

## LESSON:

## Cross Out Secondhand Smoke

**Summary:** Students read a brief science article and use 20 words from the article to complete a crossword puzzle.

**Lesson type:** Short Lesson—this lesson will take 20 to 30 minutes to implement.

**EHP Article:** "The Public Health Payoff of 'No Smoking Allowed'"  
*EHP Student Edition*, September 2006, p. A370  
<http://www.ehponline.org/docs/2006/114-6/ss.html#thep>

**Objectives:** By the end of this lesson students should be able to

1. recognize the meaning and use of 20 terms referenced in a science article;
2. describe the public health gains made in reducing exposure to secondhand smoke; and
3. identify the target groups still at risk from secondhand smoke-related illness.

**Class Time:** 25 minutes

**Grade Level:** 9–11

**Subjects Addressed:** Environmental Health, Health, Biology, Physiology

### ► Prepping the Lesson (5 minutes)

#### INSTRUCTIONS:

1. Download the article "The Public Health Payoff of 'No Smoking Allowed'" at <http://www.ehponline.org/docs/2006/114-6/ss.html#thep>.
2. Read the article and review the word bank provided with the puzzle.
3. Make copies of the Student Instructions, which includes the puzzle and word bank.

#### MATERIALS (per student):

- 1 copy of the article "The Public Health Payoff of 'No Smoking Allowed'"
- 1 copy of the Student Instructions

#### VOCABULARY:

- bronchitis
- cotinine
- metabolism
- milliliter
- nanogram
- nonsmoker
- serum
- sudden infant death syndrome (SIDS)

#### BACKGROUND INFORMATION:

All necessary information is provided in the article.

#### RESOURCES:

*Environmental Health Perspectives*, Environews by Topic page, <http://ehp.niehs.nih.gov>. Choose Environmental Tobacco Smoke/Smoking American Lung Association, Secondhand Smoke Fact Sheet, <http://www.lungusa.org/site/pp.asp?c=dvLUK900E&b=35422>

American Cancer Society, "What Is Secondhand Smoke?"  
[http://www.cancer.org/docroot/PED/content/PED\\_10\\_2X\\_Environmental\\_Tobacco\\_Smoke-Clean\\_Indoor\\_Air.asp](http://www.cancer.org/docroot/PED/content/PED_10_2X_Environmental_Tobacco_Smoke-Clean_Indoor_Air.asp)

U.S. EPA Smoke-Free Homes Program (information on the recent Surgeon General's report on secondhand smoke and a program in which individuals pledge to keep their homes "smoke-free"), <http://www.epa.gov/smokefree/>



## ► Implementing the Lesson

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### INSTRUCTIONS:

1. Hand out the article to students and allow them to read it.
2. Hand out the crossword puzzle for them to complete.
3. See the Assessing the Lesson section for grading/answers.
4. (Optional) Share responses as a class.

### NOTES & HELPFUL HINTS:

- Another way of doing this quick exercise is to do it on an overhead transparency as a class.
- For classes with a lower reading level, provide the word bank as a reference. For more sophisticated readers, cover the word bank when copying the puzzle and have students figure out the answers from the article.
- There are several good software programs available for making crossword puzzles for use in the classroom. This particular lesson was generated using the Crossword Weaver program. Many websites offer free demo use, while others charge a small fee or require a subscription for expanded applications.

## ► Aligning with Standards

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### SKILLS USED OR DEVELOPED:

- Communication (oral, written—including summarization)
- Comprehension (listening, reading)
- Critical thinking and response

### SPECIFIC CONTENT ADDRESSED:

- Environmental health
- Secondhand smoke

### NATIONAL SCIENCE EDUCATION STANDARDS MET:

#### Science in Personal and Social Perspectives Standard

- Personal and community health
- Environmental quality
- Natural and human-induced hazards
- Science and technology in local, national, and global challenges

## ► Assessing the Lesson

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The completed crossword is on the next page.

## ► Authors and Reviewers

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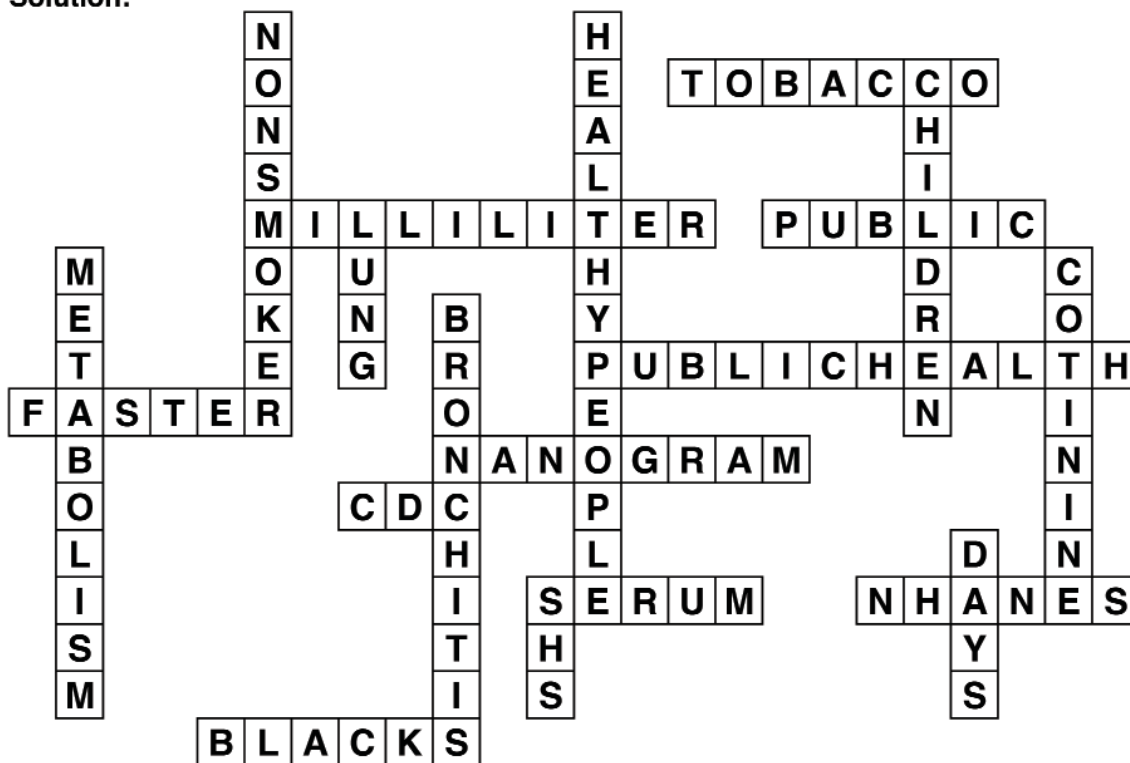
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**Reviewers:** Susan M. Booker, Erin E. Dooley, Liam O'Fallon, Laura Hemminger, Stefani Hines, Barry Schlegel, Kimberly Thigpen Tart, Heather Valli

**Give us your feedback!** Send comments about this lesson to [ehpscienceed@niehs.nih.gov](mailto:ehpscienceed@niehs.nih.gov).



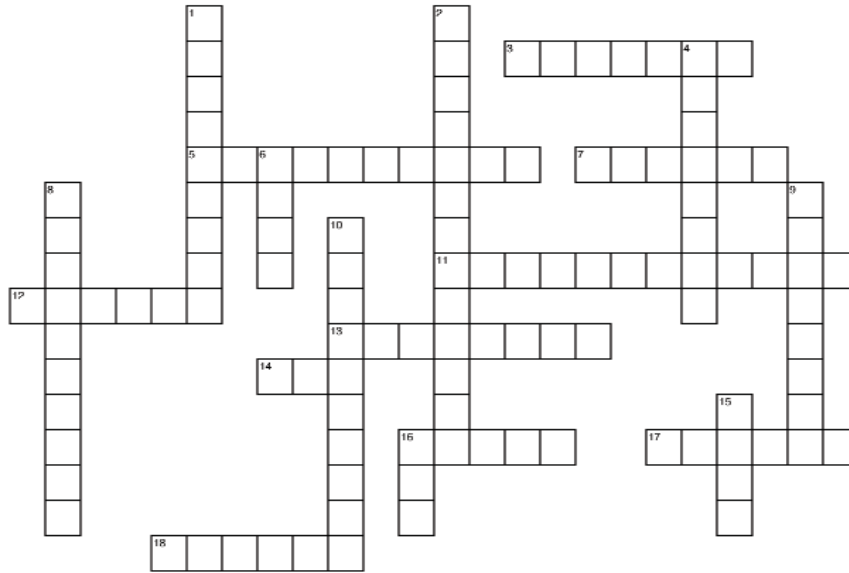
**Solution:**



# STUDENT INSTRUCTIONS: Cross Out Secondhand Smoke

**Step 1:** Read the article "The Public Health Payoff of 'No Smoking Allowed.'"

**Step 2:** Complete the crossword puzzle below using words appearing in the article.



www.CrosswordWeaver.com

### ACROSS

- 3 Plant which is the source of nicotine in cigarettes
- 5 One thousandth of a liter
- 7 Smoking bans in \_\_\_\_\_ places helped reduce exposure to SHS
- 11 The professional field which aims to improve the health of the population, not individuals
- 12 According to the study cited, exposure to secondhand smoke in the population has decreased much \_\_\_\_\_ than expected
- 13 One billionth of a gram
- 14 Agency whose researchers completed the secondhand smoke study (acronym)
- 16 The watery part of the blood (separate from the cells)
- 17 National survey which collected data on 29,849 nonsmokers (acronym)
- 18 Racial group which still faces significant exposure to secondhand smoke

### DOWN

- 1 An individual defined by having less than 10 ng/mL cotinine in the serum
- 2 \_\_\_\_\_ 2010: The document which establishes national public health goals
- 4 Age-related group which should be targeted for continued efforts to reduce SHS exposure
- 6 Form of cancer most associated with smoking
- 8 This factor likely accounts for the difference in cotinine per cigarette smoked between racial groups
- 9 Primary byproduct when the body metabolizes nicotine
- 10 Lung infection associated with exposure to cigarette smoke
- 15 Cotinine lasts only a few \_\_\_\_\_ in the bloodstream
- 16 Abbreviation for "secondhand smoke"

**Word Bank:** blacks, bronchitis, CDC, children, cotinine, days, faster, Healthy People, lung, metabolism, milliliter, nanogram, NHANES, nonsmoker, Pirkle, public, public health, serum, SHS, tobacco

