INHALANT

Prevention

RESOURCE GUIDE

SAFE AND DRUG-FREE SCHOOLS PROGRAM
IDAHO STATE DEPARTMENT OF EDUCATION

Inhalant Prevention Resource Guide

Provided to you by:

Idaho State Department of Education
School Climate and Discipline
P. O. Box 83720
Boise ID 83720-0027
208-332-6960
www.sde.state.id.us/Safe

SEPTEMBER 2001

Second Printing

Isabel Burk, M.S., C.H.E.S.
The Health network

Permission of Publication by:

Virginia Department of Education
Division of Instructional Support Services
Office of Compensatory Programs
P. O. Box 2120
Richmond, Virginia 23218-2120

DEPARTMENT OF EDUCATION

P.O. BOX 83720
BOISE, IDAHO 83720-0027

DR. MARILYN HOWARD
STATE SUPERINTENDENT
PUBLIC INSTRUCTION

September, 2001

Dear Idaho Educators:

The Inhalant Prevention Resource Guide was published as the result of the 2000 Substance Use and School Climate Survey results. Although inhalant consumption affected only between four and 12 percent of Idaho students, it was the most commonly reported drug (other than alcohol) among sixth grade students.

Inhalant abuse has been described as a "silent epidemic." Researchers have found that one of the primary reasons for inhalant abuse is peer pressure. National reports show that inhalants are most commonly abused among preteens and young teens. The use for inhalants appears to peak around 12 – 15 years of age.

We would like to thank the Commonwealth of Virginia, Department of Education, for giving permission to reprint this publication. It is through their research and efforts that this guide was originally published. We truly appreciate them sharing this valuable document

We hope that you will find this guide useful in the education and prevention of the harmful affects of inhalant use. We are all striving to ensure the continued health and safety of Idaho's children and thank all of you for your time and effort.

Sincerely

Claudia Hasselquist

Claudia Hasselquist, Coordinator
Safe and Drug Free Schools Program
School Climate and Discipline

Office Location
650 West State Street

Telephone
208-332-6800

Speech/Hearing Impaired
1-800-377-3529

FAX
208-334-2228

CONTENTS

Acknowledgments 1
Introduction 2
Important Terms 3
Scope of the Problem 5
2000 Idaho Substance Use Survey Results 7
Abusable Products 9
Chemical Ingredients in Inhalants 11
Idaho Code 18-1502B 13
Why Are Inhalants Abused 15
Methods and Materials of Abuse 17
Effects of Inhalant Abuse 19
Signs and Symptoms of Inhalant Abuse 21
Solvents and Chemicals in School 23
When Someone is Huffing 25
Inhalant Abuse Prevention 26
Planning for Prevention 28
Lessons for Grades K-3 29
Lessons for Grades 4-6 37
Lessons for Grades 7-9 55
Lessons for Grades 10-12 69
Resources 79
Poison Control Centers 81
Bibliography 82

ACKNOWLEDGMENTS

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

The original draft manuscript was produced by:

Ms. Jeanne Martino-McAllister
Director, Office of Substance Abuse Research - James Madison University

Dr. Debra Sutton
Department of Health Science - James Madison University

Isabel Burk, M.S., C.H.E.S.
The Health Network, New City, New York

NATIONAL REVIEW PANEL

Dr. Fred Beauvais
Tri-Ethnic Center for Prevention Research - Fort Collins, Colorado

Mr. Mark Groves
The Eden Children's Project - Minneapolis, Minnesota

Ms. Kate Malliarakis
Office of National Drug Control Policy - Washington, DC

Mr. Harvey Weiss, Executive Director
National Inhalant Prevention Coalition - Austin, Texas

Mr. Howard Wolfe
Massachusetts Inhalant Abuse Task Force - Arlington, Massachusetts

VIRGINIA REVIEW PANEL

Ms. Sharyl Adams
Substance Abuse Prevention Specialist - Chesterfield County Office on Youth

Dr. Anne Atkinson
President - PolicyWorks, Ltd.

Ms. JoAnn Burkholder
President - Association of Virginia Student Assistance Professionals (AVSAP)

Ms. Marla Coleman (Retired)
Director of Guidance - Moody Middle School, Henrico County Public Schools

Dr. Fran Meyer, Specialist
Comprehensive Health Education - Virginia Department of Education

Ms. Nina Pitkin, Coordinator
Safe and Drug-Free Schools Program - Fairfax County Public Schools

Ms. Myra Shook
D.A.R.E. Educational Coordinator - Virginia Department of Education

Dr. Carl Stockton
Past President - Virginia Association for Health, Physical Education, Recreation and Dance (VAHPERD)

Dr. Gaynelle Whitlock, Director
Center for School-Community Collaboration - Virginia Commonwealth University

INTRODUCTION

The deliberate inhalation of fumes, vapors, and gases poses a serious threat to the health and safety of children. Researchers have documented inhalant abuse problems for more than a century, although the general public is not aware of the extent of the problem.

Reliable national surveys report that at least one out of five school-age children has abused an inhalant product. (Specific data can be found in the chapter "Scope of the Problem.") This is an unacceptable physical, emotional, cognitive, and social health risk. The problem has attracted much more attention recently, due to publicity about the deaths of young people from inhalant abuse.

Prevention efforts should be carefully planned and implemented. Research confirms that successful prevention efforts are developmentally appropriate, congruent with other programs/activities, articulated between grade levels, and reinforced to maintain levels of understanding. To enhance skills, change attitudes and promote positive behaviors, *repeat, review, and reinforce*. It is important to teach the same concepts several different ways, and to discuss inhalant-related issues at various times during the school year when "teachable moments" present themselves.

The enclosed educational materials have been developed for use with students in grades K-12. The guide is designed for adult use with information, a prevention framework, sample lessons, materials, and resources. It can be augmented with other curricula and activities, and can be integrated into different subject areas. Teachers and counselors can use the lessons and materials with classes and small groups. The materials and concepts are also adaptable for special needs students.

IMPORTANT TERMS

Inhalant abuse refers to the deliberate inhalation of fumes, vapors, or gases to produce a mood-altering effect. This guide contains definitions common to inhalant topics and issues, reasons for use, descriptions of inhalable products and sources, methods of abuse, effects and consequences of inhalant use, an overview of concepts in inhalant prevention, and sample lessons for prevention in grades K-12. Several terms are used routinely in this document:

Huffing:	Breathing in fumes or vapors vigorously through the mouth
Sniffing:	Breathing in fumes or vapors through the nose
Bagging:	Huffing substances inside a plastic or paper bag
Ballooning:	Huffing gases from inside a balloon

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. When talking with students it may be best to use the terms "huffing" or "sniffing" since students may be more familiar with these terms than with the term "inhalants."

Abusable products: This term is used to represent any and all materials that may be selected for abuse. See the chapter on "Abusable Products" for more complete information and lists of products that are often abused.

Prevention: Prevention is *not just* education! Prevention encompasses information, skills, behaviors, and attitudes. Prevention initiatives are planned, sequential and developmentally appropriate. Activities are targeted to specific populations and delivered by trained personnel.

Who abuses inhalants?

Several stereotypes misrepresent our lack of accurate information on inhalant abuse. For instance, some people associate inhalants only with certain ethnic groups. Other people are not aware or informed about inhalant abuse, so they assume "another" group of youngsters is involved. They may subscribe to the "it can't happen here" theory. City people say kids in rural areas are abusing inhalants. In rural areas, people say it is a problem in the city. Suburban residents say it's not a problem at all.

However, more than two decades of reliable research belies these stereotypes. Although most youth do not abuse inhalants, the majority of those who abuse inhalants are young, some as young as six or seven years old. Most inhalant users are between 11 and 14 years of age.

A decade ago, male huffers greatly outnumbered female huffers. Today, only slightly more males than females admit huffing and sniffing.

In national studies, youths who identify themselves as black and Asian American are significantly *less* likely to huff or sniff than whites, Hispanics or Native Americans. Regional and local demographic data can help communities recognize their population of inhalant abusers and plan prevention programs targeted at specific at-risk populations.

National survey data

Several surveys have tracked drug use patterns of school-age youth for more than two decades. 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.

The University of Michigan has been administering the Monitoring the Future student drug survey for 24 years. The survey involves thousands of students in grades 8, 10, and 12 annually in a random sampling of schools around the country. The following are data from the 1999 results:

GRADE	Ever used inhalants	Used inhalants in past 12 months	Used inhalanats in past 30 days
8	17.9%	9.4%	4.5%
10	16.6%	7.3%	2.6%
12	14.2%	5.9%	2.2%

LIFETIME PREVALENCE OF INHALANTS IN IDAHO

In the "2000 Idaho Substance Use, Safety, and School climate Survey" students were asked if they had "used inhaled substances to get high (glue, gasoline, paint thinner, spray cans). Although inhalant consumption affected only between four and twelve percent of students, it was the *most commonly reported drug use among sixth grade students* and roughly tied with marijuana among eighth grade students. The use of inhaled substances reversed the usual trend of increased use with age – instead, inhalants were preferred by younger students. Compared to 1996, however, the use of inhalants by sixth and especially by eighth grade students has declined. It has also declined among high school seniors, who were less likely than eighth graders to report inhalant use. There was no significant difference between boys and girls in their reported use of inhalants.

INHALED SUBSTANCES TO GET HIGH
(2000 Idaho Substance Use, Safety, and School Climate Survey)

Students were asked how often do you use each of the following types of Inhaled Substances to get high (Glue, Gasoline, Paint Thinner, Spray Cans, Snappers and Poppers). Never, Some, Monthly, Weekly and Daily.

Grade 6

	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	State
Never	96%	96%	96%	97%	95%	93%	96%
Some	4%	3%	3%	2%	5%	5%	4%
Monthly	0%	0%	0%	1%	0%	2%	1%
Weekly	0%	0%	0%	0%	0%	0%	0%
Daily	0%	0%	0%	0%	0%	0%	0%

Grade 8

	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	State
Never	92%	93%	88%	86%	93%	95%	90%
Some	7%	5%	10%	11%	6%	4%	8%
Monthly	1%	1%	1%	1%	0%	0%	1%
Weekly	1%	1%	0%	1%	0%	0%	0%
Daily	0%	0%	0%	0%	0%	0%	0%

Grade 9

	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	State
Never	90%	89%	91%	93%	88%	89%	90%
Some	8%	8%	5%	7%	8%	8%	7%
Monthly	0%	1%	2%	0%	1%	1%	1%
Weekly	1%	1%	1%	0%	1%	1%	1%
Daily	0%	0%	1%	0%	0%	1%	1%

CONTINUED - -INHALED SUBSTANCES TO GET HIGH
(2000 Idaho Substance Use, Safety, and School Climate Survey)

Students were asked how often do you use each of the following types of Inhaled Substances to get high (Glue, Gasoline, Paint Thinner, Spray Cans, Snappers and Poppers). Never, Some, Monthly, Weekly and Daily.

Grade 10

	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	State
Never	92%	92%	86%	91%	85%	93%	89%
Some	7%	7%	11%	8%	11%	6%	9%
Monthly	0%	1%	0%	1%	1%	0%	1%
Weekly	0%	0%	1%	0%	2%	0%	1%
Daily	0%	0%	1%	0%	1%	0%	1%

Grade 11

	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	State
Never	90%	93%	95%	94%	90%	91%	93%
Some	8%	7%	5%	6%	7%	7%	6%
Monthly	1%	0%	1%	0%	2%	1%	1%
Weekly	1%	0%	0%	0%	1%	1%	0%
Daily	1%	0%	0%	0%	0%	0%	0%

Grade 12

	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	State
Never	91%	94%	96%	92%	90%	92%	93%
Some	7%	5%	4%	8%	7%	8%	6%
Monthly	1%	0%	0%	0%	2%	0%	0%
Weekly	0%	0%	0%	0%	0%	1%	0%
Daily	1%	0%	0%	0%	1%	0%	0%

ABUSABLE PRODUCTS

More than 1,000 everyday solvents, cleaning or shop chemicals 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. These products can be found at home, in the garage or workshop, at school, in the office, and in work settings. Less toxic substitutes are listed in the section "Solvents and Chemicals in School."

Universal availability of toxic chemicals presents a problem, because it is difficult to limit access to inhalants. Using products for their intended purpose is legal, but in many localities 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.

Educators play a crucial role in informing adults and young people about the dangers of abuse.

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, replaced quickly by the next fad product. The following list is only a sampling. It is by no means exhaustive.

This is for your information only. DO NOT distribute to students!

SOLVENTS/VOLATILE CHEMICALS *including*

Gasoline	Nail polish remover	Permanent markers	Correction fluid
Shellac	Paint stripper	Cleaning fluid	Ammonia
Model glue	Rubber cement	Household cleaners	Industrial chemicals
Toluene	Octane booster	Shoe polish spray	Nail polish
	Whiteboard cleaner		

GASES *including*

Butane	☛ Fuel for lighters and sold as lighter fluid
Freon	☛ Gas used in air conditioners
Helium	☛ Used to inflate balloons
Nitrous Oxide	☛ "Laughing gas" (whipped cream propellant, anesthetic)
Propane	☛ Gas used for cooking, heating

AEROSOLS *including*

Users primarily seek the propellant gas, not the product, although the smell and taste of specific products may attract some users. Some aerosol products are abused for both the propellant and the product formulation. Just a sampling:

Spray air freshener	Cooking spray	Hair spray	Deodorant spray
Furniture wax	Computer cleaner	Spray paint	Insecticide spray
Dusting spray	Oven cleaner	Fabric protector spray	Spray lacquer

NITRITES

Amyl Nitrite (also known as “poppers” or “snappers”)

A legitimate medication once prescribed for circulatory problems, not used commonly today. Amyl nitrate capsules look similar to ammonia capsules, small ampules covered with fabric that are broken to release the fumes.

Butyl Nitrite (also known as “Rush,” “Climax,” or “Locker Room”)

Butyl is often packaged in small brown vials. Older abusers purchase butyl at clubs, younger ones buy through friends or at disreputable convenience stores. Young people report that they purchase butyl packaged as video head cleaner. Butyl nitrite is illegal to buy, sell or possess.

CHEMICAL INGREDIENTS IN INHALANTS

Solvents and volatile products contain many different chemicals. While there are literally thousands of these products, the following table summarizes some of the active ingredients in a sampling of products.

ADHESIVES	
Airplane glue	toluene, ethyl acetate
Rubber cement	hexane, toluene, methyl chloride, acetone, methyl ethyl ketone, methyl butyl ketone
AEROSOLS	
Spray paint	butane, fluorocarbons, toluene, hydrocarbons
Hair spray	butane, fluorocarbons, propane
Air fresheners	butane, fluorocarbons
Fabric protection spray	butane, trichloroethane
Computer cleaner	dimethyl ether, hydrofluorocarbons
CLEANING PRODUCTS	
Degreaser	tetrachloroethylene, trichloroethane, methanol
Spot remover	xylene, petroleum distillates, trichloroethane
SOLVENTS	
Nail polish remover	acetone, ethyl acetate, toluene
Paint thinner	toluene, methylene chloride, methanol, acetone
Correction fluid	toluene, trichloroethylene, trichloroethane
Toluene	methyl benzene
Lighter fluid	butane, isopropane
FOOD PRODUCTS	
Whippets	nitrous oxide
Canned whipped cream	nitrous oxide

(Source: Charles Sharp, Ph.D., Neil Rosenberg, M.D.)

IDAHO CODE 18-1502B

Using products for their intended purpose is legal, but it is illegal to misuse or abuse products for intoxication. A number of approaches have been used by businesses, federal/state governments, and school systems to reduce inhalant abuse. These policies can be effective, depending upon the degree to which they are publicized and enforced.

Minors who possess and use inhalants contrary to a prescription or the manufacturer's instructions, for the purpose of becoming under the influence of the inhalant, are guilty of a misdemeanor pursuant to Idaho Code Section 18-1502B.

IDAHO CODE 18-1502B POSSESSION OF INHALANTS BY MINORS

Whenever a person under the age of eighteen (18) years is in possession and uses an aerosol spray product or other inhalant, that is not used pursuant to the instructions or prescription of a licensed health care provider or that is not used pursuant to the manufacturer's label instructions, for the purpose of becoming under the influence of such substance; such person shall be guilty of a misdemeanor, and upon conviction, may be punished by a fine not in excess of three hundred dollars ($300), or by thirty (30) days in a juvenile detention facility or by both or may be subject to the provisions of chapter 18, title 16, Idaho Code.

For the purposes of this section, the term "inhalant" means any glue, cement or other substance containing one (1) or more of the following chemical compounds: acetone and acetate, amyl nitrite or amyl nitrate of their isomers, benzene, butyl alcohol, butyl nitrite, butyl nitrate or their isomers, ethyl alcohol, ethyl nitrite or ethyl nitrate, ethylene dichloride, isobutyl alcohol, methyl alcohol, methyl ethyl ketone, n-propyl alcohol, pentacholorophenol, petroleum either, propyl nitrite or propyl nitrate or their isomers, toluene or xylene or other chemical substance capable of causing a condition of intoxication, inebriation, excitement, stupefaction or the dulling of the brain or nervous system as a result of the inhalation of the fumes or vapors of such chemical substance. [I.C., Section 18-1502B, as added by 1993, Chapter. 154, Section 1, page 390.]

Compiler's notes. The reference in the first paragraph of this section to "chapter 18 of title 16, Idaho Code" should be to "chapter 5 of title 20, Idaho Code" since S.L. 1995, chapter 44, amended and redesignated chapter 18 of title 16, the Youth Rehabilitation Act, as chapter 5 of title 20, the Juvenile Corrections Act.

Section 2 of S.L. 1993, chapter 154 is compiled as Section 16-1803.

Sec. To Sec. Ref. This section is refereed to in Section 20-505.

WHY ARE INHALANTS ABUSED?

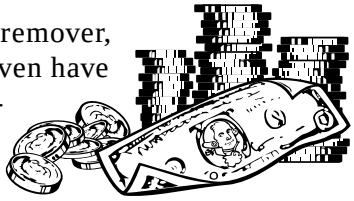
Available

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

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 chemicals and poisons, and do not question quantity sales or restrict access to products.

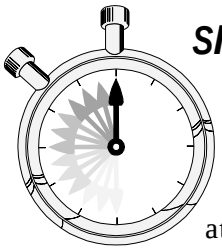
Low cost



Inhalable products are quite inexpensive. Correction fluid, nail polish remover, butane lighters, etc., often cost less than $2 per unit. Children do not even have to buy the products; they often use what they find in the kitchen, basement or workshop, or at school, friends' homes or parents' workplaces.

Works immediately

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 particularly appeal to younger students: no waiting, instant gratification.



Short-acting effects

Effects are short-lived, typically lasting 60 seconds to 5 minutes after inhalation, with effects similar to intoxication from alcohol. This suits the younger abuser, who may huff between classes, in the bathroom, on the school bus, while doing homework, etc. Experienced users try to control the dose by using the products at intervals.

Social activity

Youngsters learn how to huff from each other. 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 younger students. Inhalant abuse spreads rapidly and can become a community-wide problem. After beginning as a group activity, some youngsters continue to use alone.

Hard to detect

Because they are not illicit drugs, 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 use. 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.

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 in their socks! Small quantities of chemicals can be decanted into small containers to put in pockets, backpacks, etc.

Unrecognized hazards

Children who abuse inhalants are generally unaware of the dangers involved. The products are legal, and abuse is not widely discussed or criticized. Some children huff precisely because they believe it is a safer alternative to drugs and their friends are doing it. Neurotoxicity and brain damage are difficult concepts for youngsters to understand. Inhalant deaths are rarely recognized or publicized, so most students don't know the fatal consequences.

Paraphernalia

Inhalant abuse, for the most part, does not require paraphernalia such as hypodermic needles, crack pipes, etc., 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.

METHODS AND MATERIALS 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. NOTE: Educators should not discuss specific methods of abuse with students.

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)
- Sniffing/huffing product in a small enclosed space, such as cardboard shipping carton, car, closet, etc.
- Spraying or pouring product into a plastic bag and holding the bag over nose or mouth or both (sometimes known as "bagging")
- Spraying propellant gas into a plastic bag and holding the bag over the face
- Filling a plastic bag with freon gas from air conditioner
- Inverting spray can and inhaling the gas propellant only
- Spraying gas such as nitrous oxide or butane into a heavyweight balloon and huffing from the balloon
- "Painting" product onto fingernails, inserting nails in nose or mouth to breathe fumes
- Pouring product onto collar, cuffs, or other parts of clothing, then raising clothing to the face to huff or sniff
- Decanting product onto a rag, scarf, bandanna, handkerchief, cloth or baby diaper, then holding or tying the cloth over the face
- Soaking cotton balls/swabs in product, stuffing up nostrils
- Decanting product into an empty container such as a "pop" can, 35mm film canister, etc., then huffing/sniffing
- Soak cloth and insert into mouth

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	Cloth baby diapers
Paper bags	Fertilizer bags
Scarves or bandanas	Soda/juice cans

CAUTION

What is unique about inhalants is that the techniques and methods of administration can be just as deadly as the toxic products themselves.

Death could result:

- **from suffocation when a plastic bag covers the face**
- **when an individual chokes on his/her vomit**
- **from lack of oxygen due to vapors replacing oxygen**
- **from lack of oxygen due to saturation of lung tissue with solvent products**
- **from the explosion or combustion of volatile fumes**
- **from cardiac arrest**
- **from swallowing small plastic bags**
- **from allergies to products**
- **from accidents or other causes when individuals are under the influence**

See the section “When Someone is Huffing” for precautions on how to deal with someone who is under the influence of inhalants.

EFFECTS OF INHALANT ABUSE

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

Note: While the immediate effects may appear negative to adults, children and adolescents may not perceive them as a problem. Youngsters find many ways to become dizzy and disoriented: spinning around and around, rolling down a hill, etc. Amusement park rides such as rollercoasters and spinning "saucers" mimic these effects. So we must understand the effects from their point of view. In many ways inhalants resemble the effects of alcohol, so it may be that younger children use inhalants to mimic alcohol intoxication.

As noted in the definitions section, inhalant chemicals vary widely in composition. However, most abusable products provoke similar effects, most of which can be intensified depending on the method of use.

PASS OUT

When young people "huff" in groups, they sometimes compete to see who can become unconscious first. This practice may seem dangerous to adults, but some children may not realize the danger involved.

FLAMMABLE

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

COLD

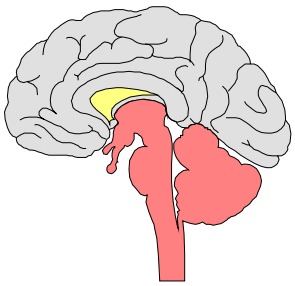
If inhaled directly from a pressurized container, a gas can cause frostbite because of its extremely low temperature. Freezing can damage tissues in the mouth, nose, and throat. Pressurized gas can damage delicate lung tissues, as well.

DEADLY

It can also be deadly if an individual drives a vehicle or operates machinery while under the influence of inhalant products. Physical coordination, reaction times, vision, and cognitive abilities are severely impaired by huffing, with resulting dangers to self and others.

Any instance of inhalant abuse carries the potential of "sudden sniffing death," that is, death by cardiac arrhythmia which can happen whenever someone huffs.

Immediate effects



Immediate effects may last only a minute or two, possibly several minutes. They are temporary.

- ✔ Hallucinations
- ✔ Dizziness
- ✔ Tremor
- ✔ Excitation
- ✔ Diminished sensitivity to pain
- ✔ Disorientation
- ✔ Emotional volatility
- ✔ Loss of coordination
- ✔ Irregular heartbeat
- ✔ Distortion of perception
- ✔ Cognitive impairment
- ✔ Nausea

Effects on the brain, circulatory, and respiratory systems

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

- ✔ Depressed central nervous system functions
- ✔ Inefficient respiratory process
- ✔ Lower volume of inhaled oxygen
- ✔ Severe headache
- ✔ Decrease in circulatory oxygen
- ✔ Impairment of hippocampus, memory
- ✔ Irregular heart rhythm
- ✔ Reduced cognitive abilities

NOTE: 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. Current scientific research and technology is unable to specifically link product exposures with definite adverse outcomes. The following list represents a range of possible consequences that may result from chemical exposure. Some of the neurological effects appear to be reversible with time and appropriate medical/rehabilitative services.

- ✔ Brain damage
- ✔ Impaired motor coordination
- ✔ Loss/impaired vision
- ✔ Lung function reduced
- ✔ Hearing loss/deafness
- ✔ Destruction of liver tissue
- ✔ Impairment of bone marrow
- ✔ Reduced kidney function
- ✔ Damage to muscles, including the heart
- ✔ Damage to neurons' myelin sheath
- ✔ Muscle tremor
- ✔ Numbness in extremities
- ✔ Slurred speech
- ✔ Decreased sensory capacities
- ✔ Memory Loss

SIGNS & SYMPTOMS OF INHALANT ABUSE

Early intervention is critical for the health and safety of the inhalant abuser. Students who huff or sniff regularly tend to exhibit behavior typical of drug abusers: acting-out behavior, drop in grades, withdrawal, mood swings, change in peer group, drastic weight loss, depression, etc. 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, 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 equipment that may denote inhalant abuse.

Products and/or Paraphernalia

Because some students huff and sniff in and around school grounds, school staff can easily 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 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 condition of individual

Because effects come and go so quickly, it is rare to observe students under the influence of inhalants. In addition, the following signs are so general that it would be difficult to connect most of them with inhalant abuse. But a student who exhibits any of the following indicators should be closely observed and possibly referred for further evaluation.

- Disorientation
- Dazed appearance
- Paint or chemical stains on face or hands
- Chemical odor on breath
- Chemical odor on clothing
- Red, pimply rash around nose and/or mouth (contact dermatitis)
- Slurred speech
- Coordination difficulties

- Increase in quantity and intensity of headaches
- Excitability

Social changes

- Increased isolation from others
- Increased defensiveness
- Attitude more favorable toward inhalant use
- Peer group changes

Schools may be an unwitting source of abusable products. Are products missing from storage areas, closets, drawers, etc.? Have staff members noticed their supplies being depleted quickly? Such discoveries may indicate that the school has become a source for huffers. A memo or meeting can raise awareness and provide an opportunity to discuss this important topic. Evidence of multiple products and paraphernalia is an important indication that inhalants are being abused. Because of the availability of solvent products in the school setting, school personnel must plan ahead to reduce the risk of abuse at school.

Assess school purchasing patterns

Some manufacturers now offer water-based products, that do not produce the same effects as other products that may be inhaled, and are less likely to be abused by students. But water-based does not mean 100 percent safety, it simply reduces effects and decreases potential for abuse.

School personnel should examine supply lists, catalogues, and vendor offerings for sources of water-based products. If the division puts out a list for bids, water-based products should be specified whenever possible. Check with your local poison control center for further details.

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 available to students.

All school personnel must be aware of the risks for abusable products. Be sure to notify cafeteria staff, janitors and custodians, transportation workers, security monitors, aides, and librarians about their potential abuse. Remind staff members to report suspicious quantities of missing products.

The following table summarizes products commonly used in schools and suggests which need to be closely supervised and which can be replaced by water-based formulations.

THIS CHART IS FOR ADULT USE ONLY.

Do not distribute to students.

SITE	PRODUCT CATEGORY	WATER-BASED FORMULATION AVAILABLE	CLOSE ADULT SUPERVISION
Vocational/Shop Classes	Solvents	No	Yes
	Glazes	No	Yes
	Refrigerant	No	Yes
	Gasoline	No	Yes
	Lacquers & Thinners	No	Yes
	Varnish	No	Yes
	Paints	No	Yes
	Spray adhesive	No	Yes
	Spray paint	No	Yes
	Cement	No	Yes
	Nail polish	No	Yes
	Polish remover	No	Yes
	Hair spray	Use only “pump”	Yes
Kitchen/Cooking	Whipped cream spray	No	Yes
	Cream chargers for whipping cream	No	Yes
	Spray shortening	No	Yes
Art Supplies	Magic markers	Yes	Yes
	Dry Erase/whiteboard markers	Yes	Yes
	Whiteboard cleaning fluid	Yes	Yes
	Rubber cement	No	Yes
	Glue	Yes	Yes
Office Supplies	Rexograph (ditto) fluid	No	Yes
	Correction fluid	Yes	Yes
Janitorial	Cleaners	Yes	Yes
	Solvents	No	Yes

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 is a very serious situation that must be handled cautiously. Make certain that any staff member who comes into contact with students is aware of the following guidelines:

What to do when someone is huffing

- ✔ Remain calm, keep student calm
- ✔ Do not excite, scare, shock, or upset the individual
- ✔ Contact the administrator in charge
- ✔ Get help
- ✔ Do not leave the individual alone
- ✔ Avoid activity or stimulation of the individual
- ✔ Ventilate the area immediately
- ✔ Move individual to well-ventilated area, if necessary
- ✔ Check the area for products and/or paraphernalia and save
- ✔ Contact the poison control center
- ✔ Contact the school nurse or appropriate school health professional
- ✔ If the individual is unconscious, call for an ambulance and turn the student on his/her side to prevent aspiration of vomit

INHALANT ABUSE PREVENTION

The most successful programs are included as part of comprehensive school health education. Research proves that "one shot" lessons or activities are not effective in helping to keep students safe and healthy. Prevention must be age-appropriate, culturally-appropriate, congruent, and consistent with other school curricula. An effective school-based prevention program (as defined by the National Institute on Drug Abuse) should include:

- Multiple years of programming
- Interactive methods
- Development and practice of skills: social skills, decision making, stress management, assertiveness, peer resistance, media literacy, and communication
- Anti-drug social norms
- Peer-to-peer activities
- Risk factors
- Increased protective factors

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

Review, repeat, reinforce, and practice skills and behaviors as often as possible, several times each school year. This builds students' abilities and reinforces attitudes and values for personal health and safety.

Inhalable products are not drugs but are substances used for drug-like effects. Most inhalant substances are poisons, and it is never safe to inhale toxins or poisons. The lessons in this guide are appropriate for a unit on the environment, poison control, or safety, as well as substance abuse prevention.

The following main concepts should be kept in mind when teaching inhalant abuse prevention across the grades. Use the form on the last page in this section to help plan your unit.

Knowledge/Information Concepts

Oxygen is necessary to sustain human life.

Oxygen has a vital role as fuel for the human body.

Inhaling gases other than oxygen deprives your brain of oxygen and results in damage to cells in the brain and other organs.

Many household substances are toxic (poisonous) when not used safely.

Some vapors, fumes, and gases, although invisible, can be poisonous.

Individuals should never inhale unidentified substances.

Children should be supervised by parents or a responsible adult whenever chemicals are being used.

Products should only be used in well-ventilated areas.

Prolonged exposure to toxic chemicals or vapors damages the brain, heart, circulatory system, vital organs, muscles, and central nervous system.

Chemical fumes pollute the earth's atmosphere, the atmosphere in a room, and the human body.

Attitudes/Values

Access to clean air is critical to survival.

Individuals are responsible for their health and wellness.

Unsafe actions have consequences.

We must respect the toxicity of chemicals and poisons.

Adults must be consulted when unknown products are found.

Chemicals should be handled with caution and used under adult supervision.

Reading labels promotes personal safety.

The human body should not be polluted by toxins or poisons in any form.

Skills/Behaviors

Appropriate use of sense of smell.

How to recognize substances that may be toxic or poisonous.

Alerting an adult when chemical products are found.

How to read and interpret product labels.

How to take appropriate safety precautions when using chemicals, toxins, and poisonous products.

Decision-making and problem-solving skills.

Awareness of normal functioning of the body, alert to changes in feelings and function.

Techniques to resist peer pressure to huff or sniff.

PLANNING FOR PREVENTION

Use the planning grid to coordinate lessons and reinforce activities for each component. Teachers can compare grids to assure continuity and articulation among grade levels and schools.

GRADE	K-3	4-6	7-9	10-12
Knowledge and Information				
Attitudes and Values				
Skills				
Behavior				

GRADES K-3

Safe or Unsafe

Safe Not Sorry

For these grade levels, a complete unit for inhalant abuse prevention should include these components:

- Essentials of life: food, water, oxygen
- Oxygen's role in the body
- Length of survival without oxygen
- Define, discuss examples of "pollution"
- Define, identify, and describe "poisons"
- List poisons and toxins possible pathways of entry into the body: touch or absorption through skin; taste; smell; breathing in (inhalation)
- Recognize that smelling or breathing vapors/fumes can be dangerous
- Describe methods to avoid introducing poisons into the body
- Review and practice appropriate rules for safety and poison prevention

The following section contains sample lessons that can be included as part of a unit for inhalant abuse prevention. They are not intended to be a complete unit. These lessons would complement educational activities related to safety or the environment. Transparency masters and handouts follow the lessons.

<u>When teaching about this subject, utitlize appropriate vocabulary:</u>

- Instead of "inhalants" or "drugs," say: poisons, chemicals, toxins, fumes
- Emphasize that "body pollution" is the result of air/water/environmental pollution
- Substitiute "toxic effects" for "get high"

Be sure to express concern for the health of someone who inhales toxic fumes/vapors under any circumstances, deliberate or accidental.

SAFE OR UNSAFE?

Grades K-3

Objectives

1 - Students will be able to define "poison."

2 - Students will be able to list the negative consequences of touching, eating, or breathing poisonous substances.

3 - Students will be able to differentiate between poisonous substances and substances which are safe to touch, eat, and breathe.

4 - Students will learn that unknown substances may be poisonous.

Materials

- Mounted pictures (description below)
- Pair of tongs or thin latex gloves
- Paper grocery sack filled with prepared pictures
- Prepare a file folder: *On the cover, write in large letters: SAFE TO EAT, BREATHE, OR TOUCH? Draw appropriate pictures, if desired. Inside the open file, label one side "YES" and the other side "NO."*

Activity

Assemble a stack of magazines and cut out colorful pictures of a variety of products:

Food	Over-the-counter medicine	Insecticides
Beverages	Cleaning products	Glues, Cements

Mount each picture on stiff paper. (Laminate if possible.) Place the pictures in the grocery sack.

Display the universal symbol for poison, the skull and crossbones or "Mr. Yuk." 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 stomach ache, burning the nose, tongue, or throat, etc. Reinforce the concept that poisons can hurt when swallowed, absorbed through the skin, or breathed through the nose and mouth. Tell the class that today you will be discussing poisons.

Invite student volunteers to help with a sorting game. Use the tongs or gloves as a reminder of precautions students should use when they don't know what substance they are handling. As each student comes forward, give him or her the tongs, or help the student put on a glove. Then, invite the student to reach into the bag and pick out one picture. They should hold the picture up and name the object if they can. Be prepared to help. Then, ask the question: "Is this safe to eat, breathe, or 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, and help them identify and sort products, if necessary. Remind students that children should consult a parent or teacher whenever they encounter an unknown product or substance.

Evaluation Store the sorting game on a shelf in the classroom and periodically invite pairs of students to practice their skills. Check for accuracy. Add new pictures to the game periodically and challenge students to decide if these new pictures are safe or not. Spot check to be sure students are sorting correctly.

SAFE NOT SORRY

Grades K-3

Objectives

1 - Students will be able to describe how poisons can enter the body through the nose, mouth, skin, eyes, and ears.

2 - Students will be able to discriminate between items that are safe to smell and those that may NOT be safe to smell.

3 - Students will develop a list of safety procedures.

Materials

- Handouts: "Is it Safe?" and "Safe to Smell?"
- Green and red crayons

Activity

Tell the class that today they will be discussing how to protect their bodies and keep themselves safe. Ask students: What is the largest organ in the body? (It is the skin.) If necessary, explain what an organ is. Tell students that their skin is designed to protect other organs and the inside of the body from being exposed to harm. Brainstorm a list of conditions that the skin can protect a person against. Some ideas include: extreme temperatures, sharp objects, germs, poison, dust, dirt, etc.

Students can guess where on the body these elements could still enter. They can enter through openings 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 keep skin clean and free of cuts, scratches, etc.

Distribute "Is It Safe?" Depending on the reading level of the children, ask them to read to themselves, read out loud, or read the statements to them. Color the circle "red" if it is not safe to do this specific behavior; color the circle "green" if it is safe to do it. Discuss each situation. The children's work can be displayed in the classroom, sent home, or saved in a portfolio.

Invite students to help develop a list of safety rules. Help them to list and refine several basic rules, such as the following:

- Do not taste or smell anything unless a parent or trusted adult says it is safe;
- Do not put a product on your skin unless a parent or trusted adult says it is safe;
- Never pick up or touch unknown plants, berries, substances, or products;
- Protect the skin! Be careful and keep the body clean.

Evaluation Distribute “Safe to smell?” and direct students to put an X over the pictures of items that are not safe to smell. Check work. Discuss the possible consequences of smelling each item. Emphasize that the odors we smell are inhaled into the body where they could affect us, especially in large quantities or for long periods of time. For instance, smelling an insecticide might make a person nauseous, dizzy, or raise the heart rate. Smelling poison might make a person very sick. Smelling paint might cause headache, dizziness, or stomachache. Smelling household cleaners could result in nausea, dizziness, vomiting, headaches, illness.

Is It Safe?

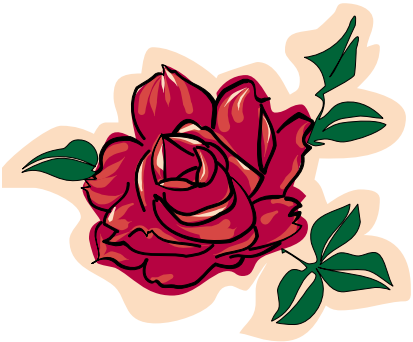
Read each sentence.
Color the circle GREEN if it is SAFE.
Color the circle RED for NO, not safe.

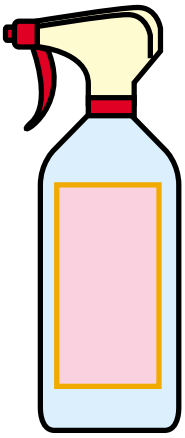
- ◯ *Is it safe to smell the juice in your cup?*
- ◯ *Is it safe to taste a wild berry from the woods?*
- ◯ *Is it safe to lick a postage stamp?*
- ◯ *Is it safe to spread glue on your hands?*
- ◯ *Is it safe to breathe from a can in the park?*
- ◯ *Is it safe to lick green powder on the floor?*

Safe to smell?

Look at each picture.

Put an X over the pictures that are <u>not</u> safe to smell.





GRADES 4-6

What do we need to live?

Getting to Know Hemoglobin

Brainworks

Huffing, Sniffing Means Danger

Preventing Body Pollution

For students in grade levels 4-6, a complete unit for inhalant abuse prevention should include these concepts:

- Overview/review of respiratory system
- Explanation and discussion of oxygen's importance to life and body functions (emphasize survival time)
- Hemoglobin's role in respiration; hemoglobin's lack of specificity to oxygen and propensity to bind to lighter gases
- Brain's importance in the functioning of the body
- Describe negative effects of oxygen deprivation on the brain and body
- Discuss and discourage "body pollution" or introducing toxins or poisons into the body
- Overview of allergic reactions to chemicals
- Review and practice safety skills related to toxins and poisons
- Skills: reading labels, following directions, taking precautions

The following section contains sample lessons that can be included as part of a unit for inhalant abuse prevention. They are not intended to be a complete unit. These lessons complement educational activities related to safety, the environment, or drug prevention. Where needed, materials follow the lesson. The blackline masters may be used to duplicate handouts or to make overhead transparencies, as appropriate.

<u>When teaching about this subject, utitlize appropriate vocabulary:</u>

- ◆ Instead of “inhalants” or “drugs,” say: poisons, chemicals, toxins, fumes
- ◆ Emphasize that “body pollution” is the result of air/water/environmental pollution
- ◆ Substitiute “toxic effects” for “get high”

Be sure to express concern for the health of someone who inhales toxic fumes/vapors under any circumstances, deliberate or accidental.

WHAT DO WE NEED TO LIVE?

Grades 4-6

Objectives

1 - Students will list three things that are most critical to survival.

2 - Students will be able to identify the length of time that an individual can survive without each item: food, water, and oxygen.

3 - Students will compare the roles of food, water, and oxygen to a person's health and safety.

Materials

- Overhead transparency: "What do we need to live?"

Activity

Ask students: "What does our body need to stay alive?" List answers on the chalkboard or chart paper. Circle food, water, and air (or oxygen) and tell the group that these are absolutely the most critical things we need to live.

Display the overhead transparency "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.) Allow several students to answer, then use the highest answer 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, living conditions, etc. For instance, a newborn baby might only survive for a couple of days, while healthy, physically fit adults in their twenties might live for two months! A compromise might be agreed upon by the class: weeks. Use a transparency marker to put "weeks" on the line below the picture of the apple.

Now ask students to consider how long someone could live without ***WATER*** (there would be food, but no water.) After several answers, poll the class: "How many think we could live more than one day? More than two days? More than five days?…etc."

Again, explain that this is a very subjective issue. Also explain that because the human body is more than 75 percent water, a person must have adequate fluids or risk dehydration and death. Advise the class to compromise, and write "days" in the space below the picture of a glass of water.

Now, 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/her breath. When a person cannot breathe, he or she becomes unconscious soon and, if no additional oxygen/air is available, the individual will soon die. *(NOTE: Students may know about the "cold water phenomenon" whereby the body immersed in icy cold water appears to shut down to prolong survival. If the person is young, healthy, lucky, and properly revived, it is possible to recover fairly well.)*

Remind the group that even trained divers can only hold their breath for 10 minutes or so. Survival times would be much shorter for infants and toddlers, people

with lung impairments such as asthma or emphysema, or those who are very ill. Explain that cells need oxygen to perform their basic functions.

Generalize by writing the word “minutes” on the line below the picture of the atom.

Instruct students to look at the three items and decide which of the three is the most important every second of their lives. Clearly it is oxygen: life is over in a matter of minutes without it!

Review by reminding students how important it is to safeguard our air supply and our body’s respiratory system to make sure that we get enough oxygen.

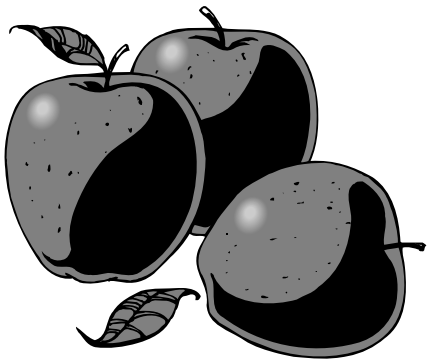
Evaluation

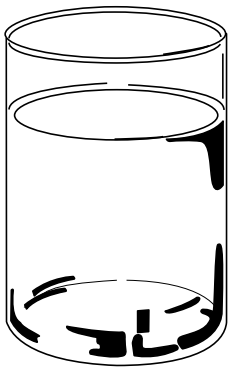
Students can write a three-to-five sentence paragraph about oxygen’s importance to the body. Pair students with a partner to check that each paragraph includes at least one statement describing how oxygen is vital to the body’s functioning.

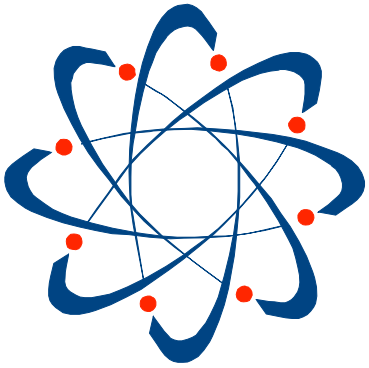
Reinforce this concept by asking students why firefighters wear oxygen masks? Remind them that oxygen is critical to life, and toxic fumes such as those generated by a fire can reduce the amount of oxygen available for breathing.

What do we need to live?

Food ***Water*** ***Oxygen***







GETTING TO KNOW HEMOGLOBIN

Grades 4-6

Objectives
1 - Students will be able to explain hemoglobin's main function.
2 - Students will describe oxygen's role in the body.
3 - Students will explain the negative consequences of inhaling fumes and vapors that replace oxygen in the body.

Materials
- Overheads: "Inside the Lungs" and "Oxygen and Your Body"
- Handout: "Hemoglobin & Oxygen"

Activity

Use the overhead transparency "Inside the Lungs" to help students review the structures and functions of the respiratory system. Tell students that lungs are structured for maximum inhalation/absorption of oxygen through the large numbers of alveoli (air sacs) and capillaries that surround the lungs.

Use the transparency "Oxygen and Your Body" to explain the pathway for oxygen through the bloodstream to the brain and body.

Ask students why the oxygen goes first to the brain. Explain that because the brain directs all operations of the body, it must receive lots of fresh oxygen as quickly as possible. Although there are many gases in air, remind students that oxygen is the only gas that the human body can use as fuel. (This may be an appropriate time to discuss the role of oxygen as a fuel for individual cells.) Tell students that although the brain is a comparatively small organ (2 percent of body weight), it receives 16 percent of all blood circulated in the body! If the brain doesn't get enough oxygen, no part of the body or brain will be able to function properly.

Distribute the handout "Hemoglobin and Oxygen" and ask for volunteers to read the top portion. 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! Hemoglobin knows which gas is oxygen and it selects oxygen, pulls it into the blood stream, and circulates it throughout the body.

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," because the gas 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 anymore; they want their body to use another gas instead. Is this possible? No. The human body is designed to use oxygen only, and no other gas can be used.

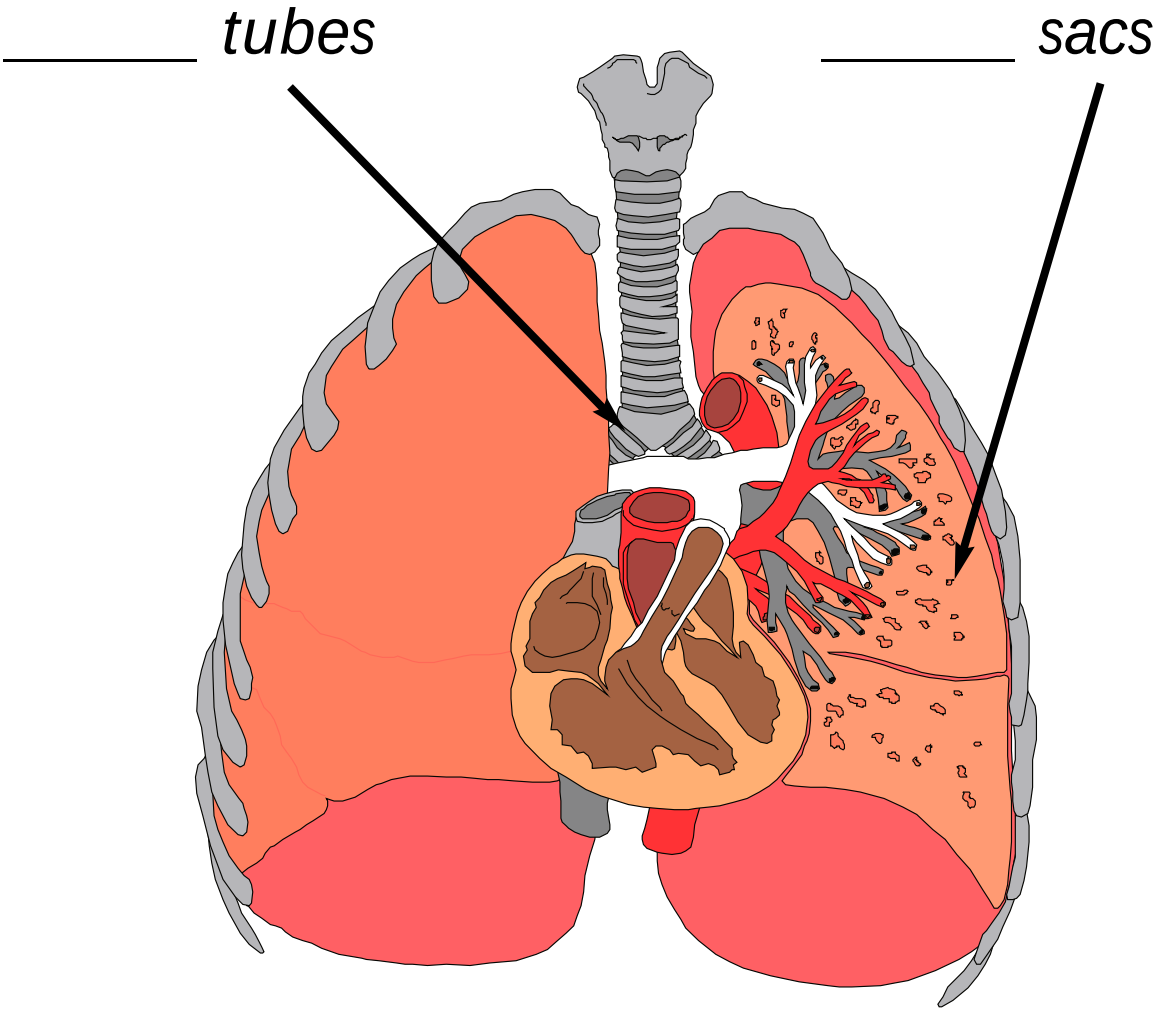
Students can read aloud the section of the handout on brain damage. Tell students that brain cells can get hurt – anywhere from slightly damaged to completely

destroyed -- when they do not get enough oxygen. This damage may be temporary or permanent, and no one can predict in advance 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 operations and coordination, the thinking process, and receiving and interpreting signals from the senses.

Evaluation Invite students to role-play an oxygen molecule for the class. They can describe/demonstrate the journey from the air, into the nose/mouth, down the throat, into the bronchial tubes and the air sacs, being "grabbed" by hemoglobin, entering the bloodstream via a capillary, and traveling through the body. Check for understanding of the respiratory process. Several students can role-play this scenario.

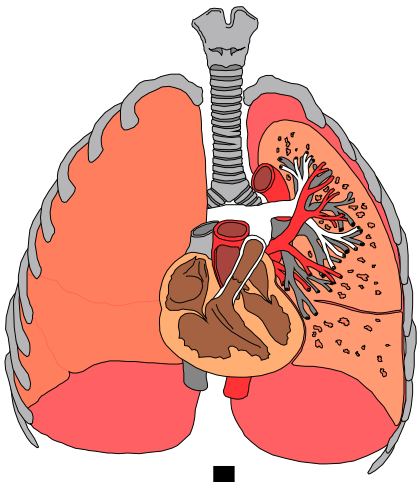
Invite other students to demonstrate what happens when dangerous fumes and vapors enter the body. Ask volunteers to summarize the effects of these fumes and vapors on the respiratory system and on body functions.

Inside the Lungs



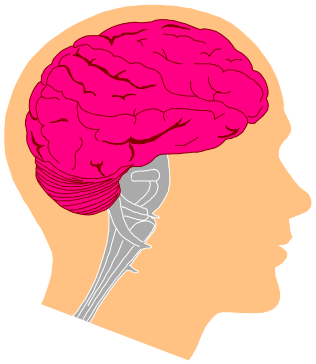
Capillaries with blood surround lung cells and air sacs. In the blood are red blood cells. Red blood cells contain hemoglobin. Hemoglobin grabs oxygen!

Oxygen and Your Body

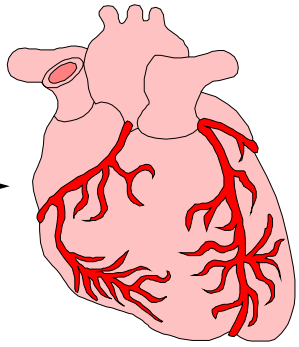


1

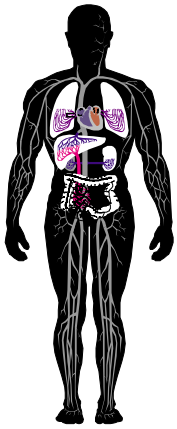
Blood contains red blood cells. Red blood cells contain hemoglobin. In the lungs, hemoglobin grabs oxygen, pulls it into blood.



2

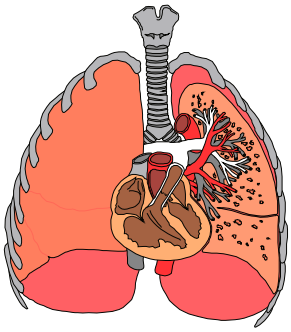


3



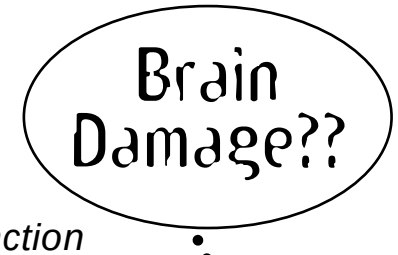
4

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

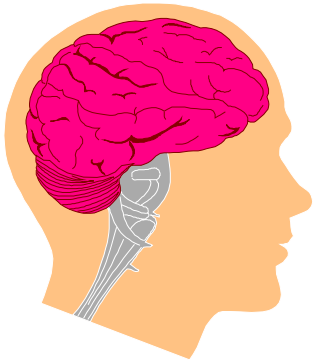


Hemoglobin and Oxygen

- ***in the lungs, hemoglobin picks up oxygen from the air sacs***
- ***if other gases are in the lungs (vapors and fumes, for instance) there may not be much oxygen for hemoglobin to pick up***
- ***this leaves your brain cells and body WITHOUT enough oxygen!***



Without enough oxygen, the brain cannot function well. It could be damaged.Brain damage means changes to the cells or functions of the brain. It is a very serious problem.



Brain damage could result in:
- *memory problems*
- *difficulty with balance or movement*
- *problems with seeing, hearing, speaking*
- *loss of body functions*
- *learning difficulties*
- *uncontrollable behavior*
- *other physical, mental, or emotional changes*

Sometimes this damage is permanent, sometimes it is not permanent.

BRAINWORKS

Grades 4-6

Objectives 1 - Students will be able to identify areas of the brain.
2 - Students will be able to explain the functions of the four areas of the brain.
3 - Students will analyze the effects of oxygen loss on each section of the brain.

Materials Overhead: "How The Brain Works"

Activity Use the overhead "How the Brain Works" to introduce the sections and functions of the brain:

Cerebellum: Controls body coordination, balance, voluntary muscles

Cerebrum: Controls thinking, memory, decision making, logic, learning

Medulla: Regulates heart, respiration, digestion, organ functions

Spinal cord: Controls nerve impulses through the central nervous system

During the discussion, challenge students to give examples of actions controlled by each section of the brain. Some ideas students may mention are:

Cerebellum: Clapping hands, holding a tennis racket, jumping, dancing.

Cerebrum: Remembering a delicious dinner, deciding what clothes to wear, solving a math problem.

Medulla: Heart beating, maintaining proper body temperature.

Spinal cord: Transmitting pain signals from a fingertip to the brain, for interpretation, feeling a light touch such as a fly landing on your skin.

Now, ask students to imagine what would happen to these important activities if the brain didn't have enough oxygen. Discuss some specifics, such as movement, thinking, heartbeat, etc.

Evaluation Students can complete these sentence stems orally or in writing:

One thing I learned today is _____.

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

My cerebellum needs oxygen to _____.

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

Students can make and display posters labeling brain areas and identifying their functions

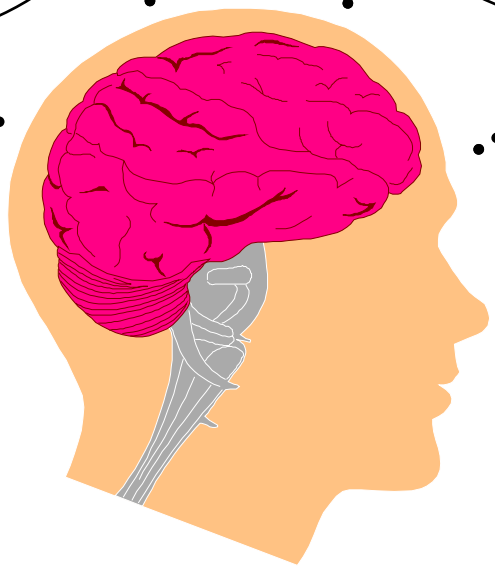
How the Brain Works

Cerebellum
coordination, balance, movement

Medulla
involuntary functions such as heart, breathing, digestion

Cerebrum
conscious thought judgment, decisions, reasoning

Spinal Cord
nerve impulses between body and brain



HUFFING, SNIFFING MEAN DANGER

Grades 4-6

Objectives

1 - Students will demonstrate their recognition of the terms "huffing" and "sniffing."

2 - Students will list substances and products they may think are being huffed and sniffed.

3 - Students will be able to conclude that substances that are huffed or sniffed are dangerous inside the body.

Materials none

Activity

This activity can serve 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.

Tell students that you (the teacher or group leader) have just become aware of some new terms, and you want to see if they know about them. Invite students to raise their hands if they have heard of the terms "huffing" or "sniffing." Make a mental note of the numbers of students as an indication of general awareness of the practice.

Now, ask the group "what things do people huff or sniff?" List the group's ideas on the chalkboard or newsprint. Allow plenty of time for answers. Students typically generate a list of 6-12 products/substances, usually including correction fluid, household cleaners, felt-tip markers, etc. Inquire: "Are these products designed to be used inside the body?" Explain that the majority are considered poisonous (toxic) if taken internally. Are they safe to eat? Point out that huffing or sniffing results in the product being taken internally.

Ask if this could be dangerous, and why? Lead a discussion about the kinds of products on the list and their appropriate usage. At the teacher's discretion, students can copy in their notebooks the phone number of the appropriate poison control center.

Charlottesville: Blue Ridge Poison Center	804-924-5543
Richmond: Virginia Poison Center	804-828-9123

Note: a few students may have questions about huffing or are concerned about someone else's huffing. The teacher should invite these students to speak with him/her privately, and arrange for further information from the SAP counselor, school nurse, or other personnel.

Evaluation Pairs of students can create a list of rules for poisons or toxins in the home. These rules should include ideas for safe storage, safe handling, and supervision of use of these products. Share the lists and compile a master list that can be distributed or displayed.

PREVENTING BODY POLLUTION

Grades 4-6

Objectives
1 - Students will be able to list a variety of polluting conditions.
2 - Students will be able to relate poisons and toxins to "body pollution."
3 - Students will be able to identify and practice procedures to safeguard the body from poisons.

Materials
- Wordsearch

Activity

Begin with an informal survey, asking students how many of them are concerned with water pollution, air pollution, or the ozone layer. Now ask students who is concerned about "body pollution?" The response may not be the same! Mention that "body pollution" occurs when certain chemicals and poisons enter the body. Help students to understand that the body can become polluted the same way the atmosphere or water can become polluted.

Ask students if they can tell whether water or air is polluted by just looking at it. (The answer is usually no, although some polluted water may be obviously polluted with 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 insects, animals, and humans. Discuss how our senses can expose us to pollutants, so it is best not to smell or taste unknown products because those senses introduce substances and fumes into the body. Point out that we must protect our bodies from contamination and pollution.

Introduce the synonyms "toxin" and "poison" by writing the words "toxin" and "toxic" on the chalkboard for students to define; be sure to note that "poison" is a synonym. Brainstorm a list of poisons with the class. Ask students to consider several ways that a poison might enter a person's body. Be sure to include:

- swallowed
- absorbed through the skin
- inhaled into the lungs

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

- Do not taste or smell anything unless you are certain it is safe, or a parent or trusted adult says it is safe.
- Do not put a product on your skin unless a parent or trusted adult says it is safe.

- Never pick up or touch unknown substances or chemicals.
- Read labels and instructions carefully and completely.
- Use all products in a well-ventilated room or outdoors.
- When working with household products, wear protective gear such as gloves, safety glasses, safety mask.

As appropriate, offer students the following telephone numbers of poison control centers in Virginia.

Charlottesville: Blue Ridge Poison Center	804-924-5543
Richmond : Virginia Poison Center	804-828-9123

Evaluation Divide the class into small groups of three or four students. Allow several minutes for each group to develop a role-play that centers around them finding or seeing a can/bottle/container outside the schoolyard and what to do with it. The scenario should include at least one of the safety procedures that the class developed. Groups can present their role-plays to the class. Ask students to observe each role-play and note which of the safety procedures above were used in the role-play situation. Discuss.

Distribute the Wordsearch and challenge the group to find all the words.

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

Find the following words in this puzzle.

The words may be forward or backward, horizontal, vertical, or diagonal.

AIR
BRAIN
BREATHE
HEMOGLOBIN
LABEL
LIVE
LUNGS
OXYGEN
POISON
POLLUTION
SAFETY
SMELL
TOXIC

WORD SEARCH

T	K	P	O	B	H	G	C	E	E	A	M
N	I	B	O	L	G	O	M	E	H	I	H
O	X	Y	G	E	N	B	V	I	X	R	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

Find the following words in this puzzle.

The words may be forward or backward, horizontal, vertical, or diagonal.

AIR	OXYGEN
BRAIN	POISON
BREATHE	POLLUTION
HEMOGLOBIN	SAFETY
LABEL	SMELL
LIVE	TOXIC
LUNGS	

GRADES 7-9

What Do We Need To Live?

Huffing, Sniffing Means Danger

Label-Wise

Toxins and Poisons: Health Consequences

Keeping Children Safe

Being a Friend, Helping a Friend

For these grade levels, a unit for inhalant abuse prevention should include the following concepts:

- Review of the respiratory system, hemoglobin, gas exchange
- List, describe, discuss the negative health consequences of oxygen deprivation
- Discuss environmental toxins and personal safety issues related to poisons and toxic chemicals
- Discuss and discourage body pollution
- Skills reading labels, following directions, taking precautions
- Skills regarding inhalant abuse or any risky behavior: decision-making, communication, peer refusal, personal responsibility
- Helping a friend who is huffing or sniffing

The following section contains sample lessons that can be included as part of a unit for inhalant abuse prevention. The lessons are not intended to be a complete unit. These lessons complement educational activities related to safety, the environment, or drug prevention. Where needed, materials follow the lesson. The blackline masters may be used to duplicate handouts or to make overhead transparencies, as appropriate.

<u>When teaching about this subject, utitlize appropriate vocabulary:</u>

- ◆ Instead of “inhalants” or “drugs,” say: poisons, chemicals, toxins, fumes
- ◆ Emphasize that “body pollution” is the result of air/water/environmental pollution
- ◆ Substitiute “toxic effects” for “get high”

Be sure to express concern for the health of someone who inhales toxic fumes/vapors under any circumstances, deliberate or accidental.

WHAT DO WE NEED TO LIVE?

Grades 7-9

Objectives

1 - Students will list three things that are most critical to survival.

2 - Students will be able to identify the length of time an individual can survive without each item: food, water and oxygen.

3 - Students will compare the roles of food, water, and oxygen to a person's health and safety.

Materials

- Overhead transparency: "What do we need to live?"

Activity

Ask students: "What does our body need to stay alive?" List answers on the chalkboard or chart paper. Circle food, water, and air (or oxygen) and tell the group that these are the most critical things we need to live.

Display the overhead transparency "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.) Allow several students to answer, then use the highest answer 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, state of health, living conditions, etc. For instance, a newborn baby might only survive for a couple of days, while healthy, physically fit adults in their twenties might live for two months! A compromise might be agreed upon by the class: weeks. Use a transparency marker to put "weeks" on the line below the picture of the apple.

Now ask students to consider how long someone could live without ***WATER*** (there would be food, but no water.) After several answers, poll the class: "How many think we could live more than one day? More than two days? More than five days?...etc."

Again, explain that this is a very subjective issue. Also, explain that because the human body is more than 75 percent water, we must have adequate fluids or risk dehydration and death. Advise the class to compromise, and write "days" in the space below the picture of a glass of water.

Now, 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 a person can hold his or her breath. When a person runs out of oxygen, he or she becomes unconscious, and if no additional oxygen/air is available, the individual will soon die. *(NOTE: the only exception is the "cold water phenomenon" whereby the body immersed in icy cold water appears to shut down to prolong survival. If the person is young, healthy, lucky and properly revived, it is possible to recover fairly well.)*

Remind the group that even trained divers can only hold their breath for 10 minutes or so. Survival times would be much shorter for infants and toddlers, people with lung impairments such as asthma or emphysema, or those who are very ill. Explain that oxygen provides "fuel" for cells to perform their basic functions.

Generalize by writing the word "minutes" on the line below the picture of the atom.

Instruct students to look at the three items and decide which of the three is the most important every second of their lives. Clearly it is oxygen: life is over in a matter of minutes without it!

Evaluation

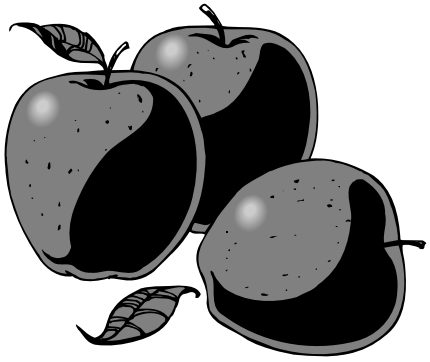
Review by reminding students how important it is to safeguard our air supply and our body's respiratory system to make sure that we get enough oxygen.

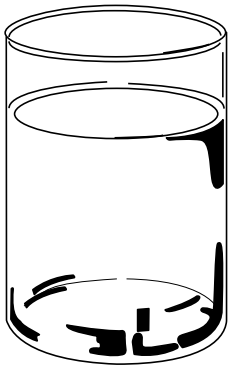
Students can write a three-to-five sentence paragraph about oxygen's importance to the body. Pair students with a partner to check that each paragraph includes at least one statement describing how oxygen is vital to the functioning of the body.

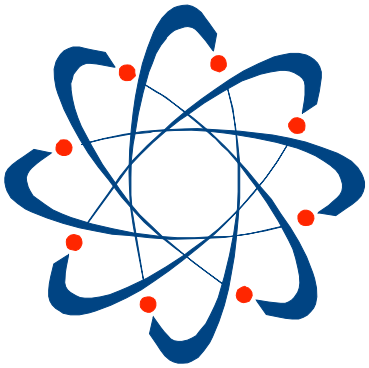
Reinforce this concept by asking students why firefighters wear oxygen masks? Remind them that oxygen is critical to life, and toxic fumes such as those generated by a fire can reduce the amount of oxygen available for breathing.

What do we need to live?

Food **Water** **Oxygen**







HUFFING, SNIFFING MEAN DANGER

Grades 7-9

Objectives

1 - Students will demonstrate recognition of the terms "huffing" and "sniffing".

2 - Students will list substances and products they may think are being huffed and sniffed.

3 - Students will be able to determine that substances that are huffed or sniffed are inappropriate (and dangerous) inside the body.

Materials none

Activity

This activity can serve 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.

Tell students that you (the teacher or leader) have just become aware of some new terms, and want to see if they know them. Ask students to raise their hands if they have heard the terms "huffing" or "sniffing." Make a mental note of the numbers of students.

Now, ask the group "What things do people huff or sniff?" List the group's ideas on the chalkboard or newsprint. Allow plenty of time for answers. Students typically generate a list of 6-12 products/substances, usually including correction fluid, household cleaners, felt-tip markers, etc. Inquire: "Are these products designed to be used inside the body?" Explain that the majority are considered poisonous (toxic) if taken internally. Are they safe to eat? Point out that huffing or sniffing results in the product being taken internally.

Ask if this could be dangerous, and why? Lead a discussion about the kinds of products on the list and their appropriate usage. At the teacher's discretion, students can copy the phone number of the appropriate poison control center into their notebooks.

Charlottesville: Blue Ridge Poison Center	804-924-5543
Richmond : Virginia Poison Center	804-828-9123

Evaluation

Note: A few students may have questions about huffing or are concerned about someone else's huffing. The teacher should invite these students to speak with him/her privately, and arrange for further information from the counselor, school nurse or other appropriate personnel.

Ask students to find synonyms for the word "poison." On the blackboard or on chart paper, start a list they can add their own words. Invite students to write two or three sentences explaining the meaning of this phrase: "For external use only."

LABEL-WISE

Grades 7-9

Objectives

1 - Students will practice reading labels of ordinary products such as correction fluid, nail polish, household cleaners.

2 - Students will explain the warnings and safety precautions on the labels of common household products.

Materials

- At least 20 empty, clean containers of products with tops securely taped or glued closed. Products may include nail polish, turpentine, isopropyl alcohol, rubber cement, correction fluid, spot remover, bleach, aerosols, insecticide, etc. Make sure there is a legible warning label on each, and, if possible, a list of ingredients.
- Handout: "Looking at the Label"

Activity

Divide the class into groups of two or three students and give each group two handouts and two empty product containers. Allow seven to eight minutes for each group to fill out the worksheets, then invite each group in turn to present one of the products to the class with this information:

List of ingredients

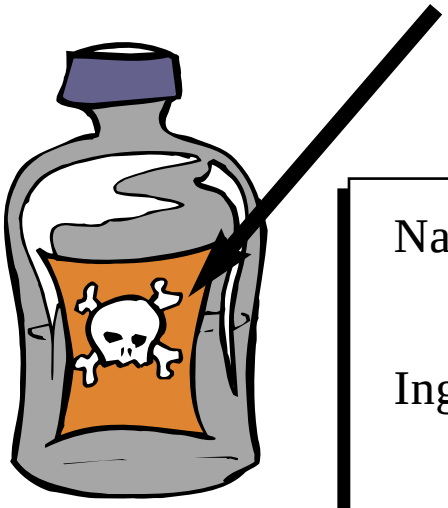
Summary of label warnings

Safety precautions

Evaluation

Students can design a brochure or poster with appropriate safety information about a product they have at home or at school. At the teacher's discretion, this can be done individually or in pairs. Brochures or posters can be displayed in the classroom, hallway, school library or at a parent meeting.

Looking At The Label



Name of product:

Ingredients listed:

Summary of label warnings:

Safety precautions for using this product:

Students in group:

TOXINS and POISONS: HEALTH CONSEQUENCES

Grades 7-9

Objectives
1 - Students will correlate toxins, poisons, and pollutants with risks to health.
2 - Students will identify health consequences that may result from exposure to toxins, poisons, and pollutants.

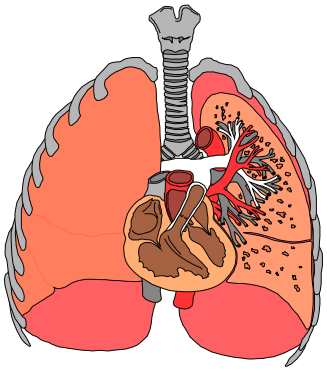
Materials
- Empty, clean containers of products with tops securely taped or glued closed. Products may include: nail polish, turpentine, isopropyl alcohol, rubber cement, correction fluid, spot remover, bleach, aerosols, insecticide, etc. Make sure there is a legible warning label on each, and, if possible, a list of ingredients. Where possible, use products named by students in an earlier lesson.
- Handout: Toxins and Poisons: Health Consequences

Activity
Display empty product containers. Review previous learning about labeling of poisons and chemicals, if necessary. Tell students that many of these products contain chemicals known as "solvents." Explain that solvents are chemicals designed to remove fats, grease, dirt, and soil, and tell them that the vapors of these products contain solvents in gas form. Ask if these might "pollute" the body? (yes!)

Let the class know that many, many tissues and organs in the body are composed of fat cells and fatty membranes. What might happen if the solvent chemicals touched these fatty areas? Distribute the handout "Toxins and Poisons: Health Consequences." Invite students to read each section aloud and discuss the serious effects of solvents on the body. Summarize by asking students to point to parts of the body that could be damaged by poisons and toxins. Remind students that it is important not to "pollute" the body.

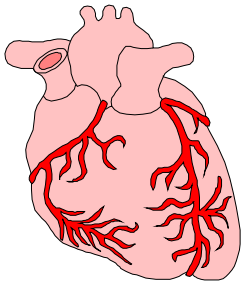
Evaluation
Invite students to draw a full size outline of the body and label major organs and body parts, including the health consequences of toxins and poisons. Divide into small groups and direct students to discuss each body part. Check for understanding. A chemistry or biology instructor might talk to the class about the effects of toxins and / or solvents on the human body.

TOXINS AND POISONS:
HEALTH CONSEQUENCES



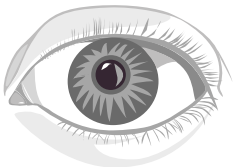
- ***reduces oxygen absorbtion***
- ***reduces lung function***

- ***disturbs heart rhythm - erratic***
- ***can stop heart entirely***



- ***painful headaches***
- ***neural coating destroyed***
- ***impairs memory, learning***
- ***trouble with coordination***

- ***problems with eyes, ears***
- ***affects smell and taste***



KEEPING CHILDREN SAFE

Grades 7-9

Objectives
1 - Students will be able to identify some potential dangers of household products.
2 - Students will develop a list of safety precautions to keep younger children safe from poisons and toxins.

Materials
- 10-15 empty containers of products with tops securely taped or glued closed. Products may include: nail polish, isopropyl alcohol, rubber cement, household cleaner, correction fluid, spot remover, bleach, etc.
- Handout: "Rules for Safety"

Activity

Your students are going into an imaginary business! They will prepare for roles as babysitters or care-givers of kindergarten age children.

Pair up students and let them decide who will act the part of a five-year-old child, and who will act the part of a babysitter. Here's the scene: While playing outside, the five-year-old child finds an unfamiliar container, perhaps an empty can of turpentine or empty cigarette lighter. They are to role-play what happens next. What does the younger child do? How does the babysitter handle the situation? All groups are to do this at one time, working in their paired groups. After the students finish role-playing, switch roles and repeat. Invite several students to role-play in front of the whole group.

Reconvene as a group and discuss the possible hazards and consequences if the youngster had touched, eaten, smelled, or swallowed the contents of the product.

Ask each pair to develop a list of safety rules that they will help teach the child they are caring for. Students can write them on the handout. Post the lists, allow the class to examine all of them, and summarize into one main poster. Encourage them to add the contact information for the closest poison control center:

Charlottesville: Blue Ridge Poison Center	804-924-5543
Richmond: Virginia Poison Center	804-828-9123

Hang the poster in the classroom.

Evaluation Find out if primary grade teachers can invite all students to visit their classrooms. The older students can show the poster and discuss safety rules regarding containers and unknown products. Students also may wish to make a presentation at a meeting of parents of elementary schoolchildren.

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

BEING A FRIEND, HELPING A FRIEND

Grades 7-9

Objectives

1 - Students will describe important responsibilities of friendship.

2 - Students will explore a variety of ways to help their friends.

3 - Students will differentiate between getting a friend "in trouble" and getting a friend "into help."

4 - Students will be able to name at least one resource person to refer a friend to for help.

Materials Handout: "Responsibilities of Friendship"

Activity

Lead a discussion on friendship. Are friends important? Why? How can you tell who is really your friend? What are the characteristics of a friend? What responsibilities are involved in being a friend?

Distribute the handout "Responsibilities of Friendship." Students can check the statements that they agree with and add one or two additional responsibilities. Pair students and allow several minutes for sharing ideas.

Inquire if anyone in the class has ever had serious concerns about a friend. (Remind students not to mention anyone by name or disclose any sensitive information.) Invite students to discuss how this felt for them, and if they were able to help the friend. Is it worth risking the friendship to help a friend? Can this be a difficult decision? What risks might be involved in helping a friend?

Remind the group that many times helping a friend can make a critical difference. Ask them to differentiate between getting a friend "in trouble" and getting a friend "into help."

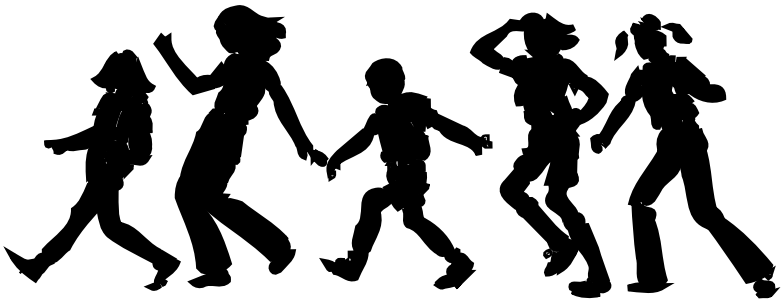
Brainstorm a list of ways that a friend could guide a friend to get help, if needed. Discuss. Then brainstorm a list of people who might act as resources for young people in need of assistance. The list might include parents, teachers, school nurse, counselor, hotline, and more. If desired, this list can be posted in the classroom.

Evaluation Small groups of students can write and dramatize role-plays that depict young people with problems. Suggestions for difficulties: eating disorder, huffing, shoplifting, depression, etc. Each group can create a scenario and then offer at least two different ways that a friend can help a friend. Make sure that students understand how to access adult resources within the school.

RESPONSIBILITIES OF FRIENDSHIP

What does it mean to be a friend?

Check the boxes that YOU think are responsibilities of friendship. Add two of your own ideas.



- ☐ ***Listen to a friend's problems.***
- ☐ ***Give a friend good advice.***
- ☐ ***Keep a friend company.***
- ☐ ***Tell a friend if you think he or she is wrong.***
- ☐ ***Help a friend who is afraid.***
- ☐ ***Warn a friend if he or she is making a mistake.***
- ☐ ***Help a friend fix a broken bicycle.***
- ☐ ***Lend a friend lunch money.***
- ☐ ***Share a snack with a friend.***
- ☐ ***Help a friend with homework.***

GRADES 10-12

Toxins and Poisons: Health Consequences

Toxins, Poisons, and the Brain

Safety and Prevention of Toxic Poisoning

Being a Friend, Helping a Friend

For these grade levels, a complete unit for inhalant abuse prevention should include the following:

- Review the respiratory system, hemoglobin, gas exchange
- Overview of oxygen deprivation and brain functions
- Identify and describe biological/physical implications of other gases replacing oxygen in the blood (including helium)
- Describe and discuss negative effects of toxic chemicals, poisons and pollutants on the heart, the brain, and other organs
- Safety precautions against environmental/personal pollution
- Overview of the magnitude of toxic pollution and prevention/cleanup efforts
- Understanding of efforts and organizations that protect people from toxins and poisons

The following section contains sample lessons that can be included as part of a unit for inhalant abuse prevention. The lessons are not intended to be a complete unit. These lessons complement educational activities related to safety, the environment, or drug prevention. Where needed, materials follow the lesson. The blackline masters may be used to duplicate handouts or to make overhead transparencies, as appropriate.

<u>When teaching about this subject, utitlize appropriate vocabulary:</u>

- ◆ Instead of “inhalants” or “drugs,” say: poisons, chemicals, toxins, fumes
- ◆ Emphasize that “body pollution” is the result of air/water/environmental pollution
- ◆ Substitiute “toxic effects” for “get high”

Be sure to express concern for the health of someone who inhales toxic fumes/vapors under any circumstances, deliberate or accidental.

TOXINS and POISONS: HEALTH CONSEQUENCES

Grades 10-12

Objectives

1 - Students will correlate toxins, poisons, and pollutants with risks to health.

2 - Students will identify health consequences that may result from exposure to toxins, poisons, and pollutants.

Materials

- Empty, clean containers of products with tops securely taped or glued closed. Products may include: nail polish, turpentine, isopropyl alcohol, rubber cement, household cleaner, correction fluid, spot remover, bleach, aerosols, etc. Make sure there is a legible warning label on each, and, if possible, a list of ingredients.
- Handout: Toxins and Poisons: Health Consequences

Activity

Display empty product containers. Review previous learning about labeling of poisons and chemicals, if necessary. Tell students that many of these products contain chemicals known as "solvents." Explain that solvents are chemicals designed to remove fats, grease, dirt, and tell them that the vapors of these products contain microscopic amounts of solvent chemicals Ask if these might "pollute" the body?

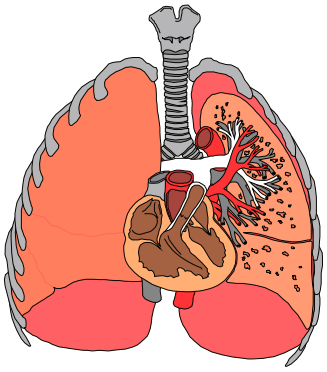
Let the class know that many, many tissues and organs in the body are composed of fat cells and fatty membranes. What might happen if the solvent chemicals touched these fatty areas?

Distribute the handout "Toxins and Poisons: Health Consequences." Invite students to read each section aloud and discuss the serious effects of solvents on the body. Summarize by asking students to point to parts of the body that could be damaged by poisons and toxins.

Evaluation

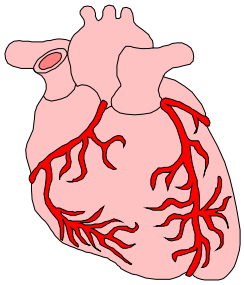
Invite students to draw a full-size outline of the body and label major organs and body parts, including the health consequences of toxins and poisons. Divide into small groups and direct students to discuss each body outline. Check for understanding.

TOXINS AND POISONS:
HEALTH CONSEQUENCES



- ***reduces oxygen absorbtion***
- ***reduces lung function***

- ***disturbs heart rhythm - erratic***
- ***can stop heart entirely***



- ***painful headaches***
- ***neural coating destroyed***
- ***impairs memory, learning***
- ***trouble with coordination***

- ***problems with eyes, ears***
- ***affects smell and taste***

TOXINS, POISONS, and THE BRAIN

Grades 10-12

Objectives

1 - Students will be able to define the intended actions of solvent chemicals.

2 - Students will be able to describe the potential damaging effects that solvent chemicals and vapors can have on the brain.

Materials

- Overhead transparency: "Toxins, Poisons, and The Brain"

Activity

Review/assess previous learning about functions of the brain and appropriate handling of toxins, poisons, and chemicals, if necessary.

Display the overhead transparency "Toxins, Poisons and The Brain." Explain to the students that they may remember that the brain is not a very heavy organ, weighing only 2 percent of the entire body's weight. One reason it is so light is because one-third of its cells are fat cells, and fat cells weigh less than muscle or bone.

Point out that although the brain is only 2 percent of the body's weight, it gets 16 percent of all circulated blood. Challenge students to guess why the brain receives so much blood. Reinforce the critical life-support functions that the brain performs, in addition to its other "services" of thinking, creating, feeling, etc.

Pose the questions on the transparency "Toxins, Poisons, and The Brain" to the class: What are solvents designed to do to fat and grease? (Dissolve these substances. If appropriate, clarify for the group that many toxins and poisons are solvents.) What damage might occur if solvent chemicals circulated through the brain? (Fat cells and fatty tissues might be partially dissolved.)

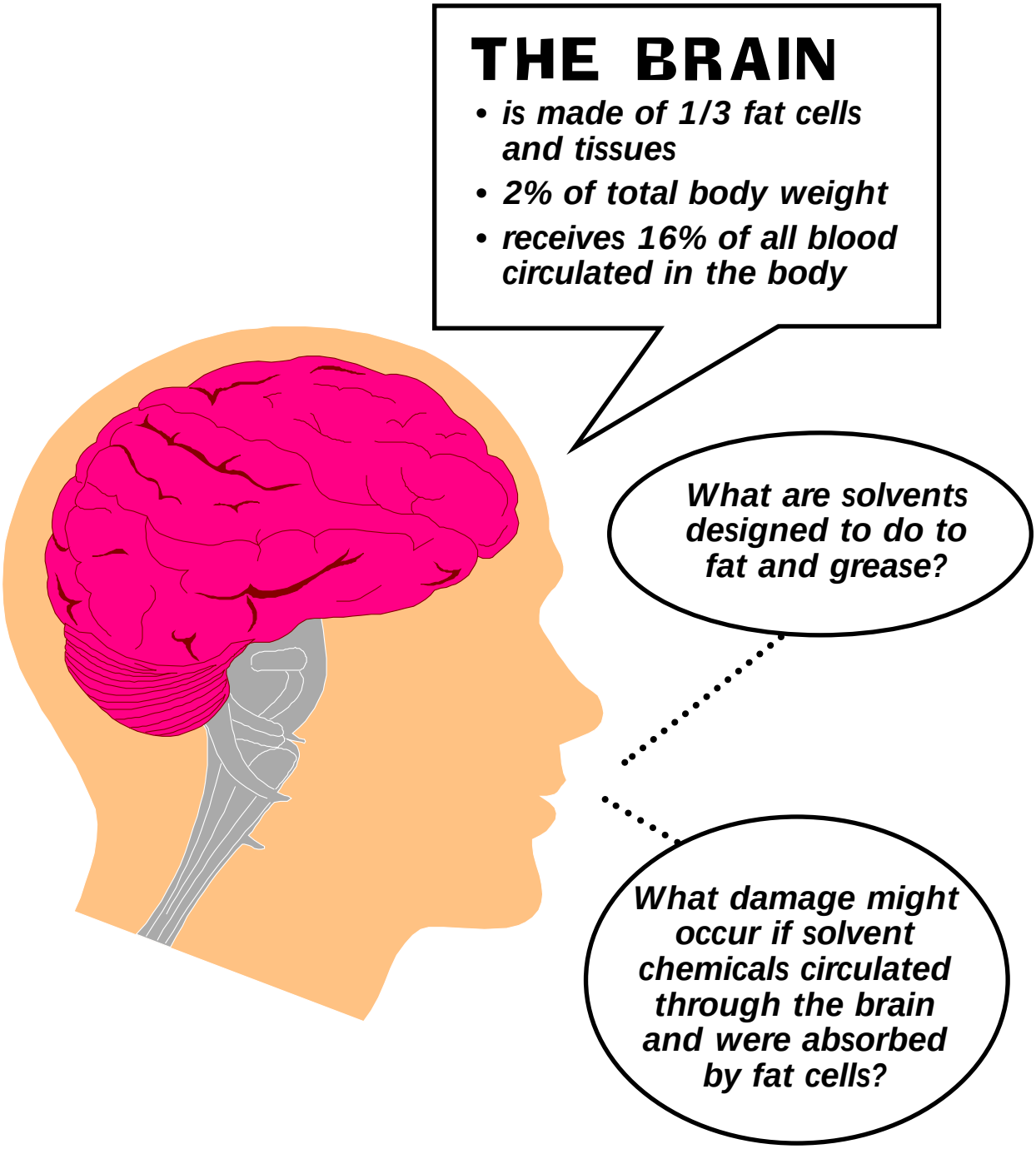
Discuss the implications of fat cells in the brain being damaged or destroyed. Scientists have proven that neurons' protective coating, called the myelin sheath, can be destroyed by contact with solvents and solvent vapors. (To illustrate, you can say that the myelin sheath acts as insulation for the neuron that carries electrical impulses within the brain. What happens when the insulation is destroyed? The neuron's signal is short circuited.) Destruction of fatty tissue and brain cells can result in significant impairment to brain functions, including memory, language, sight, hearing, smell, taste, coordination, heart rhythm, and more.

How can solvent chemicals get into the brain? Solvent vapors are inhaled, enter the bloodstream, and travel immediately to the brain. Brainstorm precautions that a person can take to protect against solvent chemical vapors entering the body. Transfer the ideas to a poster and post it in the classroom, referring to it whenever cleaners and chemicals are present.

For additional learning, invite the chemistry instructor to discuss safety precautions in the laboratory.

Evaluation Students can write a three-paragraph letter to a friend who has a summer job in an automobile repair shop. The letter should list precautions that can be taken to protect against toxins and solvents in the workplace. Some points that should be included: adequate ventilation; wearing protective gear such as gloves, masks and safety glasses; reading labels and following directions; closing containers when not in use.

TOXINS, POISONS, AND THE BRAIN



SAFETY & PREVENTION OF TOXIC POISONING

Grades 10-12

Objectives

1 - Students will be able to list and describe three agencies that protect us from poisons, toxins, and pollutants.

2 - Students will be able to explain the duties of an organization that protects people's health and safety.

Materials

- Telephone directories or reference information
- Access to Internet and the World Wide Web, if appropriate

Activity

Put the acronyms OSHA and EPA on the chalkboard and inquire if any student knows what they represent. (If desired, arrange for reference materials so that students can research these agencies, and others.) The Occupational Safety and Health Administration (OSHA) is responsible for the safety and health of people in the workplace. The Environmental Protection Agency (EPA) protects the environment and its effects on people.

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. Pairs or small groups of students can look up the local OSHA regional office and request information, pamphlets, etc. to report back to the class about the mission and duties of OSHA. They can also use the Internet and visit OSHA on the web at http://www.osha.gov .

Students also can report on the Agency for Toxic Substances and Disease Registry. Students may be surprised at the everyday products that are covered by this agency. They can find this organization at
http://www.atsdr.cdc.gov

Similarly, students can research and report on the Environmental Protection Agency, found at http://www.epa.gov.

For further information, contact the safety and risk manager of the local hospital or major corporation. Many times they are willing to visit with school groups or will allow a group of students to conduct an interview.

If there is a chemical spill cleanup team in your area, invite a member to speak to the class or grade.

Evaluation

Individual students or pairs of students can select one of these organizations and write an article for the school newspaper about the organization's purpose and activities. Additional articles can be posted on the classroom bulletin board.

BEING A FRIEND, HELPING A FRIEND

Grades 10-12

Objectives

1 - Students will describe important responsibilities of friendship.

2 - Students will explore a variety of ways to help their friends.

3 - Students will differentiate between getting a friend "in trouble" and getting a friend "into help."

4 - Students will be able to name at least one resource person to refer a friend to for help.

Materials

- Handout: "Responsibilities of Friendship"

Activity

Lead a discussion on friendship by asking how friends are important? Why? How can you tell who is really your friend?

Distribute the handout "Responsibilities of Friendship." Students can check the statements that they agree with and add one or two additional responsibilities. Pair students and allow several minutes for sharing ideas.

Inquire if anyone in the class has ever had serious concerns about a friend. (Remind the group that no names may be mentioned.) Invite students to discuss how this felt for them, and if they were able to help the friend. In what ways can friends help friends? Is it worth risking the friendship to help a friend? Can this be a difficult decision? Remind the group that many times helping a friend can make a critical difference. Ask them to differentiate between getting a friend "in trouble" and getting a friend "into help." Brainstorm a list of ways that a friend could guide a friend to get help, if needed. Discuss. Then brainstorm a list of people who might act as resources for young people in need of assistance. The list might include parents, teachers, school nurse, counselor, hotline, and more. If desired, this list could be posted in the classroom.

Evaluation

Small groups of students can write and dramatize role-plays that depict young people with problems. Suggestions for difficulties: eating disorder, huffing, shoplifting, etc. Each group can create a scenario and then offer at least two different ways that a friend can help a friend. Make sure that students understand how to access adult resources within the school.

RESPONSIBILITIES OF FRIENDSHIP

What does it mean to be a friend?

Check the boxes that YOU think are responsibilities of friendship. Add two of your own ideas.

- ☐ ***Listen to a friend's problems.***
- ☐ ***Give a friend good advice.***
- ☐ ***Keep a friend company.***
- ☐ ***Tell a friend if you think he or she is wrong.***
- ☐ ***Help a friend who is afraid.***
- ☐ ***Warn a friend if he or she is making a mistake.***
- ☐ ***Help a friend fix a broken bicycle.***
- ☐ ***Lend a friend lunch money.***
- ☐ ***Share a snack with a friend.***
- ☐ ***Help a friend with homework.***

Agency for Toxic Substances and Disease Registry

Division of Toxicology

1600 Clifton Road NE, Mailstop E-29

Atlanta, GA 30333

800-447-1544

National resource for information and research on poisons, chemicals, toxins and pollutants.

Eden Children's Project

2649 Park Avenue South

Minneapolis, MN 55404

612-874-9441

Information on assessment, treatment, community issues, prevention. Coordinates statewide inhalanat collaborative prevention and treatment projects.

National Clearinghouse on Alcohol and Drug Information

P.O. Box 2345

Rockville, MD 20852

800-729-6686

Publications, newsletters, research, materials.

National Inhalant Prevention Coalition

2904 Kerbey Lane

Austin, TX 78703

800-269-4237

Comprehensive source for information, materials, publications, referral, resources. Coordinates the National Inhalant and Poisons Awareness Week campaign, conducted every March, publisher of ViewPoint, quarterly newsletter on inhalant issues.

The Health Network

11Adam Place

New City, NY10956

845-638-3569

Training, program development, inservice, resources. Slide show for adult audiences.

Tri-Ethnic Center for Prevention Research

Colorado State University

Fort Collins, CO 80523-1879

970-491-7902

An excellent source for information, research, resources, scientific studies. Eminent medical researchers, publications and archives.

INTERNET RESOURCES

Agency for Toxic Substances and Disease Registry
<http:www.atsdr.cdc.gov>

Environmental Protection Agency
<http://www.epa.gov/>

Join Together (national organization for communities to remain free of drugs and violence)
<http://www.jointogether.org>

National Clearinghouse for Alcohol and Drug Information
<http://www.health.org>

National Inhalant Prevention Coalition
<http://www.inhalants.com>

National Institute on Drug Abuse
<http://www.nida.nih.gov>

Occupational Safety and Health Administration
<http://www.osha.gov>

Partnership for a Drug-Free America
<http://www.drugfreeamerica.org>

POISON CONTROL CENTER

Idaho Poison Center **1-800-860-0620**
c/o Rocky Mountain Poison and Drug Center (RMPDC)
1001 Yosemite Circle
Denver CO 80230-6800
http://www.rmpdc.org

National Capital Poison Center **1-202-625-3333**
3201 New Mexico Avenue NW, Suite #310
Washington, DC 20016
TDD line for the deaf is 1-202-362-8563
http://www.poison.org

BIBLIOGRAPHY

Bates, Plemons, Jumper-Thurman, Beauvais, (1997) "Patterns by Gender and Ethnicity Among School Attenders and Dropouts" in Drugs and Society.

Bowen, SE, Daniel, J, Balster, RL, (1999) "Deaths Associated with Inhalant Abuse in Virginia from 1987-1996," Drug and Alcohol Dependence vol 53.

Burk, I., Weiss, H. (2000) "Reducing the Risk of Inhalant Abuse," Middle Matters, Spring, 2000, vol. 8, # 3.

Burk, I., Weiss, H. (1999) "Inhalants: The Silent Epidemic," Prevention Pipeline, vol. 12 #6, Rockville: SAMHSA/CSAP

Burk, I. (1996) "School-Based Prevention Programs," ViewPoint, vol. 6 #1, Austin: NIPC.

Crider, Rouse, Ed., (1988) Epidemiology of Inhalant Abuse: Update, NIDA Monograph #85. Rockville: NIDA.

Green, M. (1992). Inhalants: Teachers' Guidebook to Inhalant Abuse Prevention. Austin: National Inhalant Prevention Coalition.

Groves, M. (1996). Sniffing and Huffing: A Comprehensive Guide for the Prevention and Treatment of Children's Inhalant Abuse. Minneapolis: Eden Statewide Children's Chemical Health Services Project.

Inhalant Abuse Prevention: A Community Approach (1996). Ohio Prevention and Education Resource Center/Cincinnati Drug and Poison Information Center. Cincinnati: OPERC.

Johnston, O'Malley, Bachman (1999) National Survey Results on Drug Use from the Monitoring the Future Study, Rockville: NIDA.

Kann, Kinchen, Williams, Ross, Lowry, Grunbaum, Kolbe, (2000) Youth Risk Behavior Surveillance – United States, 1999, MMWR vol 49, No. SS-5; Rockville: CDC.

Kozel, Sloboda, De La Rosa, Ed., (1995) Epidemiology of Inhalant Abuse: an International Perspective. National Institute on Drug Abuse Monograph # 148. Rockville: NIDA.

Lettieri, D. (1991) Understanding Inhalant Users: An Overview for Parents, Educators and Clinicians. Texas Commission on Alcohol and Drug Abuse.

National Household Survey on Drug Abuse Population Estimates 1998. Substance Abuse and Mental Health Services Administration, Rockville: NIDA.

National Inhalant Prevention Coalition (1998). Inhalants: The Silent Epidemic. Austin: NIPC.

Neumark, D, Delva, J, Anthony, JC, (1998). The Epidemiology of Adolescent Inhalant Drug Involvement in Archives of Pediatrics and Adolescent Medicine. vol 152 #8.

NIDA Research Report Series (1994). Inhalant Abuse: Its Dangers Are Nothing to Sniff At, Rockville: National Institute on Drug Abuse.

Office of National Drug Control Policy, (1998) The National Drug Control Strategy: 1998. Washington, D.C.

Reidel, S. (1995) "Inhalants: A Growing Health Concern," Behavioral Health Management, May-June, 1995 vol. 15 # 3.

Sharp and Rosenberg, (1997). "Inhalant-Related Disorders," Psychiatry Volume 1. Philadelphia: WB Saunders/Harcourt Brace & Co.

BIBLIOGRAPHY

Sharp and Rosenberg, (1996). "Inhalants" in Substance Abuse: A Comprehensive Textbook. New York: Williams & Wilkins.

Sharp, Beauvais, Spence, Ed. (1992) Inhalant Abuse: A Volatile Research Agenda,. National Institute on Drug Abuse Monograph # 129.

Shuckit, M. (1991) "The Nitrite Inhalants" in Drug Abuse & Alcoholism Newsletter. November, 1990.

Stare, R. (1995) "Every Breath Counts," Prevention Forum, Springfield: Prevention First, Inc.

Understanding Inhalant Users, Texas Commission on Alcohol and Drug Abuse. Austin, TX (1991).