

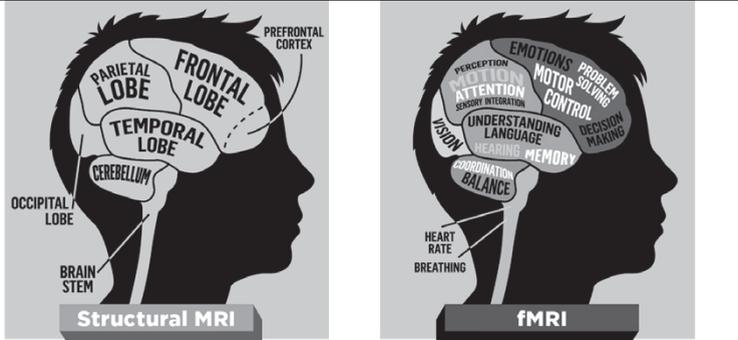
Heads Up: Real News About Drugs and Your Body

Brought to you by Scholastic and the scientists at the National Institute on Drug Abuse, National Institutes of Health, U.S. Department of Health and Human Services

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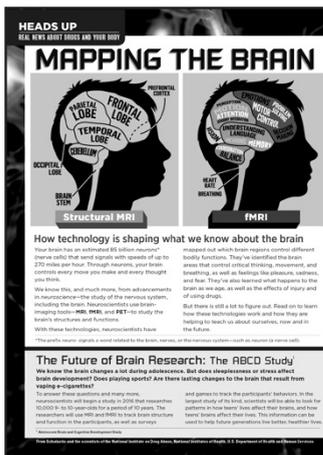
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- For this Heads Up Teacher Edition Compilation refer to NIH Pub No. 17-DA-8033.
- For the accompanying Heads Up Student Edition Compilation refer to NIH Pub No. 17-DA-8032.

Visit scholastic.com/headsup/teachers and teens.drugabuse.gov for more information.



MAPPING THE BRAIN

The brain is the body's most complex organ, controlling everything from our heartbeat to how we make important decisions. Through research and the use of brain-imaging tools, neuroscientists are learning just how critical the teen years are for brain development. This article explains for students how brain-imaging techniques work, how they apply to their lives, and also highlights some of the things neuroscientists have learned about drug use. It may also inspire them to want to learn more about neuroscience!

Critical-Thinking Questions:

1. How can brain research help explain how teens make decisions? (*Brain imaging can show more brain activity for teens in the area that processes motivation and pleasure than that used for decision making. This indicates that teens may focus more on rewards and less on risks when making decisions.*)
2. Describe how each brain-imaging tool highlighted in the article teaches something different about the relationship between the brain and drug use. (*Structural MRI scans can show changes in a person's brain structure as a result of using drugs. Functional MRIs [fMRI] show that teens may focus more on rewards and less on risks when making decisions—which can increase risks for using drugs. PET scans have shown how using drugs can cause changes in the way brain cells function.*)
3. How might findings from brain research, such as the ABCD study, help doctors in their jobs? (*Doctors can use brain research to better understand who might be at greater risk for disease, or how using drugs changes the brain. This information can give insight into prevention and possible treatments.*)

Writing Prompts:

- What are two ways using drugs may affect the brain?
- Compare and contrast each of these three brain imaging technologies: structural MRI, fMRI, and PET.
- How might changes in the brain caused by using drugs make it more difficult for a person to stop using drugs?

Paired Reading, Writing Prompts:

- "Wiring Your Brain," headsupscholastic.com/students/wiring-your-brain

Writing Prompt: Evaluate the statement: "Using drugs can interfere with brain development."

- "The Awesomely Evolved Human Brain," headsupscholastic.com/students/awesomely-evolved-human-brain

Writing Prompt: Explain the role of dopamine in the brain and how it might affect behavior.

Tiered Vocabulary Tools:

Visit scholastic.com/headsups/brain-imaging-tools for vocabulary printables that support the student article and lesson.

Video Extension:

"The Human Brain: Major Structures and Functions," <https://teens.drugabuse.gov/videos>

After reading the article, watch this short video with your students and ask them what new information about the brain they learned. Discuss how brain imaging may have helped scientists to learn facts explained in the video. Have students write down at least one question they still have about the brain after reading the article and watching the video. Ask them to conduct additional research, and write a 3–4 paragraph report on their findings.

Student Work Sheet: "Can You Think Like a Neuroscientist?"

The skills work sheet on the next page has students imagine they are neuroscientists studying the brain.

Answer Key:

- 1) **a.** Structural MRI; structure. **b.** Starting from write-in box, upper right, clockwise: frontal lobe; prefrontal cortex; brain stem; cerebellum; occipital lobe; temporal lobe; parietal lobe
- 2) fMRI; function
- 3) **a.** PET scan; the cellular level **b.** You can conclude that using drugs contributes to a decrease in dopamine activity.
- 4) Structural MRI would be used to track anatomical changes in the prefrontal cortex because this technique produces a detailed map of brain structure.
- 5) fMRI imaging could help determine which areas of the brain are involved in making risky decisions. The technique shows which areas of the brain are most active during certain behaviors and functions.

[Continue to work sheet on next page.]

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SUBJECT

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

COMMON CORE STATE STANDARDS

- RST.9 Analyze structure of relationships among concepts in a text.
- W.9 Draw evidence to support analysis and reflection.

NEXT GENERATION SCIENCE STANDARDS

- LS1.A Structure and Function
- LS1.D Information Processing

NATIONAL SCIENCE EDUCATION STANDARDS

- Structure and Function in Living Things
- Personal and Community Health

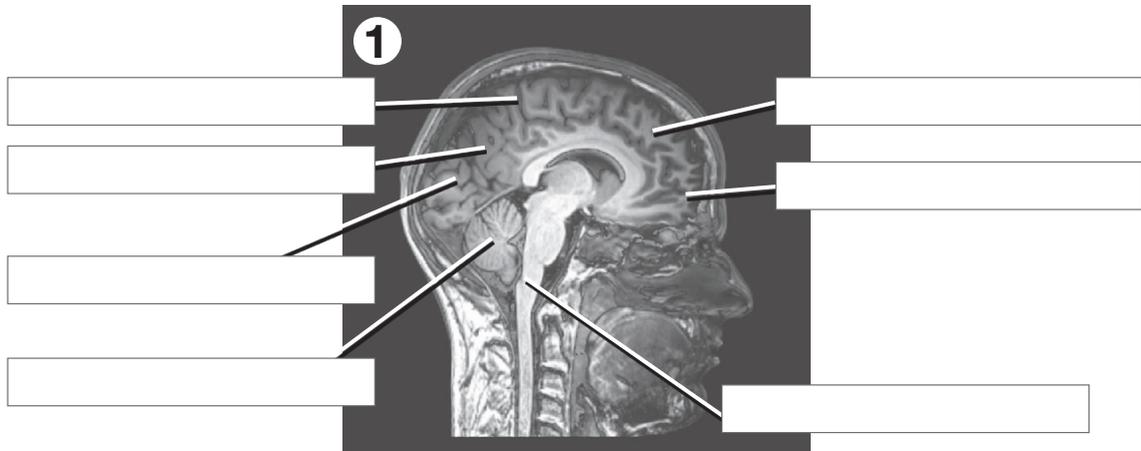
Additional Teaching Resources:

- headsupscholastic.com/teachers
- teens.drugabuse.gov

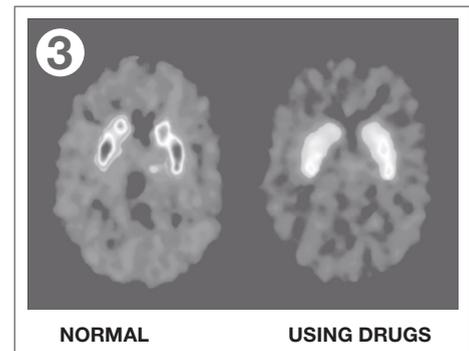
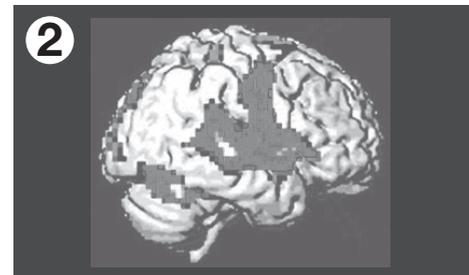
Can You Think Like a Neuroscientist?

Use the information from “Mapping the Brain” to answer the questions below and analyze real images of the brain. Record your responses on a separate sheet of paper as necessary.

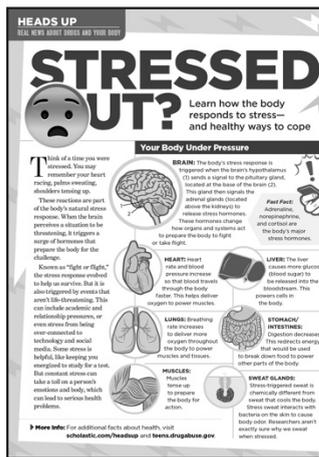
1. **a.** The image below shows regions of the brain. What type of scan is shown?
What kind of information about the brain does it provide (structure, function, or cellular)?
- b.** Label the highlighted regions of the brain.



2. The image at right shows brain activity levels while a person is laughing. What type of scan is shown? What kind of information does it provide?
3. **a.** These images (below right) were created using radiotracers that attached to dopamine receptors in the brain. What type of scan is shown? What kind of information does it provide?
- b.** Dopamine is the brain chemical that helps us feel pleasure. Dopamine levels are higher in the brain on the left. What can you conclude about how using drugs affects the brain?
4. What type of imaging technique would you use to learn about how the size of the prefrontal cortex changes as kids grow into adulthood? Explain your answer.



5. What type of imaging technique would you use to find out which areas of the brain are active when a person considers making a risky decision? Explain your answer.



STRESSED OUT?

Learn how the body responds to stress—and healthy ways to cope.

Stress is a part of life, but students may have difficulty coping and feel overwhelmed, which can increase the risk for drug use. The article “Stressed Out?” helps explain how the body’s stress response system works, as well as the health consequences of ongoing (chronic) stress. Students will learn how their bodies respond to stress, and how they can manage under pressure.

Critical-Thinking Questions

- 1) What is the fight-or-flight response and why is it an important process in the body? *(The fight-or-flight response prepares the body to face a challenging situation. It helps focus the brain to make decisions quickly and boosts energy in the body if a physical reaction is needed. This is important because fight or flight evolved to help us survive.)*
- 2) Beyond helping you to survive in emergencies, how can stress be helpful to you? What are some examples? *(Stress can increase focus, energy, and responsiveness. This can be helpful in giving you focus for studying for a test and energy to play sports. [Additional answers may apply.]*
- 3) How can pressures in everyday teen life lead to health problems? *(Constant stress from problems might lead to chronic stress, in which the body’s stress response system is not allowed to return to normal levels. This has many health risks including illness; sleep problems; migraine headaches; mental health problems; problems with learning and memory; and chronic health problems such as heart disease, obesity, and diabetes. It can also increase the risk for drug use and for developing an addiction.)*

Writing Prompts

- What are signs that may indicate a person is experiencing chronic stress?
- Explain how chronic stress may increase a person’s risk of using drugs.
- How might chronic stress as a teenager impact a person’s life into adulthood? Support your answer with evidence from the text.

Paired Reading/Writing Prompts

- “Stress and Drug Abuse: The Brain Connection,” <http://headsup.scholastic.com/students/stress-and-drug-abuse>

Writing Prompt: Explain how situations in a person’s life that result in chronic (ongoing) stress might put him or her at risk for using drugs.

Tiered Vocabulary Tools:

Visit scholastic.com/headsup/stress-vocabulary-tools for vocabulary printables that support the student article and lesson.

Student Work Sheet: “Stress Test”

The skills work sheet on the next page has students critically analyze what they have learned in the article.

Answer Key:

Part 1: 1. c; 2. e; 3. b; 4. a; 5. d

Part 2: Answers will vary but should include specific evidence from the work sheet as well as the student article about the specific body reactions to stress and the reasons for them.

Part 3: Answers will vary.

Additional Student Resource:

“Nine Tips to Help You Cope With Stress,” teens.drugabuse.gov/blog/post/nine-tips-help-you-cope-stress

Research Topic:

Read the blog entry: “Teens and ‘Nomophobia’: Cell Phone Separation Anxiety” at teens.drugabuse.gov/blog/post/teens-and-nomophobia-cell-phone-separation-anxiety. Conduct your own cell phone research. How often do you check your phone, and what is your stress level when you don’t have phone access?

[Continue to work sheet on next page.]

SUBJECT

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

COMMON CORE STATE STANDARDS

RST.6-8.1 and RST.9-10.1

- Cite specific textual evidence to support analysis of science and technical texts.

NEXT GENERATION SCIENCE STANDARDS

MS-LS1-3 and HS-LS1-2

- From Molecules to Organisms: Structures and Processes

NATIONAL SCIENCE EDUCATION STANDARDS

- Structure and Function in Living Things
- Personal and Community Health

Additional Teaching Resources:

- headsup.scholastic.com/teachers
- teens.drugabuse.gov

STRESS TEST

PART 1 MATCH THE RESPONSE

When you feel under stress, your body's stress response system kicks into gear to tackle the situation. Match each body organ below with the way in which it responds to stress.



1. Heart

a. Tense to protect against injury.



2. Brain

b. Releases glucose into the bloodstream to power cells.



3. Liver

c. Rate increases to push blood through the body faster.



4. Muscles

d. Activity decreases so energy can be used in other parts of the body.



5. Stomach/ Intestines

e. Signals the release of the hormones adrenaline and cortisol.

PART 2 THINK ABOUT IT

Use information from this work sheet, as well as the article "Stressed Out?" to respond to the questions below. Record your answers on a separate sheet of paper.

1. Identify a situation in which you experienced stress.

2. Write about how your body responded to the stressful event, and explain why your body reacted the way it did.

3. What strategies will you use to reduce this type of stress in the future?

Be sure to use evidence from the texts to support your answer. Write in complete sentences.

PART 3 COPING WITH STRESS

Stress-release strategies can help you cope with day-to-day stress so that it doesn't turn into chronic stress. Pick one of the exercises below and try it for at least 10 minutes every day for a week. Report back to your class how it helped you or not.



1. Deep Breathing Focus: Find a quiet space. Breathe deeply through your nose for a count of four. Hold your breath for a count of two. Then, let the breath out through your mouth for a count of four. Try to continue for 10 minutes or more.



2. Physical Activity: Lace up and go for a walk or a run. Try to get your heart pumping, but not so much that you can't talk. In fact, you might ask a friend or family member to join you to help make it more fun!



3. Step Away From Your Phone: This exercise is best for those "attached" to their phones. Put your phone away and do not check it for two hours or four hours or a whole day. Let your parents know, and ask them not to call you unless it's absolutely necessary, and then pick up only for them. At first you may feel more stressed and worried about what you are missing. But see if it gets better as each day goes by. Track your progress.

OPIOIDS AND THE OVERDOSE EPIDEMIC National Institute on Drug Abuse

America is facing a serious health crisis involving opioid drugs. On average, 3,900 people begin using prescription opioid painkillers for nonmedical use every day, greatly increasing each person's risk for addiction and overdose. Deaths involving opioid overdoses have more than quadrupled since 1999. The article "Opioids and the Overdose Epidemic" helps to show the extent of the crisis as well as what is causing it. The article also explains that while prescription opioid pain medications can play an important role in a person's medical care, they need to be used with extreme care. Included is advice on how students can keep themselves and loved ones safe.

Critical-Thinking Questions:

- 1) An epidemic occurs when a disease or health-related event or behavior happens in a community at far greater rates than would normally be expected. What evidence indicates that the United States is facing an opioid overdose epidemic? *(Answers may include that more people died from drug overdoses in 2015 than any other year on record; heroin use and overdoses have increased across many age groups and populations; the number of people dying from opioid drugs today is more than four times the number who died in 1999.)*
- 2) What are some ways to help control the opioid overdose epidemic? Support your answer with textual evidence. *(Answers may include to improve how opioid medications are prescribed and dispensed so that only people who really need the drugs get them; carefully monitor those who receive prescriptions; make medications such as naloxone readily available so that if a person overdoses, he or she can quickly get lifesaving help; increase education about opioids so people better understand the risks.)*
- 3) Nearly all people who use heroin also use at least one other drug. What impact can that have on overdose rates? *(It may lead to higher overdose rates because mixing opioids with other drugs increases the risk for overdose.)*
- 4) What are at least three pieces of advice that can help people stay safe if they are prescribed opioid pain medications? *(Answers may include to talk with their doctor to make sure that there are no other safe alternatives; take the medications only as prescribed; seek help if they begin taking opioids for nonmedical reasons; never combine opioids with alcohol or other drugs; don't share prescriptions with other people; only take medications supplied by a doctor or pharmacy.)*

Writing Prompts:

- **Grades 6–8:** What are three ways people can misuse prescription opioid pain medications? What are some possible consequences of this?
- **Grades 9–10:** Explain at least three factors that may have led to an increase in the number of opioid overdoses in America.
- **Grades 11–12:** Why do you think heroin use is increasing among many different populations in America? Support your answer with evidence from the text.

Tiered Vocabulary Tools:

Visit scholastic.com/headsup/opioidepidemic-vocabulary for a tiered vocabulary list to support this article.

Student Work Sheet:

The skills work sheet on the next page has students analyze graphs and combine the information with what they learned in the article to answer critical-thinking questions.

Answer Key: **1.** The graph also includes the number of heroin overdose deaths from 1999–2015. **2.** Roughly 40%. **3.** Answers may include that more people have started using heroin over time and that heroin potency has increased, making overdoses more likely. **4.** The increase in the number of drug overdose deaths due to opioids is more than half the total number of drug overdose deaths. **5.** Answers may include that the number of opioid prescriptions has increased, and with more people using the drugs there is more chance of abuse; some people who become addicted to opioid painkillers are turning to heroin, which is cheaper and often easier to obtain than prescription opioids; there has been an increase in the production and use of illegal fentanyl—a very powerful opioid that can cause overdoses. **6.** Answers may vary but should include the evidence that naloxone can prevent death in opioid overdose if it is given soon enough. If ordinary people have access to it, they may be able to get it to an overdose victim quickly and save the person's life.

[Continue to work sheet on next page.]

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COMMON CORE STATE STANDARDS

RST.6-8.1 and RST.9-10.1

- Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.7 and RST.9-10.7

- Evaluate content presented in diverse formats, including visually and quantitatively.

NEXT GENERATION SCIENCE STANDARDS

MS-LS1-3 and HS-LS1-2

- From Molecules to Organisms: Structures and Processes

NATIONAL SCIENCE EDUCATION STANDARDS

- Structure and Function in Living Things
- Personal and Community Health

Additional Teaching Resources:

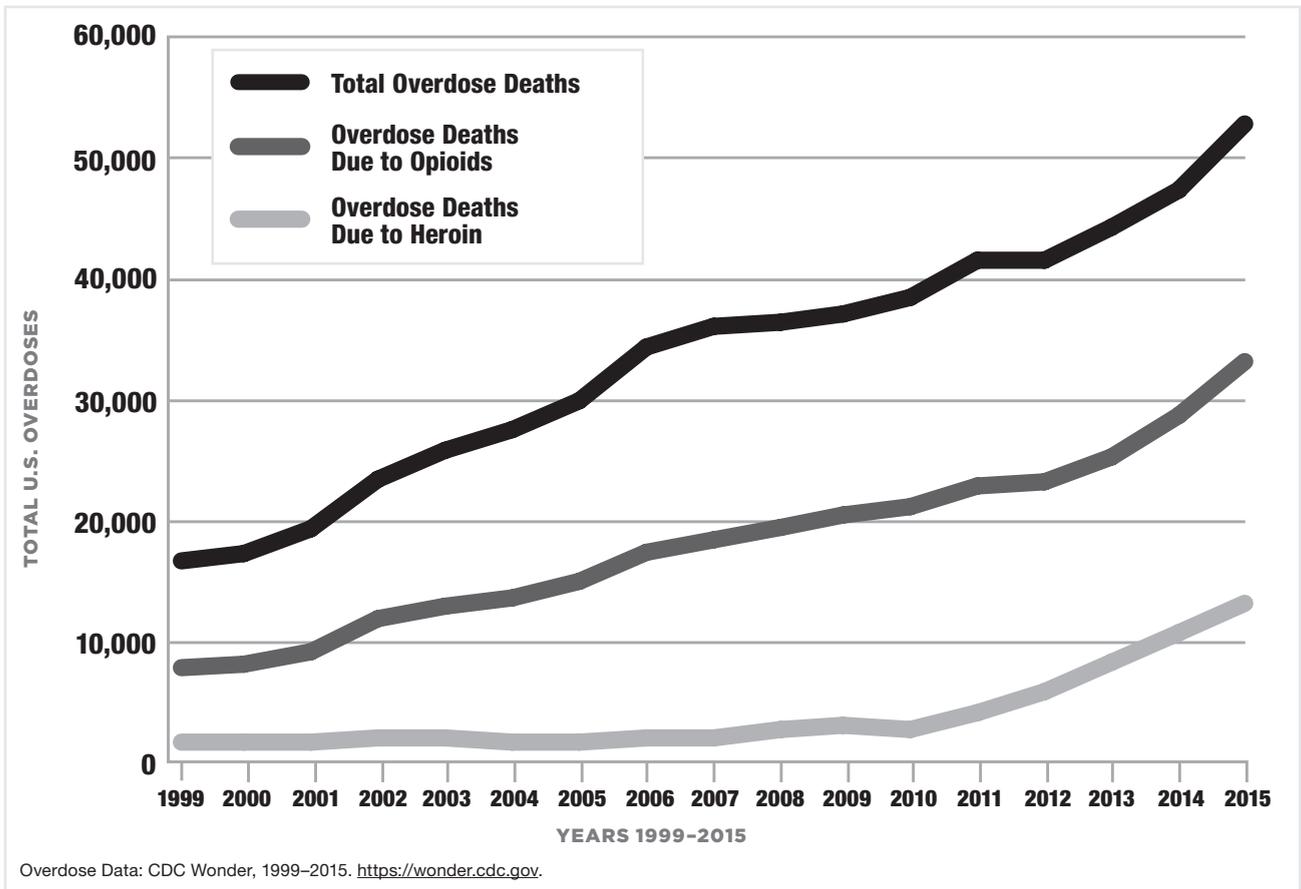
- heads.up.scholastic.com/teachers
- teens.drugabuse.gov



Opioids in America: Alarming Trends

Statistics show that opioid overdose is a public health emergency in America. In 2015, 3.8 million Americans reported that they had misused prescription painkillers in the last month. The use of heroin has also increased dramatically in recent years. Abusing these powerful drugs greatly increases a person's risk for overdose. Complete the activity below to analyze statistics of the opioid crisis.

Directions: Study the graph below, which has been modified from the graph shown in the article "Opioids and the Overdose Epidemic." Then, use the information in both graphs and the article to answer the questions that follow.



- How is the graph above different from the graph shown in the article?
- According to the graph, roughly what percentage of the opioid overdose deaths in 2015 were due to heroin?
- What are two possible factors that may have impacted the change in heroin overdose deaths over time?
- What evidence is there that the recent increase in drug overdoses is due mainly to opioids?
- What are three possible reasons that the number of drug overdoses related to opioids has increased in recent years? Use evidence from the graphs and the article to support your answer.
- Drugs that can reverse the overdose effects of opioids, such as naloxone, are normally given only by medical personnel. Do you think these medications, as well as training to administer them, should be readily available to all people? Explain your answer.

ADDITIONAL FREE TEACHER RESOURCES:

Recognizing and Responding to Bullying

Build health and life skills with this poster/teaching guide that aims to prevent bullying as well as lower the associated risk for substance use.

scholastic.com/headsup/teachers/standupagainstabullying

Visit scholastic.com/headsup/teachers for more science and health resources.



Compilation 2016-17 Teacher Edition

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