Brains in Action

How specialized brain sections work together

SS24.P.5c "Describe the specialized and interdependent functions of sections of the brain, including the lobes and hemispheres of the cerebral cortex."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each brain section named in the passage, then circle the job it performs. Number two places where information or support passes between sections.

A Reply at the Debate

1. At a school debate, Maya listens to an opponent while watching a countdown clock. Her brain does not assign this moment to one all-purpose control center. The temporal lobes help process the opponent's speech sounds, while parts of the occipital lobes process the clock's visible numbers. The parietal lobes help her locate her notes on the desk and track the position of her hand. As she plans a reply, parts of the frontal lobes support decisions and help start movements needed for speaking. These areas exchange information, so what Maya hears and sees can shape what she says next.

2. The cerebral cortex has a left and a right hemisphere. Each hemisphere receives information from and controls much of the opposite side of the body, but complex tasks often use both sides. In most people, networks in the left hemisphere play a major role in producing and understanding language. Networks in the right hemisphere often contribute to attention across space and to features of speech such as tone. A thick bundle of nerve fibers called the corpus callosum connects the hemispheres. When Maya hears a sarcastic remark, language networks and tone-sensitive networks can share information instead of working as isolated teams.

3. Maya stands, turns toward the audience, and speaks without falling. The cerebellum helps adjust the timing and accuracy of her movements, including her posture and speech movements. The brainstem helps regulate automatic functions such as breathing and heart rate. Her frontal lobes select the main point she wants to make, while motor areas in the frontal lobes help send commands for the movements of speech. Airflow from breathing supports her voice, and feedback from hearing helps her adjust its volume. A strong reply depends on these systems working together, not on any single section acting alone.

2 ANSWER WITH EVIDENCE

Use the passage

1. Maya sees that the clock is nearly out of time. How could the occipital and frontal lobes work together to change her reply?

2. Maya reaches toward her notes as she prepares to speak. Describe the different, connected roles of the parietal and frontal lobes.

3. Maya hears a sarcastic remark. How can the two hemispheres and the corpus callosum help her understand it?

4. Maya speaks while standing. What different support do the cerebellum and brainstem provide?

3 YOUR TURN

Your own words

Imagine a student catching a tossed ball while answering a friend's question. In 4 to 5 sentences, explain how at least three named brain sections, including two cerebral lobes and either a hemisphere or the cerebellum, perform different jobs and work together.

ANSWER KEY

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HIGH SCHOOL · SS24.P.5c

PART 1 · READ AND MARK

Underline each brain section named in the passage, then circle the job it performs. Number two places where information or support passes between sections. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Maya sees that the clock is nearly out of time. How could the occipital and frontal lobes work together to change her reply?	**The occipital lobes process the clock's visible numbers. The frontal lobes use that information when deciding what to say.**
2	Maya reaches toward her notes as she prepares to speak. Describe the different, connected roles of the parietal and frontal lobes.	**The parietal lobes help locate the notes and track her hand. The frontal lobes help plan her reply and start movements.**
3	Maya hears a sarcastic remark. How can the two hemispheres and the corpus callosum help her understand it?	**In most people, left-hemisphere networks help process the words, while right-hemisphere networks help process the tone. The corpus callosum lets the hemispheres share information.**
4	Maya speaks while standing. What different support do the cerebellum and brainstem provide?	**The cerebellum helps adjust posture and speech movements. The brainstem helps regulate breathing, which provides airflow for her voice.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The occipital lobes process the sight of the ball, and the parietal lobes help locate it in space. The temporal lobes process the friend's words. The frontal lobes help plan an answer and start the reach, while the cerebellum adjusts the reach as the student catches the ball. These sections exchange information so the student can track the ball while answering.

Accept other accurate connections between specialized functions. Do not require students to assign a complex task exclusively to one lobe or hemisphere.