Bark and Balance

How automatic responses change when a threat passes

HAP.6.6 "Describe the major characteristics of the autonomic nervous system. Contrast the roles of the sympathetic and parasympathetic nervous systems in maintaining homeostasis."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two characteristics of the autonomic nervous system, circle three sympathetic responses, and number three parasympathetic responses. Use your marks to compare how the two divisions help maintain homeostasis.

A Bark on the Way to School

1. On the way to school, Maya pedals past a yard when a dog suddenly barks. Her body responds before she chooses what to do. The autonomic nervous system, or ANS, controls many automatic functions of internal organs. It helps regulate heart rate, blood vessel diameter, and digestion without conscious direction. Its signals travel from the brain and spinal cord to organs through nerves. Two divisions, sympathetic and parasympathetic, often affect the same organs in different ways. They adjust organ activity as conditions change, helping maintain homeostasis, a workable balance inside the body.

2. The dog's bark signals a possible threat, and the sympathetic division prepares Maya to act. Her heart beats faster, moving more blood each minute. Her airways widen so air can move more easily, and her pupils widen to let in more light. Blood flow to her working leg muscles increases, while digestive activity slows. Sweat glands become more active, helping release heat during exertion. These changes do not mean the body has stopped regulating itself. They redirect resources toward movement and quick responses, which may protect Maya from danger.

3. After Maya sees that the dog is behind a fence, she slows down and takes a break. Parasympathetic activity becomes more influential as the immediate threat passes. Her heart rate falls, her pupils become smaller, and digestive activity rises again. Slower heart activity reduces the body's demand for energy while she rests; renewed digestion helps process her breakfast. Both divisions can remain active at the same time, and not every organ receives equal control from both. For example, most sweat glands receive sympathetic signals rather than matching parasympathetic signals. Homeostasis depends on adjusting their effects to meet changing needs, not keeping every measurement fixed.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do the ANS's automatic control and two divisions help Maya maintain homeostasis as conditions change?

2. Compare sympathetic and parasympathetic effects on Maya's heart and digestion.

3. Choose two sympathetic changes in the passage. Explain how each helps Maya respond to a possible threat.

4. Why is it inaccurate to say the two divisions always have exact opposite effects on every organ? Use evidence from the passage.

3 YOUR TURN

Your own words

Invent a different everyday situation that shifts from a challenge to rest. In four or five sentences, describe one sympathetic effect during the challenge and two parasympathetic effects afterward, explain how each phase supports homeostasis, and include why the divisions are not simply on-off switches.

Bark and Balance

PART 1 · READ AND MARK

Underline two characteristics of the autonomic nervous system, circle three sympathetic responses, and number three parasympathetic responses. Use your marks to compare how the two divisions help maintain homeostasis. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do the ANS's automatic control and two divisions help Maya maintain homeostasis as conditions change?	**The ANS adjusts organ activity without conscious direction. Its two divisions change their effects as Maya moves from a possible threat to rest, helping meet her body's changing needs.**
2	Compare sympathetic and parasympathetic effects on Maya's heart and digestion.	**During the threat, sympathetic activity makes her heart beat faster and slows digestion. Afterward, parasympathetic activity lowers her heart rate and increases digestion.**
3	Choose two sympathetic changes in the passage. Explain how each helps Maya respond to a possible threat.	**A faster heartbeat moves more blood each minute, and wider airways let air move more easily. Both changes support a quick response.**
4	Why is it inaccurate to say the two divisions always have exact opposite effects on every organ? Use evidence from the passage.	**Most sweat glands receive sympathetic signals rather than matching parasympathetic signals, so the divisions do not always act as opposites on the same organ.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

When I rush up three flights of stairs to catch a train, my heart beats faster as sympathetic activity helps deliver blood for movement. After I sit down, parasympathetic activity slows my heart rate, reducing energy demand. It also increases digestive activity, helping process my lunch. These changes help my body meet a challenge and then adjust to rest. Both divisions can remain active at once, so neither is simply switched off.

Accept other passage-supported effects and explanations that connect organ changes to changing needs. For Part 3, look for a new situation, one sympathetic effect, two parasympathetic effects, a homeostasis explanation for each phase, and an accurate statement about overlapping activity.