



***Enhanced Learning
Educational Services***
“the study skills specialist”

ALL ABOUT YOUR BRAIN



Understanding your brain can help you make informed choices about the most effective ways to approach your learning.

- You should read each point and **highlight the key phrases** in that point.
- Discuss with a friend or parent as you read through the handout.
- You may like to work through this over a number of sessions.

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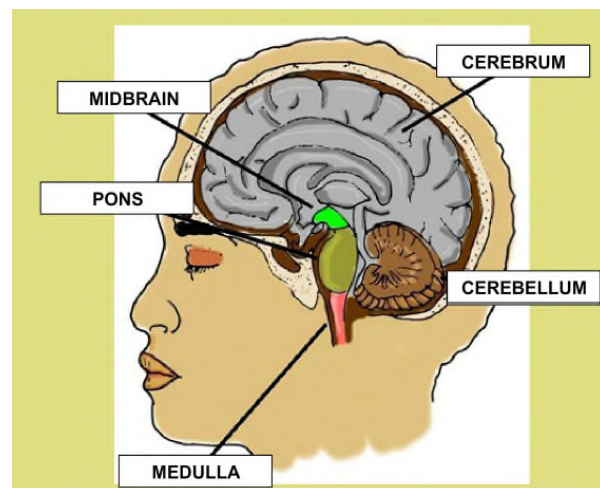
1. THE STRUCTURE OF THE BRAIN

FOREBRAIN, OR CEREBRUM:

- The cerebrum is a soft jellylike substance that makes up a round 85% of the brain's mass.
- Cerebrum is covered by a thin (but tough) laminated cortex (the wrinkled-looking outer tissue), and inside the cerebrum is the limbic system, and the basal ganglia.
- As the forebrain makes up such a large part of the brain, and is critical to memory, it is explained, and shown in further detail, in a later section on the cerebrum.

MIDBRAIN:

- 2% of the brain's mass.
- Controls sensory processes sending sensory impulses to other parts of the brain.
- Sits on top of the "Pons", a bridging structure that is about 2.5cm in length.



HINDBRAIN:

- 13% of the brain's mass.
- Consists of the cerebellum (see below), pons (sits underneath the midbrain) and medulla (sits underneath the pons).
- Functions collectively to coordinate balance, physical coordination, posture, equilibrium and motor activity.
- It also manages sleep patterns and regulates unconscious functions such as breathing and blood circulation.
- The cerebellum is sometimes called "little brain" because it looks like a mini-brain inside the brain. Cerebellum is the area of the brain most associated with balance, coordination, posture and motor control. The cerebellum is also important for procedural memory, such as knowing how to ride a bike. Cerebellum takes up one-tenth of the brain by volume, but contains nearly half of all the neurons in the brain. The neurons in the cerebellum are so compacted that they can form an immense number of connections. This part of the brain that processes balance, posture and movement is the same part of the brain that processes much of the learning and is involved in the coordination of cognitive processes.

Brainstem:

- If you take the pons, medulla and the midbrain, together they are called the "brainstem".
- This is the stalk-like part of the brain connecting the spinal cord and the forebrain.
- The brainstem is really important as every nerve impulse that passes between the brain and the spinal cord has to go through the brainstem.

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- The brainstem is sometimes called the "old brain" (as this is the oldest part of our brain) or the "reptilian brain" (this is because an entire reptile brain looks like just this bit of our brain).
- The brainstem is responsible for basic vital life and body functions such as breathing, heartbeat, body temperature, digestion and blood pressure.
- This is where instincts like "flight or fight" come from.



a. See if you can explain in your own words a little about each of these terms: forebrain, midbrain, hindbrain, brainstem.

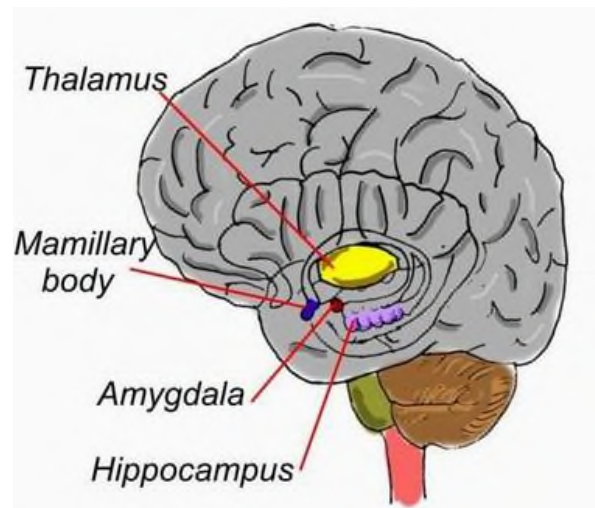
2. LOOKING CLOSER AT THE CEREBRUM: LIMBIC SYSTEM

This section focuses on how the brain processes information and forms memories according to the senses or emotions involved. Remember that the CEREBRUM is 85% of the brain's mass. This is where a lot of the action in the brain takes place as it is the most developed part of the brain.

LIMBIC SYSTEM:

The limbic system (the inside bit of the Cerebrum), sometimes called the "emotional" brain or the "old mammalian" brain, is buried deep within the cerebrum, and has several components:

- **THALAMUS:** All incoming sensory info (except smell) comes here first. Acts as a relay station to the cerebral cortex.
- **AMYGDALA:** Is associated with memory and emotions. Amygdala is Greek for "almond". Smell and taste are inextricably linked and, because we often have a conditioned response to a smell or taste (eg. we may really love or hate it), memories associated with these are processed and formed here. Decides the emotional value of the information coming into the brain and if the info is it important.
- **HIPPOCAMPUS:** Is a seahorse shaped structure in the brain located across both hemispheres. Hippocampus is actually the Greek word for "seahorse". Helps convert short-term memories into long-term memories with lots of cells particularly designed to aid in memory functions. Also has the incredible ability to create new brain cells. The hippocampus works sort of like a mail processing centre, with everything coming in and then deciding where it is sent.



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