

THE BIG PICTURE

ANATOMY OF THE BRAIN

Every aspect of our lives — from breathing and sleeping to personality, likes and dislikes — is governed by the brain. This artist's rendition depicts some of the parts of the brain and explains how they affect our functions.

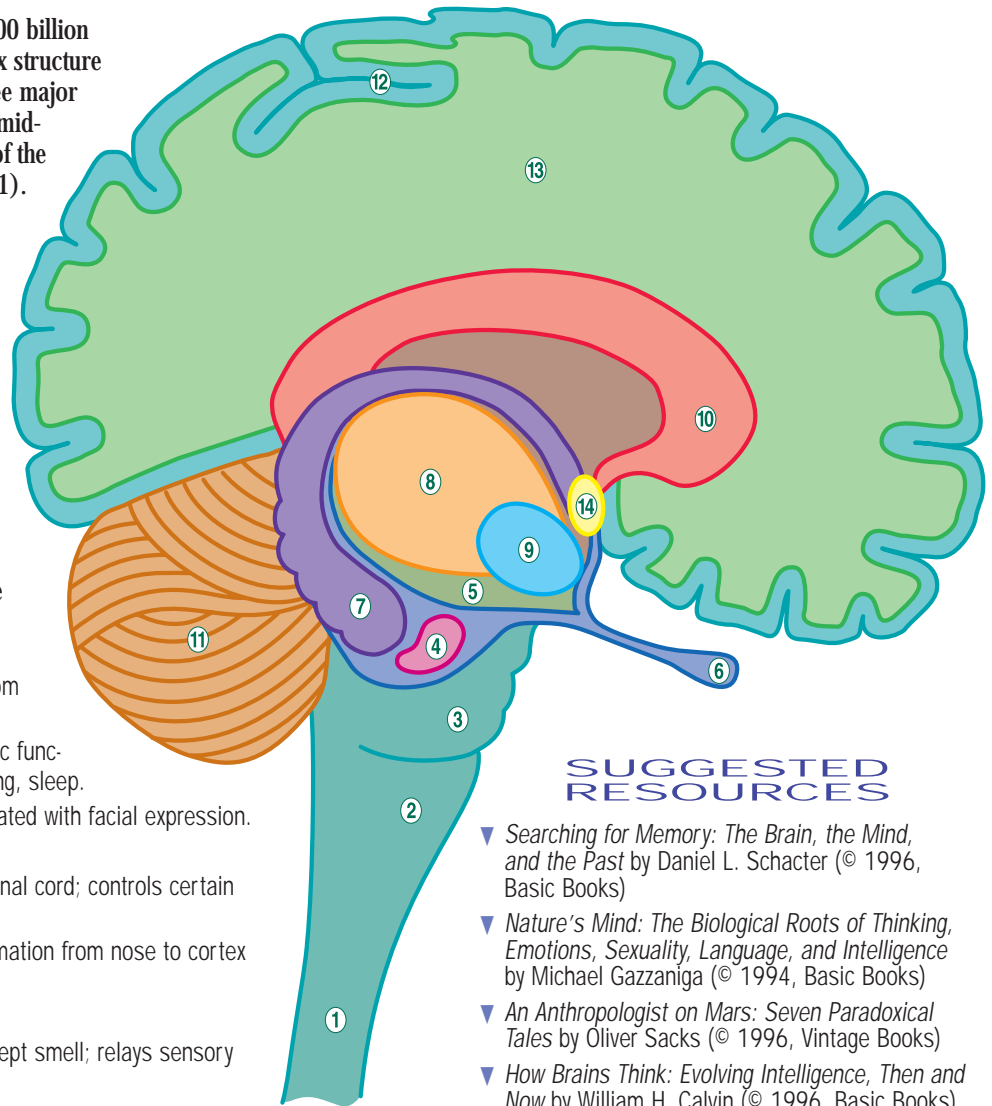
Weighing in at about 1,450g and containing 100 billion neurons, the human brain is the most complex structure we know. The human brain is made up of three major regions: the forebrain or cerebrum (13); the mid-brain (5); and the hindbrain, which consists of the medulla oblongata (2) and the cerebellum (11).

The cerebrum is divided into two hemispheres, left and right, each consisting of four lobes; the lobes are named after the bones of the skull that protect them (frontal, parietal, occipital, temporal).

The surface of the cerebrum is the cerebral cortex (12), which is composed of neuron cell bodies collectively known as gray matter. The many folds of the cerebral cortex provide more surface area and more room for neuron cell bodies than a smooth surface.

Here are some other important parts of the human brain:

1. **SPINAL CORD:** Conveys impulses to and from the brain.
2. **MEDULLA OBLONGATA:** Helps regulate basic functions like breathing, blood pressure, sneezing, sleep.
3. **PONS:** Links cortex with cerebellum; associated with facial expression.
4. **AMYGDALA:** Activated by emotions.
5. **MIDBRAIN:** Forwards impulses from the spinal cord; controls certain reflex responses.
6. **OLFACTORY BULB:** Forwards sensory information from nose to cortex and amygdala.
7. **HIPPOCAMPUS:** Keeps track of memories.
8. **THALAMUS:** Associated with all senses except smell; relays sensory impulses to the cerebral cortex.
9. **HYPOTHALAMUS:** Regulates many body functions, such as heart rate, body temperature, sleep cycles, hormone levels, libido, hunger, thirst.
10. **CORPUS CALLOSUM:** Links left and right hemispheres of the brain, allowing them to communicate.
11. **CEREBELLUM:** Controls muscle coordination and sense of balance; also involved in learning of motor skills.
12. **CEREBRAL CORTEX:** Wrinkled outer layer of the cerebrum; controls our higher-level, advanced abilities like speech and reasoning.
13. **CEREBRUM:** Serves as the center for speech, reasoning, emotions and personality; interprets sensory information and controls motor impulses.
14. **SEPTUM:** Associated with feelings of pleasure.



SUGGESTED RESOURCES

- ▼ *Searching for Memory: The Brain, the Mind, and the Past* by Daniel L. Schacter (© 1996, Basic Books)
- ▼ *Nature's Mind: The Biological Roots of Thinking, Emotions, Sexuality, Language, and Intelligence* by Michael Gazzaniga (© 1994, Basic Books)
- ▼ *An Anthropologist on Mars: Seven Paradoxical Tales* by Oliver Sacks (© 1996, Vintage Books)
- ▼ *How Brains Think: Evolving Intelligence, Then and Now* by William H. Calvin (© 1996, Basic Books)
- ▼ *The Brain Pack: An Interactive Three-Dimensional Exploration of the Mysteries of the Mind* by Ron Van der Meer and Ad Dudink (© 1996, Running Press)
- ▼ *Sleep Thieves: An Eye-opening Exploration Into the Science and Mysteries of Sleep* by Stanley Coren (© 1996, The Free Press)
- ▼ *The Brain* (© 1990, *How Things Work* series, Time-Life Books, Inc.)
- ▼ *Scientific American* magazine:
 - "Dyslexia," November 1996
 - "The Puzzle of Conscious Experience," December 1995

SOURCES FOR ILLUSTRATION: A PICTORIAL HANDBOOK OF ANATOMY AND PHYSIOLOGY BY DR. JAMES BEVAN (© 1994, REED INTERNATIONAL BOOKS LIMITED) AND MIND AND BRAIN (© 1993, JOURNEY THROUGH THE MIND AND BODY SERIES, TIME-LIFE BOOKS, INC.)