

Brain Wave Frequencies

DELTA (0.1-4 Hz)

1 second 



Delta are the slowest human brain wave frequencies and the highest amplitude. Delta rhythms originate from the brainstem - our reptilian brain. Delta waves cycle up to 4 Hz (cycles per second) and occur in relatively immobile, unconscious, deep, dreamless, non-REM sleep - stages 3 and 4. As delta waves increase, awareness of the physical world decreases. High power delta waves are produced in some paranormal processes and trance states. Access to information in our unconscious mind is associated with delta frequencies.

Delta rhythms dominate infants' brains up to one year. Peak performers decrease delta waves when high focus and optimal performance are required. On the other hand, research shows that individuals with attention deficit challenges naturally increase rather than decrease delta wave activity with focusing tasks. This reversed delta response can restrict their ability to focus and maintain attention; the brain is habituated into a drowsy state.

THETA (4-8 Hz)

1 second 

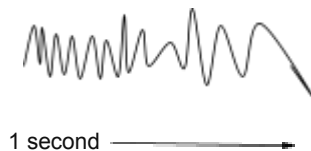


Slow theta activity has a frequency of 4 to 8 Hz. Theta rhythms originate in the midbrain limbic system and hippocampal regions. The presence of high-power theta waves represents a subconscious state between sleep and wakefulness. Theta frequencies are associated with drifting, trance, deep healing, mind-body integration and insight.

Theta brain wave activity is present during sleep as well as internal processes like creativity, intuition, daydreaming, and fantasizing as well as meditation, prayer and spiritual awareness.

Children up to about 12 years-old have high power theta activity. Balanced theta brain wave rhythms support adaptive and complex behaviors like recall, memory and learning. Stress, anxiety and disease are associated with theta imbalances, resulting in behavioral activation and inhibition issues like distractibility and impulsivity.

ALPHA (8-12 Hz)

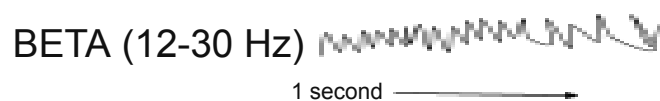


Alpha waves cycle at between 8 and 12 Hz; The strength of alpha waves peak at around 10 Hz. Alpha brain wave frequencies originate from the white “connecting” matter just below the surface brain cortex. The strongest alpha frequencies are found in the occipital and frontal cortices. Closed eyes increase alpha production by 30 to 50 percent.

Alpha waves bridge the unconscious mind with the conscious “alert” mind. Balanced alpha production supports affect regulation, relaxation, calmness, mental coordination and resourcefulness. Alpha is associated with quiet,

focused attention and quick, efficient action. People produce alpha while creatively problem-solving and during mental activation.

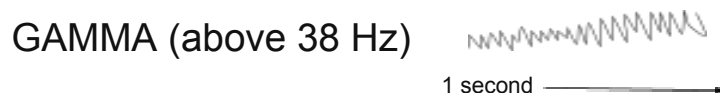
Balanced alpha wave production is associated with meditation and related effects such as elevated mood and recognition of truth, goodness and beauty. EEG neurofeedback training to increase alpha-theta ratios can lead to increased sensation (the ability to feel more deeply), improved abstract thinking and self-control. Training alpha 8-10 Hz is associated with inner-awareness, mind-body integration and balance. Alpha training in the 10-12 Hz range promotes centering, healing and mind-body connection.



Beta brain wave activity is fast and low amplitude; oscillating at between 12 and 30 cycles per second. High beta activity is found symmetrically and asymmetrically in the frontal cortex. Beta wave activity is reduced in brain-damaged areas.

Beta brain rhythms dominate the adult human brain, especially during alert or anxious states with eyes open, while listening, during analytical problem solving, decision making and information processing.

Low beta production in the 12 Hz range is associated with attention deficit and trouble focusing. Beta is inhibited by motion. High beta frequencies over 25 Hz are associated with agitation, anxiety and sometimes panic.



Gamma waves are the fastest frequencies and have the lowest amplitude, cycling at between 38-100 cycles per second. Gamma waves are found throughout the human brain.

Gamma activity is associated with superconsciousness, special forms of intelligence and high-level information processing. High power gamma wave activity appears during integrative processes that require multiple brain regions, simultaneous and consolidative processing or “binding” information.