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\textsuperscript{th} of a 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
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
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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