



Lesson Plan 020105

Petroleum Poisons (Target: Grades 3-6)

Objectives:

1. Create awareness of harmful, toxic petroleum distillates found in household and consumer products.
2. Demonstrate how to find information about specific consumer products and to review information about health risks associated with the chemicals used in those products.
3. Challenge students to ask parents/adults questions about the safety of cleaning products and other types of liquid/chemical consumer products found at home.

Materials/Sources:

1. 4 common consumer household cleaning products that contain petroleum distillates and carry the warning "HARMFUL OR FATAL IF SWALLOWED" or "CONTAINS PETROLLEUM DISTILLATES" on the bottom of the front panel of the package. Products could include liquid furniture polish, nail polish remover, pesticides, solvents, etc. Try to find "National" brands that students might recognize from TV ads or from visits to stores with parents/adults.
2. Web site: <http://householdproducts.nlm.nih.gov>
3. Worksheet: "Hiding Places for Popular Poisons."

Methods:

1. Review the ingredients listed on the back of each package. NOTE: Although manufacturers are not required to list all ingredients in their product formulas ('trade secrets'), the federal government requirements disclosure of specific poisonous/toxic chemicals found in those products. On the classroom board, write the names of each of the dangerous chemicals listed on the consumer products you are analyzing.
2. In class, look up specific information about the products you have brought to show the class. This can be done with a visit to the Household Products Database web site (householdproducts.nlm.nih.gov). At this government-sponsored site you can review consumer products that have controlled chemical compounds among their ingredients. You can search by product trade names or browse through specific chemical names and see what consumer products contain those chemicals. Also, you can see links to medical information about side effects of each chemical.
3. Worksheet: Hand out copies of "Hiding Places for Popular Poisons" worksheet.
4. Discussion: Using the worksheet, ask students to fill in blanks with suggestions on what types of consumer products (i.e. "bleach", "glass cleaner", etc.) may be found in what rooms/places in their homes. Also, ask students if they can remember/think of specific trade names of any of these products.

Lesson Information:

1. In the last 100 years, several advances in manufacturing technology have made chemical production and synthesis much more efficient and affordable. This has led to the creation of 'non-natural' chemical compounds that have

been incorporated into all types of manufacturing processes, industrial products and consumer products. Also, the advent of the industrial revolution, which created a need for petroleum products for engine fuel and lubricants, has resulted in the widespread use of a family of chemical by-products associated with fuel refining. This family of extremely harmful chemicals has become common in modern consumer product manufacturing: it is called petroleum distillates.

2. In its crude form, petroleum is made up of long chains carbon atoms and hydrogen atoms (we refer to them as hydrocarbons). Petroleum is of little use in this state; however, when its hydrocarbon chains are broken down, they can be manipulated into a wide range of useful compounds. How is this accomplished? Believe it or not, by boiling—or distilling. "Cracked" hydrocarbons, when subjected to intense heat, yield a variety of compounds, each of which has a different boiling point and separates in the distillation process. Some of those compounds include gasoline, ethylene, propane, butane, diesel fuel, etc. These powerful, toxic, concentrated compounds are commonly known to be in fuels, degreasers and solvents, lighter fluids, nail polish removers, paint and paint thinners, mineral spirits, etc. However, petroleum distillates are incorporated into many other more subtle applications, such as household cleaners, personal care products and plastics.
3. Our continued thirst for petroleum and its by-products has created a dangerous situation for our planet. Not only does the actual use of petroleum and petroleum distillates cause air, ground and water pollution, the process of finding and retrieving and moving and refining petroleum creates massive pollution. Also, because petroleum is not a renewable resource, it is rapidly being depleted and is, by some estimates, due to 'run out' by 2050. Although the federal government's own bureaus and organizations support these facts, many powerful manufacturing industries have successfully lobbied for delays in mandatory fuel efficiency standards for automobiles, and for tighter controls on chemical waste production.
4. It is important to understand that, although petrochemicals have made our lives more convenient and have provided short-term benefits (affordable travel, reduction in insect-borne diseases, etc.), there are hidden long-term costs. Future generations will have to fund the incredibly expensive process of extricating toxic chemicals from the air, water and land. Further, treating the human illnesses caused by exposure to solvents, pesticides, etc., could cost tens of billions of dollars. This casts serious doubt on the notion that petrochemicals are an 'inexpensive' convenience.
5. There are natural, less toxic alternatives for many of these offending consumer products. Many of these natural alternatives are made from plant-based, renewable resources and are packaged in containers that are more easily and fuel-efficiently recycled. By making responsible choices about alternatives to petrochemicals, we can make our homes and communities safer.

Ask Rustle the LeafTM About...

Dear Rustle:

Can you tell me what kind of products might contain poisons made from petroleum?

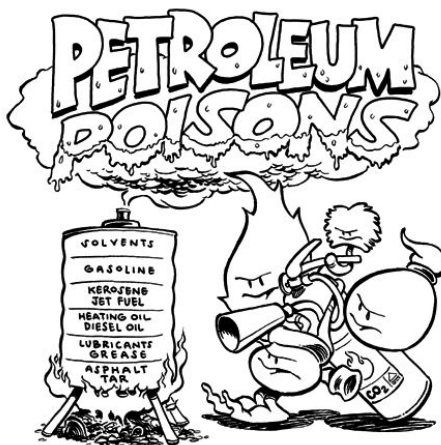
-- Eric, Ridgefield, CT

Dear Eric:

It may be hard to believe, but almost every kind of product that's used for cleaning can contain poisons. That includes everything from grease removers to furniture polish to glass cleaner to bathroom tile and tub cleaners. These cleaners have one thing in common: they are made with ingredients that were distilled from crude oil (petroleum). Companies that use petroleum and other toxins in their products aren't trying to poison the environment. They're goal is to make the most affordable, powerful cleaners they can. They do it so people who buy those cleaners pay less for them and save a lot of money (which everyone likes). Unfortunately, there's still a 'price' to pay for all these toxic chemicals in household products...and the environment ends up paying that price.

As more and more of these 'petroleum poisons' are rinsed down drains or poured out in driveways or thrown into the trash, they find their way into groundwater, topsoil and even into the very biological tissues of plants and animals...including humans. On a cellular level, these poisons can cause mutations and diseases (like cancer).

On a global level, there's another effect caused by these poisons. Many of the chemicals used in these cleaners are known as 'petroleum distillates.' You may recognize the word 'petroleum' as being associated with oil and gas. Petroleum distillates are chemicals that come from petroleum. In other words, not only do many toxins in cleaning products pollute the earth in their end use, they first require the energy and environmental risks of drilling,



pumping, shipping and refining crude oil.

That's the bad news, Eric. The good news is that there are a growing number of companies making natural, biodegradable, non-polluting cleaners to replace all those cleaners containing 'petroleum poisons.'

Today, people can buy all types of cleaners and dish soaps and laundry detergents made without toxins. In most cases, these 'natural' companies also package their natural cleaners in recycled and/or highly recyclable containers—a real bonus where Planet Earth is concerned. So, where can you find these natural cleaners? Almost every health food or natural products store sells them. And now, even major grocery store chains and mass retail chains are starting to sell them. In most cases, these natural cleaners cost a little more than the national brands we've come to recognize. But, a few dollars per year is a small price to pay when you consider the long-term impact on the Earth.

Thanks for your question, Eric! I hope you become a grown-up that understands the importance of choosing natural products whenever possible.

Your Friend,

RUSTLE^{THE} LEAF

Read the “Ask Rustle the Leaf About Petroleum Poisons” page and fill in the blanks below:

Petroleum is another name for chemicals that come from crude oil. Petroleum can be _____ to create a number of other chemicals used in household products.

Some of these products are used for _____ and _____.

Although companies that make products with petroleum chemicals are not trying to cause problems, they are contributing to _____ of the environment.

Also, products made with petroleum chemicals can affect the health of _____

and _____, even causing diseases like _____.

In the future, people will have to find ways to _____ petroleum and other chemicals from

the air, water and ground. This makes the idea that petroleum-based cleaners are

_____ seem questionable.



Petroleum Poisons Word Find

(Words below do not have spaces in puzzle)

ASPHALT	LUBRICANTS
BUTANE	MINERAL OIL
DIESEL FUEL	NAIL POLISH
DISTILLATE	PAINT
FURNITURE POLISH	PARAFFIN
GASOLINE	PESTICIDES
GREASE	PETROLATUM
HEATING OIL	SOLVENTS
JET FUEL	TAR
KEROSENE	TOLUENE
	XYLENE



HIDING PLACES FOR PETROLEUM POISONS

Petroleum Poisons in the Kitchen

APPLICATION (Example: countertop cleaner)	BRAND NAME (Example: Formula 409)

Petroleum Poisons in the Bathroom

APPLICATION (Example: glass cleaner)	BRAND NAME (Example: Windex)

Petroleum Poisons in the Laundry Room or Storage Closet

APPLICATION (Example: spot remover)	BRAND NAME (Example: Clorox)

PAGE 2: HIDING PLACES FOR “PETROLEUM POISONS”

Petroleum Poisons in the Garage or Workshop

APPLICATION (Example: brake fluid)	BRAND NAME (Example: Raybestos)

Petroleum Poisons in the Garden Shed

APPLICATION (Example: pesticide)	BRAND NAME (Example: Raid)

Petroleum Poisons in the Living Room

APPLICATION (Example: furniture polish)	BRAND NAME (Example: Old English)

For help with this worksheet, visit: <http://www.epa.gov/kidshometour/tour.htm#view>. This web site offers a “Toxic House Tour”, which highlight the various places where Petroleum Poisons and other household toxins can be found.

RUSTLE THE LEAF™

BY PONCE & WRIGHT

CLASSROOM COMIC

