

Inhalant Abuse Prevention Toolkit



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- ◆ Resources included in this packet from:
 - <http://teens.drugabuse.gov/mom/teachguide/MOMTeacherGuide.pdf>
 - <http://www.nida.nih.gov/PDF/Scholastic/HeadsUp-Student-Yr4.pdf>
 - <http://www.nida.nih.gov/PDF/Scholastic/HeadsUp-SkillsBook-Yr2.pdf>

Compiled by:



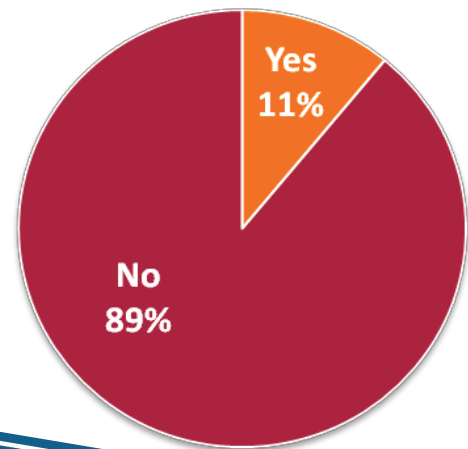
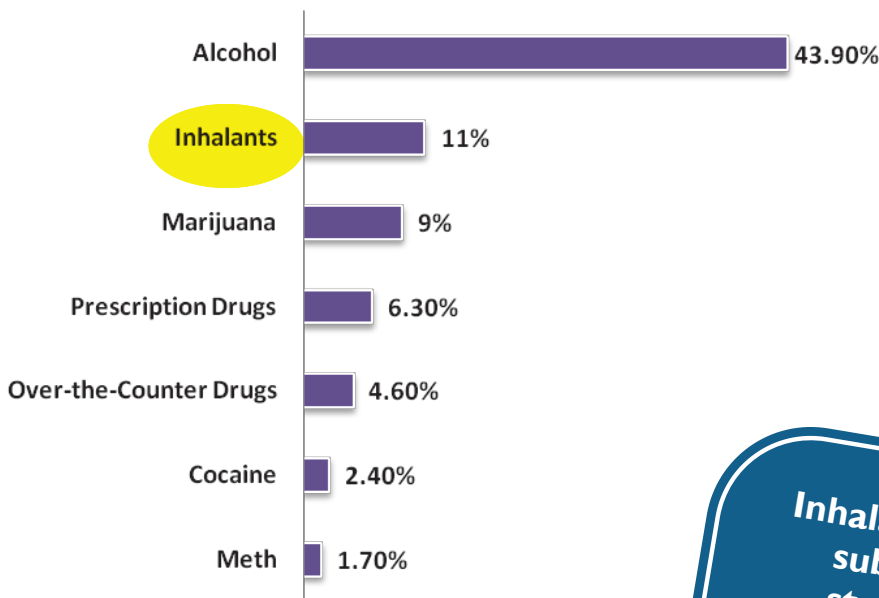
Prevention Resource and Media Center
1237 West Divide Avenue, Suite 1D
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Phone: 701-328-8919
E-mail: ndprmc@nd.gov
Website: www.nd.gov/dhs/prevention

PROFESSIONALS

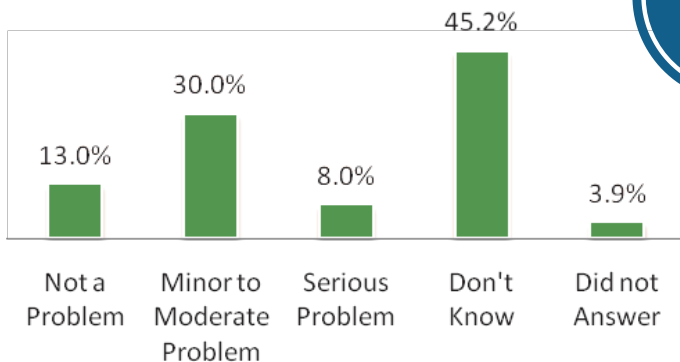
INHALANT ABUSE IN NORTH DAKOTA

Percent of middle school students who have reported use of the following substances
(YRBS, 2009)

Middle school students who have ever sniffed glue, or breathed the contents of spray cans, or inhaled any paints or sprays to get high
(YRBS, 2009)



Community member perception of youth inhalant (glue, paint, aerosols, solvents, etc.) use in their community
N=2357
(CRS, 2008)



Inhalants are the 2nd most abused substance among middle school students

1 in 10 middle school students have abused inhalants

Almost half of community members do not know if youth inhalant abuse is a problem in their community



Inhalants are gases and vapors from products used in homes, offices, and schools that are inhaled. Because they get into the lungs and blood so quickly and because they are toxins and pollutants, they damage all parts of the body. When people abuse inhalants, they are really *poisoning* themselves.

Common Street Names

Laughing gas	Oz
Snappers	Bolt
Poppers	Whiteout
Bold	Dusting
Rush	Moon gas

How Inhalants are Used:

“Sniffing” or “Snorting” – Inhalants are “sniffed” from a container or sprayed directly into the nose or mouth.

“Huffing” – A chemical-soaked rag is held to the face or stuffed in the mouth and the substance is inhaled.

“Bagging” – Substances are sprayed or deposited into a plastic or paper bag and the vapors are inhaled. Using a plastic bag may result in suffocation if the individual passes out and his or her nose and mouth are covered.

Inhalants are placed on sleeves, collars, other items of clothing, blankets or baby diapers, and are sniffed over a period of time. This is a particularly popular method of disguising inhalation of gasoline fumes.

Fumes are discharged into soda cans and inhaled from the can.

Users inhale from balloons filled with nitrous oxide and helium.

Death Due to Inhalant Abuse Is Attributed to the Following:

Sudden Sniffing Death Syndrome: cardiac arrest

Asphyxiation: high concentrations of inhaled fumes displacing the available oxygen in lungs, as a result of repeated inhalations

Suffocation: blocking air from entering the lungs when inhaling from a plastic bag placed over the head (bagging)

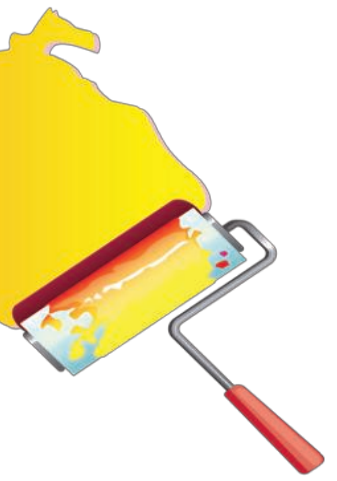
Choking: inhaling one’s own vomit

Fatal injury: drowning or motor vehicle fatalities

Inhalants are toxic.

Chronic exposure can lead to brain damage or nerve damage similar to multiple sclerosis; damage to the heart, lungs, liver and kidneys; and prolonged abuse can affect thinking, movement, vision and hearing.

SIGNS AND SYMPTOMS OF INHALANT ABUSE



Common Behavioral Warning Signs

- Behavior mood changes
- Uncharacteristic problems in school
- Hallucinations
- Anxiety, excitability, restlessness, irritability, anger

Common Physical Warning Signs

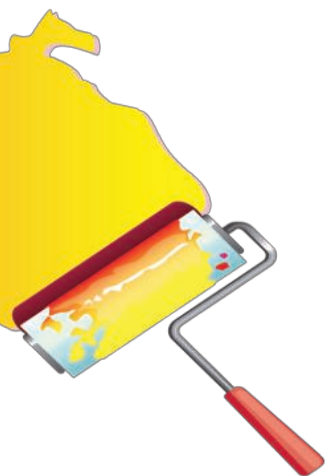
- Drunk, dazed, or dizzy appearance
- Glassy, glazed, or watery eyes
- Red or runny eyes and nose
- Spots and/or sores around the mouth
- Slurred or disoriented speech
- Lack of physical coordination
- Unusual breath odor or chemical odor on clothing
- Nausea and/or loss of appetite



Common Situational Signs

- Traces of paint or other products where they wouldn't normally be, such as on face, lips, nose, or fingers
- Fingernails painted with permanent markers or correction fluid
- Pens or markers held close by the nose
- Constant smelling of clothing, sleeves, collars, or hair scrunches
- Numerous butane lighters, empty or partially filled, in room, backpack, or locker
- Missing household products
- Gasoline, paint-soaked rags, or used spray paint in a child's room or other unusual location; hidden rags, clothes, or empty containers of potentially abused products in closets, under the bed, or in the garage

WHAT YOU CAN DO TO HELP PREVENT INHALANT ABUSE



Educate yourself about the problem.

Do not make available products that can be easily abused and keep abusable products stored safely.

Be conscious of how much of an item is being used by youth.

Do not tolerate any experimentation.

Encourage the purchase of safer alternatives.

Ensure that youth get the message that inhalants are poisons, not drugs.



Successful inhalant abuse prevention incorporates a variety of strategies, including education, skill building, raising awareness among adults, environmental changes and policy development.

IN CASE OF AN EMERGENCY...

- ★ Call 911 immediately
- ★ Keep child calm, reduce cardiac stress
- ★ Do not leave the person alone
- ★ Try to determine the source of the inhalant so the medical professionals can help more quickly



INHALANT ABUSE CHECKLIST

~ FOR ADULTS ONLY, DO NOT DISTRIBUTE TO YOUTH

Kitchen

- Aerosol whipped cream
- Whippets (nitrous oxide cartridges)
- Cooking spray
- Insecticides
- Spray (aerosol) cleaners

Basement or workshop

- WD-40 (spray lubricants)
- Fabric protector (Scotch Guard)
- Paint, cans or spray (especially gold or silver spray paint)
- Paint thinner
- Mineral spirits
- Toluene
- Paint remover, stripper
- Lacquer thinner
- Contact cement
- Solvent-based caulking
- Contact cleaner
- Turpentine

Miscellaneous

- Any spray (aerosol) cans
- Mothballs
- Freon
- Air conditioners
- Refrigerators
- Halon (from fire extinguisher)
- Gas cigarette lighters
- Gas cigarette lighter refills (butane)
- Lighter fluid
- Dry cleaning fluid and spot removers

Anesthetics

- Nitrous oxide
- Whippets (nitrous oxide cartridges)
- Aerosol whipped cream
- Ether
- Chloroform

Nitrites

- Amyl nitrite
- Butyl nitrite
- Balloons (nitrous oxide)

Garage

- Gasoline
- Stove fuel
- Propane (from barbeque grills, portable torches)
- Carburetor cleaner
- Starter fluid
- Flat tire repair aerosol cans ("Fix-A-Flat")
- Tanks (nitrous oxide)

School/office supplies

- Correction fluid
- Correction fluid thinner
- Permanent markers
- Dry erase markers & cleaner
- Contact cement
- Rubber cement
- Ducco cement, airplane or model glue
- Spray adhesive
- Computer air duster

Bathroom

- Hair spray
- Air freshener (aerosol)
- Nail polish and nail polish remover
- Spray deodorant
- Spray cleaners
- Asthma inhaler

Examples of Paraphernalia

- Plastic bags
- Paper bags
- Rags
- Toilet paper tubes stuffed with tissues
- Empty soda cans
- Empty cologne or perfume bottles



ENVIRONMENTAL PREVENTION OF INHALANT ABUSE

~ FOR ADULTS ONLY, DO NOT DISTRIBUTE TO YOUTH

Identify products that can be abused. One clue is a label warning: 'Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal', 'Avoid breathing vapors', 'Use in well-ventilated area'.

Find non-toxic substitutes. Many products such as correction fluid, glues, permanent markers, paints, and stains have 'water based' or 'non-toxic' versions.

When a safer product cannot be substituted, use under close supervision. Account for usage, check product inventory and be aware of disappearing supplies.

Do not discuss specific products as inhalants – this may arouse curiosity and lead to increased experimentation. Teach children about the dangers of vapors and gases and about safe use of products. Avoid making the connection that these products can be used as drugs and always stress that these products are dangerous *poisons, toxins, and pollutants*.

Product	Source of Inhalant	Prevention Strategies		
		Use Water-Based Products	Supervise Use of Solvent-Based Products	Alternatives
General Supplies	Cements, glues (including rubber cement)	✓	✓	Avoid products with toluene and xylene
	Typewriter correction fluid, printing inks	✓	✓	Use "Correction Tape"
	Permanent markers, dry erase markers	✓	✓	Use "Low Odor" and/or non-toxic markers, discourage sniffing scented markers
	Spray paints and clear finishes	✓	✓	
Cleaning Supplies	Any product in aerosol can		✓	Use hand pumps instead of aerosol cans
	Aerosol air fresheners and deodorizers		✓	Use solid air fresheners
	Computer cleaner ("air duster")		✓	Use canned carbon dioxide
Garage/Shop Supplies	Paints, varnishes, stains, paint thinner, lacquer, thinner, spray lubricant, contact cement	✓	✓	
	Gasoline		✓	
Butane Fluid	Lighters, replacement fluid		✓	
Auto	Degreasers, spray lubricants, solvents, Freon, brake fluid, gasoline, lacquers, car paint		✓	
Health and Beauty	Nail polish and nail polish remover, hair spray		✓	
	Aerosol deodorants		✓	Use stick deodorants rather than aerosol
Cooking Supplies	Cooking spray		✓	Use oil in spray pump
	Whipping cream in aerosol cans, whipping cream cartridges (whippets)		✓	Use whipped cream in a tub or make from scratch



ENVIRONMENTAL PREVENTION OF INHALANT ABUSE *CONT.*

THINGS TO DO IN...

SCHOOLS

THE LOCAL COMMUNITY

School policies can help to confine dangerous practices by limiting the ability of students to abuse inhalant substances.

Regulate minimum age for purchase of certain products.

Evaluate current school policies on alcohol and other drugs to make sure inhalant substances and related paraphernalia are addressed.

Work with hardware stores, grocery stores, and other suppliers to move abusable products into a locked area or into an area where there is surveillance.

Distribute written policies to students, parents, and staff at least once a year.

Put warning labels/symbols on products.

Encourage the purchase and use of safe alternatives to inhalable substances.

SAMPLE SCHOOL POLICY

No person may possess, use, manufacture, sell, or distribute alcohol or other substances, nor use or possess paraphernalia for the purpose of illicit or inappropriate drug use, at any time, on school property, buildings and grounds, in school sponsored vehicles or at school-sponsored events at other sites. The terms "alcohol, drugs, and other substances" shall be construed to refer to all substances in all forms, including, but not limited to: alcohol and alcohol-containing beverages, all forms of tobacco, **inhalable substances (including gases, solvents, butane, propane, adhesives and similar products)**, marijuana, cocaine/crack, LSD, PCP, amphetamines, heroin, methadone, scheduled narcotics, steroids, herbal stimulants, herbal euphorants, look-alikes and any substances commonly referred to as "designer drugs."

According to North Dakota Century Code (19-03.1-22.1.) ... "An individual is guilty of a class B misdemeanor if that individual intentionally inhales the vapors of a volatile chemical in a manner designed to affect the individual's central nervous system; to create or induce a condition of intoxication, hallucination, or elation; or to distort, disturb, or change the individual's eyesight, thinking processes, balance, or coordination."

WHAT TO SAY TO YOUTH



Inhalants are not a drug, they are a poison.

Discuss what poisons are and what effects they have on a healthy body.

Talk about oxygen and how it is needed to sustain life.

Be firm and consistent. Open windows or use fans when products call for proper ventilation.

Discuss the purpose of common household and commercial products. Emphasize that, when not used properly, certain fumes or gases may harm the body, act as a poison, and can make the child sick.

Read product labels together. Talk about the directions and answer any questions children may have. Check the label to see if use by children is recommended before a child uses a product.

Educate children about the dangers, but avoid educating about specific products being used as inhalants.

Monitor children's activities.

WHAT NOT TO SAY...

- Do not discuss specific products that are abused.
- Do not inform youth that these products will get you high.
- Never explain or demonstrate techniques for inhaling products.



FOR IMMEDIATE RELEASE

March 2011

Department of Human Services Makes Available Inhalant Prevention Materials for Upcoming Inhalant Awareness Week

Bismarck, N.D. – In North Dakota, inhalants are the second most abused drug among middle school students, with alcohol ranking first (Youth Risk Behavior Survey 2009). Inhalant Awareness Week, held March 20-26, is designed to increase understanding about the use and risks of inhalants and to initiate community dialogue.

The Prevention Resource and Media Center (PRMC), which is part of the North Dakota Department of Human Services' Division of Mental Health and Substance Abuse Services, has FREE clearinghouse materials and other items that can be checked out to support local prevention efforts. The PRMC has also developed an Inhalant Abuse Prevention Toolkit that contains information for educators, parents, community members, and youth. Other available resources include brochures and DVDs.

"Inhalant Awareness Week is an opportunity to raise awareness about inhalant abuse," said Pamela Sagness, prevention administrator for the division. "It is also a time for all of us to look around our homes, workplaces, and communities to ensure we are creating a safe environment for our youth."

Materials from the PRMC are FREE to North Dakota communities and can be shipped directly at no cost.

The Division of Mental Health and Substance Abuse Services is a leading resource for substance abuse information and prevention efforts in the state. The division operates the North Dakota Prevention Resource and Media Center, which offers free resources to individuals, schools, and communities.

For more information on services or resources, contact the Prevention Resource and Media Center at 701-328-8918, toll-free 1-800-642-6744, TTY: 701-857-8666, or visit the Web site www.nd.gov/dhs/prevention.

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INHALANT AWARENESS WEEK

(Held third week of March annually)

There are more than 1,000 household, shop, office, and industrial products that qualify as inhalants. Inhalants are poisons to your body and can cause death with the first use.

In North Dakota, 11% of middle school students reported having used inhalants at least one time in their lives (YRBS, 2009). Inhalants are the second most-used drug among middle school students (alcohol being the first).

The following signs and symptoms can indicate that someone may be abusing inhalants:

- Mood swings
- Irritability
- Anger
- Agitation
- Sleepiness
- Loss of appetite
- Constant sniffing and coughing
- Dilated pupils
- Presence of bags, rags, and empty product containers

What you can do:

- You can prevent inhalant abuse in the home by becoming familiar with which household products are toxic, replacing certain substances with water-based solvents, and locking or monitoring toxic products that are stored in the house.
- Supervise the use of inhalable products.
- Initiate conversations with your children—they will listen. Remember to emphasize that inhalants are poisons, toxins, pollutants, and fire hazards, NOT drugs. Avoid referring to specific inhalant products and drug-like effects, as this may spark curiosity.
- Prepare children for peer pressure.
- Urge youth-serving professionals in your child's life (teachers, coaches, and youth workers) to ensure that youth environments are free of poisons that can be used as inhalants.

AVAILABLE RESOURCES AT PRMC

FREE resources...

Call 701-328-8919

or

E-mail

ndprmc@nd.gov

Inhalants: No Huffing DVD

Sarah, Josh, and Kelsey are facing the toughest decision of their lives. Their friend Jacie has died from inhaling chemicals. The realization is made that another one of their friends is in the same danger. They get caught up in a moral dilemma between not wanting to be labeled as “uncool” and saving their friend’s life. What will they do? *Inhalants: No Huffing*, uses intense visuals and music to tell a morality tale about an issue that is of great concern to teenagers, not being labeled as a “snitch” no matter what the consequences.

Huffing: The Latest Facts about Inhalant Abuse DVD

This gripping program shares unforgettable real stories of teens fighting their abuse of inhalants, as well as two families who lost children to inhalant abuse. One interview segment involves an Ohio police officer whose son died after a brief experiment with inhalants. Another recounts a recovering user who learned first-hand that huffing inhalants is not only perilous, but can quickly lead to other types of drug abuse. In between the real stories, a group of teens talk directly to viewers addressing the addictive nature of inhalants and clearly outlining the damage these toxic chemicals cause to the brain, heart and lungs.

Inhalants DVD

Since chemicals in more than 1,400 products can be sniffed or huffed for their psychoactive and mind-altering effects, it’s not surprising that inhalants are the most frequently abused substances in the U.S. This video explores the history of inhalant abuse; the effects of inhalants on the body and the short- and long-term health impacts; and teenage attitudes toward inhalants. The major classes of commonly abused inhalants and treatment and prevention measures are described in the video, as well.

BROCHURE



North Dakota Prevention Resource and Media Center
1237 West Divide Avenue, Suite 1D
Bismarck, ND 58501
Phone: 701-328-8919
E-mail: ndprmc@nd.gov
Website: www.nd.gov/dhs/prevention



WEB RESOURCES

Alliance for Consumer Education

www.inhalant.org

A nonprofit organization focused on safe use of consumer products. Key focus area on inhalant prevention. Publishes a variety of resources, particularly for educating parents about inhalants.

National Inhalant Prevention Coalition

www.inhalants.org

Comprehensive source for information, materials, and resources. Coordinates the National Inhalant and Poisons Awareness Week campaign.

National Institute on Drug Abuse

www.inhalants.drugabuse.gov

Contains a variety of articles, research information and resources about inhalants.

Office of National Drug Control Policy

www.whitehousedrugpolicy.gov

Publications section has links to a variety of information on inhalants.

Partnership for a Drug-Free America

www.drugfreeamerica.org

Creates a variety of information for mass media campaigns, including television and radio PSAs that address the issue of inhalants.

Substance Abuse and Mental Health Services Administration (SAMHSA)

National Clearinghouse for Alcohol and Drug Information (NCADI)

www.ncadi.samhsa.gov

Contains a variety of free information.

Virginia Inhalant Abuse Prevention Resource Guide (2nd edition)

www.inhalants.org/Inhalantbook.pdf

This is a K-12 grade curriculum and resource guide published by Virginia Department of Education.

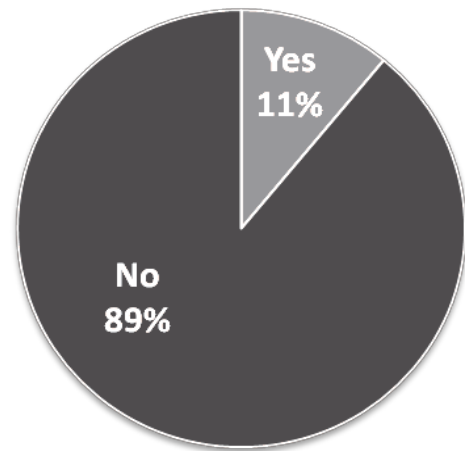
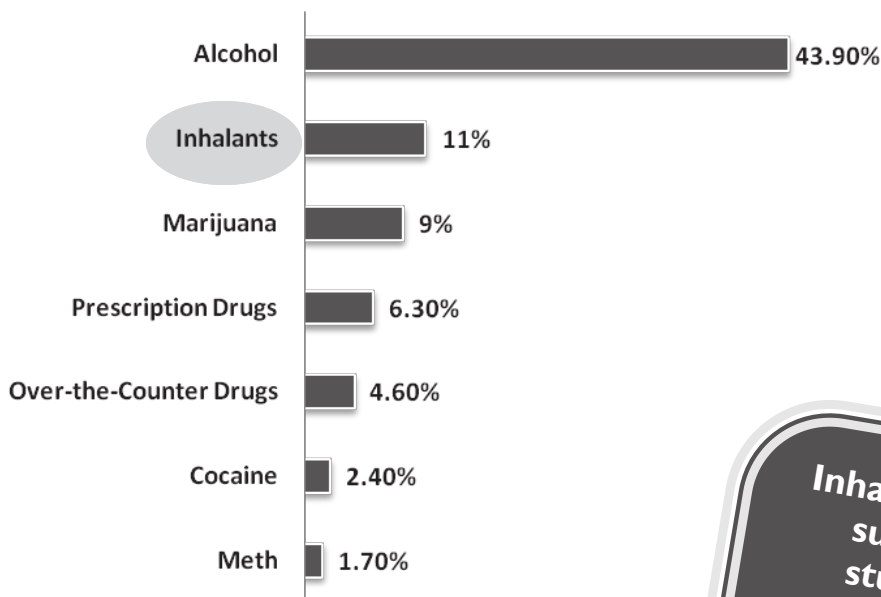
PARENTS



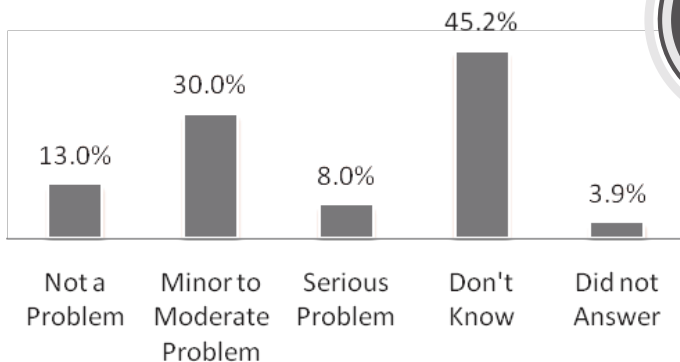
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Community member perception of youth inhalant (glue, paint, aerosols, solvents, etc.) use in their community
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Almost half of community members do not know if youth inhalant abuse is a problem in their community

SIGNS AND SYMPTOMS OF INHALANT ABUSE

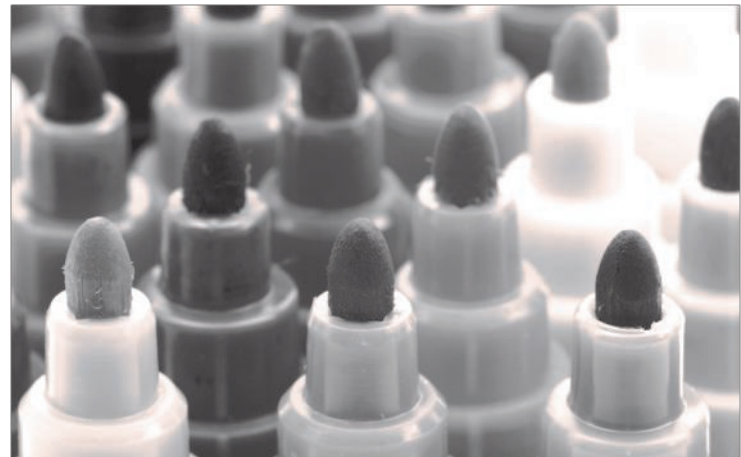


Common Behavioral Warning Signs

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Common Physical Warning Signs

- Drunk, dazed, or dizzy appearance
- Glassy, glazed, or watery eyes
- Red or runny eyes and nose
- Spots and/or sores around the mouth
- Slurred or disoriented speech
- Lack of physical coordination
- Unusual breath odor or chemical odor on clothing
- Nausea and/or loss of appetite



Common Situational Signs

- Traces of paint or other products where they wouldn't normally be, such as on face, lips, nose, or fingers
- Fingernails painted with magic markers or correction fluid
- Pens or markers held close by the nose
- Constant smelling of clothing, sleeves, collars, or hair scrunches
- Numerous butane lighters, empty or partially filled, in room, backpack, or locker
- Missing household products
- Gasoline, paint-soaked rags, or used spray paint in a child's room or other unusual location; hidden rags, clothes, or empty containers of potentially abused products in closets, under the bed, or in the garage

INHALANT ABUSE CHECKLIST

~ FOR ADULTS ONLY, DO NOT DISTRIBUTE TO YOUTH ~

Kitchen

- Aerosol whipped cream
- Whippets (nitrous oxide cartridges)
- Cooking spray
- Insecticides
- Spray (aerosol) cleaners

Basement or workshop

- WD-40 (spray lubricants)
- Fabric protector (Scotch Guard)
- Paint, cans or spray (especially gold or silver spray paint)
- Paint thinner
- Mineral spirits
- Toluene
- Paint remover, stripper
- Lacquer thinner
- Contact cement
- Solvent-based caulking
- Contact cleaner
- Turpentine

Miscellaneous

- Any spray (aerosol) cans
- Mothballs
- Freon
- Air conditioners
- Refrigerators
- Halon (from fire extinguisher)
- Gas cigarette lighters
- Gas cigarette lighter refills (butane)
- Lighter fluid
- Dry cleaning fluid and spot removers

Anesthetics

- Nitrous oxide
- Whippets (nitrous oxide cartridges)
- Aerosol whipped cream
- Ether
- Chloroform

Nitrites

- Amyl nitrite
- Butyl nitrite
- Balloons (nitrous oxide)

Garage

- Gasoline
- Stove fuel
- Propane (from barbeque grills, portable torches)
- Carburetor cleaner
- Starter fluid
- Flat tire repair aerosol cans ("Fix-A-Flat")
- Tanks (nitrous oxide)

School/office supplies

- Correction fluid
- Correction fluid thinner
- Permanent markers
- Dry erase markers & cleaner
- Contact cement
- Rubber cement
- Ducco cement, airplane or model glue
- Spray adhesive
- Computer air duster

Bathroom

- Hair spray
- Air freshener (aerosol)
- Nail polish and nail polish remover
- Spray deodorant
- Spray cleaners
- Asthma inhaler

Examples of Paraphernalia

Plastic bags
Paper bags
Rags
Toilet paper tubes stuffed with tissues
Empty soda cans
Empty cologne or perfume bottles



WHAT TO SAY TO KIDS

CHILDREN AGES 6-11

- ▶ Play a game, “Is it safe to smell or touch?”
- ▶ Read product labels together, discuss directions, answer any questions honestly.
- ▶ Suggest opening windows or using fans when products call for proper ventilation.
- ▶ Teach by example—show your child that you use household products according to the directions.
- ▶ Monitor your child’s activities and friends.
- ▶ Look for “teachable moments.”

WHAT NOT TO SAY...

Do not discuss specific products that are abused.

Do not inform youth that these products will get you high.

Never explain or demonstrate techniques for inhaling products.

TEENAGERS

- ▶ Ask your teen what they know about Inhalants.
- ▶ Do they have friends who abuse Inhalants?
- ▶ Ask if they know the physical damage that can occur from sniffing”
 - Damage to brain, liver, lungs, kidneys
 - Loss of memory and smell
 - Death—even the first time
- ▶ Tell your child that the consequences of abusing products are as dangerous as those from abusing alcohol or using illegal drugs.
- ▶ Let them know that sniffing products to get high is not the way to fit in. Help them address peer pressure. It may seem harmless, but the high can come with a deadly cost.
- ▶ Be absolutely clear—emphasize that unsafe actions and risky behavior have serious consequences.
- ▶ Encourage your child to come to you, a teacher, clergy, counselor, coach or adult friend if they have any questions or concerns.
- ▶ Monitor their activities, know their friends, be a good listener, set limits.
- ▶ Seize communication opportunities.

YOUTH



POISON



VAPORS:

THE TRUTH ABOUT INHALANTS

**Inhalants can cause harm to the whole body,
including long-lasting damage to the brain,
physical disabilities, and even death.**

Photo credits: spray from a metal can © Harry/istockphoto.com; Custom Medical Stock Photo; ball and chain © Paul Harvey/istockphoto.com

WHAT IS AN INHALANT?

Inhalants are toxic—that is, **poisonous**—chemical vapors that can be misused to produce mind-altering effects, often with disastrous results.

These harmful vapors can be found in a variety of common household and office products, including nail polish remover, gasoline, aerosol sprays, correction fluid, whipped cream canisters, computer spray cleaners, paint thinners, and markers. Even when used for their intended purposes, such as cleaning or painting, these products are so toxic that they are recommended for use only in well-ventilated areas. That's to prevent people from accidentally breathing in the poison. When they are intentionally inhaled in order to experience a "high," they are known as **inhalants**, and can cause serious harm to the whole body. Abuse of certain inhalants may result in irreversible effects, including hearing loss, limb spasms, bone marrow damage, and damage to the central nervous system and brain. Serious but reversible effects may include liver and kidney damage and depletion of oxygen in the blood. An adequate blood oxygen level is critical to the function of every organ and tissue in our bodies.



HEADS UP: ONE TIME IS ONE TOO MANY

Inhalants are incredibly effective poisons. They enter the bloodstream quickly and are then distributed throughout the brain and body. They have direct effects on both the central nervous system (brain and spinal cord) and the peripheral nervous system (nerves throughout the body).

How severely can inhalants harm you? According to Dr. David Shurtleff, who heads the Division of Basic Neurosciences and Behavior Research at the National Institute on Drug Abuse (NIDA), they can affect your ability to think, talk, remember, hear, and even walk. They may be addictive, and they can wreak havoc on a healthy body from head to toe, causing hearing loss, vision loss, convulsions, and damage to the lungs, liver, kidneys, heart, bone marrow, and muscles.

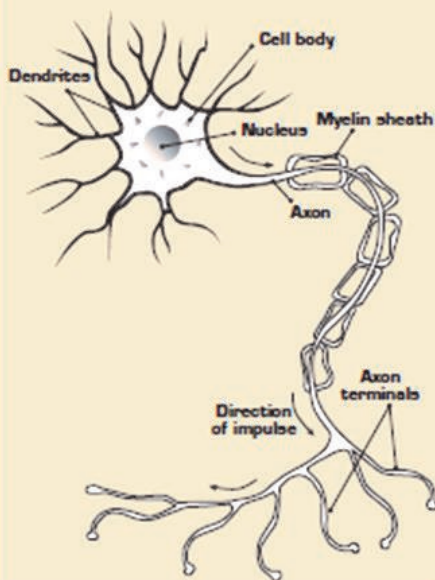
Most frightening is that just one time can be one too many with inhalants. As explained by Dr. Nora D. Volkow, director of NIDA, "Even in an otherwise healthy person, a single session of abusing highly concentrated amounts of certain inhalants can lower oxygen levels enough to cause asphyxiation, or disrupt heart rhythms and cause death from cardiac arrest." There's a chilling name for this: *sudden sniffing death*. There are people—including teens and pre-teens—who have used inhalants and paid the ultimate price.

Consider Kyle Williams, a 14-year-old who kissed his mom goodnight and headed to his room one evening in March 2005. The next morning his

One Harmful Effect of Inhalants

Inhalants destroy nerve fibers throughout an inhalant abuser's brain, which can lead to muscle spasms and difficulty with basic activities like walking and talking. How do inhalants destroy nerve fibers? Primarily by causing the myelin around them to deteriorate. Myelin is typically found in a thick layer around the axons, the long parts of nerve fibers through which impulses flow. If you picture nerve cells as your body's electrical wiring, then think of myelin as the rubber insulation that protects an electrical cord. When myelin breaks down, nerves become much less capable of transmitting messages. What happens? Imagine attaching heavy weights to your ankles just before leaving the starting blocks in a fifty-yard dash. When there's a normal heavy layer of myelin around the axon, nerve impulses travel as fast as 120 meters per second. Without myelin, these impulses slow to a crawl of only about 2 meters per second. Do the math—that's a deceleration of over 95 percent! In short, a losing pace.

Inhalant Abuse Breaks Down the Myelin Sheath Surrounding Nerve Fibers





**HEADS UP
REAL NEWS
ABOUT DRUGS
AND YOUR BODY**

INHALANTS: POISON VAPORS

Heads Up: Inhalants Are Poisons That Affect the Whole Body

Check out this diagram to learn about the damage the chemicals in inhalants can do.

mother went in to wake Kyle up. Instead, she found him dead in bed, with a straw from the can of computer cleaner he had inhaled still in his mouth. One of Kyle's friends had shown him how to get high this way about a month before. Some might think such cans contain nothing but compressed air. They couldn't be more mistaken.

HOW INHALANTS DO THEIR DAMAGE

Inhalant vapors often contain more than one chemical, increasing the risk of serious harm. Some chemicals leave the body quickly, but others are absorbed by fatty tissues in the nervous system, including the brain. They can stay there for a long time.

One of these fatty tissues is myelin—a protective cover that surrounds many of the body's nerve cells (neurons). Nerve cells in your brain and spinal cord send and receive messages that control just about everything you think and do. Deterioration of myelin can lead to muscle spasms, tremors, or even difficulty with basic actions such as walking, bending, and talking.

Toluene, one of the most common chemicals in inhalants, is found in glue, spray paint, paint thinner, and a number of other products known as solvents. Toluene can damage myelin—and also the liver, the kidneys, and the ability to hear.

Other inhalants such as benzene (found in gasoline) can compromise the body's ability to produce blood

Blackouts

Inhalants can cause rapid changes in blood pressure, which can lead to blackouts and fainting.

Hearing Loss

Inhalants can cause hearing loss, perhaps by damaging the hairs of the inner ear or by harming the protective coating (myelin) on the nerves that carry sound impulses to the brain.

Damage to Central Nervous System

Fumes from inhalants can change brain chemistry and permanently damage the central nervous system (brain and spinal cord).

Liver and Kidney Damage

Inhalants can cause serious harm to these organs, which have many vital functions, including filtering harmful substances out of the body.

Bone Marrow Damage

Inhalants can damage bone marrow, where blood cells are made, increasing the risk of leukemia and aplastic anemia (potentially fatal illnesses).

Limb Spasms

Inhalants break down the myelin needed for nerves to transmit messages, resulting in muscle spasms and tremors in arms and legs.

Inhalant	Sources	Harmful Effects
Toluene	<ul style="list-style-type: none"> Spray paint Glue Dewaxer Fingernail polish 	<ul style="list-style-type: none"> Hearing loss Damage to central nervous system Liver and kidney damage
Trichloroethylene	<ul style="list-style-type: none"> Cleaning fluid Correction fluid 	<ul style="list-style-type: none"> Hearing loss Liver and kidney damage Vision damage
Hexane	<ul style="list-style-type: none"> Glue Gasoline 	<ul style="list-style-type: none"> Limb spasms Blackouts
Nitrous Oxide	<ul style="list-style-type: none"> Whipped cream dispensers Gas cylinders 	<ul style="list-style-type: none"> Limb spasms Blackouts
Benzene	<ul style="list-style-type: none"> Gasoline 	<ul style="list-style-type: none"> Bone marrow damage Immune system damage

cells, which can lead to a life-threatening disease called aplastic anemia. Various chemicals in other inhalants can also cause hepatitis, liver failure, weight loss, muscle weakness, disorientation, inability to concentrate, loss of coordination, irritability, and depression. In short, *inhalants can seriously mess you up.*

HHEADS UP: THERE ARE NO SAFE INHALANTS

Some teens who understand the dangers of inhaling glue or computer cleaner may believe that inhaling nitrous oxide is safe—maybe because medical professionals sometimes administer it. **They are wrong.** Nitrous oxide, also known as laughing gas, is an odorless gas used by dentists as a painkiller, but when abused, it can be as dangerous as any other inhalant. It can damage your peripheral nerves, causing numbness, tingling, and even paralysis. It also causes blackouts.

When you breathe in pure

nitrous oxide, it binds with the oxygen in your blood. This means your body's tissues can't get the oxygen they need. Dentists never give pure nitrous oxide to patients. They always mix it with oxygen. People who sell balloons or little canisters filled with nitrous oxide on the street or at concerts don't know how to do this—and even if they did, they wouldn't bother. If you inhale nitrous oxide outside of a dentist's office, you'll likely be flooding your body with sulphuric acid, ammonia, and nitric oxide—all toxic substances.

HHEADS UP: YOUNGER TEENS ARE MOST AT RISK

It is vitally important that you tell your friends what you've learned about the risks of inhalants. While recent studies show that overall drug abuse is down among teens, the abuse of inhalants has increased, especially among younger teens. According to the most recent Monitoring the Future

survey, a study of youth drug trends sponsored by NIDA, twice as many 8th-graders as 12th-graders are using inhalants. In 2004, more than 17 percent of this age group reported having used inhalants at least once in their lives—a statistically significant increase compared with the previous year.

A key problem revealed by the Monitoring the Future survey is that more than **38 percent of 8th-graders didn't realize that regular use of inhalants is harmful.** More than 66 percent of this age group didn't think that using inhalants once or twice was risky. This lack of awareness can set the stage for disastrous health consequences. The more kids know about the harmful effects of inhalants, the more likely they'll be able to make the smart choice and avoid inhalants altogether.

For help with a drug problem or to locate treatment centers, go to www.findtreatment.samhsa.gov or call the national hotline at 1-800-662-HELP.

Cutting Edge: Drug-Abuse Statistics

To find out the data about dangers for teens regarding inhalants and other drugs of addiction, check out these Web sites for the latest statistics:

www.drugabuse.gov Scientific information from NIDA about all drugs of abuse and advice on how to quit.

<http://monitoringthefuture.org> Here you'll find data from the latest Monitoring the Future survey. Funded by NIDA, this survey of youth drug-use trends has been conducted annually by the University of Michigan's Institute for Social Research for more than 25 years.

www.nida.nih.gov/about/organization/CEWG/CEWGHome.html Established by NIDA in 1976, the Community Epidemiology Work Group (CEWG) provides ongoing community-level surveillance of drug abuse through analysis of quantitative and qualitative research data.

www.drugabusestatistics.samhsa.gov Enter this site to access findings from the National Survey on Drug Use and Health, which investigates national drug-use trends among the general population age 12 and older.

www.cdc.gov/healthyyouth/yrbs/index.htm This will take you to the Youth Risk Behavior survey, which collects data from students in grades 9–12 nationwide. It includes questions on a variety of health-related risk behaviors, from drug use to seat-belt use.



HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY



Top 10 Things You Need to Know About Inhalants

Educate yourself about this dangerous class of drugs with our Top 10 list below. Then, make your way through the "Find the Facts" maze on the next page.

1

Household products can be dangerous. Inhalants are breathable chemical vapors that produce mind-altering effects. Some of these come from everyday household products like spray paint, glues, and cleaning fluids. But these toxic chemicals were never meant to be inside a human body!

2

Using inhalants just one time can kill you. Sniffing highly concentrated amounts of the chemicals in solvents or aerosol sprays can cause heart attacks and even death within minutes. Known as "Sudden Sniffing Death," this can happen the first time you use inhalants or anytime after. You can also die from lack of oxygen, since you are filling your lungs with chemicals instead of air.

3

No matter how inhalants are taken, they still spell danger. Inhalants are breathed in through the nose or mouth in a number of ways, variously called sniffing, snorting, huffing, or bagging. But there is no safe way to breathe toxic fumes.

4

Your brain may never be the same again. The poison in inhalants can kill so many brain cells that brain tissue actually shrinks. People who abuse inhalants may have difficulty with memory, learning, and thinking.

5

When you hurt your brain, you hurt your body. Inhalants dissolve the protective coating called myelin on the neurons, or cells in the brain. Myelin helps messages travel rapidly along nerve cells. When myelin is damaged, messages move too slowly—resulting in muscle spasms, tremors, and even difficulty walking and talking.

6

By using inhalants, you risk depression. Inhalants can affect an abuser's mood even when he or she is not huffing. The sniffer can fall into a gloomy mood where nothing about life seems good or hopeful—a condition doctors call depression.

7

You can lose your hearing for good. Use of toluene (a chemical found in spray paints and glues) and trichloroethylene (a chemical found in cleaning fluids and correction fluids) can cause hearing loss.

8

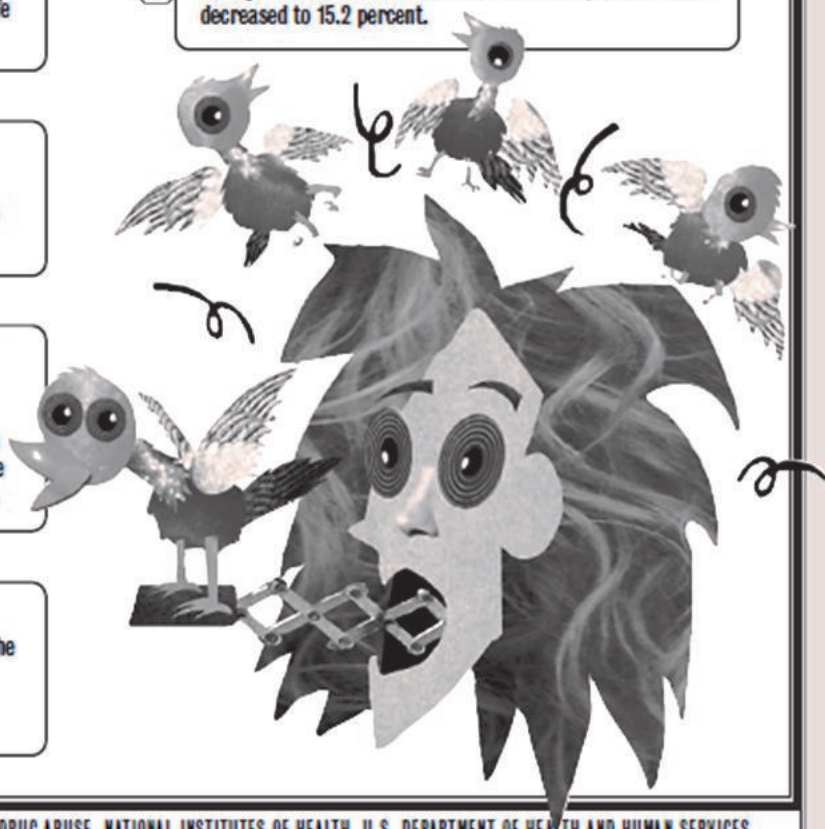
The destruction could go as deep as inside your bones. Use of benzene (or gasoline) can damage bone marrow.

9

Damage can go beyond your brain and bones. Chronic exposure to inhalants can lead to significant damage to the heart, lungs, liver, and kidneys.

10

Fewer teens are trying inhalants. According to a recent NIDA-funded study, 17.1 percent of 8th-graders surveyed had tried inhalants in 2001. In 2002, that number decreased to 15.2 percent.



4

FROM SCHOLASTIC AND THE SCIENTISTS OF THE NATIONAL INSTITUTE ON DRUG ABUSE, NATIONAL INSTITUTES OF HEALTH, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Inhalants



BACKGROUND

Most inhalants are common household products that give off mind-altering chemical fumes when sniffed. These common products include paint thinner, fingernail polish remover, glues, gasoline, cigarette lighter fluid, and nitrous oxide. They also include fluorinated hydrocarbons found in aerosols, such as whipped cream, hair and paint sprays, and computer cleaners. The chemical structure of the various types of inhalants is diverse, making it difficult to generalize about the effects of inhalants. It is known, however, that the vaporous fumes can change brain chemistry and may be permanently damaging to the brain and central nervous system.

Inhalant users are also at risk for Sudden Sniffing Death (SSD), which can occur when the inhaled fumes take the place of oxygen in the lungs and central nervous system. This basically causes the inhalant user to suffocate. Inhalants can also lead to death by disrupting the normal heart rhythm, which can lead to cardiac arrest. Use of inhalants can cause hepatitis, liver failure, and muscle weakness. Certain inhalants can also cause the body to produce fewer of all types of blood cells, which may result in life-threatening aplastic anemia.

Inhalants also alter the functioning of the nervous system. Some of these effects are transient and disappear after use is discontinued. But inhalant use can also lead to serious neurological problems, some of which are irreversible. For example, frequent long-term use of certain inhalants can cause a permanent change or malfunction of nerves in the back and legs, called polyneuropathy. Inhalants can also act directly in the brain to cause a variety of neurological problems. For instance, inhalants can cause abnormalities in brain areas that are involved in movement (for example, the cerebellum) and higher cognitive function (for example, the cerebral cortex).

MECHANISM OF ACTION

Inhalants enter the bloodstream quickly and are then distributed throughout the brain and body. They have direct effects on both the central nervous system (brain and spinal cord) and the peripheral nervous system (nerves throughout the body).

Using brain imaging techniques, such as magnetic resonance imaging (MRI), researchers have discovered that there are marked structural changes in the brains of chronic inhalant abusers. These changes include a reduction in size in certain brain areas, including the cerebral cortex, cerebellum, and brainstem. These changes may account for some of the neurological and behavioral symptoms that long-term inhalant abusers exhibit (for example, cognitive and motor difficulties). Some of these changes may be due to the effect inhalants have on myelin, the fatty tissue which insulates and protects axons and helps speed up nerve conduction. When inhalants enter the brain and body, they are particularly attracted to fatty tissues. Because myelin is a fat, it quickly absorbs inhalants, which can then damage or even destroy the myelin. The deterioration of myelin interferes with the rapid flow of messages from one nerve to another.

Inhalants can also have a profound effect on nerves that are located throughout the body. The polyneuropathy caused by some inhalants, as well as other neurological problems, may be due in part to the effect of the inhalants on the myelin sheath that covers axons throughout the body. In some cases, not only is the myelin destroyed, but the axons themselves degenerate.

The following activities, when used along with the magazine on inhalants, will help explain to students how these substances change the brain and the body.

Inhalants



OBJECTIVE

- ★ The student will learn the effects of inhalant use on brain-behavior relationships.

INHALANTS ACTIVITY ONE

Introduce this activity by reminding students that inhalants can slow or stop nerve cell activity in some parts of the brain; for example, the frontal lobes (complex problem solving), cerebellum (movement and coordination), and hippocampus (memory). Students will break into small groups and contribute in a round-robin fashion to a story about a fictional student who uses inhalants. The students should be encouraged to include problems (symptoms) in the description that would be associated with inhalant use, as well as other symptoms that would not. These stories can then be shared (either in oral or written form) with the rest of the class, who will be required to identify the inhalant-related behavioral components and then describe the brain areas that are involved in these behaviors. Students will then search the Internet and other sources to obtain information about the way in which activity in the frontal lobes, cerebellum, and hippocampus influences behavior, and prepare a report summarizing their findings.

OBJECTIVE

- ★ The student will understand the effect of inhalants on brain structures, physiology, and behavior.

INHALANTS ACTIVITY TWO

Review the regions of the brain and structures affected by inhaling solvents, gases, and nitrites. Then divide the class into groups of 4-6, and have each group write a rap music video about the effects of inhalants on brain areas and structures, as well as brain-behavior relationships. When the songs are finished, have each group perform their music video.

OBJECTIVE

- ★ The student will become more familiar with the neuroscience concepts and terminology associated with the effects of inhalants on the brain and body.

INHALANTS ACTIVITY THREE

The students will complete the Inhalants Word Search, and the teacher will then review the words and have the students discuss how the terms relate to inhalant use. A copy of the Word Search and the Word Search Solution is included in the guide.

Inhalants



WORD SEARCH

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

Amygdala

Fumes

Myelin

Axon

Glue

Polyneuropathy

Cell

Inhalant

Sniff

Cerebellum

Kidney

Vapor

Cortex

Liver



FOR MORE COPIES, CONTACT:

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