



## **Distance Learning Program Anatomy of the Human Brain/Sheep Brain Dissection**

This guide is for middle and high school students participating in AIMS Anatomy of the Human Brain and Sheep Brain Dissections. Programs will be presented by an AIMS Anatomy Specialist. In this activity students will become more familiar with the anatomical structures of the human brain by observing, studying, and examining human specimens. The primary focus is on the anatomy, function, and pathology. Those students participating in Sheep Brain Dissections will have the opportunity to dissect and compare anatomical structures. At the end of this document, you will find anatomical diagrams, vocabulary review, and pre/post tests for your students.

The following topics will be covered:

1. The neurons and supporting cells of the nervous system
2. Organization of the nervous system (the central and peripheral nervous systems)

## **National Science Education (NSES) Content Standards for grades 5-8**

- Content Standard A Science as Inquiry
- Content Standard C, Life Science: Structure and function in living systems; Diversity and adaptations of organisms
- Content Standard F, Science in Personal and Social Perspectives: Personal Health

### **Show Me Standards (Science and Health/Physical Education)**

- Science 3. Characteristics and interactions of living organisms
- Health/Physical Education 1. Structures of, functions of and relationships among human body systems
- Health/Physical Education 2. Principles and practices of physical and mental health
- Health/Physical Education 3. Diseases and methods for prevention, treatment and control
- Health/Physical Education 5. Methods used to assess health, reduce risk factors and avoid high risk behaviors.

### **Vocabulary**

**Alzheimer's disease** - a progressive form of presenile dementia that is similar to senile dementia except that it usually starts in the 40s or 50s; first symptoms are impaired memory which is followed by impaired thought and speech and finally complete helplessness

**Aneurysm** - a cardiovascular disease characterized by a sac-like widening of an artery resulting from weakening of the artery wall

**Arachnoid** - Of or relating to a delicate membrane enclosing the spinal cord and brain.

**Axon** - The usually long process of a nerve fiber that generally conducts impulses away from the body of the nerve cell.

**Brain Stem** - The portion of the brain, consisting of the medulla oblongata, pons Varolii, and midbrain, that connects the spinal cord to the forebrain and cerebrum.

**Central Sulcus** - the sulcus separating the frontal lobe of the cerebral cortex from the parietal lobe called also fissure of Rolando, Rolandic fissure

**Cerebellum** - The tri-lobed structure of the brain, lying posterior to the pons and medulla oblongata and inferior to the occipital lobes of the cerebral hemispheres, that is responsible for the regulation and coordination of complex voluntary muscular movement as well as the maintenance of posture and balance. The second largest part of the brain.



**Neurosurgeon-** A physician who does surgery on the nervous system

**Neurons** - Any of the conducting cells of the nervous system. A typical neuron consists of a cell body, containing the nucleus and the surrounding cytoplasm (perikaryon); several short radiating processes (dendrites); and one long process (the axon

**Sulci** - Any of the narrow fissures, groove or depression separating adjacent convolutions or gyri of the brain.

**Suture** - The line of junction or an immovable joint between two bones, especially of the skull.

**Thalamus** - A large ovoid mass of gray matter situated in the posterior part of the forebrain that relays sensory impulses to the cerebral cortex.

**Temporal Lobe** - The lower lateral lobe of either cerebral hemisphere, located in front of the occipital lobe and containing the sensory center of hearing in the brain.

**Transverse fissure** - The cerebrum is separated from the cerebellum by the transverse fissure

**Tumor** - An abnormal growth of tissue resulting from uncontrolled, progressive multiplication of cells and serving no physiological function

**Ventricle** - A small cavity or chamber within a body or organ . Any of the interconnecting cavities of the brain.

**White Matter** - Whitish nerve tissue, especially of the brain and spinal cord, consisting chiefly of myelinated nerve fibers

**Supplemental Materials/Websites:**

**AIMS**  
**Anatomy of the Human Brain**  
**Pre/Post Test**

1. The two main components of the Central Nervous System are:  
\_\_\_\_\_ & \_\_\_\_\_
2. Control of voluntary movements of specific body parts is located in this lobe. \_\_\_\_\_
3. The outer layer of the brain or grey matter, that is the highest center of nervous system activity is called the \_\_\_\_\_.
4. The middle meningeal layer, which contains the cerebrospinal fluid, is called the \_\_\_\_\_.
5. The cerebrospinal fluid (CSF) is produced deep within the ventricles of the brain by specialized vessels called the \_\_\_\_\_.
6. The convoluted (folded) surface of the brain is comprised of a system of rounded ridges separated by deep grooves. The elevated ridges are called \_\_\_\_\_, and the grooves are called \_\_\_\_\_.
7. Name the four main lobes of the brain: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
8. The part of the brain involved in the coordination of voluntary motor movements, balance, equilibrium, and muscle tone.  
\_\_\_\_\_
9. This is the term used to describe brain damage caused by a blocked blood vessel or bleeding in the brain. \_\_\_\_\_
10. This is the lower portion of the brain stem which deals with autonomic functions including breathing, blood pressure, and control of heart rate. \_\_\_\_\_
11. Axons of the brain are coated with a fatty substance which helps to speed impulses between neurons and gives “white matter” of the brain its color. This coating is called \_\_\_\_\_.
12. This lobe is responsible for processing sensory stimulation from receptors throughout the body. \_\_\_\_\_

Bonus: Are you interested in a career in medicine, as either a doctor, nurse, or some other member of the healthcare community?  
Y or N

**AIMS**  
**Anatomy of the Human Brain**  
**Pre/Post Test**  
**Answer Sheet**

- 1) Brain      Spinal Cord
- 2) Frontal
- 3) Cerebral Cortex
- 4) Arachnoid
- 5) Choroid Plexus
- 6) Gyri      Sulci
- 7)