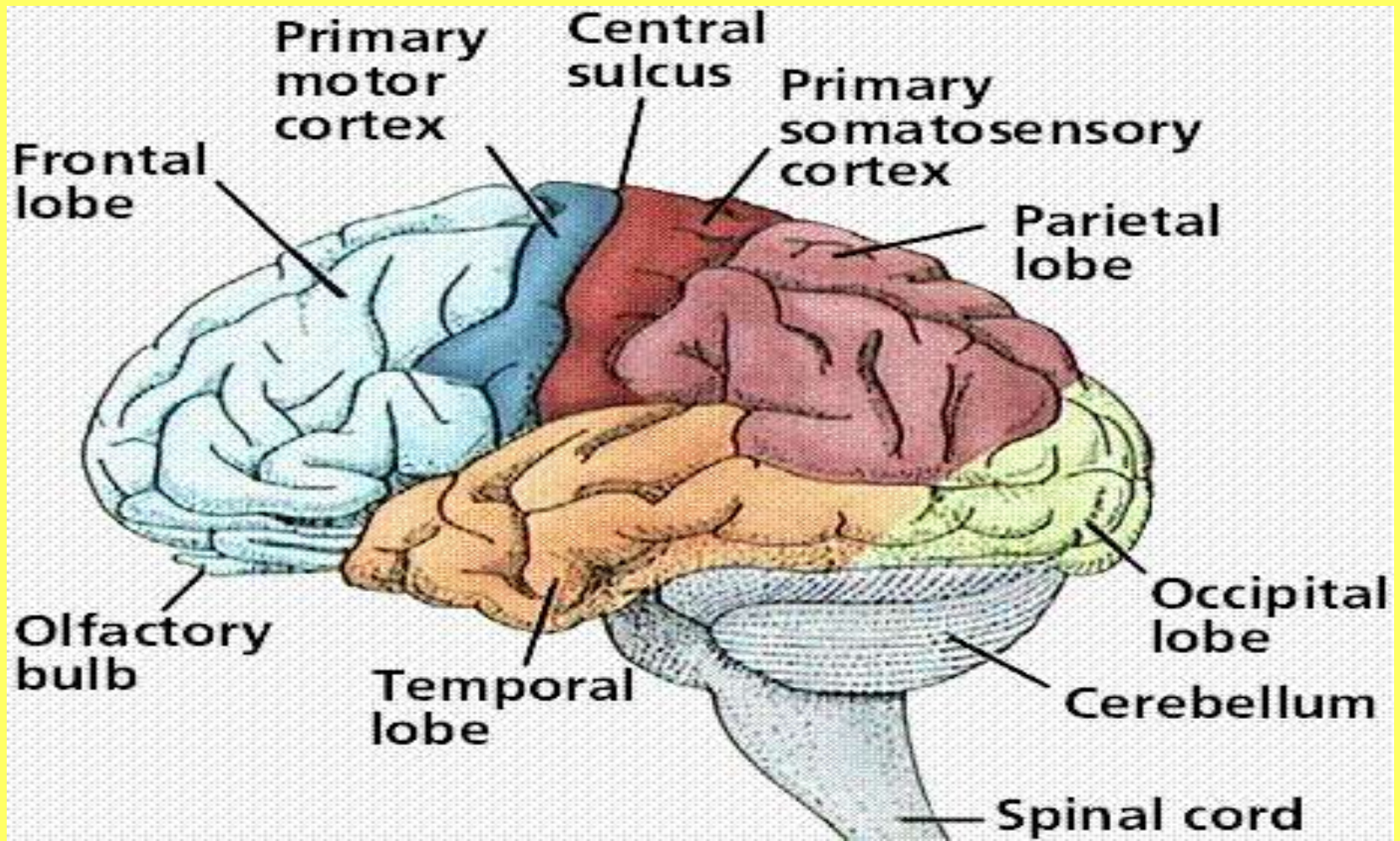
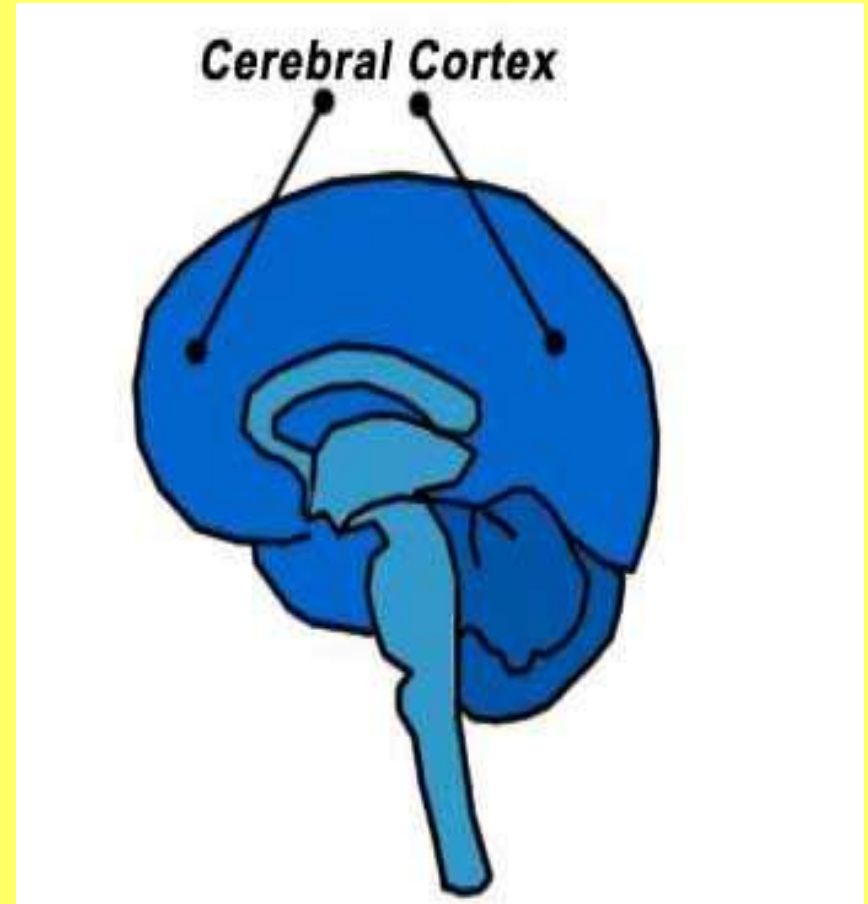


The Cerebral Cortex and Lobes



Cerebral Cortex

- **Commander-in-chief**
- **Makes up 2/3 of the brain**
 - **Arranged in folds and wrinkles**
 - **Spread out would be 2 feet by 3 feet**



Cerebral Cortex



- Thin outer covering about $1/8^{\text{th}}$ of an inch thick
 - Contains billions of cell bodies (what gives it its grey appearance)
 - Amount of grey matter is positively correlated with human intelligence
- Cortex is divided into two sections but are connected by a thick band of nerve fibers called the corpus callosum
 - What makes the transfer of information possible

Cerebral Cortex

- Hemispheres
 - Right (control movement and feeling on the left side of the body)
 - Left (control movement and feeling on the right side of the body)
 - Each hemisphere can be divided into 4 sections or lobes



The Lobes

- **Frontal Lobe**
 - Largest of the brain's lobes
 - Responsible for motor control and higher mental processes
 - Examples: Plan for the future, make decisions, pursue goals



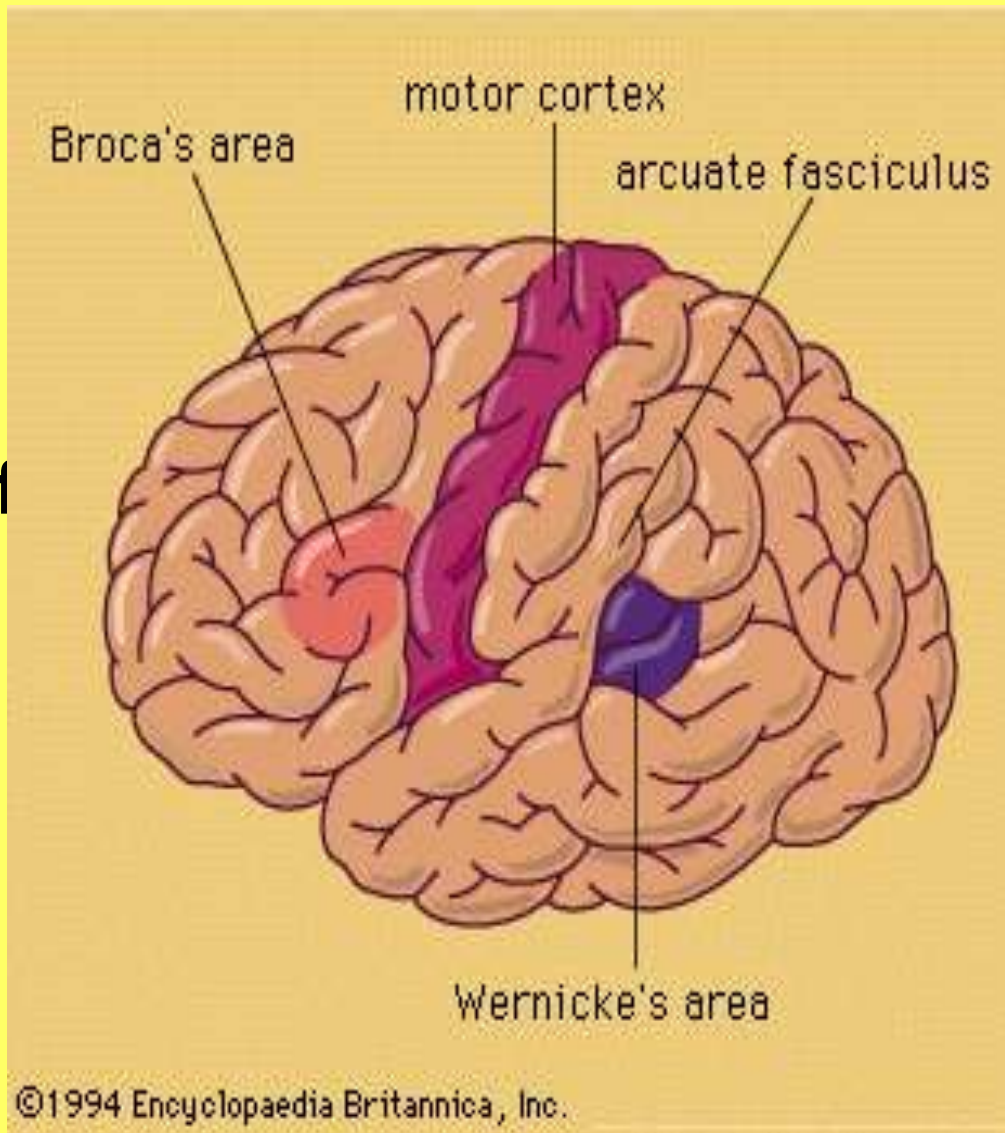
Frontal Lobe

- **Motor Cortex**
 - **Controls specific voluntary body movements**
 - **Neurons that fire, cause parts of our body to move**
 - **Study: Hooked up an electric current to dog's motor cortex- the electric current was a stimulation to certain body parts that would move uncontrollably because they were being stimulated**



Frontal Lobe

- **Broca's area (located in left frontal lobe)**
 - Responsible for speech production
 - Controls muscles of the tongue, throat, and face allowing people to speak smoothly and fluently
 - If damage occurs-
Broca's aphasia



Broca's Aphasia

- **Patients know what they want to say but can speak very little or not at all**
- **The muscles do not work**



Parietal Lobe

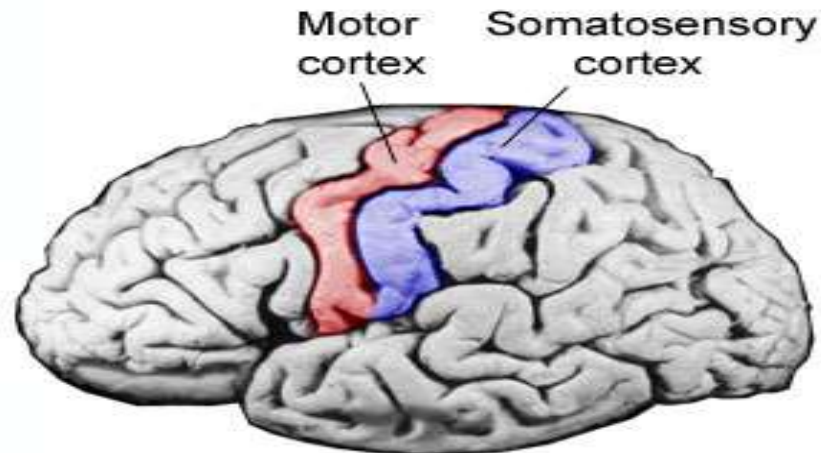
- **Directly behind the frontal lobe**
- **Responsible for processing body sensations (reception and processing of touch)**
- **Contains the Somatosensory Cortex**



Somatosensory Cortex

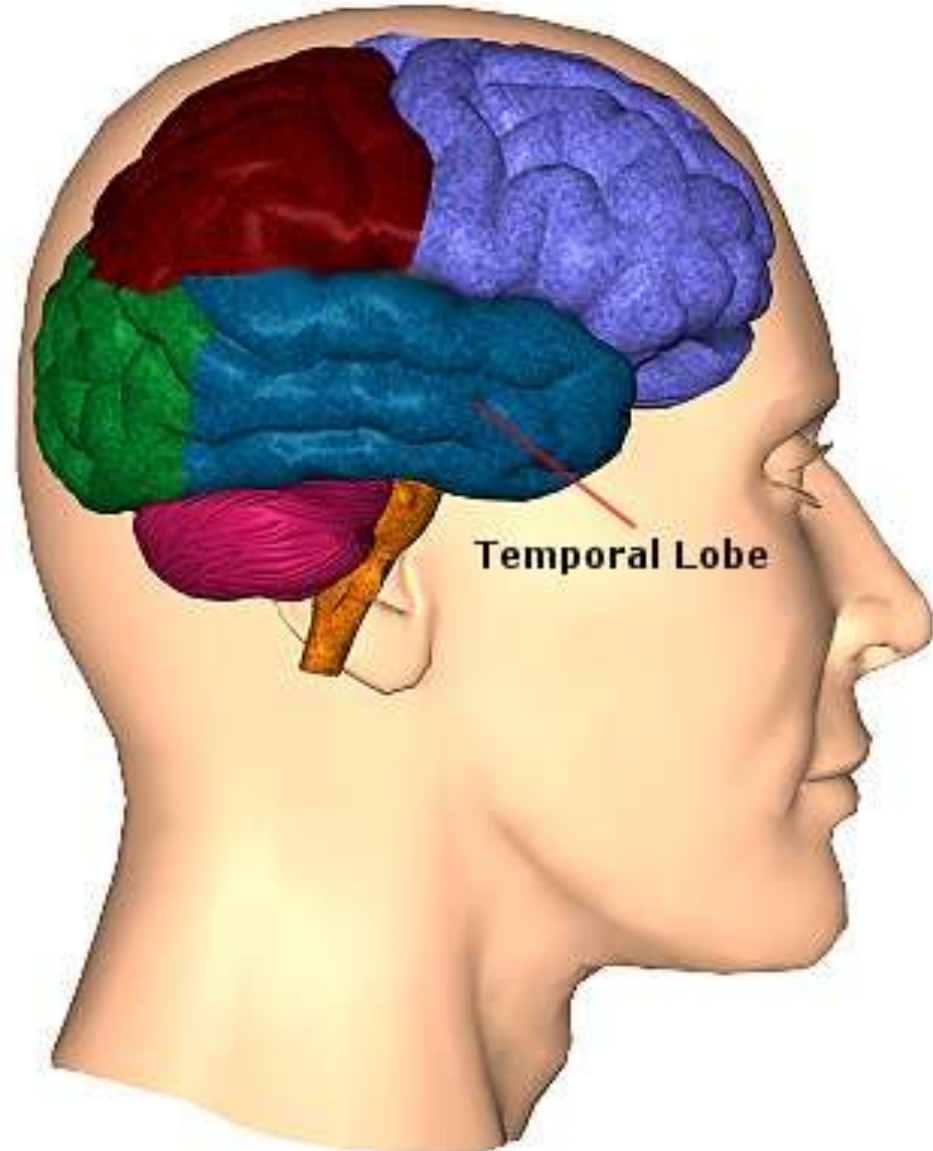
- **Receives messages from skin senses all over the body**
 - Pain, touch, temperature
- **Helps us understand what we are touching**
 - rough, smooth, hot, cold

Figure F-3: Motor and Somatosensory Cortex



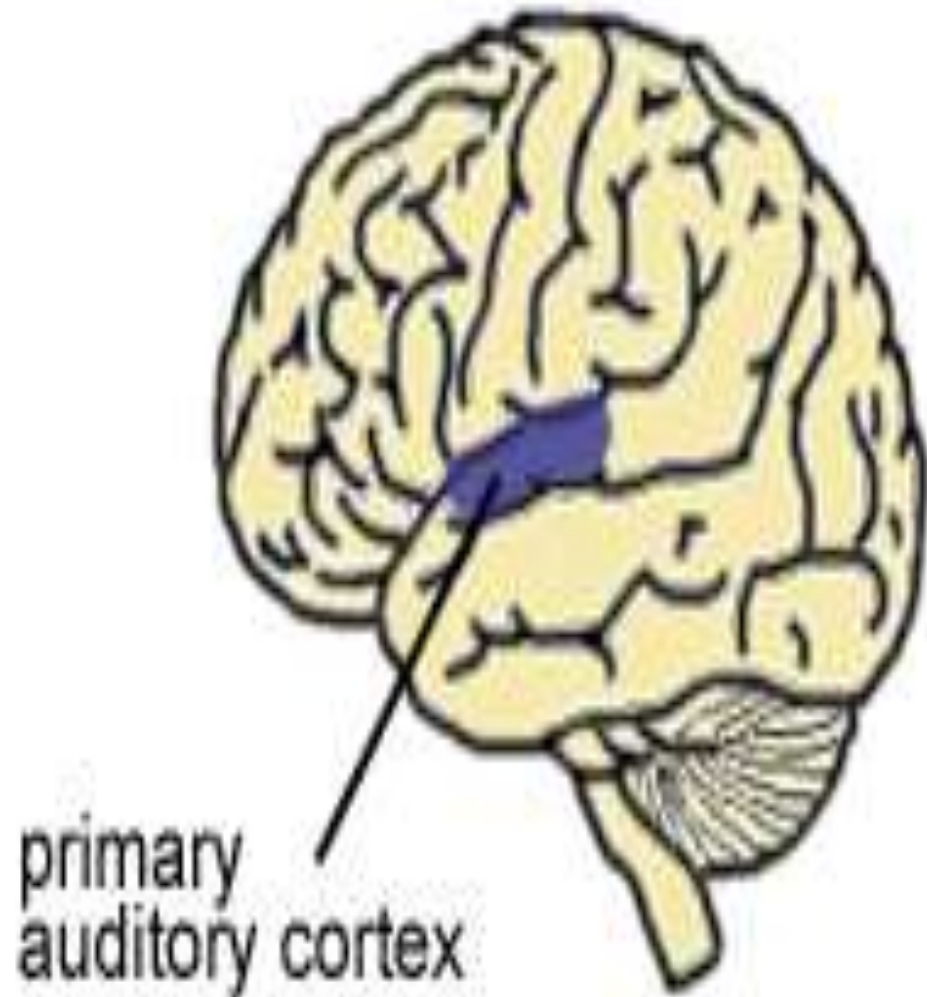
Temporal Lobe

- **Directly behind ears**
- **Responsible for processing sound and holding memories of sounds**
- **Contains the Auditory Cortex**



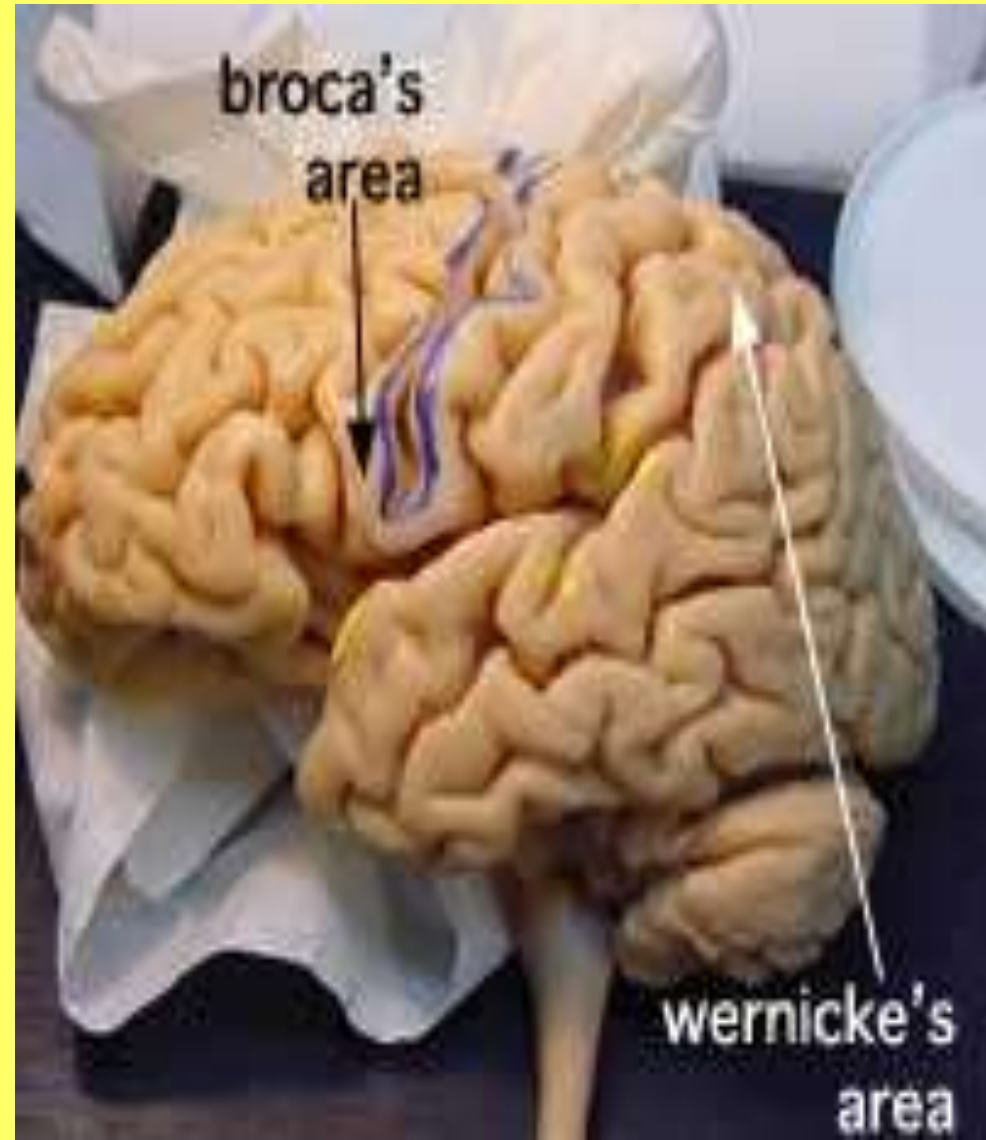
Auditory Cortex

- **Responsible for the comprehension of the spoken word and understanding the meanings of words**
 - **Wernicke's Area (located in the left temporal lobe)**
 - **Unscramble sounds and put them into meaningful words**



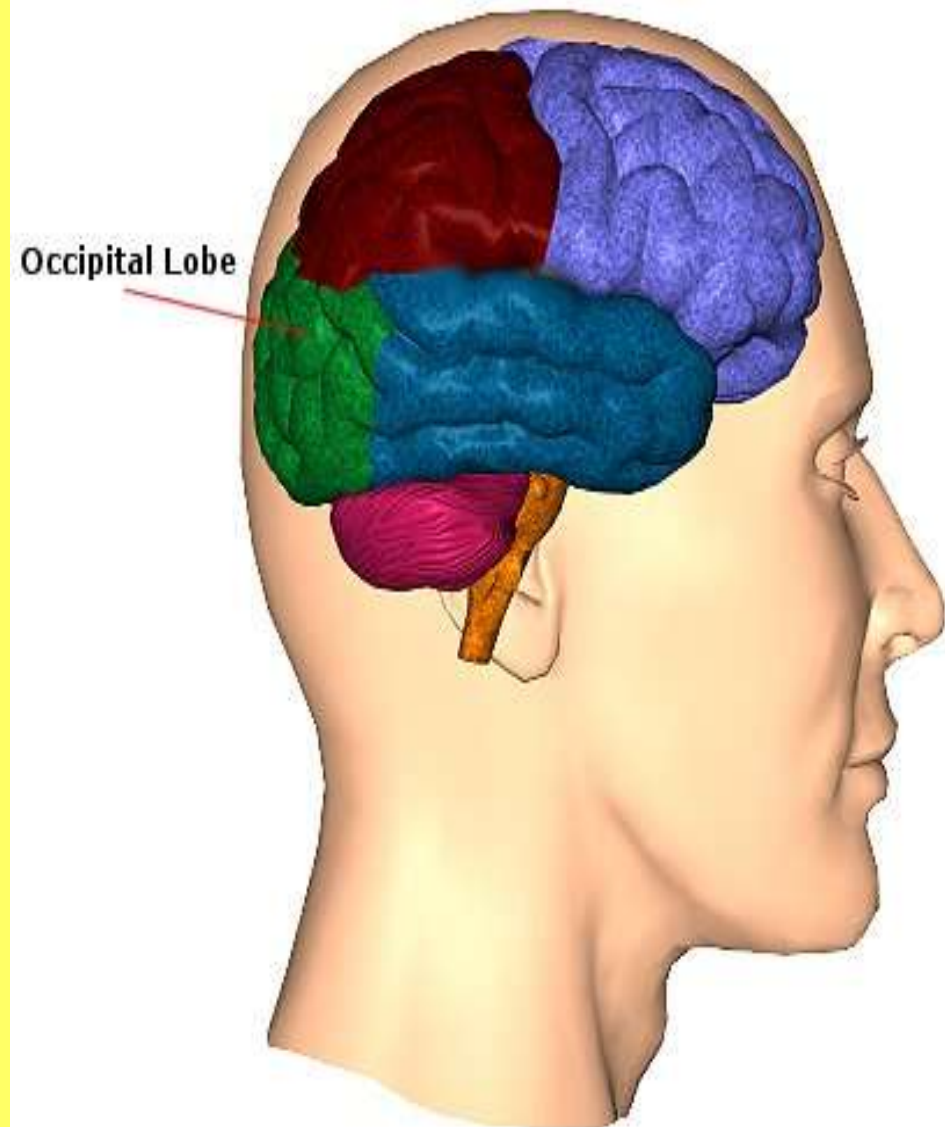
Wernicke's Area

- **Damage to the area**
- **Wernicke's Aphasia**
 - **Speech is fluent and words are articulated**
 - **Message doesn't make sense to others**
 - **p. 60**



Occipital Lobe

- **Behind Parietal Lobe**
- **Responsible for processing vision**
 - **Reception and interpretation of things we see**



Occipital Lobe

- **Visual Cortex**
 - Area that processes vision
 - If damage is done
 - No longer can objects be identified through vision- have to use touch or smell
 - Can't comprehend what you see and must use another sense to tell what object is

