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What do you already know?
Did You Know…

- There over a billion nerve cells in the human body.
- Nerves can carry signals at 100 meters per second.
Did You Know…

- If all your neurons were lined up, they would form a 600 mile long line.

- Neurons are the largest cell in the body; they do not undergo the process of mitosis.
Nervous System

- The nervous system controls:
  - Emotions
  - Movements
  - Thinking
  - Behavior

http://www.life-in-spite-of-ms.com
Nervous System

- Is divided into 2 parts:
  - Central Nervous System (CNS)
  - Brain and spinal cord

http://www.life-in-spite-of-ms.com
Nervous System

- Peripheral Nervous System (PNS)
  - Smaller branches of the nerves

- Skull and membranes protect the brain

- Vertebrae and membranes protect the spinal cord
Neurons

- Messages travel through these cells to and from the brain.
- **Cell Body**: contains the nucleus and produces energy
- **Dendrites**: receives impulses from other neurons
- **Axon**: carries impulses away from the body
  - toward the dendrites of the next neuron
Parts continued…

- **Myelin sheath**: protects axons and speeds transmissions of impulses

- **Synapse**: is the space between the nerve cells

Microsoft ClipArt
**Neurotransmitters**: chemicals released by the neurons

- **Dopamine**: motivation/positive stress
- **Glutamate**: learning/memory
- **Serotonin**: regulates sleep, mood
The Brain

Did You Know...

- The brain weighs about 3 pounds.

- The right side of the brain controls the left side of the body and the left side controls the right side of the body.
The Brain

Did You Know...

- The brain is made up of 75% water.
- There are no pain receptors in the brain, therefore it cannot feel pain.
- The human brain is the fattest organ in the body. It is about 60% fat.
Brain Anatomy

The human brain is comprised of 3 parts:

- Hindbrain
- Midbrain
- Forebrain
Brain Anatomy - Hindbrain

Comprised of 3 parts:

The **Hindbrain** is located at base of skull and consists of:

- **Cerebellum**: posture, balance, voluntary movement
- **Medulla**: breathing, heart rate, reflexes
- **Pons**: bridge between the spinal cord and the brain
Brain Anatomy – Hindbrain

known as the brain stem
Brain Anatomy - Midbrain

The Midbrain integrates sensory information. Examples:

- Handles all sensory information that passes between the spinal cord and the forebrain.

- It is also involved in body movement in relation to auditory and visual signals.

- Located just above the hind brain.
Brain Anatomy - Midbrain
The Forebrain contains-

- Thalamus: relay station for all sensory information except smell.
- Hypothalamus: controls hunger, thirst, sexual behavior
- Hippocampus: important in forming memories
- Amygdala: involved in memory and emotions
Brain Anatomy - Forebrain

**Cerebrum**: the largest and most developed part of brain.
Responsible for intelligence, personality, thinking
The cerebral cortex is a gray tissue that covers the cerebrum
The cerebral is divided into two hemispheres which contain the...

- **Occipital lobe**: for vision
- **Parietal lobe**: handles information from the senses
- **Temporal lobe**: hearing, memory, emotion, speaking
- **Frontal lobe**: organization, planning, creative thinking
Cerebrum

http://en.wikipedia.org/wiki/Intraparietal_sulcus
Famous Head Injury Case: Phineas Gage

- People described him as a nice man.
- In 1848 he worked for the railroad and an explosion occurred that propelled a metal rod through his cheek and into his skull.
Famous Head Injury Case: Phineas Gage

- He survived, but his personality changed. He was angry and belligerent.

- This was the first brain injury case to suggest a link between brain trauma and personality change.
References and Resources

Images


**Textbooks**

**Websites**

**KidsHealth**
#1 most-trusted source for physician-reviewed information and advice on children's health and parenting issues. For parents, kids, teens

[www.kidshealth.org](http://www.kidshealth.org)

**Brain Facts**
Learn the basics of how the brain’s 100 billion nerve cells are born, grow, connect, and function. Neuroanatomy; Cell Communication; Brain Development.

[www.brainfacts.org](http://www.brainfacts.org)