# Brain on Stage

Trace how brain regions work together during a performance.

**P.2.1** "Describe the structure and function of the major regions of the brain; specifically the forebrain, hindbrain, midbrain, and the four lobes of the cerebral cortex..."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline every named brain part in the passage, then circle words that explain what each part does. Use your marks to trace how brain structures influence actions and mental processes.

### Maya's Entrance

1. At a school play rehearsal, Maya steps onto a dark stage as a cue light flashes. Her brain does not run the scene from one control center. The forebrain includes the cerebral cortex, its folded outer layer, and deeper structures such as the thalamus and hypothalamus. The cortex supports complex thought and deliberate action. The thalamus relays much incoming sensory information to the cortex, while the hypothalamus helps regulate hunger, body temperature, and stress responses. These structures affect how Maya notices the light, plans her entrance, and feels a quick surge of nervousness before speaking.

2. Four lobes make up each half of the cerebral cortex. The frontal lobe helps Maya choose when to enter and sends commands for voluntary movements as she walks. The parietal lobe processes touch and helps her judge where her feet are in relation to the stage edge. The occipital lobe processes visual information, including the bright cue light. The temporal lobe processes sounds, helping her hear a fellow actor's line, and supports understanding spoken language. These jobs overlap: to respond at the right moment, Maya must combine what she sees, hears, and decides to do.

3. Below the forebrain, the midbrain helps orient Maya toward a sudden sound or flash and contributes to movement control. Farther back and lower, the hindbrain includes the cerebellum, pons, and medulla. The cerebellum helps coordinate her steps and balance. The pons helps regulate sleep and breathing, while the medulla controls vital automatic functions such as breathing and heart rate. As Maya walks, speaks, and steadies her nerves, these regions work with the cortex rather than taking turns. A stumble would involve more than one region: seeing the edge, adjusting her movement, and keeping her balance must happen together.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. Maya feels nervous as the cue light appears. How could the thalamus and hypothalamus each shape her response?

2. Maya decides to step forward but must avoid the stage edge. How do the frontal and parietal lobes contribute differently?

3. A fellow actor speaks while Maya watches the cue light. Which lobes help her process these two signals, and why does she need both?

4. A loud crash makes Maya turn, then she steadies herself. How do the midbrain and one hindbrain structure support these different actions?

## 3 YOUR TURN

Your own words

Imagine a student catching a tossed set of keys while talking with a friend. In 5 to 6 sentences, explain how one forebrain structure outside the cortex, two named cortical lobes, the midbrain, and one named hindbrain structure could shape the student's actions or mental processes.

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## PART 1 · READ AND MARK

Underline every named brain part in the passage, then circle words that explain what each part does. Use your marks to trace how brain structures influence actions and mental processes. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | Maya feels nervous as the cue light appears. How could the thalamus and hypothalamus each shape her response? | **The thalamus relays much incoming sensory information, helping Maya notice the light. The hypothalamus helps regulate her stress response, which may contribute to her nervousness.** |
| 2 | Maya decides to step forward but must avoid the stage edge. How do the frontal and parietal lobes contribute differently? | **The frontal lobe helps her decide to move and sends commands for walking. The parietal lobe helps her judge where her feet are in relation to the edge.** |
| 3 | A fellow actor speaks while Maya watches the cue light. Which lobes help her process these two signals, and why does she need both? | **The temporal lobe helps her hear and understand the actor's words, while the occipital lobe processes the sight of the cue light. She combines both signals to respond at the right moment.** |
| 4 | A loud crash makes Maya turn, then she steadies herself. How do the midbrain and one hindbrain structure support these different actions? | **The midbrain helps her orient toward the sudden sound. The cerebellum, a hindbrain structure, helps coordinate her movement and balance.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

The occipital lobe processes the sight of the keys flying toward the student. The temporal lobe helps the student hear the friend's voice while watching the keys. The thalamus relays much of this sensory information to the cortex. The midbrain helps the student turn toward the sudden movement. The cerebellum coordinates the student's reach and balance as the keys land in one hand.

Accept other accurate links between named structures and their functions. The open response must include all five requested brain parts or categories and explain each part's contribution.