

1 **The Human Brain**

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- Makes up 1/45th of your weight.
- Developed from the inside out
- Works without our awareness most of the time.

3 **Lower Level Brain Structures: The most primitive part of the brain**

4 **The Brainstem: the brain's basement**

- The Medulla
 - Controls heartbeat and breathing
 - The brain's "crossover" place

5 **The Reticular Formation**

- extends from spinal cord behind medulla
- filters incoming stimuli.
- controls sleeping and waking

6 **The Cerebellum**

- Extends from rear of brain stem
- Coordinates voluntary movement

7 **The Thalamus**

- Receives information from the body and routes it to the appropriate area of the brain.

8 **The Limbic System**

- The Amygdala
 - 2 almond-shaped clusters of neurons above the spinal cord
 - Influence aggression and fear
 - Kluver

9 **The Limbic System--continued**

- The Hippocampus
 - Related to memory and learning
 - Information transferred from short-term memory to long term memory may

be stored here for hours or weeks before permanent storage elsewhere in the brain.

10 **The Hypothalamus**

- Controls motivators such as hunger, thirst, sexual arousal
- Controls emotional responses
- Takes orders from the “thinking” parts of the brain
- Triggers the fight or flight response

11 **The Cerebral Cortex**

- About 1/8 inch thick
- Contains 30 billion neurons and over a trillion synaptic connections.
- Folds increase the brain’s surface, providing room for more neurons and more neural activity.

12 **Lobes of the Cerebral Cortex: The Frontal Lobe**

Responsible for planning, organizing, thinking about the consequences of behavior.
Stores some types of memories
Contains Broca’s Area in left lobe.
Contains motor areas of the brain

13 **The Cerebral Cortex: Temporal Lobes**

- Contains the brain’s hearing centers
- Contains Wernicke’s area in left lobe

14 **The Cerebral Cortex: The Parietal Lobes**

- Contain the sensorimotor areas of the brain

15 **The Cerebral Cortex: The Occipital Lobes**

Contain the vision areas of the brain

16 **Motor function and the brain**

- Penfield and Foerster: Mapped the motor cortex in the frontal lobes in conscious patients and observe the patient’s motor responses. Found that the parts of the body that require precise control occupy larger areas in the frontal lobe.

17 **Sensory Function and the Brain**

- Controlled by the somatosensory areas in the parietal lobes
- The more sensitive the body area—lips, clitoris, tip of penis, etc.—the more space is devoted to it in this area.
- If the vision center in your brain were stimulated you would “see” your mother’s face or your first car.

- 18 **Associative Areas in the Brain**
- $\frac{3}{4}$ of the neurons in the cerebral cortex have no specific sensory or motor function.
 - These areas interpret, integrate and act on information processed by the sensory areas.
 - Ex: The associative areas in the frontal lobe allows us to plan, judge and process new memories.
- 19 **Associative Areas of the Brain—in the frontal lobes**
- Damage to associative areas in the frontal lobe can alter personality by removing inhibitions.
 - Ex: Phineas Gage
- 20 **The Divided Brain**
- The two hemispheres of the brain are connected through the corpus collosum.
 - The two different sides of the brain have slightly different functions, although many overlap.
- 21 **Functions of the Right Hemisphere**
- Recognition
 - Perceiving differences
 - Expressing emotion
 - Perceiving emotion in others
 - Complex language pattern recognition
- 22 **Functions of the Left Hemisphere**
- Quick, literal interpretation of language
 - Sequential thinking
 - Logical thinking
- 23 **Experiments on the divided brain**
- Pencil experiment
 - Heart experiment
- 24 **All of us use both hemispheres of the brain at the same time.**
- Examples:
- Reading a book
 - Listening to a lecture