Finding the Beat

How biology and experience work together in development

PS.4.1 "Explain the interaction of environmental and biological factors in human development, including the role of the brain in all aspects of development."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB In each paragraph, underline one environmental influence and circle a related biological response, then connect the pair with an arrow to show how they interact.

Nia Joins the Drumming Group

1. At fifteen, Nia joins a neighborhood drumming group. At first, she loses the beat when other players speed up. Her ears carry sound information to her brain, which helps her predict the next beat and coordinate her hands. She practices a short pattern at home each day. Repeated practice can strengthen connections among brain cells involved in listening and movement, making the pattern easier to play. Nia's growing body gives her the ability to move and hear, but her access to a drum, time to practice, and feedback from other players shape how those abilities develop.

2. One week, Nia sleeps only five hours a night because her long bus ride and homework keep her up late. She knows the rhythm but makes more mistakes at rehearsal. During sleep, the brain helps strengthen newly practiced skills, and too little sleep can weaken attention and coordination. When a neighbor offers her a quiet place to practice earlier in the day, Nia can finish sooner and get more sleep. Her progress changes not because her basic biology suddenly changes, but because an environmental change supports a biological need that affects how her brain learns.

3. At the first public performance, Nia's heart races. A stress response prepares her body for action, but high stress can make it harder for her brain to focus on the rhythm. An older player tells her to follow the bass drum and reminds her that mistakes are normal. Nia feels less threatened and listens more closely, helping her join the group again. Her development is not just about faster hands: the brain also helps her manage feelings, learn from others, and take part in a community. Support from people around her works together with her body's responses.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do Nia's physical abilities and her access to practice and feedback work together as she learns to drum?

2. How could the neighbor's offer change Nia's learning? Explain the link between her surroundings, sleep, and brain function.

3. How does the older player's response interact with Nia's stress response during the performance?

4. Nia's development involves more than moving her hands faster. Using the passage, explain how her brain is involved in both a physical skill and a social or emotional change.

3 YOUR TURN

Your own words

Imagine a teen learning to cook a new recipe at a community kitchen. In four or five sentences, explain how one biological factor and one environmental factor could interact to affect the teen's learning, and describe the brain's role.

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PART 1 · READ AND MARK

In each paragraph, underline one environmental influence and circle a related biological response, then connect the pair with an arrow to show how they interact. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do Nia's physical abilities and her access to practice and feedback work together as she learns to drum?	**Her body allows her to hear and move. Practice and feedback help her brain strengthen connections used for listening and movement.**
2	How could the neighbor's offer change Nia's learning? Explain the link between her surroundings, sleep, and brain function.	**A quiet place lets Nia practice earlier and sleep longer. Sleep helps her brain strengthen practiced skills and supports attention and coordination.**
3	How does the older player's response interact with Nia's stress response during the performance?	**The player's reassurance helps Nia feel less threatened. She can focus on the rhythm again despite her body's stress response.**
4	Nia's development involves more than moving her hands faster. Using the passage, explain how her brain is involved in both a physical skill and a social or emotional change.	**Her brain coordinates listening and hand movements as she drums. It also helps her manage fear and respond to another player's support.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A teen's ability to coordinate hand movements helps them prepare ingredients. At the community kitchen, an instructor demonstrates each step and gives feedback. As the teen practices, the brain coordinates sight and movement and can strengthen connections used for the skill. The instructor's feedback helps the teen adjust their movements and learn the recipe.

Accept other accurate biological and environmental factors if the student explains how they interact. The Part 3 response must describe a specific role for the brain, not merely name it.