

# The Gifted Brain

What makes Gifted children learn differently?



# What does it mean to be gifted and talented?

- ◉ Being gifted is not just a number, it is a profile.
- ◉ Being gifted is not always a blessing.
- ◉ It has been said that *giftedness* relates to above average aptitude and talent relates to above average performance in areas of human activity-math, music, literature(Gagne, 1985)
- ◉ Is it something more? What does it mean to you?

# Reactions to being gifted

- 1) Denying talent
- 2) Feeling obligated to give
- 3) Dissonance
- 4) Risk Taking
- 5) Competition
- 6) Impatient
- 7) Premature ID



# GT fact or fiction?

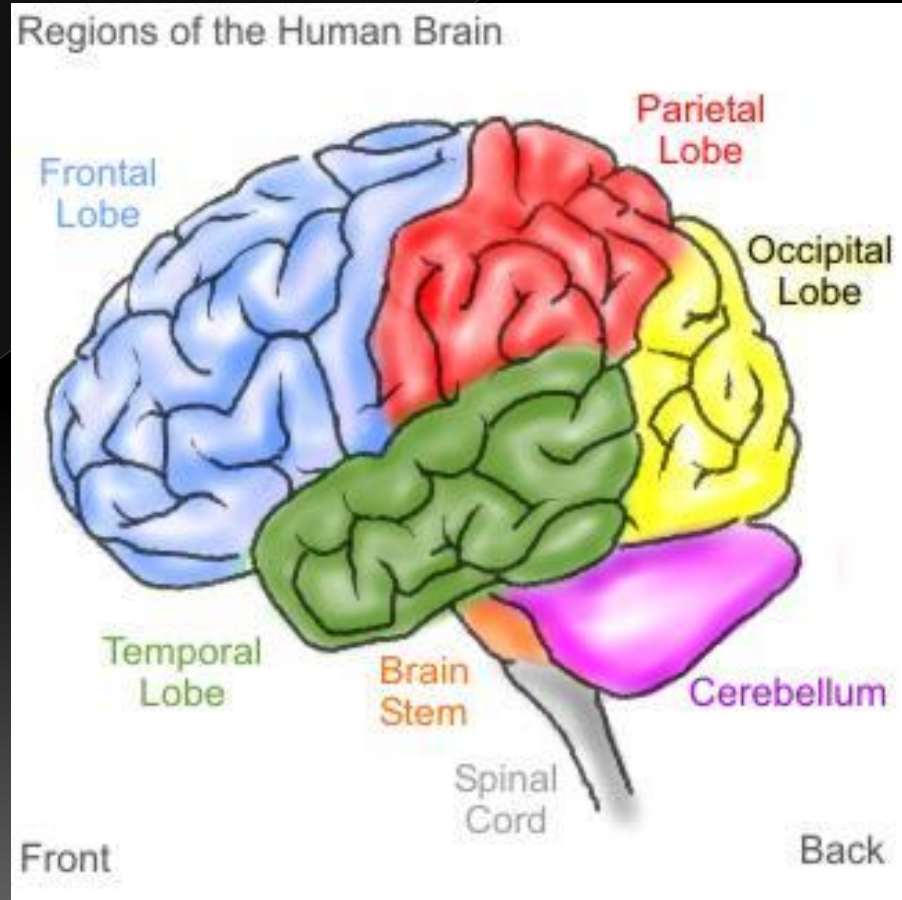
- 1) A GT student can take care of him or herself and learn on their own.
- 2) Academically gifted children have general intellectual power that makes them gifted in all areas.
- 3) Gifted students have higher self-esteem than nongifted students.
- 4) Giftedness in any area requires a high IQ.

# Fact or Fiction?

5. The grouping of Gifted Students increases academic benefits.
6. Gifted Students do not have to work hard.
7. Reading and writing skills developed at a young age do not have a direct correlation.
8. All children are gifted.

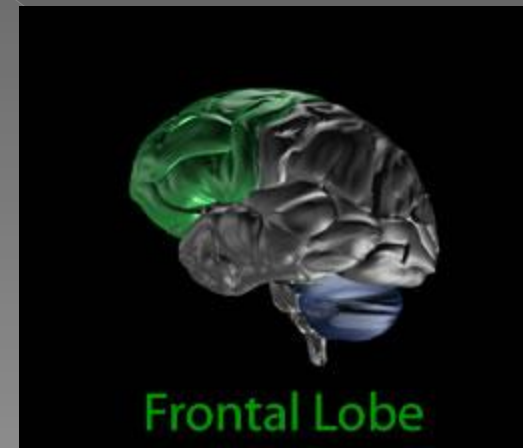
# The Parts of the Brain

- ✓ Four Lobes
- ✓ Cerebellum
- ✓ Brain Stem
- ✓ Limbic Area
- ✓ Cerebrum
- ✓ Brain Cells



# The Frontal Lobe

- ◉ Responsible for movement through the motor cortex
- ◉ Contains the prefrontal cortex
- ◉ Working memory is located here
- ◉ Regulates emotions



# The Temporal, Occipital, and Parietal Lobes

- ◉ Temporal=Speech Center
- ◉ Occipital= Vision
- ◉ Parietal=Stimuli, Sensory Integration, and Orientation



Temporal Lobe



Occipital Lobe



Parietal Lobe



# The Cerebellum and the Brain Stem

Brain Stem

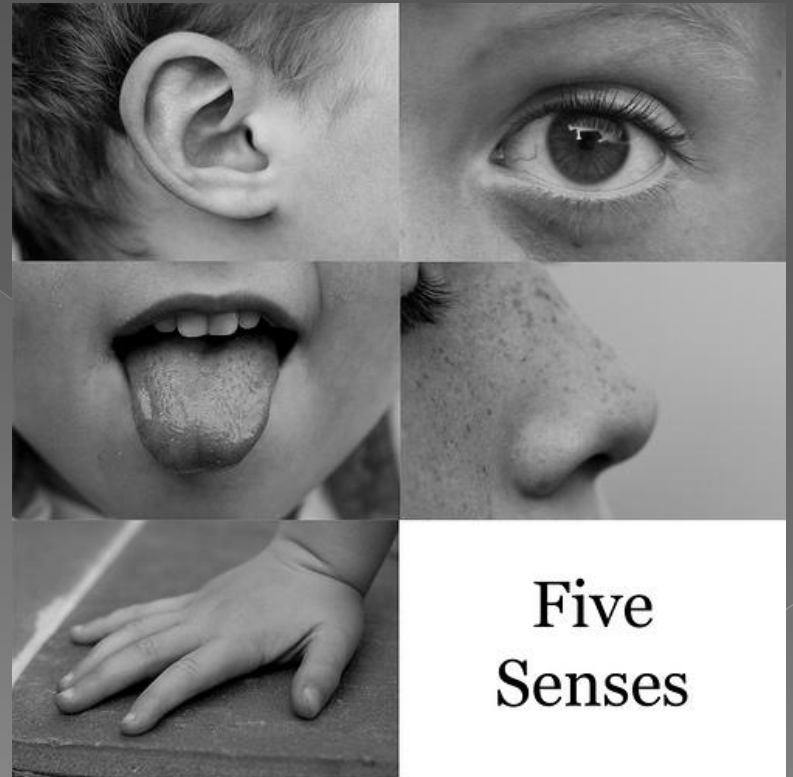
Cerebellum

- Means “little brain”
- Responsible for movement
- Vital body functions
- Referred to as the “reptilian brain”
- Houses the reticular activating system

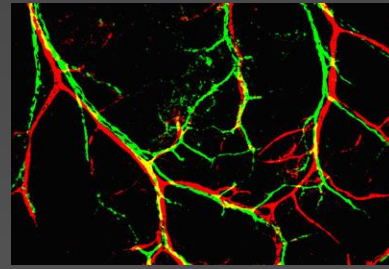


# The Limbic Area

- Thalamus
- Hippocampus
- Amygdala
- Matures by age ten to twelve



# The Cerebrum



- Covered by the cortex
- This encases the four lobes of the brain
- Remember that the nerves in the brain cross over to the opposite side. (right crosses to left, left crosses to right)
- The bridge that allows the two hemispheres to connect is called the corpus callosum

# Brain Cells

- ◉ Almost all neurons are created before birth
- ◉ The brain is composed of approximately a trillion cells



# Brain Size, Intelligence, and Speed of Learning

- In a recent study of twins, levels of intelligence were linked to the amount of matter present in the frontal lobes, however this can not be proved



# Memory

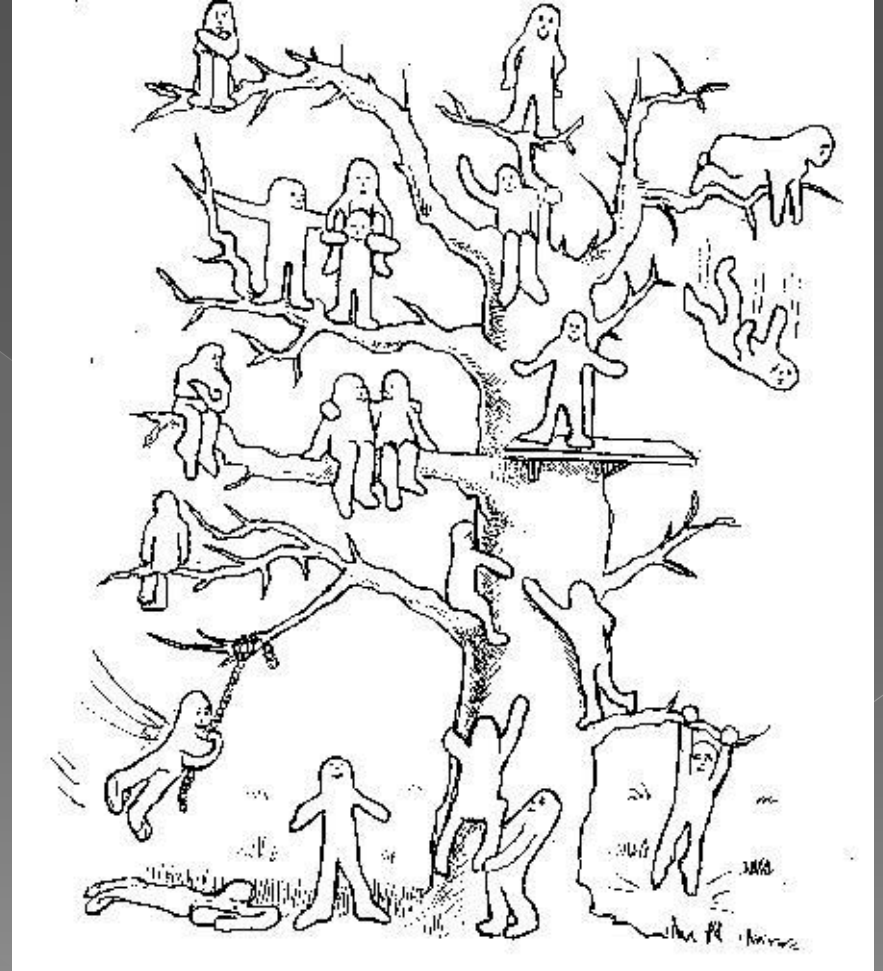
- Learning is the process of acquiring new knowledge, memory is the process of retaining the knowledge and skills for the future
- Research shows that the frontal lobe plays a part in working memory AND long term memory
- “Memory is the diary that we all carry about with us.” ~ Oscar Wilde

# Memory and Study Skills

- Students need help creating effective study skills for life
- Gifted children possess a wealth of knowledge and like to pick it up on their own
- Study Skills are necessary so students know what to do with the new information they acquire

# Emotions and Memory

- Parts of the brain that deal with the input of emotion may play a role in the creation of memories





# Theories and Definitions of a Gifted Brain

- Joseph Renzulli
- Robert Sternberg



# What is Giftedness?

- Giftedness in one area is more common than giftedness across the board
- Results from the interaction of three traits (Renzulli, 1978)
- Renzulli (1986) believes that giftedness is divided into two types of performance:  
Schoolhouse Giftedness  
and  
Creative-productive Giftedness

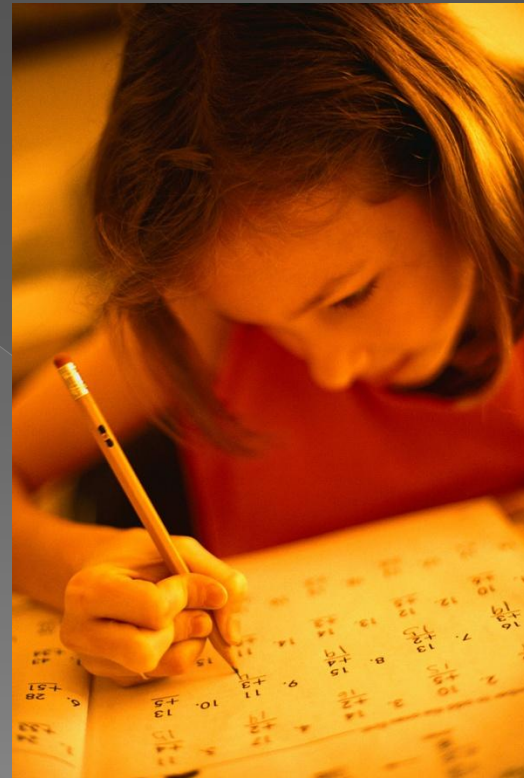
# Multiple Intelligences

- Howard Gardner came up with the theory of multiple intelligences



# The Triarchic Theory and the Pentagonal Implicit Theory of Giftedness

- Robert Sternberg developed these theories in 1985 and 1995
- Three types of intelligence
  - Analytical
  - Creative
  - Practical



# Psychological Characteristics



“The purpose of psychology is to give us a completely different idea of the things we know best. “ ~ Paul Valery

# The Cerebral Hemispheres

- Right frontal lobe is wider and protrudes over the left frontal lobe
- Left occipital lobe is wider and protrudes over the right occipital lobe
- Right hemisphere contains more norepinephrine (a neurotransmitter)
- Left hemisphere contains more dopamine
- Right hemisphere contains more estrogen receptors

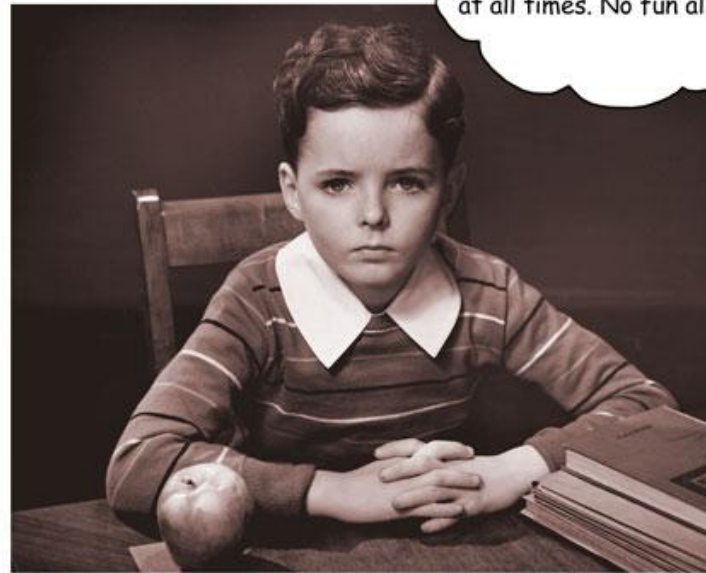
# The Cerebral Hemispheres

## Cont'd

- Right brain deals with new information
- After repetition, the brain creates coping strategies and learning occurs due to a change of behavior
- Repetition leads to routine and responses move to the left hemisphere by way of the corpus callosum

# How does learning occur?

- Reception
- Integration
- Interpretation





# Decision Making and Neural Efficiency

## Neural Efficiency

## Decision Making

- Single Answer questions require the use of veridical decision making
- This is what gets us through the day
- Decisions based on context and priority are made using adaptive decision making
- This is what gets us through life
- This occurs when the frontal lobes experience more events that allow for adaptive decision making and complex problem solving
- Helps the brain to become more efficient (neural efficiency)

# Nurture-what can you do to help your child grow?

- School Attendance
- Breast Feeding
- Diet



# Male vs. Female

Male

- In cognitive problem solving studies, males seemed to be more context dependent
- Tendency to “size up” the problem at hand and come up with a solution that is appropriate to the specific context
- Better at communicating within the hemispheres of the brain

Female

- In cognitive problem solving studies, females seemed to be more context independent
- Tendency to seek solutions that can apply across a number of different situations.
- Better at communicating between the hemispheres of the brain

# Encouragement

- Studies show that students who are excessively given praise for their intelligence and academic performance may lead to the belief that good test scores and high grades are more important than trying, learning, and mastering something new
- Also showed that students praised for intelligence learn to value performance,
- Children praised for effort and hard work value learning opportunities

# What can we do to challenge the gifted?

Creativity, Bloom's  
Taxonomy,  
Social/Emotional, and  
PBL's

“Creativity comes from trust . Trust your instincts. And never hope more than you work.”

~ Rita Mae Brown

# Differentiation

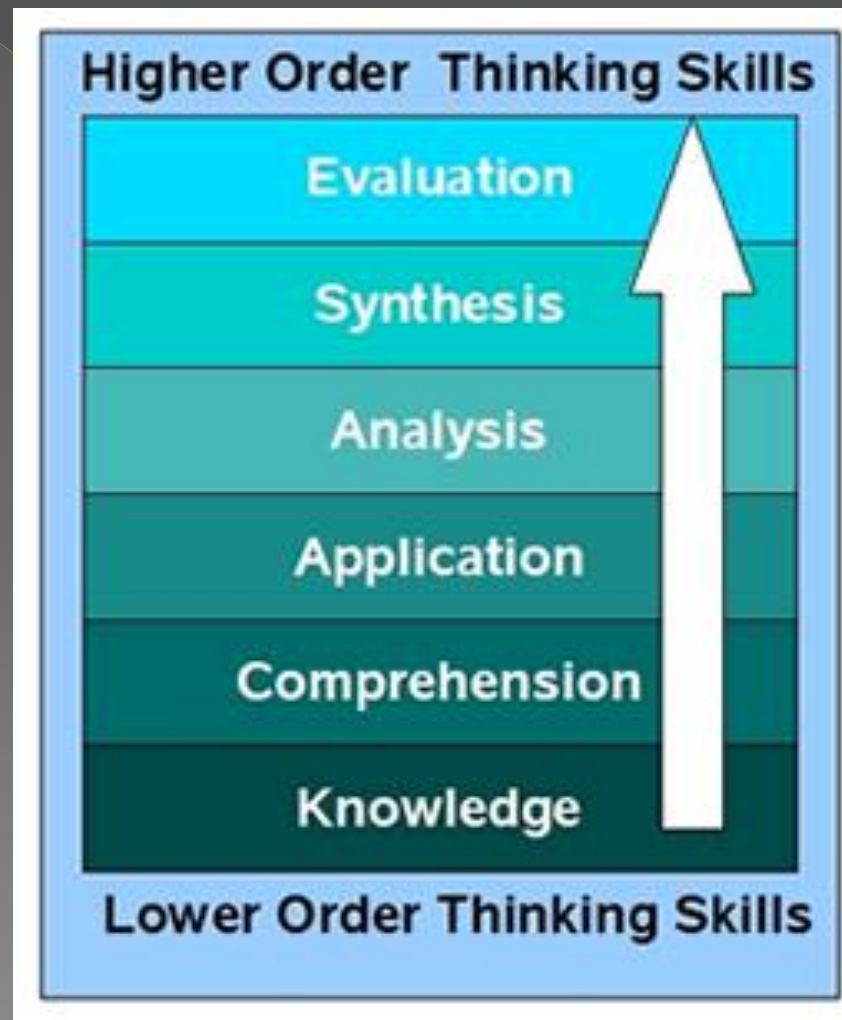
- Differentiation means changing the way curriculum is presented and the application of student learning
- Use of the learning strategies that provide depth and complexity based on the students ability
- Products allow students to showcase their talents and curiosities as well as to share their learning with an appropriate audience
- Students are allowed to work more independently and at their own pace
- Also allows students to pursue their interests outside the school setting

# Social and Emotional Climate

- Open ended questions are a great way for students to be challenged
- Mistakes help us learn
- More than one right answer
- More than one way to find an answer
- Must be able to explain



# Bloom's Taxonomy





- ◉ Level One: Knowledge
- ◉ Level Two: Comprehension
- ◉ Level Three: Application
- ◉ Level Four: Analysis
- ◉ Level Five: Synthesis
- ◉ Level Six: Evaluation

# Convergent and Divergent Thinkers

- First three levels of Bloom's Taxonomy
- Learner recalls and focuses on what is already known to solve a problem
- Learner gains new insights and opinions
- Learner makes discoveries that were NOT originally part of the information given

# Creative Thinking

- “Studies show that creativity may be the result of a series of cognitive processes that can be developed in most individuals.” ~Sousa, 2003
- Four behaviors associated with creativity:  
Fluency, Flexibility, Originality, and  
Elaboration

# Ten Ways to Encourage Creativity

- 1) Redefine Problems
- 2) Analyze One's Ideas
- 3) Sell One's Ideas
- 4) Knowledge is a Double-Edged Sword
- 5) Surmount Obstacles



# Ten Ways to Encourage Creativity Cont'd

- 6) Take Sensible Risks
- 7) Willingness to Grow
- 8) Believe in Yourself
- 9) Tolerance of Ambiguity
- 10) Find What You Love and Do It



# Problem Based Learning

- ◉ Real life
- ◉ Multifaceted
- ◉ Significant complexity
- ◉ Lack information
- ◉ Unclear steps
- ◉ Creation of alternative solutions
- ◉ Selection of one solution
- ◉ Develop a plan

# Resources

- ◉ Webb, James T. *Misdiagnosis and Dual Diagnoses of Gifted Children and Adults: ADHD, Bipolar, OCD, Asperger's, Depression, and Other Disorders*. Scottsdale, AZ: Great Potential, 2005. Print.
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- ◉ Winner, Ellen. "Uncommon Talents: Gifted Children, Prodigies, and Savants." *Scientific American* (1998). Web.
- ◉ Eide, Brock, and Fernette Eide. "Brains on Fire: The Multimodalily of Gifted Thinkers." *Hoagies Gifted Ed.* Web. <[www.hoagiesgifted.org](http://www.hoagiesgifted.org)>.