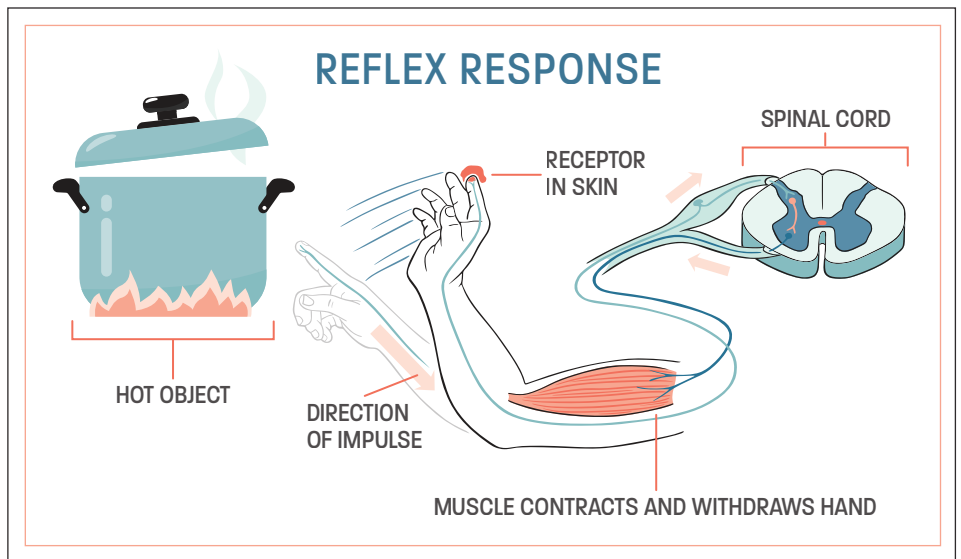


THE NERVOUS SYSTEM PART 2

Keep going! Use the reading to answer the questions below.

Some messages from sensory receptors are processed directly by the spinal cord. Let's consider the example of touching a hot pot on a stove. Ouch! Immediately you pull your hand back. This whole process happens very fast. This is known as a **reflex**. A reflex response doesn't require the brain at all. Instead, when your spinal cord receives nerve impulses from your fingers, your spinal cord sends an impulse directly back. This nerve impulse tells the motor neurons in your hand to pull your hand away from the pot. Reflexes are useful because they allow the body to respond without having to think about what action to take.

Reflex actions are paired with other nervous impulses which travel to the brain for interpretation. This is why your feeling of pain is often delayed. The reflex response happens first, and then the brain registers pain. After the unpleasant experience of touching a hot pot on a stove, most people learn to be careful around hot objects. How do you learn this information? Sensory experiences can generate an



immediate response, like the reflex of pulling your hand away coupled with the feeling of pain. These immediate responses are processed into stored information, or memories, in the brain. So, the next time you encounter a hot pot on the stove, you will be less likely to touch it.

Show what you know! Use the reading to answer the questions below.

1. Match the part of the nervous system with its function in the list below.

- | | | |
|------------------------------|-----------------|---|
| a. Peripheral nervous system | I. | Region of the brain that processes smell |
| b. Cranial nerve | II. | Controls involuntary actions like your heartbeat |
| c. Spinal cord | III. | Helps maintain your balance |
| d. Cerebellum | IV. | Includes all of the nerves outside of the brain and spinal cord |
| e. Cerebrum | V. | Is made up of the brain and spinal cord |
| f. Brain stem | VI. | Sends signals between the brain and the face, neck, and torso |
| g. Central nervous system | VII. | Controls reflexes |

THE NERVOUS SYSTEM PART 2

Show what you know! Use the reading to answer the questions below.

2. Why is it useful for humans to have both an autonomic and a somatic system?

Sample answer: It is useful for humans to have the autonomic system that controls involuntary actions because it allows them to respond to stimuli quickly and without conscious thought. The somatic nervous system is helpful because it allows humans to choose when to take an action, like picking up a spoon or throwing a ball.

3. Jay is walking past the basketball court. His friend Taylor attempts a three-point shot and misses. Taylor yells, "Watch out!" Jay hears Taylor and turns to see the ball flying toward him. Jay instinctively raises his arms to block the ball. Number the nervous system response steps below into the correct order.

___ 3 ___ Jay's eyes see the ball.

___ 4 ___ Jay's muscles move to block the ball.

___ 1 ___ Jay's ears hear his friend yelling.

___ 2 ___ Jay's brain interprets the yell from his friend.

4. What part of Jay's experience was a reflex? Explain how this reflex was useful for Jay.

Sample answer: Jay's instinct to raise his arms to block the ball is a reflex. This reflex was useful because it helped Jay avoid getting injured.

5. Explain how memories of this experience would be useful for Jay in the future.

Sample answer: Jay's experience of having to block the basketball coming towards him may be stored as a memory that helps him remember to pay attention when near the basketball court.

6. Bridget is threading a fishing lure on some fishing line. Her finger accidentally touches one of the sharp hooks on the lure. Bridget immediately pulls her finger away. That hurt! Bridget examines her skin to see if she needs a bandage. Number the nervous system response steps below into the correct order.

___ 1 ___ Bridget's finger touches the hook.

___ 2 ___ Bridget's muscles move her finger away.

___ 3 ___ Bridget feels pain in her finger.

___ 4 ___ Bridget's brain directs her eyes to look at her finger.

7. What part of Bridget's experience was a reflex? Explain how this reflex was useful for Bridget.

Sample answer: Bridget's muscles moving her finger away from the hook is a reflex. This reflex was useful to Bridget because it prevented the sharp hook from further piercing her finger.

8. Explain how memories of this experience would be useful for Bridget in the future.

Sample answer: Bridget's experience of feeling pain when touching a sharp hook may be stored as a memory that helps her be more careful when handling a fishing lure with hooks.