



Function of Cerebral Hemisphere

Color index

- **Important**
- Further Explanation



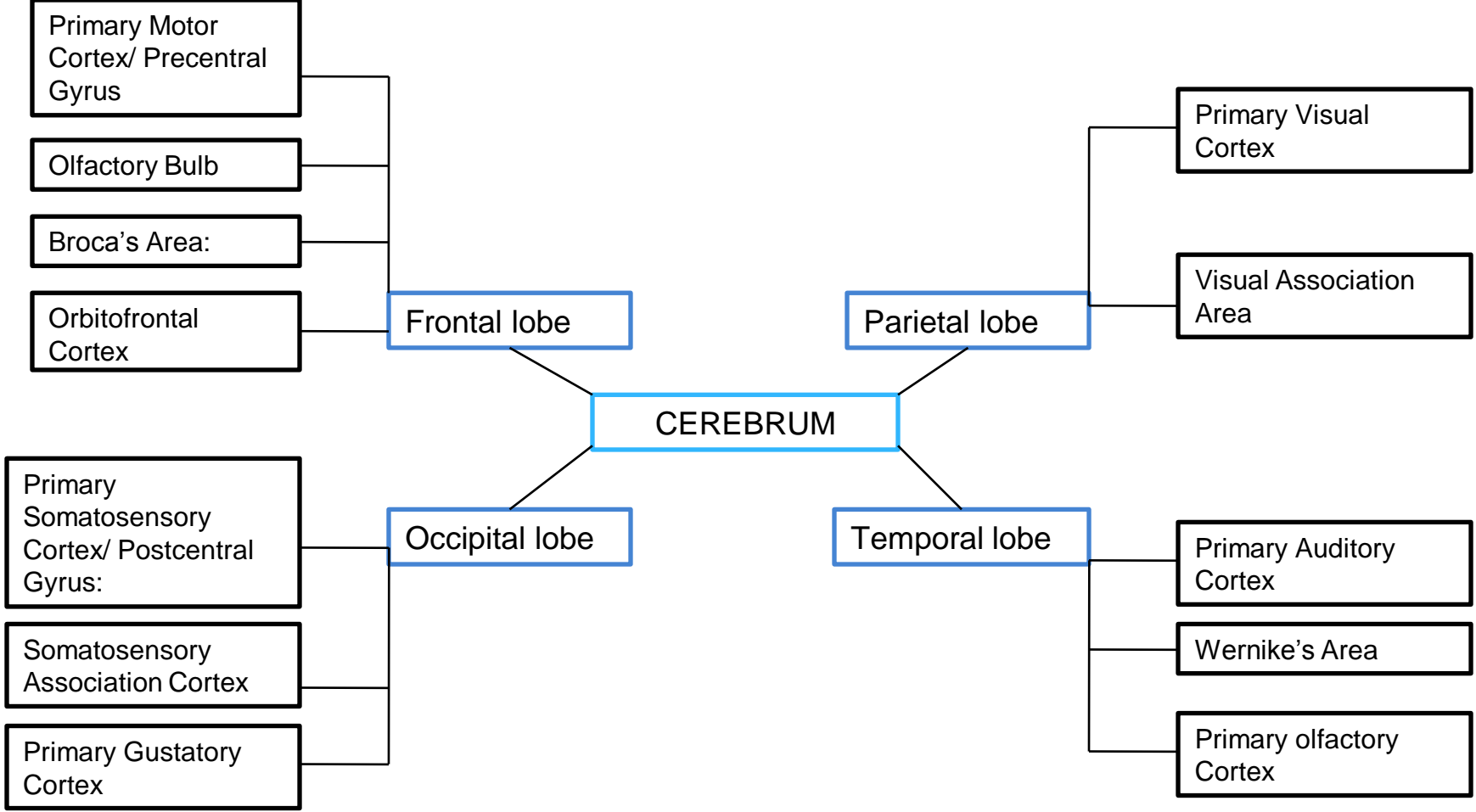
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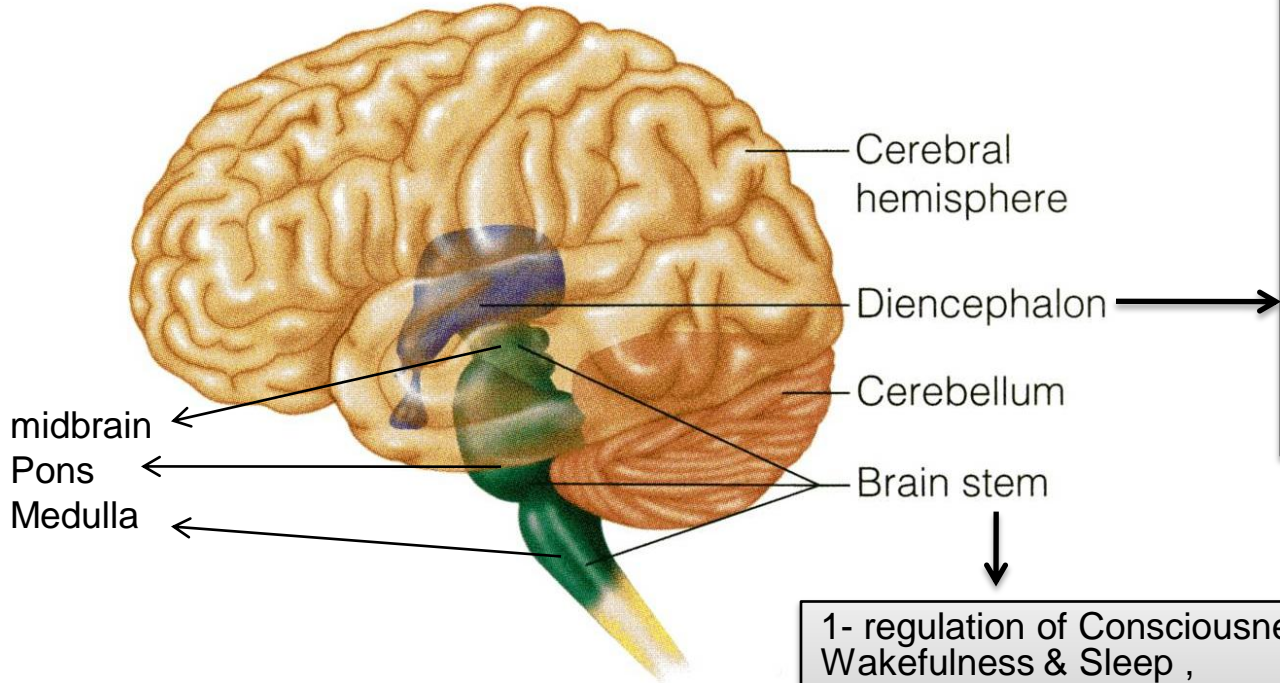
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Anatomy of the brain :



Mainly :

(1)Thalamus :

relaying of
sensory and motor
signals to the
cerebral cortex)

(2) Hypothalamus :

(contains center for
autonomic and
endocrine control)

- ↓
- 1- regulation of Consciousness , Wakefulness & Sleep ,
 - 2- Respiratory , CV and GIT control ,
 - 3- Balance
 - 4- it contain several Cranial Nerve nuclei

Cerebrum :

The largest division of the brain. It is divided into 2 hemispheres by **longitudinal fissure**, each of 2 hemispheres is divided into 4 lobes: **frontal**, **parietal**, **occipital** & **temporal** Occasionally **Insula**(deep to temporal)

Cerebral features :

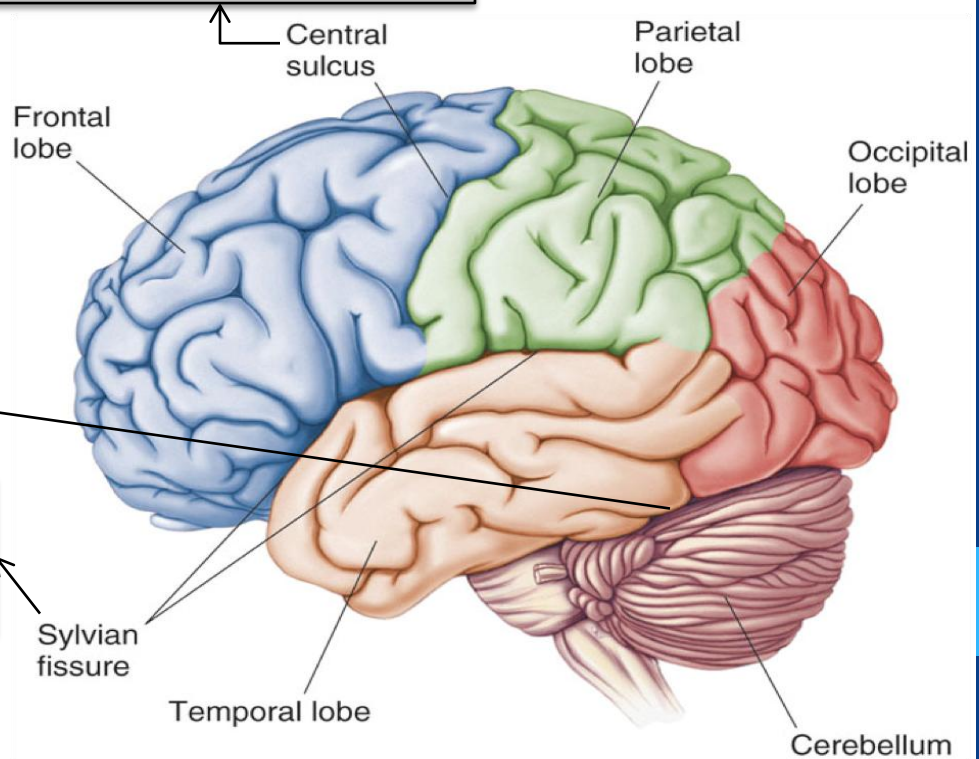
- 1- **gyri**: Elevated ridges “winding” around the brain.
- 2- **sulci**: Small grooves dividing the gyri.
- 3- **fissures**: Deep grooves, generally dividing large regions/lobes of the brain.

- Separates the Cerebrum from the Cerebellum.

Transverse fissure

Divides the Temporal Lobe from the Frontal and Parietal Lobes .

Divides the Frontal Lobe from the Parietal Lobe.



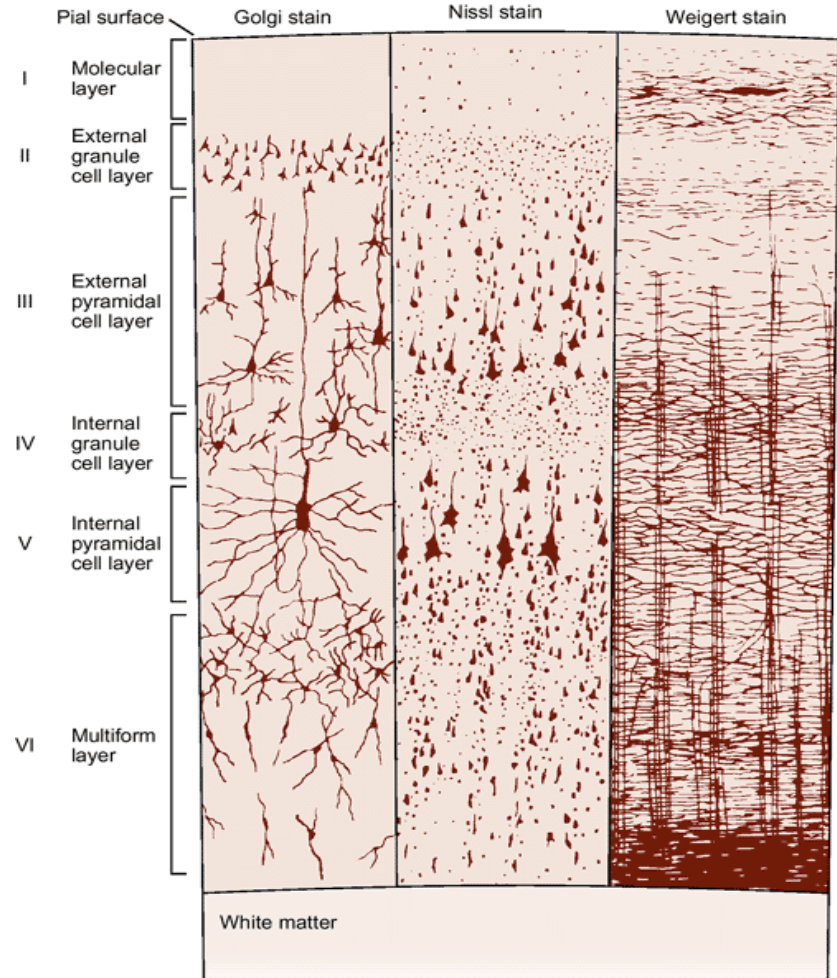
Cerebral cortex

1. The sensory signal excites neuronal **layer IV** first; then the signal spreads toward the surface of the cortex and also toward deeper layers.

2. Layers **I and II** receive diffuse, nonspecific input signals from lower brain centers that facilitate specific regions of the cortex. This input mainly controls the overall level of excitability of the respective regions stimulated.

3. The neurons in **layers II and III** send axons to related portions of the cerebral cortex on the opposite side of the brain through the corpus callosum.

4. The neurons in **layers V and VI** send axons to the deeper parts of the nervous system. For eg to basal ganglia and thalamus



1-Frontal lobe

Location	Function	Lesions
Deep to the frontal bone	<p>1- plays an integral role in :</p> <ul style="list-style-type: none">• memory formation• emotions• decision making/reasoning• personality <p>2- Responsible for initiation and execution of voluntary movement</p> <p>3- contains Broca's area of speech in the dominant hemisphere (i.e., in the left hemisphere in most people)</p>	<p>1- paralysis on opposite side of the body ,</p> <p>2- Broca's Aphasia: Results in the ability to comprehend speech, but the decreased motor ability (or inability) to speak and form words if lesion</p> <p>involves Broca's area in the dominant hemisphere.</p>

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Broca's Area: Controls facial neurons and speech "motor speech"
On **LEFT** cerebral hemisphere

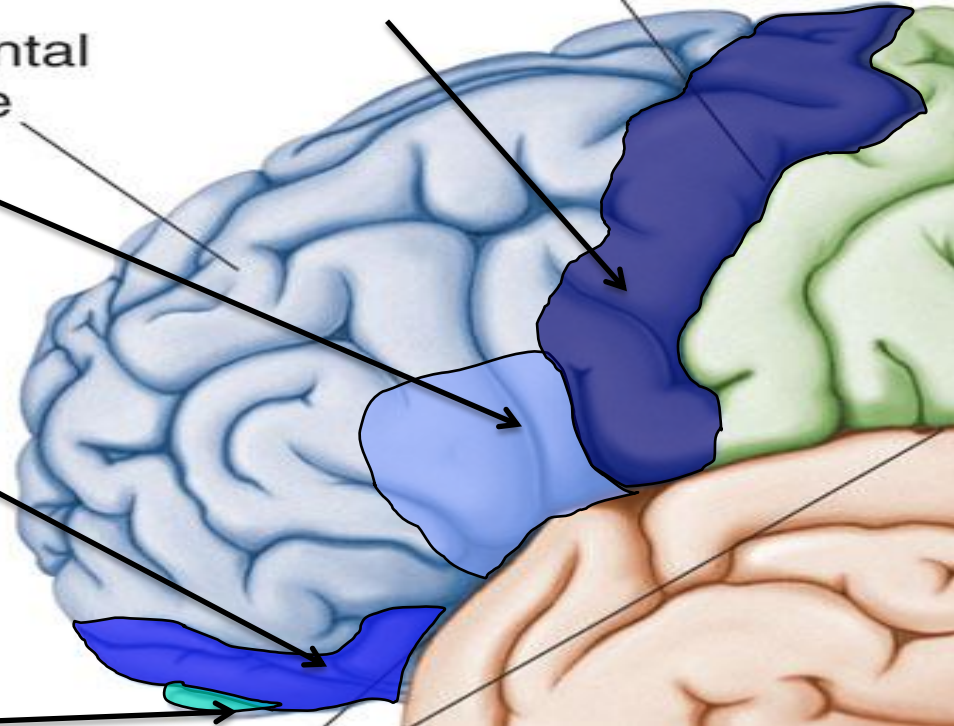
Orbitofrontal Cortex :
Site of Frontal Lobotomies

Olfactory Bulb : Cranial Nerve I, Responsible for sensation of Smell

**Primary Motor Cortex/
Precentral Gyrus:** Cortical site involved with controlling movements of the body.

Frontal lobe

Central sulcus



2- Parietal lobe

Location	Function	Lesions
<p>Deep to the parietal bone of the skull</p>	<ul style="list-style-type: none">- Senses and integrates sensation(s)- Spatial awareness and perception <p>(Proprioception - Awareness of body/ body parts in space and in relation to each other)</p>	<p>Parietal lobe is essential for our feeling of touch, warmth/heat , cold, pain , body position and appreciation of shapes of palpated objects .</p> <p>When damaged , the person loses the ability to recognize shapes of complex objects by palpation (palpation = examination of objects by touch) .</p> <p>& develops Sensory Inattention on opposite side</p>

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Primary Somatosensory Cortex/ Postcentral Gyrus:

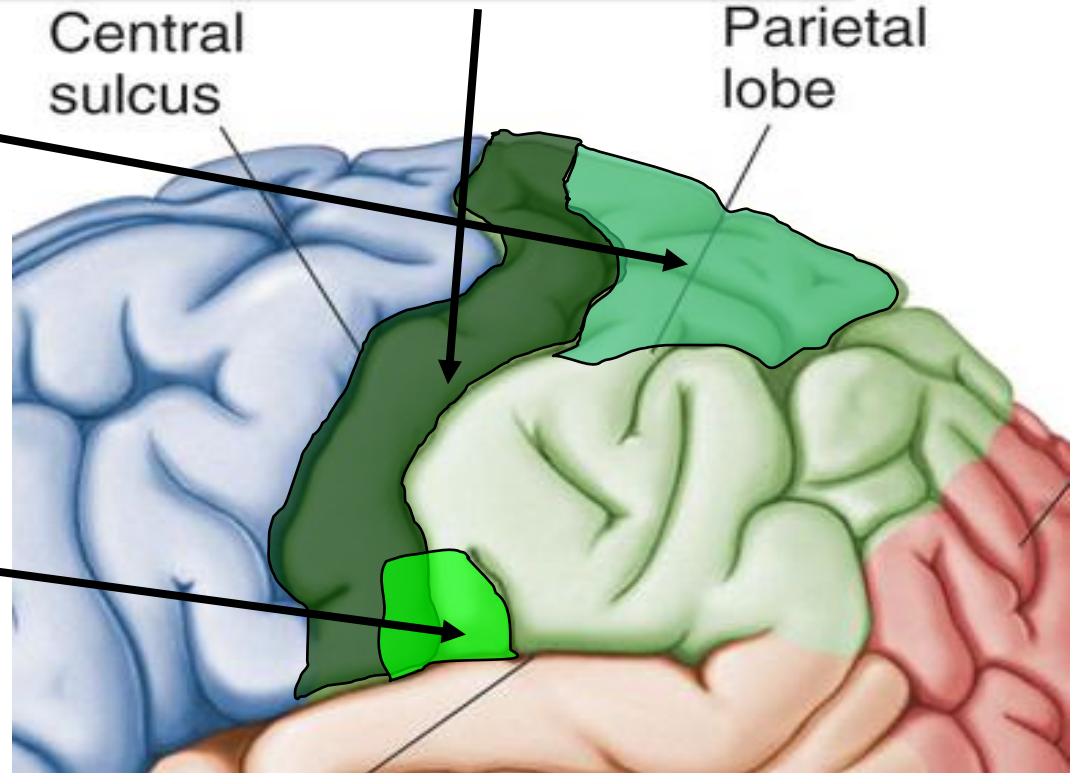
Site involved with processing of **tactile and proprioceptive** information & general sensations from opposite half of the body

Somatosensory Association Cortex

Assists with the integration and interpretation of sensations relative to body position and orientation in space. May assist with visuo-motor coordination.

Primary Gustatory Cortex

Primary site involved with the interpretation of the sensation of Taste.



3-Occipital Lobe

Location	Function	Lesions
Deep to the occipital bone of the skull	processing, integration, interpretation, etc. of Vision and visual stimuli.	<p>Lesions in the parietal-temporal-occipital association area are associated with color agnosia, movement agnosia and agraphia.</p> <p>Damage to the primary visual cortex, can cause blindness due to the holes in the visual map on the surface of the visual cortex that resulted from the lesions.</p>

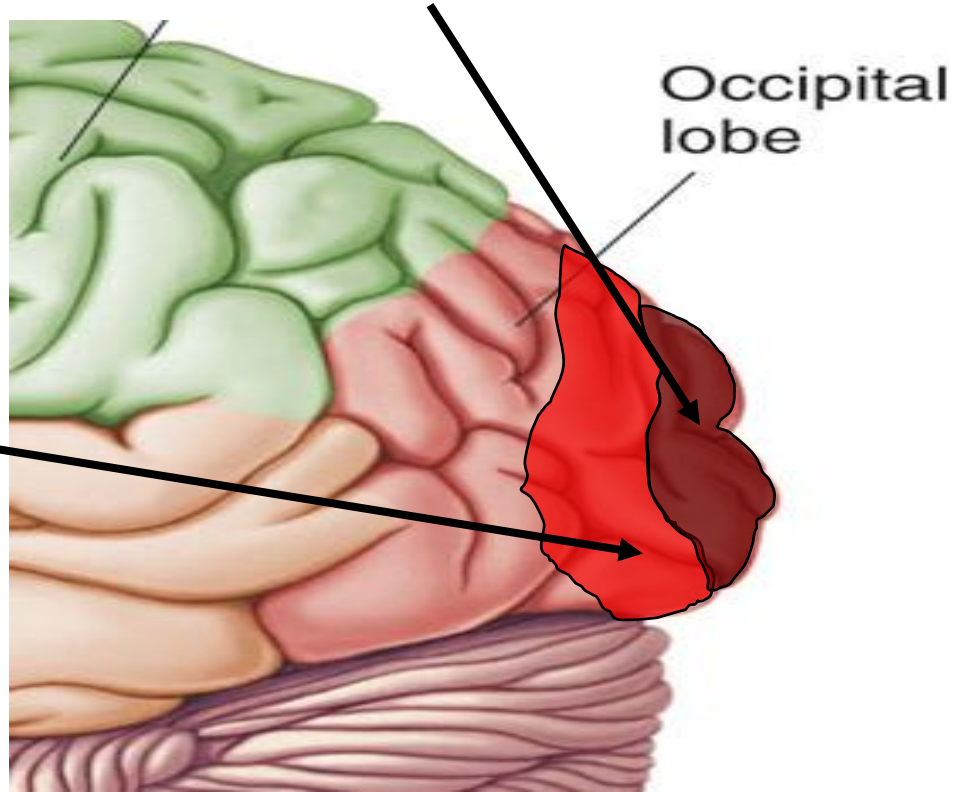
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Primary Visual Cortex

This is the primary area of the brain responsible for **sight -recognition of size, color, light, motion, dimensions**, etc.

Visual Association Area

Interprets information acquired through the primary visual cortex.



4- Temporal lobe

Location	Function	Lesions
In sides of the brain deep to the temporal bone of the skull	1-Organization / Comprehension of language 2-Hearing & smell 3-Information Retrieval (Memory and Memory Formation)	may lead to memory impairment can be associated with temporal lobe epilepsy - Wernicke's Aphasia Language comprehension is inhibited. Words and sentences are not clearly understood, and sentence formation may be inhibited or non-sensical.

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Primary Auditory Cortex

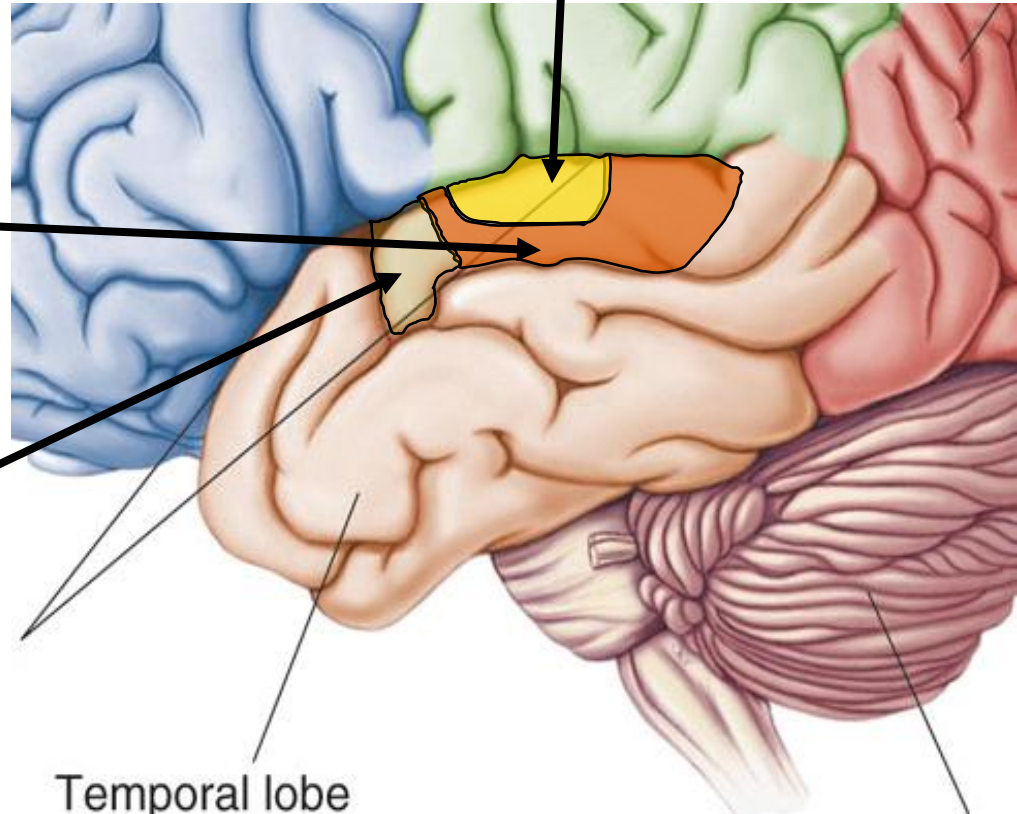
Responsible for hearing

Wernike's Area

Language comprehension.
Located on the **Left** Temporal Lobe.

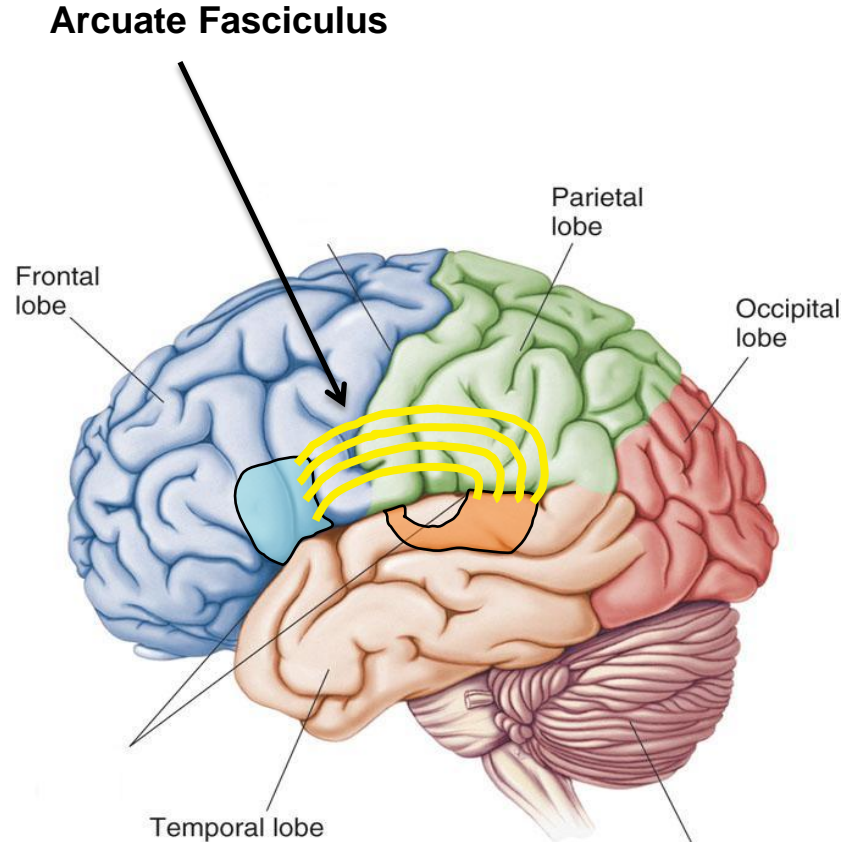
Primary Olfactory Cortex (Deep)

Interprets the sense of smell
once it reaches the cortex via
the olfactory bulbs. (Not visible on
the superficial cortex)



Arcuate Fasciculus

Function	Lesions
A white matter tract that connects Broca's Area and Wernicke's Area through the Temporal, Parietal and Frontal Lobes. Allows for coordinated, comprehensible speech	Conduction Aphasia - Where auditory comprehension and speech articulation are preserved, but people find it difficult to repeat heard speech.



1- The sensory signal excites neuronal layer :

- A. II
- B. III
- C. IV
- D. V

2- Broca's area in :

- A. Left frontal lobe
- B. Left temporal lobe
- C. Left parietal lobe
- D. Left occipital lobe

3- Lesions in the parietal-temporal-occipital association give us:

- A. color agnosia
- B. movement agnosia
- C. blindness
- D. A,,B

4- if there were a lesion in temporal lobe which one of the following will occur

- A. Conduction Aphasia
- B. Wernicke's Aphasia
- C. blindness
- D. Broca's Aphasia

5- if there were lesion in Arcuate Fasciculus the patient will find difficult with:

- A. repeat heard speech.
- B. Understand the word
- C. Form the words and sentence
- D. Recognizing color

6- Paralysis in the opposite side of the body is a sign for:

- A. Lesion in temporal lobe
- B. Lesion in Frontal lobe
- C. Lesion in parietal lobe
- D. Lesion in occipital lobe

1- what is the main function of the thalamus

relaying of sensory and motor signals to the cerebral cortex

2- Name 2 areas in the parietal lobe

1. Primary Gustatory Cortex
2. Somatosensory Association Cortex
3. Primary Somatosensory Cortex/ Postcentral Gyrus

3- what is Wernicke's Aphasia

. Language comprehension is inhibited.

4- what is the function of Olfactory Bulb

Responsible for sensation of Smell

T H A N K
O U R

BEST OF LUCK

Done By:

✦ Abdullah alfaleh

