

Heads Up: Real News About Drugs and Your Body

Welcome to **Heads Up**: Brought to you by Scholastic and the scientists at the National Institute on Drug Abuse, *Heads Up* gives you the facts about the real effects of drugs on the teen brain and body. Check out the articles and features inside to get the latest news so you can make informed choices about your health and your future.

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For the accompanying Student Edition Compilation, refer to NIH Pub No.: 10-7647.



Real Questions, Real Answers About Drugs

In This Installment:

- Answers to some of teens' most frequently asked questions about drugs and addiction
- Where teens can find reliable, science-based answers to their questions about drugs
- Tips for making smart choices when faced with important decisions



Dear Teacher:

The teen years are filled with situations that raise questions about drugs. Getting answers to these questions can help teens make healthy decisions when faced with peer pressure about drug use. If they know the facts about how drugs may affect their brains and bodies, they'll be more likely to say "no."

But many teens don't know where to get the facts about drugs. Some teens may feel comfortable talking to their parents, teachers, or other trusted adults, but many may be too embarrassed, or fear getting in trouble. Instead, they may rely on word of mouth or other unreliable sources to get information.

In this year's first installment of *Heads Up*, we give answers to some of the questions that teens have asked most frequently during NIDA's Drug Facts Chat Day—an annual event where teens can anonymously send questions to the nation's top drug and addiction experts. We also highlight other reliable sources of information about drugs and give teens tips for making smart decisions. We hope you will share the article with your students and encourage them to seek out science-based answers to their questions.

Sincerely,

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



Lesson Outline

KEY CONCEPTS

- Teens frequently face situations that can raise tough questions about drugs. They need safe, reliable sources to get answers to their questions.
- Some teens may be afraid to ask adults questions about drugs. They may instead rely on potentially inaccurate information gathered from friends.
- The National Institute on Drug Abuse (NIDA) provides several resources where teens can anonymously get science-based answers to their questions. Resources include the Heads Up series, NIDA's Web site, and NIDA's Drug Facts Chat Day.
- Teens can put the facts they learn about drugs into action to make smart decisions, or to help a family member or friend who is in trouble with drugs.

BEFORE READING

- Have students think of some questions they may have about drugs. Acknowledge that their questions may come from many different perspectives or experiences. Then have volunteers share their questions. Some examples might include: Which drugs are the most dangerous? Is it okay to use drugs occasionally?

- Ask students where they might go to get answers to their questions about drugs and addiction, or to find information about how to help a friend with a drug-abuse problem. Discuss the pros and cons of various sources of information.

AFTER READING

- Did any of the questions written by real teens in the article surprise you? How many of the questions were ones you have heard teens ask in the past?
- What are some safe, reliable resources for answering questions about drugs?

CRITICAL THINKING

- Why is it important to ask questions about drugs or drug addiction?
- How can having the facts help you make decisions in situations involving drugs?

WRITING PROMPT

- Have students write a scene with dialogue in which a teen uses facts about drugs to make a smart decision in a difficult situation.

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.

Name: _____ Date: _____

Getting the Facts About Drugs and Addiction

Below are some questions asked by teens during NIDA's Drug Facts Chat Day. Pretend that you are a scientist at NIDA who is writing answers to these questions. You can find facts to support your answers by doing research at <http://teens.drugabuse.gov>. Check out the "Facts on Drugs" section.

1. "There are kids in my school who smoke pot and they seem okay. What's the big deal?"
(Hint: Research the short- and long-term effects of using marijuana.)

2. "How many people die from smoking cigarettes?" (Hint: Research the effects of smoking and nicotine addiction.)

3. "Can steroids cause any problems with your body?" (Hint: Research how steroids affect the hormone balances in the body.)

4. "What are the effects of the use of ecstasy?" (Hint: Research how MDMA [ecstasy] affects the brain and body.)

5. Write your own question and then research the answer.

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Dear Teacher:

The latest *Heads Up* installment highlights addiction science research that may help students think differently about the lasting effects of abusing methamphetamine and smoking cigarettes, and about *who* can conduct research.

The student article focuses on two unusual research projects conducted by three teens, all honored with a 2009 Intel ISEF Addiction Science Award.

The student worksheet profiles the research of a scientist who used functional Magnetic Resonance Imaging (fMRI) to scan the brains of adults and adolescents to better understand why adolescents make risky decisions.

These accounts illustrate how scientists—whether teens or trained professionals—use the scientific method to answer



questions about drug abuse. We hope that by sharing these materials with your students, you will encourage them to do the same.

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

In this Installment:

- **Student article:** Reports on the remarkable research of the teen winners of the 2009 Intel ISEF Addiction Science Awards
- **Student worksheet:** Reports on how teen brains and adult brains differ when making decisions

TSl: Teen Science Investigations

Lesson Overview: The student article and this accompanying lesson/student worksheet are to be used together to highlight how scientists use the scientific method to find answers to questions. Below, you'll find questions to engage students and help them comprehend both the article and the worksheet.

Alignment with National Science Education Standards (NSES)

- *Science as Inquiry:* Having abilities necessary to do scientific inquiry; understanding scientific inquiry
- *Science in Personal and Social Perspectives:* Risks and benefits

Student Article:

Before-Reading Discussion:

- Have you ever had a question about the lasting effects of drugs on the body? How might drug abuse affect the environment? How would you go about finding the answers?
- How do you think scientists find answers to their questions about drug abuse?

After-Reading Discussion:

- What surprised you most about the research that the teen scientists conducted?
- After reading about their findings, do you think differently about the health risks of abusing methamphetamine? About smoking cigarettes and about cigarette smoke?

Writing Prompt:

- The teen scientists profiled in the article were inspired to ask questions after learning something that surprised them. Have students come up with their own research questions based on something they have heard or read in a news report. What inspired their questions? How might they design an experiment to find an answer?

Student Worksheet:

Before-Reading Discussion:

- What things do you consider when you are making a decision?
- In what circumstances might it be dangerous to make a decision too quickly?

After Reading:

- Have students answer questions at the bottom of the worksheet.

Answers to Worksheet Questions:

1. Answers will vary.
2. Answers will vary, but may include a discussion on whether or not teens, whose brains are still developing, should be given the same rights and be held to the same standards as adults.
3. Answers will vary, but may include brainstorming on how to pause and really consider the consequences of a decision. Teens may need to take time to research and gather facts about a situation or get advice from an adult before making a decision.
4. See steps at the end of the student article "TSl: Teen Science Investigations" for possible answers.

More Information

- For more information about the Intel ISEF Addiction Science Awards, visit www.drugabuse.gov/sciencefair.
- To find out more about the latest developments in addiction science, check out the blog at <http://teens.drugabuse.gov/blog>.
- To learn more about methamphetamine and tobacco addiction, visit <http://teens.drugabuse.gov>.

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THE CASE OF THE TEEN BRAIN

Assignment: Study the article to learn more about the teen brain. Then complete the questions below.

● Investigator:

Dr. James Bjork, Scientist, National Institute on Drug Abuse, National Institutes of Health

● Mystery:

"I've always been interested in what it is about the brains of some people that causes them to do something that could irreversibly change their life," says Dr. Bjork. He started studying impulsive behavior in adults, but found that many highly destructive behaviors, such as drug abuse, start in adolescence. He wanted to find out if unique features exist in the teen brain that make this kind of impulsive behavior more likely.

● Uncovering Clues:

Dr. Bjork studied how people's brains respond to environmental challenges when they are making decisions.

Experiment Design: Dr. Bjork asked adults and adolescents to play a game that involved a conflict between being able to win a guaranteed reward or risking it all for the opportunity to win more.

Data Collection: As the participants played the game, Dr. Bjork studied their brain activity using *functional Magnetic Resonance Imaging* (fMRI). This specialized brain scan allowed him to see which areas of the brain were engaged (or activated) when the participants made decisions about what risks to take in the game.

Data Analysis: Dr. Bjork's research showed that while the game was being played, the *middle frontal cortex* was much more engaged/active in adults than in teens.

"I had to present adolescents with a very clear and severe threat of monetary loss [in the game] to start getting that area of the brain to become active," says Dr. Bjork. These findings are supported by other research that shows that the brain continues to mature through a person's 20s, and that the frontal cortex of the brain is one of the last sections to fully mature.

● Drawing Conclusions:

Dr. Bjork's findings may help us understand why adolescence is a

time of heightened risk-taking behavior. His experiment shows that a part of the cortex that helps us weigh risks and rewards is less active in teens, and this may affect how they make decisions. By being less sensitive to risk and more impulsive, teens could make unwise decisions about drugs, especially when the consequences of drug use are not always immediate or clear. Not all risk-taking, however, is bad for one's health. Teens' spirit for adventure means they can be more open to positive risks, such as taking up the challenge of learning a new skill, making new friends, or becoming interested in a new hobby.

Dr. Bjork suggests that this research supports the idea that restrictions, including legal ones, may be needed to help protect teens from some risky situations. These restrictions include the 21-year-old drinking age law and possibly even graduated driver's licenses that give teens increased driving privileges over time.

Photo credit: magnifying glass © i-Stockphoto.

QUESTIONS

(Write your answers on a separate sheet of paper.)

1. Dr. Bjork's research suggests that teenagers may be more likely to act impulsively than adults and make risky decisions. Can you think of instances where you have observed this to be true, and/or instances where you have observed this *not* to be true?
2. Dr. Bjork's research suggests that teens' brains are different from adults' brains when it comes to weighing risks and rewards in making a decision. Given these findings, do you think that teens should be held accountable for their actions? Why or why not? Under what circumstances?
3. How can teens use the findings from Dr. Bjork's study to help them make better decisions when they are in risky situations, including those involving drugs and alcohol?
4. Dr. Bjork's research follows the scientific method. Which steps of the scientific method can you identify in the description of his research above? See the magazine article "TSI: Teen Science Investigations" for clues.



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Dear Teacher:

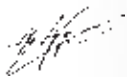
This installment of *Heads Up* has something new.

Past series articles have well documented the science of the effects of drug abuse and addiction, as well as how adolescent brain development has profound implications on decision making in teens.

Knowledge of these facts is essential for teens to make smart choices when it comes to drugs. In this new article and lesson, you'll find valuable facts about the dangers of abusing prescription drugs, marijuana, alcohol, and tobacco. You'll also find practical tools for students to help them take smart actions in light of the facts.

This installment highlights real-life scenarios that teens may encounter involving drugs, as well as techniques they can practice in making good decisions—all while navigating the myriad choices and concerns that they face as teens.

We hope you will share the article and this lesson with your students and encourage them to practice putting facts into action.



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

In This Installment:

- **Student article:** Practical techniques for teens to make smart decisions based on their factual knowledge of drugs
- **Student worksheet:** Role-playing exercises to build skills for taking smart actions when it comes to drugs

FACTS INTO ACTION

Lesson Overview: The decision-making lesson below and role-play reproducible worksheet on the reverse side reinforce comprehension of techniques students will learn about in the student article “Facts Into Action.” The worksheet also contains myth-busting facts to help students make smart choices when it comes to drug abuse.

Alignment With National Science Education Standards (NSES)

- *Science in Personal and Social Perspectives:* Risks and benefits; Personal and community health

Student Article:

Discussion Questions: Before you conduct the lesson, have students read the student article “Facts Into Action.” Choose from the questions below to guide discussion before and after reading.

Before-Reading Discussion: Engage students in the topic by asking them to think of a time when they had to make a difficult decision. Discuss the following:

- What facts played a role in their decision? Why were the facts important?
- What other factors did they have to consider to make a decision?
- What goes into making a smart choice when one faces a tough decision?

After-Reading Discussion:

- Do you think the scenarios in the article were true to life? How so? How not?
- Why is knowing the facts about drugs important? What are some good sources for getting facts about drugs?
- How are the tips for action helpful? What are some other ways you could get out of a sticky situation in which drugs are involved?

Activity Prompt:

Explain to students that practicing thoughtful decision making can help in making smart choices about many things, including drug abuse. First, outline on the board these steps to decision making:

- What is the problem?
- What are your options?
- What facts do you know? What *don't* you know?
- What are other factors to consider?
- What is the outcome of each option?
- What decision will you make?
- How can you implement the decision?

Second, divide students into small groups and ask them to choose a scenario from the student article. Third, have each group work through the decision-making steps for the scenario by answering the questions outlined on the board. As a wrap-up, ask students: Why is it important to pause and think before making a decision?

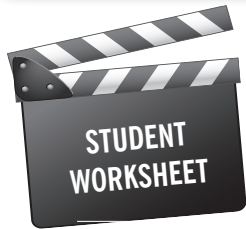
Student Worksheet:

Role-Play Activity: Introduce the activity by telling students they will role-play in hypothetical situations involving tobacco, alcohol, and prescription drugs. Divide students into groups of four. Have students work together to decide what Character #4 should do to avoid using the drug. Point out that leading by example might give others the courage to say “no, thanks” as well.

More Information

- For more facts about the drugs discussed in this lesson, visit <http://teens.drugabuse.gov> and www.drugabuse.gov/.
- To learn more about how teens make decisions, read the article and lesson “Teens and Decision Making: What Brain Science Reveals” found at <http://teacher.scholastic.com/scholasticnews/indepth/headsup/support/index.asp?article=reproducibles>.
- For more about teens and decision making, check out www.fox.com/pause/.

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ROLE-PLAY: FACTS INTO ACTION

Read each scene, the facts in “Reality Check,” and other considerations in “Time Out.” Pretend you are Character #4. What would you do? On a separate sheet of paper, write the action you would take, why, and how it might impact the other characters. Then, as a group, take turns being Character #4 and acting out the scenes.

SCENE #1:

(Characters #1–3 are about to smoke cigarettes behind the high school gym. Character #4 is asked to join them in smoking.)

CHARACTER #1: “Does anyone have a cigarette I can bum?”

CHARACTER #2: “Here you go. I snuck a pack out of the house last night. My mom would freak out if she knew I smoked. She’s always saying how hard it is for her to quit.”

CHARACTER #3: “It’s only bad if you smoke a lot. I heard you have to smoke a ton of cigarettes to get addicted. Hey, what about you—want one?” (*directed to Character #4*)

CHARACTER #4: (*Follow the directions in “Now What?” below to script your response.*)

Reality Check! It seems Character #3 has it all wrong: One cigarette can start someone down the path toward addiction. And it’s a fact that teen smokers are more likely than adults to become addicted to smoking, and at a faster rate.

The primary chemical in cigarettes, nicotine, is highly addictive. Within 10 seconds after inhalation, nicotine activates “pleasure” feelings in the brain. These feelings dissipate quickly, meaning you need to take another puff to feel good again. This cycle can lead to long-term smoking and its lethal consequences. In fact, of smokers under 18, more than 6 million will likely die prematurely from a smoking-related disease.

Time Out: Think about it. You really don’t want to smoke, but how can you tell your friends? Will you feel awkward if you flat-out say “no”? Will they still ask you to hang out? Even if they don’t, why risk your health? Plus, all that smoke in your lungs could hold you back in any sport you may want to participate in.

Now What? (*Write your answers to the following questions on a separate sheet of paper.*)

- What is your response?
- Why did you choose this action?
- How might the other characters react?

SCENE #2:

(Characters #1–3 have snuck alcohol into a party. Then Character #2 surprises everyone by offering prescription pills.)

CHARACTER #1: “I can’t believe we snuck in those beers. I’m feeling pretty buzzed from just two.”

CHARACTER #2: “Man, I’m not. It takes me like a six-pack to get a buzz. Let’s really party and take these pills that were prescribed for my cousin.”

CHARACTER #3: “Wow, I’ve never done that. Sure, I’m up for trying anything—how about you?” (*directed to Character #4*)

CHARACTER #4: (*Follow the directions in “Now What?” below to script your response.*)

Reality Check! Characters #1, 2, and 3 are all on a dangerous path. Drinking when you are a teenager increases your chances of developing alcohol problems when you get older—more than four in 10 individuals who start drinking before age 15 eventually become alcoholics. Individuals who need to drink a lot just to get a buzz often do just that. Since they are tolerant to alcohol’s effects, they need to drink more and more to get a buzz, which increases their chances of becoming alcoholics.

And mixing prescription medicines with alcohol? Definitely not smart. Abusing prescription medications—painkillers like OxyContin® or Vicodin®, or anti-anxiety drugs like Xanax® or Valium®—is dangerous enough. But mixed with alcohol, they can be lethal—as in, you stop breathing, or go into a coma, which you may never come out of.

Time Out: Think about it. Most people at the party aren’t doing drugs and you know that drinking and abusing prescription drugs is not for you—the health risks are real and serious. So is your fear of doing something you’ll regret (which any cell phone could record for all the world to see). But you still want to have fun with your friends. How can you get out of this situation without feeling embarrassed?

Now What? (*Write your answers to the following questions on a separate sheet of paper.*)

- What is your response?
- Why did you choose this action?
- How might the other characters react?

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