Lesson Plans for Student Activities

Lesson 1: Obesity and Drug Addiction—What Do You Know?

OBJECTIVE To give students information about the connection between drug addiction and obesity; to increase students' understanding of addiction and the brain; to broaden students' understanding of the scientific process; and to assess students' knowledge of the topics before and after reading the article

NATIONAL SCIENCE EDUCATION STANDARDS

Life Science; Technology; Science in Personal and Social Perspective

WHAT YOU WILL DO

- Before beginning the lesson, hold a class discussion based on these questions: "Are there more teens who have weight problems now than in the past?" "How big of a problem is obesity?" "Could there be a connection between obesity and drug addiction?"
- Tell students that they are going to find out how much they know about food addiction and its connection to drug abuse. Distribute copies of Student Activity Reproducible 1. Tell students to write their names on the paper and label it No. 1. Then have them answer the questions. Collect and grade the papers.
- Have students read the article, **"Obesity and Drug Addiction: The Brain Link."** Next, hold a discussion based on these questions: "What is the connection between obesity and drug addiction?" "How can this connection help scientists understand how to treat and prevent both conditions?"
- Next, tell students it's time to find out how much they've learned. Give them a second copy of Student Activity Reproducible 1. Tell them to write their names on the paper and label it No. 2. When students have finished, collect the papers, score them, and record your data in the Assessment Guide below.
- Wrap up the lesson by discussing the "chicken-and-egg" question from the article: "What comes first, obesity or drug addiction, or a low level of D2 receptors in the brain?"

ANSWERS TO QUIZ QUESTIONS:

1. d; 2. c; 3. c; 4. b; 5. d; 6. b; 7. c; 8. c; 9. d; 10. a.

Lesson 2: Dangerous Cravings and the Brain

OBJECTIVE Students use scientific data to draw conclusions about the effect of increasing D2 dopamine receptor levels in the brain.

NATIONAL SCIENCE EDUCATION STANDARDS

Science as Inquiry; Science in Personal and Social Perspective

WHAT YOU WILL DO

- Tell students that scientists know that D2 receptor levels are lower in people who suffer from obesity or drug or alcohol addiction. Ask students why they believe this is so.
- Explain that students will read about an experiment in which alcohol-addicted and non-alcohol-addicted rats were medically altered to increase D2 receptor levels in their brains. The researchers compared the alcohol intake of the rats before and after the treatment. Ask students: "If increasing the D2 receptors causes the alcohol-addicted rats to stop drinking, what might be the implications for humans?"
- Distribute Student Activity Reproducible 2. Have students complete it.
- Wrap up the lesson by asking students to speculate on how this experiment and others like it might lead to useful treatments for addiction.

ANSWERS TO REPRODUCIBLE:

1. Yes, the increase in D2 receptors led to a drop in alcohol consumption. 2. Alcohol consumption fell in both groups, but the percentage drop was larger among the alcohol-addicted rats. In the non-alcohol-preferring rats, the D2 increase almost totally abolished alcohol consumption. In the rats that preferred alcohol, it reduced alcohol consumption to the level normally seen in non-alcohol-preferring rats. 3. This was done as a control to show that it wasn't the pressure of the needle itself but the D2 receptor gene causing the change in consumption.