

UNIT

Brain Anatomy
Elementary 3-5

TIMEFRAME

30 minutes

MATERIALS

Labeled brain
diagram
Unlabeled
worksheets
Brain puzzle

Brain Basics

Synopsis

This lesson aims to provide a general overview of the parts of the brain and their different functions

Learning Outcomes

Students should be able to label the lobes of the brain, cerebellum, brain stem, somatosensory cortex and motor cortex (these are the parts focused on in the puzzle) with perfect accuracy

Background for Teachers

The human brain is composed of four main parts; the cerebrum, the cerebellum, the brainstem, and the diencephalon. The cerebrum (also referred to as the cortex) is the largest part of the brain and is split into four main lobes. The frontal lobe is the furthest forward, (behind the forehead) and is responsible for higher mental processing such as critical thinking, decision making, and is also where much of our personalities come from. The temporal lobe is located on either side of the brain and is responsible for processing auditory information, comprehending language, and encoding memories. The parietal lobe (located behind the frontal lobe and above the temporal lobes) is the primary sensory area and processes any touch information and the positioning of our bodies in space. The occipital lobe is located in the back of the brain and serves the sole purpose of processing visual information. The cerebellum is responsible for coordination of voluntary movements and plays a large role in balance, coordination, and posture among other things. The brainstem is the lowest part of the brain that continues into the spinal cord and allows information to be sent from the brain to the body and vice versa.

TEACHING TIPS

This is definitely a lot of information, so pick and choose which parts you want to focus on in a way you think keeps the lesson cohesive!

ARIZONA LEARNING STANDARDS

3.L2U1.6

5.L4U3.12

Activity Instructions

- Use the diagram to explain the functions of the four lobes, cerebellum, and brain stem as in depth as you see appropriate while making sure to point out where these areas are on the diagram.
- After discussing and practicing, invite students to try and complete the brain puzzle on the outline which provides a very good reference.
- Provide students with worksheets, you may do this worksheet as a guided activity, on their own, or even as a homework assignment depending on time limits

Extensions

Discuss what affect damage to the different parts of the brain could have.

Discuss how the same diagnosis (ex- concussion or stroke) could have different effects on a person depending on where the damage occurred.

The human brain is not completely matured until about 25 years old! Which parts of the brain do you think take the longest to develop? (answer: the frontal lobe, especially the ability to inhibit behavior) Which parts likely develop the quickest? (areas related to the senses since we need these to successfully navigate the world)

Key Terms & Concepts

Frontal lobe: executive functions (see background) and voluntary body movements

Parietal lobe: touch sensation, visual spatial orientation, attention, sensory integration

Temporal lobe: auditory sensation, language, memory, basic emotion

Occipital lobe: vision

Cerebellum: coordination, posture, and balance

Brain stem: automatic body functions like breathing, swallowing, circulation, digestion

Gyrus: lumps on the brain (as opposed to the dips called sulcus)

Resources

Executive Functions:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4084861/>

Parietal lobe:

<https://www.sciencedirect.com/science/article/pii/B0080430767034719>

Temporal lobe:

<https://www.sciencedirect.com/science/article/pii/B0080430767034690>

Cerebellum (just the function section):

<https://www.medicalnewstoday.com/articles/313265.php>

General overview: <https://www.verywellmind.com/the-anatomy-of-the-brain-2794895>