

ALPHABETICAL BRAIN™ VOCABULARY
DETAILS ABOUT CONSCIOUSNESS
Brain Flash Card #1 - October 8, 2015
WHAT IS YOUR CONSCIOUSNESS
AND WHY IS IT SO IMPORTANT?

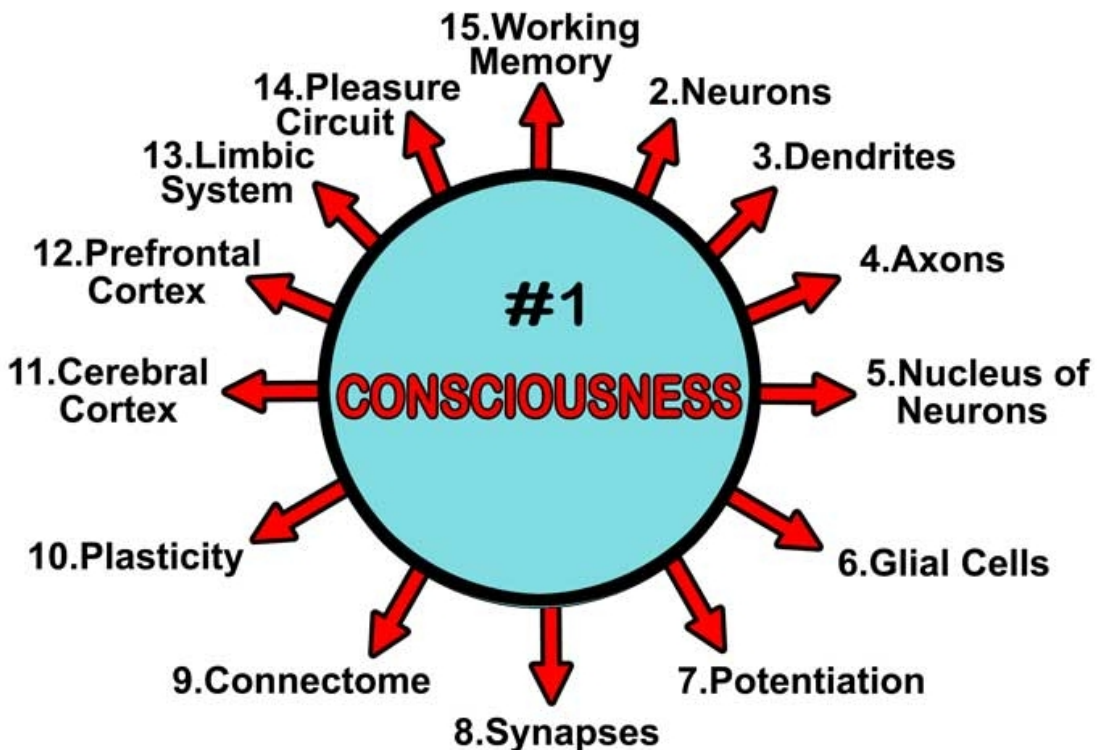
BRAIN SCIENCE FACTS

What is the purpose and function of your consciousness? Your consciousness is what makes possible your awareness of being alive. It gives you your experience of being you. Consciousness is caused by the global circuitry of your neuronal pathways and signaling processes.

To be conscious and able to activate your awesome brainpower, all of the neuronal fibers in all of the neuronal pathways in all of your nerve tracts, and all of their synaptic connections in your brain and nervous system must be working well together. This means that 100% of your brain's structures must be functioning well together when you are aware of yourself thinking or feeling anything.

The dynamic global connectivity caused by the functions of your neurons and synapses is now known as your connectome since it connects your brain and nervous system. The neuronal signaling processes cause ionic currents, which are made of sodium and potassium ions, to flow continuously through your brain and body. The ionic currents are generated by the cell bodies of all of your neurons and they flow throughout the four main parts of your brain, including your cerebrum, limbic system, cerebellum, and brainstem.

You can integrate the idea of CONSCIOUSNESS into your overall concept of the global connectivity of your brain's structures and their functions by momentarily focusing your attention on the following circular symbol:



THIS SYMBOL REPRESENTS A SIMPLIFIED VIEW OF THE
"GLOBAL CIRCUITRY"
REQUIRED FOR YOU TO BE CONSCIOUS

<p>When you recognize the complexity of the biological circuitry of your brain and the massive connectivity of your billions of neurons and trillions of synapses, you will get a glimpse of the vastness of the brainpower that is required for you to be conscious and self-aware.</p> <p>As brain scientists discovered new facts about the human brain during the past 100 years, and especially during the past few years, they invented new words to name and describe their new discoveries about brain functions and structures.</p> <p>For example, the phrase "executive brain functions" refers to brain functions and systems of the brain that can control other brain structures and functions, especially those that produce thoughts and feelings and behavior.</p> <p>One good way to begin thinking about your own brain is to think about the ten most important brain facts about your consciousness and prefrontal cortex that give you control over your thoughts and feelings and behavior.</p> <p>You need to learn why the brain facts are so important and you need to remember them always. They are vitally important as a psychological foundation for understanding the biological basis of everything that matters in your life. A solid awareness of them can give your "mind" control over your "brain."</p> <p>If you forget them or never learn about them, you may become confused by the dangerous primitive cultural metaphors (traditional fallacies and myths) that can distort and misconstrue your perception of reality and cause you to waste your precious time.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>
<p>FIRST FUNDAMENTAL BRAIN FACT: [1] Consciousness is caused by the global circuitry of all of your neuronal pathways and signaling processes.</p> <p>Approximately 900 trillion synapses attach your 100 billion neurons to each other and to all of your internal organs and glands and muscles. The neuron cell bodies start action potential spikes, which flow from neuron to neuron through the trillions of synaptic clefts (gaps) that connect your brain and nervous system in a vast biochemical web.</p> <p>The synaptic vesicles release sodium or potassium ions depending upon the electro-chemical potential across the synapse terminal buttons that attach to your muscles, internal organs, and many of your glands.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>

<p>SECOND FUNDAMENTAL BRAIN FACT: [2] The structure of your cerebrum, which is the newest region of your brain to have evolved, is the intellectual resource center of your life.</p> <p>It contains four lobes (regions), which include your frontal lobe, temporal lobe, parietal lobe, and occipital lobe. Also the four lobes consist of eight areas (sections), since your brain is divided into two hemispheres (halves).</p> <p>The two hemispheres are known as your left brain and your right brain. Distinct membranes separate the eight areas, but numerous neuronal pathways connect all of them for dynamic interactive connectivity.</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>
<p>THIRD FUNDAMENTAL BRAIN FACT: [3] The structure of your prefrontal cortex (PFC) is the executive decision-maker of your life.</p> <p>Your prefrontal cortex is located in your frontal lobe at the front of your cerebrum just behind your forehead with neuronal connections to all brain areas, including those associated with free choice in your cerebrum and feelings in your limbic system and unconscious behavior in your cerebellum and brainstem.</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>
<p>FOURTH FUNDAMENTAL BRAIN FACT: [4] The essential components of your sense of self are two small clumps of neurons that are the central control hubs of your prefrontal cortex.</p> <p>These two small functional modules are each the size of a penny and are located high in the forward part of your two frontal lobes. They are located above your eyes and one inch behind your forehead inside your prefrontal cortex in both the left and the right hemispheres of your divided cerebrum.</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>

<p>FIFTH FUNDAMENTAL BRAIN FACT: [5] Your ability to think and make decisions depends upon having healthy neuronal pathways inside your anterior cingulate gyrus.</p> <p>This means that your neurons and the glial cells that protect them must be healthy in order for biochemical (electro-chemical) signals to be conducted rapidly and efficiently through your cingulate pathways. Your glial cells nourish, insulate, and protect your neurons from toxic chemicals.</p> <p>Your glial cells are called white matter in contrast to your neurons, which are called gray matter, because of the way the gray cell bodies of neurons inside your cerebral cortex look naturally without a microscope. The distance the biochemical signals travel is only a few inches from the structure of your prefrontal cortex (behind your forehead) to the structure of your hippocampus (at the bottom of your limbic system).</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>
<p>SIXTH FUNDAMENTAL BRAIN FACT: [6] The four triggers of your long-term memory circuits, your semantic, episodic, autobiographic, and procedural (or muscle) memory circuits, are all located in the structure of your hippocampus.</p> <p>The evolutionary importance of your long-term memory circuits is obvious, since the two sides of the structure of your hippocampus are at the bottom of your limbic system in the most protected part of your brain. Your long-term memory consolidation system is activated by the four triggers of your specialized long-term memory circuits. They are essential for your perception of having an enduring self-identity.</p> <p>But to be useful, the four circuits of your long-term memory structure in your hippocampus must be connected to the structure of your working memory, which is located in your prefrontal cortex.</p> <p>Your working memory directs all of your conscious executive brain functions, since it is wired to control the functions of the other key major parts of your brain, including your cerebrum and limbic system and even your brainstem-cerebellum complex, which is the oldest (reptilian) part of your evolving brain.</p> <p>Your working memory enabled you to control the movement of your body and to develop your unique sense of self as you grew from being a baby to being an adult. You had to make many thousands of decisions to create your self-identity and personality during that long period of time.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>

SEVENTH FUNDAMENTAL BRAIN FACT: [7] Your brain's neuroplasticity (plasticity) gives you the ability to learn new words and to expand your neuronal database of facts and ideas about the meaning of life every day.

For your brain to control your body's movements, your prefrontal cortex had to unconsciously "learn" through many thousands of experiences how to connect to and control your sensory cortex and your motor cortex from the time you were a toddler and a child and a teenager and, finally, an adult. At each of the predictable developmental stages of the physical growth of your body, your brain's parts were growing in connectivity.

Your hippocampus had to unconsciously "remember" in your procedural (muscle) memory circuit what all of the signaling and the movements of your body meant through that long process of bodily growth and change.

During the developmental stages of childhood growth (from birth to age 12) and also of adolescence growth (teen years), neuroplasticity is largely a process of one's existing neurons connecting functionally to activate all appropriate areas of muscle movement patterns as well as language acquisition. By increasing general vocabulary during this time, a person can achieve a richer and more comprehensive neuronal database for thinking and decision-making.

Then during adulthood, neuroplasticity is largely a process of increasing dendritic connections among the surviving neurons after one's original birth neurons are naturally trimmed or pruned during the second decade of life.

The two major control centers of your body's movements are your sensory cortex and your motor cortex. They can be activated by both your conscious and unconscious behavior.

Your sensory cortex and your motor cortex are both located in two separate narrow "strips" in the six thin wrinkled layers of your cerebral cortex, which covers your cerebrum. Your cerebral cortex contains the densely crowded cell bodies of at least 10 billion of your brain's 100 billion neurons.

Your sensory cortex is located in the top of your cerebrum two-thirds of the way towards the back of your head. It receives biochemical signals activated by all of your senses through your nervous system. It is known as your sensory cortex strip. Your motor cortex is located in front of your sensory cortex. It stimulates the biochemical signals that activate all of your muscles and bodily organs. It is known as your motor cortex strip.

The two structures of your sensory cortex and motor cortex, with their inputs and outputs, are both connected to all of your muscles through your nervous system, which is part of your complex connectome. Your connectome unites your brain and spinal cord's central nervous system (CNS) and peripheral nervous system (PNS) in separate parallel neuronal tracts to and from your spine and brain.

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<p>EIGHTH FUNDAMENTAL BRAIN FACT: [8] For you to be aware of yourself, your prefrontal cortex must be connected to your language module in your left temporal lobe and also your hippocampus at the bottom of your limbic system.</p> <p>Simultaneously, for you to be conscious of yourself as a passionate and conscientious human being with the freedom to choose your own thoughts and actions, your prefrontal cortex must be connected to your reticular activating formation located in your brainstem and the triggers of the two vital unconscious brain functions that regulate your breathing (lungs) and your heartbeat (heart) located in your cerebellum.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>
<p>NINTH FUNDAMENTAL BRAIN FACT: [9] The source of your thoughts, which is your cerebrum, can control the source of your feelings, which is your limbic system, if you have the proper brain knowledge.</p> <p>This supreme brain fact is derived from the new knowledge about the function of your working memory and the global circuitry of all of the neuronal pathways in your connectome. This is a transformative revolutionary idea since it means that you are totally in charge of your own thoughts and feelings and actions, whether you give yourself credit for your phenomenal personal power or not.</p> <p>This brain idea has been verified by scientific experimentation during the past few years after hundreds of thousands of fMRI brain scans have proven it beyond any reasonable doubt. The most significant new evidence is the complexity of your connectome and its complicated biochemical communication system.</p> <p>Measuring the blood flow and sugar levels inside the brain with sophisticated computerized microscopes reveals what parts of the brain are activated when a person is conscious of having specific thoughts or feelings.</p> <p>To repeat for clarification, the source of your thoughts is the biochemical activity in your cerebrum and the source of your feelings is the biochemical activity in your limbic system, assuming that all of the other systems of your brain and body are functioning normally.</p> <p>Again, to repeat for more clarification, your cognitive resources are a function of your cerebrum while your executive decision maker is the central control function of your prefrontal cortex (the front part of the frontal lobe of your cerebrum).</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p> <p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>

TENTH FUNDAMENTAL BRAIN FACT: [10] When the neurons in the pathways of the anterior cingulate gyrus get entangled and obstructed, neuronal signaling from your prefrontal cortex to your hippocampus can get blocked and cause Alzheimer's disease or other dementias.

Alzheimer's can be caused by tumors or the buildup of amyloid plaque caused by toxic proteins or cellular debris such as prions that can make holes in human brains. In addition, a brain research study published in the July issue of the neuroscience journal *The Neuron* reported that the loss of memory can also be caused by biochemical imbalances in the medial temporal lobe, which can destroy the protein bridges connecting memories to each other.

Any disruptions of the neuronal signaling along the cingulate pathways or in the medial temporal lobe can damage the operation of both the brain's working memory and its long-term memory consolidation system. When the cingulate pathways, which connect the prefrontal cortex to the long-term memory circuits, are interrupted due to Alzheimer's or tumors or traumatic brain injuries, such as concussions from sports injuries or bomb blasts, there is usually permanent damage to one's mind, including one's self-identity.

Destruction of the neuronal signaling between the prefrontal cortex and the hippocampus can cause the dramatic loss of self-awareness or the loss of the sense of time or the loss of facial recognition skills or the loss of all three even though conscious awareness of nonpersonal routine situations may not be affected.

Sadly, that is why Alzheimer's patients typically cannot recognize the faces of their spouses or friends or remember what they were doing or where they were a few minutes ago. The documentary film on CNN Sunday night (June 28, 2015) honoring the great guitar player and singer, Glen Campbell, depicted the terrible impact Alzheimer's can have on a person and their whole family and social network.

To restate this alarming fact, Alzheimer's disease and the other dementias are usually caused by damaged cingulate pathways that cannot relay ionic current back and forth efficiently.

This means that the biochemical signals or impulses of information from the brain's executive control mechanism in the prefrontal cortex cannot reach the brain's long-term memory consolidation system in the hippocampus or memories cannot get to the prefrontal cortex.

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<p>SIGNIFICANCE OF THE NEW BRAIN SCIENCE FINDINGS: With no cure in sight, it is essential that you become aware of the specific scientific ways in which you can avoid or delay the onset of permanent brain damage due to the whole spectrum of dementias and traumatic brain injuries.</p> <p>Because of the new brain facts and ideas revealed by modern brain research, the causes of brain disorders and diseases, such as strokes, brain tumors, and traumatic brain injuries, including concussions, are better understood now than ever before in the past.</p> <p>Since there are so many promising options available for optimizing your brain health, it is imperative that you use critical thinking and reading skills to make effective decisions based upon your own unique life circumstances and the best scientific evidence available.</p> <p>If you want to have a healthy brain, it is crucial that you eat, sleep, exercise, and relax properly, at all ages, since good blood circulation is required for good brain health.</p>	
<p>QUICK REVIEW: for quick recall in your short-term and working memory system at the moment, study the following summary list of the ten fundamental brain facts and then answer the ten questions to memorize the facts and generate your own questions for further thinking about the consequences of knowing the new brain facts and associated ideas:</p>	
<p>[1] Consciousness is caused by the global circuitry of all of your neuronal pathways and all of your neuronal signaling processes.</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>
<p>[2] The structure of your cerebrum, which is the largest and newest region of your brain to have evolved, is the intellectual control center of your life.</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>
<p>[3] The structure of your prefrontal cortex, which is located at the forward part of your frontal lobe, is the decision-maker of your life.</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>
<p>[4] The essential functional components of your sense of self are two small clusters of neurons that are the central control hubs of your prefrontal cortex (PFC).</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>
<p>[5] Your ability to think and make decisions depends upon having healthy neuronal pathways inside your anterior cingulate gyrus consisting of neurons and glial cells.</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>
<p>[6] The four triggers of your long-term memory resources, which are located in the structure of your hippocampus, are your semantic, episodic, autobiographic, and procedural (or muscle) memory circuits.</p>	<p>Agree <input type="checkbox"/></p> <p>Disagree <input type="checkbox"/></p> <p>Uncertain <input type="checkbox"/></p>

<p>[7] Your brain's neuroplasticity gives you the ability to learn new words and to expand your neuronal database of facts and ideas about the meaning of life every day.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>
<p>[8] For you to be aware of your self, your prefrontal cortex must be connected to your language module in your left temporal lobe, and your hippocampus.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>
<p>[9] The source of your thoughts, which is your cerebrum, can control the source of your feelings, which is your limbic system, with the proper education.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>
<p>[10] When the neurons in the pathways of the anterior cingulate gyrus get entangled and obstructed, neuronal signaling from your prefrontal cortex to your hippocampus can get blocked and cause Alzheimer's disease or other dementias.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Uncertain <input type="checkbox"/></p>
<p>SELF-TEST: for long-term memory consolidation, answer the following seven questions to remember the seven brain facts in your long-term semantic memory resources:</p> <p>(1) What neuronal pathways can get entangled and obstructed and cause Alzheimer's disease or other dementias by blocking neuronal signaling?</p>	
<p>(2) What brain structure can control your feelings if you have the proper brain knowledge?</p>	
<p>(3) For you to be aware of yourself and able to think, your prefrontal cortex must be connected to what communication module in your left temporal lobe?</p>	
<p>(4) What process gives you the ability to learn new words and to expand your neuronal database of facts and ideas about the meaning of life?</p>	
<p>(5) In what brain structure are the four triggers of your long-term memory resources, which include your semantic, episodic, autobiographic, and procedural (or muscle) memory circuits?</p>	
<p>(6) What is inside your anterior cingulate gyrus that connects your prefrontal cortex to your hippocampus and makes possible your ability to think and make decisions?</p>	
<p>(7) What are the functional components of your sense of self that are the central control hubs of your prefrontal cortex?</p>	
<p>(8) What brain structure, located in the forward part of your frontal lobe, is the executive decision-maker of your life?</p>	
<p>(9) Which of your brain structures is the largest and the newest to have evolved to become the intellectual control center of your life?</p>	
<p>(10) What is caused by the global circuitry of all of your neuronal pathways and all of your neuronal signaling processes?</p>	

These ten brain facts can become a solid foundation or mental scaffolding for your eventual mastery of the complete sequence of the 15 free brain ideas in the **Humanist Family Brain Survey**.

You will be expanding your intelligence and using your brainpower to more efficiently control your time and the rest of your life. You will be able to start using these key words in the **Alphabetical Brain™ Vocabulary** when you think about how to solve important personal and social problems in the future.

In addition to this free information, there will be more brain facts and ideas on additional brain flash cards that you can buy on the **Alphabetical Brain™ Vocabulary App** later this fall.