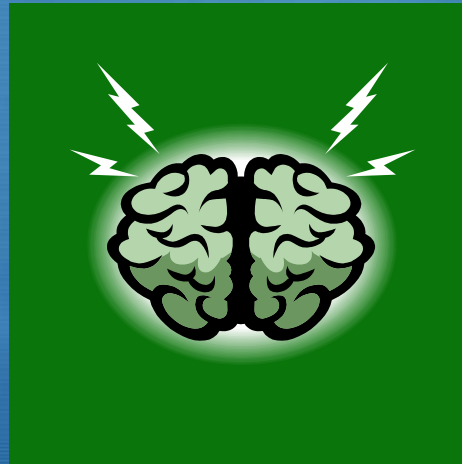


Better Brains for Babies

Prime Times for Learning



Neuroscience Terminology

- ◆ Glial Cells are cells in the brain that primarily support and nourish neurons.
- ◆ Neurons are nerve cells in the brain that are primarily responsible for transporting information.
- ◆ Axons are the sender – the long ending of a neuron that sends information.
- ◆ The protective coating around an axon preventing short-circuiting between neurons is called the myelin sheath.





More Terms



- ◆ Dendrites (the receiver) are short nerve projections from the cell body of the neuron that receive information.
- ◆ Synapses are connecting places where chemical information is delivered by the axon of a neuron and received by dendrites of another neuron.
- ◆ Serotonin is the neurotransmitter carrying coded information regulating the onset of sleep.

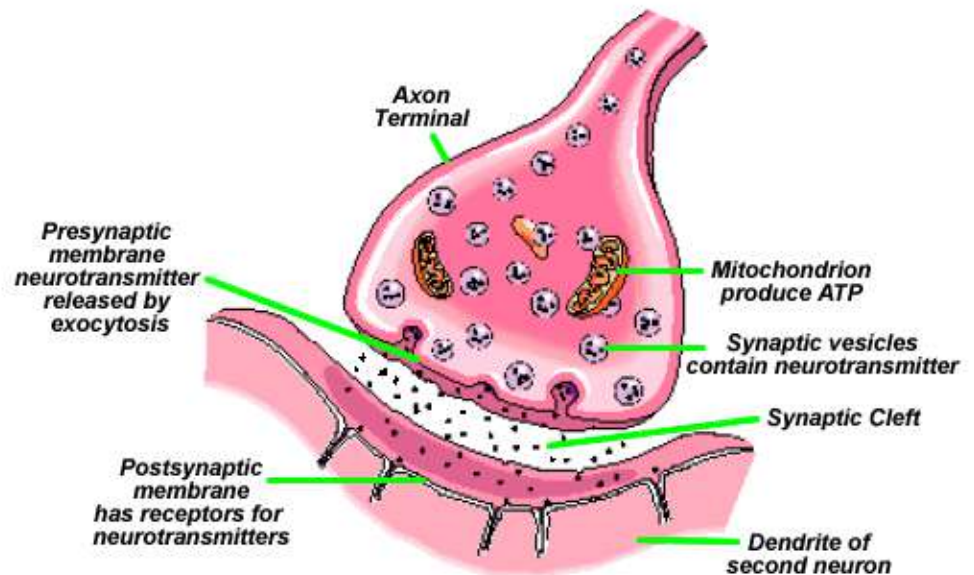
dendrites

axon terminals

axon

cell body

A SYNAPSE



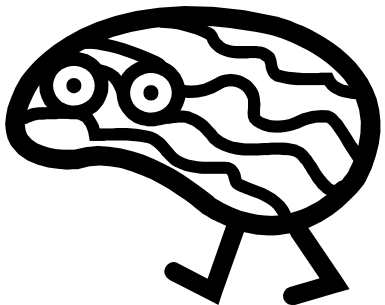
Your Brain....

- ◆ Is oblong in shape and weighs about 3 pounds. It takes up about half of the volume of your head. It has the appearance of a pinkish gray wrinkled walnut, smells like blue cheese, and feels soft and slimy like gelatin. The brain is the commander in chief of *everything* your body does twenty-four hours a day.



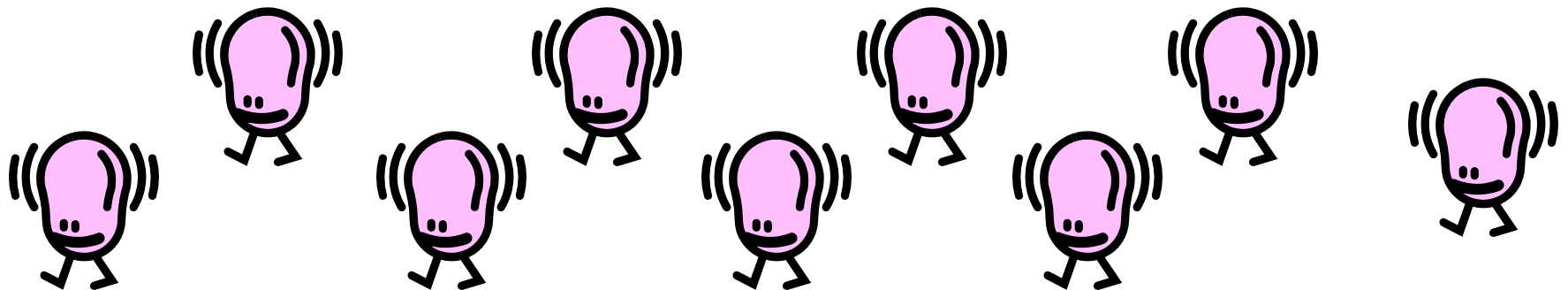
Brain Facts

- Before birth, a baby's neurons increase in number at an astonishing rate increasing the size of the brain. They are not fully equipped, properly positioned, or completely functioning.
- 30,000 neurons would fit in the space the size of a pinhead.
- At birth, the brain's cerebral cortex has 100 billion neurons; but few neurons are connected.



Brain Facts Cont.

- After birth, neurons are not created. The increase in brain size is due to an increase in the size of neurons and the number of connections they make through axon growth and dendrite branching.
- Experience creates neuron connections. Each neuron can make between 5,000 and 50,000 connections with other neurons.



Brain Facts Cont.

- ◆ By age three, 1,000 trillion connections exist...twice as many as adults have.
- ◆ Connections used repeatedly become permanent. Those that are seldom or never used get pruned or “weeded out.”



Brain Building Exercise

- ◆ Different parts of the brain control how we act and feel. Your brain controls how you throw a ball and play the piano. It also keeps you calm under stress and figures out a math problem. You can help the brain grow by “exercising” it.

Think about your muscles. Your brain, like your muscles, gets stronger when you exercise. If you run, your leg muscles get stronger. You exercise your brain when you think. If you only watch TV and never talk, the part of the brain in charge of talking may shrink! Listening to music is good for your brain. Playing music and dancing is even better for your brain!



Windows of Opportunity

- ◆ We learn some things most easily during certain times. These are times when the brain is most ready to learn something new. When the window is open, it is easy to learn. When it is closed, you can still learn, but it is harder. Most of the brain windows open and close during the first few years of life. These windows are “prime times” for learning. Each part of your brain grows larger and more active depending on what you see, hear, taste, feel, and smell.

Seeing: Birth to 4 years

- During this time, babies need to see shapes and colors. They need to see things that are close and far away, and things that move. The brain has to learn how to see! That is why if a baby has anything wrong with his eyes, it should be fixed early.



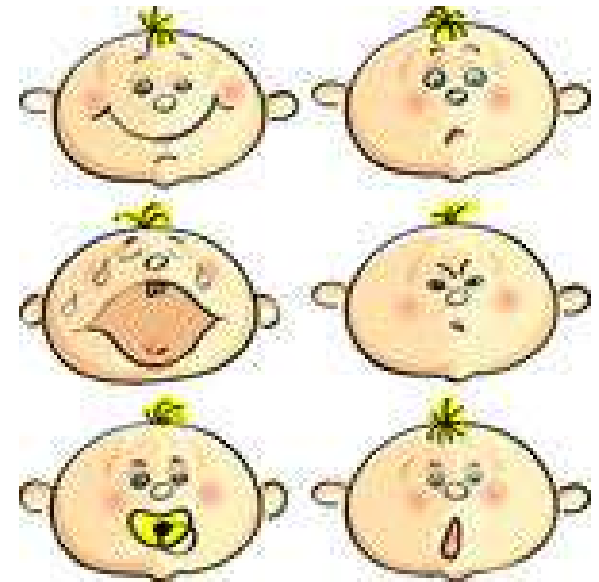
Talking and Reading: Birth to 10 years

- ◆ Babies are born ready to learn any language. They understand and babble the language they hear the most. The more talking, singing, and reading a baby hears, the more words he will understand and use. Babies also learn how sentences are put together so they make sense. This is the best time for babies to learn a second language!!



Feelings: Birth to 18 months

- ◆ The part of the brain that handles feelings learns very early. Feelings like happiness, hopefulness, and sadness begin here. How you treat your baby shapes this growth. The feeling part of the brain keeps growing through the teenage years. What happens early is most important for the brain's feelings.



Music and Math Skills

1 year to 5 years

- ◆ The part of the brain that hears music is the same part that does math. Listening to rich, complex music is good for a baby's brain. This kind of music helps a baby learn the skills needed to do math. The earlier a child studies a musical instrument (like a piano), the more of his brain is used for it. So, if you want a child to be good in math, give him music lessons too!!



Movement Skills: Birth to 2 years

- Every mother knows that babies can kick even before birth! During the first months after birth, a baby's brain learns to control her muscles. These muscles help her hold her head up, roll over and crawl. Active games and gentle exercise help her brain learn these skills. Soon she will learn to use her small muscles to do things like pick up small toys and feed herself. Be patient and encourage her to keep trying!



How the Brain Works...

10 Things We Know...





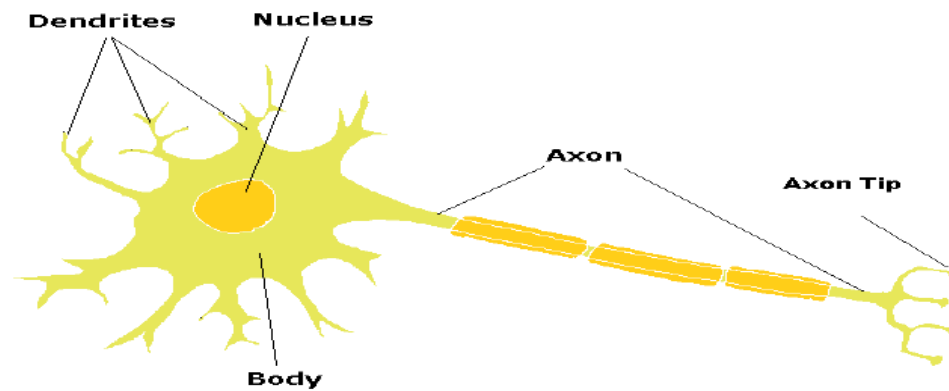
- 1. What happens before birth affects learning: When you are pregnant, you need to eat healthy foods and get enough B-vitamins. Drinking, taking drugs, and not eating the right foods can hurt baby's brain!

- 2. The brain changes after birth: Most of the cells are there before birth, but brain cells make most of their connections with other cells during the first 3 yrs. of baby's life. The brain changes and makes connections until about age 10.



3. What happens in a baby's life affects his/her brain: The brain makes connections based on what the baby does. If a baby doesn't do certain things, some parts of the brain won't connect.

4. Bigger heads don't mean smarter babies: And just having a big brain doesn't make you smarter. Dolphins have bigger brains than people, but humans are smarter b/c our brains work more quickly. We have exactly the connects we need.



5. Babies' brains are more active than adults' brains: a 3-year-old's brain is twice as active as an adult's. By about age 3, the brain's cells are all connected. Over the next few years, some of the connections change. The connections used the most get stronger. The connections not used much will die.

6. The brain grows in spurts: There are "prime times" when the brain learns things best. Babies and young children learn languages more easily than adults because their brains are ready to learn language.



7. We can learn throughout our lives: People can still learn new things when they get older. Learning might be harder after the prime times are over, but it can still happen. Adults may learn a new language more slowly than their children. But adults can still learn how to speak other languages.

8. Learning starts before a child goes to school: Good early care can help a child be ready to learn. Warm, loving care helps babies form a strong bond with their caregiver. Children with this strong bond are more ready to learn. Bad things that happen, like abuse, can slow down brain development. This makes learning harder.



9. Enrichment is good for all children: All babies and children need to try new things. This helps their brain cells make new connections. Remember that children learn by doing. Let a baby explore the world. Give him/her new things to do. Help him/her when she tries something new. Teach him/her to be creative.

10. Children don't need expensive toys to get smarter: What children need most are loving care and new things to do. Doing things with baby doesn't have to cost money. Talk and sing to baby. Go on walks and show him/her what you see. Visit the library and pick out a new book. Showing baby new things helps her brain to grow.

Better Brains for Babies!

- ◆ As you play with baby, see how he/she takes in everything around him. Give baby the best home you can! Make it safe! Protect him/her from scary things. Talk a lot with baby, even before he/she can talk. Sing songs and dance together. Show him/her that he can trust you. Remember, the first years last forever!



The Brain

