

# Brain Facts Daily Planner (2004)



Neuroscience for Kids

<http://faculty.washington.edu/chudler/neurok.html>

Instructions:

1. Print all of the pages on "regular" letter-sized (8.5" x 11") paper.
2. Cut all of the pages in half, right down the middle.
3. Put the title page at the front.
4. Put the other pages in order by month, January through December.
5. Place the "Notes" page at the end.
6. Staple all the pages on the left side.
7. Throw away this instruction page.

# January 2004

# February 2004



## **BRAIN FACTS**

There are approximately 100 billion neurons in the human brain.<sup>1</sup>

The average human brain weighs about 3 pounds (1.4 kilograms).

Eagles have more than 1 million photoreceptors per square millimeter in their retinas; humans have 200,000 photoreceptors per square millimeter.<sup>2</sup>

Each day in the United States, 33 babies are born with permanent hearing loss.<sup>3</sup>

Every year 27 million people in the US benefit from pain relief, sedation and unconsciousness from anesthetics.<sup>4</sup>

January 2004

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## **BRAIN FACTS**

An "absolute threshold" is the stimulus intensity a person can detect 50% of the time. Here are examples of absolute thresholds for the five senses:

Vision: a candle flame, 30 miles away, on a dark, clear night.

Hearing: A ticking watch 20 feet away in a quiet place.

Taste: A teaspoon of sugar in 2 gallons of water.

Smell: a drop of perfume in a three-room apartment.

Touch: The wing of a bee falling from 1 centimeter onto your cheek.<sup>5</sup>

February 2004

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# March 2004

## **BRAIN FACTS**



Average (median) amount of sleep each day by university students:  
 in 1969 - 7.75 hours  
 in 1979 - 7.13 hours  
 in 1989 - 6.75 hours  
 in 2001 - 6.65 hours<sup>6</sup>

On May 13, 1935, World War I hero Colonel T.E. Lawrence (better known as "Lawrence of Arabia") suffered a fractured skull when he lost control of his motorcycle. He fell into a coma and died five days later.<sup>7</sup>

Approximately 1 in every 1,000 people in the US has the autoimmune disease multiple sclerosis.<sup>8</sup>

Raccoons can smell an acorn buried up to two inches under dry powdery sand.<sup>9</sup>

### March 2004

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# April 2004

## **BRAIN FACTS**



Sharks have some amazing sensory abilities. Sharks can detect:

fish extracts with concentrations of only 1 part per 10 billion parts. This amount can alter a shark's behavior;

electrical fields generated by animals. To detect these fields, sharks use special organs called ampullae of Lorenzini that are located below their eyes;

water movement through a series of pit organs (the lateral line system) located under their skin;

pressure that depresses their skin only eight ten-thousandths of an inch (10 microns).<sup>10</sup>

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# May 2004



## **BRAIN FACTS**

Caffeine facts:

Worldwide, 120,000 tons of caffeine are consumed each year.

In the US, more than 80% of adults consume caffeine on a daily basis.

The average daily consumption of caffeine among adults is 200 mg/day.

The highest coffee consuming countries are Finland, Sweden, Denmark, Norway and Belgium.

Women metabolize caffeine about 25% faster than men.<sup>11</sup>

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# June 2004



## **BRAIN FACTS**

Pesticides which disrupt the nervous system are part of the reason why 32 species of frogs have become extinct in the last few decades and 200 species are in decline.<sup>12</sup>

Botox temporarily paralyzes muscles by interfering with acetylcholine, which transmits nerve signals to muscles. Sales of the wrinkle-softening toxin Botox totalled \$309.5 million in 2001.<sup>12</sup>

In 1999, 30.1% of all traffic accidents resulting in a fatality involved alcohol.<sup>13</sup>

Huntington's disease (HD), an incurable, untreatable inherited illness, affects 30,000 people in the US. HD slowly kills neurons which causes impairment of muscle coordination, memory, judgment, and emotional stability.<sup>14</sup>

### June 2004

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Neuroscience for Kids

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# July 2004

## **BRAIN FACTS**



Approximately 160 million people in the US wear glasses or contact lenses.<sup>15</sup>

Cats can hear sounds in a 10.5 octave range. Humans have a hearing range of about 9.3 octaves.<sup>16</sup>

In 2001, eight young U.S. football players (7 in high school, 1 in a Pop Warner program [ages 7-16 years old]) died as a direct result of injuries suffered on the field. Of these eight players, six died of brain injuries, 1 died of a fractured neck and one died of a ruptured spleen.<sup>17</sup>

An estimated 46.5 million people 18 years or older were current smokers in the United States in 2000.<sup>18</sup>

July 2004

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# August 2004

## **BRAIN FACTS**



The country with the most neurologists per person is Lithuania, where there are approximately 6,240 people for every neurologist.<sup>19</sup>

Americans spend \$11 billion each year for glasses and contact lenses.<sup>16</sup>

In 2002, the US government will spend close to \$19 billion treating and preventing drug abuse.<sup>20</sup>

The word "dendrite" (the part of a neuron that brings information toward the cell body) comes from the Greek word meaning "tree."

The word "neurology" was coined by Thomas Willis in 1681.

August 2004

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# September 2004

# October 2004

## **BRAIN FACTS**



As people age, their ears get larger. Ear circumference increases an average of 0.51 millimeters per year.<sup>21</sup>

The giant squid has the largest eyeball of any living animal. The diameter of the giant squid's eyeball is 25 cm. The diameter of a human's eye is 2.4 cm and that of the blue whale is 15 cm.<sup>22</sup>

Bipolar disorder, a brain disease that causes extreme shifts in mood, energy and functioning, affects approximately 2.3 million adults in the U.S. or about 1.2% of the population.<sup>23</sup>

The complete inability to taste is called ageusia and the reduced ability to taste is called hypogeusia.

September 2004

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## **BRAIN FACTS**



Humans can feel a dot that is only 0.006 mm high and 0.04 mm across when it is moved across a fingertip. A standard Braille dot is 167 times higher.<sup>24</sup>

In 2001, 17,448 people died in alcohol-related motor vehicle crashes. That is 41% of the year's total traffic deaths.<sup>25</sup>

Parkinson's disease affects 1-3% of people over the age of 65 years and 10% of those over 80 years.<sup>26</sup>

The vertebral column, the collection of bones (back bone) that houses the spinal cord, is approximately 70 cm long.

The word "retina" comes from the Latin word meaning "net."

October 2004

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# November 2004



## **BRAIN FACTS**

Thomas Edison, the famous inventor, thought that sleep was a waste of time. He is reported to have said, "Sleep is an acquired habit. Cells don't sleep. Fish swim in the water all night. Even a horse doesn't sleep. A man doesn't need any sleep."

In 2001, the use of GHB (gamma hydroxybutyrate) resulted in 3,340 emergency-room visits in the U.S., according to the Substance Abuse and Mental Health Services Administration.<sup>27</sup>

The average intelligence quotient (IQ) score is 100. About 68% of the population has IQ scores between 85 and 115; about 95% of the population has IQ scores between 70 and 130; about 99.7% of the population has IQ scores between 55 and 145.

November 2004

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# December 2004



## **BRAIN FACTS**

The length of myelinated nerve fibers in the brain is 150,000 - 180,000 km.<sup>28</sup>

Composer Ludwig van Beethoven may have been poisoned by lead. Researchers at Argonne Research Laboratory found that a lock of Beethoven's hair had lead levels 100 times greater than normal. Scientists speculate that lead may have caused some of the problems (irritability, depression) that Beethoven experienced during his life.

Smells and tastes are experienced in approximately 1% of all dreams.<sup>29</sup>

The word "brain" appears 66 times in the plays of William Shakespeare.<sup>30</sup>

December 2004

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Notes:

<sup>1</sup>Kandel, E.R., Schwartz, J.H. and Jessell, T.M., *Principles of Neural Science*, New York: McGraw Hill, 2000.

<sup>2</sup>Schwab, I.R., You have an eagle eye (cover illustration), *Br. J. Ophth.*, 84:1089, 2000.

<sup>3</sup>Northern, J.L. and Downs, M.P., *Hearing in Children*, 5th edition, Philadelphia: Lippincott Williams & Wilkins, 2002.

<sup>4</sup>Melton, L., Count to 10, *Scientific American*, February 2002.

<sup>5</sup>Feldman, R.S., *Understanding Psychology*, 4th edition, New York: McGraw-Hill, 1996, p. 98.

<sup>6</sup>Hicks, R.A., Fernandez, C. and Pellegrini, R.J., The changing sleep habits of university students: an update. *Percep. Motor Skills*, 93:648, 2001.

<sup>7</sup>Maartens, N.F., Wills, A.D. and Adams, C.B.T., Lawrence of Arabia, Sir Hugh Cairns, and the origin of motorcycle helmets. *Neurosurgery*, 50:176-180, 2002.

<sup>8</sup>*Science News*, Vol. 161, January 5, 2002, p. 4.

<sup>9</sup>Zeveloff, S.J., *Raccoons: A Natural History*, Washington, D.C.: Smithsonian Institution Press, 2002.

<sup>10</sup>Hoyt, E., *Creatures of the Deep*, Buffalo (NY): Firefly Books, 2001.

<sup>11</sup>Weinberg, B.A. and Bealer, B.K., *The World of Caffeine. The Science and Culture of the World's Most Popular Drug*, New York: Routledge, 2001.

<sup>12</sup>Newsweek, May 13, 2002.

<sup>13</sup>National Institute on Alcohol Abuse and Alcoholism, <http://www.niaaa.nih.gov/databases/crash01.txt>

<sup>14</sup>*Discover magazine*, January, 2002.

<sup>15</sup>Walker, T.C. and Miller, R.K., *2001 Health Care Business Market Research Handbook*, 5th edition, Norcross (GA): Richard K. Miller & Associates, Inc., 2001.

<sup>16</sup>Bradshaw, J., Behavioral biology, in *The Waltham Book of Dog and Cat Behaviour*, edited by C. Thorne, Oxford: Pergamon Press, 1992.

<sup>17</sup>National Center for Catastrophic Sport Injury Research, <http://www.unc.edu/depts/nccsi/SurveyofFootballInjuries.htm>

<sup>18</sup>Center for Disease Control and Prevention, <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5129a3.htm>

<sup>19</sup>Bergen, D.C., Training and distribution of neurologists worldwide, *J. Neurological Sciences*, 198:3-7, 2002.

<sup>20</sup>Lawler, A., White house stirs interest in brain-imaging initiative, *Science*, August 2, 2002, p. 748.

<sup>21</sup>Tan, R., Osman, V. and Tan, G., Ear size as a predictor of chronological age, *Archives of Gerontology and Geriatrics*, 25:187, 1997.

<sup>22</sup>Motani, R., Rothschild, B.M. and Wahl, W., Large eyeballs in diving ichthyosaurs, *Nature*, 402:747, 1999.

<sup>23</sup>National Institute of Mental Health, <http://www.nimh.nih.gov/publicat/manic.cfm>

<sup>24</sup>Boron, W.F. and Boulpaep, E.L., *Medical Physiology, A Cellular and Molecular Approach*, Philadelphia: Saunders, 2003.

<sup>25</sup>National Highway Traffic Safety Administration, U.S. Department of Transportation. Traffic safety facts 2001: alcohol. Washington (DC): NHTSA, 2002.

<sup>26</sup>Helfand, S.L., Chaperones take flight, *Science*, 295:809, 2002.

<sup>27</sup>Newsweek, February 3, 2003, p. 52.

<sup>28</sup>Pakkenberg, B., Pelvig, D., Marnier, L., Bundgaard, M.J., Gundersen, H.J.G., Nyengaard, J.R. and Regeur, L., Aging and the human neocortex. *Exp. Gerontology*, 38:95-99, 2003.

<sup>29</sup>Zadra, A.L., Nielsen, T.A., Donderi, D.C., Prevalence of auditory, olfactory, and gustatory experiences in home dreams, *Perceptual and Motor Skills*, 87:819-826, 1998.

<sup>30</sup>Jaffe, S., The unstuff'd brain, *The Scientist*, April 21, 2003.