



Drugs and the Teen Brain

As a teacher, you know that teens are at a critical time of development. The brain doesn't become fully developed until the mid-20s. This fact makes teens especially susceptible to the harmful effects of drugs and alcohol, putting them at a greater risk for addiction as well as damage to the brain. By sharing the article "Drugs and the Teen Brain" and teaching this lesson, you will help students learn how their brain develops and why using drugs and alcohol is especially risky.

Critical-Thinking Questions

1 Describe how your brain changes as you grow. How can these changes affect your behavior or abilities? *Answers may include that as you grow older, you develop and refine synapses (connections between neurons). These signal pathways allow you to learn, and they support your memory and emotions. Parts of the brain develop at different times. Specific regions of the brain are responsible for tasks such as movement, emotions, and critical thinking. As each region matures, it strengthens a person's abilities in the tasks related to that region.*

2 Explain the purpose of the prefrontal cortex and the limbic system in the brain. Give examples of types of behavior or activities that are controlled by each of these areas. *The prefrontal cortex is the area of the brain that is involved in critical thinking and decision making. This area may be active when someone weighs the pros and cons of a decision, tries to solve a problem, or plans for the future. The limbic system is involved in emotions and rewards. This area is active when a certain activity makes you feel sad or happy, such as spending time with friends.*

3 Why are teens more at risk for becoming addicted to drugs than adults? Support your answer with text evidence. *Answers may include that people can become addicted to drugs because using them causes feelings of pleasure, which causes a release of dopamine in the brain. This chemical helps the brain remember the pleasurable experience. Over time, bursts of dopamine teach the brain to seek out drugs over any other rewarding experience. Teens are more at risk because the teen brain, which relies heavily on the reward center in the limbic system, is more sensitive to the effects of dopamine.*

Writing Prompts

Grades 6–8 Explain how the prefrontal cortex helps to reduce risk-taking.

Grades 9–10 The legal drinking age is 21. Do you agree with this policy? Cite text evidence to support your answer.

Grades 11–12 Parts of the teen brain are not yet fully developed. Explain why this can be harmful but also beneficial.

Paired Reading

"Addiction Is a Disease"
(<https://teens.drugabuse.gov/blog/post/addiction-disease>)

This article describes how drugs can cause brain changes that lead to addiction.

Writing Prompt Cite text evidence from the article "Addiction Is a Disease" to describe additional ways that drug addiction harms the brain. Also explain why addiction is considered a disease.

Activity Sheet Answers

Multiple choice 1. c; 2. b; 3. d; 4. False; 5. b; 6. True; 7. a; 8. True.

"Now Try This" 1. Answers may include that because the critical-thinking area of their brains is still developing, teens rely on the limbic system (involved in rewards and emotions) to make decisions. This may cause teens to make risky decisions that give immediate rewards. Teens' limbic systems are also more sensitive to dopamine, which may cause them to crave drugs more than adults. **2.** Answers may include that the teen brain is still in development, so exposure to drugs can negatively affect a teen's neural pathways. Positive experiences, like learning a skill, help the brain build new connections.

Subject Areas

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

Standards

CCSS

RST.6-8.1 / RST.9-10.1

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

W.6-8.1 / W.9-10.1

- Write arguments to support claims using valid reasoning and relevant and sufficient evidence

NGSS

MS-LS1.A / HS-LS1.A

- Structure and function

MS-LS1.D / HS-LS1.D

- Information processing

NGSS Practices

- Obtaining, evaluating, and communicating information/engaging in argument from evidence

NSES

- Personal Health
- Science and technology in society/science and technology in local, national, and global challenges

NCSS

- 8. Science, technology, and society

Additional Lesson Resources

- Vocabulary List: scholastic.com/headsup/drugsandtheteenbrain
- headsup.scholastic.com/teachers
- teens.drugabuse.gov



What Do You Know About the Teen Brain and Drugs?

Answer these questions to test your knowledge.



1. The brains of teenagers are:

- a. larger than those of adults
- b. the same as adult brains
- c. not yet fully developed
- d. made up of different parts than those of adults

2. The limbic system of the brain is involved mainly with:

- a. decision making
- b. emotions
- c. problem solving
- d. balance

3. The last part of the brain to fully develop is:

- a. the emotion center
- b. the part of the brain that controls automatic behavior like breathing
- c. the reward center
- d. the part of the brain involved in critical thinking

4. Teen brains are less sensitive to the effects of drugs than those of adults.

- True
- False

5. Which of the following statements is NOT true about the brain's prefrontal cortex?

- a. It helps people to weigh the risks of actions.
- b. It develops fully during childhood.
- c. It is used when adults need to make decisions.
- d. It can be damaged by drug use.

6. Drug use can cause changes to the brain.

- True
- False

7. Dopamine is:

- a. a natural chemical in the brain linked to pleasurable feelings
- b. a chemical found in drugs that affects the brain
- c. the region of the brain involved in emotions
- d. a natural chemical in the brain that decreases risk-taking

8. The number of connections between neurons in your brain can be affected by drug use.

- True
- False

NOW TRY THIS

Answer the following questions on a separate piece of paper after reading "Drugs and the Teen Brain."

1. What is the importance of the limbic system in the teen brain? Describe two ways this system can make teens more vulnerable to drugs.
2. Explain why a person's actions during their teen years can have a permanent impact on their life. Use evidence about brain development to support your answer.

For more information, visit scholastic.com/headsup

From Scholastic and the scientists of the National Institute on Drug Abuse, National Institutes of Health, U.S. Department of Health and Human Services