It is all in your head!! The brain is the center of what we think, feel, and do. Along with the nervous system, it plays a vital role in being mentally healthy.
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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.

Here are some interesting facts about the nervous system. There are many others at various websites. There are over a billion nerve cells in the human body— the number is more than the stars in the Milky Way.
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.

Here are some interesting facts about the nervous system. There are many others at various websites.
The Nervous System controls:
- Emotions
- Movements
- Thinking
- Behavior

The Central Nervous System controls reflex functions and is a path to the brain.
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The Peripheral Nervous System controls most voluntary movements. Examples would be raising your arm, scratching, etc.
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 and toward the dendrites of the next neuron

Students could draw and label parts of neurons.
Parts continued…

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

- **Synapse**: is the space between the nerve cells
Neurotransmitters: chemicals released by the neurons

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

This is the medium by which nerve signals travel.
Here are some interesting facts about the brain.

- 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.
Here are more interesting facts about the brain.

- 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

Students could make a diagram of the brain and label as the various slides are presented. Students could use the Personal Word Wall for vocabulary words.
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

Students could make a diagram of the brain and label as the various slides are presented. Students could use the Personal Word Wall for vocabulary words.
Brain Anatomy – Hindbrain

known as the brain stem
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.

The forebrain covers the brain’s central core.
Brain Anatomy - Midbrain
The forebrain covers the brain’s central core.
The cerebral cortex is the top layer of 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
Share with students that they will have an opportunity to make a brain and label it similar to this one.
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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.

Doctors were able to study his personality change and contributed the change to his brain injury.
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.

Students could do further research into this case.
References and Resources

Images


**Textbooks**

**Websites**
**KidsHealth**
America's 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)