

Reaching & Teaching the Teenage Brain



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Puberty



Changes in the Adolescent

- Search for identity - Who am I?
- Shift of influence from parents to peers
- Brain development



Brain Quiz: True or False?

- People are left-brain or right-brain.
- The larger the brain the smarter the person.

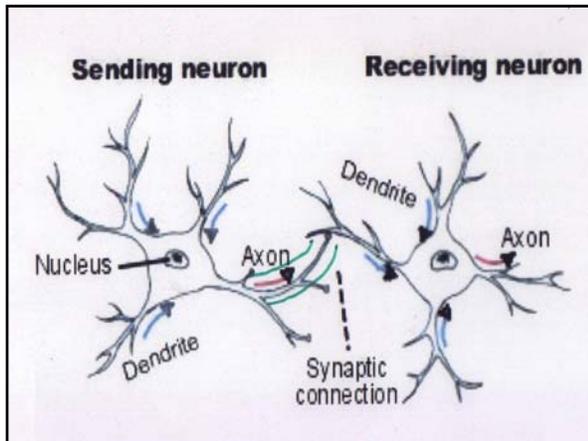


- Green
- Blue
- Brown
- Orange
- Pink
- Red
- Yellow
- Black
- Blue

Processes in the Brain

1. Production of dendrites
2. Pruning – use it or lose it
3. Myelination





Synaptic Connections

100 Billion Neurons

Short-term memory Increases by 30%

Pruning occurs developmentally

Human Brain weighs About 3 lbs.

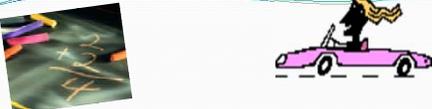
May I have your Attention Please

- Novelty - invite a guest speaker, get some movement going, tell a joke, video
- Emotion - music, debate, cooperative learning, personal story
- Make it Meaningful - real world application, what's in it for me

Make Processing a Priority

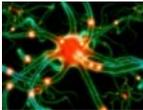
- Small or large group discussion
- Give examples
- Summarize
- Add additional information
- Identify the most valuable piece of information
- Create a simile, metaphor, or analogy





Neurons that fire together wire together

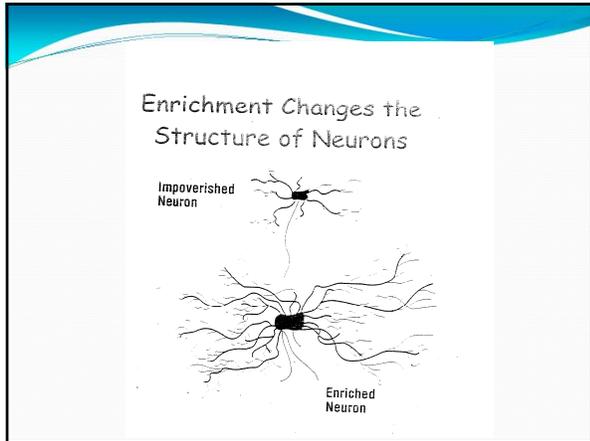
-Pat Wolfe

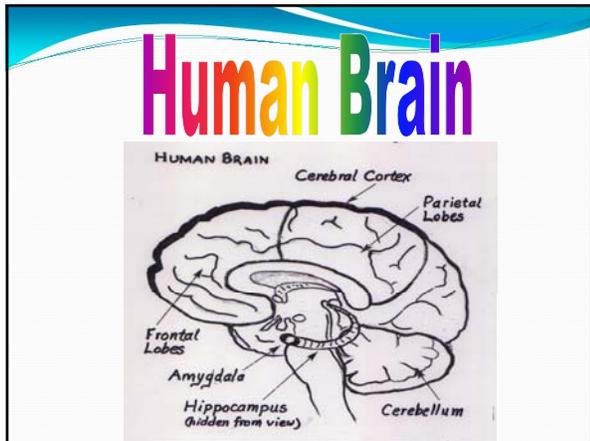


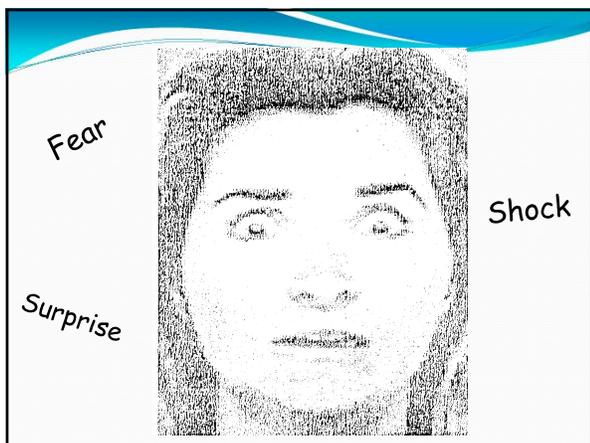
The Learning Pyramid

- Read 5 %
- Hear 10%
- See 20%
- See & Hear 30%
- Discuss with Others 50%
- Direct Experience 75%
- Teach to Someone Else 95%









Amygdala vs. Frontal Lobes

❖ Misunderstandings

❖ Emotional Language



❖ Bad Decision Making

Emotional Commotion

• Disorganized & Forgetful

• Pseudostupidity

• Anger & Aggression

• Mood Swings



Emotional Development cont.

• Adolescent Hypocrisy

• No one understands me and I'm indestructible.



Gender Brain Differences

- Hypothalamus
- Amygdala
- Hippocampus
- Activity in General



Mirror Neurons

- Mirror Neurons fire when they observe someone else's actions - sight, sound
- Intent is taken into account with the action
- Main concern is the goal of the action, not the action itself
- Occurs at a sub-conscious level



Mirror Neurons

- Social Abilities - empathy
- Addictive Behaviors
- Autism (ASD)
- Violence (Video Games)



Your Brain On-Line

- Well designed computer tutorials and games are instruction at it's best: feedback is immediate, consequences are natural, individualize easily for enrichment or acceleration, can also do group work, provides practice
- Aids in focus, memory tasks and strategizing - can it be transferred
- Motivates students
- Impact on Plasticity



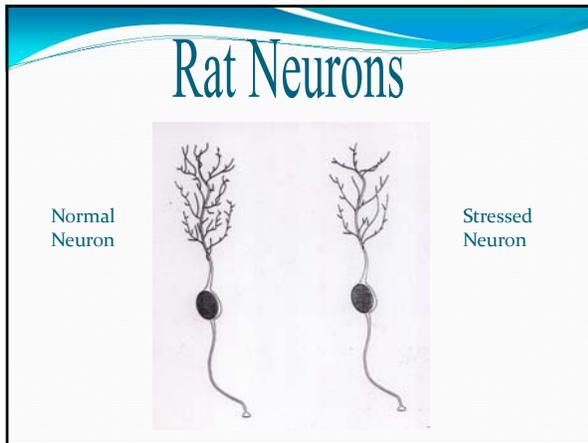
Violent Video Game Research

* The emotional part of the brain is engaged in violent video games, while the logical part of the brain goes to sleep and stays asleep



- * Violent video game players become indifferent to violent behavior
- * Testosterone agitates the amygdala

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Reducing

- Teach coping skills
- Insure students have the necessary academic background
- Clarify your expectations
- Provide homework helpers and tutoring
- Use competition carefully
- Allow some choice
- Teach study skills
- Multiple assessments

Stress

Sleep

- **Role of melatonin**
- **Sleep needs increase**

Spirit of Belonging

1. Having Friends 

2. Good Grades 
3. Participating in Class

Strategies to Support Belonging

- Easy access to librarians
- Be a role model
- Routines within the library
- Call them by name, greet in hallways and lunchroom – connection
- Use inclusive words, such as “our” library and “all of us working together.”
- Ask for students’ opinions.



Strategies Cont.

- Organize school fundraisers/service
- Encourage study groups outside of class.
- Extracurricular activities
- Positive rapport with school police officers



Divergent Thinking



Longitudinal Study of Creativity and Gifted

- 3 – 5 yrs. old 98%
- 8 – 10 yrs. old 32%
- 13 – 14 yrs. old 10%
- 25+ yrs. old 2%

The At-Risk Teenager

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Factors That Put Teens At-Risk

- Poverty
- Living in neighborhoods with high crime & easy accessibility to drugs & alcohol
- Academic failure
- Delinquent friends
- Dysfunctional family
- Mother's education
- Abuse
- TEENAGE BRAIN



Window of Sensitivity

- Addiction:
 - Alcohol
 - Smoking
 - Drugs



Dopamine

- Immediate effect of drinking alcohol is an increase in dopamine
- The brain becomes fooled into naturally producing less dopamine
- The body becomes dependent upon alcohol to feel good, dependence occurs



Adolescent Addiction

- **Adolescent addiction occurs more quickly and are more resistant to recovery**
- **Teenagers have a reduced sensitivity to intoxication**
- **Adolescents are less inhibited**
- **Drugs and alcohol have a greater effect on their cognition**



Girls Implode, Boys Explode Cutting

- They cut to relieve strong emotion; tensions, stress. It takes away the numbness they are feeling in their lives.
- Brain releases endorphins creating feelings of pleasure with each cut.
- Serotonin, a calming agent is believed to be misused.




Great Books for At-Risk Students

- Hatchet _____
- Holes _____
- The Twilight Series _____
- The Harry Potter Series _____
- The House of Night Series _____
- Crackback _____
- Blueford Series _____
- Call of the Wild _____
- Touching Spirit Bear _____

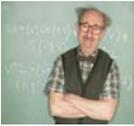
ADHD

- Smaller Brain
- Frontal Lobes smaller & reduced activity
- Basal Ganglia - reduced activity
- Short attention span
- Trouble sequencing
- Hyper-focus



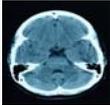
Reactive Strategies

- Stay calm & non-confrontational
- Don't get off topic, stick to the facts
- Don't defend yourself verbally
- Don't point the blame
- Repeatedly restate your directive
- Ask them, "What do you know?"



Depression

- Puberty
- Serotonin
- Right Prefrontal Cortex
- Hippocampus



Thank You for Coming



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