

DANGEROUS CHEMICALS

At least 7,000 different chemicals (such as those found in car batteries and household cleaners) are hidden in tobacco smoke. Hundreds of them are toxic to your body.

ORGAN DESTROYER

Tobacco smoke can harm nearly every organ in your body.

ELECTRONIC THREAT

E-cigarettes contain the same addictive drug, nicotine, that real cigarettes do. Candy flavors appeal to kids and create the impression that these products are safe.

STAY SMART ABOUT TOBACCO

TOUGH TO QUIT

Nicotine in tobacco is especially addictive for young people. Roughly three out of four teens who smoke before 18 will smoke into adulthood.

DEATH RISK

About six million people die each year due to tobacco-related diseases.

ENDANGERS OTHERS

People who breathe in secondhand smoke from a lit cigarette absorb the same toxic chemicals as smokers do.

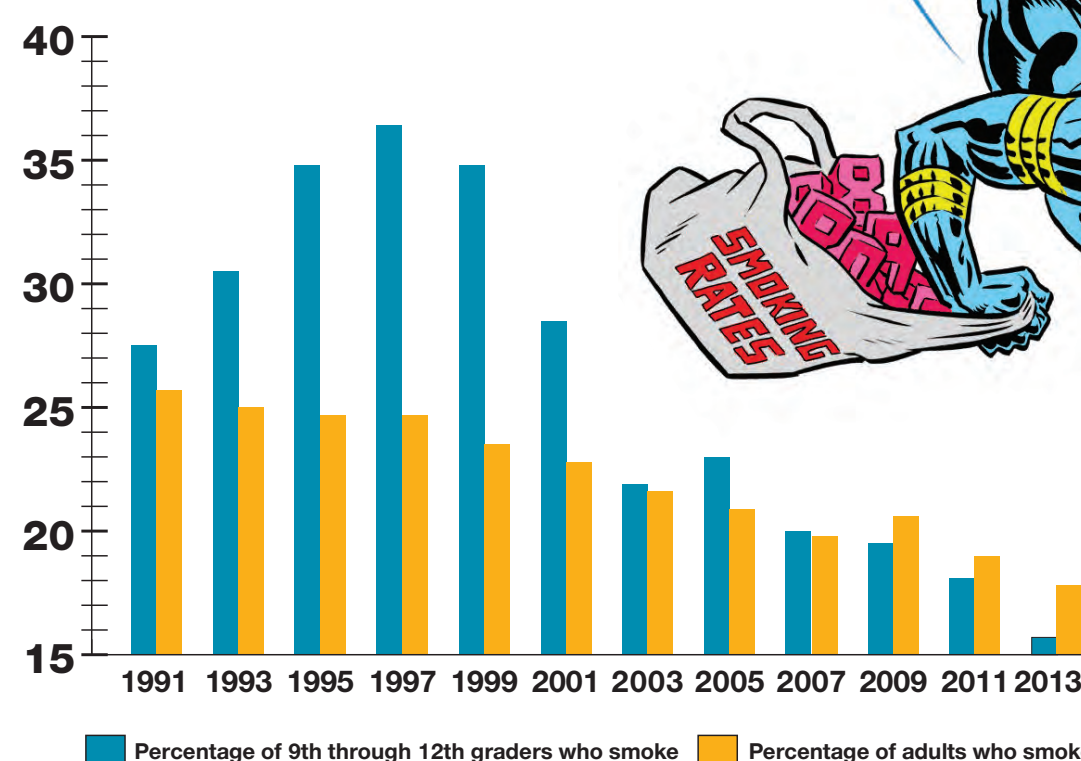
CHILDHOOD DISEASE

Kids who regularly breathe in secondhand smoke tend to have more ear infections and respiratory illnesses, such as bronchitis.

TOXIC RESIDUE

Chemicals from tobacco smoke can stick to surfaces days after someone smokes. This is sometimes called thirdhand smoke and can affect people and animals.

GOOD NEWS!



Smoking rates continue to nose-dive for teens and adults.

GET SMART ABOUT TOBACCO



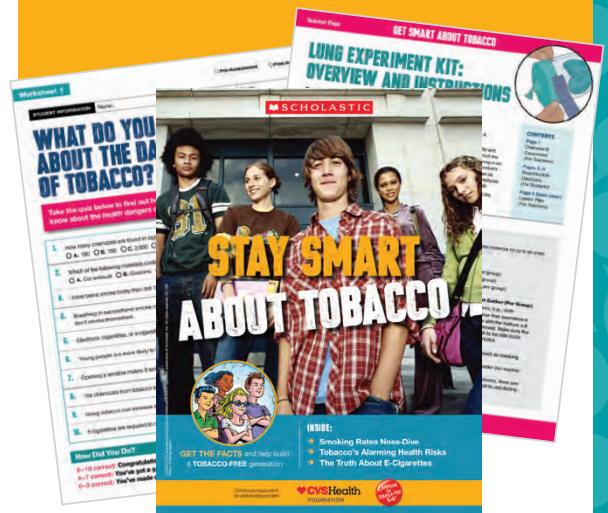
Health and Science Education Program

POSTER, LESSONS, AND STUDENT MAGAZINE THAT:

- ➔ **GIVE** students health and science facts about the dangers of tobacco products
- ➔ **EMPOWER** students to keep themselves safe from tobacco products
- ➔ **BUILD** skills with activities that support Common Core and National Health and Science Standards.

ALSO INCLUDES:

- Hands-On Experiment
- Student Contest
- Teacher Feedback Incentives



scholastic.com/get_smart_about_tobacco

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Dear Teacher:

Welcome to “Get Smart About Tobacco,” a program developed by the CVS Health Foundation in collaboration with Scholastic Inc. and the Campaign for Tobacco-Free Kids to educate students in grades 6–7 about the dangers of tobacco. The poster/teaching guide and accompanying magazine have been developed to give students the health and science facts about tobacco products, and to empower them to make smart decisions and stay tobacco-free. The program also includes directions and materials to conduct a simple and illuminating hands-on experiment, as well as details about a dynamic student poster contest.

The good news is that smoking rates in both adults and youth are dropping. But tobacco use still occurs in middle and high school. In a 2014 study, one in 13 middle school students reported using one or more tobacco products in the last 30 days. Over 40 percent of middle school students are also at risk from the dangers of secondhand smoke exposure. Plus, the use of tobacco products other than cigarettes is growing. Between 2013 and 2014, the number of middle school students who use electronic cigarettes—which usually contain the addictive drug nicotine—tripled.

Studies have shown that school-based tobacco-prevention programs can help reduce the number of kids who smoke and the number who start. That’s especially important because studies show that the majority of adult smokers started smoking before the age of 18.

The accompanying student magazine is packed with articles and graphics that give students the facts about the short- and long-term consequences of the use of tobacco products. Along with the poster/teaching guide and hands-on activity, the materials are designed to give students the tools they need to say no to tobacco. The materials also support your classroom curriculum by reinforcing skills in health, scientific literacy, reading comprehension, writing, and critical thinking.

We urge you to share this important program with your students to help build a tobacco-free generation.

Sincerely,

Ann Amstutz Hayes
Vice President and Group Publisher
Scholastic Inc.

Eileen Howard Boone
President
CVS Health Foundation

GETTING STARTED:

- **POSTER:** Hang the **classroom poster** to begin a discussion about the dangers of tobacco. Before displaying the poster, be sure to make copies of all of the lessons and worksheets on the poster back.
- **STUDENT MAGAZINE:** Hand out the individual **magazine** to each of your students. The materials communicate **health and science** facts about the human body and the dangers of tobacco products.
- **LESSONS AND WORKSHEETS:** Use the **lesson plans** and **worksheets** to expand on the **health and science** knowledge in the magazine, as well as reinforce critical-thinking, reading comprehension, and writing skills.
- **HANDS-ON EXPERIMENT:** Engage student learning with a hands-on experiment that demonstrates how smoking damages the lungs.
- **ADDITIONAL TOOLS:** Visit **scholastic.com/get_smart_about_tobacco/tools6-7** for supporting vocabulary lists, writing prompts, and paired-reading suggestions.
- **POSTER CONTEST:** Encourage students to enter the Stay Smart About Tobacco **poster contest** (see back cover of student magazine) for a chance to win great prizes, including gift cards, and a Grand Prize trip to a tobacco-prevention youth conference!

**WE WANT
YOUR
FEEDBACK!**

Submit the following completed surveys to be entered for a chance to receive Scholastic gift certificates and books!

✓ **Student Assessments**

Mail in, submit online, or email completed student assessments for a chance to receive one of two \$500 Scholastic gift certificates.

✓ **Teacher Survey**

Complete the teacher survey card and send it in for a chance to receive five (5) free books from Scholastic (50 recipients).

See back cover for details!

Lessons

Reminder: Before hanging the poster, be sure to copy all of the lesson plans and worksheets on the poster back.

Pre-Lesson Discussions

Hang the poster and use it to engage students in a conversation about the dangers of tobacco, secondhand smoke, and e-cigarettes. Possible questions to ask students during the discussion:

- ➔ *What are some of the dangers of tobacco?* (Breathing in tobacco smoke can cause breathing problems and lead to cancer; tobacco products are addictive; etc.)
- ➔ *What is secondhand smoke?* (Smoke that is given off by a lit cigarette, cigar, or pipe or that is exhaled by a person smoking.)
- ➔ *What are e-cigarettes?* (Battery-powered devices that heat a liquid containing nicotine. When e-cigarettes are activated, people inhale the nicotine.) *Why should kids not use e-cigarettes?* (They contain nicotine, which harms brain development, causes addiction, and could lead to use of other tobacco products.)
- ➔ *Why is it helpful to know the facts about how tobacco can affect your body?* (The information helps you make healthy decisions about situations involving tobacco and secondhand smoke; you can use the information to inform others about the dangers and help convince them to stay away from tobacco; facts help support your arguments.)

Post-Lesson Discussions:

As the students read the accompanying magazine and you complete each of the worksheets, refer back to the poster. Ask students to consider what additional facts they have learned that they would add to the poster. *What facts did they learn that surprised them? What facts would impact people's decisions about using tobacco or related products? What facts would they add to the poster front to help encourage people to stay tobacco-free?*

Lesson 1 Pre- and Post-Assessment

Worksheet 1: What Do You Know About the Dangers of Tobacco?

Objective: To assess your students' knowledge about the dangers of tobacco before and after using this program. (Note: Student pre- and post-assessment quizzes can be submitted by teachers and entered for a chance to receive Scholastic gift certificates. See back cover for details.)

Critical-Thinking Questions: Before handing out the quiz, ask students: *What do you think you know about the dangers of tobacco?* After taking the quiz the first time, have students read the materials in the accompanying magazine. Use the materials in the poster guide and then have students take the quiz again. Ask students: *What facts about tobacco surprised you the most? Why is it important for scientists to study the effects of tobacco products, including e-cigarettes, on the body?* (Knowing the facts helps officials create laws and warnings about who can use the products; learning the facts can help people make healthy decisions about tobacco.)

Lesson 2

Worksheet 2: Know the Facts

Objective: To teach students about how tobacco, tobacco smoke, and nicotine affect different parts of your body.

Skills Covered: Human health; human body; reading comprehension; textual evidence; integrating visual information; critical thinking

Lesson Plan: Before completing the activity, ask students: *Why is tobacco harmful to your health? What parts of your body are affected by tobacco? Are smokers the only ones affected by tobacco smoke? Are e-cigarettes safe?* Hand out the worksheet and have students complete it individually.

Key Concepts: Tobacco and tobacco smoke contain toxic chemicals and carcinogens (substances that cause cancer). When you use tobacco or breathe in tobacco smoke, the chemicals are absorbed by tissues in the mouth and lungs and travel in the bloodstream through the body. The chemicals in tobacco smoke can change brain processes, cause damage to different organs, and cause cancer. Nonsmokers who breathe in tobacco smoke are exposed to some of the same health risks. Nicotine found in tobacco, including e-cigarettes, is addictive. It changes the way signals are processed in the brain and makes people crave more of the chemical. People's attitudes about tobacco have changed over time as scientific evidence about its dangers has built up. As a result, today's smoking rates are lower than they have been in decades. Because e-cigarettes are relatively new, there is less research about their health risks. Research is currently being conducted so that people can be informed of the risks.

Critical-Thinking Discussion Questions: *What are some reasons youth are particularly at risk from the effects of tobacco?* (Their bodies are still developing, so their organs may be more affected by the chemicals.) *Why is it sometimes difficult to make healthy decisions about tobacco products, including e-cigarettes?* (Peer influence can pressure you to make poor decisions; tobacco marketing makes smoking seem fun and cool.) *Why might teens not know the risks of e-cigarettes?* (They may not know these products contain addictive nicotine; e-cigarettes don't have any warning labels; they may be featured in advertisements that are designed to appeal to teens; they have candy-like flavors that may make them seem harmless.)

Lesson 3

Worksheet 3: Making Smart Decisions

Objective: Students will be presented with scenarios in which tobacco products may pose a danger to themselves or others. They will brainstorm how they should react to the situation and use facts they have learned to write an appropriate response.

(Lessons continued on next page.)

Skills Covered: Human health; textual evidence; evaluate arguments; recall relevant information; write opinion essays; critical thinking

Lesson Plan: Before completing the activity, ask students: *Why is it important to encourage people around you not to smoke?* (Tobacco smoke is dangerous for both smokers and nonsmokers around them.) *Do you think knowing the facts might affect people's decisions about using tobacco or related products? Why or why not?* Hand out the worksheet and have students complete it individually. After everyone has finished, reconvene as a class and discuss their answers.

Key Concepts: Many students face situations in which they must make healthy decisions about tobacco, exposure to secondhand smoke, and products, such as e-cigarettes. To stay healthy, they need to choose not to use these products and also to protect themselves from secondhand smoke. That means encouraging people around them not to smoke. Peer pressure or concerns about what friends might think can make it difficult to make healthy decisions. Helping students consider what they might do and say in certain situations before they happen can better prepare them to make healthy decisions when they need to.

Critical-Thinking Discussion Questions: *Why is it sometimes difficult to make healthy decisions about tobacco or other related products, such as e-cigarettes?* (Peer influence can pressure you to make different decisions; it can be difficult to stand up to adults and older teens.) *Why might teens not know the risks of e-cigarettes?* (The products don't contain tobacco, so people might think they are safe; they don't have the same warnings as tobacco products; they may include advertisements that appeal to teens; they have candy-like flavors that may make them seem harmless.)

STANDARDS

- Health/Life Skills
- Science Literacy
- English Language Arts

National Science Education Standards:

- Personal Health
- Structure and Function in Living Systems

Next Generation Science Standards (NGSS):

LS1.A: From Molecules to Organisms: Structures and Processes

Common Core State Standards for English Language Arts:

- RI.1:** Cite textual evidence
RI.2: Central idea and details
RI.8: Evaluate claims in a text
W.1 & 2: Write opinion and informative texts
W.7: Synthesize multiple texts

WORKSHEETS ANSWER KEY

WORKSHEET 1: What Do You Know About the Dangers of Tobacco? (Assessment Quiz)

1. D; 2. E; 3. False; 4. True; 5. False; 6. True; 7. False; 8. True; 9. True; 10. False.

WORKSHEET 2: Know the Facts

1. The percentage of adults and youth who smoke has decreased in the last 10 years. Answers may vary about why but may include that education has helped give people the facts about how dangerous cigarettes and tobacco are for health. That may have encouraged fewer people to smoke.
2. These products contain nicotine, a drug that is addictive. It causes changes in the brain that make you feel more alert or give you a sense of pleasure. But once the effects wear off, you crave more of it.
3. Answers may vary but should include benzene, which can be found in gasoline; formaldehyde, which is used to embalm dead bodies; cadmium, which is used in batteries; or polonium 210, which is found in fuels from nuclear reactors.
4. Answers may include that people once thought tobacco could help people,

such as soldiers injured in World War I. Over time, evidence grew that tobacco was dangerous. Eventually, government officials created laws, such as banning certain ads, aimed at protecting people from the dangers. Smoking rates then decreased.

5. E-cigarettes are not regulated by the FDA and they do not need to have the same warnings on their packages as tobacco cigarettes. Answers may include that this may make teens think that the products are safe to use.
6. Answers will vary.

WORKSHEET 3: Making Smart Decisions

1. Answers will vary but may include that Ashley should not stay at her friend's house. She could invite Natalie over to her house. At Natalie's house she would be exposed to secondhand smoke from the college students' cigarettes. Opening windows does not eliminate the risk of secondhand smoke. Tobacco smoke contains dangerous chemicals that are absorbed into your body when you breathe in the smoke. These chemicals can harm nearly every organ in your body. Also, even if the college students leave and the smoking stops, the smoke lingers

in the air and she could be exposed to the chemicals from tobacco smoke, which stick on surfaces. This is called thirdhand smoke.

2. Answers will vary but may include that Sam should encourage his brother and his brother's friend not to use e-cigarettes. E-cigarettes contain nicotine, the same addictive drug that is in tobacco cigarettes. The drug affects the way the brain processes information and causes you to crave more. Studies have shown that adolescents are even more sensitive to nicotine than adults. The drug may impact the development of the prefrontal cortex. E-cigarettes may lead people to want to smoke tobacco cigarettes. Some e-cigarettes also contain toxic chemicals that may cause cancer, including flavoring chemicals that have been linked to severe lung disease. E-cigarettes have ads and flavors that may appeal to young people, but that doesn't mean they are safe. The US government does not currently regulate the products. One reason is that it takes time for scientists to gather the evidence needed to make laws about the use of e-cigarettes. Scientists are busy collecting data about the effects of e-cigarettes.

ADDITIONAL RESOURCES:

- cdc.gov/tobacco/basic_information/youth/index.htm
- kickbuttsday.org
- smokefree.org
- teens.drugabuse.gov/drug-facts/tobacco-nicotine-e-cigarettes
- tobaccofreekids.org

Sources for Poster/Teaching Guide: Allen et al., *Environ Health Perspect*: (2015) "Flavoring Chemicals in E-Cigarettes." CDC, *MMWR*: (2013) "Youth Risk Behavior Survey." DiFranza et al., *Tob Control*: (2000) "Initial Symptoms of Nicotine Dependence in Adolescents." Goniewicz, et al., *Tob Control*: (2014) "Levels of Selected Carcinogens and Toxicants in Vapour From Electronic Cigarettes." Gromysz-Kalkowska et al., *Ann Univ Mariae Curie Sklodowska Med.*: (2002) "Taste Perception of Cigarette Smokers." International Agency for Research on Cancer: (2006) "IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 88." Matt, et al., *Environ Health Perspect*: (2011), "Thirdhand Tobacco Smoke." Jamal et al., *MMWR*: (2014) "Current Cigarette Smoking Among Adults—US, 2005–2013"; (1993) "Cigarette Smoking Among Adults—US, 1991." Sly et al., *Med J. of Aust*: (2007) "Exposure to Environmental Tobacco Smoke in Cars Increases the Risk of Persistent Wheeze in Adolescents." National Center for Health Statistics: (1965–2011) "National Health Interview Survey." US Food and Drug Administration: (2009) "Evaluation of E-Cigarettes." US Department of Health and Human Services: (2014) "The Health Consequences of Smoking—50 Years of Progress"; (2006) "The Health Consequences of Involuntary Exposure to Tobacco Smoke."

STUDENT INFORMATION

Name:

Grade:

WHAT DO YOU KNOW ABOUT THE DANGERS OF TOBACCO?



Take the quiz below to find out how much you know about the health dangers of tobacco.

1. How many chemicals are found in cigarette smoke?
 A. 100 B. 700 C. 2,000 D. 7,000 E. 10,000
2. Which of the following materials contains chemicals that are also found in tobacco smoke?
 A. Car exhaust B. Gasoline C. Rat poison D. Household cleaners E. All of the above
3. More teens smoke today than did 10 years ago. True False
4. Breathing in secondhand smoke can increase people's risk of cancer even if they don't smoke themselves. True False
5. Electronic cigarettes, or e-cigarettes, are harmless because they have candy-like flavors. True False
6. Young people are more likely to become addicted to nicotine than adults. True False
7. Opening a window makes it safe to be near someone who is smoking. True False
8. The chemicals from tobacco smoke can stick to surfaces for days. True False
9. Using tobacco can increase a person's chance of having a heart attack. True False
10. E-cigarettes are required to carry warning labels, like real cigarettes. True False

How Did You Do?

8–10 correct: Congratulations! You know the facts about the dangers of tobacco.

4–7 correct: You've got a good grasp of the dangers of tobacco.

0–3 correct: You've made a good start. Do some research to learn more about tobacco.

KNOW THE FACTS

The magazine *Stay Smart About Tobacco* is packed with facts and figures about tobacco. Read over the articles to learn about how tobacco and related products can affect your body. Then use the information you have learned to answer the following questions.



1. How have smoking rates changed in the last 10 years? What do you think has caused this trend?

2. Explain why it can be difficult to stop using cigarettes, chewing tobacco, or e-cigarettes once a person starts.

3. What are three chemicals found in tobacco smoke that can cause cancer? Where else can each of these chemicals be found?

4. Explain how attitudes about cigarettes have changed over time. Use evidence from the Tobacco Timeline to support your answer.

5. Do e-cigarettes contain warnings on the packaging like real cigarettes do? How do you think this affects teens' attitudes about the products?

6. What's one thing you learned about tobacco that surprised you? Explain your answer.

MAKING SMART DECISIONS

What would you do or say if you were faced with a potentially risky situation involving tobacco? It can be helpful to make a plan beforehand so that you are better prepared to react on the spot.

Read the scenarios below. What could you say if you were in the situation to help you and the people around you stay safe from tobacco? On a separate piece of paper, write a paragraph explaining how you would respond to each scenario. Using facts can help strengthen your argument when you are saying no to something. Be sure to support your answer with facts about the dangers of tobacco and related products.

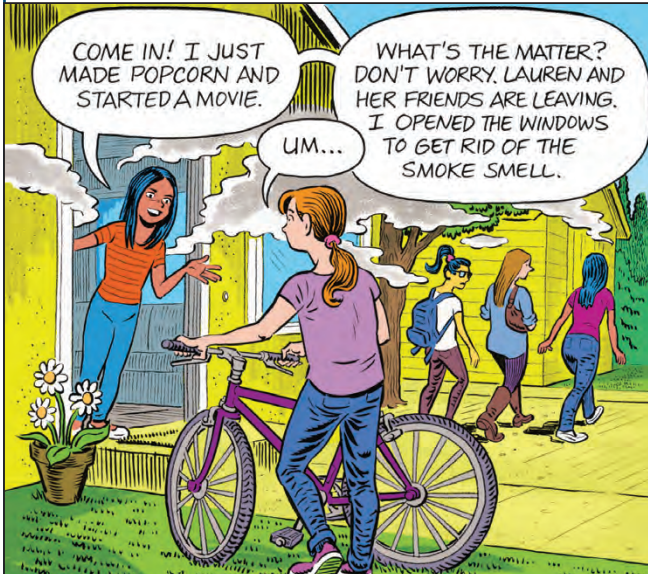
Scenario 1:

Ashley is going to her friend Natalie's house. Natalie's sister Lauren is home from college and has some friends over. When Ashley arrives at Natalie's, she notices that Lauren and her friends have been smoking in the house.

Natalie: Come in! I just made popcorn and started a movie.

Ashley: Um...

Natalie: What's the matter? Don't worry. Lauren and her friends are leaving. I opened the windows to get rid of the smoke smell.



Should Ashley stay at her friend's house, where people have been smoking?

Write a paragraph explaining the risks. What would you do or say if you were in this situation?

Scenario 2:

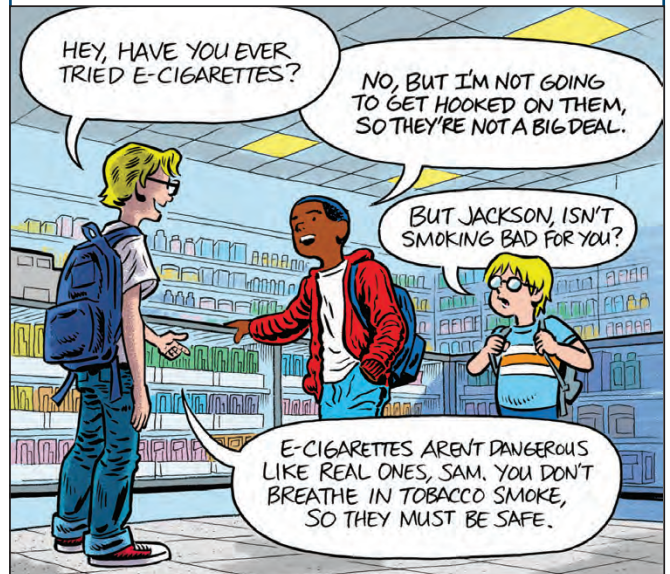
Sam is in a convenience store with his older brother, Jackson, and his brother's high school friend Luke. They are looking at a display of e-cigarettes.

Jackson: Hey, have you ever tried e-cigarettes?

Luke: No, but I'm not going to get hooked on them, so they're not a big deal.

Sam: But Jackson, isn't smoking bad for you?

Jackson: E-cigarettes aren't dangerous like real ones, Sam. You don't breathe in tobacco smoke, so they must be safe.



What do you think about the older boys' claims about e-cigarettes? What should Sam say?

Write a paragraph explaining why teens should avoid e-cigarettes. What dangers do they pose?

Teachers: We Want to Hear From You!

Help Us Evaluate This Program—and Be Entered to Receive *Scholastic Gift Certificates and Books!*



Due Date:
May 2, 2016

You can help us evaluate the success of these materials in two ways:

- **STUDENT ASSESSMENTS**
- **TEACHER SURVEY**

To thank you for supporting our mission of creating free, quality classroom materials, we will enter you in a giveaway for Scholastic gift certificates and/or books. We value your expertise in helping us to create valuable programs for teachers and students.

Student Assessments

Enter for a chance to receive a \$500 Scholastic gift certificate (two recipients)!

1. Before teaching the Get Smart About Tobacco lessons, conduct a pre-assessment by having students complete Worksheet 1: “What Do You Know About the Dangers of Tobacco?” or the online form at scholastic.com/get_smart_about_tobacco/student_assessment. Check the “pre-assessment” box on each worksheet.
2. Teach the Get Smart About Tobacco lessons.
3. Conduct a post-assessment by having students retake the same Worksheet 1 or online form. Check the “post-assessment” selection on each worksheet.
4. **How to Enter (three options):**
 - **Entry by Mail:** Mail in copies of the completed student pre- and post-assessments, along with your name, address, grade(s) you teach, school name, phone number, and email address to: **Student Assessment, GM/Space 530, Scholastic Inc., 557 Broadway, New York, NY 10012.**
 - **Online Entry:** Have students complete the assessments online at scholastic.com/get_smart_about_tobacco/student_assessment. Once the assessments are complete, send an email to getsmart@scholastic.com with your name, address, grade you teach, school name, phone number, and email address along with the date and time of completion and the number of students who completed each assessment.
 - **Entry by Email:** Email digital scans of the completed pre- and post-assessments along with your name, address, grade you teach, school name, phone number, and email address to get-smart-about-tobacco@scholastic.com.



➔ **You will be entered in a drawing to receive one of two \$500 gift certificates from Scholastic!**

Teacher Survey

Enter for a chance to receive five (5) free books from Scholastic (50 recipients)!

How to Enter:

1. Complete the enclosed postage-paid **teacher survey card** and mail it in.
OR
2. Go to scholastic.com/get_smart_about_tobacco/take_survey and complete the survey online.



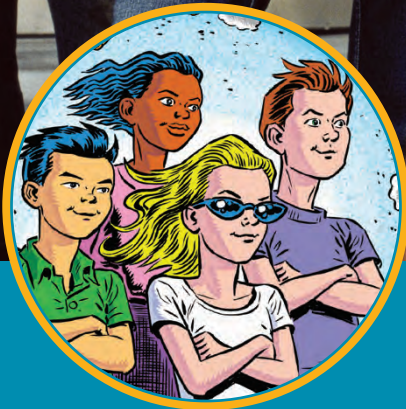
➔ **You will be entered in a drawing to receive five (5) free books from Scholastic (50 recipients)!**

NO PURCHASE NECESSARY. Both the Student Assessment and the Teacher Survey giveaways are open to legal residents of the 50 United States (including the District of Columbia) who currently teach grades 6–7 and are 18 years of age or older. The deadline to enter both giveaways is May 2, 2016; entries must be postmarked by May 2, 2016. Void where prohibited. **Student Assessments:** To enter, mail in completed pre- and post-assessments to: Student Assessment, GM/Space 530, Scholastic Inc., 557 Broadway, New York, NY 10012. All assessments must also include teacher name, address, grade(s) taught, school name, phone number, and email address. Two (2) recipients will each receive a \$500 Scholastic gift certificate (total approximate retail value: \$1,000). For complete rules, go to scholastic.com/get_smart_about_tobacco/assessment_6-7_rules. **Teacher Survey:** To enter, send a completed postage-paid post-program survey card by mail or complete the online survey at: scholastic.com/get_smart_about_tobacco/take_survey. Fifty (50) recipients will each receive five (5) free books from Scholastic. For complete rules, visit scholastic.com/snpsurveyrules.



STAY SMART

ABOUT TOBACCO



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GET THE FACTS and help build
a **TOBACCO-FREE** generation

INSIDE:

- ➔ Smoking Rates Nose-Dive
- ➔ Tobacco's Alarming Health Risks
- ➔ The Truth About E-Cigarettes

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Do you know the facts about tobacco?

You've probably heard many times that smoking is bad for your health, but do you know how it could affect your body and your life? Did you know that most teens today don't smoke?

This magazine, *Stay Smart About Tobacco*, was designed to give you the facts about the dangers of tobacco products. The articles on the following pages give you the latest scientific evidence about the risks of everything from secondhand smoke to e-cigarettes. Plus, you'll find tips on how to help encourage friends or family to quit.

You are your best protection against the hazards of tobacco. Arm yourself with the facts so that you can make healthy decisions and help build a tobacco-free generation.

Photo: © Media Bakery.

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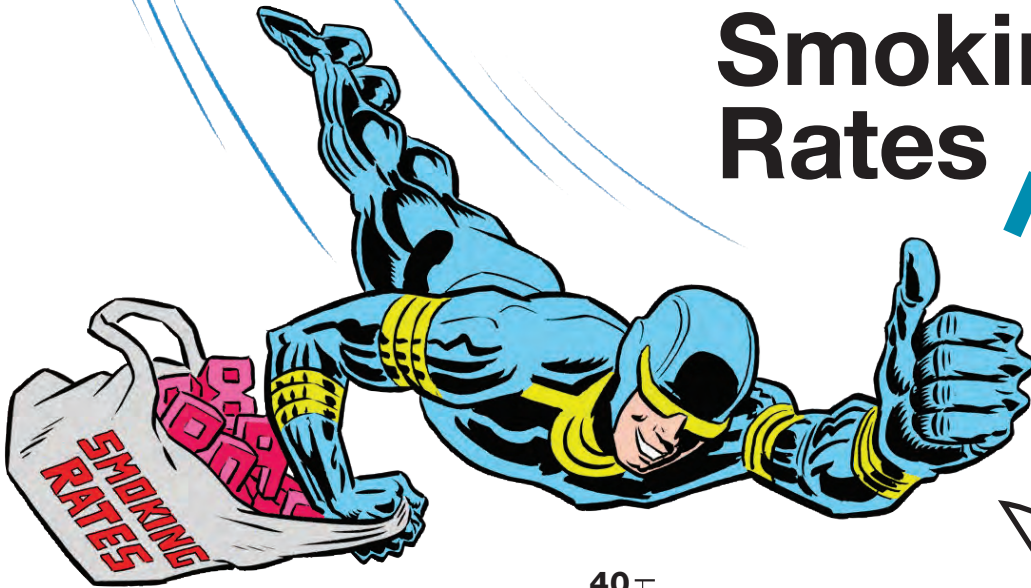
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Enter for a chance to attend a tobacco prevention youth conference!

Check out the student poster contest on the back cover. Create your own anti-tobacco messaging for a chance to win great prizes!

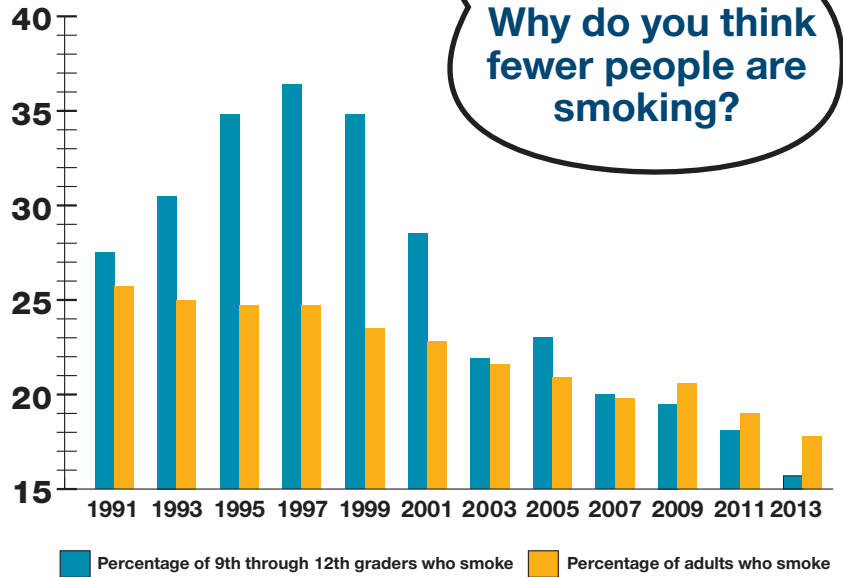


Smoking Rates

Nose-Dive

Since the 1960s, health officials and the US government have been educating people about the dangers of tobacco in the hopes that fewer people will use it. The good news is that it's helping!

The statistics show more and more that teens and adults increasingly do not smoke. Studies show that the rates of smoking in people of all ages have decreased significantly in the last 20 years. The percentage of adult smokers is the lowest it has been since scientists at the Centers for Disease Control and Prevention (CDC) began keeping track in 1965.



Why do you think fewer people are smoking?

NICOTINE:
DON'T
GET
HOOKED



Some people think they can try smoking just a few times and not be affected. Science shows that's not true. In fact, about three out of four teen smokers end up smoking into adulthood, even if they intend to quit after a few years.

The reason is that tobacco contains nicotine. This highly addictive chemical changes the way brain signals are processed. It increases heart rate, making a person feel more alert. Nicotine also raises the level of dopamine,

a brain chemical linked to feelings of pleasure.

When these effects wear off, people feel a strong need for more nicotine. Stopping the use of the drug can cause uncomfortable withdrawal symptoms, such as headaches, irritability, and concentration problems.

New research shows that young people are even more at risk for nicotine addiction than adults. A teen can become hooked after only two weeks of smoking.

TOBACCO WARNING: SERIOUS HEALTH RISKS

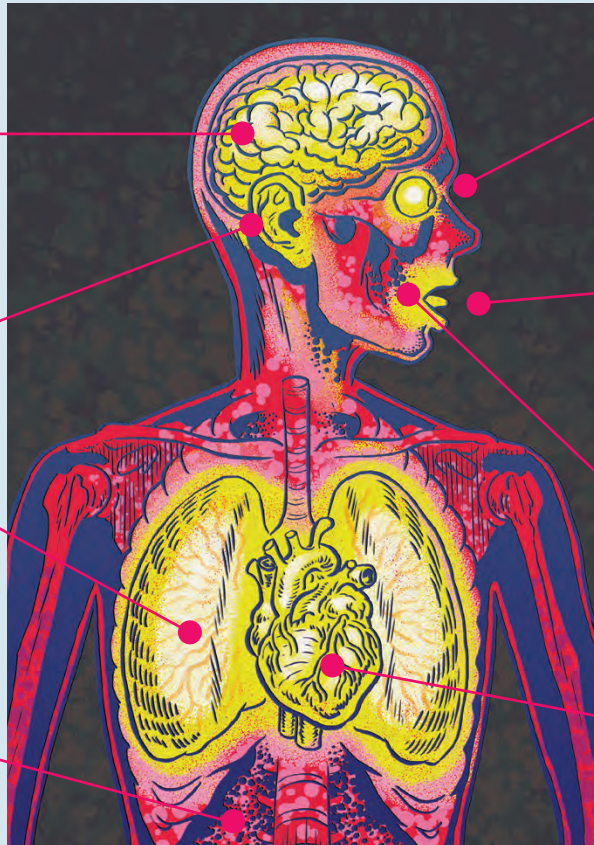
Tobacco contains many toxic chemicals. When people use smokeless tobacco, such as chew or dip, or smoke a cigarette, these chemicals are absorbed into the body. That's true even for nonsmokers who inhale secondhand smoke. Look at the diagram below to see how these chemicals can affect your body.

BRAIN: Nicotine in tobacco and related products causes feelings of pleasure by raising the level of the brain chemical dopamine; when the nicotine wears off, the feeling disappears. The result: People crave more nicotine.

EARS: Children who are exposed to secondhand smoke have more ear infections.

LUNGS: The poisonous chemicals in tobacco smoke damage cilia, fine hairs in the lungs. That makes it difficult to breathe and increases the risk of serious illnesses, such as pneumonia. The chemicals can also cause lung cancer.

BLOOD: Chemicals in tobacco can make blood cells stickier. That increases a person's risk of a potentially deadly stroke, when blood stops flowing to parts of the brain.



EYES: Smoking increases the risk of developing cataracts—a condition in which the lens of the eye becomes cloudy, making it difficult to see.

TONGUE: Using tobacco products can damage the tongue's taste buds, which detect flavors. People who smoke may not be able to taste as well as nonsmokers.

MOUTH: Using smokeless tobacco, such as chew and dip, can cause gums to bleed and may lead to mouth cancer.

HEART: The chemicals in tobacco damage the body's blood-carrying vessels. These changes can cause your heart to beat harder and faster, increasing the risk of a heart attack.

Secondhand Smoke: Everyone Is at Risk

You don't have to smoke a cigarette to be at risk from the dangerous chemicals hidden inside.

The secondhand smoke that comes off lit cigarettes or that is exhaled by a smoker contains the same dangerous chemicals that a smoker inhales. When nonsmokers breathe in secondhand smoke, these chemicals are absorbed in the body. According to the Centers for Disease Control and Prevention, more than 40,000 nonsmoking Americans die every year from diseases that are caused

by exposure to secondhand smoke.

Young people who are regularly exposed to secondhand smoke have a greater risk of ear infections and respiratory problems, such as bronchitis and pneumonia. Secondhand smoke can trigger an asthma attack in a child. Children with asthma who are around secondhand smoke have more severe and frequent asthma attacks.



✓ HOW TO STAY SAFE

To protect nonsmokers, many states have laws that ban smoking in public places, such as restaurants and workplaces. Some states also now have laws that prohibit smoking in a car when anyone under the age of 18 is riding along.

You can also help protect yourself. Avoid being near anyone who is smoking. Opening a window isn't enough to keep the chemicals away. Smoke from one cigarette can linger in a room for hours. The chemicals from smoke can even stick to surfaces such as furniture, and linger for days after someone smokes. Ask your parents to make sure no one smokes in your home so that you aren't at risk.



CIGARETTES: PACKED WITH POISONS

When a cigarette is lit, the burning tobacco emits more than 7,000 chemicals into the air. These substances don't just cause a stink. Hundreds of the chemicals are toxic to humans and about 70 of them are believed to cause cancer.

The chemicals either occur naturally in tobacco leaves or are produced by the chemical reactions that happen when the leaves are burned. Find out what's lurking in tobacco smoke and where else you can find these poisonous chemicals.

CARBON MONOXIDE:

This chemical, a common ingredient in car exhaust, is also found in cigarette smoke. In high concentrations, it can be deadly.

CADMIUM: This heavy metal is used to make batteries. It's also a known carcinogen, meaning it causes cancer.



LEAD: Once used in paint, it's now known to be toxic to humans. It can affect the way the brain works, especially in children.



FORMALDEHYDE: Perhaps best known as the chemical used to preserve dead bodies, formaldehyde may cause cancer in people. It also irritates the skin, eyes, and respiratory tract.

BENZENE: Found in crude oil and gasoline, this chemical has been proven to cause cancer.



ARSENIC: This highly toxic chemical is found in rat poison.

AMMONIA: This chemical gives some household cleaners their strong smell. It's also used in many fertilizers. Ammonia can irritate tissues and damage cells.



POLONIUM 210:

This radioactive element emits radiation that can cause cancer. It's found in the uranium ores used to power nuclear reactors.



✓ HELP SOMEONE QUIT

Do you have family or friends who smoke? You may be able to help encourage them to quit. Many smokers who quit say that the support of loved ones helped.

Experts say that lecturing or nagging a smoker isn't likely to be beneficial.

Instead, try explaining to your loved ones the reasons you want them to quit, such as that you are worried they might get sick. Share some of the facts you have learned about tobacco.

Don't forget that quitting is very difficult. Many people have slips when they try to stop. You can support loved ones by celebrating their successes, both big and small.

Resources

Point those who smoke toward these resources that can help them quit:

- teen.smokefree.gov
- 1-800-QUIT-NOW
- smokefree.gov

E-Cigarettes: A Growing Threat

What you need to know about a recent trend

In the past 10 years, e-cigarettes, or electronic cigarettes, have become a more than \$1 billion industry in the United States. They can now be commonly seen in stores and advertised on television or in your favorite magazine.

Manufacturers claim e-cigarettes are safe because they don't burn tobacco. However, e-cigarettes deliver the same addictive chemical, nicotine, as real cigarettes. Scientists are just beginning to learn about the possible risks they pose.

On the Rise

Manufacturers of e-cigarettes claim their products are a safe

alternative for people who are addicted to the nicotine in tobacco. In recent years, many adults have tried using the devices to cut down on cigarettes. But studies have not proven that e-cigarettes help people quit. According to research, most adults who use e-cigarettes also smoke tobacco cigarettes.

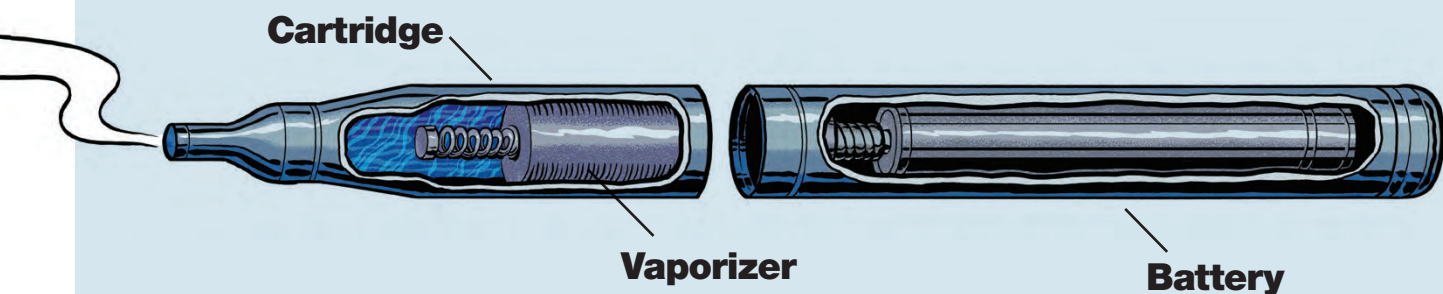
Unlike tobacco, e-cigarette use is not currently regulated by the US government. Most states prohibit people under the age of 18 from using them. Still, in recent years, teens have begun trying them. Between 2013 and 2014, the use of electronic cigarettes among students in middle school tripled. They are

the most commonly used nicotine products among middle school students.

Health Risks

Although e-cigarettes don't release dangerous tobacco smoke, they are not harmless. Like real cigarettes, e-cigarettes deliver doses of the addictive drug nicotine. This powerful drug is particularly dangerous for the developing brains of young people (see "Nicotine: Don't Get Hooked," page 3).

Some early studies suggest that teens who use e-cigarettes are also more likely to use tobacco cigarettes. One reason is that if teens get hooked on the nicotine in



TOBACCO TIMELINE

Check out how scientific knowledge and attitudes

1913:

The first modern cigarette is introduced.



1914–1918:

Doctors claim cigarettes help soldiers injured in World War I.

1930:

Scientists report the first scientific evidence that links smoking to cancer.



1964:

The Surgeon General's Report on Smoking and Health is released. It highlights the dangerous health consequences of smoking.



1965:

Congress requires that all cigarette packets and ads include the Surgeon General's warning highlighting the risks.



YOUTH MARKETING?

Today, many types of advertising for tobacco products are banned, including on TV and the radio. Advertisements for e-cigarettes, however, don't have the same limitations.



Many e-cigarette ads include images that portray the products as something fun to try. Many of these features are especially appealing to young people. The ads may include celebrities and teen activities, such as going to concerts. They also might highlight that most e-cigarettes have appealing flavors, such as chocolate and candy.



Check out some of the images in this section that may be found in e-cigarette ads. What image of e-cigarettes do these features portray? Why might these messages be dangerous for young people?



Photos (from top): © Michael Bodmann/Getty Images; © PLAINVIEW/Getty Images; © Justin Horrocks/Getty Images.

e-cigarettes, they may eventually turn to real cigarettes.

Tests of some e-cigarettes have shown that they contain toxic chemicals, such as formaldehyde, a substance that is believed to cause cancer. A recent study showed that 75 percent of e-cigarettes tested contained a flavor chemical called diacetyl that has been linked to lung disease. Studies have shown that people who regularly inhale the chemical have a higher risk of developing severe respiratory problems.

The liquid inside e-cigarettes can also be poisonous if someone drinks or touches it. In 2015, there were an average of 255 calls every month to poison control centers about e-cigarettes.

Rules Required

One of the biggest concerns about e-cigarettes is that they are not currently regulated by the government. That means that there are few rules about safety, warning labels, and advertising (see “Youth Marketing?” at right). A 2009 study by the US Food and Drug Administration showed that the labels on e-cigarettes did not always accurately state the amount of nicotine in the products.

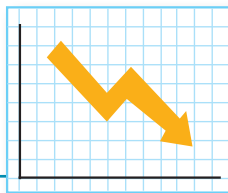
In 2014, the FDA proposed a new rule that would require e-cigarettes to be regulated by the US government. In the meantime, health officials are issuing warnings about the devices.

How E-Cigarettes Work

Unlike real cigarettes, e-cigarettes don't burn tobacco. Instead, the devices have a cartridge inside that holds a liquid that contains nicotine, flavors, and other chemicals. When a user inhales on the e-cigarette, it causes a battery to power a vaporizer in the device. The vaporizer heats up the liquid and turns it into a vapor. The nicotine-containing vapor is inhaled, which is why using e-cigarettes is sometimes called “vaping.”

about tobacco and related products have changed over time.

1971: All television and radio ads for smoking are banned.



2000s: Smoking rates among adults and youth decrease.

2003–2007: E-cigarettes are introduced worldwide.



2008: Health officials begin to ask for restrictions on e-cigarettes and more research into the risks.

2014: The FDA proposes a rule to regulate e-cigarettes as tobacco products.

Motivate kids to stay smart about tobacco and keep tobacco-free.



How to Enter:

1. The Challenge: Create an original poster that motivates kids to stay smart about tobacco and keep tobacco-free.

All entries must showcase:

- A creative, artistic interpretation of “The Challenge”
- An inspirational message that calls on young people to stay tobacco-free
- Originality
- Technical skill

Also:

- Posters must be no larger than 11" x 17".
- Any artistic medium may be used.
- Entries must be submitted by April 20, 2016.
- Only individual entries will be accepted—no group entries.
- No videos will be accepted.

2. With each entry, include the following information:

- Student’s Name • School Name • Student’s Grade
- School City and State • Teacher’s Name

3. Your poster may be submitted in one of two ways:

Mail:

Stay Smart About Tobacco
Poster Contest
P.O. Box 713
New York, NY 10013-0713

Online:

Have one of your teachers create a JPG or PDF of your poster. Only your teacher may submit the entry online.



Photo: © Westend61/Getty Images.

Prizes

Grand Prize: A 4-day/3-night trip to the “Say What!” tobacco prevention youth conference in Montgomery, Texas. This is a fun-filled training and networking opportunity that focuses on taking youth to the next level in tobacco prevention.

Runners-Up: Ten (10) Student Winners will receive a \$200 American Express Gift Card.



\$1,050 in gift cards and Scholastic gift certificates will be given to teachers of winning students.

FOR TEACHERS: Visit the contest page at scholastic.com/stay_smart_about_tobacco_contest.

NO PURCHASE NECESSARY. Void where prohibited. All students who are legal residents of, and currently reside in, the 50 United States (and the District of Columbia) and who are currently enrolled in grades 6–7 are eligible to enter, except for those who have family members living in the same household employed by Scholastic Inc., CVS Health Foundation, Campaign for Tobacco-Free Kids, and other related companies. Visit scholastic.com/stay_smart_about_tobacco_contest for complete Official Rules and restrictions. All entries submitted by mail must be postmarked by 4/20/16, and received by 4/27/16. All entries submitted online must be received by 11:59 PM EST on 4/20/16. ERV of Prizes: Grand Prize (\$2,100); Runner-Up Prizes (\$2,000); Teacher Prizes (\$1,050)

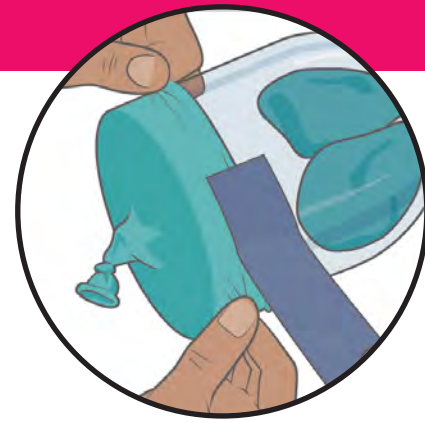


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SOURCES FOR STUDENT MAGAZINE: Allen et al., *Environ Health Perspect:* (2015) “Flavoring Chemicals in E-Cigarettes.” CDC, *MMWR:* (2015) “Tobacco Use Among Middle and High School Students—U.S., 2011–2014”; (2013) “Youth Risk Behavior Survey.” DiFranza et al., *Tob Control:* (2000) “Initial Symptoms of Nicotine Dependence in Adolescents.” Goniewicz et al., *Tob Control:* (2014) “Levels of Selected Carcinogens and Toxicants in Vapour From Electronic Cigarettes.” Gromysz-Kalkowska et al., *Ann Univ Mariae Curie Skłodowska Med.:* (2002) “Taste Perception of Cigarette Smokers.” HHS, *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General* (2012). International Agency for Research on Cancer: (2006) “IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 88.” Matt et al., *Environ Health Perspect:* (2011). “Thirdhand Tobacco Smoke.” Jamal et al., *MMWR:* (2014) “Current Cigarette Smoking Among Adults—U.S., 2005–2013”; (1993) “Cigarette Smoking Among Adults—U.S., 1991.” Johnston et al.: (2014) “Monitoring the Future National Survey, 1975–2013—Vol. 1.” Sly et al., *Med J. of Aust:* (2007) “Exposure to Environmental Tobacco Smoke in Cars Increases the Risk of Persistent Wheeze in Adolescents.” Sussman et al., *Sub Use and Misuse:* (1999) “Effects of 34 Adolescent Tobacco Use Cessation and Prevention Trials...” National Center for Health Statistics: (1965–2011) “National Health Interview Survey.” U.S. Food and Drug Administration: (2009) “Evaluation of E-Cigarettes.” U.S. Dep’t of Health and Human Services: (2014) “The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General”; (2012) “Preventing Tobacco Use Among Youth and Young Adults”; (2006) “The Health Consequences of Involuntary Exposure to Tobacco Smoke.”

LUNG EXPERIMENT KIT: OVERVIEW AND INSTRUCTIONS



Grades 6–7

Overview:

This hands-on experiment is designed to show students how smoking can affect the lungs. A supporting lesson plan is included on the back cover.

Balloons of the same size, but with different elasticity, will model both healthy and damaged lungs. A single balloon, which is easier to fill with air, represents healthy lungs in which the alveoli (tiny air sacs in the lungs) are soft and pliable and can easily expand and contract to bring in air. A less elastic balloon, which is two balloons doubled up, is harder to fill and represents a smoker's lungs. Smoking damages the elasticity of the alveoli tissue, leading to breathing difficulty known as emphysema. Smoking also causes chronic bronchitis, or swelling of the bronchial lining. This reduces the amount of air that flows into the lungs, which students will simulate in the experiment as well.

By comparing the balloons, students will see how less air fills the damaged lungs, analogous to the decreased air capacity that people who smoke experience.

CONTENTS

Page 1

Overview of Experiment
(For Teachers)

Pages 2–3

Reproducible Directions
(For Students)

Page 4 (back cover)

Lesson Plan
(For Teachers)

TIME REQUIRED: Two 50-minute classes or one 90-minute class

SUMMARY OF PROCEDURE:

Step 1. Students will determine the volume of air that can be held in representations of a healthy lung and an unhealthy lung.

Step 2. Students will create a model comparing a healthy lung with a less elastic lung (emphysema) and simulate narrowed bronchial tubes (chronic bronchitis).

TEACHER SETUP:

- Collect the materials listed on the right, including gathering or instructing students to bring in plastic bottles. Cut off the bottom of each bottle before class time (use of a box cutter is recommended).
- *Optional:* Bring three additional balloons per student beyond what was provided in the kit. This will enable each individual student to enact Step 1 of the experiment (otherwise, one volunteer from each group will blow up the balloons).
- Reproduce the student directions on the inside for each student group.

LESSON: See back cover.

MATERIALS:

Each teacher's kit includes materials for up to six small groups of five students.

Enclosed Materials

- ➔ 25 balloons (4 per group)
- ➔ 15 straws (2 per group)
- ➔ ½ lb. clay (chunk per group)

Materials Teacher Must Gather—Per Group

- ➔ Flexible tape measure, e.g., cloth
- ➔ Clear plastic container that resembles a one-liter soda bottle with the bottom cut off and the label removed. Make sure the plastic is thin enough to be able to be squeezed and constricted.
- ➔ Scissors
- ➔ Wide adhesive tape, such as masking tape
- ➔ *Recommended:* box cutter (for teacher only)
- ➔ *Optional:* additional balloons, three per student, for each student to use during Step 1



HOW TO CONDUCT THE LUNG EXPERIMENT

Getting Started: Read all directions before beginning the experiment.

Part 1

You will use balloons to set up representations of a healthy lung and an unhealthy lung. Then, using mathematical formulas, you'll compare the volume of air each balloon holds.

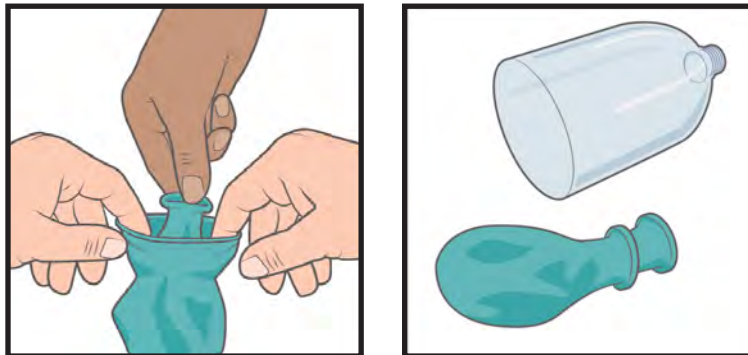
1.1 “Healthy” elastic lung = one balloon

One volunteer from each group will blow up one balloon as big as possible in one large breath for four seconds. An additional volunteer can keep track of time.

Hold the balloon closed tightly while another volunteer uses a tape measure to find and write down its circumference.

1.2 “Unhealthy” less elastic lung = two balloons

Tobacco causes lung tissue to become less stretchy. To create a less elastic balloon, one volunteer should use both index fingers to widen the neck of one balloon so that another volunteer can insert a second balloon. The neck of the inner balloon should be inside the neck of the outer balloon so air can still enter the inner balloon.



Using this double balloon, repeat the process of blowing up the balloon for four seconds as well as measuring and recording its circumference.

1.3 Estimate the volume

Using a separate sheet of paper, estimate the volumes of air inside the “healthy” balloon and the “unhealthy” balloon. Assume they are spheres, and use the math formulas provided.

FORMULA BANK

$$\text{Circumference} = 2\pi r$$

$$\text{Volume of a sphere} = (4/3)\pi r^3$$

Note: π can be approximated with 3.14.

THINK IT THROUGH: How does the amount of air held in the less elastic “unhealthy” balloon lung compare to the air in the elastic “healthy” balloon lung? Why might this be?



Part 2

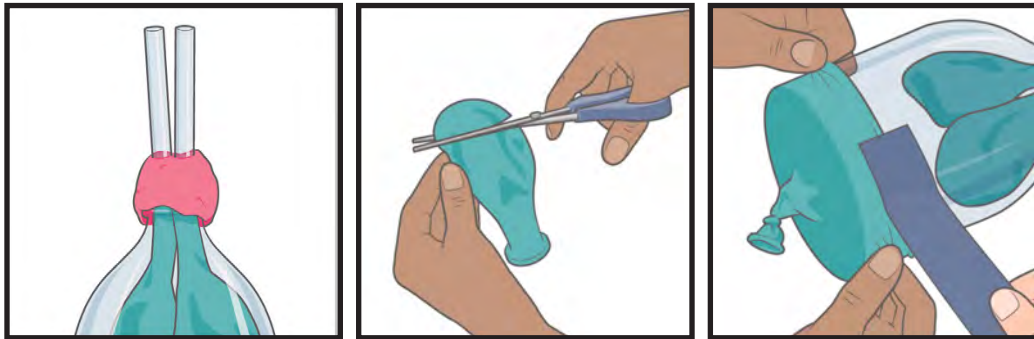
You will use the balloons to create a model of the lungs with one healthy lung and one damaged lung for comparison.

2.1 Building the Lung Model

Use straws to represent the bronchial tubes through which air enters the lungs. Insert straws into the neck of both the “healthy” and “unhealthy” balloons. Squeeze the balloons to remove any extra air. Then, tape the balloon’s neck to the straw to create an airtight seal.

Using clay to make another airtight seal, attach the straws inside the neck of the clear plastic bottle. Be sure to cover the narrow space between the two straws with clay. The top of the straws will be open to the air above the bottle, and the balloons will hang inside the bottle.

To cover the bottle’s open bottom, cut off the top half of a balloon and knot the bottom tail. Then, while one volunteer holds the balloon bottom piece over the bottle, another volunteer should cover the edges with tape to make it airtight. While taping, squeeze the bottle to remove extra air.

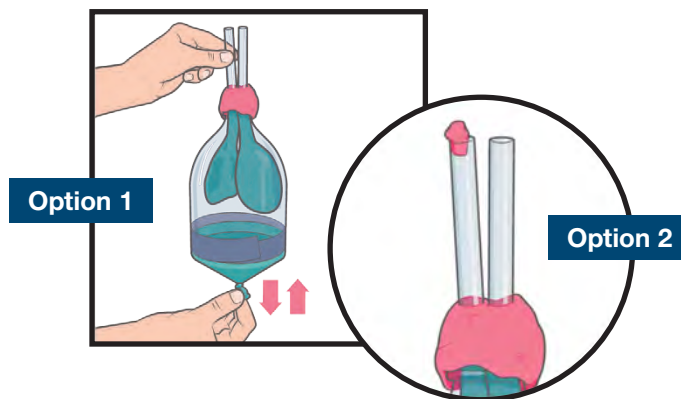


2.2 Narrowing the Bronchial Tubes

Narrow the straw connected to the less elastic (double) balloon to simulate narrowed bronchial tubes in the lungs. You can use one or both of the following methods:

Option 1. Pinch the straw protruding from the less elastic balloon.

Option 2. Use clay to narrow the straw protruding from the less elastic balloon.
(The effect will be more noticeable if the straw is almost completely blocked.)



While one volunteer narrows the straw, push and pull the bottom balloon knot in and out to represent the movement of the diaphragm in the human body. The push/pull motion causes air to flow in and out of the balloons in the same way the lungs inflate and deflate as a person breathes.

THINK IT THROUGH: Observe and describe the inflation of the “healthy” versus “unhealthy” balloons. Compare and contrast the balloon models in terms of healthy human lungs versus lungs that have been damaged by tobacco smoke.



LESSON PLAN: LUNG EXPERIMENT

Objective: Students will create a model of the human lung that shows how tobacco smoke can impact lung function.

Skills Covered: Health; Developing and Using Models; Planning and Conducting Experiments; Critical Thinking

Lesson Plan: Before completing the activity, ask students: *How does smoking affect a person's lungs?* (The chemicals in tobacco smoke damage the tissues in lungs, which makes it difficult to breathe and may cause cancer.) *Describe how your body breathes air in and out.* (Your diaphragm moves down, causing your lungs to inflate and draw in air through the bronchial tubes. When your diaphragm pushes up, it pushes air back out.) *How do you think smoking might affect how your lungs inflate and deflate?* (Answers will vary but may include that smoking might make it harder for lungs to inflate and deflate.)

Hand out the enclosed materials and instructions and have students complete the hands-on activity. After everyone has finished, reconvene as a class and discuss the results.

Key Concepts: Healthy lungs have tiny air sacs called alveoli, which are soft and pliable. The alveoli can easily expand and contract to bring in air. Smoking hardens the alveoli tissue. This makes it difficult for the alveoli to expand and contract, making it harder to breathe. Smoking also inflames the bronchial tubes. When this happens, less air enters the lungs with each breath.

Critical-Thinking Questions: *How were the two different balloons you used in the experiment analogous to the lung of a smoker and a healthy lung? Explain.* (The less elastic balloon was more difficult to inflate, which is analogous to a smoker's lung. The balloon was less flexible, similar to how the alveoli in the lungs of a smoker become less flexible and can't hold as much air. The regular balloon was flexible and held more air.) *Why is it important for lung tissue to stay flexible?* (Lungs take in air by expanding and contracting. If someone's lungs can't flexibly expand all the way, a person won't get enough air and will feel sick.)

VOCABULARY*

alveoli (*noun*): small air sacs in the lungs through which gases from the air move into and out of the bloodstream
> *singular* **alveolus**

analogous (*adjective*): similar
> *related word* **analogy**

approximate (*verb*): to estimate or to calculate the almost exact value

bronchial tube (*noun*): a tube that carries air from the windpipe (air tube in the throat) to the lungs

bronchitis (*noun*): a disease in which the bronchial tubes become inflamed (swollen) and produce too much mucus

chronic (*adjective*): occurring for a long time or occurring again and again

circumference (*noun*): the external boundary of a circle

contract (*verb*): to become smaller

diaphragm (*noun*): a muscle that separates the chest cavity from the abdomen

emphysema (*noun*): a disease in which the alveoli in the lungs break down and become less elastic, making it difficult to breathe

inflamm (*verb*): to become affected by inflammation, in which damaged body tissues become swollen, red, and painful

volume (*noun*): the amount of space filled by an object

SUPPORT FOR HIGHER STANDARDS:

National Health Education Standards

1: Students will comprehend concepts related to health promotion and disease prevention to enhance health

Next Generation Science Standards (NGSS):

Investigations; Models; **LS1.A:** Structure and function

National Science Education Standards (NSES):

Personal health; Evidence, models, and explanation; Change, constancy, and measurement; Structure and function in living systems

Common Core Standards for Math

6.EE.B: One-variable equations and inequalities

7.EE.B: Real-life problems using algebraic expressions

MP.1: Problem solving

MP.4: Model with mathematics

MP.5: Use appropriate tools

Common Core Standards for Literacy in Science

RST.3: Follow a multistep procedure for experiments

RST.4: Determine the meaning of domain-specific words

RST.9: Compare information from experiments and texts

*Vocabulary sourced or adapted from *The American Heritage Children's Science Dictionary* and *Merriam-Webster*.