

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

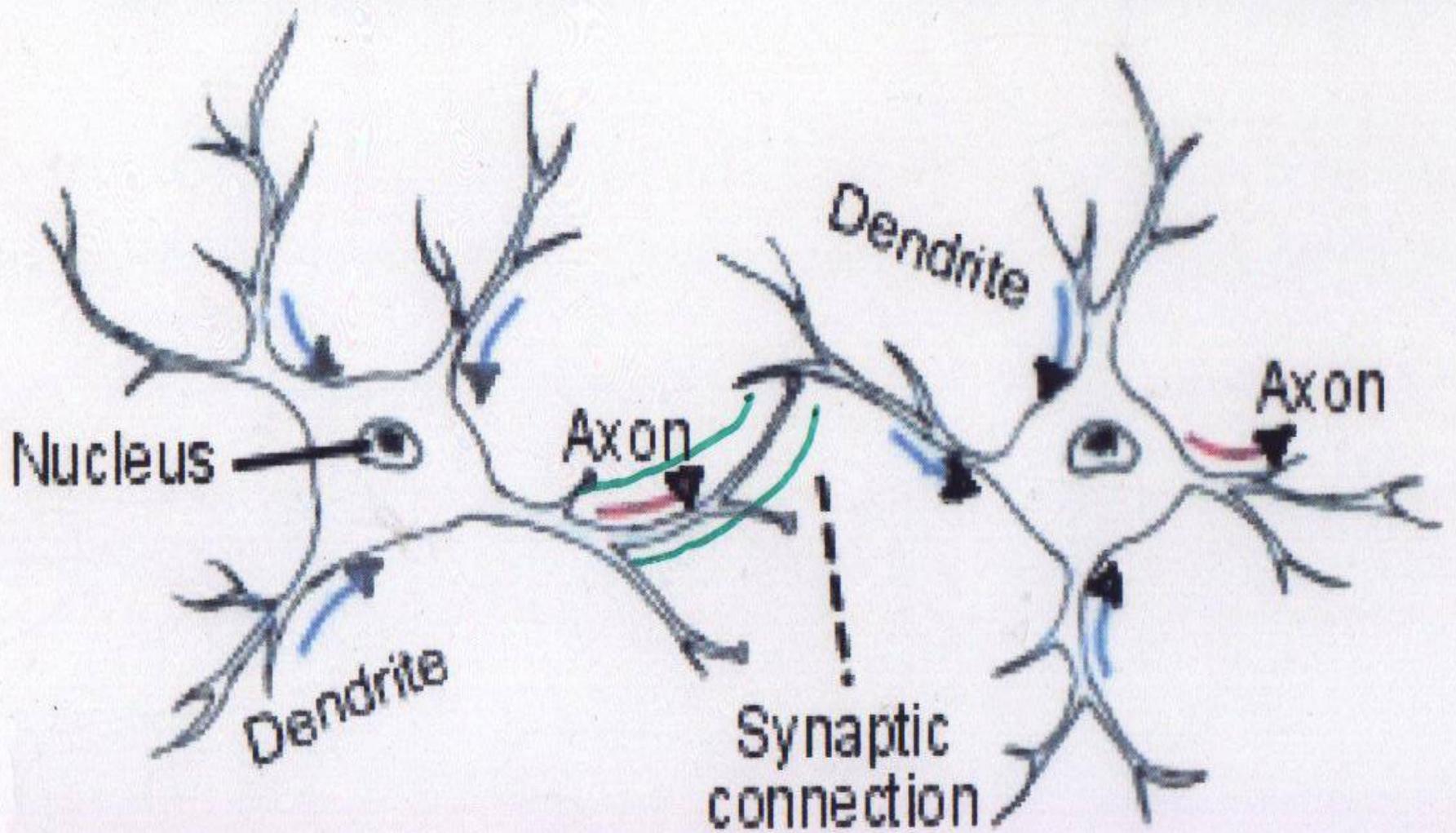
Processes in the Brain

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



Sending neuron

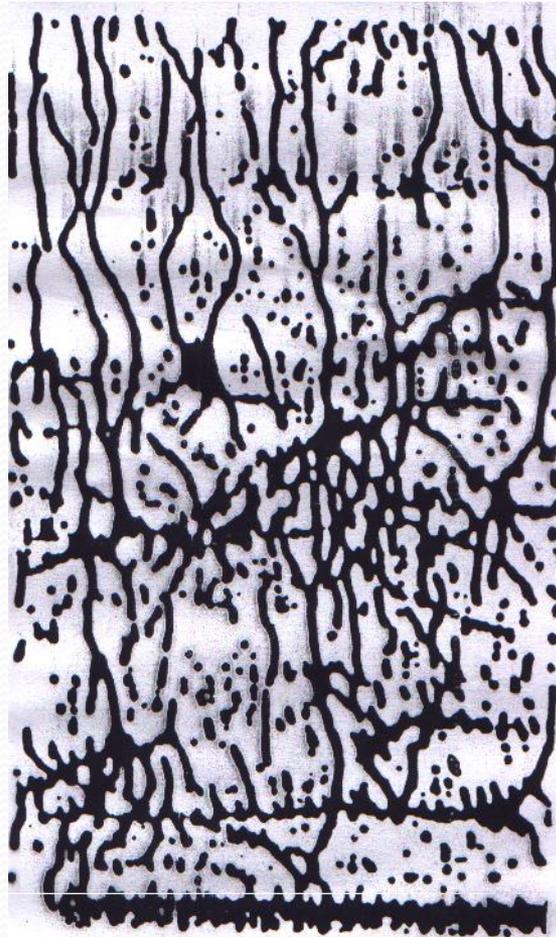
Receiving neuron



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

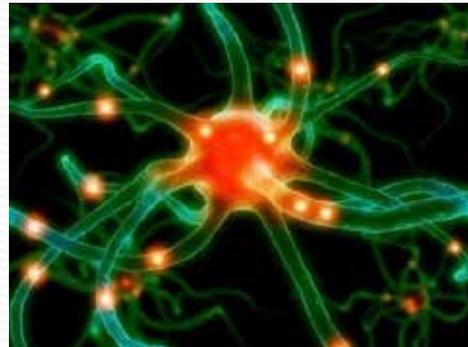
- Small or large group discussion
- Give examples
- Summarize
- Add additional information
- Identify the most valuable piece of information
- Create a simile, metaphor, or analogy





Neurons that fire
together wire together

-Pat Wolfe



The Learning Pyramid

Read 5 %

Hear 10%

See 20%

See & Hear 30%

Discuss with Others 50%

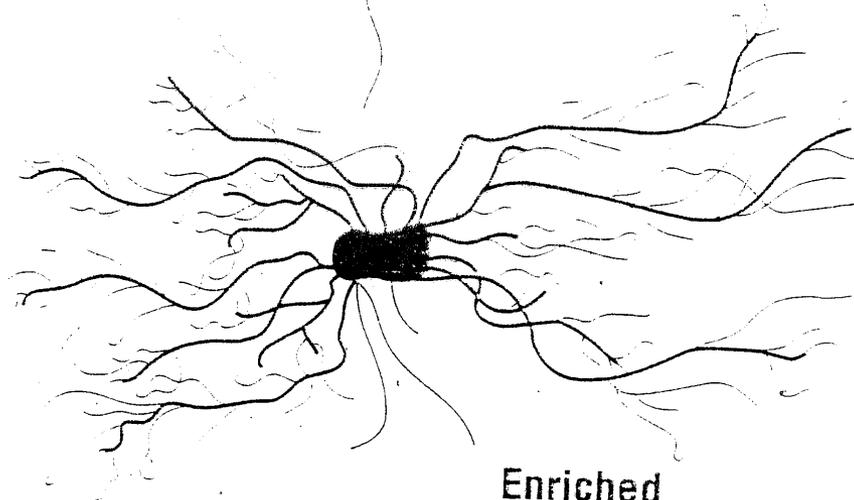
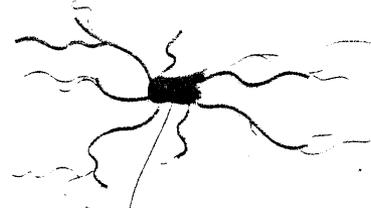
Direct Experience 75%

Teach to Someone Else 95%



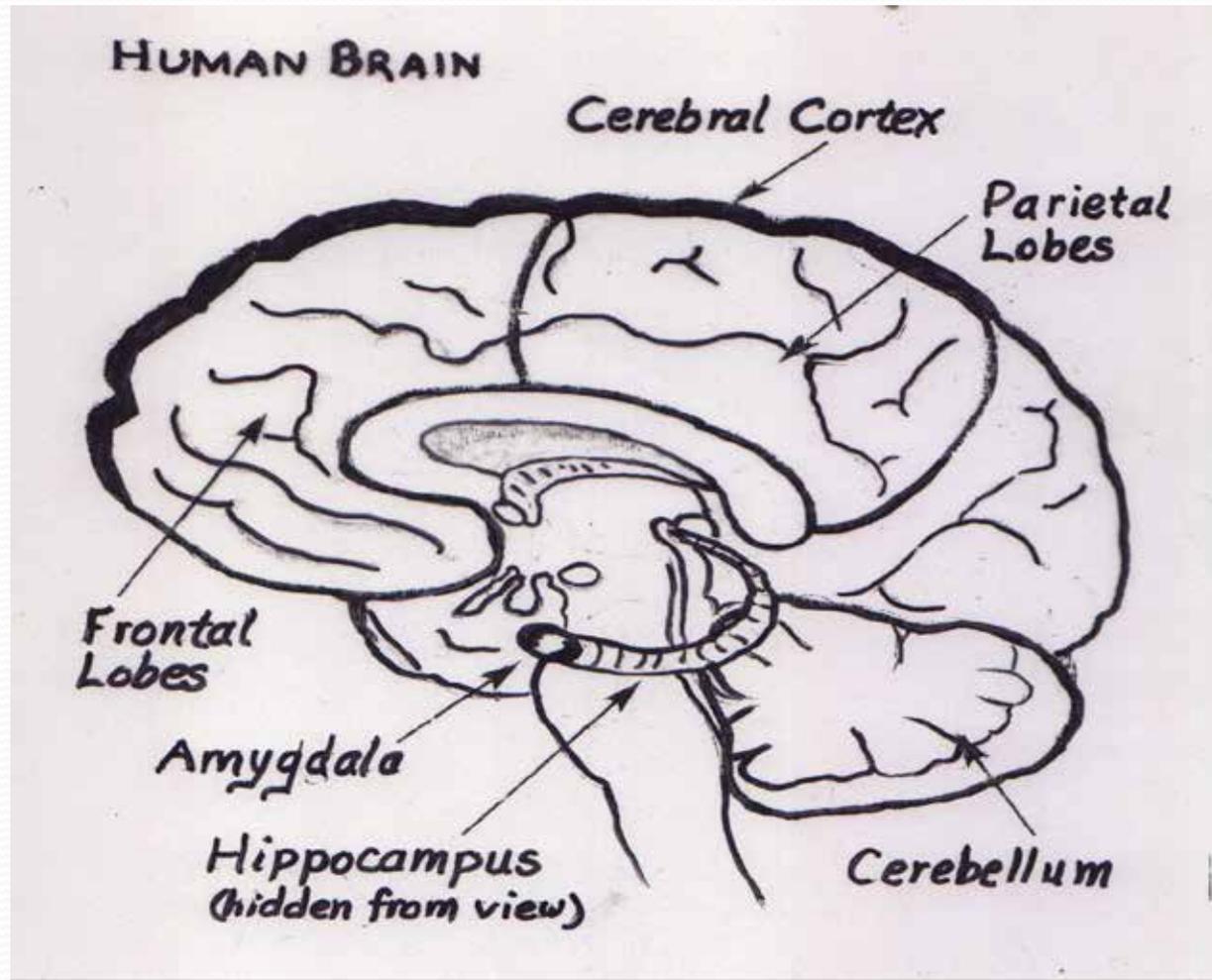
Enrichment Changes the Structure of Neurons

**Impoverished
Neuron**



**Enriched
Neuron**

Human Brain



Fear



Shock

Surprise

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.



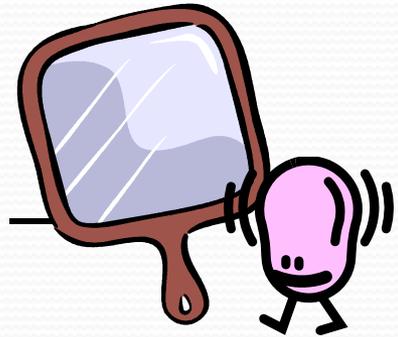
Gender Brain Differences

- 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)



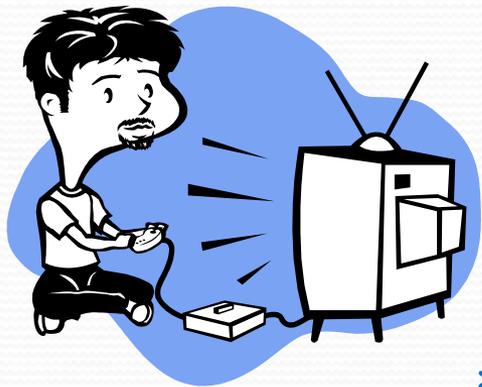
Your Brain On-Line

- 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

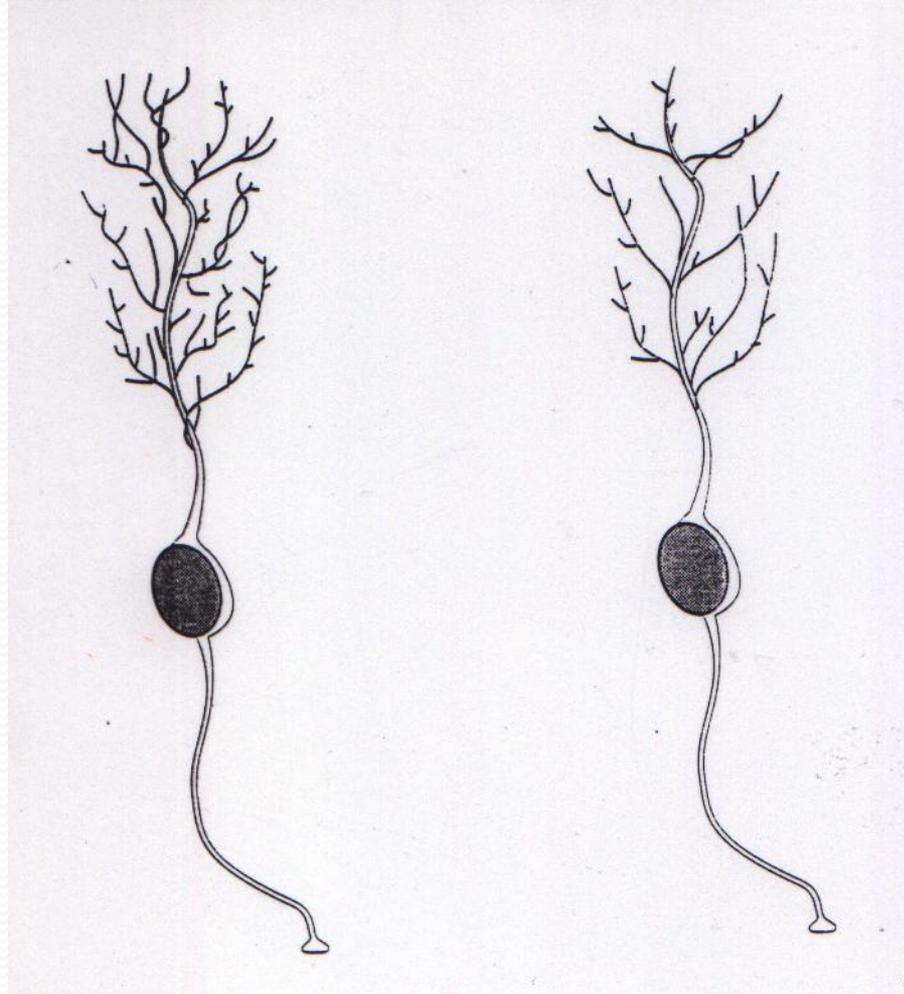
* Testosterone agitates the amygdala



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Rat Neurons

**Normal
Neuron**



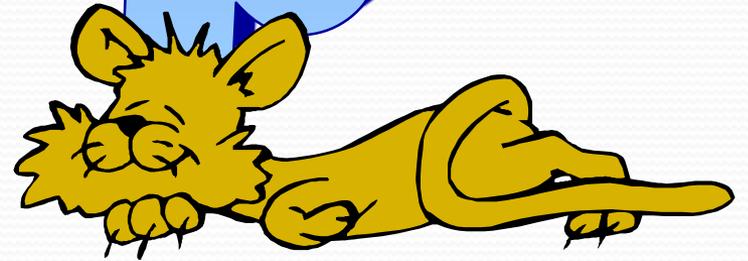
**Stressed
Neuron**

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

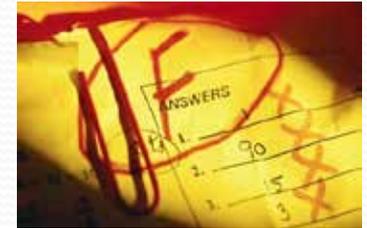
SLEEP



- Role of melatonin
- Sleep needs increase

Spirit of Belonging

1. Having Friends

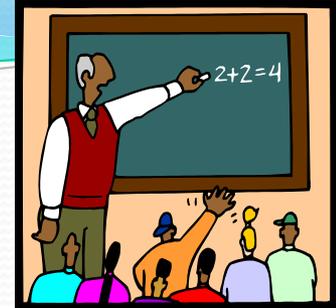


2. Good Grades



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

Sheryl Feinstein

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

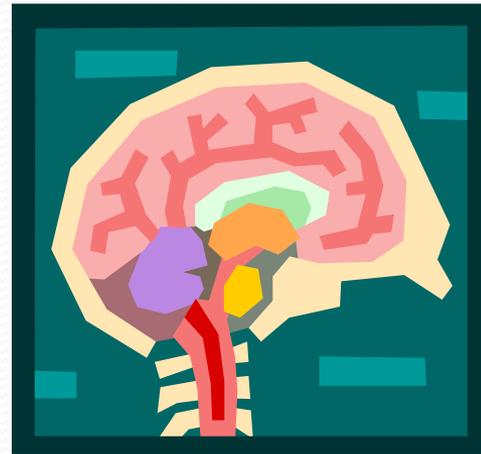
- Blueford Series

- Call of the Wild

- Touching Spirit Bear

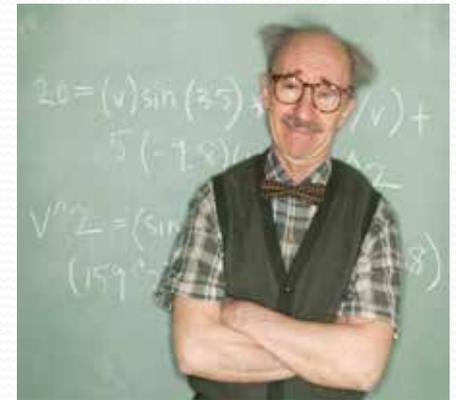
ADHD

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



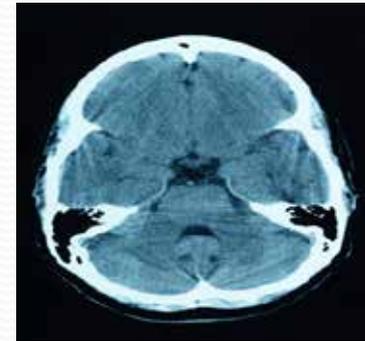
Reactive Strategies

- 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?”

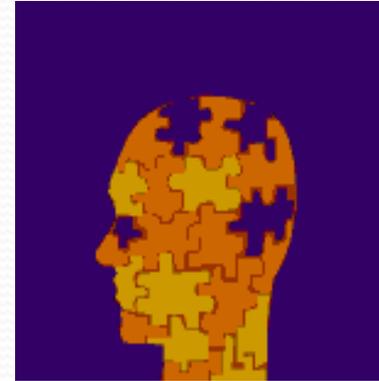


Depression

- Puberty
- Serotonin
- Right Prefrontal Cortex
- Hippocampus



Thank You for Coming



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