary and concepts may require further development. Activities are designed to be flexible so that learning styles of all students may be honored during instruction.

This curriculum corresponds to the 2001 Virginia Department of Education's *Health Education, Physical Education and Driver Education Standards of Learning for Grades 3-5* as follows:

The student will:

- 3.1 explain that health habits impact personal growth and development. (b)
- 3.2 use decision-making skills to promote personal health and well-being. (a,c)
- 3.3 identify the effects of drug and inhalant experimentation and alcohol and tobacco use on personal health. (b,c,d,e)
- 4.2 develop the skills necessary for coping with difficult relationships. (a)
- 4.3 describe and evaluate the effects of alcohol, inhalants, tobacco, and drug use on the family and community. (a,b,d)
- 5.1 demonstrate the interpersonal skills necessary to build healthy relationships. (b)
- 5.2 demonstrate responsibility for developing personal health habits and practicing the behaviors that promote an active, healthy lifestyle.
- 5.3 analyze the risks of dependence and addiction associated with the use of alcohol, tobacco, inhalants and other drugs on the systems of the body. (a,b,c)

Sample Letter to Parents and Guardians of Students in Grades 3-5

Dear _____,

Today our class is beginning a unit of study on inhalant abuse prevention. Inhalants are legal, everyday products that can be found on grocery store and hardware shelves and in the kitchen, bathroom, office and storage areas of your home. When used properly, these products help us perform necessary tasks in and around our homes and schools. When used improperly, these products can cause health and safety problems for everyone, especially children and teens. The products contain chemicals that are toxic when used in violation of package directions. For this reason, inhalants will be referred to as poisons and toxic substances during our class discussions.

Inhalant abuse refers to the deliberate inhalation of fumes, vapors or gases to achieve a mood-altering effect. Although inhalants are legal products when used as directed, their abuse by young people may result in later drug use, brain damage or death, even after a single use. Research tells us that children are often first introduced to inhalants in the elementary years.

The brain is growing and changing rapidly throughout childhood and adolescence and is not completely developed until roughly age 25. The growing brain is particularly vulnerable to the impact of toxic substances.

When you ask your child to share what the class discussed about inhalants, the brain and the impact toxic substances can have on the brain, you will be assisting them in recalling critical information and practicing valuable skills.

If you would like to learn more about inhalants and about how to talk to your child about them, visit www.inhalantabusetraining.org on the Internet. This site provides a brief overview on inhalants that has proven very helpful to concerned adults.

Please call me with any questions or concerns you may have. Thank you for your interest in this topic.

Sincerely,

P.S. All poison centers in the United States can be reached by calling the nationwide toll-free number. Calls are answered by the U.S. Poison Center that serves the individual making the call, based on his or her area code and exchange.

For poison emergencies and information, call:

1-800-222-1222

24 Hours a Day, 7 Days a Week

What Do We Need to Live?

GRADES

3-5

OBJECTIVES

- Students will list three things that are essential for survival.
- Students will identify the length of time people can survive without food, water or oxygen.
- Students will compare the roles of food, water and oxygen to a person's health and safety.

MATERIALS

- What Do We Need to Live?
- Chart paper, chalkboard or whiteboard
- Appropriate water-based, non-toxic, unscented markers

VOCABULARY

- *Essential* - required, necessary.

ACTIVITY

Begin by asking students to think about three things they would like to have and three things they absolutely need for survival. List their responses, then circle food, water and oxygen (or air). Introduce the vocabulary word *essential* and explain that the things they must have are *essential*, required or necessary for them to survive. Explain that food, water and oxygen are the most essential things people need in order to live.

Display *What Do We Need to Live?* and ask students to guess how long a person could live without any **FOOD**. There would be water, but no food. Take guesses from several students and use the highest answer given to poll the class. *How many people think we could live longer than _____ without any food?*

Explain that there is no precise answer, but there is a range of possibilities depending on an individual's age, general health and living conditions. For example, a newborn baby might only survive for two days, while healthy, physically fit adults in their twenties might live for two months! A compromise of **weeks** might be agreed upon by the class. List **weeks** below the picture of food.

Now ask students to consider how long someone could live without **WATER**. There would be food, but no water. After several students answer, use the highest number again to poll the class. *How many think we could live more than _____ without any water?*

Again, explain that this issue is very subjective. Since the human body is more than 75% water, a person must take in adequate fluids or risk dehydration and death. Advise the class to compromise and write **days** below the water.

Finally, discuss the length of time that a person might survive without **OXYGEN**. After several students have answered, point out that survival time is virtually limited to the number of minutes that a person can hold his or her breath.* When a person cannot breathe, he or she soon becomes unconscious and, if no oxygen is available, the individual will soon die. Remind the group that even trained divers can only hold their breath for up to about eight minutes and that the world's record for holding breath is nine minutes. Survival time would be much shorter for infants and toddlers, people with lung impairments such as asthma or emphysema, the very elderly or those who are very ill. Explain that cells need oxygen to perform their basic functions. Generalize by writing **minutes** below the symbol for oxygen.

Guide students in evaluating the three items and deciding which of the three is most important every single second of their lives. Clearly it is **OXYGEN**. Life would be over in minutes without it!

Review by reminding students how important it is to safeguard our air supply and our body's respiratory system to make certain that we have adequate oxygen at all times.

WRAP UP

Ask for a volunteer to explain this statement: *Oxygen is more important than water or food for survival.*

If necessary, remind students that people can survive only minutes without oxygen, while some may survive days without water and weeks without food. Offer students the choice to write a paragraph, prepare to verbally explain or draw a picture to illustrate that concept. Have students pair off and share their responses.

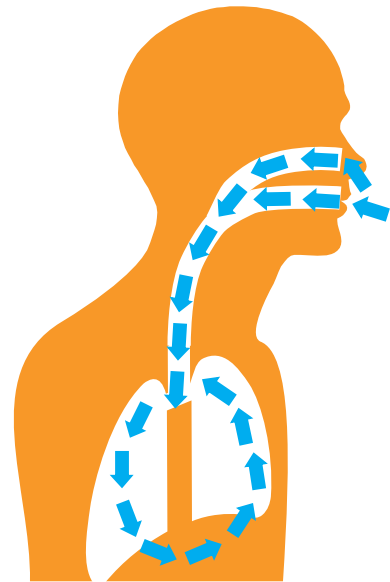
Reinforce the importance of oxygen and an adequate air supply by asking students why firefighters wear oxygen masks. Remind them that oxygen is critical to life and that toxic fumes, such as those generated by a fire, can reduce the amount of oxygen available for breathing.

**Students may know about the "cold water phenomenon" whereby the body immersed in icy water appears to shut down to prolong survival. If the person is young, healthy and properly revived, it is possible for them to recover fairly well.*

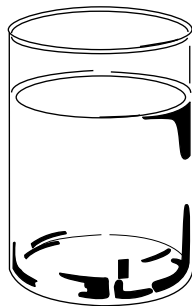
What do we need to live?



FOOD



OXYGEN



WATER

Breathe In, Breathe Out

GRADES

3-5

OBJECTIVES

- Students will describe the process of respiration.
- Students will describe the role of oxygen in the body.
- Students will learn the main function of hemoglobin.
- Students will explain the negative effects of an inadequate oxygen supply to the brain and the body.
- Students will explain the negative effects of toxic substances on the brain and the body.

MATERIALS

- *Inside the Lungs*
- *Oxygen and Your Body*
- *Hemoglobin and Oxygen*
- Overhead projector or LCD projector
- Appropriate water-based, non-toxic, unscented markers

VOCABULARY

- *Respiration* - the act or process of inhaling and exhaling; breathing; ventilation.
- *Trachea* - the tube connecting the mouth to the bronchial tubes that carries air to the lungs; the windpipe.
- *Bronchial tubes* - the system of tube-like structures that connects the trachea to the lungs.
- *Capillaries* - the tiny blood vessels that form an intricate network throughout the body to distribute oxygen and nutrients to the cells and remove waste products.
- *Alveoli* - tiny, thin-walled, capillary-rich air sacs in the lungs where the exchange of oxygen and carbon dioxide takes place.
- *Red blood cells* - the disk-shaped cells in the blood that contain hemoglobin. Red blood cells supply oxygen to all body cells and remove the carbon dioxide wastes that result from metabolism.
- *Hemoglobin* - a complex molecule which carries oxygen in the blood.

This vocabulary will be introduced as **Inside the Lungs and Oxygen and Your Body** are used.

ACTIVITY

Display *Inside the Lungs* and introduce or review the structures and functions of the respiratory system. Tell the students that the lungs are designed for maximum inhalation and absorption of oxygen through the large numbers of *alveoli* (air sacs) and *capillaries* (narrow tubes) that surround the lungs.

Use *Oxygen and Your Body* to explain the pathway for oxygen through the bloodstream to the brain and the body. Have students immediately repeat oxygen's pathway in the body to a partner. Emphasize that the pathway oxygen follows is the same pathway any substance that is breathed in would follow to the brain. Remind students how quickly oxygen or the other unfiltered substances get to the brain - within seconds.

Ask students why oxygen is routed to the brain before going to any other part of the body. Elicit responses and summarize that oxygen is essential for the creation of energy in the brain. Since the brain directs all operations of the body, it must receive routine supplies of fresh oxygen so it has the energy to function properly and to command other body parts to function properly.

Distribute *Hemoglobin and Oxygen* and read and explain the information or ask volunteers to read its top portion. Review the information after they read aloud. Ask students how they can tell one gas from another. *Do gases look different? Because gases are invisible, they all look alike to us. Hemoglobin knows the difference! We breathe in and oxygen goes into the lungs. Hemoglobin selects oxygen, pulls it into the bloodstream and circulates it through the body. We breathe out and rid our bodies of carbon dioxide.*

Pose this scenario to students: *Suppose you went on a space mission and landed on Mars. Would you be able to step outside of the spaceship without a spacesuit?* Children will probably respond NO! The gaseous mixture on Mars cannot

be used by the human body. The gases might even be toxic. Then ask if students can decide that they don't like oxygen any more. Can they choose to have their bodies use another gas to do the same work that oxygen does for the body? Is this possible? No. The human body is designed to use only oxygen to help create energy.

Refer to *Hemoglobin and Oxygen* once again and ask that students read the section on brain damage. Tell students that brain cells can get hurt - anywhere from slightly damaged to completely destroyed - when the body is polluted because toxic substances replace oxygen or when there is not enough oxygen available for other reasons. This damage may be temporary or permanent, and no one can predict what the results might be or if the person will recover completely.

Lead a discussion about the importance of healthy cells in the brain. Include such concepts as the brain's role in muscle functioning and coordination, the thinking process and receiving and interpreting signals from the senses. Present specific examples of how oxygen deprivation might impact a runner (slower speeds, more awkward movements, muscle cramps), a dancer (less grace and fluidity of movement, muscle cramps) or a singer (less vocal range, inability to sustain musical notes). Ask for students to provide other examples that relate to learning and memory. In each situation discussed, clarify that the loss of oxygen to the cells always results in the body not functioning as well as with an adequate supply of oxygen.

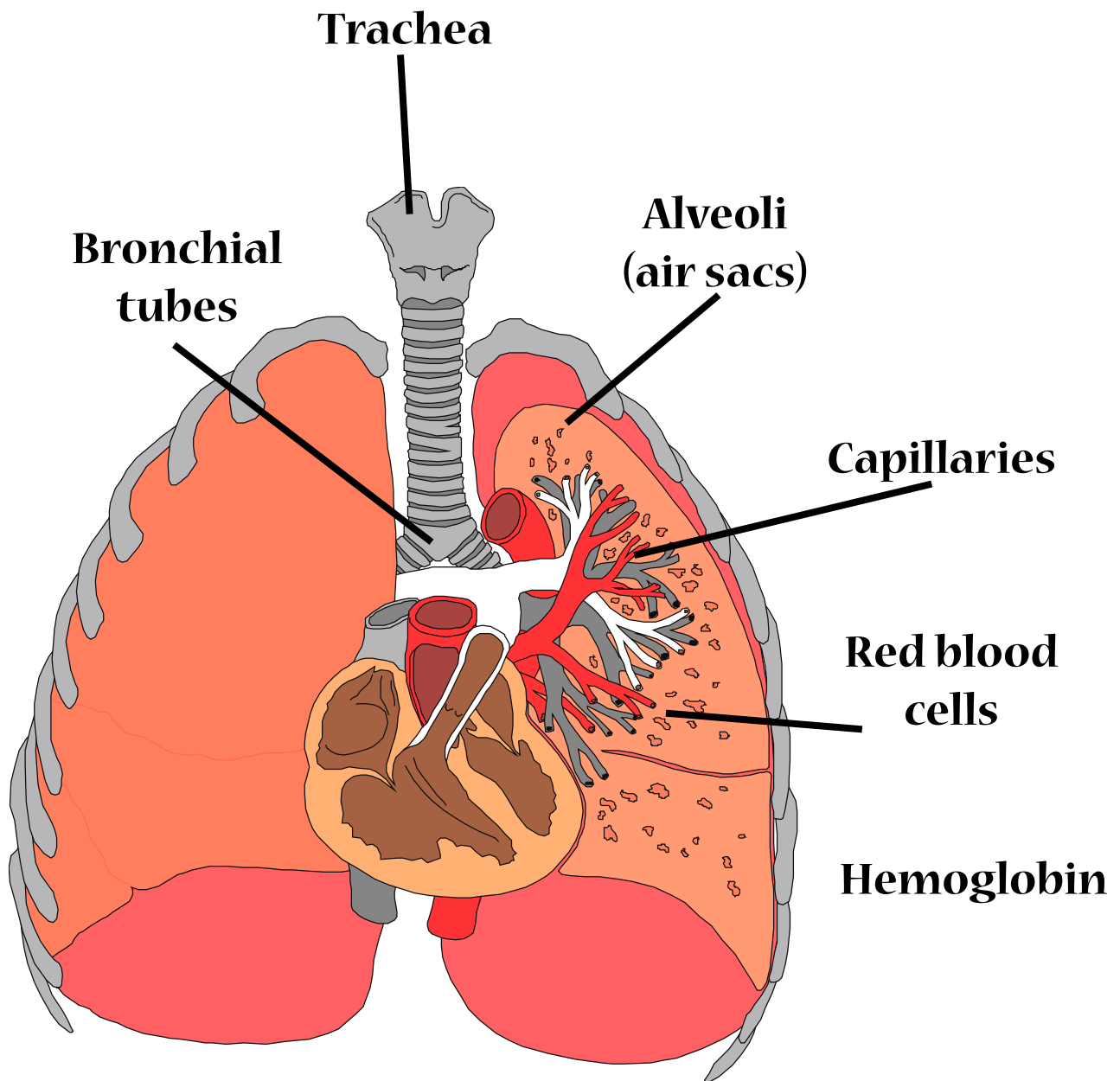
The introduction of poisons into the brain results in displacing oxygen and in toxic fumes and vapors damaging or destroying brain cells. Explain that when dangerous fumes and vapors enter the body, they are not filtered. Harmful chemicals from those fumes and vapors go directly to the brain. They reduce the body's oxygen supply and they poison the brain and the body. The first time or any time concentrated toxic substances are introduced into the body, they can kill.

WRAP UP

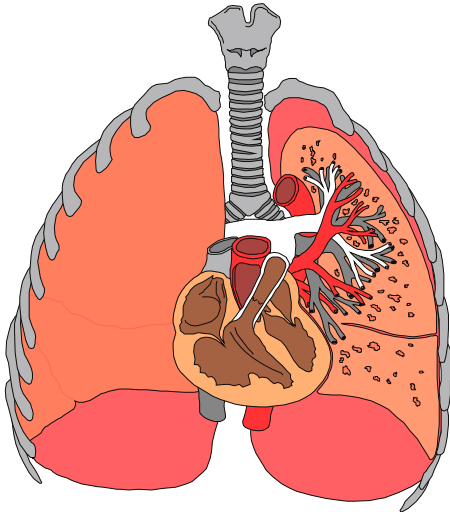
Invite each class member to partner with a peer and review the pathway that oxygen takes in the body, the role hemoglobin plays in respiration and the time it takes for oxygen or any other unfiltered, inhaled substance to reach the brain. The second partner can review what happens to the brain when harmful chemicals are inhaled into the body.

Challenge students to brainstorm creative ways they can demonstrate the pathway oxygen takes to the brain and the body. Suggest that they could create a role play, think of using plastic tubes, marbles, sponges and similar materials, using edibles or create a colorful diagram. Collect and post ideas. Follow up with the actual projects when appropriate.

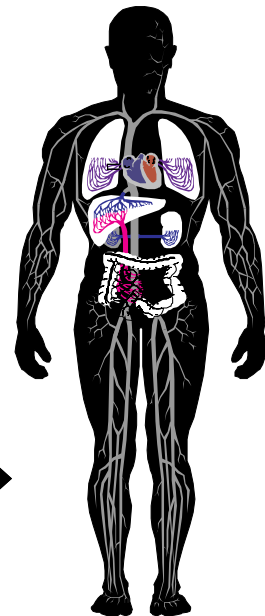
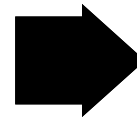
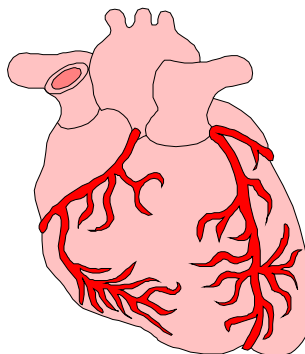
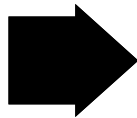
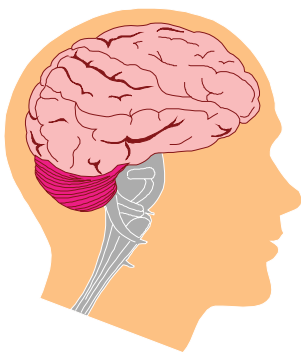
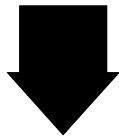
Inside the Lungs



Oxygen and Your Body



**Blood contains red blood cells.
Red blood cells contain
hemoglobin.
In the lungs, hemoglobin
grabs oxygen and
pulls it into blood.**



**Blood takes oxygen from the lungs first to the BRAIN,
then to the HEART, and then through the body.**

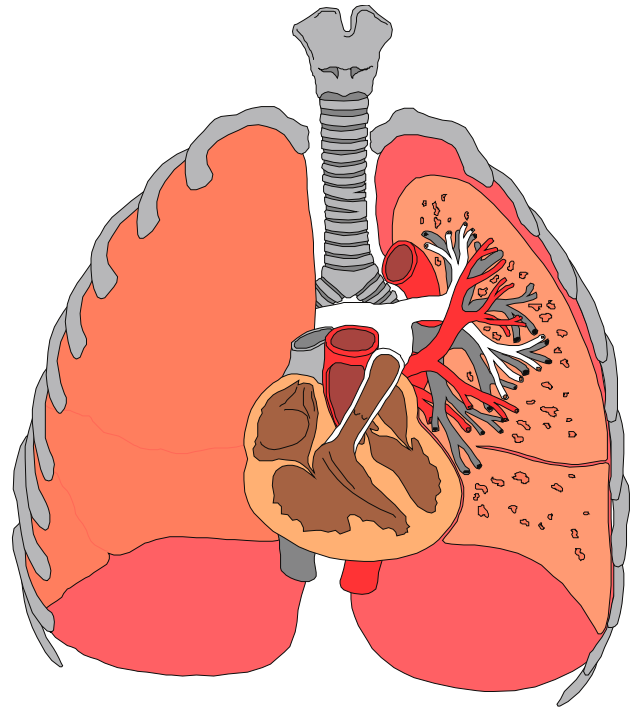
Hemoglobin and Oxygen

Hemoglobin picks up oxygen from the alveoli in the lungs.

If vapors and fumes are in the lungs, there may not be much oxygen for the hemoglobin to pick up.

Vapors and fumes in the lungs mean that poisons are in the lungs.

This leaves your brain cells and body with concentrated toxic fumes and without enough oxygen.



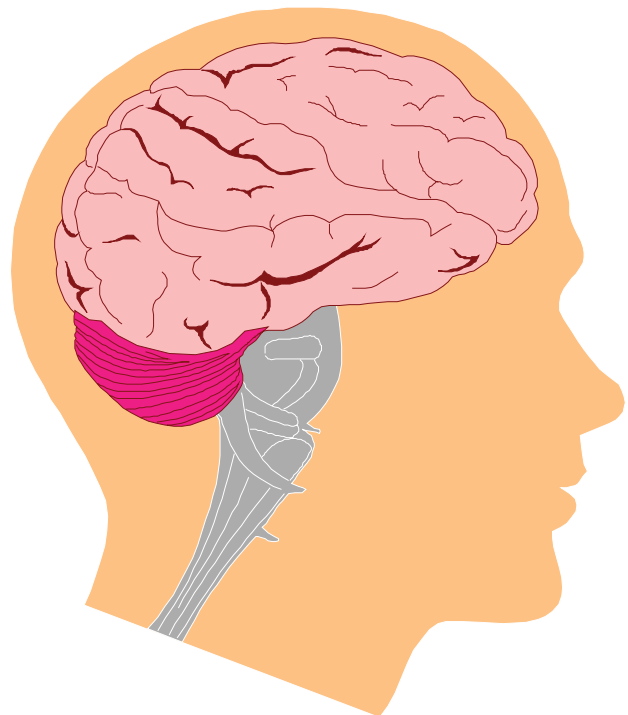
Without enough oxygen, the brain cannot function well. It could be damaged. Breathing in concentrated toxic fumes can cause brain damage, too. Brain damage means changes to the cells and functions of the brain.

Brain damage could result in:

- memory problems.
- difficulty with balance or movement.
- problems seeing, hearing and speaking.
- loss of body functions.
- learning difficulties.
- uncontrollable behavior.
- other physical, mental or emotional changes.
- death.

Sometimes damage is temporary.

Sometimes damage is permanent.



Brainworks

GRADES

3-5

OBJECTIVES

- Students will identify four major regions and four lobes of the brain.
- Students will repeat the brain functions of the four regions and four lobes.
- Students will analyze the effect of oxygen loss on each region.

MATERIALS

- *How the Brain Works*
- *Amazing Brain Facts*
- Cutouts of the four regions and four lobes of the brain
- Individual hand outs of the outline of the brain, if desired
- Overhead projector or LCD projector
- Chart paper
- Appropriate water-based, non-toxic, unscented markers

VOCABULARY

- *Cerebral cortex* - wrinkly outer layer of the brain that helps us see, hear, taste, feel things, talk, think, solve problems, learn and remember things. The cerebral cortex contains the frontal lobe, temporal lobe, parietal lobe and occipital lobe. They each perform special functions.
- *Cerebellum* - lower back part of the brain that helps control balance and movement.
- *Brainstem* - base of the brain that continues into the spinal cord that controls body functions such as breathing, heart rate, blood pressure and digestion.
- *Spinal cord* - thick column of nerve tissue that extends from the base of the brain into the backbone. It carries nerve impulses back and forth between the brain and other body parts.
- *Command Center* - the brain, for purposes of these lessons.

This vocabulary will be introduced as the lesson develops.

ACTIVITY

Project *How the Brain Works* to introduce each region of the brain. As a region is introduced, explain where it is located and have a volunteer place it properly inside the black line drawing of the brain. Define that region and state one thing that can take place in the body because of the work it does. Challenge students to give additional examples. Extend their contribution by adding:

Cerebral cortex - problem solving, memorizing facts, planning, organizing

Cerebellum - dancing, playing sports, clapping hands, doing yoga and aerobics

Brainstem - digesting food, breathing

Spinal cord - sends pain signals, coordinates reflex actions

Come back to the cerebral cortex and explain that, within that region of the brain, there are four lobes. Supply students with cutouts of the four lobes and challenge them to fit the pieces together within the cerebral cortex on the posted black line drawing of the brain. Explain that there are many tasks taken care of in the cerebral cortex and that special regions of the brain, called lobes, are responsible for certain tasks.

Frontal lobe - talking, solving problems, reasoning

Temporal lobe - Language, memory, reading social cues, distinguishing smells, sounds

Occipital lobe - recognizing shapes and colors

Parietal lobe - understanding spoken and written language

Challenge your students to use **their** frontal lobes to come up with a strategy for remembering all the regions of the brain and the lobes and their functions. Encourage volunteers to share their learning strategies. Post the strategies on chart paper.

Tell students that it's time for some *Amazing Brain Facts*. Project the title only, hiding the fun facts. Create a fill-in-the-blank opportunity for some of the facts that may have been taught previously. As you introduce each new bit of information, have fun with it. For example, when sharing that

the brain weighs about three pounds, students would enjoy knowing that the human brain weighs about as much as a Chihuahua! When sharing that a third of all the cells in the brain are fat cells, ask if students think the brain has thought about dieting. Have fun as you introduce or review these fascinating facts.

As you conclude this activity, stress the final statement. If we want these messages to travel well so our bodies can work well, we must take very good care of our brains! Get ideas from volunteers on how they take very good care of their brains. Possible responses are to use helmets when riding bikes or ATVs, eating well, getting enough sleep, taking a multi-vitamin, getting regular exercise and staying away from concentrated toxic fumes indoors or outdoors.

WRAP UP

As you read the sentence stem aloud, have each student share answers with a partner.

One thing I learned today was _____.

I think the most important region of my brain is _____ because _____.

I think the most important lobe of my cerebral cortex is _____ because _____.

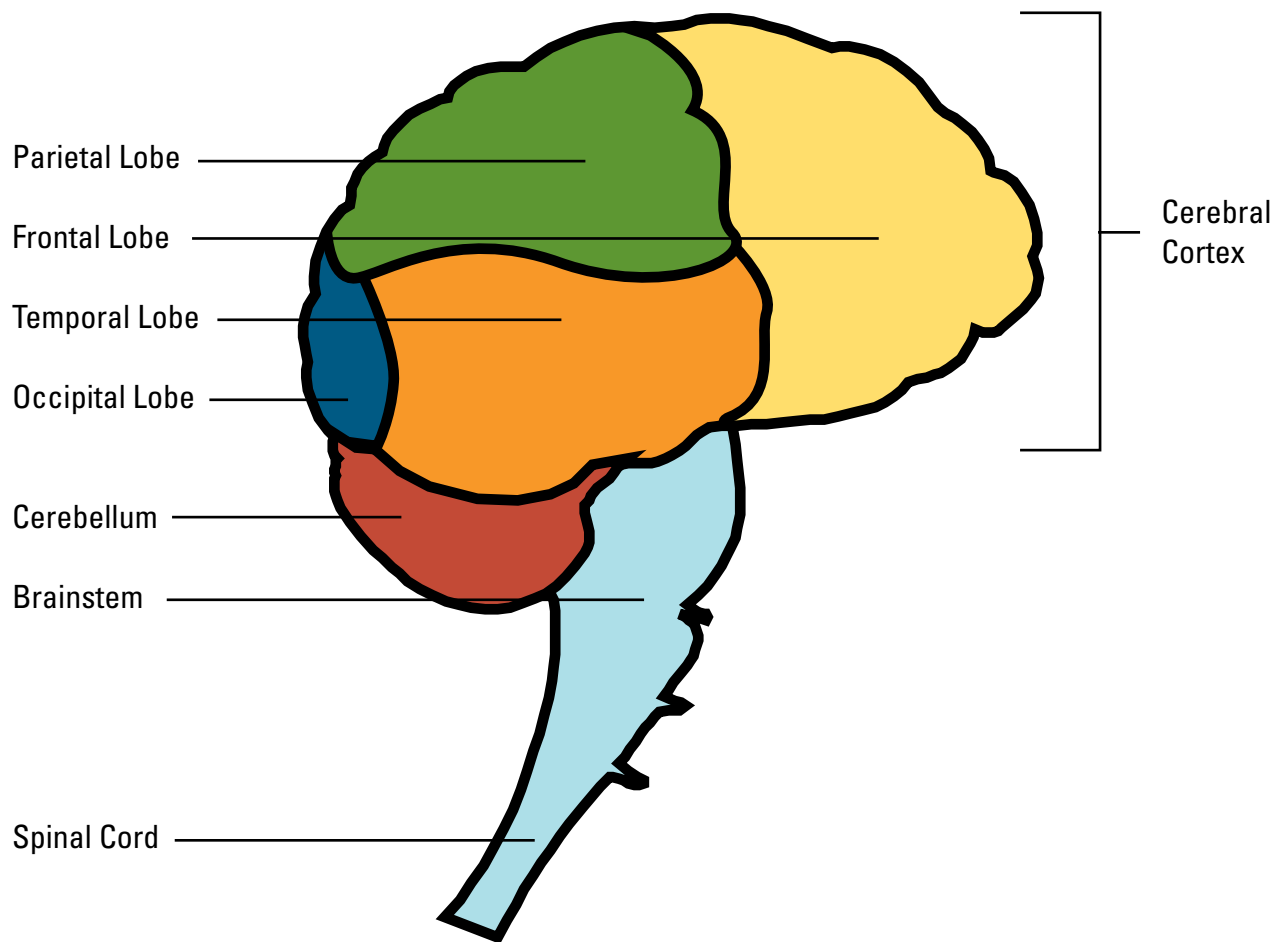
My cerebellum needs oxygen to _____.

Without enough oxygen, my occipital lobe might not be able to _____.

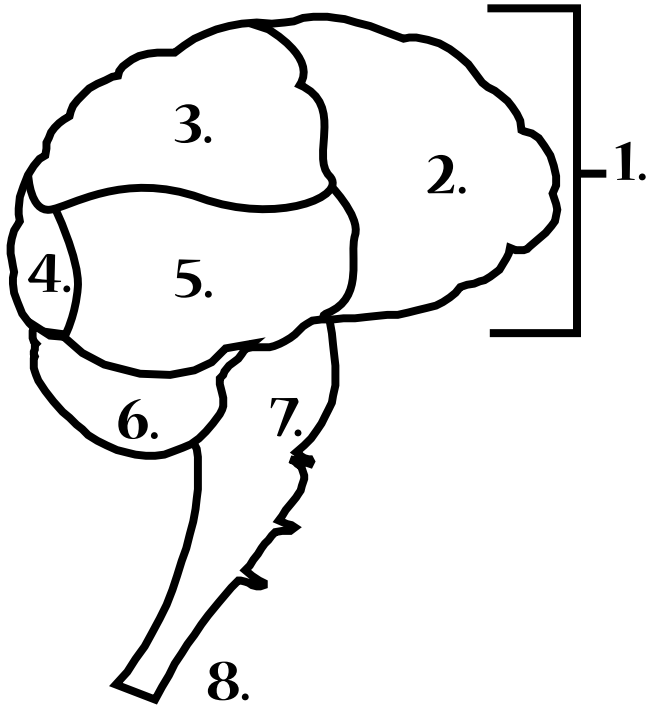
One way I can take very good care of my brain is to _____.

Remind all students that it is very important to LOVE AND CARE FOR THEIR BRAINS!

How the Brain Works



How the Brain Works



Label the regions and lobes of the brain. Briefly explain the function of each region and lobe.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

Amazing Brain Facts

Check out these fun facts about our brains.

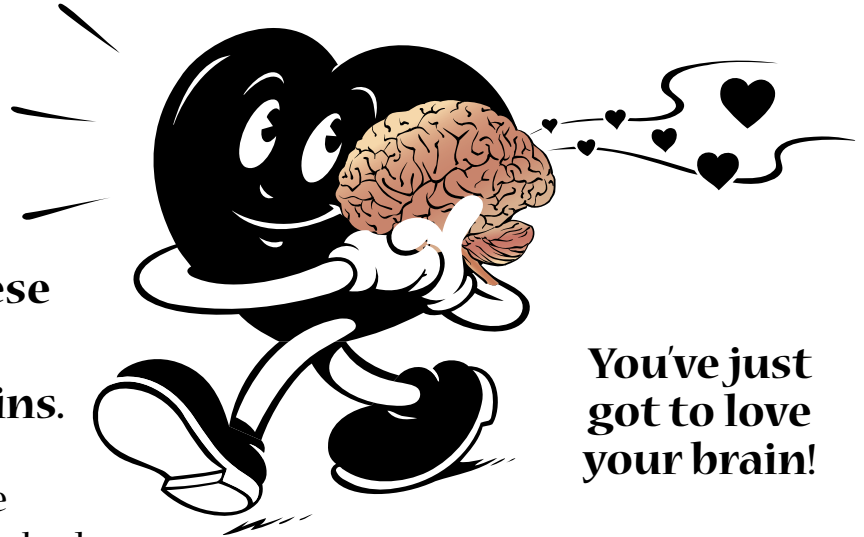
The brain is the *command center* of the body.

The brain weighs about three pounds.

One third of the cells in the brain are fat cells.

The back part of the brain receives information. The back part tells us, for example, that we have been touched.

The front part of the brain gives meaning to that information. The front part tells us that the touch was a good touch, a hug from someone we know and love.



You've just got to love your brain!

The brain is not fully developed until we are about 25 years old!

There are more connections in our brains than there are stars in the universe.

The brain has about 100 billion nerve cells called neurons.

Neurons send up to 50,000 messages through the brain per minute!

If we want these messages to travel well so our bodies can work well, we must take very good care of our brains.

Adapted from Which Brain Do You Want? © 2004 Amen Clinics, Inc. and MindWorks Press

What You Can't See *CAN* Hurt You

GRADES

3-5

OBJECTIVES

- Students will list a variety of conditions that result in pollution.
- Students will relate poisons to body pollution.
- Students will distinguish between *invisible* and *harmless*.
- Students will identify procedures to safeguard the body from poisons.

MATERIALS

- Chart paper, newsprint, blackboard or whiteboard
- Appropriate water-based, non-toxic, unscented markers
- Word Search

VOCABULARY

- *Pollution* - contamination of air, water or soil by substances that are harmful to living things.
- *Poison* - a substance taken internally or applied externally that is harmful to health or a danger to life.

- *Solvent* - a substance, usually liquid, that is capable of dissolving another substance.
- *Degreaser* - a substance that removes grease or oil by treating with a chemical.

ACTIVITY

Begin by asking a student volunteer to define pollution. Clarify or expand their definition as necessary and ask students if they are concerned about pollution of the air, water, soil or the ozone layer. Then ask if they are concerned about body pollution. The results may not be the same. Explain that body pollution can occur when certain chemicals and poisons enter the body. Help students understand that the body can become polluted the same way the atmosphere or water can become polluted.

Pose this question: *Can you see pollution in the air or water?* The answer is usually *no*, although some pollution is obvious due to smog, garbage or oil spills. Remind the class that pollutants are very often invisible, so it is a good idea to remember that *what you can't see can hurt you*. Lead a brief discussion about some of the hazards of pollution, including pollutants' effects on animals and humans. Discuss how our senses can expose us to pollutants, so we should not smell or taste unknown products or substances unless a trusted adult says they are safe to smell or taste. Point out that we must protect our bodies from contamination and pollution.

Ask students to consider the impact of air quality on our health and safety. The media provides warnings when air quality is unsafe for people with health issues such as allergies, asthma

and emphysema. People with lung problems are advised to stay indoors to protect their health when air quality is unsafe.

Write the term *poison* on the board or newsprint and ask students to define it. Ask students to give examples of poisons. Ask students to consider several ways a poison might enter a person's body. Possible responses are:

- swallowing a product
- touching a substance which penetrates the skin
- breathing a product into the lungs

Have volunteers name some poisons that might be breathed into the lungs. As specific poisons are mentioned, ask students if they can *see* the poison. Since these poisons are vapors, fumes and gases, they are invisible. They are not harmless just because they cannot be seen. *What you can't see **can** hurt you.*

Tell students that they have control over their immediate environment when using products with toxic vapors by following instructions carefully, such as only using in well-ventilated areas. Share that there is a big difference between getting a whiff of common household products and breathing in concentrated fumes. Getting a whiff of the product is not a problem. Breathing its concentrated fumes will be. If common products are not used according to instructions, oxygen may be replaced by toxic fumes in the lungs. This means poisons are in the lungs and heading to the brain and the rest of the body. Poisons in the body can lead to brain damage, serious heart and lung conditions, diseases and death.

Explain that some poisons that can be breathed are *solvents*, which act as *degreasers*. Explain that degreasers dissolve other substances. Ask students what the acetone in nail polish remover

does to fingernail polish. Ask students to think about what solvents might do to their brains and their bodies.

Ask the class to develop a list of safety procedures that will help students protect themselves from body pollution. Some ideas to include:

- Do not taste or smell anything unless you are certain it is safe or a trusted adult assures you it is safe.
- Do not put a product on your skin unless you are certain it is safe or a trusted adult assures you it is safe.
- Never touch or handle unknown substances or chemicals.
- Read all labels and instructions carefully and follow instructions as written.
- Use all chemicals and sprays outdoors or in a well-ventilated room.
- When working with household products, wear appropriate protective gear such as gloves.

Divide the class into small groups of three or four students. Allow ten minutes for each group to develop a response to the scenario of finding a spray can, bottle or similar container on school grounds and taking appropriate actions and precautions. The scenario should include at least one of the safety procedures developed by the class earlier. Group responses can be in the form of poetry, rap, role plays, art work or a news report. As groups present their responses to the class, ask observers to note which of the safety procedures were used in each situation. Discuss additional comments or concerns following all group responses.

As you complete this discussion on safety precautions when using *poisons*, tell the students to make a special note of the Poison Center's toll-free number. For poison emergencies and information, call:

Poison Center
1-800-222-1222
24 Hours a Day, 7 Days a Week



WRAP UP

Distribute the word search and challenge the group to find all hidden words. Send the word search home, asking students to share the special message at the bottom of the work sheet with adults at home.

Word Search

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

Look forward, backward, vertical or diagonal. Find these words in the puzzle!

AIR
BRAIN
BREATHE
HEMOGLOBIN

LABEL
LIVE
LUNGS
OXYGEN
POISON

POLLUTION
SAFETY
SMELL
TOXIC

Special message to adults at home:
Please keep all household products and medications
locked and out of your children's reach!

Call 1-800-222-1222 for poison emergencies.

Word Search Solutions

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

Supplemental Activities

Discussion Starters

Use these topics to promote quick discussion during transition times. These concepts are developed in lessons throughout the curriculum.

- Ways to prevent *body pollution*
- Our brain as a *command center*
- The pathway of oxygen to the brain
- The pathway of any inhaled substance to the brain
- How quickly oxygen (and anything inhaled) gets to the brain
- Connecting *body pollution* to *air pollution*
- Connecting atmospheric quality to our personal air quality

Springboard Analogies

Complete these analogies as a group or with a partner. Use these to start discussions concerning safety issues.

Eyes are to see as ears are to _____.

Tongues are to taste as fingers are to _____.

Air is to breathe as food is to _____.

Label is to read as directions are to _____.

Emergency is to 911 as Poison Emergency is to ____.

Hand is to work glove as eyes are to _____.

Steel-toed shoes are to feet as a protective mask is to _____ and _____.

Degreasers are to grease as solvents are to _____ in the brain.

Smog is to the air as poisons are to the _____.

Springboard Answer Key

Eyes are to see as ears are to hear.

Tongues are to taste as fingers are to touch/feel.

Air is to breathe as food is to eat.

Label is to read as directions are to follow.

Emergency is to 911 as Poison Emergency is to 1-800-222-1222.

Hand is to work glove as eyes are to safety glasses/goggles.

Steel-toed shoes are to feet as a protective mask is to mouth and nose.

Degreasers are to grease as solvents are to fat cells/fatty tissue in the brain.

Smog is to the air as poisons are to the body.

FAST FACTS™ on the Brain, Oxygen and Toxic Substances

Students will review material and recall critical information by using a learning strategy called FAST FACTS™. This is one of a series of strategies to assist learning developed by Dr. Dennis Embry of the PAXIS Institute. He calls these strategies “simple gifts.” The FAST FACTS™ strategy is applied here to the topic of learning about the brain, oxygen and toxic substances. This strategy allows review of material in a fun way where everyone is involved!

The teacher will assign students to work in pairs and will distribute a copy of FAST FACTS™ to every student in the class.

Direct the students step-by-step through the exercise as follows:

1. Ask students to decide who will be the first coach and first learner on their team. Roles will switch halfway through the exercise.
2. Ask all students to quickly and silently read both the questions and the answers.
3. When it appears most students have finished reading, tell the learners to turn over their study sheets.
4. Tell the students to listen as you go over the directions:
 - Coaches will read each question aloud quickly.
 - Without looking at the answers, the learner will answer questions aloud. If the answer is correct, the coach will award the learner 5 points. If the answer is not correct, the coach will ask the learner to listen and will repeat the question and answer again. The coach will then ask the question a final time.
5. If the learner gets it right this time, the coach awards the learner 3 points. If not, a zero is recorded.
- **BE CERTAIN TO RECORD ALL POINTS EARNED AS YOU COACH!**
- Continue working through the questions and answers, coaching by REPEATING questions and answers when necessary, until time is called.
- When I tell you to, change roles quickly. The learner now becomes the coach. The new coach will continue to record points on the same work sheet.
- The coach will start with the very next question on the list and continue through the questions until I tell you to stop.
- Ask students if they have any questions.
5. Tell students they can start. When students are about halfway through the questions, signal students to change roles and continue.
6. When it appears most students have finished, tell them to stop.
7. Ask them to add up all the fives, threes and zeros for each learner and then tally total team points. Poll the class on their team total points, reminding them that they learned more and earned more working as teams.
8. Tell students to congratulate their partner on a job well done!

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Facts about the Brain, Oxygen and Toxic Substances

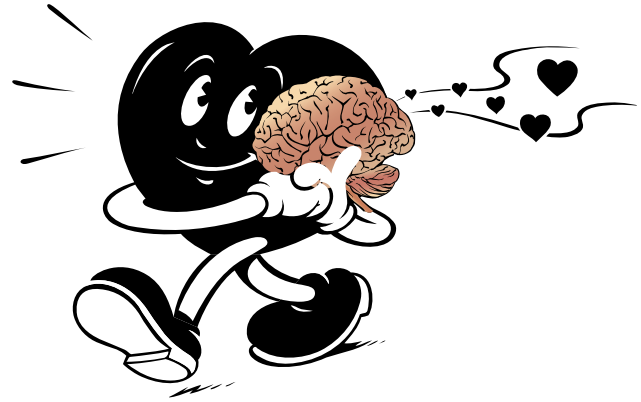
Question	Answer	5	3	0
1. What organ is the "command center" of the body?	Brain			
2. What are three things we need to stay alive?	Food, water, oxygen			
3. We cannot live longer than a day without food. T or F	False			
4. If a person cannot breathe, they can become _____.	Unconscious			
5. Which is most important for survival: food, water or oxygen?	Oxygen			
6. We need a constant supply of this gas to function well.	Oxygen			
7. Toxic substances can cause brain cells to become _____.	Damaged			
8. Hemoglobin is contained in all red blood cells. T or F	True			
9. Where does oxygen go before it goes to the heart?	Brain			
10. Breathing concentrated fumes can cause problems with ____.	Memory, balance, hearing, vision, speech			
11. Can our eyes see or detect a difference in gases?	No, gases are invisible			
12. What do solvents or degreasers do to fatty cells and tissues?	Damage or destroy them			
13. The brain gets about _____ of blood circulated in the body.	16% - 20%			
14. Pathway of oxygen → lungs → brain → heart T or F	T			
15. What happens if there are vapors and fumes in the lungs?	Toxic substances go to the brain			
16. What is the poison emergency toll-free number?	1-800-222-1222			
17. Poisons entering the body result in _____.	Body pollution			
18. Several ways poisons might enter the body are being _____.	Swallowed, absorbed through skin, inhaled			
19. Can we prevent body pollution by following safety rules?	Yes			
20. By what age is the brain completely developed?	About 25 years old			

Scoring Total Learning Points		
Add up number of 5, 3 and 0 point awards for each learner.	Learner Number One Points	
Enter the sum for each learner.	Learner Number Two Points	
Enter the sum for the team.	Team Total Points	

Love Your Brain!

Healthy Brain Tips

Taking care of the body's command center is very important. Challenge yourself to begin LOVING YOUR BRAIN a bit better each day!



Tip #1: Protect Your Brain

The brain is soft and the skull is very hard. It's important not to put ourselves at risk of brain injury. Wear seatbelts in cars and helmets on bicycles. Avoid motorcycles and consider sports such as golf, tennis and table tennis.

Tip #2: Avoid Toxic Substances

Using household products improperly can introduce toxic fumes to the brain. Using alcohol and other drugs can harm the teen brain. Nicotine (tobacco products) and caffeine (coffee, tea, sodas) can be harmful in large quantities since they restrict blood flow to the brain.

Tip #3: Get Enough Sleep

People who are chronically sleep-deprived have lower overall brain activity.

Tip #4: Manage Your Stress

Learn to do deep breathing or meditation to manage your stress. Chronic exposure to stress actually kills cells in the memory areas of the brain.

Tip #5: Eat Healthy

Eat plenty of lean protein and fresh fruits and vegetables. Eat a low-sugar, low-fat diet.

Tip #6: Take A Multivitamin Every Day

If we have all the vitamins and minerals we need every day, our brain can do its best.

Tip #7: Exercise

Physical exercise boosts blood flow to the brain. Blood delivers oxygen, fuel for the brain, to the brain more efficiently when we exercise.

Tip #8: Keep Learning

As new learning takes place, the brain grows and changes. Turn off electronics and read.

Tip #9: Don't Believe Every Thought You Have

Negative thoughts can come into your mind and can ruin your day. Don't let them. These are called ANTS - Automatic Negative Thoughts - and they need to be corrected!

Adapted from Which Brain Do You Want? © 2004 Amen Clinics, Inc., and MindWorks Press. Used with permission.

Guidance for Teachers: Handling Questions About Huffing Appropriately

Students may have questions about huffing and sniffing or they may be concerned about someone else's huffing and sniffing. You may invite these students to speak with you privately when appropriate. You may want to arrange further contacts with school personnel such as the counselor, nurse, psychologist or social worker. If students engage you in discussion about someone's use during your large group lesson, you will want to use this situation as a learning opportunity. First, remind students not to mention any names in the larger group. Next, make comments that will shift the focus onto the danger of toxic effects rather than the perceived fun involved.

Students may say: *Since you can buy these things in the grocery store, they can't be that dangerous.*
You may respond: *These products are very safe and useful when they are used according to their directions. Let's talk about what a package or aerosol can says about product use and possible dangers.*

Recognize a teachable moment, pick up one of the products you have on hand and ask a volunteer to help you read the product label and all information on it since you're having a hard time seeing the fine print. For example, a spray paint can may contain warnings such as the following: *Danger! Extremely Flammable. Keep away from heat, sparks and open flame. Vapors may ignite explosively. Use with adequate ventilation. Do not take internally. Keep out of the reach of children. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.* Product labels contain a lot of information, so after a student has read the label aloud, ask students what they should and shouldn't do to use the product safely. As they respond, the teacher can help them better understand what these

precautions mean by asking questions. Below are some samples of questions that may be asked.

Why do you think the directions say to use this in a well-ventilated area? What are some examples of "well-ventilated"? What might cause an explosion or fire when using this product? Why do you think the warning says not to take internally or to inhale concentrated fumes?

The warning on products about intentional misuse by concentrating and inhaling the contents may lead students to ask: **How do you concentrate the fumes to inhale them? How do kids use inhalants?** Some students may know the answer and begin sharing it. You need to direct the conversation away from techniques of use.

You may respond: *It's not important to know "how," but it is important to know what happens if you do. Huffing or sniffing a product can be harmful and fatal, even the very first time you try it. About one out of three persons who die from inhalant abuse were first-time users.*

Students may say: *But I've heard that it's fun! It makes you feel high, you know, kind of dizzy and strange.*

You may respond: *I like the feeling I get when I ride a roller coaster or one of those rides that spins really fast in circle, and it's really fun. But I notice something very different about how you get those kinds of strange sensations, don't you?*

You hope to engage the student so that he or she will answer that those dizzy or strange sensations can be a result of things that are happening due to speed, twists and turns *outside* of your body, but the sensations from inhaling vapors, gas or fumes are happening because of toxic substances that

have gotten *inside* your body and have reached the brain.

If students talk about kids who use inhalants to get high, remind them that they should be very concerned because the high that is experienced is a result of toxic effects of the poisonous chemicals that have reached the brain.

Students may say: *Why would anyone do this if it is so dangerous?*

You may say: *Most kids who do this just think they're having fun, but they don't realize how dangerous it really is. They've learned about huffing from their peers, but they probably haven't heard anything about how harmful it is from their parents or teachers. Many young people have died because they didn't know what they were actually doing was poisoning their brains and bodies with toxic fumes.*

Students may say: *I've heard it's really quick; it only lasts a few seconds or a few minutes. Nothing that quick can really hurt you.*

You may ask the student: *Do you remember how quickly oxygen gets to the brain?*

Remind the student that oxygen starts its pathway into the body because it has been inhaled. If chemicals are inhaled, they displace oxygen going to the brain. They still go directly to the brain, though, and can cause damage to cells quickly. Remember that no one can predict whether damage will be temporary or permanent, but inhalants get to the brain within seconds. Also mention that the pathway of inhalants is from the lungs to the brain to the heart and then the rest of the body and that nothing has been filtered out of the chemicals before they get to the brain. Remind students, too, that these chemicals can be toxic to the heart. They can lead to arrhythmia and can result in Sudden Sniffing Death the first time or any time inhalants are used.

Be sensitive to students' comments and concerns. Remember that it is important to refrain from being judgmental and to guide students through a discussion rather than lecture about this.

The bottom line is that huffing or sniffing can kill the first time, the tenth time, or any time someone abuses products. Bring this point into the discussion and repeat it several times throughout the discussion.

Grades 6-8

Bare Necessities

Label-wise

Brainworks

Huffing and Sniffing Mean Danger

When You're In Charge

Be a Friend, Help a Friend

In Case of Emergency

•

Supplemental Activities

Guidance for Teachers

Grades 6-8 Lesson Introduction

The following section contains sequential lessons for students from grades six through eight. Included in each lesson are objectives, materials needed, vocabulary and suggested activities. The 6-8 unit is followed by *Fast Facts*[™], a review of essential information which may be used separately to instruct key concepts in this manual. The Supplemental Activities section includes *Guidance for Teachers: Handling Questions about Huffing Appropriately*, quick discussion topics for lesson reinforcement, exercises concerning health and safety issues relating to inhalants, *Amazing Brain Facts* and *Healthy Brain Tips*. All supplemental activities may be used to reinforce inhalant abuse prevention topics taught throughout the school year. The black line masters may be used for class hand outs, overhead transparencies or as projected slides. For an electronic copy of *Inhalant Abuse Prevention: Staff Education and Student Curriculum*, visit the Virginia Department of Education's Web site at www.doe.virginia.gov.

A sample letter for parents and guardians located before the lessons introduces the inhalant abuse prevention unit of study, defines inhalants, refers parents to an online training opportunity and includes Poison Center contact information. It may be personalized and altered to meet your needs. The parent/guardian letter and all student worksheets in the 6-8 unit may be sent home in student backpacks. Distribute sensitive information regarding inhalants to parents through e-mails or direct mail, since it is imperative to avoid putting specific information about product abuse in the hands of children.

National Inhalants and Poison Awareness Week is the third week in March each year. This is an ideal time to review concepts taught and to implement educational activities and sponsor events which reinforce poison prevention and the proper use of common, readily available household products.

For grades six through eight, the Inhalant Abuse Prevention Student Curriculum includes these components:

- Oxygen deprivation, its negative effects and survival time
- Environmental toxins
- Brain structure and function
- Body pollution
- Personal safety issues related to poisons and toxins
 - Reading labels
 - Following directions
 - Taking proper precautions
- Refusal skills regarding inhalant abuse or any risky behavior
 - Communication
 - Decision-making
 - Peer pressure
 - Personal responsibility
 - Setting appropriate boundaries in friendships
- Helping a friend who is huffing or sniffing
 - Seeking help when at school
 - Seeking help when away from school

Teachers should carefully consider their choice of vocabulary and responses when talking about inhalants with their students.

- Substitute *poisons or chemicals for inhalants*.
- Substitute *experiencing toxic effects for getting high*.

- Emphasize that *body pollution* is the result of air/water/environmental pollution and of choosing to introduce harmful substances into your body.
- Always express serious concern for the health and safety of someone who inhales toxic fumes or vapors, whether accidentally or deliberately, especially if the fumes are concentrated.

Never discuss specific products or methods of abuse or show students how products are abused.

Teachers and staff using this curriculum are encouraged to adapt components of the lessons as necessary to suit the needs of students receiving instruction. Vocabulary and concepts may require further development. Activities are designed to be flexible so that learning styles of all students may be honored during instruction.

This curriculum corresponds to the 2001 Virginia Department of Education's *Health Education, Physical Education and Driver Education Standards of Learning for Grades 6-8* as follows:

The student will:

- 6.1** apply critical thinking skills and personal management strategies to address issues and concerns related to personal health and well-being. (a,d)
- 6.2** use knowledge of the body's structure and function to make sound decisions related to personal health. (b,d)
- 6.3** describe the connections between mental and physical development as they relate to adolescence. (a,d)
- 6.4** analyze the consequences of personal choices on health and well being. (b,c,d)
- 7.1** use knowledge of health concepts to make decisions related to personal safety and wellness. (b,c,d,e)
- 7.3** investigate and analyze the various factors that guide an individual's decisions about health and well-being.
- 7.5** work cooperatively with others to support and promote healthy schools, families, and communities.
- 8.1** analyze and evaluate the relationship between health-risk behaviors and the onset of health problems that can impact health and well-being during the adolescent years. (c,f)

Sample Letter to Parents and Guardians of Students in Grades 6-8

Dear _____,

Today our class is beginning a unit of study on inhalant abuse prevention. Inhalants are legal, everyday products that can be found on grocery store and hardware shelves and in the kitchen, bathroom, office and storage areas of your home. When used properly, these products help us perform necessary tasks in and around our homes and schools. When used improperly, these products can cause health and safety problems for everyone, especially children and teens. The products contain chemicals that are toxic when used in violation of package directions. For this reason, inhalants will be referred to as poisons and toxic substances during our class discussions.

Inhalant abuse refers to the deliberate inhalation of fumes, vapors or gases to achieve a mood-altering effect. Although inhalants are legal products when used as directed, their abuse by young people may be a gateway to later use of alcohol, marijuana, hallucinogens such as LSD and Ecstasy, cocaine and heroin. Brain damage and death can result from inhalant abuse even after a single use. Research tells us that children are often first introduced to inhalants in the elementary years and that the percentage of children using inhalants peaks during eighth and ninth grades.

The brain is growing and changing rapidly throughout childhood and adolescence and is not completely developed until roughly age 25. The adolescent brain is particularly vulnerable to the impact of toxic substances in inhalants and to alcohol, tobacco, marijuana or other drugs.

When you ask your child to share what the class discussed about inhalants, the brain and the impact toxic substances can have on the brain, you will be assisting them in recalling critical information and practicing valuable skills.

If you would like to learn more about inhalants and about how to talk to your child about them, visit www.inhalantabusetraining.org on the Internet. This site provides a brief overview on inhalants that has proven very helpful to concerned adults.

Please call me with any questions or concerns you may have. Thank you for your interest in this topic.

Sincerely,

P.S. All poison centers in the United States can be reached by calling the nationwide toll-free number. Calls are answered by the U.S. Poison Center that serves the individual making the call, based on his or her area code and exchange. For poison emergencies and information, call:

Poison Center
1-800-222-1222
24 Hours a Day, 7 Days a Week

Bare Necessities

GRADES

6-8

OBJECTIVES

- Students will list three things that are most critical to ensure survival.
- Students will identify the length of time an individual can survive without food, water or oxygen.
- Students will compare the roles of food, water and oxygen to a person's health and safety.

MATERIALS

- *Bare Necessities*
- Chart paper, blackboard or whiteboard
- Appropriate water-based, non-toxic, unscented markers
- Students will need pens or pencils and notebook paper
- Stopwatch or clock with second hand

VOCABULARY

- *Essential* - required, necessary.

ACTIVITY

Begin by asking students to think about three things they would like to have and three things they absolutely need for survival. List their responses, then circle food, water and oxygen (or air). Introduce the vocabulary word *essential* and explain that the things they must have are *essential*, required or necessary for them to survive. Explain that food, water and oxygen are the most essential things people need in order to live.

For the remainder of the lesson, divide students into teams of four or five members. Explain that for each series of questions below, team members will be making individual predictions and then calculating those predictions to determine the average, their team answer.

Display *Bare Necessities* and ask students to guess how long a person could survive without any **FOOD**. There would be water, but no food. Poll for team answers and summarize the range of answers for the class.

Explain that there is no precise answer, but there is a range of possibilities depending on an individual's age, general health and living conditions. For example, a newborn baby might only survive for two days, while healthy, physically fit adults in their twenties might live for two months! A compromise of **weeks** might be agreed upon by the class. List **weeks** below the picture of food.

Now ask students to consider how long someone could survive without **WATER**. There would be food, but no water. Poll the teams for their answers once more and ask a volunteer to summarize the range of answers.

Again, explain that this issue is very subjective. Since the human body is more than 75% water, a person must take in adequate fluids or risk dehydration and death. Advise the class to compromise and write **days** below the water.

Finally, ask students how long a person might survive without **OXYGEN**. Have them stand and take one or two deep breaths. Let them know that they should stay standing the entire time they are holding their breath, but once they need to take a breath they should sit down. On your signal, they will begin to hold their breath and sit when they can no longer hold it. Note the time for the last student who sits and, once all students have taken their seats, make this announcement: *No one in this class could survive longer than _____ minutes without oxygen.* Point out that survival time is virtually limited to the number of minutes that a person can hold his or her breath.* When a person cannot breathe, he or she soon becomes unconscious and, if no oxygen is available, the individual will soon die. Share that even trained divers can only hold their breath for up to about eight minutes and that the world's record for holding breath is nine minutes. Survival time would be much shorter for infants and toddlers, people with lung impairments such as asthma or emphysema, the elderly or those who are very ill. Explain that cells need oxygen to perform their basic functions. Generalize by writing *minutes* below the symbol for oxygen.

Ask team members to prepare individual paragraphs explaining why **OXYGEN** is the most critical need for humans in order to survive. Once complete, students may share their paragraphs within their teams. Team members should check for a minimum of one statement in each student's paragraph that describes survival time without food, water and oxygen.

Review by reminding students how important it is to safeguard our air supply and our body's respiratory system to make certain that we have adequate oxygen at all times.

WRAP UP

Reinforce the importance of oxygen and an adequate air supply by asking students why firefighters wear oxygen masks. Remind them that oxygen is critical to life and that toxic fumes, such as those generated by a fire, can reduce the amount of oxygen available for breathing.

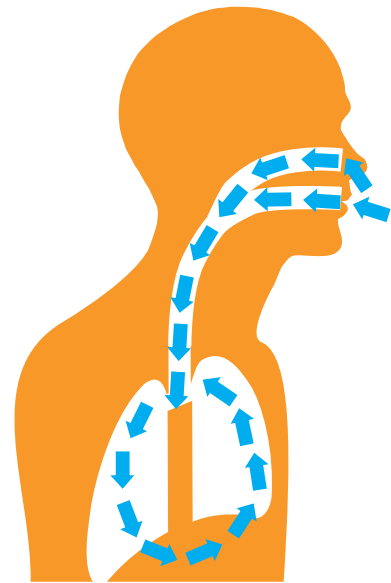
** Students may know about the "cold water phenomenon" whereby the body immersed in icy water appears to shut down to prolong survival. If the person is young, healthy and properly revived, it is possible for them to recover fairly well.*

Bare Necessities

What must we have in order to survive?



FOOD



OXYGEN



WATER

Label-Wise

GRADES

6-8

OBJECTIVES

- Students will practice reading labels of ordinary products such as correction fluid, nail polish, nail polish remover and household cleaners.
- Students will explain the warnings and safety precautions on the labels of common household products.

MATERIALS

- About 20 empty and clean containers of products with tops securely taped or glued closed. Products may include nail polish, nail polish remover, turpentine, rubber cement, correction fluid, insecticide, computer duster, aerosols, spray paint and any product in an aerosol can.
- Choose products with legible warnings and a list of product ingredients.
- *Looking at the Label*

ACTIVITY

Divide the class into groups of two to four students and give each group two hand outs and two empty product containers. Allow about five to ten minutes for each group to fill out the work sheets. Invite each group to present one product to the class with the following information:

- List of ingredients
- Summary of label warnings
- Safety precautions
- Special protective gear that may be necessary when handling this product

Ask students to choose one or two of the unfamiliar chemical ingredients listed and research the chemicals by visiting the Agency for Toxic Substances and Disease Registry at www.atsdr.cdc.gov on the Internet. They can report a description of the chemical, its primary purpose, chemical toxicity and the effects of exposure to humans and animals.

WRAP UP

Ask students to recall a time they have used one of the products that was presented to the class. Have them write a short statement about their previous use of the product and about how they might use it differently, knowing what they now know about the product.

Looking at the Label



Name of product:

Ingredients listed:

Summary of label warnings:



Safety precautions:

Protective gear needed:

Students in group:

Brainworks

GRADES

6-8

OBJECTIVES

- Students will identify four major regions and four lobes of the brain.
- Students will repeat the brain functions of the four regions and four lobes.
- Students will analyze the effect of oxygen loss on each region.
- Students will discuss differences in the developing brain and the adult brain.
- Students will learn the role of the limbic system.

MATERIALS

- *How the Brain Works*
- Cutouts of the four regions and four lobes of the brain
- Individual hand outs of the outline of the brain, if desired
- Glue sticks, if each student or groups of students will be completing the project
- Chart paper
- Tape
- Appropriate water-based, non-toxic, unscented markers

VOCABULARY

- *Command center* - the brain, for purposes of these lessons.
- *Cerebral cortex* - wrinkly outer layer of the brain that helps us see, hear, taste, feel things, talk, think, solve problems, learn and remember things. The cerebral cortex contains the frontal lobe, temporal lobe, parietal lobe and occipital lobe. They each perform special functions.
- *Cerebellum* - lower back part of the brain that helps control balance and movement.
- *Brainstem* - base of the brain that continues into the spinal cord and controls body functions such as breathing, heart rate, blood pressure and digestion.
- *Spinal cord* - thick column of nerve tissue that extends from the base of the brain into the backbone. It carries nerve impulses back and forth between the brain and other body parts.
- *Limbic system* - a group of deep structures below the cortex that are associated with emotions such as fear, pleasure, memory and motivation. (Hypothalamus, amygdala and hippocampus)

This vocabulary will be introduced as the lesson develops.

ACTIVITY

Post *How the Brain Works* onto the board. As a region of the brain is introduced, ask a volunteer to mount it in its appropriate spot. Define the region and state one thing that can take place in the body because of the work it does. Challenge students to give additional examples. Extend their contribution by adding:

Cerebral cortex - problem solving, memorizing facts, planning, organizing

Cerebellum - dancing, playing sports, clapping hands, doing yoga and aerobics

Brainstem - digesting food, breathing

Spinal cord - sends pain signals, coordinates reflex actions

Come back to the cerebral cortex and explain that, within that region of the brain, there are four lobes. Supply volunteer with cutouts of the four lobes and challenge them to fit the pieces together within the cerebral cortex on the posted black line drawing of the brain. Explain that there are many tasks taken care of in the cerebral cortex and that special regions of the brain, called lobes, are responsible for certain tasks.

Frontal lobe - talking, solving problems, reasoning

Temporal lobe - Language, memory, reading social cues, distinguishing smells, sounds

Occipital lobe - recognizing shapes and colors

Parietal lobe - spoken and written language

Challenge your students to use **their** frontal lobes to come up with a strategy for remembering all the regions of the brain and the lobes and their functions. Encourage volunteers to share their learning strategies. Post the strategies on chart paper.

Introduce one more system of the brain - the *limbic system* - and share the following information. The limbic system is also known as the reward center of the brain. Substances of abuse activate this region of the brain much the same as a pleasurable activity such as eating does. The limbic system is involved in olfaction (sense of smell) emotion, behavior and motivation.

Explain that the adolescent brain is continuing to develop and is vulnerable - easily hurt or damaged. Because of a developing frontal lobe, the teen brain more easily develops substance abuse patterns. Research tells us that teens that begin to drink or use substances before age 15 are four times more likely to develop an addiction than those who abstain from drinking or other substance use until they are at least 21.

Remind students that the brain is a complex organ which requires a regular fresh supply of oxygen to function well. If household products are not used according to instructions, oxygen will be replaced by toxic fumes in the lungs. Less oxygen is available to the brain and poisons are introduced to the brain and body. The brain cannot send efficient messages to all parts of the body if oxygen is compromised and poisons are introduced into the body.

Ask students to consider the impact of air quality on our health and safety. The media provides warnings when air quality is unsafe for people with health issues such as allergies, asthma and emphysema. People with lung problems are advised to stay indoors when air quality is unsafe to protect their health.

Remind students that they have control over the air quality in their immediate environment when using products with toxic vapors by following instructions carefully, such as only using in well-ventilated areas.

WRAP UP

As you read the sentence stem aloud, have each student share answers with a partner.

One thing I learned today was _____
_____.

I think the most important region of my brain is _____ because _____.

I think the most important lobe of my cerebral cortex is _____ because _____.

My brainstem needs oxygen to _____
_____.

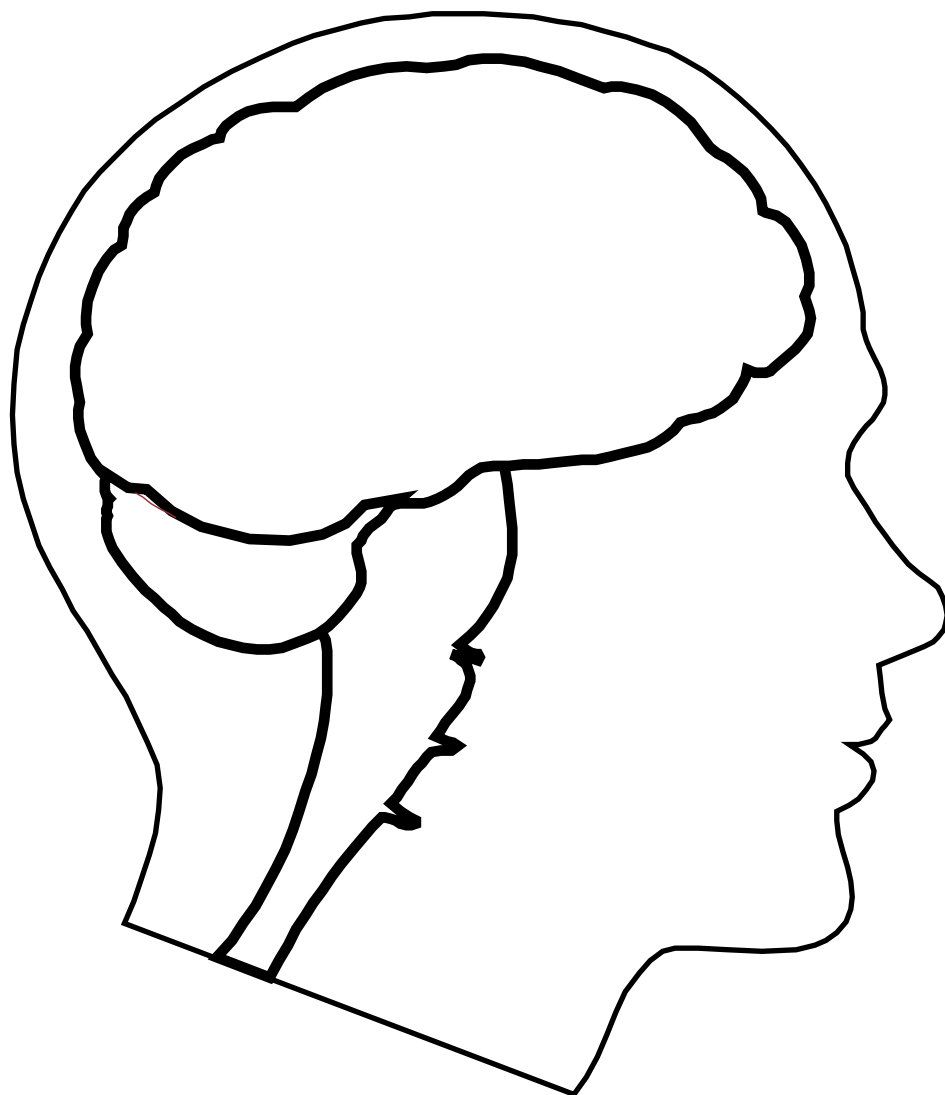
Without enough oxygen, my parietal lobe might not be able to _____.

A consequence of starting to drink or use substances before age 15 is _____.

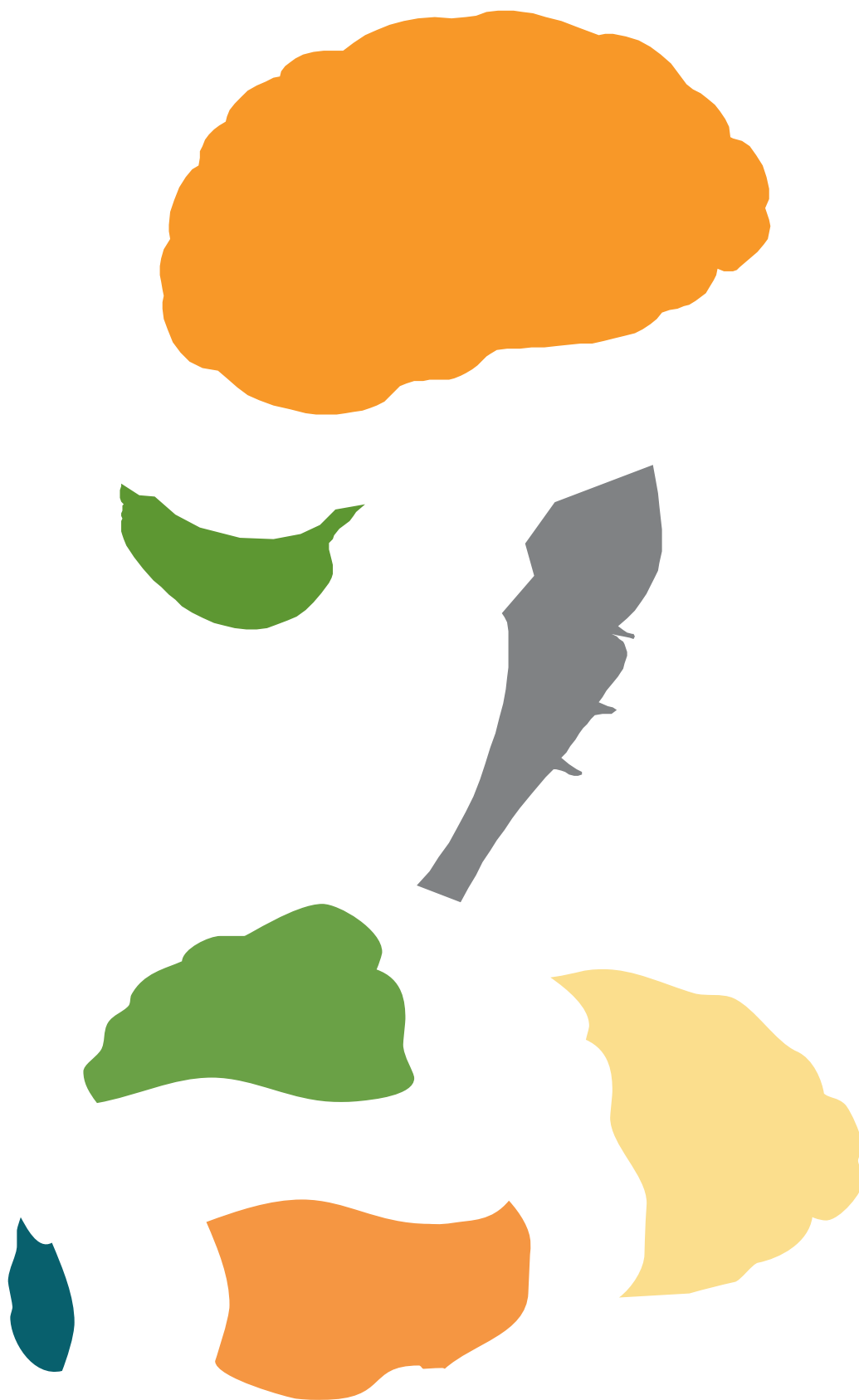
The part of the brain that controls emotion, memory and motivation is the _____.

Students may label regions and lobes on individual black line outlines of the brain. They may briefly explain the function of each region and lobe.

How the Brain Works



Cutouts for *How the Brain Works*



Huffing and Sniffing Mean Danger

GRADES

6-8

OBJECTIVES

- Teacher will assess student awareness of *huffing* and *sniffing*.
- Students will conclude that huffing and sniffing are harmful to the brain and the body.
- Students will explain the impact of solvents and degreasers on the fatty tissues of the brain.
- Students will explain health consequences of inhaling poisons.

MATERIALS

- Chart paper, blackboard or whiteboard
- Appropriate water-based unscented markers
- *Inhalants: Health Consequences*

VOCABULARY

- *Solvents* - chemicals capable of dissolving another substance.
- *Degreasers* - chemicals that can remove grease, oil or fat from other substances or products.
- *Myelin sheath* - insulation that surrounds the core of a nerve fiber.

ACTIVITY

Before the lesson, hold a brief review of fun brain facts found on the *Amazing Brain Facts* work sheet found in the supplemental activities section. Include facts such as its weight (about three pounds), the amount of fat cells and fatty tissues in the brain (one-third of the brain is made up of fatty cells and fatty tissues) and the approximate number of messages sent by neurons in the brain per minute (50,000).

The activity below serves as a general assessment of students' awareness or knowledge of inhalants. The presenter should maintain a nonjudgmental attitude so that students will be encouraged to participate.

Share with students that you've recently heard the terms *huffing* and *sniffing*. Ask if they are familiar with those terms. Make a mental note of the number of students who raised their hands as a general indication of awareness of the practice. Remind students not to mention names as they respond and ask *Do kids really do this?* Share your concern for students who may be involved in huffing and sniffing. I'm really worried. *Do they know how dangerous this is?*

As you begin the next activity, it is imperative to keep this in mind: At no time will you be explaining to the students *how* products can be abused. If students begin to comment on how they've heard inhalants are used, direct the conversation away from *how* immediately. Center the discussion on the problems that students may encounter if they experiment with huffing and sniffing.

Draw a picture of a giant spray can with its mist spreading across the paper. In the mist, make notes as students respond to your questions about toxic household spray products and other products that give off fumes or vapors that can be poisonous when breathed. Questions to consider:

What do you think these products are intended to do?

- Kill spiders, insects and bees.
- Deodorize a room.
- Paint walls and furniture.
- Stop body perspiration.
- Clean dirt and grime in the kitchen and bathroom.
- Keep hair in place.

What do you think comes out of the can when it's sprayed?

- Chemicals
- Vapors
- Fumes

Explain to your students that any time strong fumes are emitted from a product, it is likely that the product contains chemicals that are harmful to breathe. Do not leave the students with the impression that inhalants are limited to aerosol products.

What can happen if the chemicals are introduced into the body?

- Body pollution
- Brain damage
- Difficulty with memory, learning, all senses, coordination, speech
- Death

What can happen if the chemicals come in contact with heat or flames?

- Fire
- Explosion

Reinforce that these chemicals are:

- often *solvents* or *degreasers*.
- highly flammable. If they are near intense heat or a flame, an explosion is likely.
- harmful if they are breathed in concentrated form.

Share the following:

- If solvents and degreasers are introduced into our bodies and travel to our brains, brain cells can be damaged.
- If brain cells are damaged, the myelin sheath (neural coating) may be damaged.
- If the myelin sheath of our brain cells is damaged, signals from one part of the brain to another slow down.

What will that mean?

- The brain will not work as well as before the cells were damaged.
- Learning and remembering things doesn't happen as easily.
- If the brain doesn't work as well, major organs will not work as well either.

Ask a student volunteer to quickly sketch a large outline of a head and inside that, an outline of the brain on the chalkboard or on chart paper. Ask him or her to include the wrinkly detail of the cerebral cortex. Ask the class to recall the number of messages (roughly 50,000) neurons are sending to

different parts of the brain each minute. Begin to draw light pencil lines across the cerebral cortex to represent some of those messages. Mention that different lobes of the brain control different activities and functions. Ask students for examples. Possible answers include that the frontal lobe determines reasoning, judgment, problem-solving and talking; the temporal lobe assists in language, memory, reading social cues, distinguishes smells and sounds; the occipital lobe helps us recognize shapes and colors; and the parietal lobe helps us understand spoken and written language. Mention that the back part of the brain receives information and the front part gives that information meaning, so there are an incredible number of messages being sent from the back of the brain to the front.

Have students imagine the impact of solvents or degreasers being introduced to the brain. Remind them that when we breathe, oxygen goes directly to the lungs and then to the brain within seconds. Other inhaled substances travel the same path just as quickly. Begin to erase or smudge the message lines you've drawn. Ask students to talk about the difficulties someone who chooses to misuse poisonous products might experience.

Distribute *Poisons: Health Consequences* to the students. Mention that there are immediate consequences (dizziness, loss of coordination, irregular heartbeat, nausea) as well as long-term effects (impaired coordination, loss or damage to hearing, vision, speech, reduced kidney function are some).

Remind students that even a single use could be fatal.

Students may have mentioned specific products earlier as you were assessing their knowledge of huffing and sniffing. Guide them now into a discussion about appropriate and responsible usage of the products. List the products mentioned and a safety procedure to keep in mind about each one. Refer to the products mentioned as containing *poisons*. Have the students make a special note of the information and emergency number below.

All poison centers in the United States can be reached by calling the nationwide toll-free number. Calls are answered by the U.S. Poison Center that serves the individual making the call, based on his or her area code and exchange. For poison emergencies and information, call:

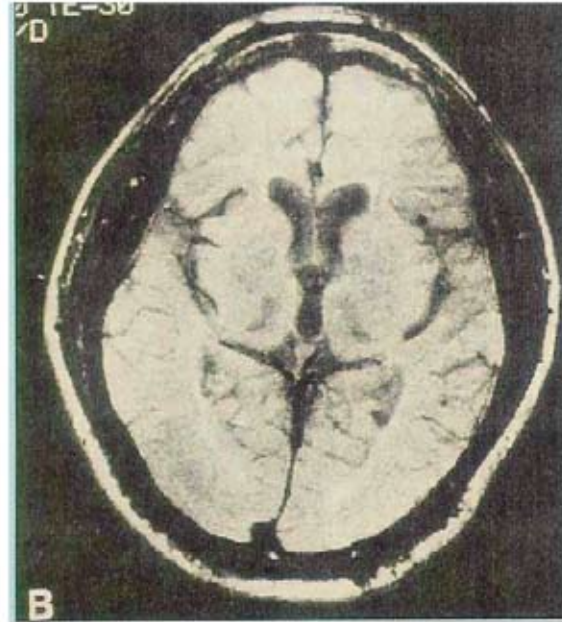
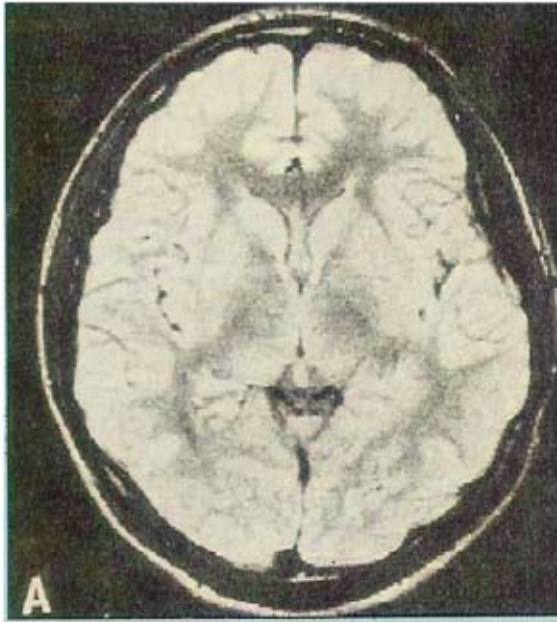
Poison Center
1-800-222-1222
24 Hours a Day, 7 Days a Week

WRAP UP

Briefly discuss environmental air quality and personal air quality. Point out a correlation between *air pollution* and *body pollution* if students do not make one during the discussion.

Ask students to turn to a peer and state three facts they most valued learning today. Ask them to state two facts they would share with a friend or family member. Finally, ask them to state one thing they will never forget.

Healthy Brain, Toluene Brain

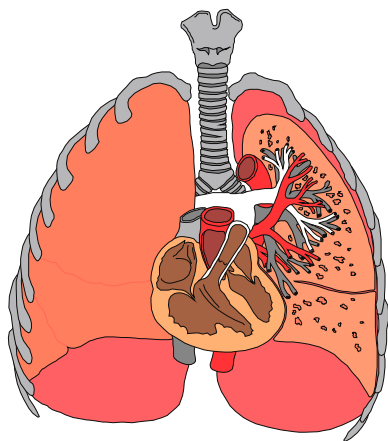


Brain image A is from a healthy male teenager who has never abused inhalants. Brain image B shows shrinkage of brain tissue in a teenage toluene abuser. Note the smaller size and the larger, empty (dark) space within the toluene abuser's brain.

*National Institute on Drug Abuse Research Report Series: Inhalant Abuse.
Images courtesy of Neil Rosenberg, M.D.*

This set of images may be a helpful reminder of potential harm of chemicals when used improperly. Use this in *Huffing and Sniffing Mean Danger* in this unit as reinforcement to concepts presented. It can be used in additional lessons as a supplement to concepts presented.

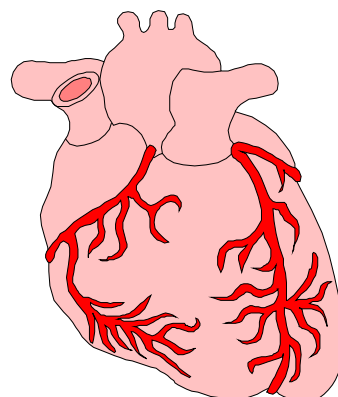
Inhalants: Health Consequences



Reduce oxygen absorption



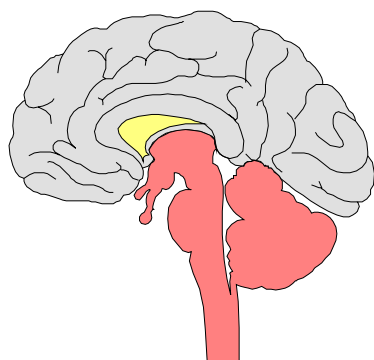
Reduce lung function



Cause irregular heart rhythm



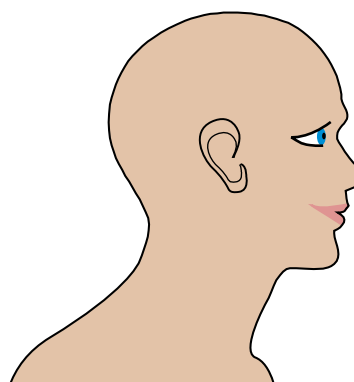
Can stop heart entirely



Cause painful headaches



Destroy brain's neural coating



Affect vision and hearing



Affect senses of smell and taste

First Time - Any Time - They Can KILL

When You're In Charge

GRADES

6-8

OBJECTIVES

- Students will plan appropriate responses to potentially dangerous situations.
- Students will develop a list of safety precautions to keep younger children safe from poisons.
- Students will memorize Poison Center toll-free number.

MATERIALS

- Clean, empty containers of air freshener, fingernail polish remover, paint thinner and cigarette lighter.
- When possible, use the same containers used in *Label-Wise*.
- *When You're in Charge* scenarios
- Notebook paper
- *Rules for Safety*

ACTIVITY

Your students may have already begun to do some babysitting or perhaps are being left in charge of their younger brothers and sisters. Today you will present teams with scenarios they may face when being left in charge. Tell students that they will have the opportunity to practice what their responses should be when faced with some common problems babysitters experience.

Divide students into teams of six members. Roles of team members will be timekeeper, first reader, second reader, summarizer, recorder and reporter.

Timekeeper - calls *start*, gives three minute and one minute warnings and calls *stop*.

First reader - reads the scenario to which the summarizer will later respond.

Second reader - reads the first aid information and other product use information.

Summarizer - tells appropriate first aid steps or next steps to take and can ask group for help.

Recorder - writes the steps on notebook paper.

Reporter - reads the scenario and the next appropriate steps aloud to the class.

Set a time limit of five minutes for the team to complete the first task. Give each team one of the four *When You're in Charge* scenarios and the appropriate empty container. Instruct teams to think about the following as they work through their scenarios:

Is this something I can easily handle?

Do I need to call (parent, guardian, 911) immediately or can I help first and then make the call?

Each team will report according to their assigned roles. See notes on teacher guide to scenarios. During the reports, clarify any misunderstandings or incorrect reporting. Pay special attention to opportunities to reinforce that:

- getting a whiff of a product is very different from breathing in concentrated fumes.
- breathing in enough products to cause coughing isn't always an emergency, but it is a signal.
- lack of color and odor does not guarantee safety. There are easy steps to take to improve these situations.

Ask each group to create a list of safety rules based on their scenario. Summarize the lists on one large classroom poster, being certain to include information on how to contact the local poison center. Display the large poster in the classroom.

Poison Center
1-800-222-1222
24 Hours a Day, 7 Days a Week

WRAP UP

Have students create their own babysitting ad including such features as their past babysitting experience, references and training received in school or in first aid class on poisons.

When You're In Charge Scenarios

Scenario #1:

A four year old child who uses the bathroom independently is able to reach the air freshener. The child sprays the freshener in the bathroom and in his adjoining bedroom before you hear the commotion. Now the child is coughing and coughing.

Scenario #2:

You are caring for your younger sister, who is playing "make-up". While you are out of the room for a minute, she soaks several cotton balls with fingernail polish remover and holds them up to her nose because she likes the smell. Now she is telling you that she is dizzy and that her head hurts.

Scenario #3:

You are in charge of your younger brother today. He is helping you paint some outdoor chairs. At the end of the job, you pour paint thinner in a bucket to clean the brushes. Your brother leans over the bucket, putting his head close to paint thinner to clean his brush.

Scenario #4:

A three year old child is playing in her back yard near the sandbox. You spot the small object just as she does. She reaches for what you now recognize as a half-empty cigarette lighter.

When You're In Charge Scenarios

Teacher Responses

Scenario #1

A four year old child who uses the bathroom independently is able to reach the air freshener. The child sprays the freshener in the bathroom and in his adjoining bedroom before you hear the commotion. Now the child is coughing and coughing.

Points to introduce or reinforce:

- Coughing is the body's way of clearing the throat and lungs of irritants.
- Getting child in fresh air away from the air freshener chemicals is important.
- Coughing should stop in a few minutes.
- If the child has asthma or other respiratory problems or if coughing persists, call parent or 911.

Scenario #2

You are caring for your younger sister, who is playing "make-up". While you are out of the room for a minute, she soaks several cotton balls with fingernail polish remover and holds them up to her nose because she likes the smell. Now she is telling you that she is dizzy and that her head hurts.

Points to introduce or reinforce:

- Young children should not be left unsupervised around toxic substances - even for a minute.
- Call 911 for assistance if an adult is not available.

Scenario #3

You are in charge of your younger brother today. He is helping you paint some outdoor chairs. At the end of the job, you pour paint thinner in a bucket to clean the brushes. Your brother leans over the bucket, putting his head close to paint thinner to clean his brush.

Points to introduce or reinforce:

- Working with chemicals in well-ventilated areas is essential.
- Leaning over for a quick second is okay, but keeping head near the product is not.
- Young children should not be in close proximity to strong chemicals for extended periods of time.

Scenario #4

A three year old child is playing in her back yard near the sandbox. You spot the small object just as she does. She reaches for what you now recognize as a half-empty cigarette lighter.

Points to introduce or reinforce:

- Getting the lighter away from the child immediately is critical since she could light it.
- Disposing of the object in a way that is out of reach is critical.
- Some objects are too small to include easily read directions. That doesn't mean they are safe.
- Some chemicals are colorless and odorless, but still dangerous.

Rules for Safety

The childcare team of

_____ and _____

is dedicated to keeping children safe.

These are our rules for household product safety:

1. _____

2. _____

3. _____

Be a Friend, Help a Friend

GRADES

6-8

OBJECTIVES

- Students will describe characteristics of friends and responsibilities of friendships.
- Students will discriminate between getting a friend *in trouble* and getting a friend *into help*.
- Students will generate a list of refusal skills necessary to confront peer pressure effectively.
- Students will name at least one resource person to refer a friend to for help.
- Students will memorize Poison Center toll-free number.

MATERIALS

- Chart paper, board or overhead transparency
- Appropriate water-based, non-toxic, unscented markers
- *The Art of Saying NO!*

ACTIVITY

Open the lesson by asking students if they have heard of the term *fakeship*. Get ideas from them on what a fakeship might be. Enjoy the ideas they may offer and then say *If I told you we are going to be discussing friendships and fakeships, you may have a better idea of what a fakeship is. Do you have any ideas now?* Remind the class that there should be no mention of names as students brainstorm during this activity. As students offer examples of what makes a true friendship and contrasting examples of what makes a fakeship, enter them on a T-chart.

Ask if anyone has ever had serious concerns about a friend. Again remind them not to mention names as they share situations. Invite students to share how it felt to be concerned about a friend. Were they able to help their friend or get their friend *into help*? Discuss the difference between getting a friend in trouble and getting a friend into help. Ask: *Is it worth risking the friendship to help a friend? Can this be a difficult thing to do? What risks might be involved in trying to help a friend?*

Discuss the difference between being responsible *for* self and responsible *to* others. Whose behavior can we control? Whose friends can we choose? Whose time can we manage? Whose decisions can we make? When we are concerned about our friends, we can tell them our concerns honestly but they may not make the decision we believe to be best. It's up to us to be a friend of character *to* our friend in need, but we cannot make decisions *for* that friend. It's important for us to have information, though, so we can guide our friend *into* help if there is a serious problem, but the next step would be theirs to take.

If we are concerned about a friend and want information about inhalants, we can contact the Poison Center for information. They can be reached at 1-800-222-1222.

Who are the resource people we can go to for help at school? Brainstorm a list on a separate chart. This will likely include: teachers, school nurse, guidance counselor, psychologist, resource officer, social worker or resource officer. Post this list for future reference of all students.

Look at the fakeship side of the first chart. Ask students: *Has anyone ever tried to pressure you into doing something you thought was dangerous or wrong? What are some ways you say no and mean it?*

Discuss that before students can be skilled at saying no to others, they need to be able to say *no* to self. Students may need to remind themselves on occasion that, although something looks like fun, it would not be good for them. Share something you have to practice saying no to, such as watching too much television, overeating or staying up too late at night. Talk with students about strategies you have used to form better habits concerning those trouble areas.

Make a class chart entitled *The Art of Saying NO!* Have teams of three to four students brainstorm ideas for how to effectively resist peer pressure, and share their ideas with the entire class. Some responses you may expect or suggest if necessary:

- Just say *no thanks* politely but firmly.
- Be a broken record if they continue to repeat the question.
- Give a reason.
(My mom would ground me forever if I got caught and I always do!)

- Walk away.
(Just leave the area where trouble is brewing.)
- Change the subject.
(Any reasonable shift from the topic will do.)
- Do something else.
(Change your activity.)
- Agree to disagree.
(I think differently about this than you do.)
- Assert yourself.
(I'm going home. If you change your mind, you can come over.)
- Turn the tables.
(Why would you ask me to do something illegal/harmful/dangerous?)
- Suggest alternatives.
(We could always go to a movie instead.)

After all choices are posted, have team members consider new strategies they may be able to successfully use when faced with peer pressure.

Pose this situation to your students: *Now consider that you have a friend experiencing difficulty and you want to help. Your friend may be wrestling with an eating disorder, bullying, huffing, shoplifting, family problems, depression or academic difficulty. Do you know of at least two adults at school you can contact who will help get support for your friend? Undoubtedly, the adults will require that your friend make a contact with them, but you can be an encourager for your friend in that process.*

Have students brainstorm a list of trusted adults at school. The list may include favorite teachers, guidance counselor, social worker, psychologist, school nurse, coaches or administrative personnel.

WRAP UP

Have students review the differences between *friendships* and *fakeships* in small groups. Remind them that true friends are looking out for their friends' best interests. Students may share a refusal strategy that they would use and a strategy they would not choose, explaining why each would or would not work for them.

All poison centers in the United States can be reached by calling the nationwide toll-free number. Calls are answered by the U.S. Poison Center that serves the individual making the call, based on his or her area code and exchange. For poison emergencies and information, call:

Poison Center
1-800-222-1222
24 Hours a Day, 7 Days a Week



In Case of Emergency

GRADES

6-8

Rapid pulse
Impulsivity
Emotionality
Sore tongue

OBJECTIVES

- Students will understand the cause of Sudden Sniffing Death.
- Students will review procedures for how to access help in case of an emergency.

MATERIALS

- Chart paper, board or overhead transparency
- Appropriate water-based, non-toxic, unscented markers

ACTIVITY

Before beginning the activity, explain the immediate effects of inhalant abuse with your students.

Students who huff or sniff may experience:

Dizziness
Lightheadedness
Giddiness
Impaired coordination
Headaches
Nausea
Slurred speech
Distorted speech
Disorientation

Huffing or sniffing can also result in *Sudden Sniffing Death*. Sudden Sniffing Death is death due to an irregular heart rhythm. It can result from inhaling vapors during a single session of abuse. As the brain is deprived of oxygen, adrenaline is released in an attempt to increase blood flow to the brain. This causes the heart to beat more rapidly, potentially resulting in cardiac arrhythmia and cardiac arrest within a few minutes. **It is particularly important not to startle a person who is inhaling, as this increases the risk of Sudden Sniffing Death.** About half of all deaths from inhalants are ascribed to Sudden Sniffing Death.

Introduce this activity by telling your class that sometimes being a friend means getting help for someone in trouble. Ask class members to imagine they have come upon a student who has been huffing on school grounds. When they find the student, he or she is slumped over and appears to be unconscious. An aerosol can is on the ground beside the student.

Discuss emergency steps the student should take to get help. List the steps and post them.

If the students were on school grounds those measures would include:

- Stay calm. Remember that startling the student could result in Sudden Sniffing Death.
- Get adult help immediately. If no adults are nearby and you have a cell phone, call 911.

- Follow instructions of the 911 dispatcher.
- When an adult arrives, follow their instructions.

If students were off school property, in a home or outdoors, steps would include:

- Stay calm. Remember that startling the person could result in Sudden Sniffing Death.
- Get an adult, if one is nearby.
- If no adult is available, call 911.
- Follow directions of the 911 dispatcher.
- Remove any source of chemicals from around nose or mouth.
- If person is unconscious, turn him or her to side to prevent choking on vomit.
- If you are inside, open windows and or/ doors.
- Do not move person unless he or she is in immediate danger.
- Save any products found in the area. This will assist medical team treating person.

WRAP UP

Have students record these emergency responses in their notebooks for future reference. Post a classroom chart for easy reference and review it every several weeks.



Supplemental Activities

Discussion Starters

Use these topics to promote quick discussion during transition times. These concepts are developed in lessons throughout the curriculum.

- Ways to prevent *body pollution*
- Our brain as a *command center*
- The pathway of oxygen to the brain
- The pathway of any inhaled substance to the brain
- How quickly oxygen (and anything inhaled) gets to the brain
- Connecting *body pollution* to *air pollution*
- Connecting atmospheric quality to our personal air quality
- Safety tips when you are in charge of younger children
- Healthy, legal thrill-seeking activities for pre-teens and teens
- Getting a friend *in trouble* vs. getting a friend *into help*
- Friendships vs. *fakeships*
- Approximate age when brain development is complete

Springboard Analogies

Complete these analogies as a group or with a partner.
Use these to start discussions concerning safety issues.

Label is to read as directions are to _____.

Emergency is to 911 as Poison Emergency is to ___.

Hand is to work glove as eyes are to _____.

Steel-toed shoes are to feet as a protective mask is to _____ and _____.

Degreasers are to grease as solvents are to _____ in the brain.

Smog is to the air as poisons are to the _____.

Responsible for is to self as *responsible to* is to _____.

Springboard Answer Key

Label is to read as directions are to follow.

Emergency is to 911 as Poison Emergency is to 1-800-222-1222.

Hand is to work glove as eyes are to safety glasses/goggles.

Steel-toed shoes are to feet as a protective mask is to mouth and nose.

Degreasers are to grease as solvents are to fat cells/fatty tissue in the brain.

Smog is to the air as poisons are to the body.

Responsible for is to self as *responsible to* is to others.

FAST FACTS™ on the Brain, Oxygen and Toxic Substances

Students will review material and recall critical information by using a learning strategy called FAST FACTS™. This is one of a series of strategies to assist learning developed by Dr. Dennis Embry of the PAXIS Institute. He calls these strategies “simple gifts.” The FAST FACTS™ strategy is applied here to the topic of learning about the brain, oxygen and toxic substances. The object of this activity is to reinforce learning in a fun way that allows students to be very involved!



1. Assign students to work in pairs and have them decide who will be the first coach and first learner on their team. Roles will switch halfway through the exercise.
2. Pass out a study sheet to every student, but ask students not to read it yet.
3. Go over the directions for the exercise (on the following page) with students. You can copy and give the directions to students or project them on a screen.
4. After you've gone over the directions and answered any questions, ask all students to silently and quickly read both the questions and the answers on their study sheets.
5. When students have finished reading, tell the learners to turn over their study sheets.
6. Give a signal for students to start. When students are about halfway through the questions, signal students to change roles and continue.
7. When it appears most students have finished, tell them to stop.
8. Ask them to add up all the fives, threes and zeros for each learner and then tally total team points. Poll the class for team totals.
9. Tell students to congratulate their partner on a job well done!

FAST FACTS™, Copyright© 2004, PAXIS Institute. Used with permission.

Directions for Facts about the Brain, Oxygen and Toxic Substances

- **Students will quickly and silently read all questions and answers.**
- **When directed to start, coaches will quickly read each question aloud to the learner.**
- **Without looking at the answers, the learner will answer the questions aloud.**
- **If the answer is correct, the coach will award the learner 5 points. If the answer is not correct, the coach will ask the learner to listen and will repeat the question and answer again. The coach will then repeat the question a final time.**
- **If the learner gets it right this time, the coach awards the learner 3 points. If not, a zero is recorded.**
- **BE CERTAIN TO RECORD ALL POINTS EARNED AS YOU COACH!**
- **Continue working through the questions and answers, coaching by REPEATING questions and answers when necessary, until time is called.**
- **When the teacher tells you to, change roles quickly. The learner now becomes the coach. The new coach will continue to record points on the same study sheet.**
- **The coach will start with the very next question on the list and continue through the questions until the teacher tells you to stop.**

Facts about the Brain, Oxygen and Toxic Substances

Question	Answer	5	3	0
1. What organ is the "command center" of the body?	Brain			
2. What are three things we need to stay alive?	Food, water, oxygen			
3. We cannot live longer than a day without food. T or F	False			
4. If a person cannot breathe, they can become _____.	Unconscious			
5. Which is most important for survival: food, water or oxygen?	Oxygen			
6. We need a constant supply of this gas to function well.	Oxygen			
7. Toxic substances can cause brain cells to become _____.	Damaged			
8. Hemoglobin is contained in all red blood cells. T or F	True			
9. Where does oxygen go before it goes to the heart?	Brain			
10. Breathing concentrated fumes can cause problems with ____.	Memory, balance, hearing, vision, speech			
11. Can our eyes see or detect a difference in gases?	No, gases are invisible			
12. What do solvents or degreasers do to fatty cells and tissues?	Damage or destroy them			
13. The brain gets about _____ of blood circulated in the body.	16% - 20%			
14. Pathway of oxygen → lungs → brain → heart T or F	T			
15. What happens if there are vapors and fumes in the lungs?	Toxic substances go to the brain			
16. What is the poison emergency toll-free number?	1-800-222-1222			
17. Poisons entering the body result in _____.	Body pollution			
18. Several ways poisons might enter the body are being _____.	Swallowed, absorbed through skin, inhaled			
19. Can we prevent body pollution by following safety rules?	Yes			
20. By what age is the brain completely developed?	About 25 years old			
21. What are three ways to love your brain?	Avoid toxins, eat healthy foods, exercise			
22. Teen brains are more vulnerable than adult brains. T or F	T			
23. Teens cannot quickly develop drug dependence. T or F	F			
24. What is controlled by the frontal lobe?	Planning, decision-making, judgment			
25. What is controlled by the parietal lobe?	Spoken and written language			

Scoring Total Learning Points		
Add up number of 5, 3 and 0 point awards for each learner.	Learner Number One Points	
Enter the sum for each learner.	Learner Number Two Points	
Enter the sum for the team.	Team Total Points	

Amazing Brain Facts

**Check out these
fun facts
about our brains.**

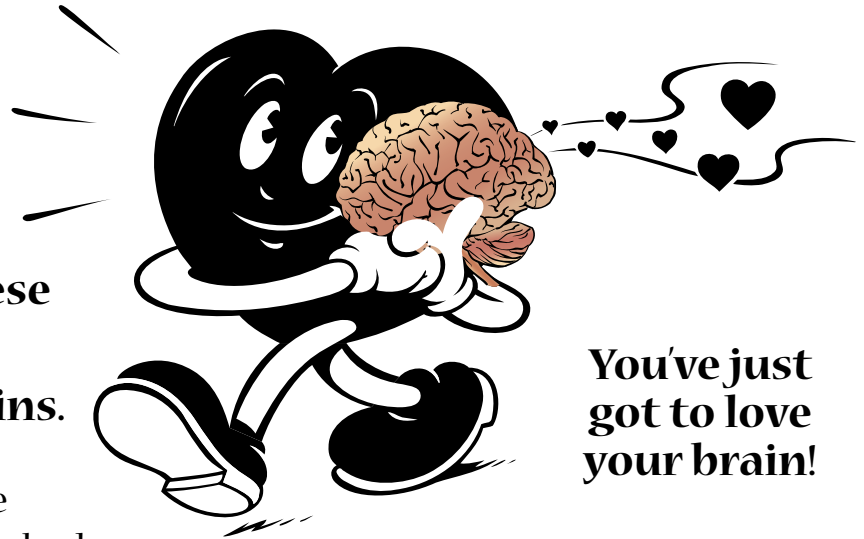
The brain is the
command center of the body.

The brain weighs about
three pounds.

One third of the cells in the brain
are fat cells.

The back part of the brain
receives information. The back part
tells us, for example, that we have
been touched.

The front part of the brain
gives meaning to that information.
The front part tells us that the touch
was a good touch, a hug from
someone we know and love.



**You've just
got to love
your brain!**

The brain is not fully developed
until we are about 25 years old!

There are more connections
in our brains than there are
stars in the universe.

The brain has about 100 billion
nerve cells called neurons.

Neurons send up to 50,000 messages
through the brain per minute!

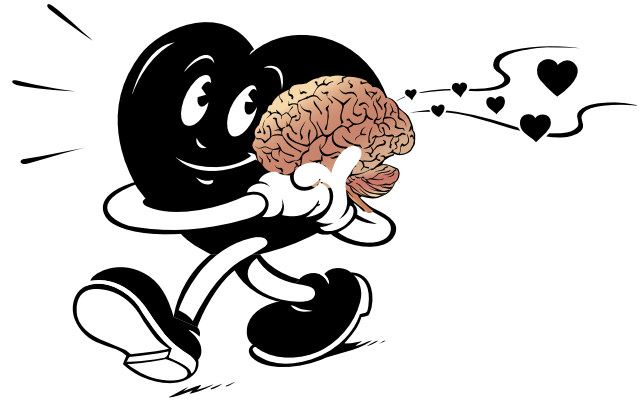
If we want these messages to travel
well so our bodies can work well,
we must take very good care
of our brains.

Adapted from Which Brain Do You Want? © 2004 Amen Clinics, Inc. and MindWorks Press

Love Your Brain!

Healthy Brain Tips

Taking care of the body's command center is very important. Challenge yourself to begin LOVING YOUR BRAIN a bit better each day!



Tip #1: Protect Your Brain

The brain is soft and the skull is very hard. It's important not to put ourselves at risk of brain injury. Wear seatbelts in cars and helmets on bicycles. Avoid motorcycles and consider sports such as golf, tennis and table tennis.

Tip #2: Avoid Toxic Substances

Using household products improperly can introduce toxic fumes to the brain. Using alcohol and other drugs can harm the teen brain. Nicotine (tobacco products) and caffeine (coffee, tea, sodas) can be harmful in large quantities since they restrict blood flow to the brain.

Tip #3: Get Enough Sleep

People who are chronically sleep-deprived have lower overall brain activity.

Tip #4: Manage Your Stress

Learn to do deep breathing or meditation to manage your stress. Chronic exposure to stress actually kills cells in the memory areas of the brain.

Tip #5: Eat Healthy

Eat plenty of lean protein and fresh fruits and vegetables. Eat a low-sugar, low-fat diet.

Tip #6: Take A Multivitamin Every Day

If we have all the vitamins and minerals we need every day, our brain can do its best.

Tip #7: Exercise

Physical exercise boosts blood flow to the brain. Blood delivers oxygen, fuel for the brain, to the brain more efficiently when we exercise.

Tip #8: Keep Learning

As new learning takes place, the brain grows and changes. Turn off electronics and read.

Tip #9: Don't Believe Every Thought You Have

Negative thoughts can come into your mind and can ruin your day. Don't let them. These are called ANTS - Automatic Negative Thoughts - and they need to be corrected!

Adapted from Which Brain Do You Want? © 2004 Amen Clinics, Inc., and MindWorks Press. Used with permission.

Guidance for Teachers: Handling Questions About Huffing Appropriately

Students may have questions about huffing and sniffing or they may be concerned about someone else's huffing and sniffing. You may invite these students to speak with you privately when appropriate. You may want to arrange further contacts with school personnel such as the counselor, nurse, psychologist or social worker. If students engage you in discussion about someone's use during your large group lesson, you will want to use this situation as a learning opportunity. First, remind students not to mention any names in the larger group. Next, make comments that will shift the focus onto the danger of toxic effects rather than the perceived fun involved.

Students may say: *Since you can buy these things in the grocery store, they can't be that dangerous.*
You may respond: *These products are very safe and useful when they are used according to their directions. Let's talk about what a package or aerosol can says about product use and possible dangers.*

Recognize a teachable moment, pick up one of the products you have on hand and ask a volunteer to help you read the product label and all information on it since you're having a hard time seeing the fine print. For example, a spray paint can may contain warnings such as the following: *Danger! Extremely Flammable. Keep away from heat, sparks and open flame. Vapors may ignite explosively. Use with adequate ventilation. Do not take internally. Keep out of the reach of children. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.* Product labels contain a lot of information, so after a student has read the label aloud, ask students what they should and shouldn't do to use the product safely. As they respond, the teacher

can help them better understand what these precautions mean by asking questions. Below are some samples of questions that may be asked.

Why do you think the directions say to use this in a well-ventilated area? What are some examples of "well-ventilated"? What might cause an explosion or fire when using this product? Why do you think the warning says not to take internally or to inhale concentrated fumes?

The warning on products about intentional misuse by concentrating and inhaling the contents may lead students to ask: **How do you concentrate the fumes to inhale them? How do kids use inhalants?** Some students may know the answer and begin sharing it. You need to direct the conversation away from techniques of use.

You may respond: It's not important to know "how," but it is important to know what happens if you do. Huffing or sniffing a product can be harmful and fatal, even the very first time you try it. **About one out of three persons who die from inhalant abuse were first-time users.**

Students may say: *But I've heard that it's fun! It makes you feel high, you know, kind of dizzy and strange.*

You may respond: *I like the feeling I get when I ride a roller coaster or one of those rides that spins really fast in circle, and it's really fun. But I notice something very different about how you get those kinds of strange sensations, don't you?*

You hope to engage the student so that he or she will answer that those dizzy or strange sensations can be a result of things that are happening due to speed, twists and turns *outside* of your body, but

the sensations from inhaling vapors, gas or fumes are happening because of toxic substances that have gotten *inside* your body and have reached the brain.

If students talk about kids who use inhalants to get high, remind them that they should be very concerned because the high that is experienced is a result of toxic effects of the poisonous chemicals that have reached the brain.

Students may say: *Why would anyone do this if it is so dangerous?*

You may say: *Most kids who do this just think they're having fun, but they don't realize how dangerous it really is. They've learned about huffing from their peers, but they probably haven't heard anything about how harmful it is from their parents or teachers. Many young people have died because they didn't know what they were actually doing was poisoning their brains and bodies with toxic fumes.*

Students may say: *I've heard it's really quick; it only lasts a few seconds or a few minutes. Nothing that quick can really hurt you.*

You may ask the student: *Do you remember how quickly oxygen gets to the brain?*

Remind the student that oxygen starts its pathway into the body because it has been inhaled. If chemicals are inhaled, they displace oxygen going to the brain. They still go directly to the brain, though, and can cause damage to cells quickly. Remember that no one can predict whether damage will be temporary or permanent, but inhalants get to the brain within seconds. Also mention that the pathway of inhalants is from the lungs to the brain to the heart and then the rest of the body and that nothing has been filtered out of the chemicals before they get to the brain. Remind students, too, that these chemicals can be toxic to the heart. They can lead to arrhythmia and can result in Sudden Sniffing Death the first time or any time inhalants are used.

Be sensitive to students' comments and concerns. Remember that it is important to refrain from being judgmental and to guide students through a discussion rather than lecture about this.

The bottom line is that huffing or sniffing can kill the first time, the tenth time, or any time someone abuses products. Bring this point into the discussion and repeat it several times throughout the discussion.

Grades 9-12

What's Going On Up There?

Inhalants: Health Consequences

A Shared Mission

Be a Friend, Help a Friend

In Case of Emergency

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Supplemental Activities

Guidance for Teachers

Grades 9-12 Lesson Introduction

The following section contains sequential lessons for students from grades nine through twelve. Included in each lesson are objectives, materials needed, vocabulary and suggested activities. The 9-12 unit is followed by *Fast Facts*[™], a review of essential information which may be used separately to instruct key concepts in this manual. The supplemental activities section includes *Guidance for Teachers: Handling Questions about Huffing Appropriately*, quick discussion topics for lesson reinforcement, exercises concerning health and safety issues relating to inhalants, *Amazing Brain Facts* and *Healthy Brain Tips*. All supplemental activities may be used to reinforce inhalant abuse prevention topics taught throughout the school year. The black line masters may be used for class hand outs, overhead transparencies or as projected slides. For an electronic copy of *Inhalant Abuse Prevention: Staff Education and Student Curriculum*, visit the Virginia Department of Education's Web site at www.doe.virginia.gov.

A sample letter for parents and guardians located before the lessons introduces the inhalant abuse prevention unit of study, defines inhalants, refers parents to an online training opportunity and includes Poison Center contact information. It may be personalized and altered to meet your needs. The parent/guardian letter and student worksheets in the 9-12 unit may be sent home in student backpacks. Distribute sensitive information regarding inhalants to parents through e-mails or direct mail, since it is imperative to avoid putting specific information about product abuse in the hands of children.

National Inhalants and Poison Awareness Week is the third week in March each year. This is an ideal time to review concepts taught and to implement educational activities and sponsor events which

reinforce poison prevention and the proper use of common, readily available household products.

For grades nine through twelve, the Virginia Inhalant Abuse Prevention Student Curriculum includes these components:

- Brain structure and function
- Biological and physical implications of any gas replacing oxygen in the blood
- Negative effects of poisons and pollutants on the heart, brain and other organs
- Safety precautions against environmental and body pollution
- Introduction to organizations and policies that protect people from poisons and toxins
- Refusal skills regarding inhalant abuse or any risky behavior
- *Sudden Sniffing Death* - cause and explanation
- Helping a friend who is huffing or sniffing

Special note: Health Standards of Learning are developed through grade ten, but lessons in this curriculum can be accessed and repeated in grades eleven and twelve as appropriate.

Teachers should carefully consider their choice of vocabulary and responses when talking about inhalants with their students.

- Substitute *poisons* or *chemicals* for *inhalants*.

- Substitute *toxic effects* for *high* and *experiencing toxic effects* for *getting high*.
- Emphasize that *body pollution* is the result of air/water/environmental pollution and of choosing to introduce harmful substances into your body.
- Always express serious concern for the health and safety of someone who inhales toxic fumes or vapors, whether accidentally or deliberately, especially if the fumes are concentrated.

Never discuss specific products or methods of abuse or show students how products are abused.

Teachers and staff using this curriculum are encouraged to adapt components of the lessons as necessary to suit the needs of students receiving instruction. Vocabulary and concepts may require further development. Activities are designed to be flexible so that learning styles of all students may be honored during instruction.

This curriculum corresponds to the 2001 Virginia Department of Education's *Health Education, Physical Education and Driver Education Standards of Learning for Grades 9-12* as follows:

The student will:

- 9.1 apply health knowledge and skills to the development and analysis of personal goals to achieve and maintain long-term health and well-being. (c,d,g)
- 9.3 analyze, synthesize, and evaluate the relationship between positive health behaviors and the prevention of injury and premature death. (a,e)
- 10.1 demonstrate an understanding of health concepts, behaviors, and skills that reduce health risks and enhance the health and well-being of self and others throughout life. (c,d)
- 10.5 evaluate how different types of behavior impact the community. (g)

Sample Letter to Parents and Guardians of Students in Grades 9-12

Dear _____,

Today our class is beginning a unit of study on inhalant abuse prevention. Inhalants are legal, everyday products that can be found on grocery store and hardware shelves and in the kitchen, bathroom, office and storage areas of your home. When used properly, these products help us perform necessary tasks in and around our homes and schools. When used improperly, these products can cause health and safety problems for everyone, especially children and teens. The products contain chemicals that are toxic when used in violation of package directions. For this reason, inhalants will be referred to as poisons and toxic substances during our class discussions.

Inhalant abuse refers to the deliberate inhalation of fumes, vapors or gases to achieve a mood-altering effect. Although inhalants are legal products when used as directed, their abuse by young people may be a gateway to later use of alcohol, marijuana, hallucinogens such as LSD and Ecstasy, cocaine and heroin. Brain damage and death can result from inhalant abuse, even after a single use. Research tells us that the percentage of students using inhalants peaks during eighth and ninth grades. However many high school students continue to abuse inhalants.

The brain is growing and changing rapidly throughout adolescence and is not completely developed until roughly age 25. The adolescent brain is particularly vulnerable to the impact of toxic substances in inhalants and to alcohol, tobacco, marijuana or other drugs.

When you ask your child to share what the class discussed about inhalants, the brain and the impact toxic substances can have on the brain, you will be assisting them in recalling critical information and practicing valuable skills.

If you would like to learn more about inhalants and about how to talk to your child about them, visit www.inhalantabusetraining.org on the Internet. This site provides an overview on inhalants that has proven very helpful to concerned adults.

Please call me with any questions or concerns you may have. Thank you for your interest in this topic.

Sincerely,

P.S. All poison centers in the United States can be reached by calling the nationwide toll-free number. Calls are answered by the U.S. Poison Center that serves the individual making the call, based on his or her area code and exchange. For poison emergencies and information, call:

1-800-222-1222
24 Hours a Day, 7 Days a Week

What's Going On Up There?

GRADES

9-12

OBJECTIVES

- Students will identify four major regions and four lobes of the brain.
- Students will repeat the brain functions of the four regions and four lobes.
- Students will analyze the effect of oxygen loss on each region.
- Students will learn about survival time without oxygen.
- Students will discuss differences in the developing brain and the adult brain.
- Students will learn the role of the limbic system.

MATERIALS

- *How the Brain Works*
- Cutouts of the four regions and four lobes of the brain
- Individual hand outs of the outline of the brain, if desired
- Overhead projector or LCD projector
- Chart paper
- Appropriate water-based, non-toxic, unscented markers

VOCABULARY

- *Command center* - the brain, for purposes of these lessons.
- *Cerebral cortex* - wrinkly outer layer of the brain that helps us see, hear, taste, feel things, talk, think, solve problems, learn and remember things. The cerebral cortex contains the frontal lobe, temporal lobe, parietal lobe and occipital lobe. They each perform special functions.
- *Cerebellum* - lower back part of the brain that helps control balance and movement.
- *Brainstem* - base of the brain that continues into the spinal cord and controls body functions such as breathing, heart rate, blood pressure and digestion.
- *Spinal cord* - thick column of nerve tissue that extends from the base of the brain into the backbone. It carries nerve impulses back and forth between the brain and other body parts.
- *Limbic system* - a group of deep structures below the cortex that are associated with emotions such as fear, pleasure, memory and motivation. (hypothalamus, amygdala and hippocampus)

This vocabulary will be introduced as the lesson develops.

ACTIVITY

Project *How the Brain Works* to introduce each region of the brain. As a region is introduced, ask students if they know what that part of the brain controls. Mount that region in its appropriate spot. State one thing that can take place in the body because of the work that region does. Challenge students to give additional examples. Extend their contribution by adding:

Cerebral cortex - problem solving, memorizing facts, planning, organizing

Cerebellum - dancing, playing sports, clapping hands, doing yoga and aerobics

Brainstem - digesting a big meal, breathing

Spinal cord - sends pain signals, coordinates reflex actions

Come back to the cerebral cortex and explain that, within that region of the brain, there are four lobes. Explain that there are many tasks taken care of in the cerebral cortex and that special regions of the brain, called lobes, are responsible for certain tasks.

Frontal lobe - talking, solving problems, reasoning

Temporal lobe - language, memory, reading social cues, distinguishing smells, sounds

Occipital lobe - recognizing shapes and colors

Parietal lobe - understanding spoken and written language

Challenge your students to use **their** frontal lobes to come up with a strategy for remembering all the regions of the brain, the lobes and their functions. Encourage volunteers to share their learning strategies. Post the strategies on chart paper.

Introduce one more system of the brain - the *limbic system* - and share the following information. The limbic system is also known as the reward center of the brain. Substances of abuse activate this region of the brain much the same as pleasurable activity such as eating does. The limbic system is involved in olfaction (sense of smell), emotion, behavior and motivation. Explain that the adolescent brain is continuing to develop and is vulnerable - easily hurt or damaged. Because of a developing frontal lobe, the teen brain more easily develops substance abuse patterns. Research tells us that when teens begin to drink or use substances before age 15, they are four times more likely to develop an addiction than those who abstain from drinking or other substances until they are at least 21. The National Institute on Drug Abuse has recently announced that research indicates all addiction begins in adolescence. It is critical to encourage teens to chase their dreams and seek safe, high-energy, thrilling fun, while avoiding toxic substances in the process.

WRAP UP

Challenge your students to think about this: A brain impacted by poisons and toxins will begin to send incorrect signals, slower signals or no signals at all to different body parts. Picture the brain as a busy four-way intersection with traffic lights. Imagine what it would look like if all the brain signals being sent out were:

- Stuck on yellow
- Stuck on green
- Stuck on red

Refer to the *How the Brain Works* poster and have students make predictions based on that information. Ask: *What are some things that may happen in the cerebral cortex due to use of substances? What changes might we observe that can relate to tasks of the cerebellum? What functions controlled by the brainstem might be altered?*

Inhalants: Health Consequences

GRADES

9-12

OBJECTIVES

- Students will identify health consequences that may result from exposure to poisons and pollutants.
- Students will explain the purpose of solvents and degreasers.
- Students will describe toxic effects chemicals and their vapors have on the brain.
- Students will determine healthy tips for caring for the brain.

MATERIALS

- *Inhalants: Health Consequences*
- *Bright Ideas?*
- Five to 10 empty and clean abusable product containers with tops securely taped or glued closed.
- Overhead projector or LCD projector
- Chart paper
- Appropriate water-based, non-toxic, unscented markers

ACTIVITY

Display empty product containers and briefly review information about the labeling of poisons and chemicals. Tell students that many of the products contain chemicals known as *solvents*. Ask if they know what solvents are designed to do. Ask them to think of the word dissolve, which is related to solvents. If necessary, explain that solvents are designed to remove fats, grease, dirt, grime and soil from pipes, pots and pans, clothing, carpeting or similar items. Ask students to turn to a partner and identify one solvent that is in the kitchen, bathroom or garage at their home and to explain the purpose of that particular solvent. Share with students that vapors from the products contain solvents. Mention, too, that these solvents are highly flammable. They are extremely dangerous when in the presence of intense heat or flames. Ask: *Do vapors have the potential to pollute the body?*

Trace the pathway that solvent vapors take to the brain: they enter the nose or mouth, go into the lungs and then travel directly, unfiltered, to the brain in a matter of seconds. Inform the class that many tissues and organs in the body contain fat cells and fatty membranes. Share that one-third of all the cells in the brain are fat cells.

Discuss the implications of fat cells in the brain being damaged or destroyed. Scientists have proven that the protective coating of neurons, the myelin sheath, can be destroyed by contact with solvents and solvent vapors. To illustrate, share that the myelin sheath acts as insulation for neurons carrying electrical impulses within the brain. What happens when the insulation is destroyed? The neurons' signals are short-circuited. Destruction of fatty tissues and brain

cells can result in significant impairment to brain functions. Ask volunteers to list problems people may experience when fatty tissues and cells have been destroyed. They may recall that problems are likely with memory, language, sight, hearing, taste, smell, coordination and heart rhythm.

Have students complete the *Inhalants: Health Consequences* work sheet to review concepts above.

Display *Bright Ideas*? Divide students into teams and challenge them to create original posters discouraging use of solvents. Share student ideas or their work after a few minutes.

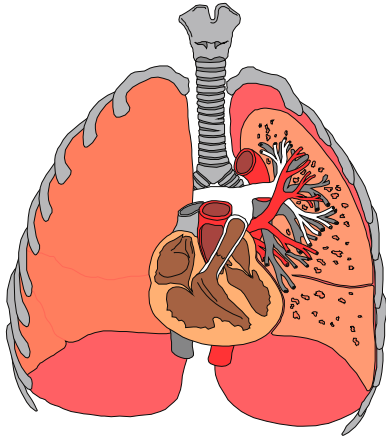
Remind students that if products containing solvents are not used according to instructions, oxygen will be replaced by toxic chemicals in the lungs. This results in less oxygen being available to the brain and in toxic effects to the brain cells and tissues.

WRAP UP

Students may write a letter of several paragraphs to a friend who has a part-time job as a painter's helper, auto repair trainee or cosmetology trainee. They should share concepts of these lessons with their friend and ask their friend to take proper precautions while at work. These friendly reminders should be included in the letter:

- Make certain work setting has proper ventilation.
- Wear protective gear such as gloves, masks and safety glasses.
- Read and carefully follow product labels and directions.
- Products should be capped and sealed when not in use.

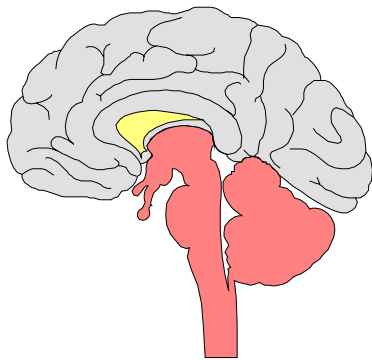
Inhalants: Health Consequences



Reduce oxygen absorption



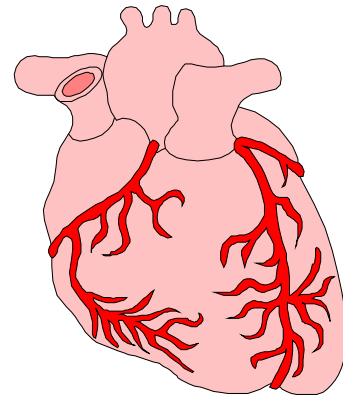
Reduce lung function



Cause painful headaches



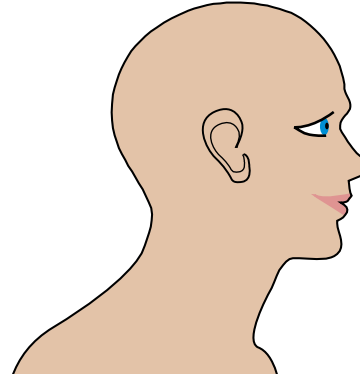
Destroy brain's neural coating



Cause irregular heart rhythm



Can stop heart entirely



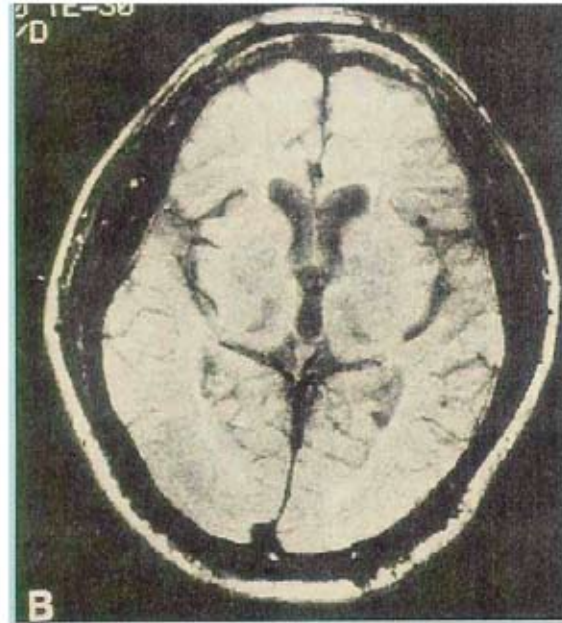
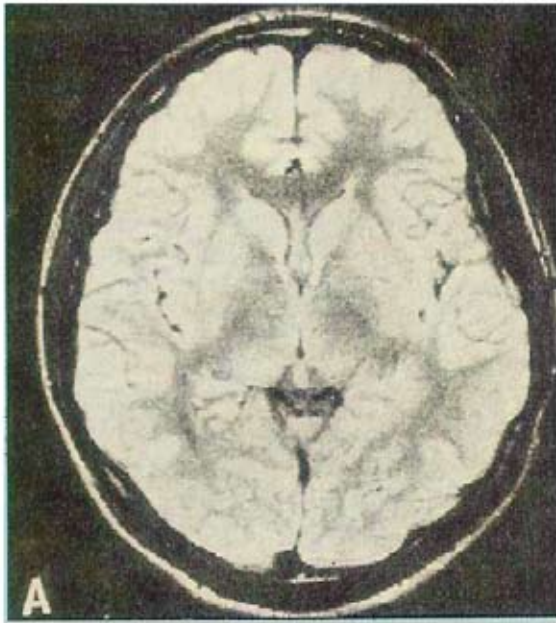
Affect vision and hearing



Affect senses of smell and taste

First Time - Any Time - They Can KILL

Healthy Brain, Toluene Brain

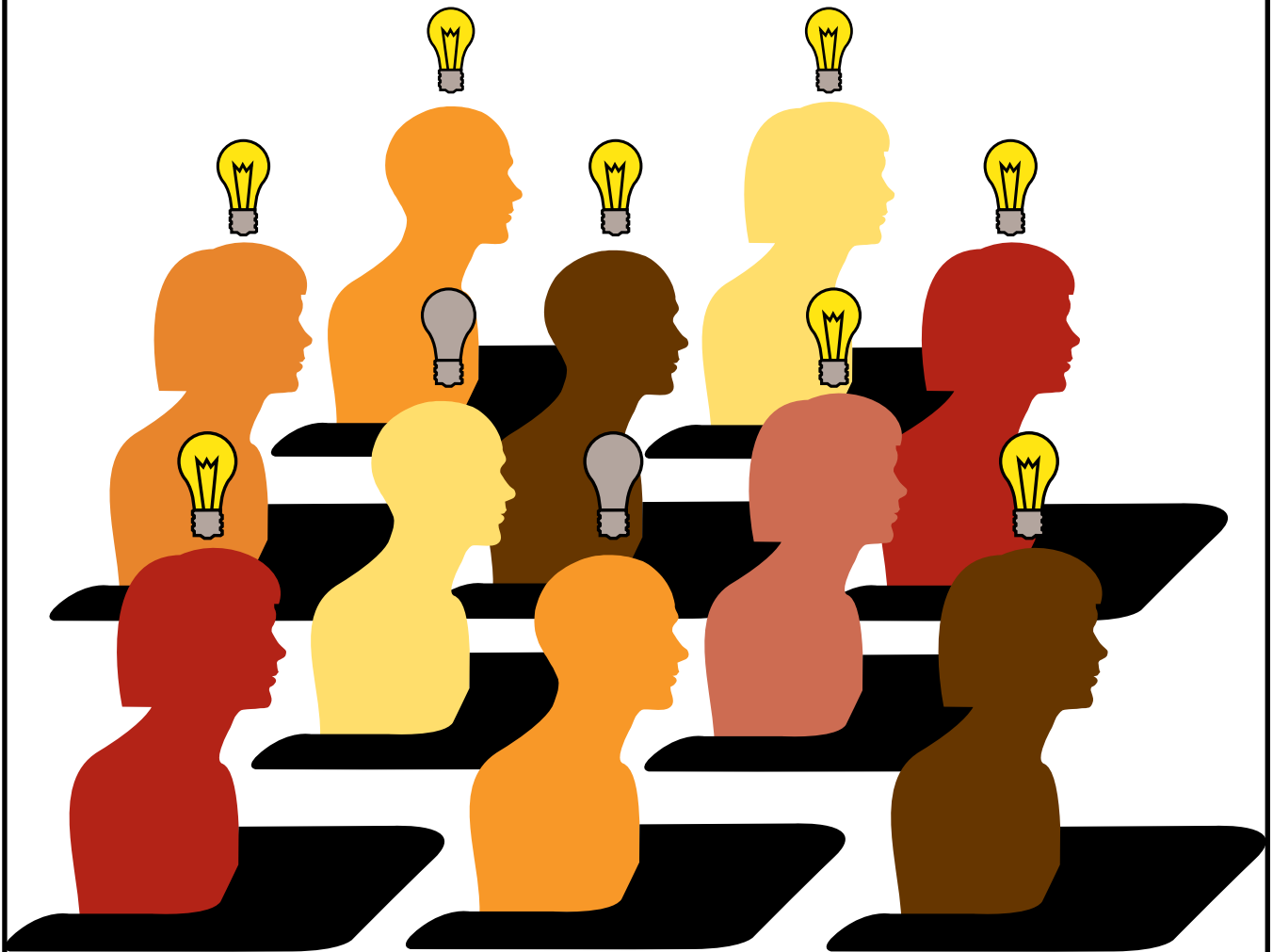


Brain image A is from a healthy male teenager who has never abused inhalants. Brain image B shows shrinkage of brain tissue in a teenage toluene abuser. Note the smaller size and the larger, empty (dark) space within the toluene abuser's brain.

*National Institute on Drug Abuse Research Report Series: Inhalant Abuse.
Images courtesy of Neil Rosenberg, M.D.*

This set of images may be a helpful reminder of potential harm of chemicals when used improperly. Use this in *Inhalants: Health Consequences* as reinforcement to concepts presented. It can be used in additional lessons as a supplement to concepts presented.

Bright Ideas?



A Shared Mission

GRADES

9-12

OBJECTIVES

- Students will list agencies whose function is to protect us from poisons and pollutants.
- Students will explain the duties of an organization that protects people's health and safety.
- Students will compare the loss of air quality in our environment to the loss of air quality in the body.

MATERIALS

- Telephone directories or reference information
- Access to the Internet
- Various organizations' reference materials

ACTIVITY

List acronyms OSHA and EPA on the chalkboard and inquire if any student knows what they represent. The Occupational Safety and Health Administration (OSHA) is responsible for the health and safety of people in the workplace. Tell students that workers may be exposed to chemicals, poisons, pollutants or toxins while on the job. OSHA sets up guidelines to help protect

workers' health. The Environmental Protection Agency (EPA) protects the environment and its effects on people.

Pairs or small groups of students can request information and pamphlets from the regional OSHA office or conduct Internet research at www.osha.gov. They can also research the Environmental Protection Agency at www.epa.gov. Students can access information about everyday, easily available and potentially toxic products at www.atsdr.cdc.gov, the Agency for Toxic Substances and Disease Registry's website. They can also visit www.poison.org to explore resources available through the National Capital Poison Center website. Ask for a volunteer to call 1-800-222-1222 for poison information. Students can report to class on the mission and duties of the various agencies.

For Poison Emergencies and Information

All U.S. Poison Centers can be reached by calling the nationwide toll-free number. Calls are answered by the poison center that serves the individual making the call, based on his or her area code and exchange.

Poison Center

1-800-222-1222

24 Hours a Day, 7 Days a Week

WRAP UP

Encourage students to write a school newspaper article on poisons and pollutants and the agencies charged with protecting the health and safety of those in the workplace and our environment regarding these substances.

Be A Friend, Help A Friend

GRADES

9-12

OBJECTIVES

- Students will describe characteristics of friends and responsibilities of friendships.
- Students will discriminate between getting a friend *in trouble* and getting a friend *into help*.
- Students will name at least one resource person to refer a friend to for help.
- Students will generate a list of refusal skills necessary to confront peer pressure effectively.
- Students will learn emergency procedures for getting care for a friend who has been huffing.
- Students will learn Poison Center toll-free number.

MATERIALS

- Chart paper, newsprint, board or overhead transparency
- Appropriate water-based, non-toxic, unscented markers
- *The Art of Saying NO!*

ACTIVITY

Open the lesson by asking students if they have heard of the term *fakeship*. Get ideas from them on what a fakeship might be. Enjoy the ideas they may offer and then say *If I told you we are going to be discussing friendships and fakeships, you may have a better idea of what a fakeship is. Do you have any ideas now?* Remind the class that there should be no mention of names as students brainstorm during this activity. As students offer examples of what makes a true friendship and contrasting examples of what makes a fakeship, enter them on a T-chart.

Ask if anyone has ever had serious concerns about a friend. Again remind them not to mention names as they share situations. Invite students to share how it felt to be concerned about a friend. Were they able to help their friend or get their friend into help? Discuss the difference between getting a friend *in trouble* and getting a friend *into help*. Ask: *Is it worth risking the friendship to help a friend? Can this be a difficult thing to do? What risks might be involved in trying to help a friend?*

Discuss the difference between being responsible *for* self and responsible *to* others. Whose behavior can we control? Whose friends can we choose? Whose time can we manage? Whose decisions can we make? When we are concerned about our friends, we can tell them our concerns honestly but they may not make the decision we believe to be best. It is up to each of us to be a friend of character to our friend in need, but we cannot make decisions for that friend. It is also important for us not to be swayed into doing things that are illegal, harmful or dangerous. Drawing healthy boundaries - setting limits of what we can and cannot tolerate in a friendship - is important as we experience stress in our friendships. It remains

important for us to have good information, though, so we can guide our friend *into* help if there is a serious problem, but the next step would be theirs to take.

If we are concerned about a friend and want information about inhalants, we can contact the Poison Center for information. They can be reached at 1-800-222-1222.

Who are the resource people we can go to for help at school? Brainstorm a list on a separate chart. This will likely include: teachers, school nurse, guidance counselor, psychologist, resource officer, social worker. Post this list for future reference of all students.

Look at the fakeship side of the first chart. Ask students: *Has anyone ever tried to pressure you into doing something you thought was dangerous or wrong? What are some ways you say no and mean it?*

Discuss that before students can be skilled at saying *no* to others, they need to be able to say *no* to self. Students may need to remind themselves on occasion that, although something looks like fun, it would not be good for them. Share something you have to practice saying no to, such as watching too much television, overeating or staying up too late at night. Talk with students about strategies you have used to form better habits concerning those trouble areas.

Make a class chart entitled *The Art of Saying NO!* Have teams of three to four students brainstorm ideas for how to effectively resist peer pressure, and share their ideas with the entire class. Some responses you may expect or suggest if necessary:

- Just say *no thanks* politely but firmly.
- Be a broken record if they continue to repeat the question.

- Give a reason.
(My mom would ground me forever if I got caught and I always do!)
- Walk away.
(Just leave the area where trouble is brewing.)
- Change the subject.
(Any reasonable shift from the topic will do.)
- Do something else.
(Change your activity.)
- Agree to disagree.
(I think differently about this than you do.)
- Assert yourself.
(I'm going home. If you change your mind, you can come over.)
- Turn the tables.
(Why would you ask me to do something illegal/harmful/dangerous?)
- Suggest alternatives.
(We could always go to a movie instead.)

After all choices are posted, have team members consider new strategies they may be able to successfully use when faced with peer pressure.

Pose this situation to your students: *Now consider that you are not troubled, but you have a friend experiencing difficulty and you want to help. Your friend may be wrestling with an eating disorder, bullying, huffing, shoplifting, family problems, depression or academic difficulty. Do you know of at least two adults at school you can contact who will help get support for your friend? Undoubtedly, the adults will require that your friend make a contact with them, but you can be an encourager for your friend in that process.*

Have students brainstorm a list of trusted adults at school. The list may include favorite teachers, guidance counselor, social worker, psychologist, school nurse, coaches, school resource officers or administrative personnel.



WRAP UP

Students may share a refusal strategy that they would use and a strategy they would not choose, explaining why each would or would not work for them.

All poison centers in the United States can be reached by calling the nationwide toll-free number.

Poison Center
1-800-222-1222
24 Hours a Day, 7 Days a Week

In Case of Emergency

GRADES

9-12

Impulsivity
Emotionality
Sore tongue

OBJECTIVES

- Students will understand the cause of *Sudden Sniffing Death*.
- Students will review procedures for how to access help in case of an emergency.

MATERIALS

- Chart paper, board or overhead transparency
- Appropriate water-based, non-toxic, unscented markers

ACTIVITY

Before beginning the activity, review the immediate effects of inhalant abuse with your students. Students who huff or sniff may experience:

Dizziness
Lightheadedness
Giddiness
Impaired coordination
Headaches
Nausea
Slurred speech
Distorted speech
Disorientation
Rapid pulse

Huffing or sniffing can also result in *Sudden Sniffing Death*. Sudden Sniffing Death is death due to an irregular heart rhythm. It can result from inhaling vapors during a single session of abuse. As the brain is deprived of oxygen, adrenaline is released in an attempt to increase blood flow to the brain. This causes the heart to beat more rapidly, potentially resulting in cardiac arrhythmia and cardiac arrest within a few minutes. **It is particularly important not to startle a person who is inhaling, as this increases the risk of Sudden Sniffing Death.** About half of all deaths from inhalants are ascribed to Sudden Sniffing Death.

Introduce this activity by telling your class that sometimes being a friend means getting help for someone in trouble. Ask class members to imagine they have come upon a student who has been huffing on school grounds. When they find the student, he or she is slumped over and appears to be unconscious. An aerosol can is on the ground beside the student.

Discuss emergency steps the student should take to get help. List the steps and post them.

If the students were on school grounds those measures would include:

- Stay calm. Remember that startling the student could result in Sudden Sniffing Death.
- Get adult help immediately.
- If no adults are nearby and you have a cell phone, call 911.

- Follow instructions of 911 dispatcher.
- When an adult arrives, follow their instructions.

If students were off school property, in a home or outdoors, steps would include:

- Stay calm. Remember that startling the person could result in Sudden Sniffing Death.
- Get an adult, if one is nearby. Follow their instructions.
- If no adult is available, call 911.
- Follow instructions of 911 dispatcher.
- Remove any source of chemicals from around nose or mouth.
- If person is unconscious, turn him or her to side to prevent choking on vomit.
- If person is not breathing, administer CPR chest compressions if you know how.
- Wait for help to arrive.
- If you are inside, open windows and/or doors.

- Do not move person unless he or she is in immediate danger.
- Save any products found in area. This will assist medical team treating person

Follow the links below to news articles concerning teen driving under the influence of inhalants.

www.nytimes.com/learning/teachers/NIE/anti-drug/article8.html

Fatal Car Crash Reveals Inhalant Abuse as Dangerous to Youth (02/25/2000)

www.thedailycitizen.com

Driver Gets Six Years in Fatal Auto Crash Case (07/13/2007)

Discuss the articles with your students. Your discussion could help save a life.

Never Get Into A Car With Someone Who Is Huffing or Using Substances.

WRAP UP

Have students record these emergency responses in their notebooks for future reference. Post a classroom chart for easy reference and review it every several weeks.

Supplemental Activities

Discussion Starters

Use these topics to promote quick discussion during transition times. These concepts are developed in lessons throughout the curriculum.

- Ways to prevent *body pollution*
- Our brain as a *command center*
- The pathway of oxygen to the brain
- The pathway of any inhaled substance to the brain
- How quickly oxygen (and anything inhaled) gets to the brain
- Connecting *body pollution* to *air pollution*
- Connecting atmospheric quality to our personal air quality
- Safety tips when you are in charge of younger children
- Healthy, legal thrill-seeking activities for pre-teens and teens
- Getting a friend *in trouble* vs. getting a friend *into help*
- *Friendships vs. fakeships*
- Approximate age when brain development is complete

Springboard Analogies

Complete these analogies as a group or with a partner.
Use these to start discussions concerning safety issues.

Label is to read as directions are to _____.

Emergency is to 911 as Poison Emergency is to ___.

Hand is to work glove as eyes are to _____.

Steel-toed shoes are to feet as a protective mask is to _____ and _____.

Degreasers are to grease as solvents are to _____ in the brain.

Smog is to the air as poisons are to the _____.

Myelin sheath is to neuron as insulation is to _____.

Responsible for is to self as *responsible to* is to _____.

OSHA is to the workplace as EPA is to the _____.

Springboard Answer Key

Label is to read as directions are to follow.

Emergency is to 911 as Poison Emergency is to 1-800-222-1222.

Hand is to work glove as eyes are to safety glasses/goggles.

Steel-toed shoes are to feet as a protective mask is to mouth and nose.

Degreasers are to grease as solvents are to fat cells/fatty tissue in the brain.

Smog is to the air as poisons are to the body

Myelin sheath is to neuron as insulation is to wires.

Responsible for is to self as *responsible to* is to others.

OSHA is to the workplace as EPA is to the environment.

FAST FACTS™ on the Brain, Oxygen and Toxic Substances

Students will review material and recall critical information by using a learning strategy called FAST FACTS™. This is one of a series of strategies to assist learning developed by Dr. Dennis Embry of the PAXIS Institute. He calls these strategies “simple gifts.” The FAST FACTS™ strategy is applied here to the topic of learning about the brain, oxygen and toxic substances. The object of this activity is to reinforce learning in a fun way that allows students to be very involved!



1. Assign students to work in pairs and have them decide who will be the first coach and first learner on their team. Roles will switch halfway through the exercise.
2. Pass out a study sheet to every student, but ask students not to read it yet.
3. Go over the directions for the exercise (on the following page) with students. You can copy and give the directions to students or project them on a screen.
4. After you've gone over the directions and answered any questions, ask all students to silently and quickly read both the questions and the answers on their study sheets.
5. When students have finished reading, tell the learners to turn over their study sheets.
6. Give a signal for students to start. When students are about halfway through the questions, signal students to change roles and continue.
7. When it appears most students have finished, tell them to stop.
8. Ask them to add up all the fives, threes and zeros for each learner and then tally total team points. Poll the class for team totals.
9. Tell students to congratulate their partner on a job well done!

FAST FACTS™, Copyright© 2004, PAXIS Institute. Used with permission.

Directions for Facts about the Brain, Oxygen and Toxic Substances

- **Students will quickly and silently read all questions and answers.**
- **When directed to start, coaches will quickly read each question aloud to the learner.**
- **Without looking at the answers, the learner will answer the questions aloud.**
- **If the answer is correct, the coach will award the learner 5 points. If the answer is not correct, the coach will ask the learner to listen and will repeat the question and answer again. The coach will then repeat the question a final time.**
- **If the learner gets it right this time, the coach awards the learner 3 points. If not, a zero is recorded.**
- **BE CERTAIN TO RECORD ALL POINTS EARNED AS YOU COACH!**
- **Continue working through the questions and answers, coaching by REPEATING questions and answers when necessary, until time is called.**
- **When the teacher tells you to, change roles quickly. The learner now becomes the coach. The new coach will continue to record points on the same study sheet.**
- **The coach will start with the very next question on the list and continue through the questions until the teacher tells you to stop.**

Facts about the Brain, Oxygen and Toxic Substances

Question	Answer	5	3	0
1. Which is most critical for survival: food, water or oxygen?	Oxygen			
2. At what age has the brain almost fully developed?	At about 25 years old			
3. Teen brains are more vulnerable than adult brains. T or F	True			
4. The brain gets about ____% of blood circulated in the body.	16%-20%			
5. What is the only gas the human body can use as fuel?	Oxygen			
6. Teens cannot quickly develop drug dependence. T or F	False			
7. Toxic substances in the brain cause cells to become _____.	Damaged			
8. What determines intelligence: brain size or brain complexity?	Brain complexity			
9. Which is the most complex brain of all mammals?	Human brain			
10. Approximately how much does the human brain weigh?	Three pounds			
11. What is the toll-free poison emergency number?	1-800-222-1222			
12. Pathway of oxygen: lungs _ brain _ heart _ body T or F	True			
13. What are three major regions of the brain?	Cerebral cortex, cerebellum, brainstem			
14. How many lobes make up the cerebral cortex?	Four			
15. Name the lobes of the cerebral cortex.	Frontal, temporal, occipital, parietal			
16. Each lobe of the brain is responsible for specific jobs. T or F	True			
17. What is controlled by the frontal lobe?	Planning, decision-making, judgment			
18. What is controlled by the temporal lobe?	Auditory perception, language reception			
19. What is controlled by the occipital lobe?	Visual reception, recognizing shapes, color			
20. What is controlled by the parietal lobe?	Processing spoken and written language			
21. The cerebellum controls _____ and _____.	Movement and balance			
22. The brainstem controls functions that support ____ and ____.	Survival and arousal			
23. Two examples of brainstem functions are _____.	Breathing, digestion, heart rate, alertness			
24. We have to plan to perform brainstem functions. T or F	False			
25. The limbic system is also known as the _____.	Reward system			
26. The limbic system influences us to _____.	Repeat behaviors that are pleasurable			
27. The back of the brain receives information; the front _____.	Assigns meaning to the information			
28. What are the three parts of the nervous system?	Brain, neurons (nerve cells) and brainstem			
29. What is the function of all neurons?	To carry signals from one area to another			
30. What happens if there are vapors and fumes in the lungs?	The brain experiences their toxic effects			

Scoring Total Learning Points		
Add up number of 5, 3 and 0 point awards for each learner.	Learner Number One Points	
Enter the sum for each learner.	Learner Number Two Points	
Enter the sum for the team.	Team Total Points	

Amazing Brain Facts

**Check out these
fun facts
about our brains.**

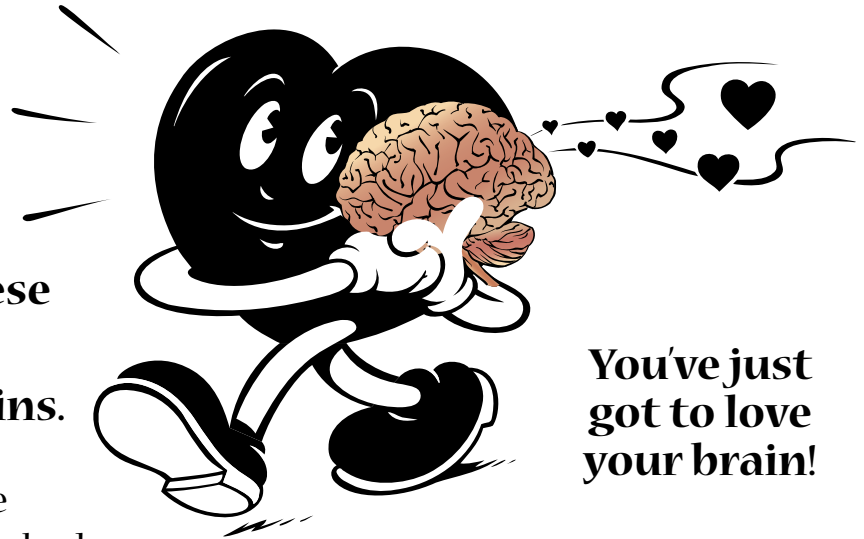
The brain is the
command center of the body.

The brain weighs about
three pounds.

One third of the cells in the brain
are fat cells.

The back part of the brain
receives information. The back part
tells us, for example, that we have
been touched.

The front part of the brain
gives meaning to that information.
The front part tells us that the touch
was a good touch, a hug from
someone we know and love.



**You've just
got to love
your brain!**

The brain is not fully developed
until we are about 25 years old!

There are more connections
in our brains than there are
stars in the universe.

The brain has about 100 billion
nerve cells called neurons.

Neurons send up to 50,000 messages
through the brain per minute!

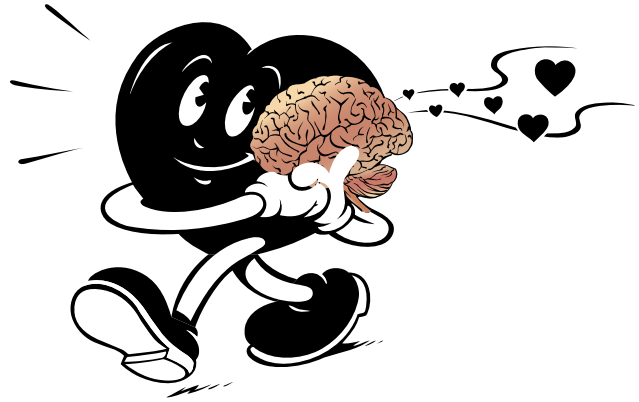
If we want these messages to travel
well so our bodies can work well,
we must take very good care
of our brains.

Adapted from Which Brain Do You Want? © 2004 Amen Clinics, Inc. and MindWorks Press

Love Your Brain!

Healthy Brain Tips

Taking care of the body's command center is very important. Challenge yourself to begin LOVING YOUR BRAIN a bit better each day!



Tip #1: Protect Your Brain

The brain is soft and the skull is very hard. It's important not to put ourselves at risk of brain injury. Wear seatbelts in cars and helmets on bicycles. Avoid motorcycles and consider sports such as golf, tennis and table tennis.

Tip #2: Avoid Toxic Substances

Using household products improperly can introduce toxic fumes to the brain. Using alcohol and other drugs can harm the teen brain. Nicotine (tobacco products) and caffeine (coffee, tea, sodas) can be harmful in large quantities since they restrict blood flow to the brain.

Tip #3: Get Enough Sleep

People who are chronically sleep-deprived have lower overall brain activity.

Tip #4: Manage Your Stress

Learn to do deep breathing or meditation to manage your stress. Chronic exposure to stress actually kills cells in the memory areas of the brain.

Tip #5: Eat Healthy

Eat plenty of lean protein and fresh fruits and vegetables. Eat a low-sugar, low-fat diet.

Tip #6: Take A Multivitamin Every Day

If we have all the vitamins and minerals we need every day, our brain can do its best.

Tip #7: Exercise

Physical exercise boosts blood flow to the brain. Blood delivers oxygen, fuel for the brain, to the brain more efficiently when we exercise.

Tip #8: Keep Learning

As new learning takes place, the brain grows and changes. Turn off electronics and read.

Tip #9: Don't Believe Every Thought You Have

Negative thoughts can come into your mind and can ruin your day. Don't let them. These are called ANTS - Automatic Negative Thoughts - and they need to be corrected!

Adapted from Which Brain Do You Want? © 2004 Amen Clinics, Inc., and MindWorks Press. Used with permission.

Guidance for Teachers: Handling Questions about Huffing Appropriately

Students may have questions about huffing and sniffing or they may be concerned about someone else's huffing and sniffing. You may invite these students to speak with you privately when appropriate. You may want to arrange further contacts with school personnel such as the counselor, nurse, psychologist or social worker. If students engage you in discussion about someone's use during your large group lesson, you will want to use this situation as a learning opportunity. First, remind students not to mention any names in the larger group. Next, make comments that will shift the focus onto the danger of toxic effects rather than the perceived fun involved.

Students may say: *Since you can buy these things in the grocery store, they can't be that dangerous.*
You may respond: *These products are very safe and useful when they are used according to their directions. Let's talk about what a package or aerosol can says about product use and possible dangers.*

Recognize a teachable moment, pick up one of the products you have on hand and ask a volunteer to help you read the product label and all information on it since you're having a hard time seeing the fine print. For example, a spray paint can may contain warnings such as the following: *Danger! Extremely Flammable. Keep away from heat, sparks and open flame. Vapors may ignite explosively. Use with adequate ventilation. Do not take internally. Keep out of the reach of children. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.* Product labels contain a lot of information, so after a student has read the label aloud, ask students what they should and shouldn't do to use the product safely. As they respond, the teacher can help them better understand what these

precautions mean by asking questions. Below are some samples of questions that may be asked.

Why do you think the directions say to use this in a well-ventilated area? What are some examples of "well-ventilated"? What might cause an explosion or fire when using this product? Why do you think the warning says not to take internally or to inhale concentrated fumes?

The warning on products about intentional misuse by concentrating and inhaling the contents may lead students to ask: **How do you concentrate the fumes to inhale them? Or how do kids use inhalants?** Some students may know the answer and begin sharing it. You need to direct the conversation away from techniques of use.

You may respond: It's not important to know "how," but it is important to know what happens if you do. Huffing or sniffing a product can be harmful and fatal, even the very first time you try it. About one out of three persons who die from inhalant abuse were first-time users.

If students talk about kids who use inhalants to get high, remind them that they should be very concerned because the high that is experienced is a result of toxic effects of the poisonous chemicals that have reached the brain.

Students may say: *Why would anyone do this if it is so dangerous?*

You may say: *Most kids who do this just think they're having fun, but they don't realize how dangerous it really is. They've learned about huffing from their peers, but they probably haven't heard anything about how harmful it is from their parents or teachers. Many young people have died because they didn't know what they were*

actually doing was poisoning their brains and bodies with toxic fumes.

Students may say: I've heard it's really quick; it only lasts a few seconds or a few minutes. Nothing that quick can really hurt you.

You may ask the student: Do you remember how quickly oxygen gets to the brain?

Remind the student that oxygen starts its pathway into the body because it has been inhaled. If chemicals are inhaled, they displace oxygen going to the brain. They still go directly to the brain, though, and can cause damage to cells quickly. Remember that no one can predict whether damage will be temporary or permanent, but inhalants get to the brain within seconds. Also mention that the pathway of inhalants is from the

lungs to the brain to the heart and then the rest of the body and that nothing has been filtered out of the chemicals before they get to the brain. Remind students, too, that these chemicals can be toxic to the heart. They can lead to arrhythmia and can result in Sudden Sniffing Death the first time or any time inhalants are used.

Be sensitive to students' comments and concerns. Remember that it is important to refrain from being judgmental and to guide students through a discussion rather than lecture about this.

The bottom line is that huffing or sniffing can kill the first time, the tenth time, or any time someone abuses products. Bring this point into the discussion and repeat it several times throughout the discussion.

Resources

Web Sites

Brochures and Other Materials

Survey Sources

Virginia Resources

Selected Publications and Articles

Poison Control Centers

Web Sites

Web-based Training for Parents

www.inhalantabusetraining.org

On-line education for parents providing information that will help them protect their children from the dangers of inhalant abuse. Takes 20 to 30 minutes to complete. There is a special section for Virginia.

Web-based Training for Nurses

“Inhalant Abuse: Nursing Implications”

www.rnceus.com/course_frame.asp?exam_id=47&directory=inhal

Nurses can obtain CEU credit for completing this on-line course. Especially useful for school public health nurses.

Alliance for Consumer Education

www.inhalant.org

A nonprofit organization focused on safe use of consumer products. Key focus area on inhalant prevention. Publishes a variety of resources, particularly for educating parents about inhalants.

National Inhalant Prevention Coalition

www.inhalants.org

Comprehensive source for information, materials resources. Coordinates the National Inhalant and Poisons Awareness Week campaign conducted every March; provides free resources; established grief support network; provides training and technical assistance.

National Institute on Drug Abuse

www.inhalants.drugabuse.gov

Contains a variety of articles, research information and resources about inhalants.

Office of National Drug Control Policy

www.whitehousedrugpolicy.gov

Publications section has links to a variety of information on inhalants.

Substance Abuse and Mental Health Services Administration (SAMHSA)

National Clearinghouse for Alcohol and Drug Information (NCADI)

www.ncadi.samhsa.gov

Contains a variety of information, including the Substance Abuse Resource Guide: Inhalants, 2004, a compilation of publications (books, brochures, fact sheets, posters, articles) on inhalants, sources and cost, if any (Inventory # MS466).

Partnership for a Drug-Free America

www.drugfreeamerica.org

Produces the Partnership Attitude Tracking Study. Creates a variety of information for mass media campaigns, including television and radio PSAs that address the issue of inhalants.

Massachusetts Inhalant Abuse Task Force

www.mass.gov/dph/inhalant

Contains a variety of helpful educational materials and information for parents, teachers, youth-serving professionals, law enforcement, retailers and others as part of *A Breath Away*, a statewide campaign to increase public awareness of inhalant abuse.

New England Inhalant Abuse Prevention Coalition

www.inhalantprevention.org

A multi-state coalition dedicated to reducing the impact of inhalant abuse among children and youth by educating parents, caregivers and youth-serving professionals to apply best practices in inhalant abuse prevention.

Federal Health and Safety Web Sites

Agency for Toxic Substances and Disease Registry

www.atsdr.cdc.gov

Environmental Protection Agency

www.epa.gov

Occupational Safety and Health Administration

www.osha.gov

Danger! Toxic Chemicals - video

An inhalant prevention video targeted for students in grades five to eight. The video explains the dangers of inhalants and models refusal skills. It does not show what products are being abused or how to abuse them. Highly recommended because it uses the approach that inhalants are not really drugs, but are poisons, toxic substances and pollutants. Publisher: Hazelden Foundation. Video, VHS format, 1999, Grades 5-8, 14 minutes; (800) 328-9000 Item 4064. *(This recommendation is from the New England Inhalant Abuse Prevention Coalition.)*

Brochures and Other Materials

A Parents' Guide to Preventing Inhalant Abuse National Inhalant Prevention Coalition

www.inhalants.org/A_Parents_Guide_To_Preventing_Inhalant_Abuse.pdf

What Every Parent Needs to Know About Inhalant Abuse (English and Spanish)

Alliance for Consumer Education

http://www.inhalant.org/media/brochure_english.pdf

Tips for Teens: The Truth About Inhalants

Substance Abuse and Mental Health Services Administration

<http://ncadi.samhsa.gov/govpubs/phd631/>

Inhalant Abuse Prevention Tip Card (English on one side/Spanish on other)

Virginia Department of Health, Division of Injury and Violence Prevention

www.vahealth.org/civp

What Parents Need to Know about Inhalants

National Capital Poison Center

www.poison.org/prevent/inhalants.asp

Survey Sources

Monitoring the Future, National Institute on Drug Abuse

<http://monitoringthefuture.org>

National Survey on Drug Use and Health

<http://oas.samhsa.gov/nsduh.htm>

Partnership Attitude Tracking Survey

www.drugfree.org/Portal/DrugIssue/Research/

PRIDE (Parents Resource Institute on Drug Education)

www.pridesurveys.com/Reports/index.html

Youth Risk Behavior Survey, U.S. Department of Health and Human Services

www.cdc.gov/HealthyYouth/yrbs/

Virginia Resources

Virginia Department of Education

Division of Special Education and Student Services
Office of Student Services
Safe and Drug-Free Schools Program
P.O. Box 2120
Richmond, Virginia 23218-2120
804-225-2871
www.doe.virginia.gov

Virginia Department of Health

Division of Injury and Violence Prevention
109 Governor Street
Richmond, Virginia 23219
1-800-732-8333
www.vahealth.org/civp

Virginia Department of Mental Health, Mental Retardation and Substance Abuse Services

P.O. Box 1747
Richmond, Virginia 23218-1797
Office of Substance Abuse Prevention:
804-225-2312
Office of Substance Abuse Treatment:
804-786-3906
www.dmhmrzas.virginia.gov

Virginia Poison Centers

1-800-222-1222
See the last page in this manual for additional contact information.

Selected Publications and Articles

"Inhalants." *Substance Abuse Treatment Advisory*. Center for Substance Abuse Treatment. Volume 3, Issue 1, March 2003.
Available on line at www.csat.samhsa.gov.
Focuses on elements of effective treatment for inhalant abusers.

Practical Theorist 7: Inhalant Abuse Prevention 101: A Community Approach to Inhalant Prevention. Community Anti-Drug Coalitions of America (CADCA), 2007.
Available from www.cadca.org.
Contains an overview of inhalant abuse and suggests strategies for coalitions for planning and implementing effective interventions.

Trends in Death Associated by the Abuse of Volatile Substances. Department of Community Health Sciences, St. George's , University of London.
Available on line at www.vsareport.org.
Yearly analysis of deaths from inhalant abuse in the United Kingdom. Data has been collected since 1971.

Bowen, S.E., Daniel, J. and Balster, R.L. "Deaths associated with inhalant abuse in Virginia from 1987 to 1996." *Drug and Alcohol Dependence*, Volume 53, p. 239-245, 1999.
Documents deaths in Virginia caused directly by inhalant overdose over a 10-year period.

Store, C., Westergaard, R., Anthony, JC. "Early Onset Inhalant Use and Risk for Opiate Initiation by Young Adulthood," *Drug and Alcohol Dependence*, Volume 78, Issue 3, (June 2005), p. 233-358.
Longitudinal study of public school students in grades 1 through 12 shows that youth initiating inhalant use prior to age 14 were twice as likely to initiate opiate use compared to those who had not used inhalants.

Volkow, Nora, M.D. "NIDA on Youth and Inhalant Abuse," *COUNSELOR, The Magazine for Addiction Professionals*, March 2006, Vol 7.

Available on line at www.counselormagazine.com. Written by the director of the National Institute on Drug Abuse, contains information about the extent of the problem, the affects of inhalants on the brain and prevention and treatment approaches.

Williams, Janet MD, Storck, Michael, MD and the Committee on Substance Abuse and Committee on Native American Child Health, "Inhalant Abuse," *PEDIATRICS*, Volume 119, Number 5, May 2007.

Available on line at <http://pediatrics.aappublications.org>.

Reviews key aspects of inhalant abuse, emphasizes the need for greater awareness and offers advice regarding the pediatrician's role in the prevention and management of this substance abuse problem.

Poison Centers

All poison centers in the United States can be reached by calling the nationwide toll-free number. Calls are answered by the poison center that serves the individual making the call, based on his or her area code and exchange.

**Poison Emergencies and Information -
call 1-800-222-1222
24 Hours a Day, 7 Days a Week**



Three poison centers serve Virginia. Each poison center has public education programs that provide resources and information on all aspects of poison prevention, including inhalants.

Western Virginia

Blue Ridge Poison Center
Blue Ridge Hospital
PO Box 67
Charlottesville, VA 22901
804-924-5543 (office)
www.healthsystem.virginia.edu/internet/brpc

Central and Tidewater

Virginia Poison Center
Virginia Commonwealth University
PO Box 980522
Richmond, VA 23298-0522
804-828-9123 (office)
www.poison.vcu.edu

Northern Virginia

National Capital Poison Center
3201 New Mexico Avenue, NW, Suite 310
Washington, DC 20016
202-362-3867 (office)
www.poison.org

Notes



For additional copies, contact:

Arlene Cundiff

Safe and Drug-Free Schools Program

Virginia Department of Education

Division of Special Education and Student Services

Office of Student Services

P.O. Box 2120

Richmond, VA 23218-2120

(804) 225-2871

Also available at

www.doe.virginia.gov

Search for Inhalant Abuse Prevention:

Staff Education and Student Curriculum



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