

The Smoking Milkshake

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ABSTRACT

Objectives: This teaching idea is designed for students to learn about the ingredients in cigarettes and the potential short-term health consequences of these ingredients, as well as to learn about the general effects of smoking. Students will complete an activity to use this information in a hypothetical, but potentially, real-world situation. **Target Audience:** Middle school students.

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INTRODUCTION

In the United States from 1997-2001, cigarette smoking was estimated as responsible for over 400,000 annual deaths.¹ Because most adults begin their smoking habits while in adolescence,² it seems clear that tobacco use prevention and refusal strategies should be taught to students prior to entering high school. The U.S. Department of Health and Human Services made a primary goal in its *Healthy People 2010* strategy to reduce smoking among adolescents to less than 16%.³ The 2005 survey statistics from the *Healthy People 2010* database indicate that approximately 23% of adolescents in grades 9-12 smoked cigarettes within the previous month.⁴ Whereas this percentage represents a considerable decrease from the estimated 35% of the 1999 baseline measure of adolescent smoking, it is a slight increase from the 22% reported in 2004.⁴ Although there does appear to be an overall downward trend in adolescent smoking prevalence, the lack of further improvement between 2004-05 indicates that reaching the *Healthy People 2010* goal of 16% by 2010 could be a significant challenge.

In the United States, some type of tobacco prevention program is included in approximately 97% of schools.⁵ Although it seems likely that teachers played a role in

reducing the percentage of adolescent smokers in those programs, results from research conducted by the American Legacy Foundation indicated that fewer than one-third of U.S. schools utilize a multi-strategy prevention program.⁵ The American Legacy Foundation reports that schools who incorporate a multi-strategy approach have a lower level of smoking prevalence among their students.⁵ A multi-strategy tobacco prevention approach consists of using at least three of the four following components: (1) learning about the short-term health consequences of smoking, (2) correcting misperceptions, (3) identifying and discussing social influences, and (4) learning refusal skills.⁵ The following lesson can be used as a part of a multi-strategy approach to address the first two multi-strategy components. This lesson also can be used to assist students in using and developing their critical thinking skills through candid conversations regarding the ingredients of cigarettes and the possible related consequences of these ingredients, as well as to learn about the general effects of smoking.

OBJECTIVES

At the end of this teaching strategy, students should be able to:

- 1) Identify hazardous cigarette ingredients

and apply that information to short-term health consequences that these ingredients and the general effects of smoking have on the body.

- 2) Assess a potential real-world situation (involving a friend's suggestion to try a cigarette) and develop a personal statement about the way this situation could be managed in a positive and effective manner using information learned in this lesson.

TARGET POPULATION

This activity is designed for middle school students. It is a strategy best used in a health or drug-related course.

MATERIALS AND RESOURCES

- Empty cigarette pack (or image of one)
- Teacher Resources (Figure 1)
- Cigarette Ingredients Labeling Worksheet (Figure 2)

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Figure 1. Teacher Resources

Why cigarettes don't have an ingredients label:

Because cigarettes are not considered a food, they are exempt from having to comply with federal regulations requiring the ingredients and nutrition labels with which people are familiar on the foods they buy. Cigarette packages have been required to carry the Surgeon General's warning since the passage of the Public Health Cigarette Smoking Act in 1970. Information about this Act can be accessed at: http://www.cdc.gov/tobacco/data_statistics/sgr/sgr_2000/highlights/highlight_labels.htm

Flavoring Ingredients in Cigarettes:

A complete list that includes the Flavoring Ingredients listed on Side A of the Cigarette Ingredient/Effects Worksheet (Figure 3) can be found at: http://www.philipmorrisusa.com/en/cms/Products/Cigarettes/Ingredients/Tobacco_Flavor_Ingredients/default.aspx?src=top_nav

Non-Tobacco Ingredients in Cigarettes:

Philip Morris states that the non-tobacco ingredients which are listed on Side B of the Cigarette Ingredient/Effects Worksheet (Figure 3) are for use in the manufacture of the actual cigarette (e.g., filter, paper, adhesive, ink). A complete list of the ingredients they use in their cigarettes can be found on their website: http://www.philipmorrisusa.com/en/cms/Products/Cigarettes/Ingredients/Non_Tobacco_Ingredients/default.aspx?src=top_nav

The Centers for Disease Control and Prevention has developed a list of summaries to explain the hazards of various toxic substances. All of the non-tobacco ingredients on Side B of the Cigarette Ingredient/Effects Worksheet (Figure 3) are a part of that list. Below are abbreviated versions of that information. More complete information about the toxicity of these ingredients can be found at the U.S. Department of Health and Human Services Agency for Toxic Substances & Disease Registry website: <http://www.atsdr.cdc.gov/toxfaq.html>.

Audible pronunciation help for each of the chemicals listed on Side B of the Cigarette Ingredients/Effects Worksheet (Figure 3) is available at: <http://dictionary.reference.com>.

- **What is acetone?** <http://www.atsdr.cdc.gov/tfacts21.html>
Acetone is a manufactured chemical that is also found naturally in the environment. It is a colorless liquid with a distinct smell and taste. It evaporates easily, is flammable and dissolves in water. Acetone is used to make plastic, fibers, drugs and other chemicals. It is the active ingredient in nail polish remover and paint thinner, and is used to dissolve other substances. Exposure to acetone can irritate a person's eyes and respiratory system, and make him/her dizzy.
- **What is ammonia?** <http://www.atsdr.cdc.gov/tfacts126.html>
Ammonia is a colorless gas with a very distinct pungent, suffocating odor. This odor is familiar to many people because ammonia is used in smelling salts, many household and industrial cleaners, and window-cleaning products. Exposure to high levels of ammonia in the air may be irritating to skin, eyes, throat and lungs, and cause coughing and burns. Lung damage and death may occur after exposure to very high concentrations of ammonia. People with asthma may be more sensitive to breathing ammonia than others.
- **What is ethylene glycol?** <http://www.atsdr.cdc.gov/tfacts96.html>
Ethylene glycol is a synthetic liquid substance that absorbs water. It is odorless but has a sweet taste. Ethylene glycol is used to make antifreeze and de-icing solutions for cars, airplanes and boats. It is also used in hydraulic brake fluids and inks used in stamp pads, ballpoint pens and print shops. When ethylene glycol breaks down in the body, it forms chemicals that crystallize and the crystals can collect in kidneys and affect kidney function.
- **What is formaldehyde?** <http://www.atsdr.cdc.gov/tfacts111.html>
At room temperature, formaldehyde is a colorless, flammable gas that has a distinct, pungent smell. It is used as a preservative and is used in the production of fertilizer, paper and plywood. Low levels of formaldehyde can cause irritation of the eyes, nose, throat and skin. It is possible that people with asthma may be more sensitive to the effects of inhaled formaldehyde.
- **What is lead?** <http://www.atsdr.cdc.gov/tfacts13.html>
Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust and has many different uses. It is used in the production of batteries, ammunition, metal products and devices to shield X-rays. Lead exposure can affect almost every organ and system in the body, with the main target for lead toxicity being the nervous system.

**Figure 1. Teacher Resources (Con't)**

- **What is mercury?** <http://www.atsdr.cdc.gov/tfacts46.html>
Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas. Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments. Mercury, at high levels, may damage the brain and kidneys as well as a developing fetus.
- **What is naphthalene?** <http://www.atsdr.cdc.gov/tfacts67.html>
Naphthalene is a white solid that evaporates easily. Fuels such as petroleum and coal contain naphthalene. It is also called white tar and has been used in mothballs and moth flakes. The major commercial use of naphthalene is in the manufacture of polyvinyl chloride (PVC) plastics. Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. This exposure could cause a person to have too few red blood cells until the body replaces the destroyed cells. This condition is called hemolytic anemia. Some symptoms of hemolytic anemia are fatigue, lack of appetite, restlessness and pale skin.
- **What is phenol?** <http://www.atsdr.cdc.gov/tfacts115.html>
Phenol is both a manufactured chemical and a natural substance. Phenol is used in slimicides (chemicals that kill bacteria and fungi in slimes) as a disinfectant and antiseptic, and in medicinal preparations such as mouthwash and sore throat lozenges. Short-term exposure to phenol in the air can cause respiratory irritation, headaches and burning eyes.
- **What is pyridine?** <http://www.atsdr.cdc.gov/tfacts52.html>
Pyridine is a colorless liquid with an unpleasant smell that is used to dissolve other substances. It is also used to make many different products such as medicines, vitamins, food flavorings, paints, dyes, rubber products, adhesives, insecticides and herbicides. Inhalation of pyridine has been known to cause headaches, giddiness, a desire to sleep, quickening of the pulse and rapid breathing in some individuals.
- **What is sodium hydroxide?** <http://www.atsdr.cdc.gov/tfacts178.html>
Sodium hydroxide is a manufactured substance that is very corrosive. Common names for this substance include caustic soda and lye. Sodium hydroxide is used to manufacture soaps, rayon, paper, explosives, dyestuffs and petroleum products. It is commonly present in commercial drain and oven cleaners. Inhalation of low levels of sodium hydroxide may cause irritation of the nose, throat and respiratory airways.
- **What is toluene?** <http://www.atsdr.cdc.gov/tfacts56.html>
Toluene is a clear, colorless liquid with a distinctive smell. Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives (glue), and rubber and in some printing and leather tanning processes. Toluene may affect the nervous system. Low to moderate levels can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite and hearing and color vision loss. These symptoms usually disappear when exposure is stopped. Inhaling high levels of toluene in a short time can make you feel light-headed, dizzy, or sleepy. It also can cause unconsciousness, and even death. High levels of toluene may affect kidneys.

Other Helpful Websites:

- American Cancer Society: <http://www.americancancer.org>
- American Legacy Foundation: <http://americanlegacy.org>
- American Lung Association: <http://www.lungusa.org>
- CDC Smoking and Tobacco Use: <http://www.cdc.gov/tobacco/index.htm>

Movies about the Smoking Industry:

These movies should NOT be shown to students (both are rated R) but rather viewed by the teacher for additional perspectives about the smoking industry. The following information was acquired from the Internet Movie Database (www.imdb.com)

- *Thank You for Smoking*. Director: Jason Reitman. Performers: Aaron Eckhart, Maria Bello. Room 9 Entertainment. MPAA Rating: R. 2005.
 - This movie is a satirical comedy that follows the machinations of Big Tobacco's chief spokesman, Nick Naylor, who spins on behalf of cigarettes while trying to remain a role model for his twelve-year-old son.
- *The Insider*. Director: Michael Mann. Performers: Russell Crowe, Al Pacino. Blue Lion Entertainment. MPAA Rating: R. 1999.
 - In this movie, a research chemist comes under personal and professional attack when he decides to appear in a "60 Minutes" expose on Big Tobacco. This movie is based on a true story.

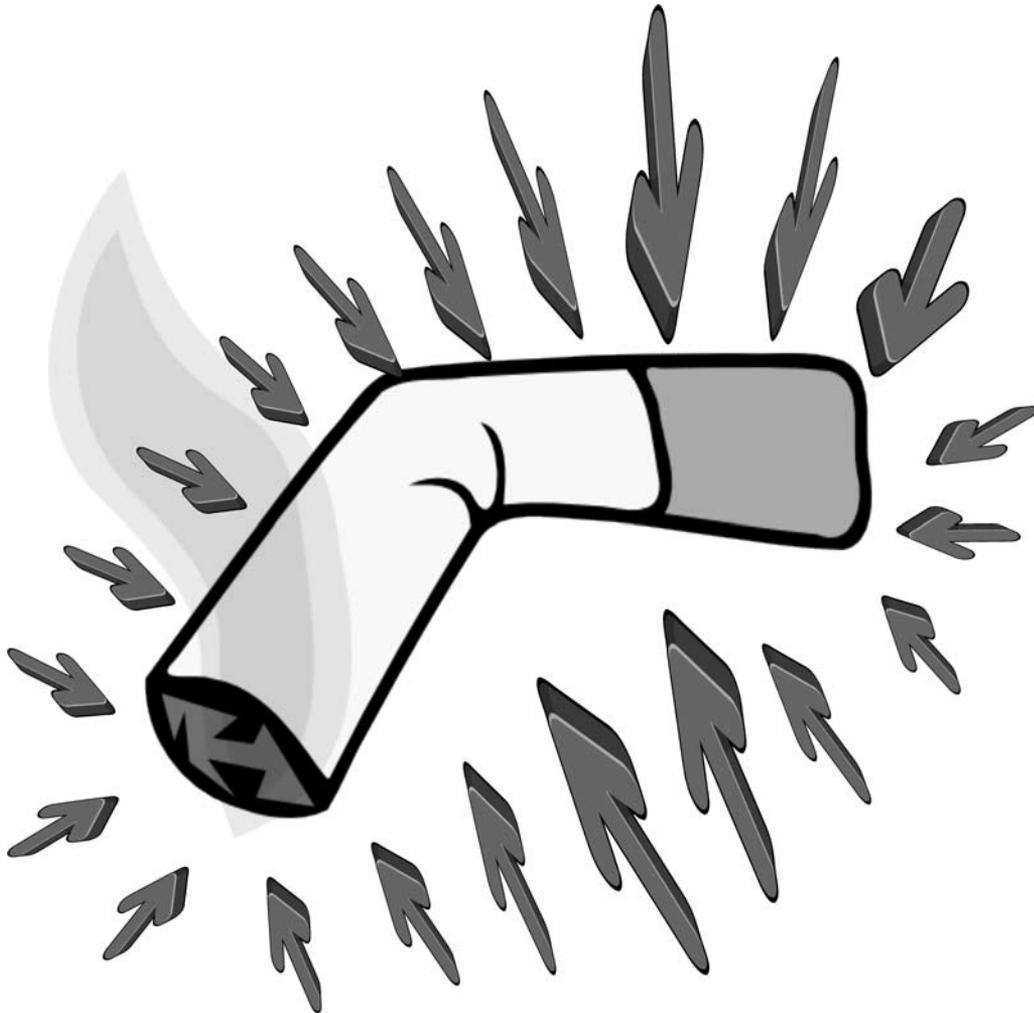


Figure 2. Cigarette Ingredients Labeling Worksheet

Cigarette Ingredients

NAME: _____

Directions: During the demonstration, as you learn the different ingredients in cigarettes, please write them beside the arrows that surround the cigarette below.



• Cigarette Ingredients/Effects Worksheet (Figure 3)

• Flavoring Ingredients (see Figure 3, Side A)
• Toxic Ingredients (i.e., plastic bottles filled with colored water and labeled as the Toxic Ingredients) (see Figure 3, Side B)

• Cigarette Scenario Worksheet (Figure 4)
• Blender
• Milkshake glass

• Drinking straw
• Container of vanilla ice cream
• Carton of milk
• Ice cream scoop
• Measuring cup

PREPARATION

Prior to beginning the class activity, the teacher should become familiar with the

Teacher's Resources (Figure 1). In addition, a table should be prepared, with prominent placing of the blender, ice cream and milk. The flavoring ingredients also should be easily visible. Because it would be unethical to use the toxic ingredients contained in cigarettes, the teacher should create substitutes by using clear plastic bottles filled with different colors. Labels with the names of the toxic ingredients should be taped to



the bottles to give the impression that those ingredients, rather than just colored water, are within. These bottles also should be displayed on the table for students to see.

PROCEDURE

The teacher will begin the activity by showing students the nutrition labels that a manufacturer places on an ice cream container and carton of milk and, thereby, open a discussion about the importance of knowing the ingredients that are in the foods people eat. The teacher should point out that, although people may not always know what some of the ingredients are in foods (as may be the case with preservatives and colorings), consumers are provided with enough information to find additional facts.

Next, the teacher should show the class the empty pack of cigarettes (or image of one) and ask them if they see a “nutrition label” (students will not be able to find a nutrition label, because cigarette packs are not required to carry one). Now, the teacher is ready to distribute the Cigarette Ingredient Labeling Worksheet (Figure 2) while leading a brief discussion with students about why cigarettes don’t have ingredients listed (Figure 1).

Next, the teacher should ask students what ingredients they believe are contained in cigarettes. While answers will vary, students of this age will likely name tobacco and a few also may indicate nicotine. Students should write those two ingredients (and any other correct ones they know) on their worksheet. The teacher should also ask if students think those ingredients are good or bad for consumption. Answers will vary depending upon previous education.

Cigarettes can have many ingredients. Philip Morris®, the nations largest cigarette manufacturer,⁶ uses over 200 ingredients in the production of their cigarettes (Figure 1). Distribute the Cigarette Ingredients/Effects Worksheet (Figure 3), and explain that using several of the listed ingredients, they, as a class, will assist the teacher in making a “Smoking Milkshake.”

To begin, the teacher should place 2 scoops of ice cream into the blender and

Figure 3. Cigarette Ingredients/Effects Worksheet

Side A. Flavoring Ingredients in Cigarettes

- Sugar
- Spearmint
- Peppermint
- Vanilla
- Cocoa
- Orange
- Lime
- Tangerine
- Coffee

Philip Morris USA. Available at: http://www.philipmorrisusa.com/en/cms/Products/Cigarettes/Ingredients/Tobacco_Flavor_Ingredients/default.aspx?src=top_nav

Side B. Non-tobacco Toxic Ingredients in Cigarettes

Non-Tobacco Ingredient	Effect
▪ Acetone (nail polish remover, paint thinner)	_____
▪ Ammonia (medicines, cosmetics)	_____
▪ Ethylene Glycol (antifreeze, brake fluid)	_____
▪ Formaldehyde (preservative, fertilizer)	_____
▪ Lead (batteries)	_____
▪ Mercury (thermometers, batteries)	_____
▪ Naphthalene (mothballs)	_____
▪ Phenol (disinfectant, mouthwash)	_____
▪ Pyridine (paint, dye, glue)	_____
▪ Sodium Hydroxide (soap, dye)	_____
▪ Toluene (fingernail polish, glue)	_____

Philip Morris USA. Available at: http://www.philipmorrisusa.com/en/cms/Products/Cigarettes/Ingredients/Non_Tobacco_Ingredients/default.aspx?src=top_nav

U.S. Department of Health and Human Services. Toxic Substances. U.S. Department of Health and Human Services Agency for Toxic Substances & Disease Registry. Available at: <http://www.atsdr.cdc.gov/toxfaq.html>

add 1 cup of milk. The teacher is ready to ask students to examine Side A of the Cigarette Ingredients/Effects worksheet (Figure 3) and point out that many of the ingredients in cigarettes are added for flavor. Using the measuring cup, begin adding small amounts of each of the flavoring ingredients. The teacher should comment that several of the items are sweet and ask students if they think that the milkshake would taste better as each flavoring ingredient is added.

After adding all of the flavoring ingredients, the teacher should have students flip the Cigarette Ingredients/Effects worksheet (Figure 3) to Side B and explain that, although many of the ingredients in cigarettes may seem harmless, like the flavorings, many

others are potentially harmful ⁷ (Figure 1). The teacher should call upon an individual student and ask him/her to name a Toxic Ingredient from the handout and share with the class the common household items in which this ingredient can be found. The teacher then should grab that “toxic ingredient” (the appropriate bottle of colored water), explain to the class its potential health effects (Figure 1), and require students to write those effects on the proper line on the worksheet. Next, the teacher should add a small amount of the “ingredient” into the blender. Several students can be called upon in turn, each reading an ingredient from the list. The teacher should continue the process of explaining the potential negative



Figure 4. Cigarette Scenario Worksheet

Cigarette Scenario

Consider the following scenario:

You are at a friend's house after school, and you both see a pack of cigarettes that has been left on the kitchen counter. Your friend takes a cigarette out of the pack and suggests that you "give it a try." Based on what you have just learned about cigarette ingredients, develop a statement explaining why "giving it a try" is not a good idea.

health effects and adding each ingredient to the "milkshake." The students should complete the worksheet as each ingredient is discussed. Again, the teacher should periodically ask students how they think the milkshake would likely taste, now that the toxic ingredients are being added (the mixture will begin to look unappetizing with the addition of the different colors of water).

Once everything has been added, the blender should be covered and started, completely mixing the ingredients. The teacher

should pour the contents into the milkshake glass and add the drinking straw. Hold the milkshake up for students to see. The mixture will likely have a murky appearance and possible unpleasant odor depending upon amounts and variations of certain ingredients used. Ask the students if they think that taking a drink of the milkshake would be a good idea. Ask "why?" or "why not?" Lead their answers into a discussion about potentially becoming ill from drinking the milkshake containing ingredients

found in cigarettes. A natural follow-up to that discussion will be to ask students about the similarities between the milkshake and cigarettes. If they agree that drinking the milkshake could be harmful, they also should begin to understand the dangers of smoking a cigarette.

The discussion should return to the cigarette package and the lack of a "nutrition label." Ask students, "Do you think people would be more hesitant to buy cigarettes or smoke them if they were actually aware



of the ingredients and what some of those ingredients may do to a body?" The teacher and students now should discuss how the lack of an ingredient list may lead people to the misperception that cigarettes are not harmful to a person.

ASSESSMENT

To assess student learning (Objective One), a quiz can be administered to cover the non-tobacco ingredients and the potential short-term health consequences of smoking a cigarette from Side B of the Cigarette Ingredients/Effects Worksheet (Figure 3). Because the chemical names of these ingredients may be difficult for some students to remember, the teacher should allow the household ingredients as acceptable answers. To further assess the effectiveness of the lesson (Objective Two), students should complete the Cigarette Scenario Worksheet

(Figure 4), which allows students the opportunity to develop a personal statement about why trying a cigarette is not a good idea using information about the potential health consequences learned from this lesson.

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