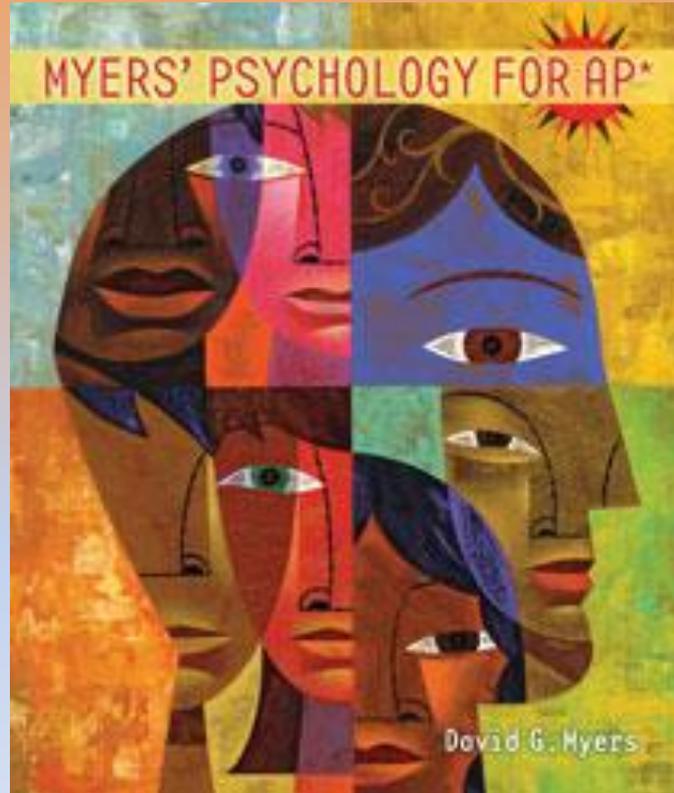


Myers' Psychology for AP*



David G. Myers
PowerPoint Presentation Slides
by Kent Korek
Germantown High School
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Unit 3B: Biological Bases of Behavior: The Brain



Unit Overview

- [The Tools of Discovery: Having Our Head Examined](#)
- [Older Brain Structures](#)
- [The Cerebral Cortex](#)
- [Our Divided Brain](#)
- [Right-Left Differences in the Intact Brain](#)
- [The Brain and Consciousness](#)



Click on the any of the above hyperlinks to go to that section in the presentation.

The Tools of Discovery: Having Our Head Examined



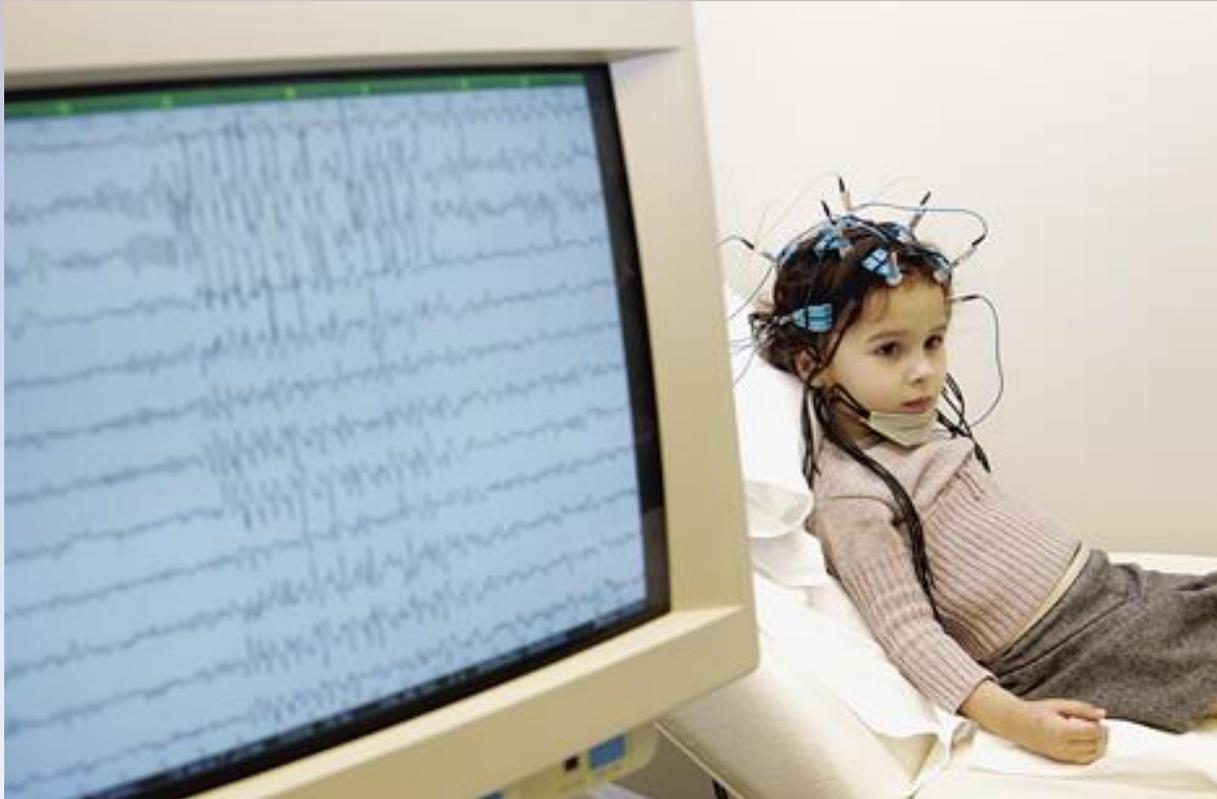
Introduction

- Lesion



Recording the Brain's Electrical Activity

- Electroencephalogram (EEG)



Neuroimaging Techniques

- CT (Computed Tomography) scan
- PET (Positron Emission Tomography) scan
- MRI (Magnetic Resonance Imaging)
- fMRI (Functional MRI)

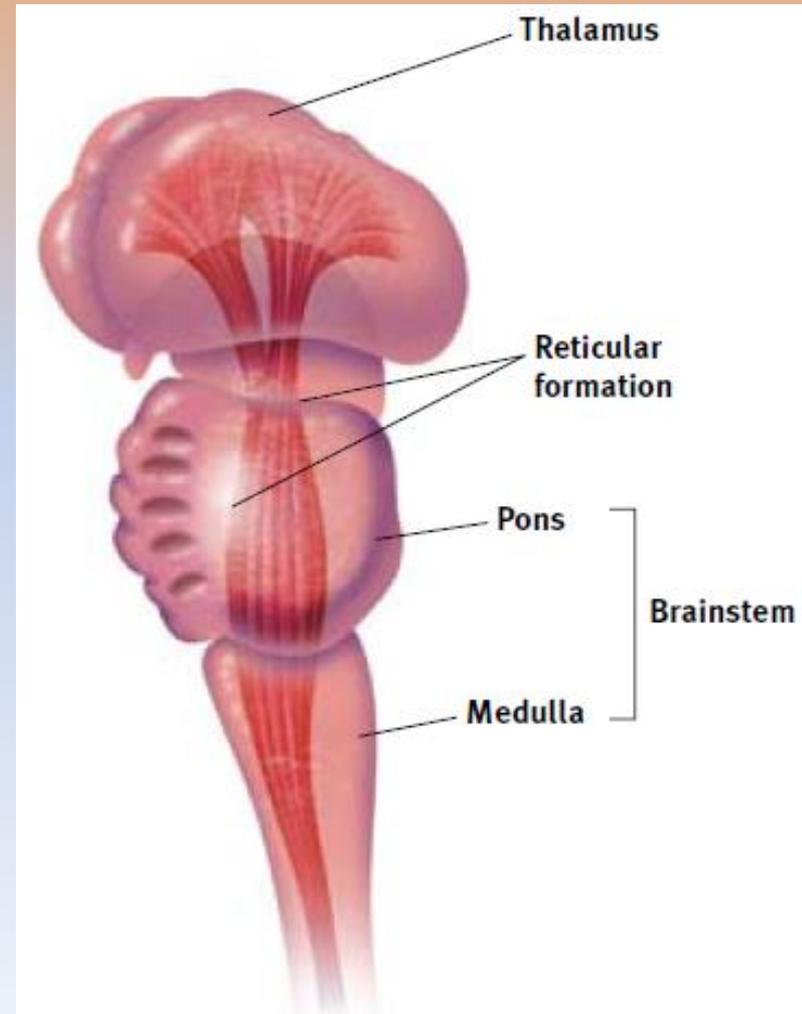


Older Brain Structures



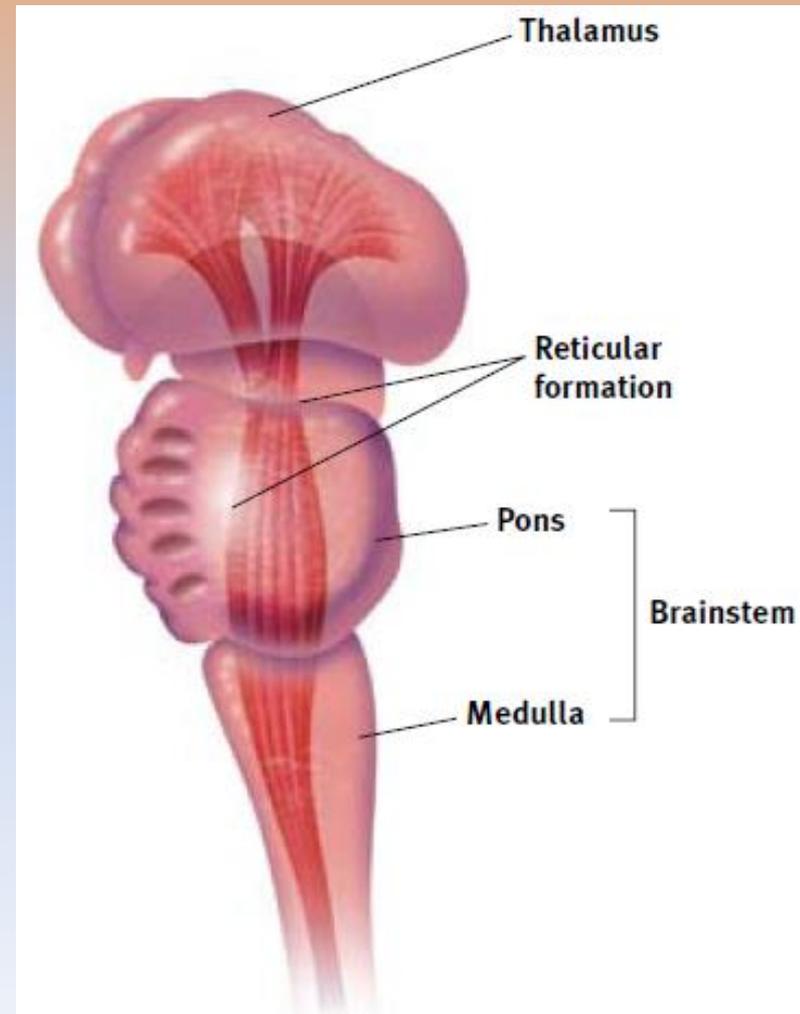
The Brainstem

- Brainstem
 - Medulla
 - Pons
 - Reticular formation



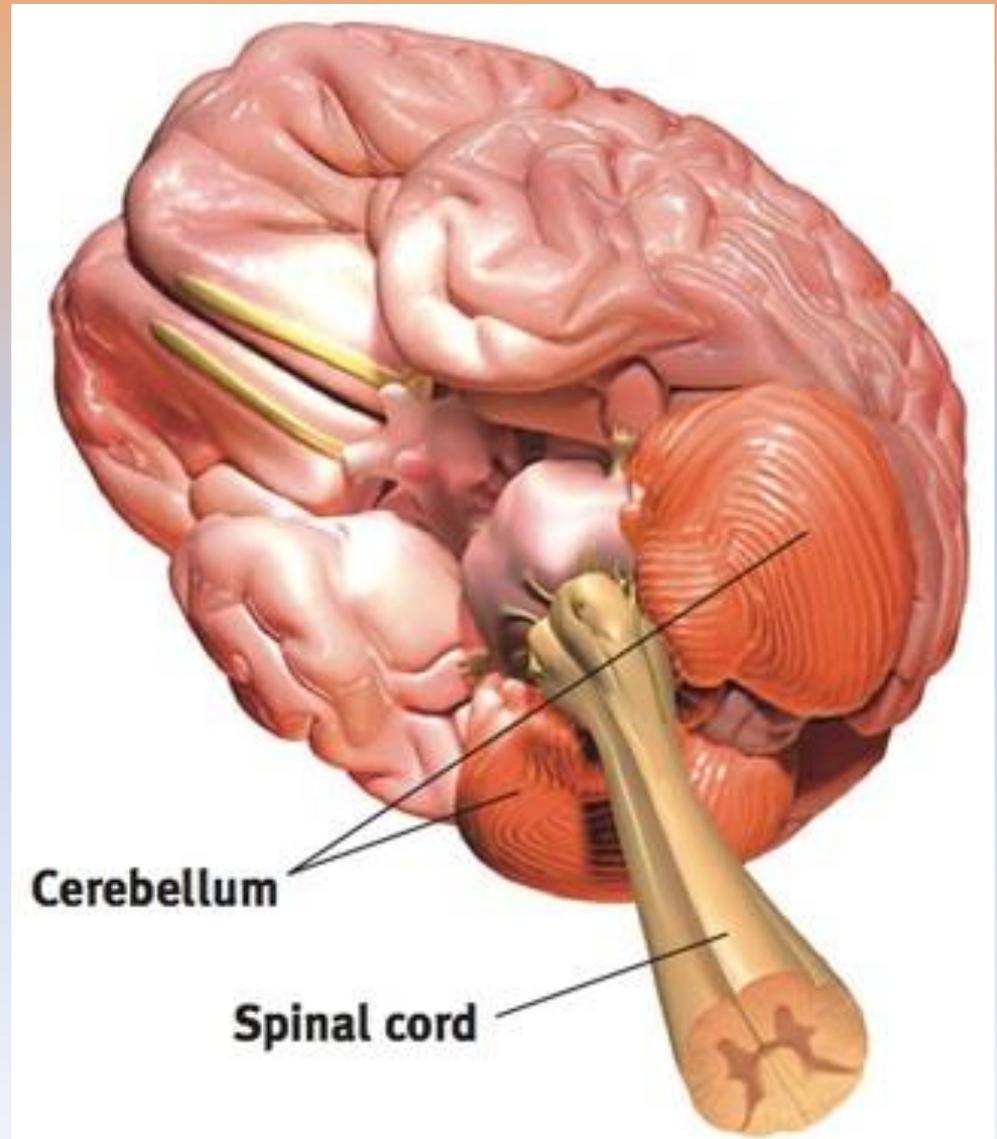
The Thalamus

- Thalamus
 - All the senses EXCEPT smell



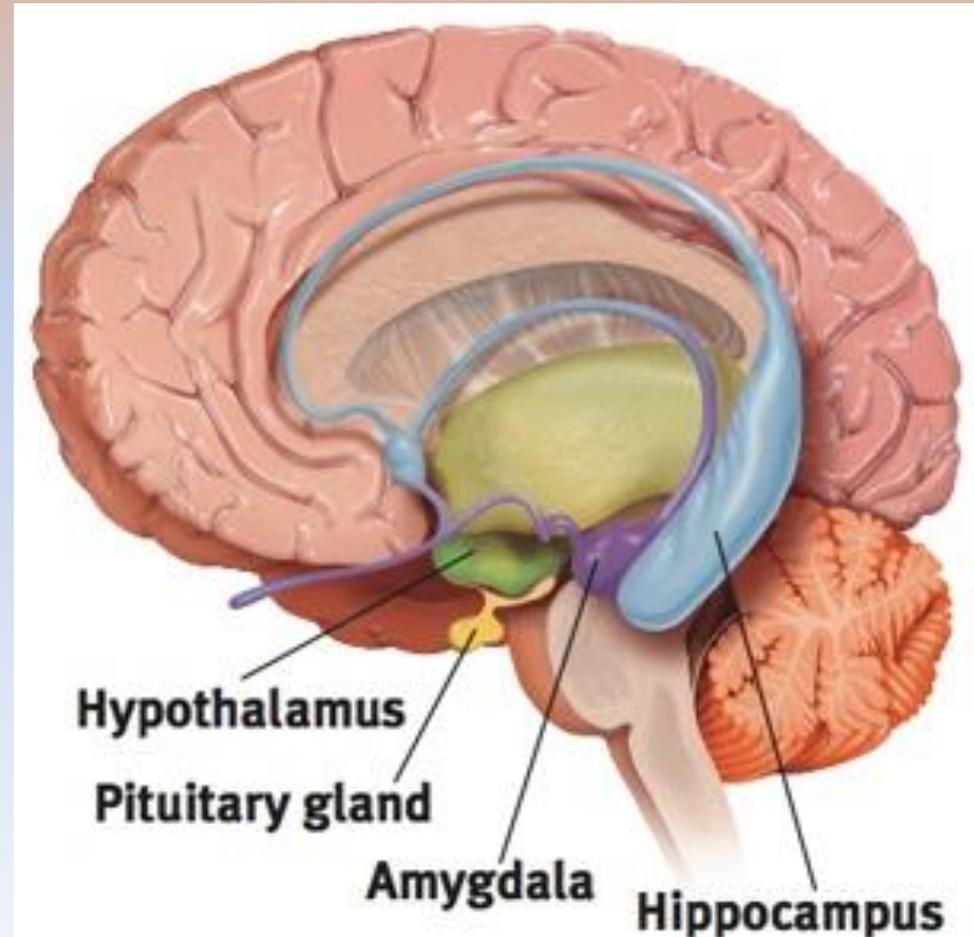
The Cerebellum

- Cerebellum
– “Little brain”



The Limbic System

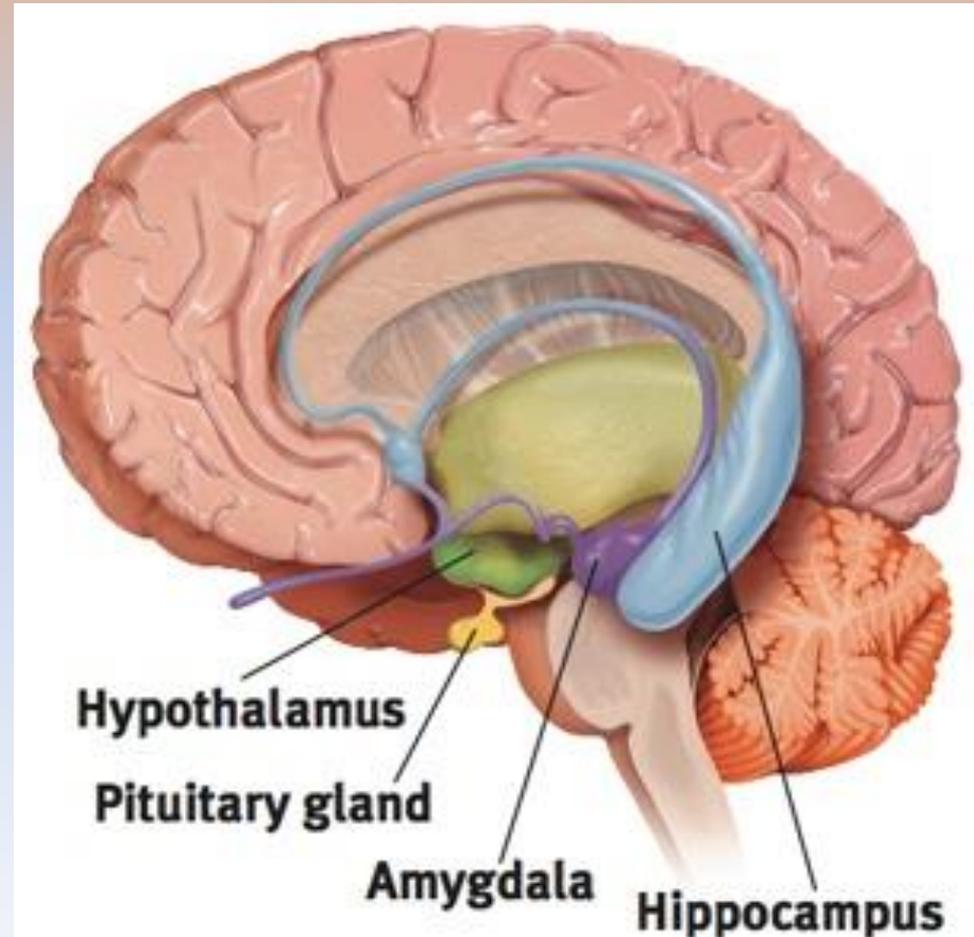
- Limbic System
 - Hippocampus



The Limbic System

The Amygdala

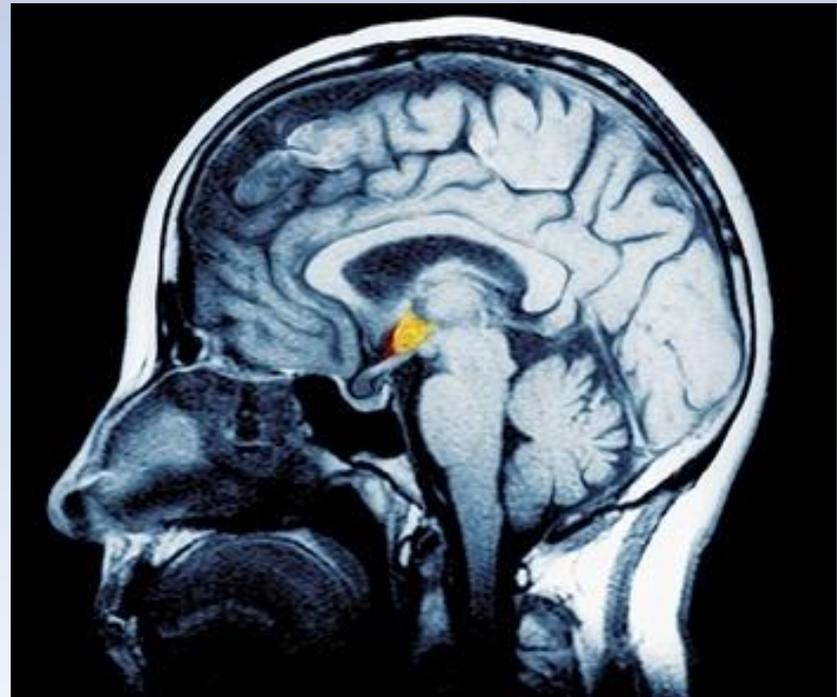
- Amygdala
 - Aggression and fear



The Limbic System

The Hypothalamus

- Hypothalamus
 - Influence on the pituitary gland
 - Reward Centers
 - Reward deficiency syndrome



The Cerebral Cortex



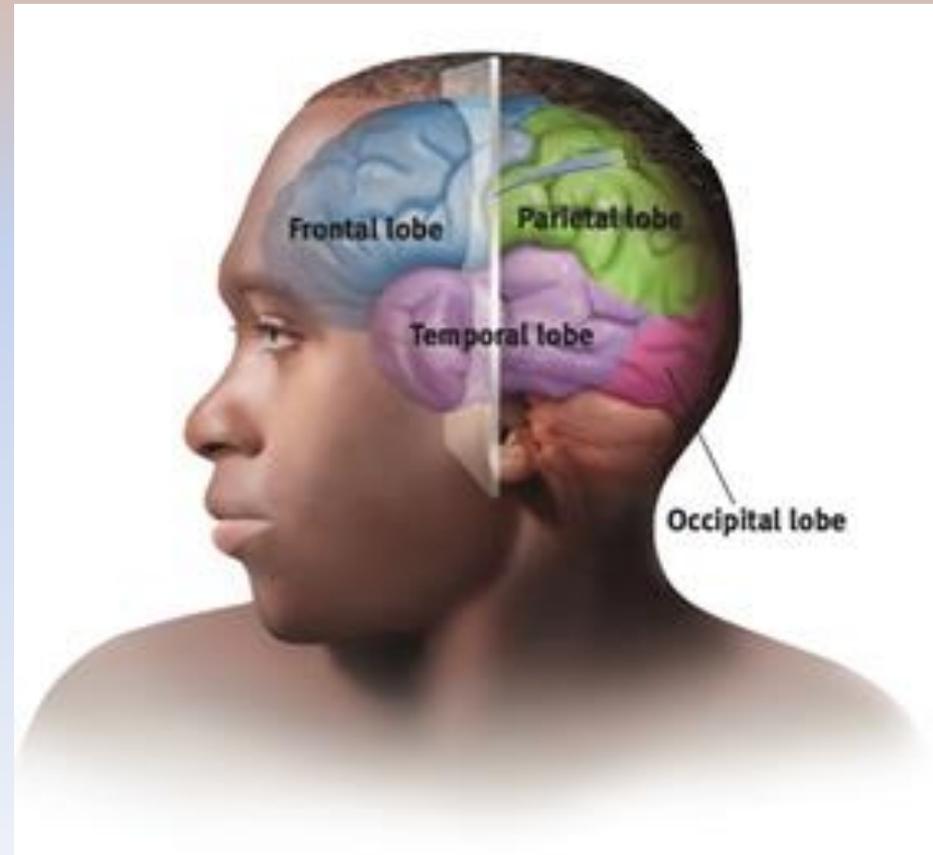
Introduction

- Cerebrum
 - Cerebral cortex



Structure of the Cortex

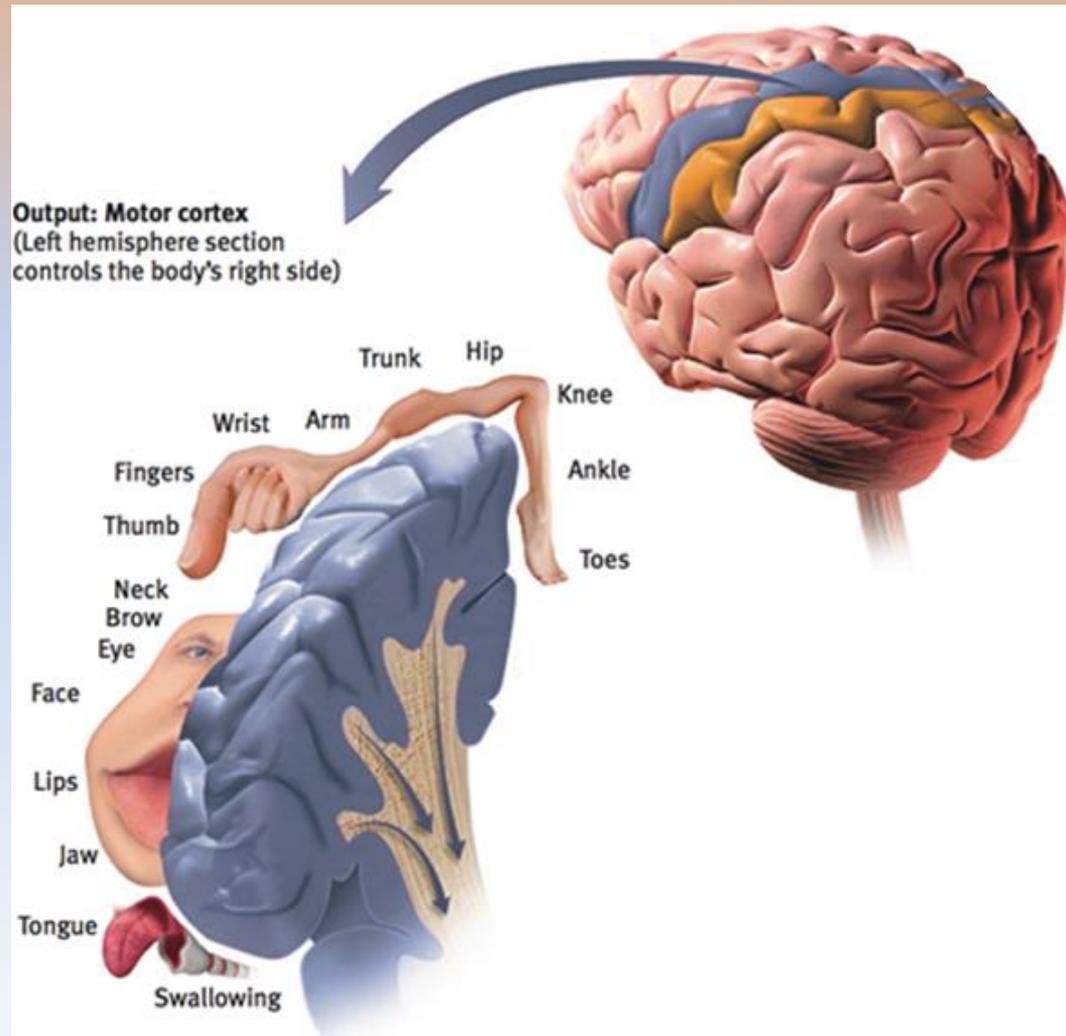
- Glial cells (“glue cells”)
- Lobes
 - Frontal lobes
 - Parietal lobes
 - Occipital lobes
 - Temporal lobes



Functions of the Cortex

Motor Functions

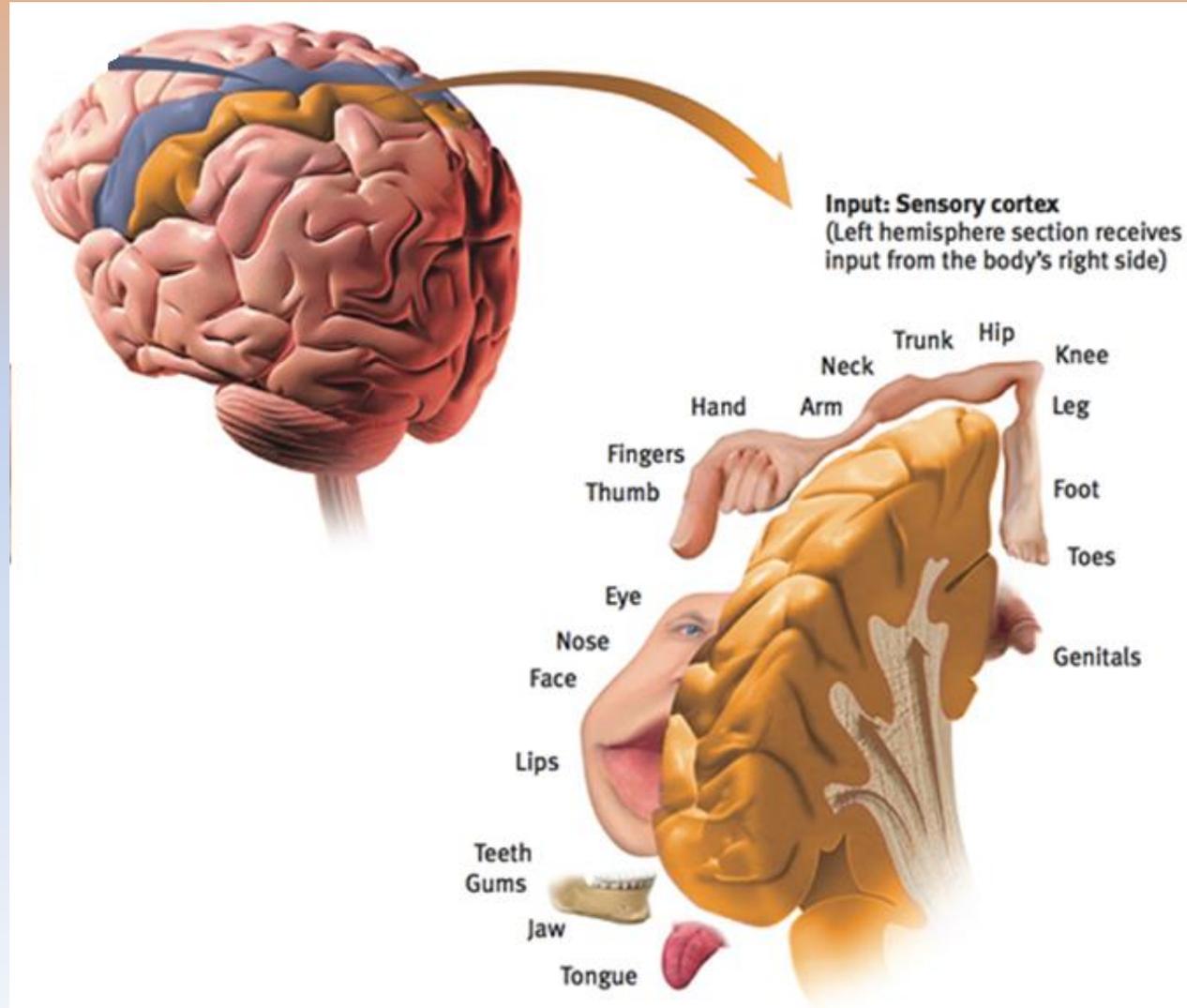
- Motor Cortex
- Mapping the Motor Cortex
- Neural Prosthetics



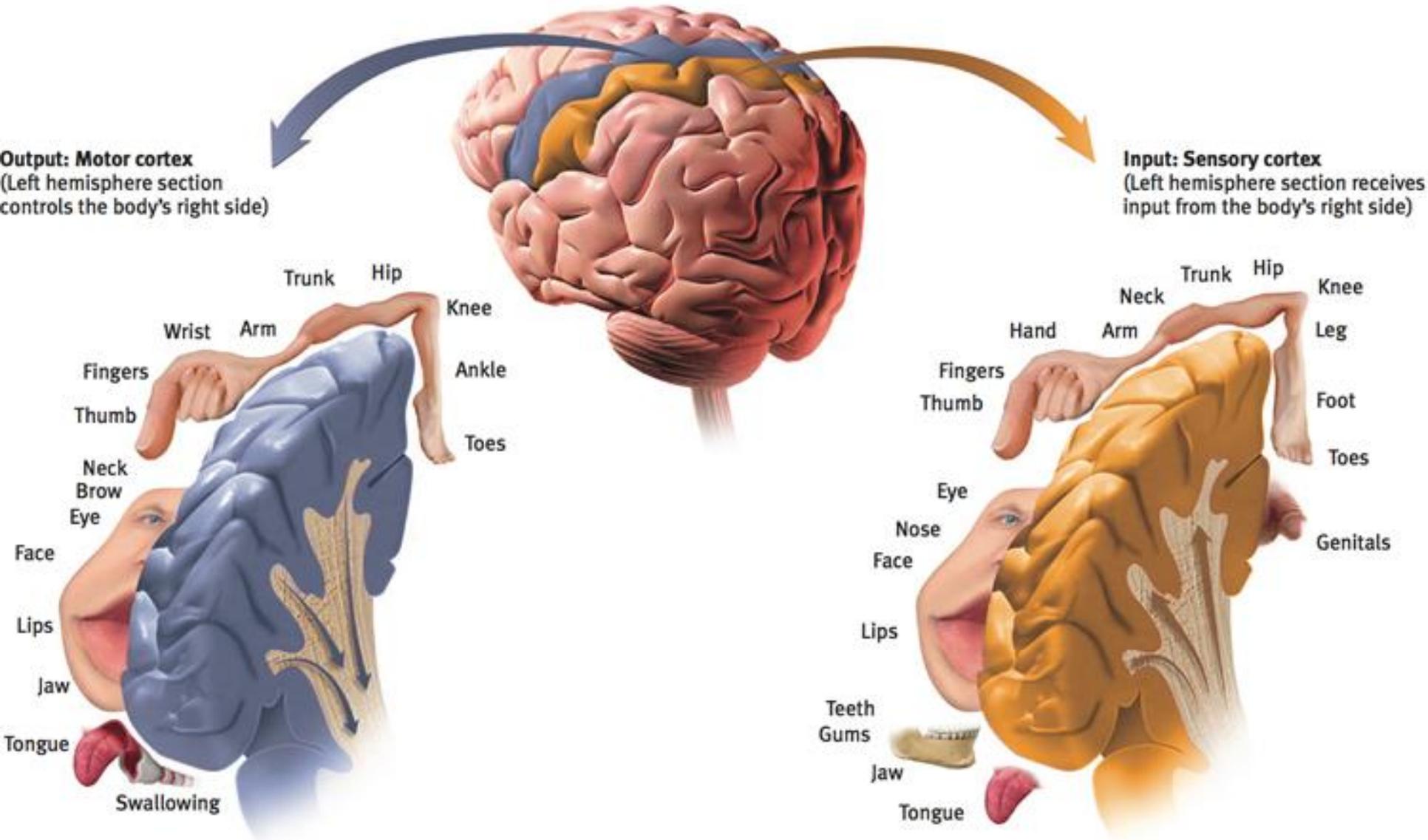
Functions of the Cortex

Sensory Functions

- Sensory cortex



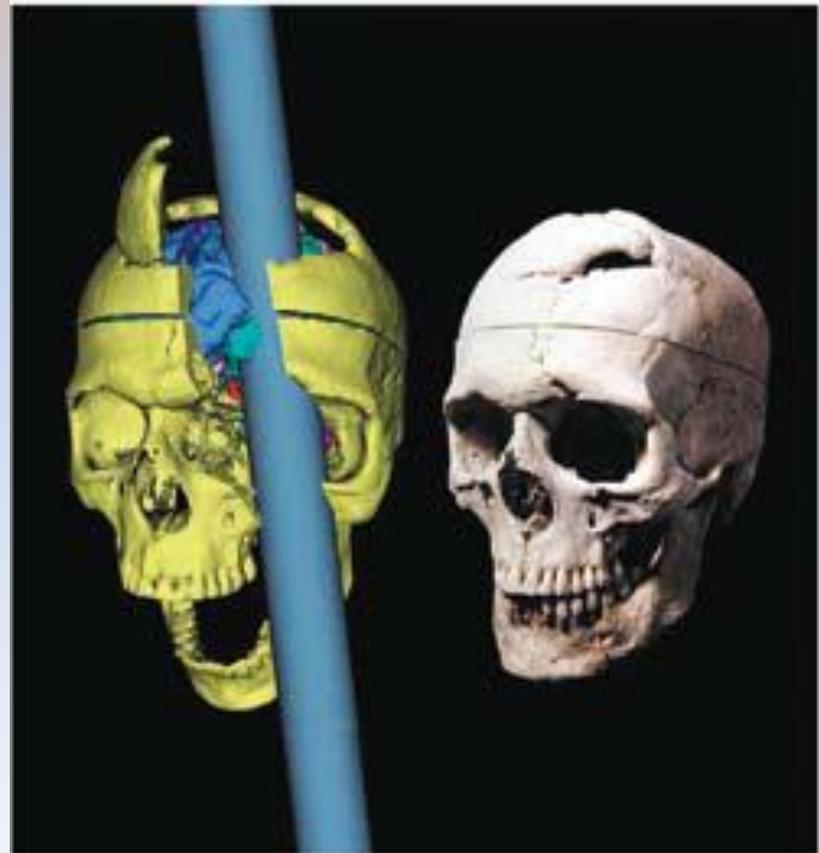
Functions of the Cortex



Functions of the Cortex

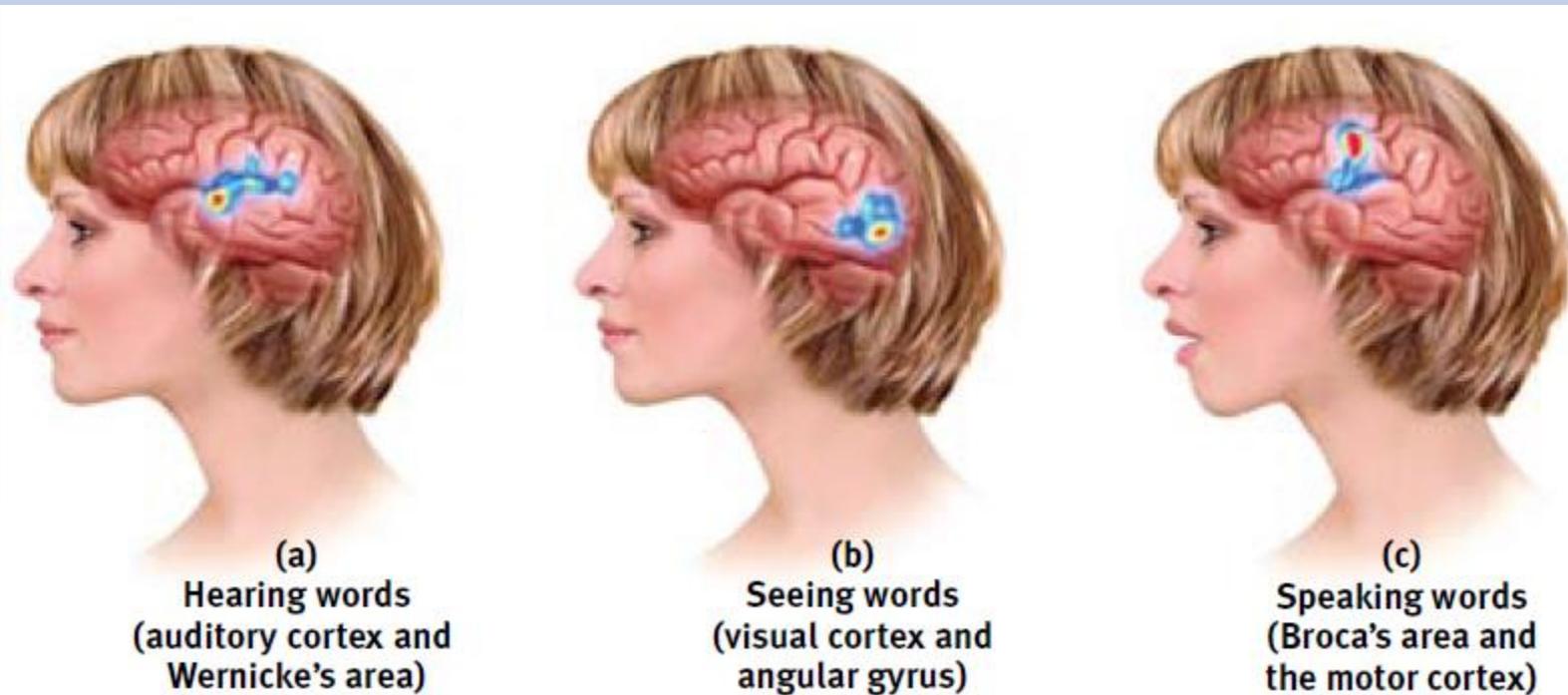
Association Areas

- Association areas
 - Frontal lobes
 - Phineas Gage
 - Parietal lobes
 - Temporal lobes

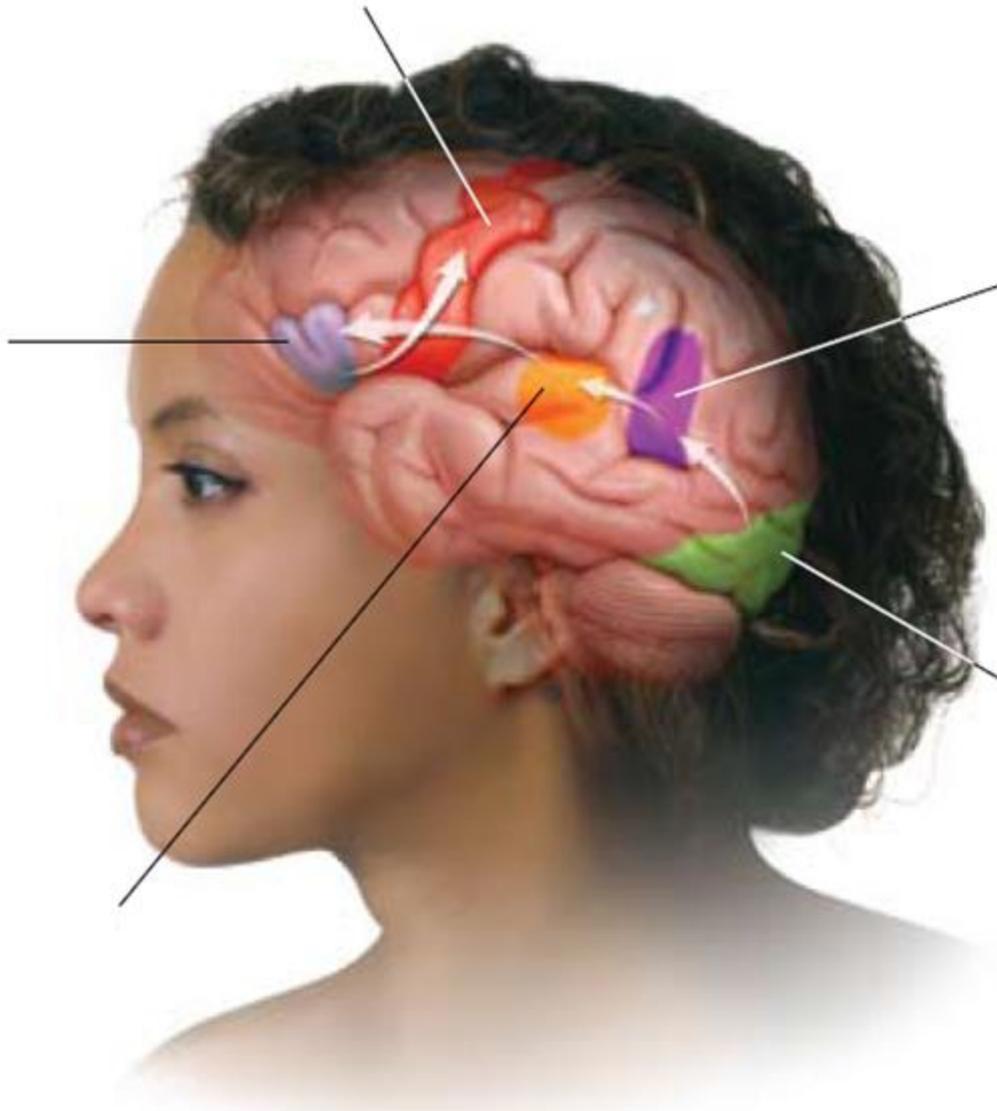


Language

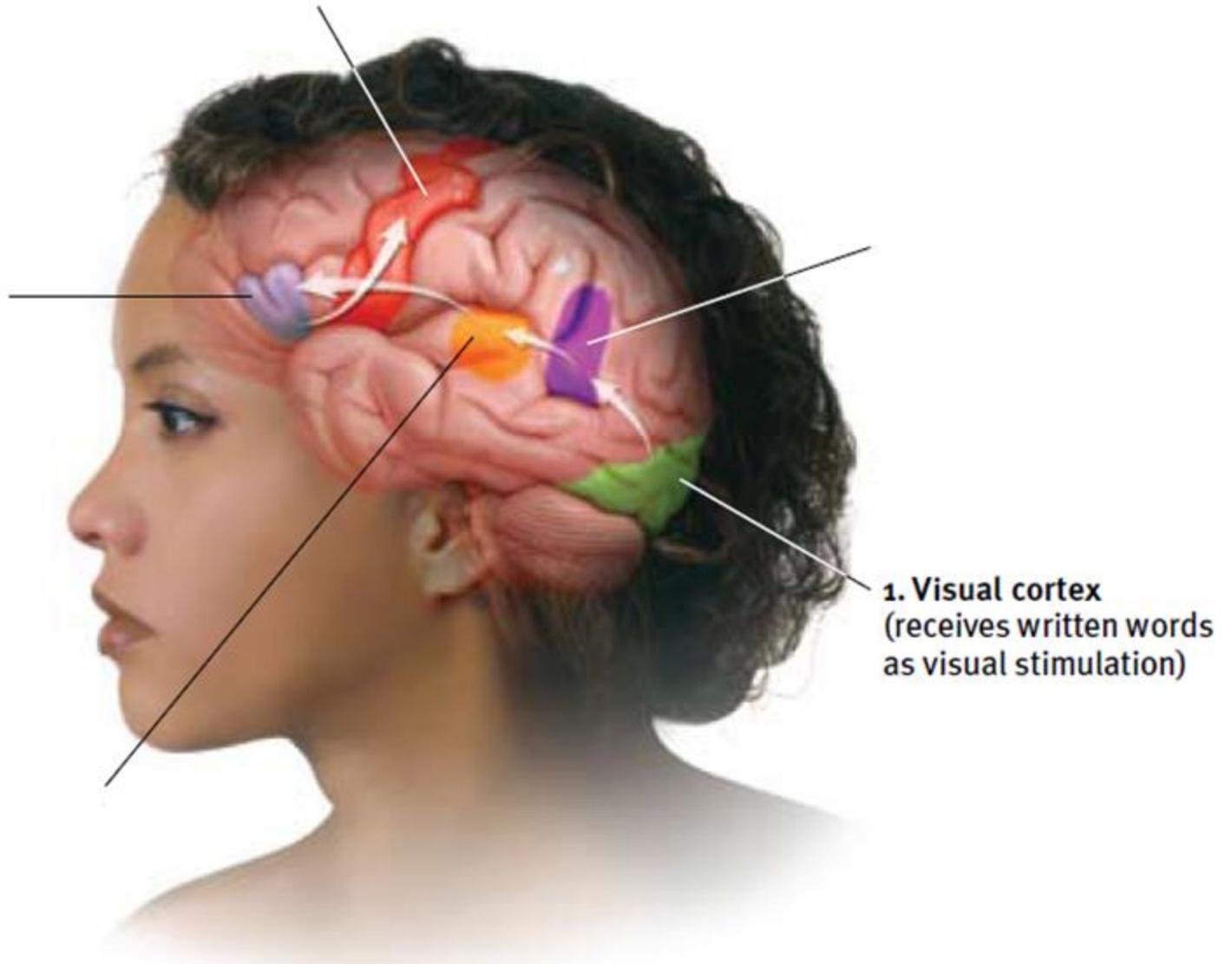
- Aphasia
 - Broca's area
 - Wernicke's area



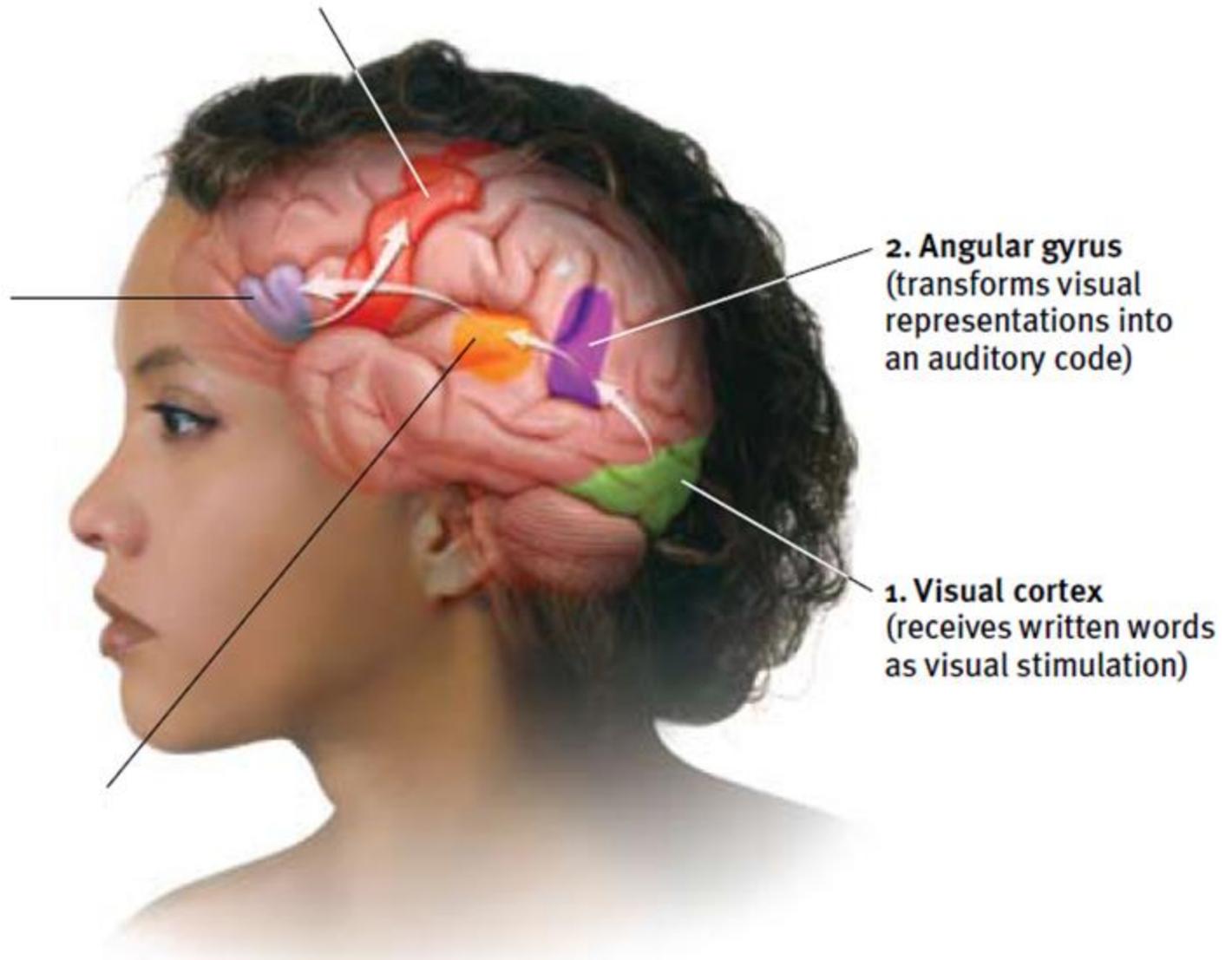
Language



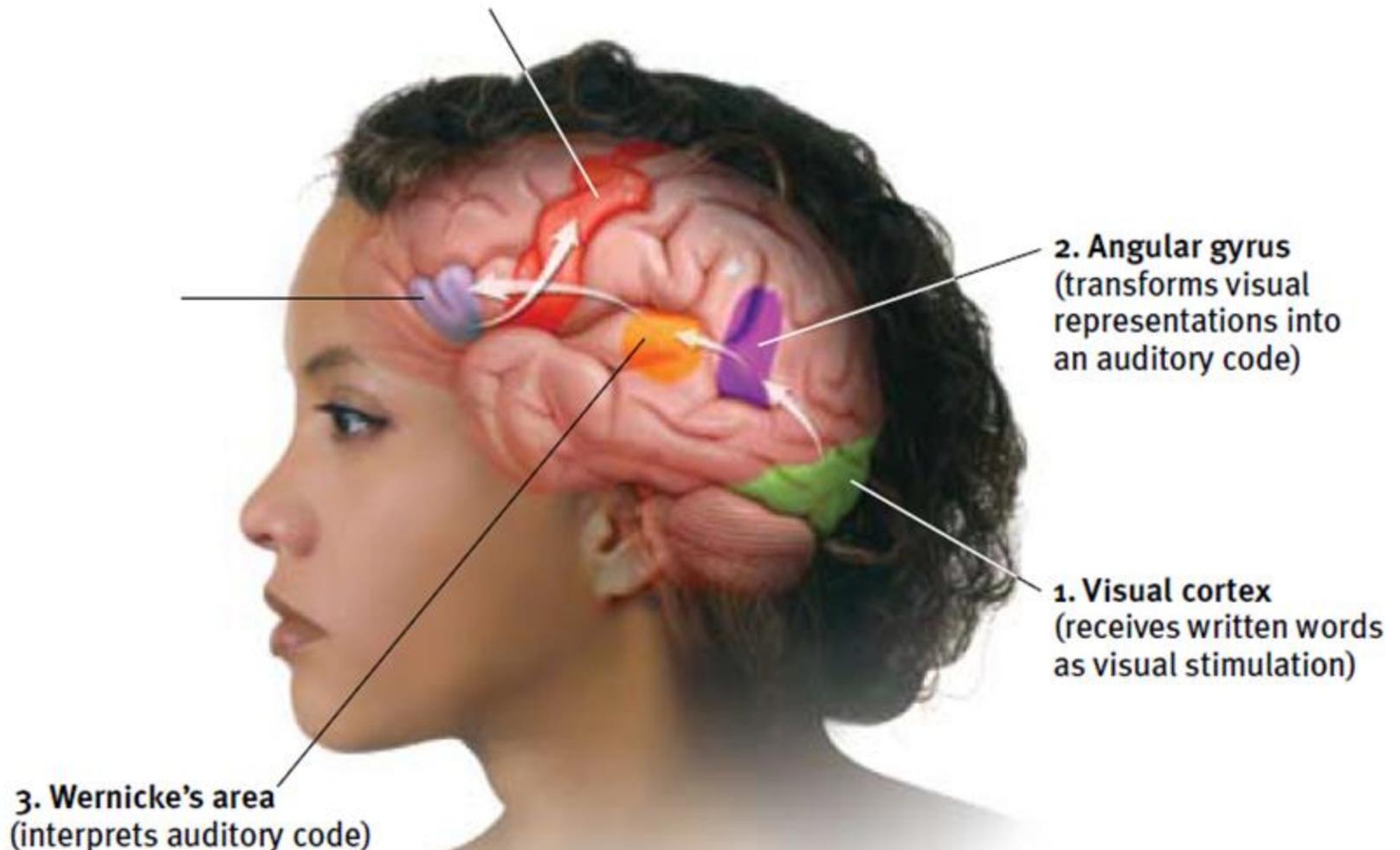
Language



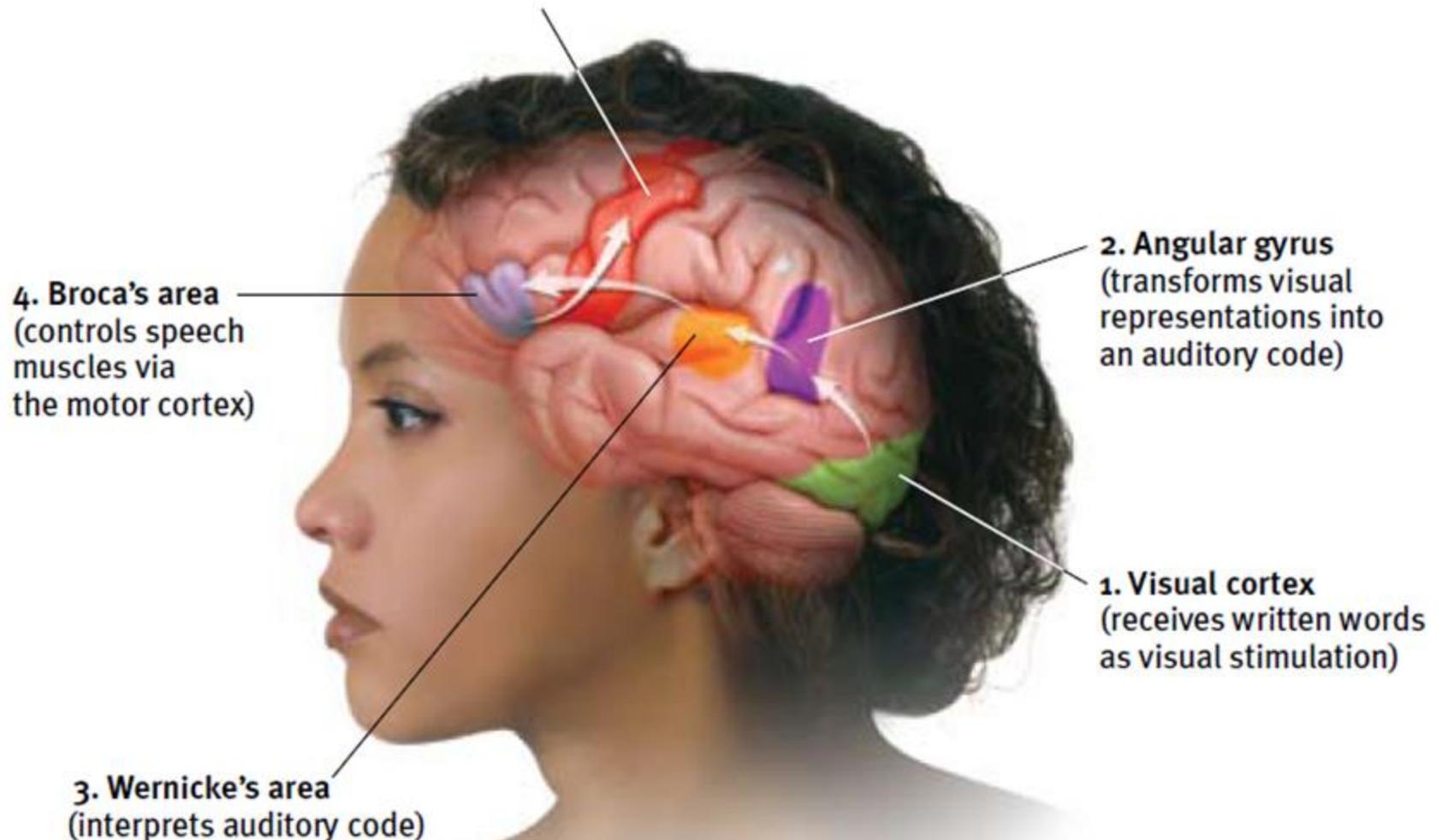
Language



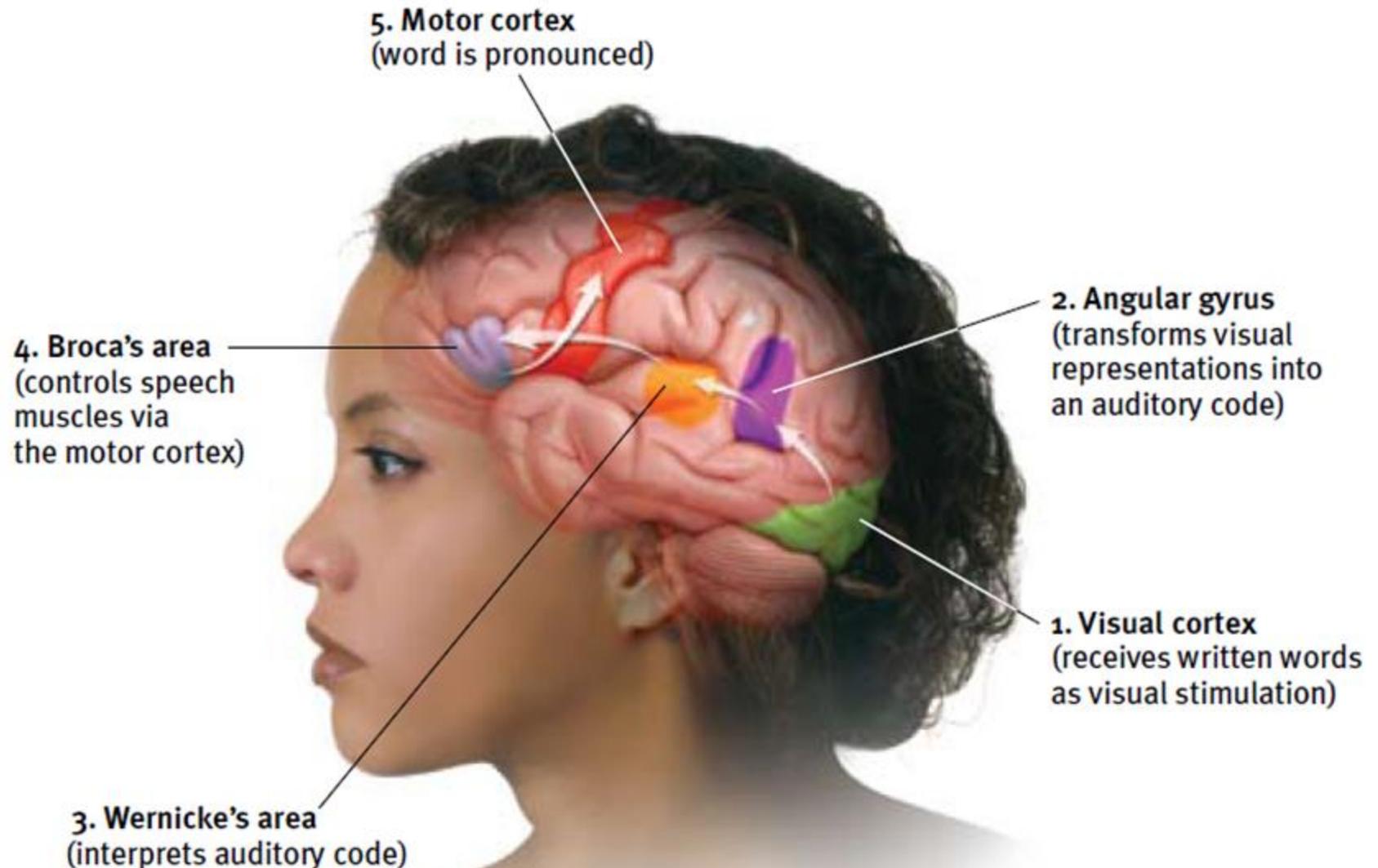
Language



Language



Language



The Brain's Plasticity

- Brain Damage
 - [Plasticity](#)
 - Constraint-induced therapy
 - [Neurogenesis](#)

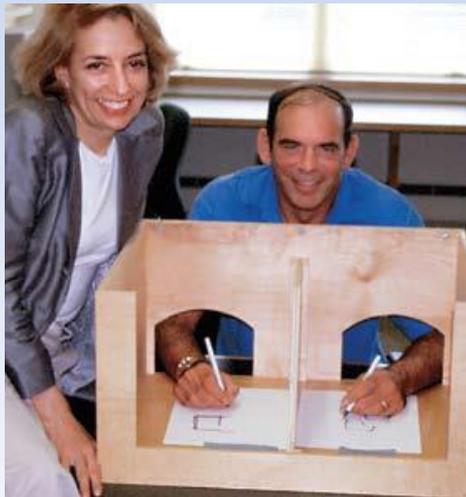
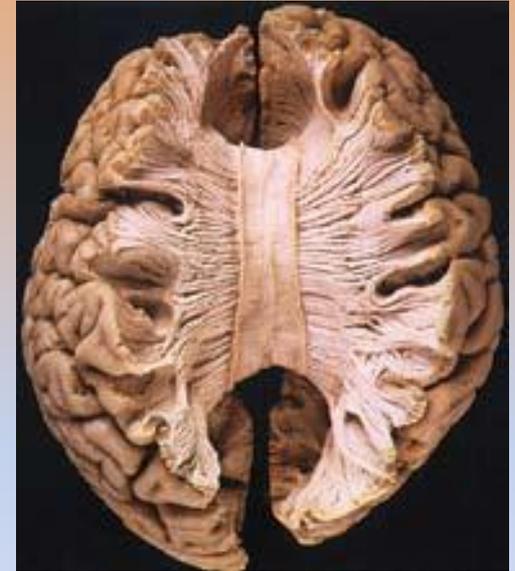


Our Divided Brain



Splitting the Brain

- Vogel and Bogen
 - Corpus-callosum
 - Split brain
 - Myers and Gazzaniga



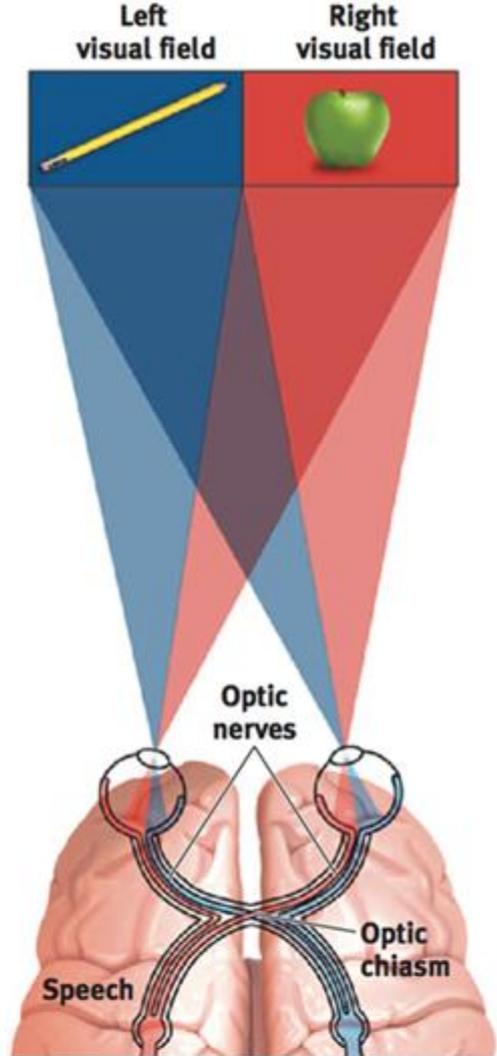
**Left
visual field**

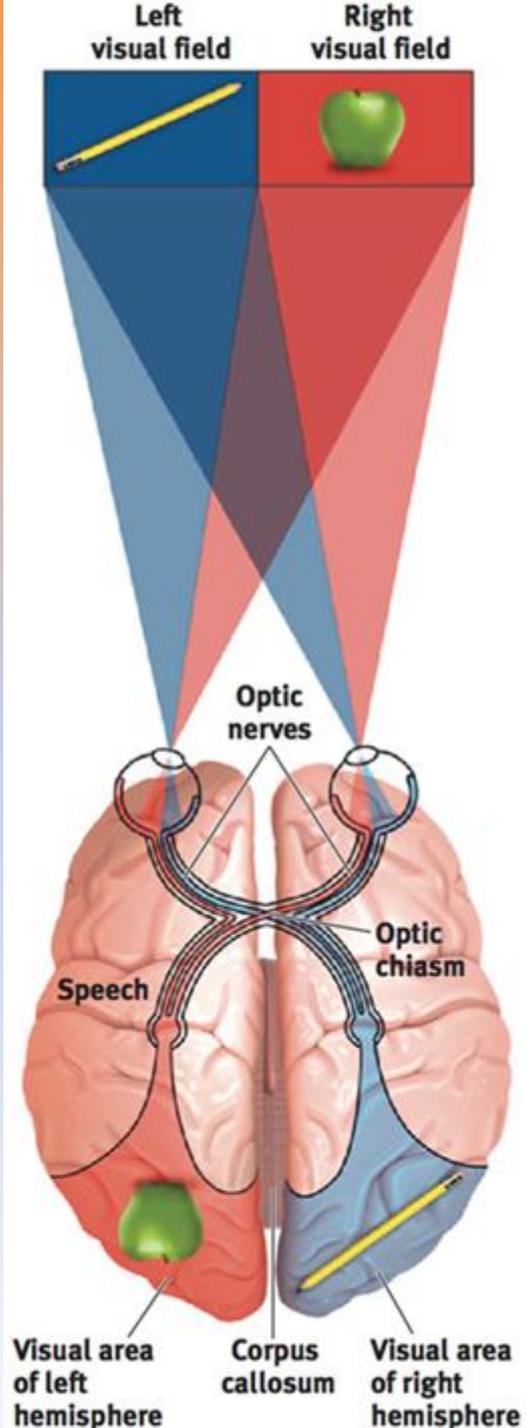


**Right
visual field**

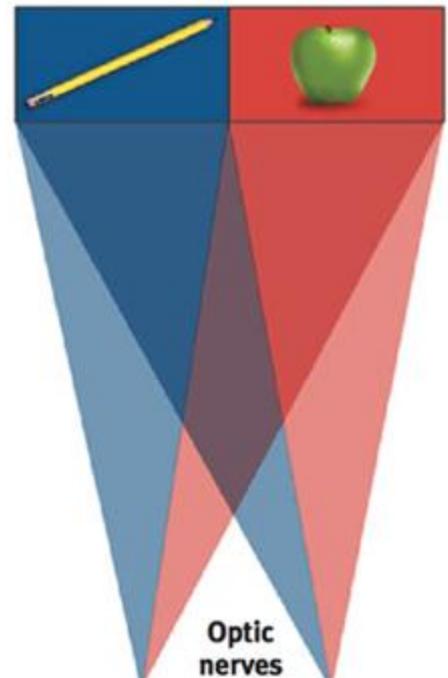






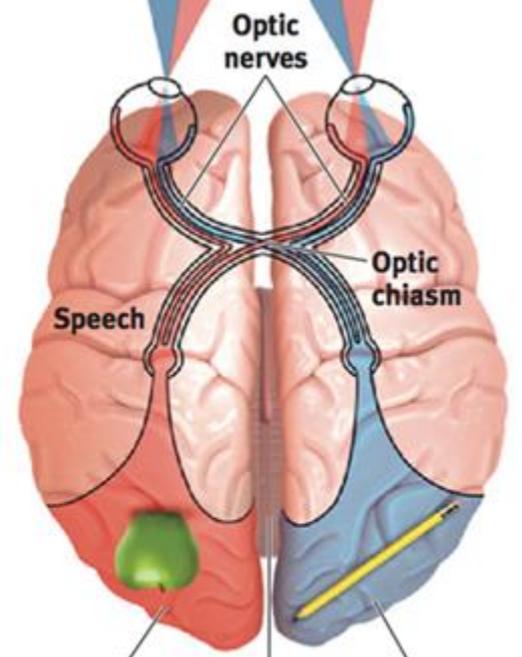


Left visual field Right visual field



(a)

(b)



or

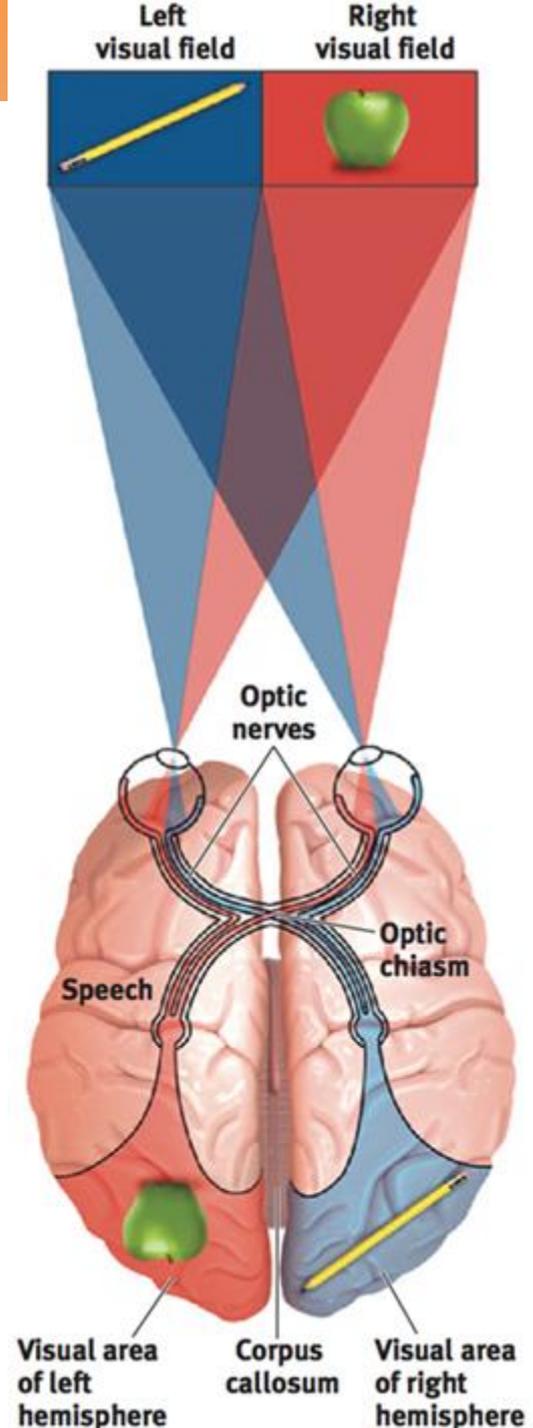
(c)

Visual area of left hemisphere Corpus callosum Visual area of right hemisphere



"Look at the dot."

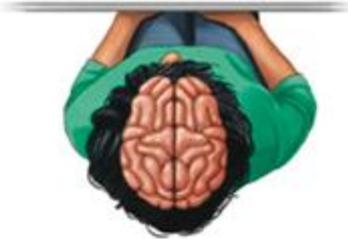
(a)



(b)

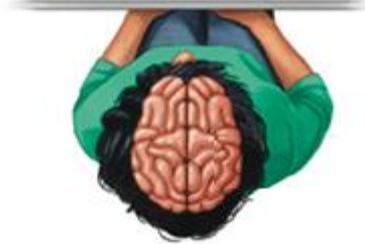
or

(c)



"Look at the dot."

(a)

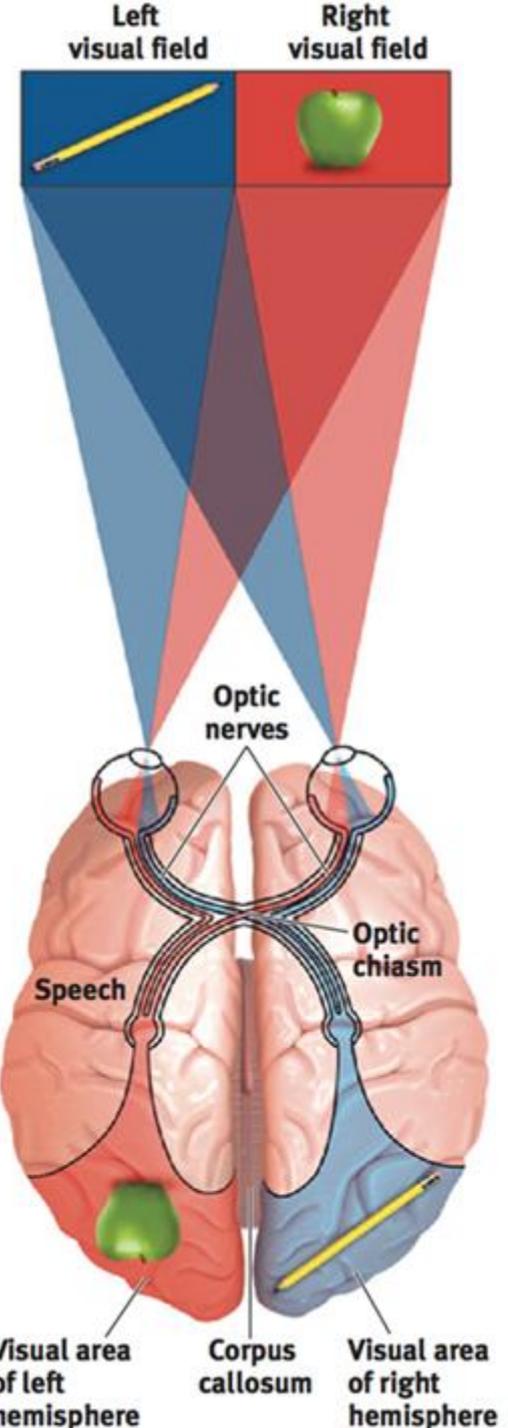


Two words separated by a dot
are momentarily projected.

(b)

or

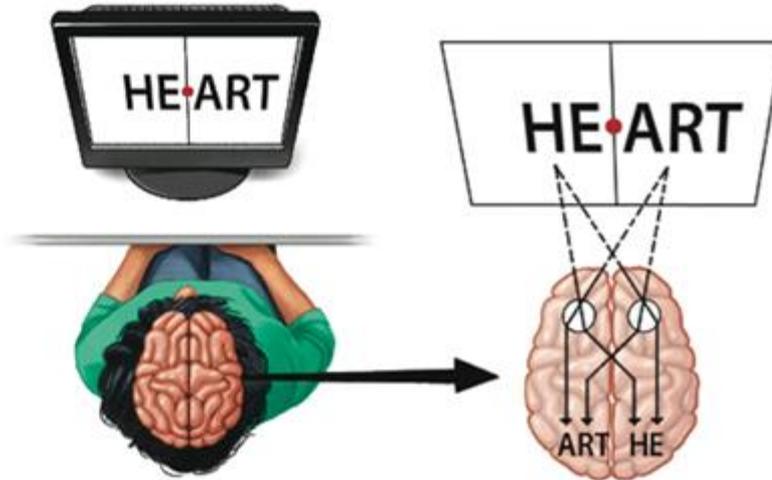
(c)





"Look at the dot."

(a)

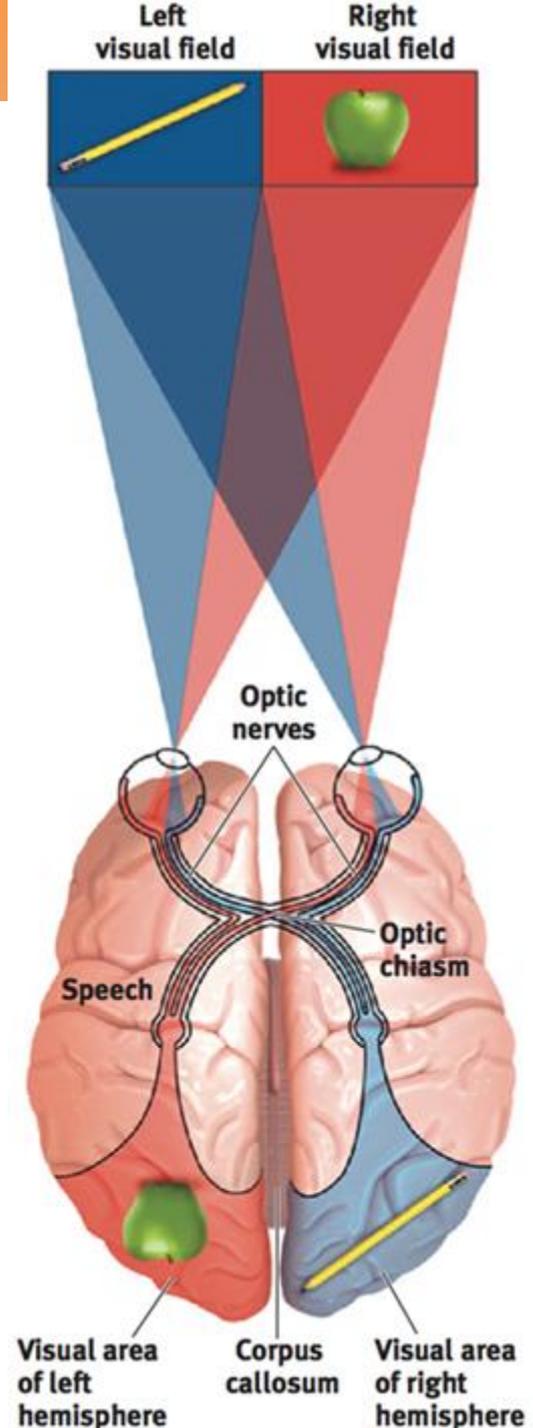


Two words separated by a dot are momentarily projected.

(b)

or

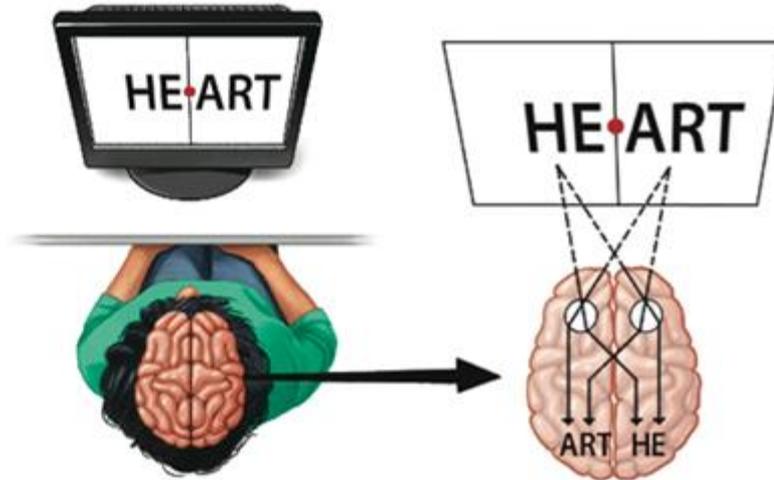
(c)





“Look at the dot.”

(a)



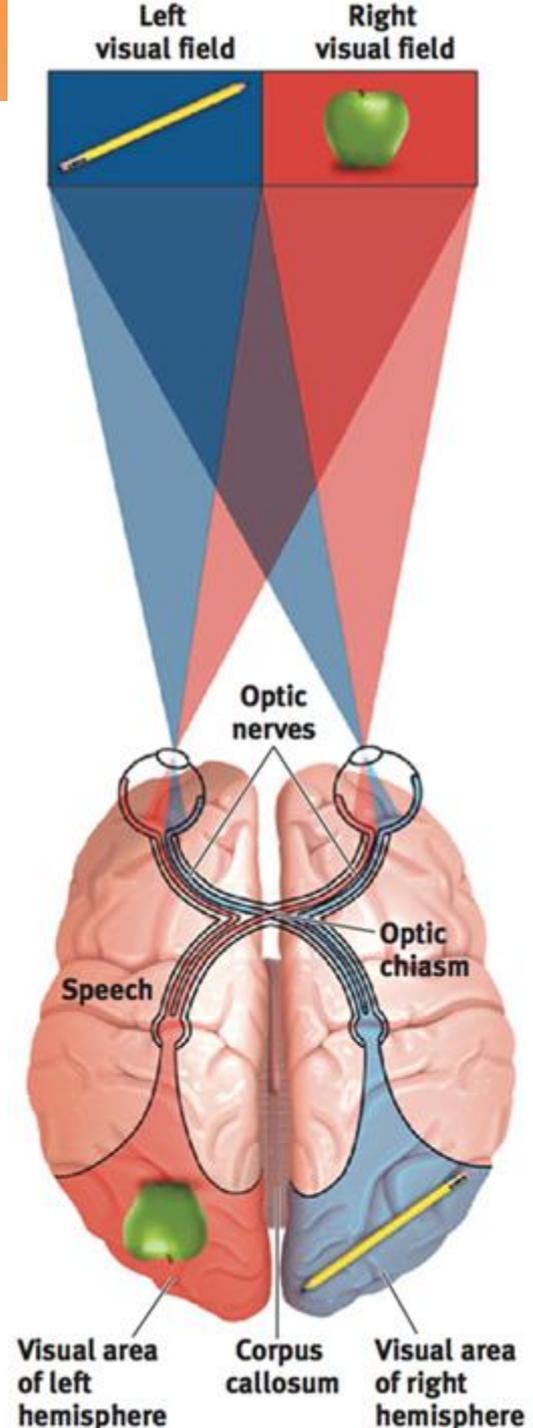
Two words separated by a dot are momentarily projected.

(b)

“What word did you see?”

or

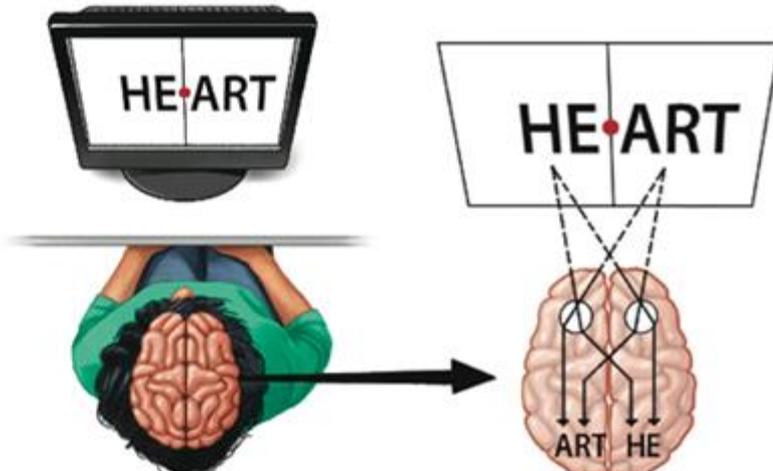
(c)





"Look at the dot."

(a)



Two words separated by a dot are momentarily projected.

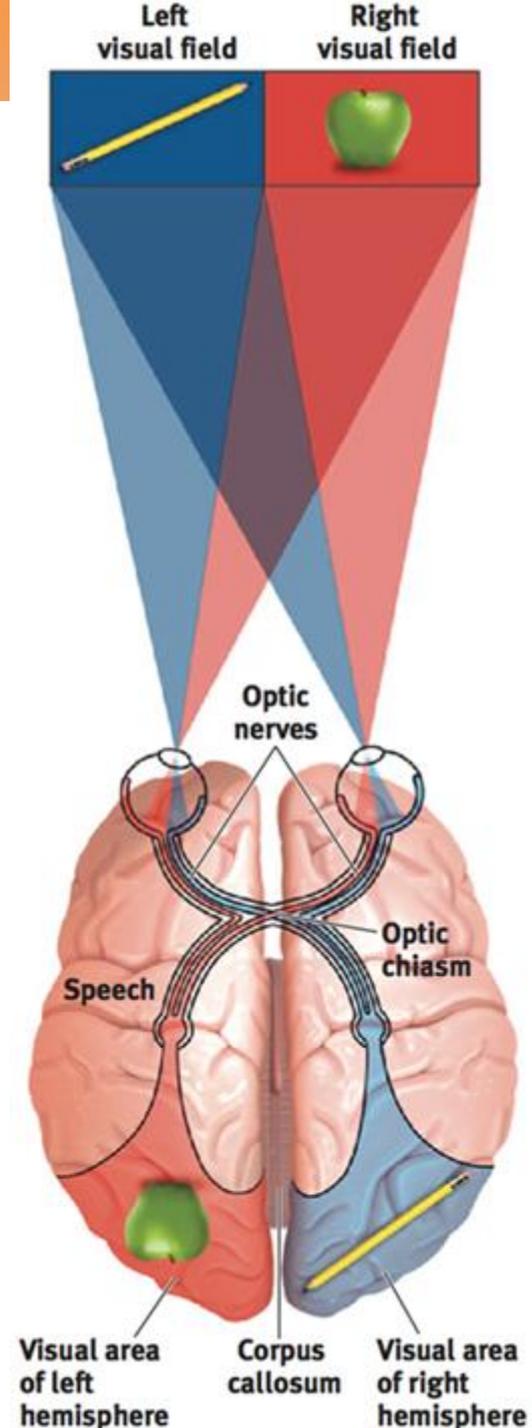
(b)

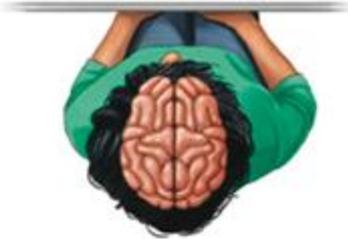


"What word did you see?"

or

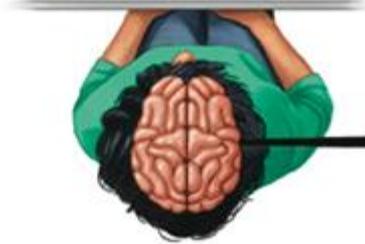
(c)





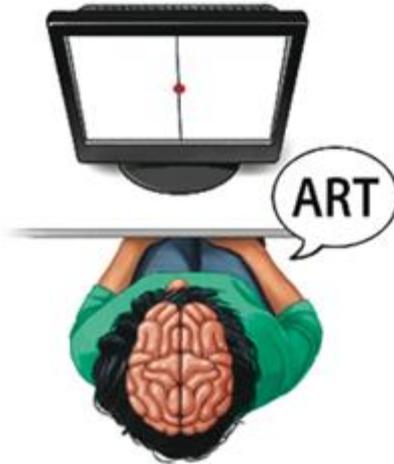
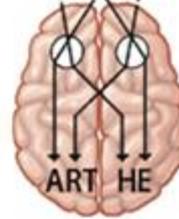
"Look at the dot."

(a)



Two words separated by a dot are momentarily projected.

(b)



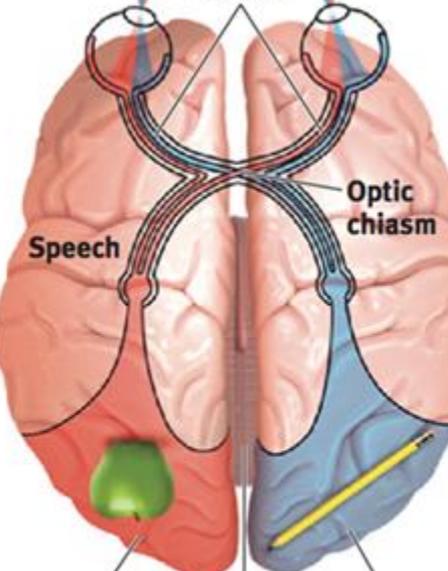
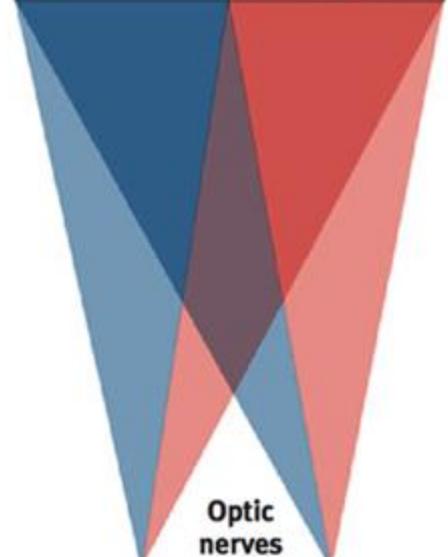
"What word did you see?"

or

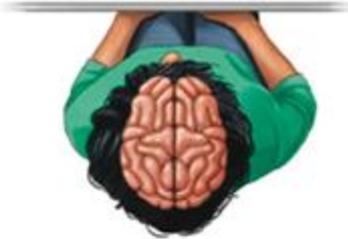
"Point with your left hand to the word you saw."

(c)

Left visual field Right visual field

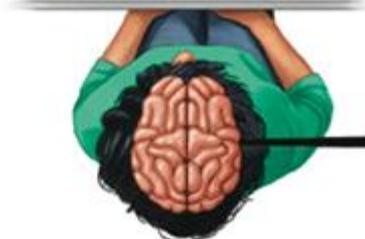


Visual area of left hemisphere Corpus callosum Visual area of right hemisphere



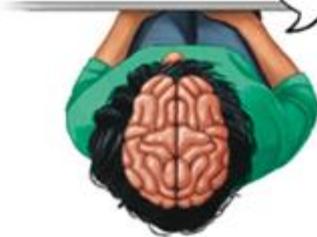
"Look at the dot."

(a)



Two words separated by a dot are momentarily projected.

(b)



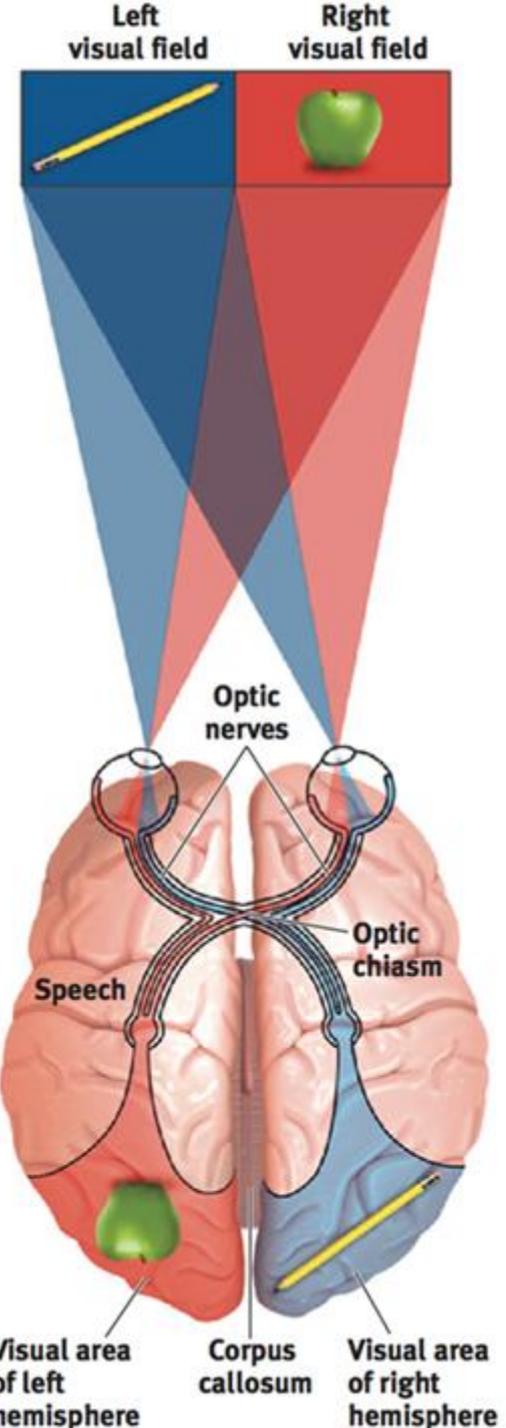
"What word did you see?"

or



"Point with your left hand to the word you saw."

(c)

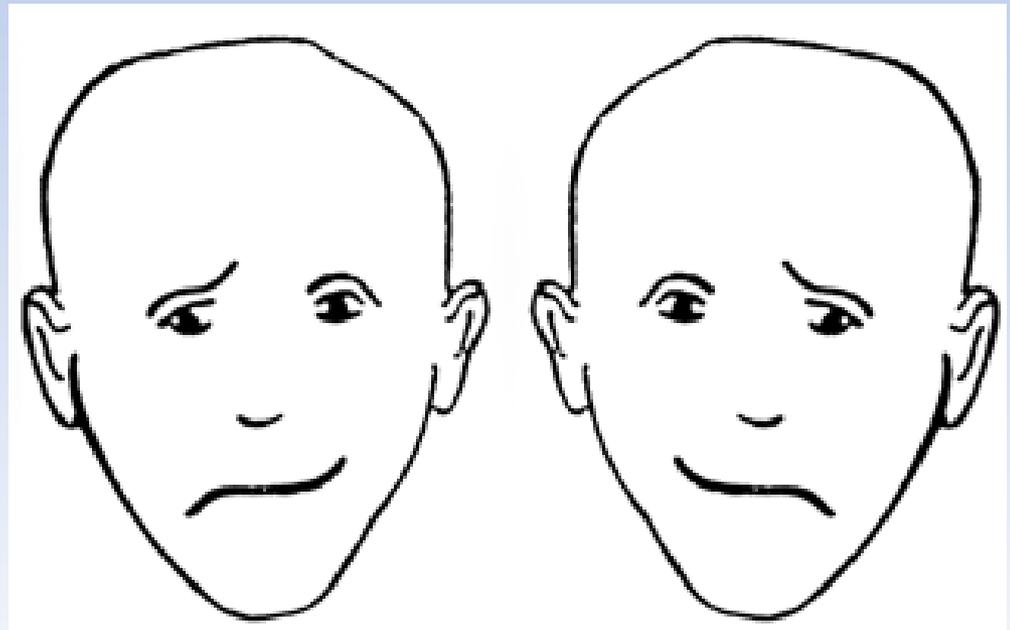


Right-Left Differences in the Intact Brain



Right-Left Brain Differences

- Hemispheric Specialization
 - Perceptual tasks
 - Language
 - Sense of self



The Brain and Consciousness



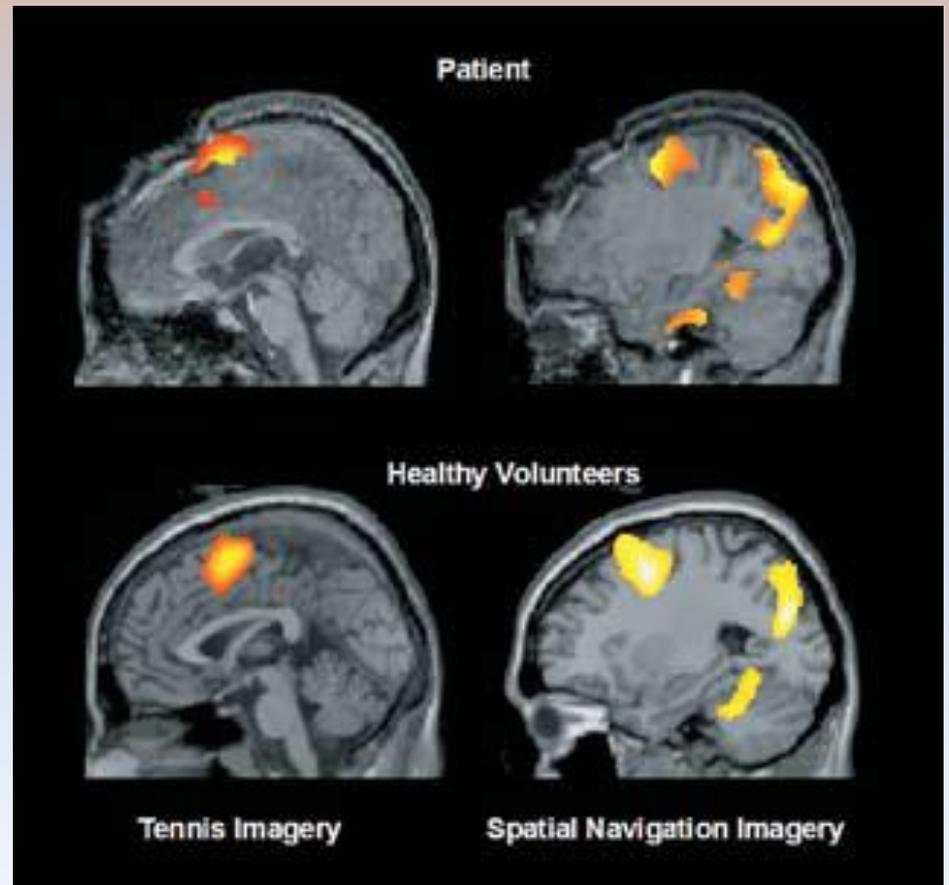
Introduction

- Consciousness



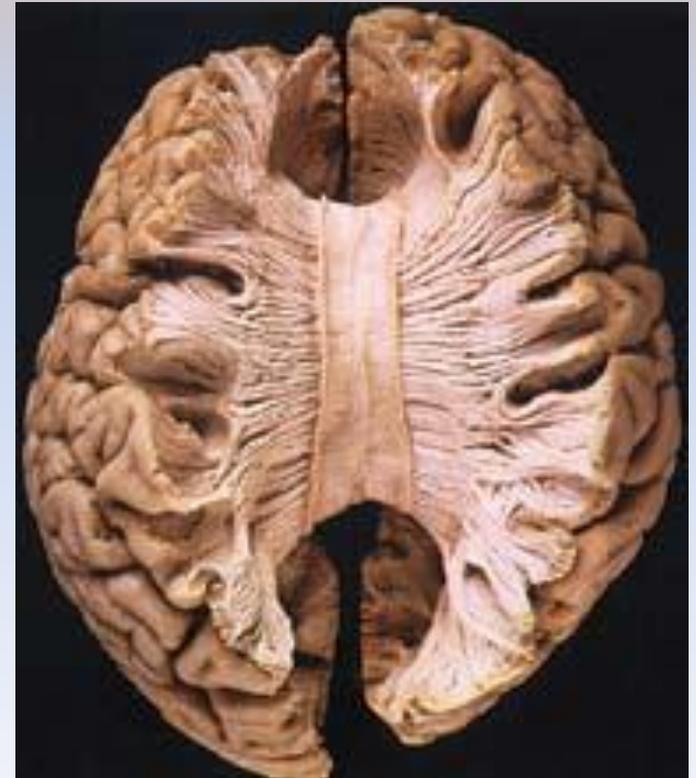
Cognitive Neuroscience

- Cognitive neuroscience



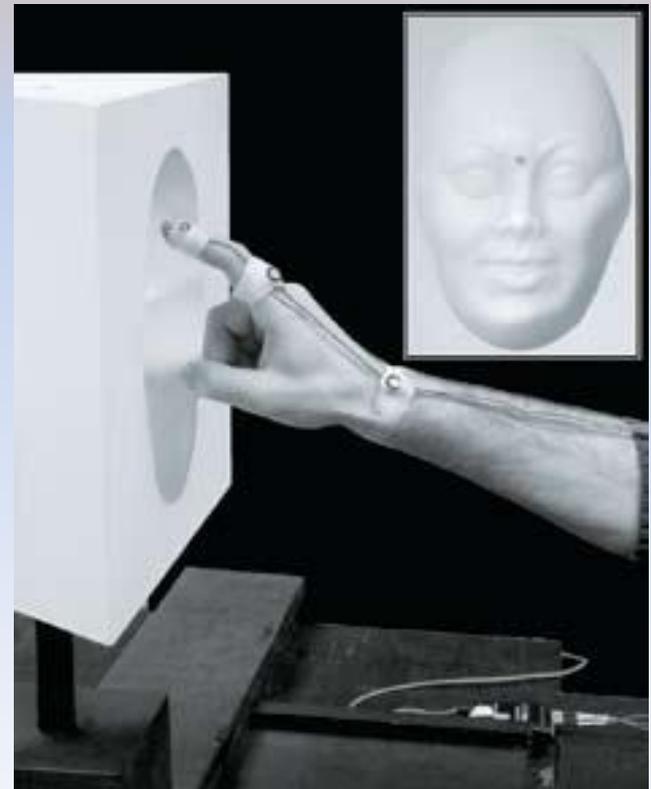
Dual Processing

- Dual Processing
 - Priming
 - Conscious left brain
 - Intuitive right brain



The Two-Track Mind

- Two-Track Mind
 - Visual perception track
 - Visual action track



The End

Teacher Information

- **Types of Files**

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- **Animation**

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- **Adding slides to this presentation**

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Teacher Information

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 - **Unit subsections hyperlinks:** Immediately after the unit title slide, a page (slide #3) can be found listing all of the unit’s subsections. While in slide show mode, clicking on any of these hyperlinks will take the user directly to the beginning of that subsection. This allows teachers quick access to each subsection.
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Teacher Information

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 - By presenting information in small chunks, students will find it easier to process and remember the concepts.
 - By continually changing slides, students will stay interested in the presentation.
 - To facilitate class discussion and critical thinking. Students should be encouraged to think about “what might come next” in the series of slides.
- Please feel free to contact me at kkorek@germantown.k12.wi.us with any questions, concerns, suggestions, etc. regarding these presentations.

Kent Korek

Germantown High School

Germantown, WI 53022

262-253-3400

kkorek@germantown.k12.wi.us

Division title (green print) subdivision title (*blue print*)

- XXX
 - XXX
 - XXX

Division title (green print)
subdivision title (*blue print*)

Use this slide to add a table, chart, clip art, picture, diagram, or video clip. Delete this box when finished

Definition Slide

= add definition here



Definition Slides

Lesion

= tissue destruction; a brain lesion is a naturally or experimentally caused destruction of brain tissue.



Electroencephalogram (EEG)

= an amplified recording of the waves of electrical activity that sweep across the brain's surface. These waves are measured by electrodes placed on the scalp.



CT (computed tomography) Scan

= a series of X-ray photographs taken from different angles and combined by computer into a composite representation of a slice through the body.

- Also called CAT scan.



PET (positron emission tomography) Scan

= a visual display of brain activity that detects where a radioactive form of glucose goes while the brain performs a given task.



MRI (magnetic resonance imaging)

= a technique that uses magnetic fields and radio waves to produce computer-generated images of soft tissue. MRI scans show brain anatomy.



fMRI (functional MRI)

= a technique for revealing bloodflow and, therefore, brain activity by comparing successive MRI scans. fMRI scans show brain function.



Brainstem

= the oldest part of the central core of the brain, beginning where the spinal cord swells as it enters the skull; the brainstem is responsible for automatic survival functions.



Medulla

= the base of the brainstem; controls heartbeat and breathing.



Reticular Formation

= a nerve network in the brainstem that plays an important role in controlling arousal.



Thalamus

= the brain's sensory switchboard, located on top of the brainstem; it directs messages to the sensory receiving areas in the cortex and transmits replies to the cerebellum and medulla.



Cerebellum

= the “little brain” at the rear of the brainstem; functions include processing sensory input and coordinating movement output and balance.



Limbic System

= doughnut-shaped neural system (including the hippocampus, amygdala, and hypothalamus) located below the cerebral hemispheres; associated with emotions and drives.



Amygdala

= two lima bean-sized neural clusters in the limbic system; linked to emotion.



Hypothalamus

= a neural structure lying below (hypo) the thalamus; it directs several maintenance activities (eating, drinking, body temperature), helps govern the endocrine system via the pituitary gland, and is linked to emotion and reward.



Cerebral Cortex

= the intricate fabric of interconnected neural cells covering the cerebral hemispheres; the body's ultimate control and information-processing center.



Glial Cells

= cells in the nervous system that support, nourish, and protect neurons.



Frontal Lobes

= portion of the cerebral cortex lying just behind the forehead; involved in speaking and muscle movements and in making plans and judgments.



Parietal Lobes

= portion of the cerebral cortex lying at the top of the head and toward the rear; receives sensory input for touch and body position.



Occipital Lobes

= portion of the cerebral cortex lying at the back of the head; includes areas that receive information from the visual fields.



Temporal Lobes

= portion of the cerebral cortex lying roughly above the ears; includes the auditory areas, each receiving information primarily from the opposite ear.



Motor Cortex

= an area at the rear of the frontal lobes that controls voluntary movements.



Sensory Cortex

= area at the front of the parietal lobes that registers and processes body touch and movement sensations.



Association Areas

= areas of the cerebral cortex that are not involved in primary motor or sensory functions; rather, they are involved in higher mental functions such as learning, remembering, thinking, and speaking.



Aphasia

= impairment of language, usually caused by left hemisphere damage either to Broca's area (impairing speaking) or to Wernicke's area (impairing understanding).



Broca's Area

= controls language expression that directs the muscle movements involved in speech.



Wernicke's Area

= controls language reception – a brain area involved in language comprehension and expression; usually in the left temporal lobe.



Plasticity

= the brain's ability to change, especially during childhood, by reorganizing after damage or by building new pathways based on experience.



Neurogenesis

= the formation of new neurons.



Corpus Callosum

= the large band of neural fibers connecting the two brain hemispheres and carrying messages between them.



Split Brain

= a condition resulting from surgery that isolates the brain's two hemispheres by cutting the fibers (mainly those of the corpus callosum) connecting them.



Consciousness

= our awareness of ourselves and our environment.



Cognitive Neuroscience

= the interdisciplinary study of the brain activity linked with cognition (including perception, thinking, memory and language).



Dual Processing

=the principle that information is often simultaneously processed on separate conscious and unconscious tracks.

