

ACTIVITY 1

The Brain–Body Connection

Drugs of abuse can have numerous effects on a person's body. Many of these happen because of how drugs affect the **central nervous system (CNS)**. Made up of the **brain** and **spinal cord**, the CNS controls not just your thinking, feeling, learning, and movements, but virtually everything your body does.

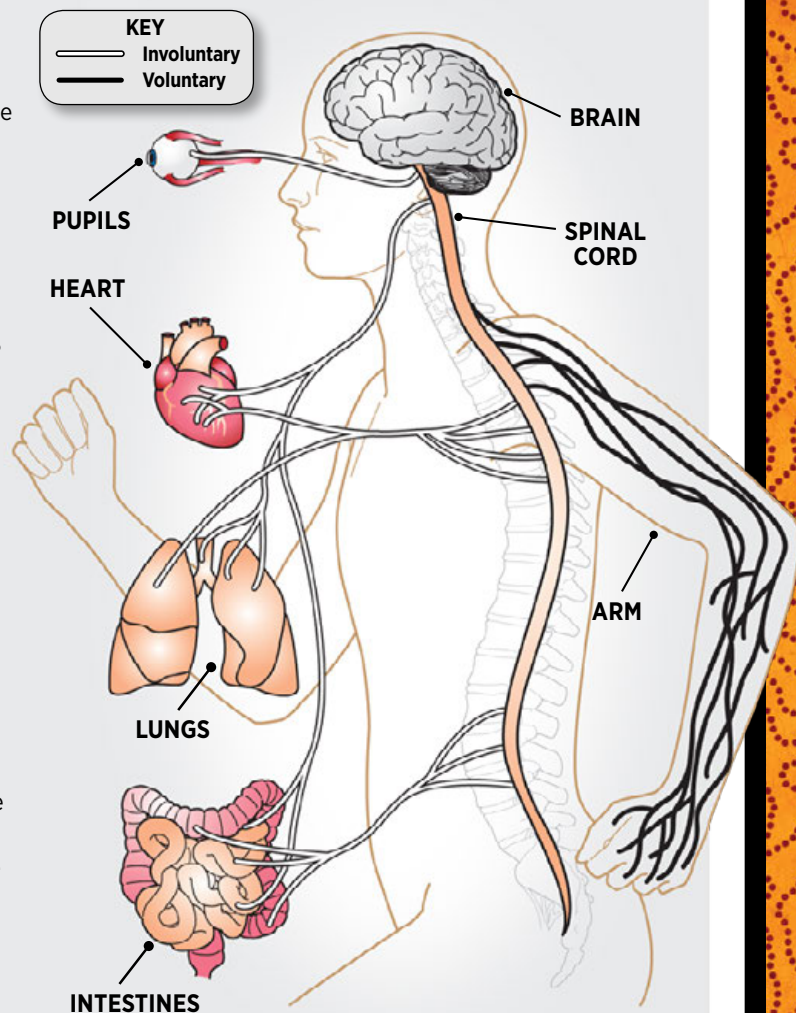
How It Works: Information from your environment—both outside (e.g., what your eyes see and skin feels) and inside (e.g., your heart rate and body temperature)—makes its way to the **brain**, which receives, processes, and integrates it so that you can survive and function under all sorts of changing circumstances and learn from experience. The **spinal cord** connects the **brain** to the rest of the body, transmitting messages back and forth from the skin, muscles, and organ systems to the brain. But how does that happen?

The **peripheral nervous system (PNS)**—see figure—serves as the wiring that connects the CNS to your organs and limbs and sends information back and forth between your brain and spinal cord to your body and vice versa.

The PNS is divided into two parts: 1) a **voluntary system** that allows you to control muscle movements, such as when you pick up a book or walk; and 2) an **involuntary system** that is your automatic pilot, controlling systems like those responsible for breathing, heart rate, and digestion to keep you alive, even when your environment changes. For example, if you see a snake, your heart rate increases and your muscles get ready to react—this is known as the fight-or-flight response, and it happens quickly because the involuntary system is very efficient.

Effects of Drug Abuse: Drugs of abuse affect many parts of the brain, including those that direct the PNS and the muscles and organs it controls. For example, marijuana and alcohol can make you uncoordinated and clumsy. That is because they act on a part of the brain that affects how your voluntary system controls your movements.

Drugs can also affect your involuntary system, causing your body to respond to a situation that doesn't really exist. For example, cocaine affects a part of the brain that tells your involuntary system to increase your heart rate as if you were stressed or panicked even when you're not. Extended heart stimulation can cause high blood pressure, strokes, and heart attacks. Abusing prescription pain relievers can create a response similar to being sluggish—causing a person's breathing to slow down. Taking large quantities or using them inappropriately (e.g., injecting) can slow breathing to dangerous levels, which can lead to death.



Think It Through: On separate paper, answer the questions below based on the passage above. Use complete sentences.

1. How does the brain tell the lungs to slow breathing?
2. Name a situation that might make your heart beat fast? What drugs cause a similar reaction?
3. What are some actions that include both voluntary and involuntary responses?