Drugs of abuse change the way an abuser’s brain works. Some of those changes might last for minutes. But other changes may be permanent. Brain cells may be killed or damaged. Damaged neuron fibers may grow back, but not exactly as they were. An abuser’s brain may never be the same—or function exactly the same way—again. Check out what drugs can do to the brain, then fill in the blanks in the box below.

### Brain shrinkage
Inhalants can kill so many brain cells that the brain actually shrinks! Memories and skills begin to disappear. Learning new things becomes more difficult.

### Memory loss
Marijuana, inhalants, and ecstasy change neurons in the **hippocampus**, damaging short-term memory. Phone numbers are hard to remember; directions and even conversations may become difficult to follow.

### Interrupted thinking
MDMA (ecstasy) can destroy brain cells in the **cerebral cortex**, the center of thinking used in math, language, planning, and game strategies.

### Increased pressure
Cocaine may boost the pressure of blood flowing through the brain until blood vessels explode. Then, brain cells can’t receive oxygen from blood and die. This “brain attack” is called a **stroke**.

### Slowed breathing
Heroin acts on the **brain stem** to slow breathing—sometimes so much that the user stops breathing and dies. Heroin also blocks pain messages from the body so they can’t reach the brain.

### Craving
Drugs such as nicotine, cocaine, and methamphetamine retrain the brain to crave drugs. To a drug abuser, the good things in life—food, the company of others, achievements—no longer feel as pleasurable.

### Impaired movement
Inhalants can damage or destroy **myelin**, a coating on neurons that helps messages travel quickly from brain to body. Muscle spasms, tremors, or permanent movement difficulties may result.

### Fill in the Blank

1. The brain may __ __ __ __ __ [ __ ] when inhalants kill cells.
2. Cocaine abusers risk damage to their brains from __ __ [ __ ] __ __ __ because the drug boosts blood pressure.
3. Heroin acts on the brain stem, slowing the user’s __ __ [ __ ] __ __ __ __ .
4. Inhalants can damage __ __ __ [ __ ] __ __, a protective coating on neuron fibers, resulting in tremors or spasms.
5. Heroin users may feel little __ __ __ [ __ ] if they injure themselves.
6. Marijuana changes the brain’s hippocampus, the seat of short-term __ [ __ ] __ __ __ __.
7. Memories and __ __ __ [ __ ] __ __ __ disappear when inhalants kill brain cells.
8. Drug addicts have a __ __ __ __ __ [ __ ] __ __ for drugs, not food or fun with other people.
9. To think of a game __ __ __ __ __ __ __ __, you use your cerebral cortex.
10. MDMA (ecstasy) users may have problems __ [ __ ] __ __ __ __ __ their own birthday party!

### Bonus
Unscramble the bracketed letters from above.

If you do this, you can actually boost your brainpower!

__ __ __ __ __ a new __ __ __ __ __

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**Know Your Brain Glossary, Part Two**

- **Brain stem**: The base of the brain, in charge of breathing, heart rate, and digestion—things you don’t think about.

- **Cerebral cortex**: The thinking part of the brain, which you use when you speak, plan, do math, and create strategies.

- **Hippocampus**: The part of the brain’s limbic system where short-term memories are formed and stored.

- **Myelin**: A fatty coating on the fibers of neurons that helps messages travel quickly along neurons in the brain.

- **Stroke**: A “brain attack” caused by burst blood vessels in the brain. Without a flow of blood and oxygen, brain cells die.

*For a brain diagram and more brain terms, see “Messed-Up Messages,” p. 3.*