

Heads Up: Real News About Drugs and Your Body

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For the accompanying Student Edition Compilation, refer to HURN09-07SC.

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Genetics and Addiction

Dear Teacher:

This issue of your Scholastic classroom magazine launches an exciting new year of *Heads Up*, featuring articles that bring students relevant and cutting-edge news about drug abuse and their health.

Our newest article, “Genetics and Addiction,” outlines connections scientists are making between genetics and drug addiction. These findings can help teens understand some of the main factors that play a role in their individual risk for drug addiction.

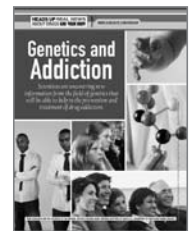
In addition to showing how drug abuse can run in families, the article outlines other biological and environmental factors that

play a part in determining whether or not a person will become addicted to drugs.

I hope you share this article with your students—to provide them with important facts and information that will help them make smart choices in their lives.

Sincerely,

Nora D. Volkow, M.D.
Director,
National Institute on
Drug Abuse (NIDA)



Lesson Plan and Worksheet

NATIONAL STANDARDS

Science (NSES, NRC): Life Science: Regulation and Behavior; Science in Personal and Social Perspectives: Risks and Benefits

Language Arts (IRA/NCTE): Evaluation Strategies; Evaluating Data

KEY CONCEPTS

- Studies of identical twins show that genes can contribute as much as half of the risk of addiction. No single factor determines whether a person will develop substance-abuse problems. Biological factors, including genetics, as well as a person’s environment and drug availability, all influence a person’s susceptibility to addiction.

BEFORE READING

- Introduce the topic of “genetics of addiction” by asking students to discuss common physical traits that run in families, such as eye and hair color, or height. What other types of traits—both seen and unseen—do students think are controlled by genes and run in families?

AFTER READING

- How can genes make a person less or more susceptible to addiction?
- Name specific environmental factors that can increase or decrease the risk of addiction.
- In addition to genetics, what are some other biological factors that can contribute to the risk of addiction?

CRITICAL THINKING

- How can genetics research help treat people struggling with addiction?
- Why is it important for teens to know the facts about genetics and other risk factors for drug abuse and addiction?
- How can knowing facts help someone make smarter choices?

WRITING PROMPT

Ask students to write an essay or a journal entry about traits they may have inherited from their parents and grandparents.

ANSWERS to “Vocabulary” in the Student Magazine: 1. c; 2. d; 3. e; 4. b; 5. a.

ANSWERS to Student Worksheet: 1. a; 2. a; 3. a; 4. a; 5. a; 6. a; 7. d; 8. d; 9. d; 10. c.

For printable past and current articles in the **HEADS UP** series, as well as activities and teaching support, go to www.drugabuse.gov/parent-teacher.html or www.scholastic.com/HEADSUP.

What Do You Know About Genetics and Addiction?

Answer the questions below to find out what you know about genetics and its role in addiction.

- Genes can influence how a person responds to drugs.
 (A) True
 (B) False
- Genes can significantly contribute to the risk of addiction.
 (A) True
 (B) False
- Genes come in different forms, or “variants.”
 (A) True
 (B) False
- Addiction is a chronic yet treatable disease that affects the brain and behavior.
 (A) True
 (B) False
- Some genes can make people more likely to abuse drugs.
 (A) True
 (B) False
- No single factor determines whether a person will become addicted to drugs.
 (A) True
 (B) False
- Genes carry instructions to make
 (A) proteins
 (B) bones
 (C) hair
 (D) all of the above
- Which of the following is a risk factor for substance abuse?
 (A) peers who use drugs
 (B) substance abuse at home
 (C) a chaotic home environment
 (D) all of the above
- Which of the following is a protective factor that reduces the risk of drug abuse?
 (A) parental involvement
 (B) strong community or school attachments
 (C) strong family connections
 (D) all of the above
- A genetic variation that decreases the enzyme CYP2A6 can protect a person against _____ addiction:
 (A) heroin
 (B) cocaine
 (C) nicotine
 (D) alcohol

Teen Science-Investigators

In This Installment:

- Profiles of three teens who are the winners of the first-ever NIDA-Scholastic *Addiction Science Awards*



More Information

- For more about the NIDA-Scholastic *Addiction Science Awards*, visit www.drugabuse.gov/sciencefair.
- For complete interviews with the three teen winners, visit www.scholastic.com/headsup.

Dear Teacher:

Every day around the world, scientists are working hard to find answers to unsolved questions. Their discoveries and research provide inspiring examples of the power of science to change the world.

But when the scientists turn out to be teens, there's even more reason to take notice. This latest installment in the *Heads Up* series offers a very special look at three teens whose remarkable research will continue to shape our knowledge about drug abuse and addiction.

As winners of the first-ever NIDA-Scholastic *Addiction Science Awards*, our "Teen Science-Investigators"—Kapil Ramachandran, Ethan Guinn, and Shelby Raye—have shown the world what can be achieved by asking questions and by finding answers through the study of science. We hope you will share this article with your students to encourage them to consider and share questions that are intriguing to them, and to recognize the power of science to provide answers.

Sincerely,

Nora D. Volkow, M.D.
Director,
National Institute on Drug Abuse (NIDA)



Lesson Plan and Worksheet

NATIONAL STANDARDS

Science (NSES, NRC): Life Science; Science in Personal and Social Perspectives

BEFORE READING

- Discuss what scientific researchers do; ask students about the role teens might play in scientific investigation.
- Discuss ways in which scientific tools and methods are used to answer questions.

AFTER READING

- Why was each teen science-investigator in the article motivated to use science and research to seek answers to the questions he or she had?
- What results of the teens' research did you find surprising?

CRITICAL THINKING

- How might the work of these teen science-investigators contribute to helping teens better understand the health consequences of drug abuse and addiction?
- What unique perspective do you think teens bring to addiction-science research?

WRITING PROMPT

Ask students to write a paragraph about a question they have about drug abuse and/or addiction. Have them describe what inspired them to ask the question and how they might use science to answer it.

STUDENT WORKSHEET

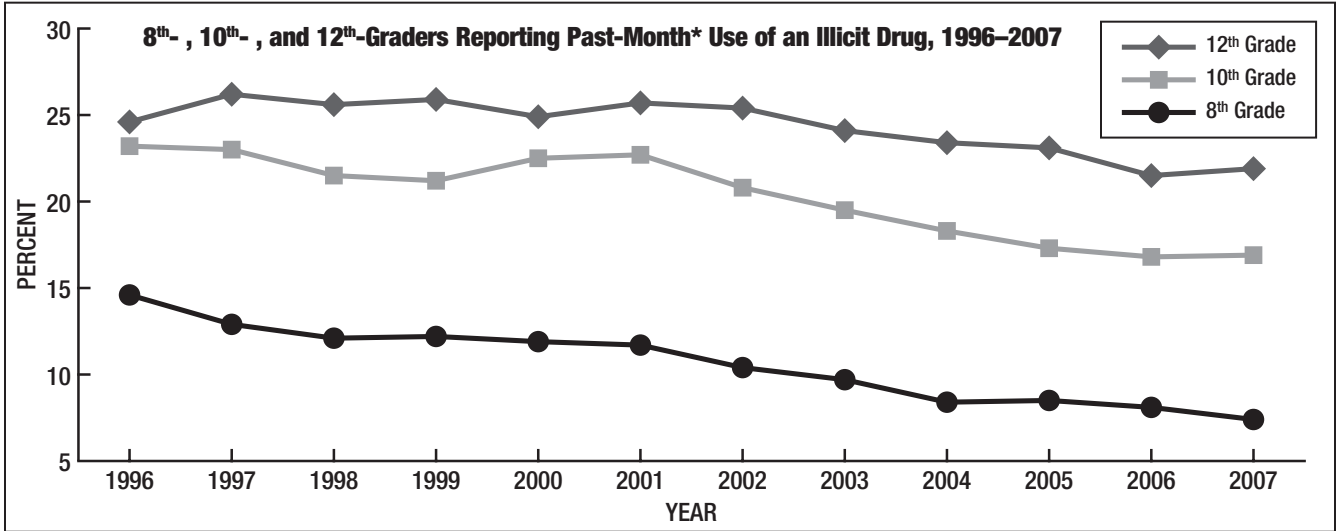
Distribute the graphing skills worksheet to build students' skills using line graphs and bar graphs. Explain that graphing and analyzing data are key parts of scientific research and reporting, and that each of the three teen science-investigators used graphs as part of their research studies.

ANSWERS to Student Worksheet: 1. b; 2. b; 3. a.

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Trends in Teen Drug Use

Collecting, graphing, and analyzing data are key parts of scientific research and reporting. Study the line graph below to analyze national trends in teen drug use from 1996 to 2007. Then answer the questions that follow.



Source: Monitoring the Future Study, University of Michigan.

* "Past month" refers to use at least once during the 30 days preceding an individual's response to the survey.

- The graph shows the percents of 8th-, 10th-, and 12th-graders who reported past-month use of an illicit drug from the years 1992 to 2007.
 - True
 - False
- Overall illicit drug use by 8th-, 10th-, and 12th-graders _____ between 1996 and 2007.
 - increased
 - decreased
 - stayed the same
- The percentage of 8th-graders using an illicit drug dropped _____ between 1996 and 2007.
 - about 50 percent
 - about 25 percent
 - more than 75 percent

Now try this: Bar graphs are another way to represent data. Like line graphs, bar graphs have a horizontal x-axis and a vertical y-axis. The height of each bar represents a certain value (percent) measured for each group. The table below includes the percentage data that were used to construct the line graph above. Select three separate years from the chart below. Then, on a separate piece of paper, create a bar graph to represent the percentage data of those three years for grades 8, 10, and 12.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
8 th Grade	14.6	12.9	12.1	12.2	11.9	11.7	10.4	9.7	8.4	8.5	8.1	7.4
10 th Grade	23.2	23.0	21.5	21.2	22.5	22.7	20.8	19.5	18.3	17.3	16.8	16.9
12 th Grade	24.6	26.2	25.6	25.9	24.9	25.7	25.4	24.1	23.4	23.1	21.5	21.9

Stimulant Addiction

In This Installment:

- Information about stimulants, including cocaine, methamphetamine (“meth”), MDMA (“ecstasy”), caffeine, nicotine, and the prescription ADHD drugs Adderall® and Concerta®
- How stimulants affect the brain
- How using stimulants damages the heart and other parts of the body



Dear Teacher:

Despite the positive news of a decline in teen drug use, the use of stimulants, such as cocaine, is still at levels that raise concern. Results from the 2007 “Monitoring the Future” survey showed that 2.0 percent of 8th-graders, 3.4 percent of 10th-graders, and 5.2 percent of 12th-graders had abused cocaine within the last year. Further cause for concern is the perceived availability of stimulants among teens. According to the same survey, 19.0 percent of 8th-graders, 30.0 percent of 10th-graders, and 41.2 percent of 12th-graders responded that cocaine powder was “fairly easy” or “very easy” to get.

In this year’s third installment of *Heads Up*, we hear the personal account of a teen drug user and provide the latest facts from NIDA scientists to highlight the hard truth about the effects of stimulants, especially cocaine, on the brain and the body. We hope you will share the article with your students so they will be well informed about the health risks and harmful effects of these powerfully addictive drugs.

Sincerely,

Nora D. Volkow, M.D.
Director,
National Institute on Drug Abuse (NIDA)



Lesson Plan and Worksheet

NATIONAL STANDARDS

Science (NSES): Life Science: Regulation and Behavior, Behavior of Organisms; Science in Personal and Social Perspectives: Personal Health, Risks and Benefits, Personal and Community Health

KEY CONCEPTS

- Stimulants are a class of drugs that “stimulate” the brain and central nervous system, temporarily increasing energy and alertness.
- Cocaine interferes with the brain’s natural “reward system.” It blocks the normal recycling of dopamine, causing the chemical to build up in the brain.
- Stimulants can be highly addictive and can have many harmful effects on the body, including potentially irreversible problems resulting from cardiovascular events (e.g., heart attacks, strokes).

BEFORE READING

- Introduce the topic by asking students whether they have heard of cocaine (“coke”) or methamphetamine (“meth”). What do they know about these drugs? How do the drugs affect a person’s behavior? How do they affect the body?

- Have students take the quiz on the student worksheet. After they complete the worksheet, have them read the article “Stimulant Addiction.” Have students compare their answers with the information in the article.

AFTER READING

- Have students retake the quiz on the student worksheet.
- How do the effects of stimulants on the brain explain why the drugs can be addictive?
- How can long-term use of stimulants affect the body?

CRITICAL THINKING

- What fact about stimulants surprised you the most? Why?
- You may have heard rumors about celebrities, such as the “It Girls” in Hollywood, taking cocaine. How might this affect a teen’s decision about using the drug?

WRITING PROMPT

Have students write an essay about what they would say to a friend who wants to take cocaine or another stimulant because he or she heard it was a “great high.”

ANSWERS to Student Worksheet: 1. A; 2. A; 3. A; 4. A; 5. A; 6. A; 7. B; 8. D; 9. D; 10. C

For printable past and current articles in the **HEADS UP** series, as well as activities and teaching support, go to www.drugabuse.gov/parent-teacher.html or www.scholastic.com/HEADSUP.

What Do You Know About Stimulants?

Answer the questions below to find out what you know about stimulants.

- Stimulants are drugs that can temporarily increase energy and alertness.
(A) True
(B) False
- Nicotine and cocaine are both stimulants.
(A) True
(B) False
- Stimulants affect the brain's natural "reward system."
(A) True
(B) False
- Cocaine can cause paranoia.
(A) True
(B) False
- Some of the effects of cocaine use can result in death.
(A) True
(B) False
- Abusing cocaine can cause a person to lose the ability to feel happy without the drug.
(A) True
(B) False
- How does cocaine affect the brain?
(A) It slows down brain function.
(B) It increases the amount of dopamine in the brain.
(C) It stops pleasurable signals from flowing through the brain.
(D) It increases the number of neurons in the brain.
- Which of the following is a possible short-term effect of using stimulants?
(A) Constricted blood vessels
(B) Diarrhea
(C) Vomiting
(D) All of the above
- Which of the following effects on the body can some stimulants cause?
(A) Bowel gangrene
(B) Disturbed heart rhythms
(C) Frequent nosebleeds
(D) All of the above
- Which of the following statements is FALSE?
(A) Nicotine is a stimulant.
(B) Cocaine can cause a young person to have a heart attack.
(C) Cocaine abuse has no effect on the brain.
(D) Using some stimulants can put a person at higher risk of contracting HIV.

The Truth About “Rehab” and Drug Addiction

In This Installment:

- Information about residential treatment centers and other treatments for drug addiction—a chronic disease
- Where and when to get help for an addiction
- What happens in drug treatment programs, including behavioral therapies and medications that help patients avoid relapse
- Why drug addiction and other mental illnesses often occur simultaneously



Dear Teacher:

“Rehab” is a commonly used term that can refer to a range of drug treatment options. Teens who read about celebrities checking into residential drug treatment centers—places that look a lot like five-star resorts—may have a glamorized view of drug addiction and treatment for drug addiction. Teens may not “get” the severity of drug addiction. If they do understand how serious drug addiction is, then they may not know where to get help. Untreated drug addiction presents the risk of serious problems within families and communities, including violence, crime, health emergencies, child abuse, and unemployment.

This final installment of this school year’s *Heads Up* series highlights the realities of treatment for drug addiction. Teens will learn that drug addiction is a serious and chronic, yet treatable, brain disease. Like other chronic illnesses, drug addiction requires continued care, and successful treatment can involve several different therapies.

I hope you share this article with your students to provide them with important facts about drug addiction and treatment.

Sincerely,

Nora D. Volkow, M.D.
 Director,
 National Institute on Drug Abuse (NIDA)



Lesson Plan and Worksheet

NATIONAL STANDARDS

Science (NSES): Life Science: Regulation and Behavior; Science in Personal and Social Perspectives: Personal and Community Health
Language Arts (IRA/NCTE): Evaluation Strategies

KEY CONCEPTS

- “Rehab” is a commonly used term to describe a range of drug treatment options. The reality of treatment is very different from what the celebrity media shows us.
- Effective treatments for drug addiction include behavioral therapies and medications.
- Successful treatment involves a combination of therapies that address a person’s individual drug-abuse patterns and drug-related medical, psychiatric, and social problems.

BEFORE READING

- Discuss with students stories they’ve read about celebrities who have drug addictions and have gone to residential drug treatment centers.
- Discuss students’ impressions of drug addiction and treatment. Ask them: *What kinds of stories have you heard about celebrities and drug addiction? What do you think of when you hear the word “rehab”?*

AFTER READING

Have students take the quiz on the Student Worksheet (see reproducible on the following page), and then ask these questions:

- *Has your impression of drug addiction and treatment changed after reading the article? How and why?*
- *What are the similarities between drug addiction and asthma?*
- *What are some of the reasons that drug addiction is often comorbid with mental illness?*

CRITICAL THINKING

- *Why would a drug-addiction treatment program require a person recovering to attend checkups with a therapist?*
- *Why do you think it is important to tailor a drug-addiction treatment program to a person’s individual needs?*

WRITING PROMPT

Have students write a mock magazine article about a teen addicted to drugs for their favorite pop-culture magazine. The article should highlight the teen’s struggles with addiction and how he or she got help. Tell students that this article should bust myths about drug addiction and treatment.

ANSWERS to Student Worksheet: 1. B; 2. A; 3. A; 4. B; 5. A; 6. D; 7. D; 8. C; 9. C; 10. D

For printable past and current articles in the **HEADS UP** series, as well as activities and teaching support, go to www.drugabuse.gov/parent-teacher.html or www.scholastic.com/HEADSUP.

What Do You Know About “Rehab” and Drug Addiction?

Answer the questions below to find out what you know about treatment for drug addiction.

1. Drug addiction is a short-term illness that is cured with medicine.
(A) True (B) False
2. People who are addicted to drugs have a compulsive and sometimes uncontrollable craving for drugs.
(A) True (B) False
3. Drug addiction and asthma are both chronic, long-lasting diseases.
(A) True (B) False
4. When a person relapses during his or her recovery from drug addiction, this means the treatment has failed.
(A) True (B) False
5. “Rehab” is a commonly used term that can refer to a range of drug treatment options.
(A) True (B) False
6. Which of the following is a “trigger” that could cause a person to relapse?
(A) Exposure to drugs
(B) Exposure to friends who abuse drugs
(C) Stress
(D) All of the above
7. Some people who need treatment for drug addiction do not receive it because
(A) they won’t admit they have a problem.
(B) they don’t know how to get help.
(C) of a range of different reasons.
(D) All of the above
8. Detoxification is
(A) the last step in drug treatment.
(B) the process of becoming addicted.
(C) the process that allows a person’s body to get rid of a drug.
(D) one-on-one counseling.
9. Methadone is used to treat
(A) anxiety and depression.
(B) alcohol addiction.
(C) opiate addiction.
(D) indigestion.
10. Which of the following is a reason that a person might suffer from both drug addiction and other mental illnesses?
(A) There are common brain areas involved and possibly even shared genes.
(B) Environmental triggers like stress can lead a person to use drugs and can also cause mental illnesses.
(C) A person experiencing the symptoms of a mental illness may turn to drugs or alcohol to cope.
(D) All of the above