Look around you. Think of all the products that have improved our health and the quality of our lives. How is it possible that these products could lead to poisonings? What makes something poisonous? It’s not always obvious. You might be surprised to learn that most poisonings result from the misuse of common household products and medicines, not from exposure to exotic chemicals. Think about it. Everything around us is made of chemicals.

More than 50 percent of all calls to poison control centers are for unintentional poisonings in children under six years of age. Brightly colored furniture polish might look like juice, and Grandma’s heart medicine might look like candy. If you have been around young children, you know how curious they are. They move fast and frequently put things into their mouths.

If you babysit for little ones, you need to keep a close watch at all times. In this true story, a teenage girl put nail polish on a 4-year-old. When she went to the next room to answer the phone, the little girl drank some of the nail polish remover. At the hospital, a breathing tube and medications could not save the little girl. How would you feel if you were that babysitter? Would you ever forget?

Obviously, prevention is a key step. Remember these safety tips:

- Keep harmful materials out of children’s reach.
- Store household products and chemicals in original containers with clear labels.
- Keep medicines in original containers.
- Never take any medication from anyone else.
- Replace child-resistant closures securely.

Some people intentionally misuse ordinary substances. Inhalant abuse is an example. This happens when someone sniffs fumes to get an intoxicating effect. This is a form of drug abuse. Believe it or not, a single experience with inhalants has landed some teens in the emergency room. Some have died from Sudden Sniffing Death. Others suffer serious health consequences from inhalant abuse over longer periods of time. Ask yourself, is it worth the risk? Use materials responsibly.

You might wonder how products that are good for you, like vitamins, could possibly be poisonous. The reason is that vitamins and medicines are helpful at a specified dose. The right dose of aspirin for an adult could end up being toxic for a toddler or a pet. Anything can be poisonous if the dosage is inappropriate. Remember, the dose makes the poison.
At the present time (yr 2000), there are 70 poison control centers (PCCs) in the United States. Find the poison control center serving your area. Go to this site and find a link: www.aapcc.org

Write down the phone number for that center. Post it near your home telephone. What information is on their web site? (make a list)

Go back to the AAPCC site. Locate a web site for a PCC in a different part of the country. How is it different from the first one you visited?

Is your family safe at home? To find out, go to the “Checklist for Poison Safety” at: http://wellness.ucdavis.edu/safety_info

People of all ages are concerned about unintentional and intentional poisonings. Visit this site to learn about Students Against Drugs and Alcohol (SADA):
www.sada.org
Click on the “information” section and read about inhalants. Find out about the serious health risks from “sniffing.”

For more details about the dangers of inhalant abuse, go to: www.usdoj.gov/kidspage/
Click on “Get it Straight” and look up inhalants in the table of contents.
Here’s another site with inhalant information:
www.inhalants.org

Can alcohol be considered a poison? Yes, you may have heard about binge drinking. This can lead to death from acute alcohol poisoning. Even at lower doses, alcohol affects your ability to react. The amount of alcohol in your body is the blood alcohol concentration (BAC) measurement. Over time, states have lowered the legal definition for driving while intoxicated (DWI) to .10 percent BAC or lower. If charged with DWI, your license may be suspended. Worse yet, you could kill yourself or someone else while driving under the influence of alcohol.

QUESTIONS: Graph #1

1. According to this graph, what increases a driver’s risk of dying?
2. Based on the data presented, does BAC have a major effect on fatality? Support your answer.
3. States have different definitions of DWI. Can you find out what the defined BAC for DWI in your state is?

QUESTIONS: Graph #2

4. What trend does this line graph show?
5. During this time period, what was the change in reported fatalities?
6. What could have caused this change? Share your ideas with the class. Discuss.
7. If the line graph continued up to the present year, what might it look like?

Forensic toxicologists work for law enforcement agencies. Through scientific testing of blood and urine samples from drivers, they help establish the physical evidence of what contributes to fatal crashes. These experts can detect evidence of alcohol and drugs in the body. Visit this site to learn more: http://caag.state.ca.us/bfs/toxlab/index.htm

There’s even a special site about pet poisonings:
www.napcc.aspca.org

What information is included on this site? (make a list)
How can you help prevent dogs and cats from being unintentionally poisoned?
Hypothesis: (Use these questions to develop a hypothesis.)
Will the product(s) be harmful to a living system?
What concentrations of this product are harmful?
How many doses and what concentrations will cause harmful effects?

A poison is any substance that can cause enough damage (through chemical action) to impair health or destroy life. A poison can be a liquid, solid, or gaseous substance. Poisons can be harmful if swallowed, inhaled, injected, or absorbed through the skin.

An acute poisoning may occur quickly after a single exposure (even though the symptoms or effects might not be noticeable right away). Chronic poisoning occurs over time with repeated exposure. Ordinary products can be poisonous if used improperly. The concentration of a substance influences its toxicity. In this activity, you will investigate the effects of products on living systems.

Work with a partner or a small group.

Procedure:
CAUTION: Do not mix different products together. This can cause dangerous chemical reactions.

Step 1: Select a household product to test. Begin with a specific concentration (For example, dilutions could be 50%, 25%, 10%). As purchased, many products are already diluted. Read the labels to find out.

Step 2: Decide how you will apply this product concentration to your plant (into the soil, onto the leaves, etc.). If you plan to test different concentrations, label the plants. Decide how often you will apply each solution. Plan a schedule to apply the solution(s) and keep accurate records.

Step 3: Observe plants at the same time every day for the next two weeks. Draw your observations. Write a description of changes you see. Take measurements to record changes in plant height or leaf size.

Step 4: Develop a classification system for changes you observe (size, leaf position, coloration, etc.). Make a chart to display this information.

Results:
What happened?
How does the control compare with the experimental plants(s)?
What concentrations were toxic to the living system?
How did the number of doses applied affect the plant(s)?

Conclusions:
Do your results support your hypotheses? Explain.
Were effects apparent after one exposure or repeated exposure to the product? Explain.

Going Further
What additional questions do you have after testing?
Can you think of other ways to test the effects of potential poisons on living systems?

What is a Poison?
A poison is any substance that can cause enough damage (through chemical action) to impair health or destroy life. A poison can be a liquid, solid, or gaseous substance. Poisons can be harmful if swallowed, inhaled, injected, or absorbed through the skin.

92 percent of all poisonings happen at home.

Most unintentional poisonings involve children younger than six years of age.
The household products implicated in most poisonings are cleaning solutions, fuels, medicines, and other common products like glue and cosmetics.

About 6 percent of all calls to poison control centers are about pet poisonings.

Certain animals secrete a poison called venom, usually injected with a bite or sting.

Some household plants (like philodendron) are poisonous to humans and animals.

Flaska's Facts
Sniffing, huffing, or bagging inhaling chemical substances. young people getting high by body. Inhalants enter the bloodstream rapidly and travel throughout the body. These inhaled vapors move into the brain and central nervous system. Then, they affect thinking processes and movement. An inhalant can cause death from cardiac arrest, when the heart stops altogether.

Sudden Sniffing Death can happen any time a person abuses inhalants, even the first time. Here's what happens. First, the intoxicated person feels lightheaded. The inhalant abuser might also feel agitated. These feelings are soon displaced with pounding headaches, nausea, vomiting, and clumsiness. Chronic abuse (over a longer period of time) may result in damage to the liver, kidney, brain, and lungs. It's not a pretty picture.

Scientists have found out that inhaled vapors cause changes in brain structure. A special technique called magnetic resonance imaging (MRI) shows images inside the body. This has revealed that the cerebral cortex, cerebellum, and brainstem actually shrink with inhalant abuse. This occurs because brain cells die when they lack an adequate supply of oxygen. Inhalants also affect the hippocampus, the center for long-term memory. In addition, inhalants attack myelin, the fatty covering that insulates nerves. As myelin deteriorates, messages from the brain to the body are short-circuited along nerve pathways. Imagine being unable to move your legs or losing your eyesight. This is a reality with inhalant abuse. Don't let it happen to you.

Brains exposed to inhalants have difficulty:

- solving problems
- learning new things
- remembering things
- coordinating movement
- concentrating

Lead is a metal that has been used for more than 1,000 years in pottery and plumbing products. More recently, lead has been used in car batteries, paints, gasoline, and other chemicals. Lead is useful because it is soft enough to be pliable, and it resists corrosion. However, swallowing or breathing in too much lead can result in lead poisoning.

Earlier, scientists thought that a measurement of 60 micrograms of lead (a very small amount) in the blood was an unhealthy exposure. Now, they think that just 10 micrograms can cause problems, especially for young children and pregnant women.

To meet this challenge, scientists are working to:

- Reformulate products to remove lead
- Clean up the environment
- Make workplaces safer with less lead exposure
- Determine hazardous levels of lead in products and the environment
- Develop new treatments for people exposed to harmful levels of lead
- Determine hazardous levels of lead in products and the environment
- Develop new treatments for people exposed to harmful levels of lead

A familiar example is the phase-out of leaded gasoline, which pollutes the air. Scientists and engineers developed new gasoline mixtures and designed new engines that would run on cleaner fuels. As a result, lead pollution of the air has dropped dramatically.

You might have heard about lead poisoning from paint. This is what happens when children swallow flakes from lead-based paint, used in older homes. Chemists have now developed lead-free formulas for house paints. Lead paint is still useful in preventing corrosion of outdoor structures. Today, workers making or using leaded products must take safety precautions. They wear protective clothing and use special equipment to protect their lungs (like respirators and masks).

After high levels of lead exposure, your body may have problems with coordination and strength, manufacture of red blood cells, high blood pressure, and other troubles. Even low levels of lead exposure may be harmful for infants or young children. Researchers have found a link between increased levels of lead in children's baby teeth and poor performance in school.

Scientists have also studied the effects of lead on young rats and frogs. The effects of lead poisoning include stunted brain growth and interference with signal transmission in the central nervous system. These animal studies provide better understanding about what happens in humans, leading to new treatments for lead poisoning.

What's the treatment for lead poisoning? Special chemicals that bind with lead can be used. Then, the body can eliminate lead naturally, preventing hazardous build-up. This chelation therapy can take months. Eliminating lead from the person's environment is also part of the treatment. Researchers continue searching for ways to prevent and treat lead poisoning.
Now that you know more about pet exposure to ice melt products, what do you think happens to plants exposed to run-off near roadsides?

Can an ordinary substance like salt be poisonous? Yes, but just how poisonous depends on the dose and the type of exposure.

Sodium Chloride (NaCl), the chemical composition of ordinary table salt, is a common ingredient in ice-melting products. In areas with winter snow and ice, products with NaCl are often spread on streets and sidewalks to make them safer for drivers and pedestrians (walkers). Animals don’t wear shoes or boots, so their feet are not protected from these chemicals. Too much salt can irritate the skin. It might sound funny, but pets that have been outdoors on streets and sidewalks in winter should have their feet thoroughly washed. When pets lick their feet to clean them off, they may ingest these harmful chemicals. Pets that drink melted snow along roads and sidewalks might get a dangerous dose of salt. This direct ingestion can lead to serious health problems. It could even be deadly.

How does a dog’s body (or yours) react when there’s too much salt? The sodium overload diffuses throughout the body fluids. Intravenous fluids (IVs) may be necessary. Even after the body gets rid of unnecessary sodium, excess sodium might be trapped in the cerebrospinal fluid around your spinal cord and brain. To reduce that sodium concentration, your body directs more water to that area. This extra fluid puts additional pressure on the brain and spinal cord. As a result, an animal (or human) might have seizures. Four grams of NaCl per kilogram of weight can kill a dog. Quick response is essential. Sometimes, ipecac syrup or hydrogen peroxide is used to induce vomiting to get rid of the offending substance. But for some ice-melts, this action would be harmful for your pet. Ask a poison control expert for treatment advice.

The U.S. Consumer Product Safety Commission (CPSC) determines if a consumer product requires child-resistant packaging. To make a decision, the CPSC looks at data from safety testing laboratories, poison control centers, and emergency rooms. The CPSC consults with manufacturers and the public about whether or not to require special packaging for products.

Look at a tube of toothpaste at home. Can you find a warning label about excess swallowing by children under 6 years of age? Should the toothpaste have child-resistant packaging? Why or why not?

Think about the pros and cons of requiring child-resistant packaging on toothpaste. If they don’t, what alternatives do they suggest to protect young children? Review the data you collect. Compare it with your classmates’ data.

Draft a press release for the public. Give specific reasons why you support or oppose child-resistant packaging for toothpaste.

Warning: Keep out of reach of children under 6 years of age. If you accidentally swallow more than used for brushing, seek professional assistance or contact a poison control center immediately.
Do you like helping other people and talking on the phone? Working at a poison control center might be the perfect job for you. At a PCC, the phone rings 24 hours a day, 365 days a year. Here are some examples of calls.

- Help! My two-year-old got into my vitamin pills.
- Oh, no! My cat just licked up the antifreeze that was dripping under our car.
- I'm babysitting for a toddler. He just swallowed a tiny battery. What can I do?

All these callers are desperate for help. If you answered the calls, would you remain calm as you helped them handle these problems?

Let's take a closer look at the example about batteries. Jane Elshami, a registered nurse (RN) and certified specialist in poison information (CSPi) at the National Capital Poison Center, explains that some batteries contain corrosive chemicals. Under certain circumstances, these chemicals might leak out, causing serious burns on the skin. If a battery is stuck in the nose or ear, the battery must be removed immediately. If skin tissue blisters, the person should seek treatment in an emergency room.

Someone might swallow a small battery by mistake. If this happens, the battery could obstruct airways, preventing breathing. An x-ray is critical to make sure that the battery is not lodged in the esophagus, where it can cause irritation and tissue damage. If it passes quickly into the stomach, it should move out of the body without lingering effects or harm. If the battery remains in the body, a medical specialist must remove it.

The poison information specialist's job includes follow-up for emergency calls. The specialist checks to find out if there are any continuing problems. About 75 percent of poisoning cases are handled at home, avoiding trips to the emergency room. With cases involving battery burns, follow-up for two years might be necessary to track recovery progress. A CSPi must also be willing to meet new challenges as they arise.

Ask a Scientist

All scientific investigations begin with questions. Here's a web site where scientists will answer the questions you ask. To pose your questions online, visit www.hhmi.org/askascientist.

U.S. Department of Energy-funded research.

BENDER

Use the symbols to figure out the words related to poisoning. Look for clues to figure out this mindbender. Can you define each term?

这些问题词中缺少一些符号。你能填入空白吗？