

# Section 2: Health Effects

The burden of disease from tobacco is astounding. More than 6.4 million American children under the age 18 will eventually die from smoking-related diseases unless current rates are reversed. Health care costs from tobacco are over \$89 Billion annually. Although lung cancer is commonly associated with smoking, there are nine other forms of cancer linked to tobacco use. Other disease burdens include emphysema, cataracts, pneumonia, and gangrene.\*

The following Fact sheets and Activities will instruct your students on the short-term and long-term health effects of tobacco use. These resources will enhance student understanding of lung function, and provide visual aids to hopefully discourage initiation of tobacco use and encourage cessation.

## Fact Sheets

- 2.1 Tobacco and Your Health
- 2.2 What You Should Know About Tobacco
- 2.3 Inhale/Exhale
- 2.4 Women and Tobacco
- 2.5 Graphic Poster of Health Effects

## Activities

### Classroom

- 2.6 Gasping For Air
- 2.7 Make Model Lungs
- 2.8 Collect Tar!

### School-Wide

- 2.9 Cups Spell-Out
- 2.10 Memorial
- 2.11 Number Crazy

## Websites

- <http://www.cdc.gov>
- <http://www.ala.gov>
- <http://www.unfiltered.com>

\*U.S. Centers for Disease Control and Prevention (CDC), State Highlights 2004: [www.cdc.gov/tobacco/datahighlights/index.htm](http://www.cdc.gov/tobacco/datahighlights/index.htm)

"Factsheet: The Toll of Tobacco in the United States of America," *Campaign for Tobacco Free Kids*, 2005.

"Cigarette Smoking-Attributable Morbidity- United States, 2000" *MMWR* 52(35): 842-844.



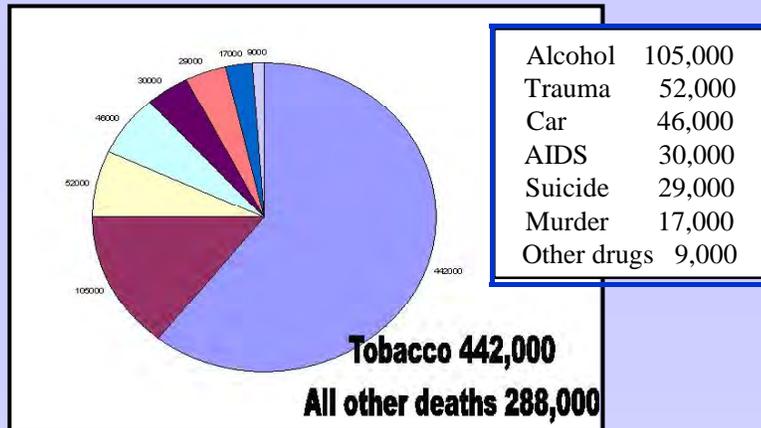
# Tobacco and Your Health



**Tobacco is the ONLY legal product that KILLS when used as intended!**

## Tobacco Kills

- On average, smokers lose 15 years of life.
- Tobacco kills 1,200 people A DAY.
- Researchers estimate that 50% of smokers who began smoking when they were young will die of a smoking related illness.
- Smokers have more colds than non-smokers because their bodies aren't as efficient at clearing out germs.
- Four out of five lung cancers are caused by smoking. Nine out of 10 people who get lung cancer die from the disease, usually within two years of diagnosis.
- More people die from smoking than from AIDS, car accidents, suicide, murder, fires and other drugs COMBINED. (see chart below)



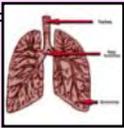
## Tobacco's Other Health Effects

- Respiratory problems such as increased coughing, phlegm, wheezing, chest colds and shortness of breath.
- Serious ailments such as bronchitis, pneumonia, emphysema, strokes, heart attacks, ulcers, ear infections, osteoporosis and impotence.
- Asthma attacks or increased asthma symptoms.
- Dental problems such as yellow teeth, gum disease, tooth decay and tooth loss.
- Dulled sense of smell and taste.
- Cold fingers and toes.
- Zits – It takes longer for a smoker's acne to heal.
- Hair loss – even for some teens.
- Low sperm count: Even teenage smokers have fewer than half as many sperm per ejaculate as non-smokers.
- Premature wrinkling and related signs of premature aging.
- Infertility, sudden infant death syndrome and low birth-weight babies.

# What You Should Know About Tobacco

- Tobacco is the #1 preventable cause of death.
- 12 million Americans have died from tobacco-related illnesses since 1964.
- 94,000 fetal and infant deaths have been caused by smoking since 1964.
- Over 435,000 Americans die from tobacco-related illness every year, and 1,200 people die every day.
- Tobacco costs the nation \$157.7 Billion dollars EVERY YEAR in health care.
- About 1 out of every 4 high school students smoke.
- Smoking causes 10 different kinds of cancer (lung, mouth, throat, cervix, pancreas, kidney, stomach, gum, pharynx and larynx) and can lead to leukemia, cataracts, pneumonia and aortic aneurysms.
- Smoking low-tar cigarettes does not reduce your risk for lung cancer.
- After stopping smoking, former smokers eventually return to normal age-related lung function.
- One half of all lifetime smokers will die early because of their decision to smoke.
- Three out of four smokers say they would like to quit
- It takes an average of 7 tries before successfully quitting

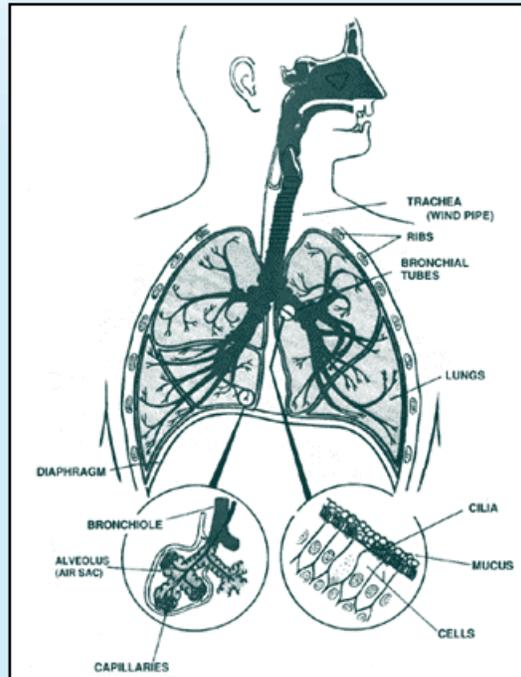
## What Tobacco Can Do To Your Body....

<p><b>Eyes and Ears</b></p> <ul style="list-style-type: none"> <li>• Increase risk of cataracts</li> <li>• Increased risk of blindness from cataract</li> <li>• Can lead to hearing loss</li> </ul> 	<p><b>Throat</b></p> <ul style="list-style-type: none"> <li>• Four out of five cases of esophageal cancer are due to smoking</li> <li>• As smoke enters your throat, cancer-causing chemicals condense on your mucous membranes</li> </ul>
<p><b>Mouth and Teeth</b></p> <ul style="list-style-type: none"> <li>• Changes the way food tastes</li> <li>• Increased risk of tongue and mouth cancer</li> <li>• Increased risk of gum disease</li> <li>• Harder for saliva to remove germ</li> <li>• Yellow teeth</li> </ul>	<p><b>Lungs</b></p>  <ul style="list-style-type: none"> <li>• Decreased lung capacity</li> <li>• Increased risk of asthma</li> <li>• 85% of lung cancers are caused by smoke</li> <li>• 90% of all emphysema cases are caused by smoke</li> </ul>
<p><b>Skin</b></p> <ul style="list-style-type: none"> <li>• Smoking decreases blood flow to the skin leading to wrinkles</li> <li>• Smokers are twice as likely as non-smokers to develop psoriasis – a red/silver rash that can occur anywhere</li> </ul> 	<p><b>Heart</b></p> <ul style="list-style-type: none"> <li>• Within 1 minute of your first puff, your heart begins to beat faster, your blood pressure to increase and forcing your heart to work harder</li> <li>• Arteries become blocked</li> </ul>

# Inhale/Exhale

Unless you breathe in oxygen, you will die within minutes. Every minute, you will breathe in and out 10 to 15 times for as long as you live! That's why it's important to take care of your lungs!

If you smoke, you inhale gases like carbon monoxide as well as tars and nicotine directly into your lungs. Tar stains the lungs and can cause cancer. Nicotine narrows your blood vessels and cuts down the flow of oxygen to your body. Carbon monoxide drives out oxygen from your red blood cells.



## How Do Our Lungs Work?

Every time you breathe in (inhalation), air travels from the nose or mouth, through the voice box (larynx) and down the windpipe (trachea). The trachea then branches into the main bronchial tubes with one going into each of the lungs.

The bronchial tubes keep dividing, becoming smaller and narrower in the process. At the end of the smallest airways are the alveoli, tiny air sacs that look like clusters of grapes. There are 300 million alveoli in the lungs - if you laid them side by side, they would cover an entire tennis court!

The alveoli are the “work horses” of the lungs since it's here that the oxygen from the air is soaked up by the blood, at the same time that the blood dumps carbon dioxide, which the body can't use, back into the alveoli. The blood then distributes the oxygen throughout the body so it can produce energy, while the carbon dioxide is breathed out (exhalation)

# Women and Tobacco



## ***Mortality***

Women smokers who die of a smoking related disease lose on average 14 years of potential life.

From 1995 to 1999, over 178,000 women died each year of smoking-related diseases.

Since the Surgeon Generals Report on Women and Smoking was released in 1980, about 3 million women in the U.S. have died prematurely of smoking related diseases.

## ***Cancer***

Cigarette smoking is the major cause of lung cancer among women. About 90 percent of all lung cancer deaths among U.S. women smokers are attributable to smoking.

In the 1980s, lung cancer overtook breast cancer as the leading cause of cancer death of women. Since 1950, lung cancer mortality rates for women have increased 600 percent.

## ***Menstrual Functions***

Women who smoke have natural menopause at a younger age than do nonsmokers, and they may experience more severe menopausal symptoms.

## ***Pregnancy***

Women who smoke during pregnancy risk pregnancy complications, premature birth, low-birth weight infants, stillbirth, and sudden infant death syndrome (SIDS).

## ***Prevalence***

A report published in the American Journal of Public Health shows that girls have an easier time buying cigarettes, even at the youngest ages.

Females are more likely than males to feel dependent on cigarettes.

## ***Advertising***

Cigarette companies first began targeting women in the 1920s to recruit female smokers, equating smoking with freedom and emancipation.

There was an abrupt increase in smoking initiation among girls around 1967- the same time advertisements for brands specifically targeted at women entered the market.

Six years after the introduction of Virginia Slims and other brands aimed at the female market, the rate of smoking initiation of 12 year-old girls had increased by 110 percent.

Marketing cigarettes as slims or thins plays into social pressures on young women to control their weight, manage stress, and appear grown-up. One study found that girls who had dieted more than once per week had four times the odds of becoming smokers.

Cigarette marketing towards women stresses an association between social desirability, independence, and smoking messages conveyed through advertisements featuring slim, attractive and athletic models.

## ***The Pill***

Women over age 35 who smoke and take the birth control pill are nine times more likely to have a heart attack than women who don't smoke and take the pill.

"Fact Sheet: Women and Girls and Tobacco" Campaign for Tobacco Free Kids, 2003.

"Fact Sheet: Tobacco Industry Targeting of Women and Girls," Campaign for Tobacco Free Kids, 2001.



**Throat Cancer - Removed Larynx**



**Stained Teeth, gingival disease**



**Gangrene Foot**



**Lung Cancer**



**Mouth Cancer**



**Mouth Cancer**

# Gasping For Air

**Time:** 10 minutes

**Materials:** One regular straw and one small coffee straw for each participant (round coffee straws are better than flat ones).

**Objective:** To help participants experience the effect of loss of lung capacity as a result of smoking.

**Note:** Be sure to determine any special health needs in the group. Do not allow someone to participate who has breathing difficulties, such as asthma or bronchitis.

*The problem with smoking is that it damages your body gradually, and it is sometimes difficult to feel the damage right away. This activity shows how it feels to have emphysema, a lung disease caused by many years of smoking. Simple acts such as standing up or walking across the room can make you feel pressure in your chest and panicky. Eventually, most people with emphysema have to use an oxygen tank for a few hours every day.*

## Activity Steps:

1. Provide each participant with a regular straw and a coffee straw. Explain that they are going to participate in an activity that demonstrates how difficult it might be to breathe in certain situations.
2. Ask each participant to pinch their nostrils closed and place the larger straw in his or her mouth.
3. Have participant breathe through the straw for one minute, while someone else (like you) times them.
4. Ask each participant to describe what it was like to breathe through the straw. In order to inhale the same amount of air that they normally inhale each minute, they needed to inhale more often, which raises the heart beat and becomes more tiring. Explain that this is what happens when a person smokes cigarettes. **Note:** Often people think that the harmful consequences of smoking are not experienced until they have smoked for many years. Point out that smoking can interfere with short-term goals like athletic performance or leisure activities.
5. Ask each participant to repeat the exercise using the coffee straw.
6. Point out that the long-term effects of smoking cigarettes are very serious. Breathing through the coffee straw demonstrates what it is like to breathe when you have chronic obstructive lung disease.
7. Remind participants of the many diseases that are linked to cigarette smoking and tobacco use.
8. Explanation: Emphysema and chronic bronchitis are two examples of chronic obstructive lung disease. In emphysema, there is a limited airflow into and out of the lungs due to changes in the smallest air passages and the walls of the alveoli (tiny air sacs). The alveoli are destroyed by cigarette smoke. It then becomes difficult for the lungs to bring in oxygen and remove carbon dioxide. The heart must work harder to get oxygen to cells. Chronic bronchitis is an inflammation of the bronchial tubes causing a thickening of the tube walls and an increase in mucous production, which narrows air passages, making it more difficult to breathe.

# Make Model Lungs

**Time:** 1 or 2 class periods

**Materials:**

Overhead transparency or plastic model of the human respiratory system  
6"x 4.5" (¼ sheet) piece of pink or gray construction paper (trachea)  
Plastic 2-liter soda bottle with black bottom cut off (thoracic cavity)  
Two round 9" or 12" pink balloons (lungs)  
Two drinking straws (bronchi)  
Medium-sized plastic bag large enough to fit over bottom end of bottle (diaphragm)  
3 or 4 cotton balls  
Transparent tape  
Medium-size, thin rubber band

**Objective:** Explain the function of the diaphragm in respiration in a paragraph of no less than 4 complete sentences to include the terms "expand", "contract", "inhale", and "exhale" as they relate to the diaphragm and the lungs during respiration.

**Activity Steps:**

- Step 1.** Teacher presents model or transparency of the human respiratory system and explains that it is just one of many working systems in the human body.
- Step 2.** Teacher follows the route of air as it enters and travels through the respiratory system, naming the parts and organs as well as their functions as the air passes through them. For example, teacher points to the trachea, names it, and says, "The trachea serves as the principal passage for conveying air to and from the lungs. Branching out from the trachea are the bronchi, which serve to carry the air to and from the individual lungs."
- Step 3.** Once the route of air is sufficiently traced and parts are named and defined, teacher recaps by retracing the route from start to finish uninterrupted.
- Step 4.** Once again, teacher points to parts and calls on individual students to name each part as the route is traced. Each time a part is named, teacher writes name on board.
- Step 5.** Teacher explains that students will now make their own models of the respiratory system and materials are distributed. Teacher may opt to display a previously made model as an example to which students may refer.
- Step 6.** Insert straws into balloons and tape together at top. These are bronchi and lungs.
- Step 7.** Insert these through open bottom of modified 2-liter soda bottle straw end first and bring ends of straws up through the neck of the bottle.

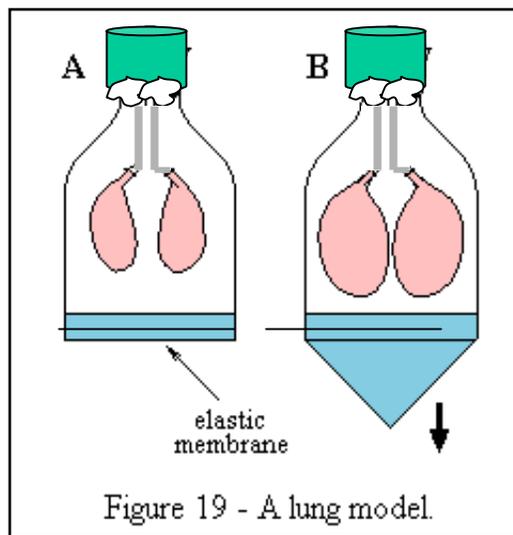
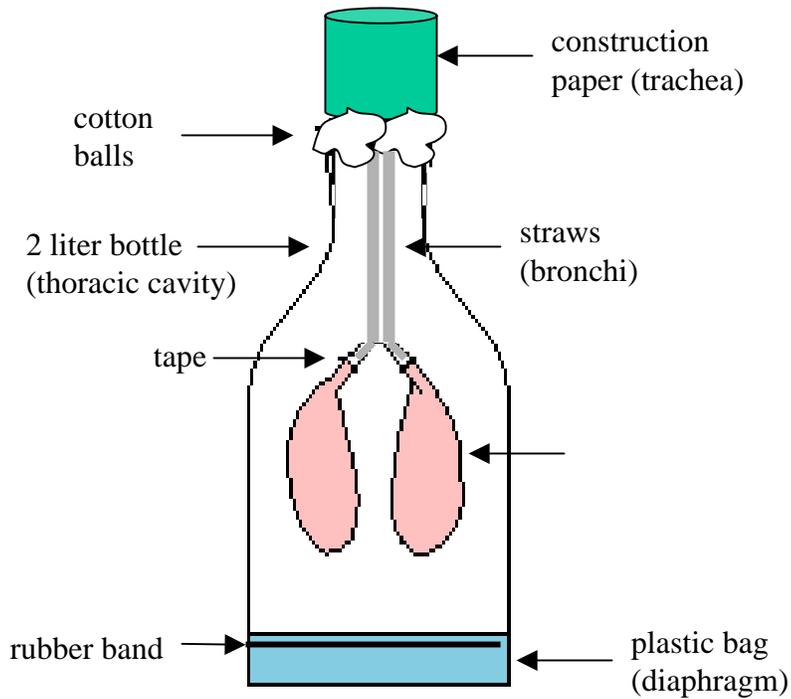
- Step 8.** Stuff neck of soda bottle with cotton balls around straws until spaces are plugged.
- Step 9.** Roll construction paper into a tube just round enough to fit over the tops of the straws. Tape closed and place over tops of two straws. This will be the trachea.
- Step 10.** Place plastic bag over bottom end of bottle and use the rubber band to hold it in place. This will serve as the diaphragm.
- Step 11.** Grasp bottom of plastic bag and pull down and push up. Watch as the "lungs" expand and contract as you do this. Students may even bend "trachea" and "bronchi" over so that the air supply is cut off and watch as nothing happens when the "diaphragm" is manipulated.

**Assessment:** Students will label the parts of the respiratory system on an activity sheet on which is depicted a cutaway view of the human respiratory system with blank spaces next to arrows pointing to parts. These parts will include the trachea, bronchi, lungs, thoracic cavity, and diaphragm. Students will also explain in a paragraph of no less than 4 sentences the function of the diaphragm in respiration and will include the terms expand, contract, inhale, and exhale (or variations of those terms) as they relate to the diaphragm and lungs. For example, when the diaphragm contracts, air is inhaled and the lungs expand with air. When the diaphragm expands, the lungs contract and the air is expelled or exhaled.

**Helpful Hints:** It is better to use cotton balls made from genuine cotton rather than the polyester type because it grips the sides of the bottle better and more efficiently prevents air from passing through. Also, ask that the bottom of the bottle be cut off at home by the parents prior to the student bringing it in.

*Please see the attached sheet for diagram of model.*

# Diagram of the Respiratory System Model from the Lesson Plan





**Time:** 1 day

**Materials:** Listed below

**Activity:** Have students collect tar. Note: The following Experiment: Tar Collector activity incorporates the use of cigarettes and the lighting of them. For ease of classroom management, it is suggested that students be put into groups of four. Make sure that students understand that all cigarettes will be distributed and lit by the teacher or another responsible adult. Monitor students at all times. For more information or other tobacco-related experiments, visit: [http://www.lung.ca/children/index\\_kids.html](http://www.lung.ca/children/index_kids.html). \*\* NOTE: Discuss this activity with your principal first as it involves actual burning of a cigarette

## EXPERIMENT: TAR COLLECTOR

Some smokers are unaware of the tar that collects in their lungs. This experiment will show some of the effects of cigarettes on a smoker's lungs.

### MATERIALS:

- 1 ketchup or mustard squeezable bottle (the tip must be large enough to hold a cigarette)
- 1 piece of Kleenex tissue paper or a few cotton balls
- 1 cigarette and matches (provided by teacher)

### METHOD:

1. Remove the lid from the bottle. Rinse and dry the container thoroughly. Place half of the Kleenex or a couple of cotton balls in the lid. Screw the lid back onto the bottle.
2. Open the flip top of the lid. Place the cigarette in the spout. You may need to cut off a portion of the spout to ensure that cigarette fits.
3. Light the cigarette. Simulate inhalation by squeezing the body of the bottle with a slow and regular pumping action. Repeat this action until the cigarette is almost finished. Optional: Repeat action with two or more cigarettes; this will yield the best results.
4. Withdraw Kleenex or cotton balls from the inside of the lid, and note the accumulation of tar.

### OBSERVATION:

- Observe the color of the Kleenex or cotton balls.
- Note the smell of the Kleenex or cotton balls.
- Note the collection of tar inside of the lid and on the Kleenex or cotton balls.
- Examine the color of the base of the cigarette filter.

## Cup Spell-Out

**Time:** 45 minutes

**Materials:** Plastic or Styrofoam cups

**Activity:** Spell out messages along the schoolyard fence.



Youth advocacy group Fighting Against Corporate Tobacco (FACT) from Bradford H.S. in Kenosha Wisconsin had a great time making a statement on the fence of their school's tennis courts. After a brainstorming meeting the youth agreed that they wanted the most exposure that they could receive. They came up with the FACTivism initiative known as "Cups in the Fence."

Their first order of business was to pick a message. The FACT group selected, "Tobacco Kills 1200 a Day." Next they plotted a location. Since the fence that surrounds their tennis courts is also next to the student parking lot, this location was perfect for their message. After getting permission from school administration the youth created their message in less than an hour. Since putting up the message, hundreds of youth have seen the message.

For more information visit <http://www.fightwithfact.com>

**Be You.. Be Tobacco Free**

# Memorial

**Time:** 1 –2 weeks

**Materials:** Poster board, note cards, mural paper

**Activity:** Set up a creative memorial to those who died from a tobacco-related illness. Include a card for participants to write the name of a person affected by tobacco. Or include postcards to mail to tobacco companies with a message about the health effects.



**Ann Abbott**, United States of America (Lung cancer)  
**Antonio Acosta Raya**, Spain (Lung cancer)  
**Umberto Agnelli**, Italy (Lung cancer)  
**Susana Aguado**, Spain (Chronic Airway Obstruction)  
**Claire Alderman**, USA (Bronchitis/Emphysema)  
**Byron Allen**, United Kingdom (Throat cancer)  
**John Andel**, USA (Lung cancer)  
**Elizabeth Atkinson**, USA (Bronchitis/Emphysema)



Have the students write names of people they knew who died from tobacco.

**from David:**

*I lost my father from emphysema when I was 24 years old. I was getting married in the Fall of that year. It was difficult for our family but it was a blessing in disguise because he was on oxygen 24 hour a day, he could barely breathe and all of his vital organs were deteriorating.*

*Emphysema is a terrible way to die. I wish my father quit smoking before his medical problem became life threatening. I quit smoking the day he died and it was definitely the best thing that I ever did for myself.*

**from Jennifer:**

*I lost the most important person to me on Feb. 10, 2003. My grandmother Dorothy Irene McFarland passed away from emphysema/COPD. If I could have breathed for her I would have. I miss her very much.*



Have the students write stories about people they know who have died and paste these on the memorial.

## Number Crazy

**Time:** One week

**Materials:** chalk, poster board, anything really!

**Activity:** Make the staggering numbers come to life around school. Chalk the sidewalks, make signs for the hallways and stairwells, create a mural or have a moment of silence.

Use the fact sheets provided in this guide at the beginning of this section or the statistics below.

**Every 72** seconds someone in the US dies from Tobacco

Tobacco kills **1,200** people A DAY

**92,000** Coloradoan youth alive today will die from Tobacco

Worldwide, someone dies from tobacco every **6 seconds**

**5.2 million** children alive today will die from a tobacco-related illness.

Cigarettes contain over **4,500** chemicals