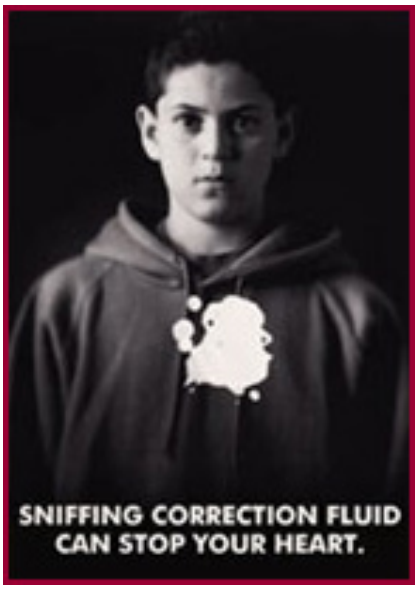
Inhalant Prevention Education

A School-Based Program

POISON Help®
1-800-222-1222
Utah Poison Control Center



Photos: National Inhalant Prevention Coalition

Introduction to Inhalant Prevention Education

The 2006 NSDUH Survey noted that 604,476 twelve-eighteen year olds used inhalants for the first time. According to the 2006 Monitoring the Future report, even though many drugs showed a decline in use, inhalants did not. Abuse can start in elementary years and peaks in middle school. Inhalant abuse is dangerous and education should start before abuse peaks in eighth grade.

Inhalants are not actually drugs. They are breathable chemical vapors or gases, (toxins) that produce psychoactive effects when misused. Most inhalants are readily available, inexpensive or free, and usually legal to purchase and possess. Many youth do not perceive them as harmful and don't understand the consequences. To learn more about inhalants prior to teaching this lesson, please take the 15-minute, free, online training at www.inhalantabusetraining.org . For more information about inhalants contact your poison center at 1-800-222-1222.

This set of lessons is designed to introduce inhalant prevention education as part of a health or science curriculum that touches on the negative effects of pollution. There is some thinking that including inhalants in a drug prevention course may increase experimentation. For this reason, these lessons address inhalant prevention from a science perspective. There are three lessons:

1. Poison Prevention (Grade 4)
2. Body Pollution (Grade 5)
3. Danger! Toxic Chemicals (Grade 6 and above)

Lesson 3 is the only time inhalants are actually discussed and should not be presented in the 4th or 5th grade.

A combination of the above the lesson plans (4. Toxic Chemicals and Poison Prevention) is also included to be used as a solo presentation in grades 6 and above.

Photo credit: www.drugabuse.gov

Lesson 4. Toxic Chemicals and Poison Prevention

Grade level 6 and above

Duration 60 minutes

Description
Inhalant abuse is the purposeful concentration of fumes or gases (poisons) with the goal of altering one's mood. This lesson will teach students what poisons are, how they are similar to inhalants, and what the first aid is for poisonings.

Subjects covered

- Science (anatomy and physiology)
- Safety
- Injury prevention
- Substance abuse prevention

Utah State Board of Education Utah Core State Standards for Health Education

Strand 4. Substance Abuse Prevention (SAP): Students will develop skills to educate themselves about the consequences of substance use and practice ways to resist negative peer pressure.

Standard 6.SAP.3: Recognize potential physical, mental, emotional, and social short and long-term consequences of alcohol, tobacco, nicotine, and other substance use.

Goals
Students will be able to prevent poisonings and respond to a poison emergency.
Students will learn that chemicals in inhalants are poisonous, and that these toxic products were never meant to be inhaled.

Objectives
By the end of the lesson, students will be able to

1. **recognize poison center services.**
2. **define "poison**."
3. **list 4 ways toxins can enter the body.**
4. **identify the function of the 4 major parts of the brain**.
5. **label the 3 main parts of a neuron (cell body, axon and dendrite).**
6. **identify the effects of inhalants on brain structures, physiology and behavior.**
7. **refuse social pressure to abuse toxic products.**

Materials

- Pencils for each student

- Butcher paper or poster board
- In class activity – Calling the Poison Center Role Play – Appendix A
- Cross section view of a brain NIDA Junior Scientist: Grades 4-5 (Appendix B)
- Cut up the task cards and apply to heavier card stock for durability (Appendix C)
- Enlarge the neuron (Appendix D) and mount on poster board
- Mind over Matter – The Brain's Response to Inhalants student handout Download material at http://teens.drugabuse.gov/mom/mom_inha1.asp and click on the "PDF Version" button on the left.
- Brain MRI image – Appendix E
- *Danger! Toxic Chemicals:* Hazelden video (www.hazelden.org) In Utah, call 1-800-222-1222 to checkout a copy of the video.
- **Call the Poison center at 1-800-222-1222 or visit www.utahpoisoncontrol.org** to order - Poison Control stickers and magnets.
- Makes copies of:
    - In class assignment – Danger Toxic Chemicals Worksheet (Appendix F)
    - Take home assignment – Internet toluene and family member project.(Appendix G)
    - Pictionary clues (Appendix H)
    - Jeopardy questions and answers (Appendix I)

Procedure
(Bold text is spoken) Today we are going to be talking about poisonings. I am going to ring this bell now. I want you to pay attention and think about what happens each time the bell is rung.
Ring a bell every 13 seconds. After one minute, ask the students - **What do you think happened each time the bell rang?** Limit the answers to the first five hands. After the brainstorm session - **Nationwide, someone calls a poison center every 13 seconds. In one minute, almost 5 different people were exposed to a poison.**

Objective 1
How many of you have ever had a family member call the poison center? Have a show of hands. If there is time at the end of the lesson you can have the students share some stories.

Explain to the students what the Poison Center is:
1. Free, confidential, 24 hour a day place you can call related to emergencies and questions.
2. Share the steps a student would take to call the poison center. When they call, they will need to share the following information:
    - What was the poison?
    - How much was taken?
    - Does the victim appear sick in anyway?
    - How does the victim look?
    - Listen carefully and ask questions if you are unclear about anything you were told to do.

Select 2 students and have them act out the role play in front of the class (Appendix A).

Objective 2
Have the students break up into small groups for this lesson.
Define the word "poison" and give 3 examples of poisons. Give the groups 1-2 minutes to brain storm and have them report back. Write some of the definitions on the board. Some possible definitions include:

- "A substance that causes illness or harm if someone eats, drinks, touches or breathes it in" or
- "A substance that through its chemical action usually kills, injures, or impairs an organism" or
- "something destructive or harmful"

Explain that there are three ways items can be poisonous:

- Too much or in large amounts
- Used in the wrong way
- Mix with other substances

Objective 3
What are some ways poisons can enter your body?
Call on students and have them place a picture of the mentioned body part on the white board (Appendix A)

Objective 4

Show a side-view cross-section of the brain (Appendix B). Label the 4 main parts: cerebral cortex, cerebellum, brain stem, and limbic system. On the chalkboard or flip chart, create 4 squares and write the parts of the brain in them (see chart below). Under each part, list the major functions that each part controls.

Cerebral Cortex	**Cerebellum**
Thinking	Movement
Perceiving	Balance
Vision	Posture
Movement	Playing ball
Reasoning	Playing a musical instrument
Artistic expression	
Brain Stem	**Limbic System**
Heart rate	Learning
Breathing	Memory
Eating	Regulates emotions
Sleeping	Pleasure
Body temperature	Motivation
Digestion	

Ask for 6 volunteers to come up to the front of the class. Give each student a card with a task on it.

Ask each student, one at a time, to perform their task. Each task should use a different part of the brain (Appendix C), such as

- Solve this math problem: 12 x 11 (cerebral cortex)
- Breathe heavily (brain stem)
- Hop on one foot (cerebellum)
- Pick up a pencil (cerebellum)
- Draw a box (cerebral cortex)
- Recall what you had for dinner last night (limbic system)

As each student performs their task, ask the class to raise their hand if they know what part of the brain controls that task.

Explain what the brain is and how inhalants can damage the brain.

Did you know that the brain acts like a computer? It processes all the information it receives and responds to it. Your brain controls virtually everything humans experience, including movement, regulating our involuntary body processes that are necessary for life, and controlling emotions. Anything that affects the way the brain functions will have a major effect on our entire being.

Inhalants are one of the things that can affect our brain functions and the rest of our body.

Inhalants are toxic chemicals, not illegal drugs. These are common household products that are deliberately breathed into the body. The fumes of these toxic products enter the body through the lungs and get transferred to the bloodstream. The blood carries these poisons to major organs, particularly the brain.

Objective 5

Throughout your brain and body you have billions of nerve cells called neurons. We are going to discuss what a neuron looks like and how it works. (Display in an appropriate place in the classroom the image of the nerve fiber on the back of the inhalant student handout and the nerve cell in Appendix D.) **Nerve cells in your brain and spinal cord are sort of like the "command central" for your body. They send and receive messages that control just about everything you think and do.**

Review the parts of the nerve cell and discuss their function.

There are three main parts of a nerve cell

1. Central cell body – Directs all activities of the neuron (includes the nucleus)
2. Dendrites – Short fibers that receive messages from other neurons and relay them to the cell body
3. Axon – Long single fiber that transmits messages from the cell body to the dendrites of other neurons or to body tissues, such as muscles.

- The axon of many cells is covered in a fatty substance known as myelin. Myelin has several functions. One of its most important is to increase the rate at which nerve impulses travel along the axon. The rate of conduction of a nerve impulse along a heavily myelinated axon can be as fast as 120 meters a second. In contrast, a nerve impulse can travel no faster than about 2 meters a second along an axon without myelin. The axons that transmit messages from the brain or spinal cord to muscles and other body tissues are what make up the nerves of the human body. Most of these axons contain a thin covering of myelin, which accounts for the whitish appearance of nerves.

Have the students trace their arm from elbow to fingers on butcher paper and label the different parts of the neuron:

- Palm of the hand – Central cell body
- Fingers – Dendrites
- Arm and elbow - Axon

Objective 6

Each poison affects the brain differently. When chemicals in products are smelled (especially in concentrated amounts) **they can damage the brain and nerve cells.** (Show MRI of brain damage, Appendix E) **Household products <u>never</u> were intended to be taken into the body. There is no safe dose of these poisons.**

Hand out the MOM handout - **We are going to take turns reading a paragraph from the inhalant handout.**

Now we will see a video that discusses the facts about inhalants, discusses the connection of toxins in household products to environmental toxins, reviews the short and long term effects of inhalant use, highlights a personal story, and offers refusal skills.

Hand out the Danger Toxic Chemicals Worksheet found in Appendix F. Have students fill in the

worksheet while they watch the video.

Show video – 14 minutes

Objective 7

After the video, have the students break up into groups and discuss the following 4 questions (examples of some potential answers are provided below each question). Have the groups report back their answers:

1. **What happens when the environment becomes polluted?**
    a. Wildlife and vegetation die or get sick
2. **What are some toxic effects from fumes?**
    - Loss of brain power
    - Trouble speaking
    - Memory loss
    - Headache
    - Blindness
    - Death
3. **Why do firefighters wear protective gear?**
    - Protect body from flames
    - Protect lungs from fumes
4. **What are 3 refusal skills strategies highlighted in the movie?**
    - Identify hot situations
    - State your case
    - Move away from the situation

Assessment

- Discussion wrap-up. Reinforce the ways toxins can harm the body and ways to protect it.
- Ask the students “Can you tell me the top 3 things you learned today?”
- Ask the students to take home the stickers and magnets and be sure to put them near telephones.

Homework - See Appendix G

Homework 1 (for those with Internet access)

Homework 2 (for those without Internet access)

Take the lesson one step further

- Have the students develop a campaign or write an article for the school paper on “Keeping Household Products Safe.”
- Have the students write a poem, song, or public service announcement about something they learned today.
- Have the students analyze an advertisement of a household product that would be dangerous to breathe in (e.g., paint, permanent markers) and identify missing important safety information. Have the students developed warning labels for several products.
- Play Jeopardy (Appendix H)
- Play Pictionary (Appendix I)

Resources

- Utah Poison Center 1-800-222-1222 www.utahpoisoncontrol.org
- Mind over Matters, The Brain’s Response to Drugs: Teachers Guide - http://teens.drugabuse.gov/mom/tg_inha1.asp
- NIDA Junior Scientist: Grades 4-5 http://www.nida.nih.gov/JSP3/MOD2/page3.htmlU.S. National Library of Medicine - Tox Town Website: www.toxtown.nlm.nih.gov
- SAMHSA https://www.samhsa.gov/data/sites/default/files/report_3095/ShortReport-3095.html , Lipari, R.N. *Understanding adolescent inhalant use.* The CBHSQ Report: June 13, 2017. Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Rockville, MD.

Appendix A

Call the Poison Control Center

Role-Play Activity

Poison Center (PC) Specialist: Poison Control Center. My name is Richard. How can I help you?

Sally: (very frightened) I'm babysitting a neighbor and he just drank some bleach.

PC Specialist: How old is the child?

Sally: 3

PC Specialist: Do you know how much he weighs?

Sally: His mom left me an information chart. It says 30 pounds.

PC Specialist: When did this happen?

Sally: Just now.

PC Specialist: How is he feeling right now?

Sally: He seems fine, but he keeps spitting.

PC Specialist: Give him a small amount of his favorite drink. What is his name?

Sally: Jimmy Buffet

PC Specialist: What is your name?

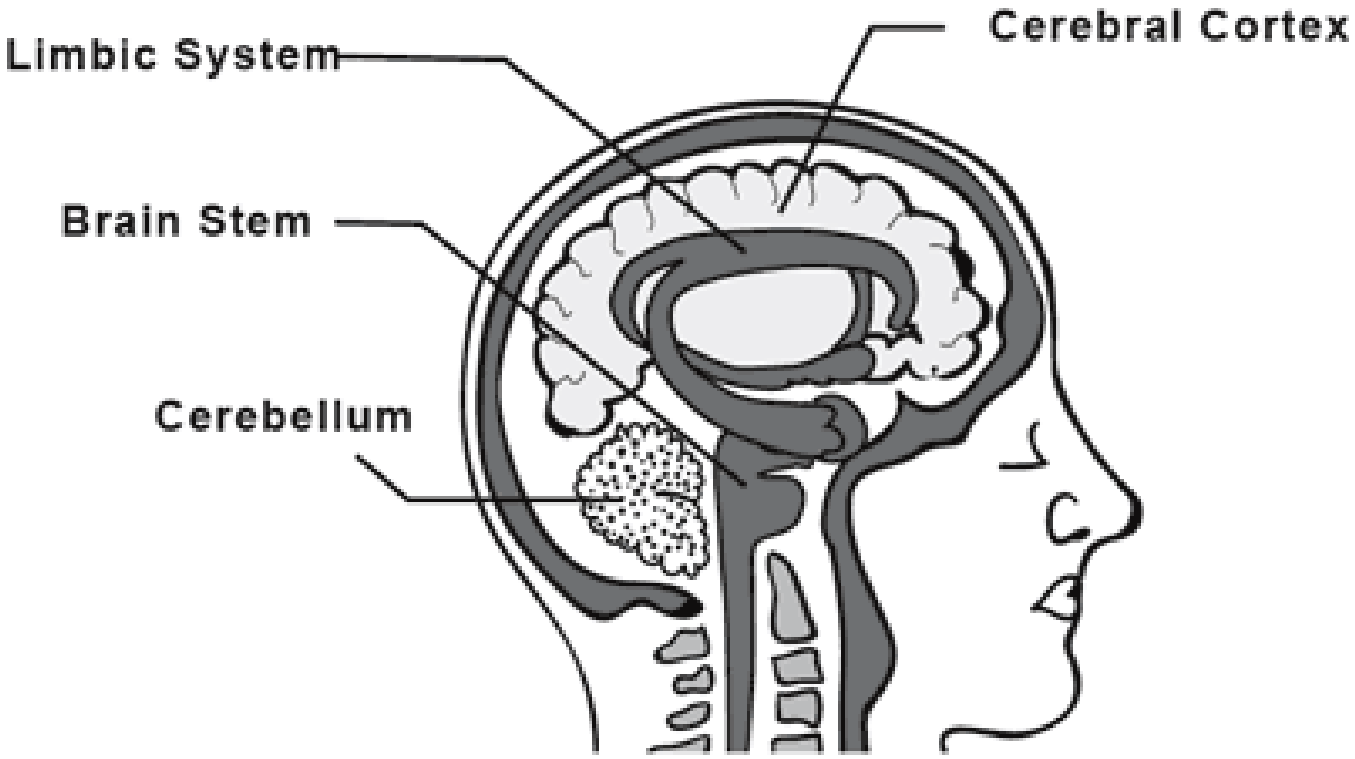
Sally: Sally Smith

PC Specialist: I think Jimmy will be fine, but I will call you back in an hour. If he gets sick, call me back immediately. What is the phone number and address where you are?

Sally: 801-123-4567 1234 Rolling Hills Drive, New Town, Utah

PC Specialist: Don't worry, Jimmy will be fine. I will check back with in an hour.

Appendix B

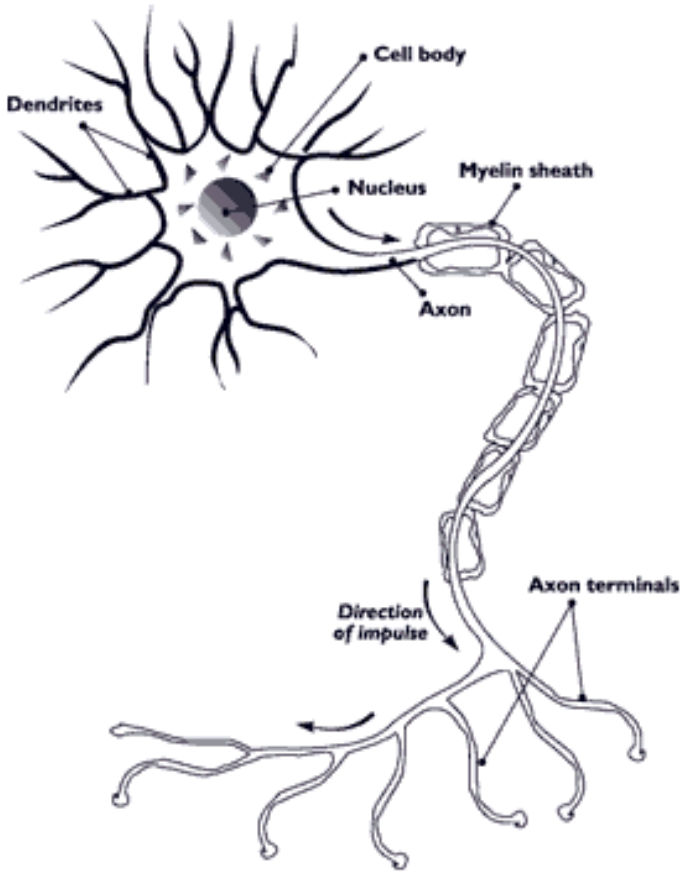


Credit: NIDA Junior Scientist

Appendix C – Task Cards

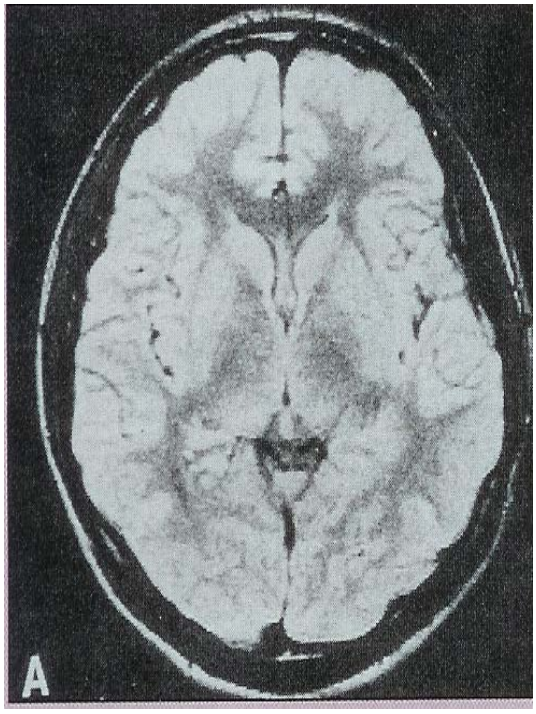
Solve this math problem. **12 x 11**	**Breathe heavily.**
Hop on one foot.	**Pick up a pencil.**
Draw a box.	**Tell the class what you ate for dinner last night.**

Appendix D

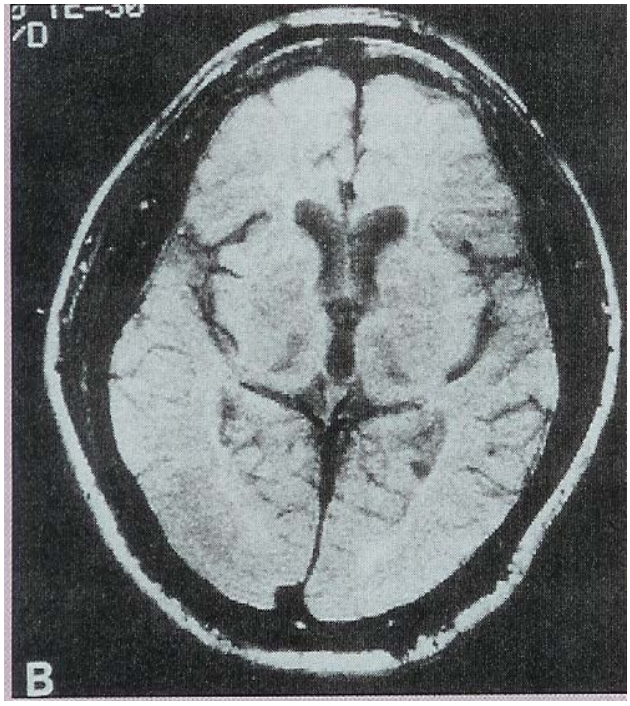


Credit: NIDA Junior Scientist

Appendix E



HEALTHY BRAIN



UNHEALTHY BRAIN

CHRONIC TOLUENE USER

Credit: Neil Rosenberg, M.D.

Appendix F

Name: _____

Danger! Toxic Chemicals
Worksheet

1. Slang terms for inhaling are _____ and _____.
2. When a toxic chemical is inhaled, it enters the body through the lungs and then is transferred to the _____.
3. Unexpected immediate death due to inhaling is called _____.
4. List 3 negative consequences of sniffing toxic chemicals:
    a.
    b.
    c.

True or false:

5. ___ In spray cans, the propellant that pushes out the product is toxic.
6. ___ Inhalants are classified as a drug.
7. ___ You can die the very first time you inhale a toxic chemical.
8. ___ After toxic chemicals are inhaled, they remain in the lungs and do not travel to other parts of the body.
9. ___ Memory loss is one of many possible consequences of inhaling toxic chemicals.

Short essay:

10. You are with friends and several members of the group think that it would be fun to sniff a toxic chemical. Based on the information presented in the video, describe how you would resist the pressure to engage in the dangerous behavior.

Appendix F

Danger! Toxic Chemicals – Answers

1. sniffing, huffing
2. bloodstream
3. sudden sniffing death syndrome
4. blurred vision, difficulty breathing, irregular heart beats, brain damage
5. T
6. F
7. T
8. F
9. T
10. Essay points: identify hot situations, state your case, move on out

Appendix G

Name: _____

Homework – Internet Activity

Research the latest information about a toxic substance. On the web, go to http://www.atsdr.cdc.gov . Click on Toxic Substances under the Toxic Substances & Health subjects on the left side of the screen. Click on Toxic Substances Portal, and then select Toluene from the list of substances. On the Toluene page, select Public Health Statement bullet. Read the 5 page document. Answer the following questions:

1. You can be exposed to toluene by _____, _____,

_____, or through _____ contact.

2. T or F You can only be exposed to toluene by breathing it.

3. List 4 products with toluene.

4. Toluene can have serious effects on what organ?

5. Toluene can cause what health problems?

6. Toluene can cause death by interfering with the way you _____ and the

way your _____ _____.

7. If you deliberately breathe toluene during pregnancy, your baby can have

_____ _____ and retard mental abilities and _____.

Appendix G

Internet Activity Answers

1. breathing, eating, drinking, skin
2. F
3. paints, paint thinner, fingernail polish, lacquers, adhesives, rubber
4. brain
5. headaches, confusion, memory loss
6. breathe, heart beats
7. birth defects, growth

Appendix G

Name: _____

Homework – Non-Internet Family Activity

Find four people to interview. Ask each of them what their favorite activity is. Then decide what part of the brain is responsible for that activity.

1. Person's name -

Activity –

What part of the brain is responsible –

2. Person's name -

Activity –

What part of the brain is responsible –

3. Person's name -

Activity –

What part of the brain is responsible –

4. Person's name –

Activity –

What part of the brain is responsible -

Appendix H

Pictionary Clues

Sick	Fan	Inhalants
Neuron (Nerve cell)	Cerebral cortex	Limbic system
Cerebellum	Brain stem	Fumes
Pollution	Paint	Fingernail polish
Glue	Spray cans	Brain
Computer	Axon	Dendrite
Flame	Lungs	Headache
Mouth	Eyes	Skin
Nose	Poison	Phone

Appendix I

Jeopardy Questions and Answers

Answers in Bold

Poisonings

100. A. This is how often someone calls the poison center.

Q. What is every 30 seconds?

Q. What is every 13 seconds?

Q. What is every 67 seconds?

200. A. This is a free, confidential, 24-hour service for poison emergencies and questions.

Q. What is the health department?

Q. What is the emergency department?

Q. What is the Poison Center?

300. A. If someone is not breathing or has passed out, you should call this number.

Q. What is 911?

Q. What is 1-800-222-1222?

Q. What is your mother?

400. A. These are four ways poisons can enter the body.

Q. What are: 1) arms, 2) legs, 3) ears, 4) hair?

Q. What are: 1) eyes, 2) mouth, 3) skin, 4) nose?

Q. What are: 1) hands, 2) feet, 3) lips, 4) neck?

Brain

100. A. This is a part of the brain.

Q. What is the Cerebellum?

Q. What is the thyroid?

Q. What is the liver?

200. A. Use this part of the brain to play basketball, walk a tightrope, and play the trumpet.

Q. What is the Brain Stem?

Q. What is the Cerebral Cortex?

Q. What is the Cerebellum?

300. A. Artistic ability comes from this part of the brain.

Q. What is the Brain Stem?

Q. What is the Cerebral Cortex?

Q. What is the Limbic System?

400. A. Some people say love comes from the heart, but it really comes from this part of the brain.

Q. What is the Limbic System?

Q. What is the Brain Stem?

Q. What is the Cerebellum?

Inhalants

100. A. When someone's heart stops because they abused inhalants.

Q. What is a short trip?

Q. What is a stroke?

Q. What is sudden sniffing death?

200. A. Slang terms for inhalant abuse.

Q. What is huffing and sniffing?

Q. What is sneezing and wheezing?

Q. What is blowing and tripping?

300. A. When a toxic chemical is inhaled, it enters the body through the lungs and then travels to this important organ.

Q. What is the stomach?

Q. What are the kidneys?

Q. What is the brain?

400. A. Three negative consequences of sniffing toxic chemicals.

Q. What are 1) red eyes, 2) ears ring, 3) brown teeth?

Q. What are 1) memory loss, 2) death, 3) burns (there are many more)?

Q. What are 1) fuzzy hair, 2) pink tongue, 3) puffy cheeks?

Saying "No"

100. A. What to do if someone you care about is abusing inhalants.

Q. What is tell a trusted adult?

Q. What is keep it a secret?

Q. What is leave them alone?

200. A. What a friend can do if they want to help someone stop inhalant abuse.

Q. What is tell everyone at school?

Q. What is hide all toxic products?

Q. What is tell a trusted adult?

300. A. What you tell a friend if they tell you inhalants are safe.

Q. What is sudden sniffing death is real and you can die the first time?

Q. What is okay I'll try some?

Q. What is maybe you are right?

400. A. Three main refusal steps you can use if someone asks you to try inhalants.

Q. What are: 1) make popcorn, 2) sing a song, 3) whistle?

Q. What are 1) yell for help, 2) start dancing, 3) ring a bell?

Q. What are: 1) identify hot situations, 2) tell them the dangers, 3) suggest a safer alternative?

Final Jeopardy A. Specialist in Poison Information

Q. Who are pharmacists and nurses?

Q. Who are volunteers who answer the phones?

Q. Who are the primary users of the poison center services?