Brain Development

Conception - Age 9+

Key Areas of Brain Development:

- Majority of brain cells develop from 4th - 7th month of gestation
- Developing brain grows 15 million cells per hour
- Brain development starts at 3 weeks
- Brain stem is the first part of the brain to become active (controls heart beat and breathing)
- Neurons form, axons grow and synapses start to connect
- Auditory cortex - last trimester to first year
- Early life skills (sucking and swallowing) are myelinated
- Cerebrum last to develop

Effects of Essential Nutrition:

- Poor nutrition during pregnancy greatly effects brain development
- Diet rich in Omega 3 fats 6 (Cold water fish, salmon, herring, mackerel, anchovies, and sardines) Helps cell function, brain and eye development
- Diet rich in Folic Acid to prevent incomplete development of brain and spinal cord

Brain Compatible Teaching/Learning Strategies or Activities:

Mother should listen to music
Mother getting plenty of exercise
Mother develops connection to baby as the child grows
This connection will foster a loving and caring relationship between mother and child
Parent should strive to relax and not stress

Birth - Age 3

Key Areas of Brain Development:

- (Birth) Brain has made more than a trillion connections. Neurons branch as connections are made
- (6 Months) Sound discrimination
- (First Year) Brain triples in weight (Brain activity increases with weight)
- Amygdala receives sensory input and communicates with other areas of brain to determine the child's response to a situation
- Eyes and visual cortex continue developing after birth
- Sensory Motor System develops as the child explores
- Experience moves child to the next level of cognitive development
- Cerebellum stimulated as child becomes active
- Brain and nervous system develop through age 3
- Limbic area regulates hunger and thirst
- 19-31 months huge increase in vocabulary
- Vision develops from birth to 12 months
- Connections strengthened through stimulus
- Brain develops in response to surroundings
- 1 year language shifts to left hemisphere as children acquire language

Effects of Essential Nutrition:

- Breast milk nutrients are essential to brain growth and development.
  -- Antibodies to prevent illness
  -- Contains long chain poly-unsaturated fatty acid
- Proper nutrition strengthens immune system
- Need nutrients that will enhance learning (proteins, unsaturated fats, complex carbohydrates, and sugars)
- Need boron, iron, selenium, vanadium, and potassium
- Proteins increase reaction time, thought, memory
- Vitamins A, B, C, and E maintain brain, vision memory
**Age 3 - 8 continued......**

*Brain Compatible Teaching/Learning Strategies or Activities:*

- Have a child read to you
- Combination of whole language and phonics
- Rhyming games and alphabet
- Encourage imagination with play
- Talk to child and question
- Problem solving activities
- Parents should talk about what they are doing - Active learning
- Provide child opportunities for social games and activities. Role model social behaviors - help child function apart from parent - Play
- Teacher should help student feel good about learning
- Non- Competitive games

**Age 9 and Older Continued.....**

*Brain Compatible Teaching/Learning Strategies or Activities:*

- Need plenty of rest
- Continue to do activities that stimulate brain development
- Exercise and physical exertion in important
- Continue to provide safe learning environment
- Non-Competitive games
- Play
- Spatial and Reasoning Tasks
- Continue to challenge child with new opportunities

**Age 9 and Older**

*Key Areas of Brain Development:*

Pre-frontal cortex becomes completely mylenated
- Rapid change in the structure of the brain
- Pre-frontal cortex
- Thickening brain cells due to new connections that are formed
- Pruning continues to occur in brain for optimal function
- Massive structural change during teen years
- Strong emotion overstimulates brain
- Brain becomes less flexible as age increases
- Synapse formation continues through age 18
- Brain continues to rewire due to exposure to new situations

*Effects of Essential Nutrition:*

- Cognitive function is supported (Reasoning, abstract thought)
- Social senses develop
- Food rich in iron helps math and reasoning skills
- B-12 increases learning ability

**Information for brochure taken from the following sources:**

*Teaching with the Brain in Mind by Eric Jensen
*www.zerotothree.org ---Brain Development
*The Dana Foundation ---Brain Development in Childhood
www.dana.org
www.pbs.org ---PBS Secret Life of the Brain