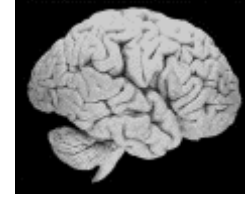


The Brain vs. The Computer

Throughout history, people have compared the brain to different inventions. In the past, the brain has been said to be like a water clock and a telephone switchboard. These days, the favorite invention that the brain is compared to is a computer. Some people use this comparison to







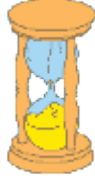





say that the computer is better than the brain; some people say that the comparison shows that the brain is better than the computer. Perhaps, it is best to say that the brain is better at doing some jobs and the computer is better at doing other jobs.



Let's see how the brain and the computer are similar and different.

The Brain vs. The Computer: Similarities and Differences

Similarity	Difference
 Both use electrical signals to send messages.	The brain uses chemicals to transmit information; the computer uses electricity. Even though electrical signals travel at high speeds in the nervous system , they travel even faster through the wires in a computer.
 Both transmit information.	A computer uses switches that are either on or off ("binary"). In a way, neurons in the brain are either on or off by either firing an action potential or not firing an action potential. However, neurons are more than just on or off because the "excitability" of a neuron is always changing. This is because a neuron is constantly getting information from other cells through synaptic contacts. Information traveling across a synapse does NOT always result in a action potential. Rather, this information alters the chance that an action potential will be produced by raising or lowering the threshold of the neuron.
 Both have a memory that can grow.	Computer memory grows by adding computer chips. Memories in the brain grow by stronger synaptic connections.
 Both can adapt and learn.	It is much easier and faster for the brain to learn new things. Yet, the computer can do many complex tasks at the same time ("multitasking") that are difficult for the brain. For example, try counting backwards and multiplying 2 numbers at the same time. However, the brain also does some multitasking using the autonomic nervous system . For example, the brain controls breathing, heart rate and blood pressure at the same time it performs a mental task.

 <p>Both have evolved over time.</p>	<p>The human brain has weighed in at about 3 pounds for about the last 100,000 years. Computers have evolved much faster than the human brain. Computers have been around for only a few decades, yet rapid technological advancements have made computers faster, smaller and more powerful.</p>
 <p>Both need energy.</p>	<p>The brain needs nutrients like oxygen and sugar for power; the computer needs electricity to keep working.</p>
 <p>Both can be damaged.</p>	<p>It is easier to fix a computer - just get new parts. There are no new or used parts for the brain. However, some work is being done with transplantation of nerve cells for certain neurological disorders such as Parkinson's disease. Both a computer and a brain can get "sick" - a computer can get a "virus" and there are many diseases that affect the brain. The brain has "built-in back up systems" in some cases. If one pathway in the brain is damaged, there is often another pathway that will take over this function of the damaged pathway.</p>
 <p>Both can change and be modified.</p>	<p>The brain is always changing and being modified. There is no "off" for the brain - even when an animal is sleeping, its brain is still active and working. The computer only changes when new hardware or software is added or something is saved in memory. There IS an "off" for a computer. When the power to a computer is turned off, signals are not transmitted.</p>
 <p>Both can do math and other logical tasks.</p>	<p>The computer is faster at doing logical things and computations. However, the brain is better at interpreting the outside world and coming up with new ideas. The brain is capable of imagination.</p>
 <p>Both brains and computers are studied by scientists.</p>	<p>Scientists understand how computers work. There are thousands of neuroscientists studying the brain. Nevertheless, there is still much more to learn about the brain. <i>"There is more we do NOT know about the brain, than what we do know about the brain"</i></p>