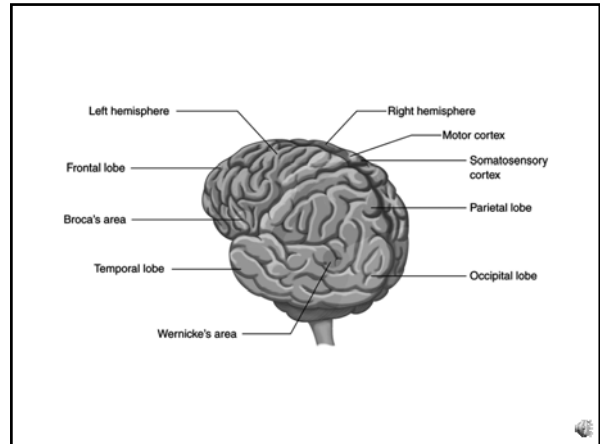

Neocortex
Psychology 472
Pharmacology of Psychoactive
Drugs



- Is the most developed in Humans
 - Has many folds and fissures
 - The folds of tissue are called gyri or a gyrus (single)
 - The fissures or valleys are called sulci or a sulcus (single)
- Is what you see when you look at a brain from the outside

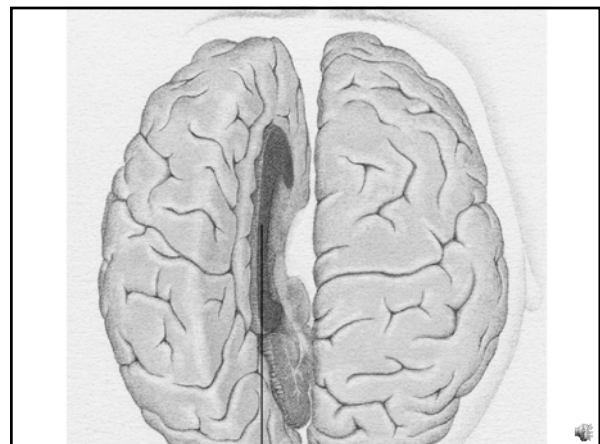
Structures are divided into several section or lobes.

Each lobe has a different function

Cortex is separated in half by a fissure called the central fissure

Splits the brain into left and right halves called hemispheres

- ### Hemispheres
- Left Hemisphere controls the right side of the body
 - Right Hemisphere controls the left side of the body
 - Each hemisphere contains 4 lobes
 - Frontal
 - Parietal
 - Temporal
 - Occipital

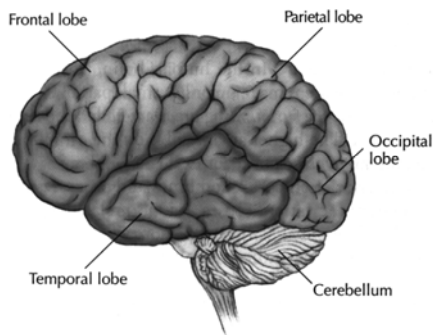


Lobes

- Each lobe is separated by a fissure or a sulcus. For us three are important
- Central Sulcus
Separates the Frontal and Parietal lobe
- Lateral Sulcus
Separates the Temporal lobe from the Frontal and Parietal lobe
- Parietal Occipital Sulcus
Separates the Parietal lobe from the Occipital lobe

Lobes of the Brain

- Frontal
- Parietal
- Temporal
- Occipital



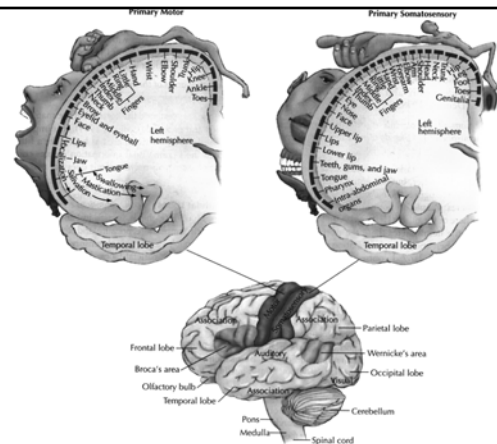
Frontal Lobe

- Contains a variety of structures
- Precentral Gyrus Also called Area 4
Is responsible for voluntary motor movement
- Areas 6 and 8
– Are responsible for muscle tone
– Gets muscles ready to fire

To Get Movement

- Areas 6 and 8 prepare muscle to contract
- Area 4 causes the muscle to contract

Basal Ganglia, Cerebellum, and other structures help smooth out the movement.



Broca's Area

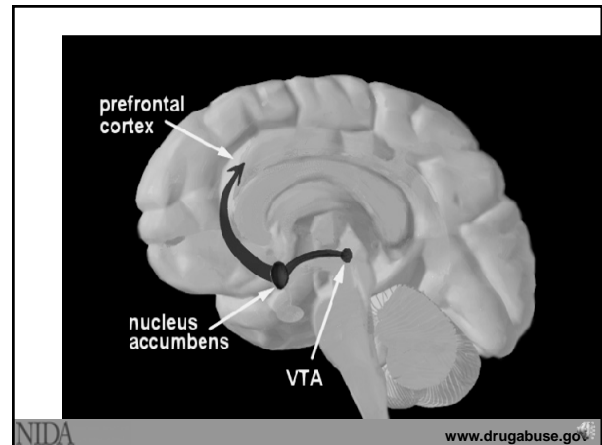
Is located at the bottom of area 4, 6 & 8.
 Is concerned with speech
 When damaged, the person can understand speech, but they cannot talk well.
 Called Broca's Aphasia

Association Area

- Remainder of the Frontal Lobe
- Is important for thought processes, memory formation and problem solving.
- When damaged have problems with memory

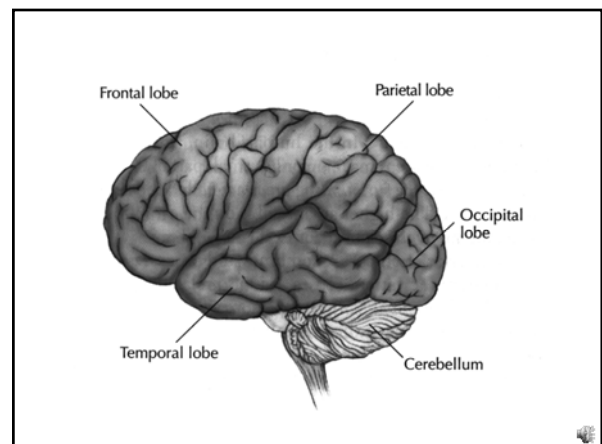
PreFrontal Cortex

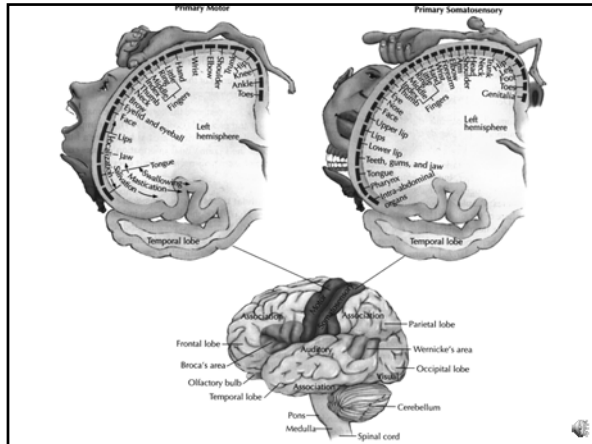
- Involved with decision making and judgement
- One of the last brain structures to develop fully
- One reason young adults make stupid decisions
- Extremely important in emotional arousal



Parietal Lobe

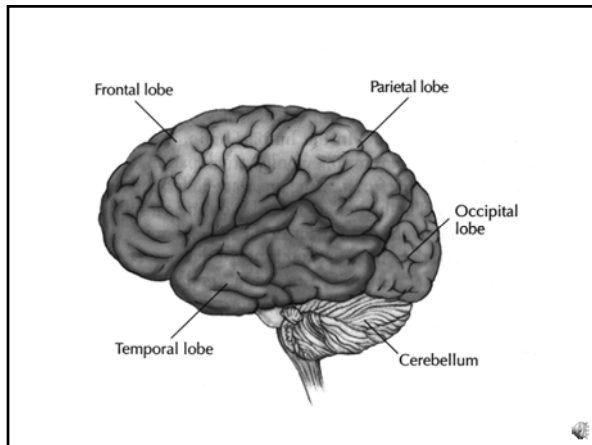
- Also contains a variety of structures
- **Somatosensory area (Area 3)**
 Is concerned with sensory functioning.
 Is where you feel pain, temperature etc.
- Area 1, Area 2, and association cortex
 Interprets what is happening in Area 3





Temporal Lobe

- Is below the Lateral Sulcus
- Is concerned with hearing and patterning of sound (speech).



Wernicke's Area

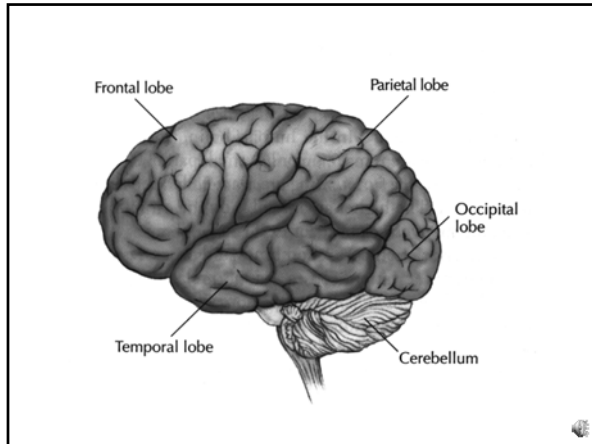
- Is a sub-area of the Temporal Lobe
- Is concerned with the integration and comprehension of speech.
- Also receives information from other areas such as the occipital lobe
- When damaged, you can speak fluently but the content is Nonsense
Called Wernicke's Aphasia
- When damaged, it is also hard to comprehend and understand written stimuli (reading).

Arcuate Fasciculus

- Is a set of fibers that look like an arc
- These fibers connect Wernicke's area with Broca's Area
- When damaged, the symptoms look like Wernicke's Aphasia

Occipital Lobe

- Is concerned with vision
 - Area 17
 - Is the primary visual cortex
 - Is where visual information goes first
 - Areas 18 and 19
 - Helps with organization of visual stimuli
- Information is then sent to other lobes



Insular Cortex / Island of Reil

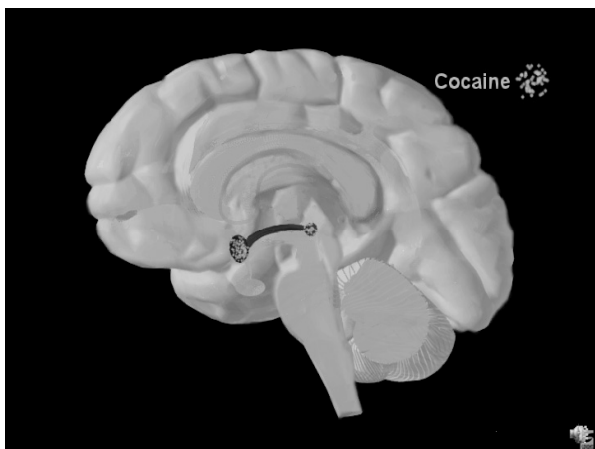
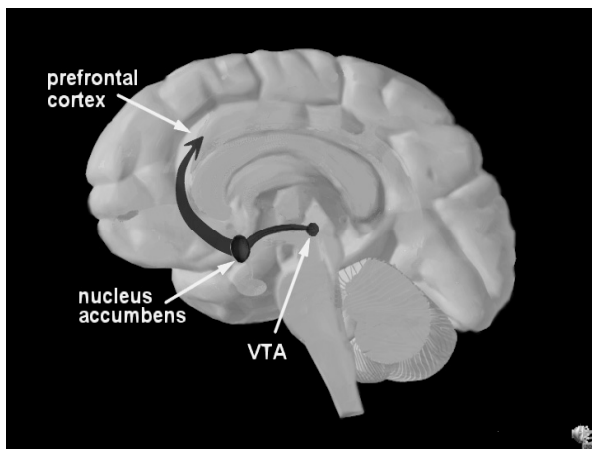
- Also called the Insular Lobe
- Is located under the lateral Sulcus
- Is concerned with Emotion, perception, motor control, self-awareness, cognitive functioning, and interpersonal experience

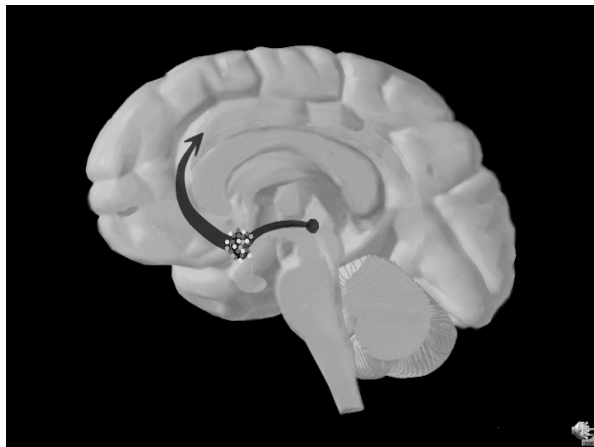
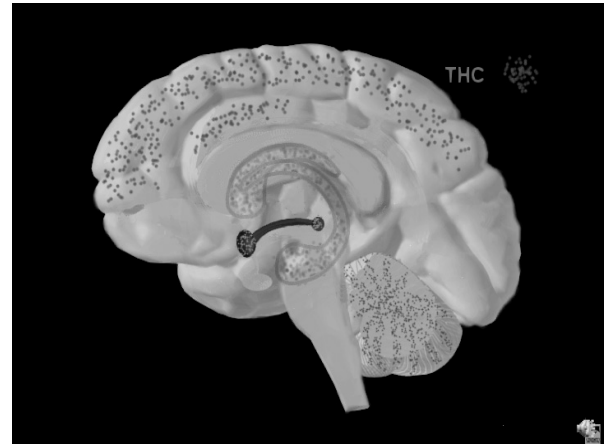
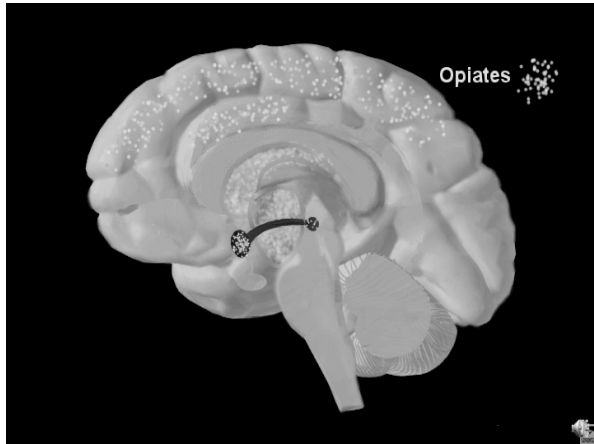
Medial Forebrain Bundle

- Structures
 - Prefrontal Cortex
 - Nucleus Accumbens
 - Ventral Tegmental Area

Medial Forebrain Bundle

- Includes
 - Prefrontal Cortical Areas (Judgment)
 - Ventral Tegmental Area (processes sensory inf.)
 - Nucleus Accumbens (directs motivated beh.)
 - Amygdala (Integrates emotion and pleasure responses)
 - Others
- Called the reward center
 - Full of dopamine neurons





- ### Hormones
- Put the system into hyperdrive
 - Speed up the process
 - Judgment is impaired due to lack of brain development in Prefrontal cortex.
 - Result
 - Impulsivity
 - Difficulty in controlling emotion
 - Preference for high stimulation and low effort activities (video games, sex, drugs)

- ### Impacts of Drugs
- Impact depends on the type of drug
 - Impact depends on age of the adolescent
 - Earlier the drug, usually the more changes and damage that results

- ### Conclusion
- The brain has lots of structures
 - Each structure is involved with lots of functions
 - Is very resistant to damage
 - When damaged, individuals can have lots of problems
 - Problems can identify where the brain is damaged.