

Reading for Digital Natives

**Library Technology
Conference**

March 19, 2009

Carol Soma

Blue Earth Area Schools

Baby Boomers

- When: 1946 - 1964
- What: Post-war affluence, freedom
- Event: Vietnam
- Attitude: Feminism, drugs, rock'n'roll
- Gadget: the Pill

Generation X

- When: 1960's - 1970's
- What: Gov't Cutbacks, loss of faith
- Event: Acid House
- Attitude: Quest for protection
- Gadget: Walkman

Generation Y

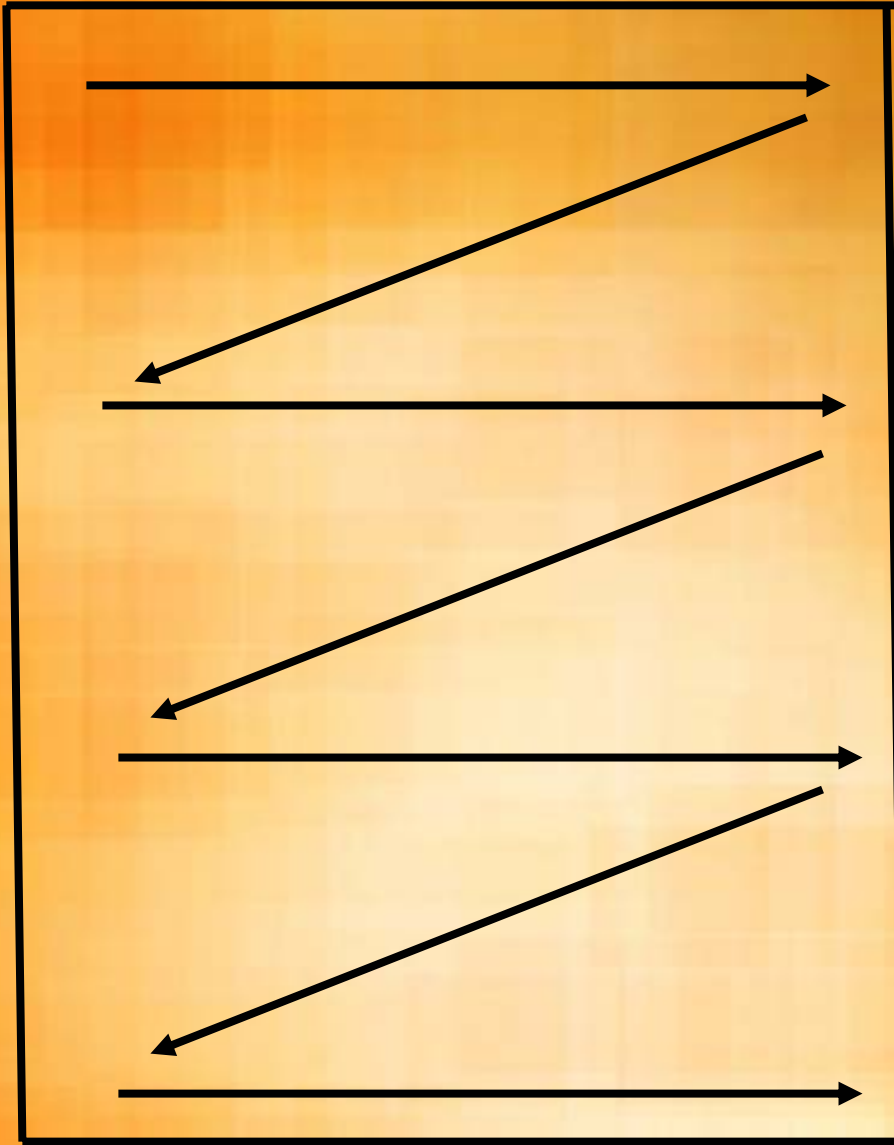
- When: late 1970's - 1990's
- What: Pop Culture, desire for fame
- Event: Berlin Wall
- Attitude: Thrive on change, uncertainty
- Gadget: Playstation

Digital Natives

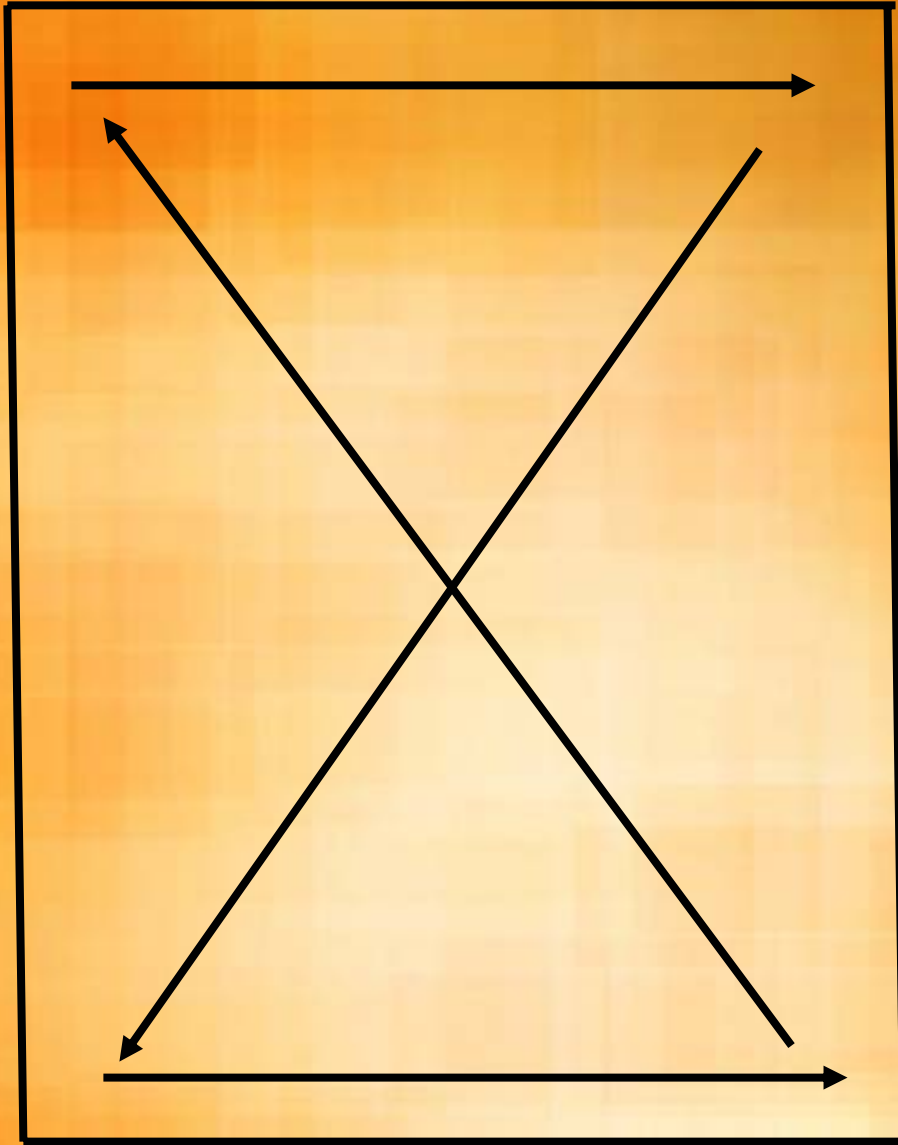
- Marc Prensky, 2001
- Fluent in digital language and technology
- Use systems for
 - Creating
 - Communicating
 - Sharing
 - Searching
 - Buying
 - Socializing
 - Analyzing
 - Learning

What is a digital native brain?

- The visual cortex is 20% larger than brains measured 20 years ago
- To compare:
 - Digital natives retain 90% of 100 pictures
 - Digital immigrants retain 60% of 100 pictures shown
 - Pre-digital retain 10% of 100 pictures shown

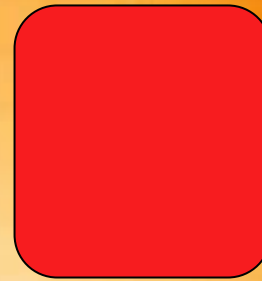
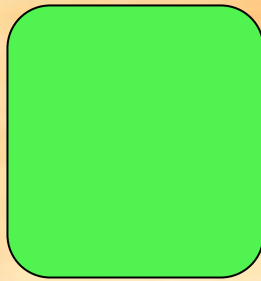


Digital Immigrant Brain



**Digital
Native
Brain**

Target Colors



- Burnt orange, neon green, red attract digital natives
- They tend to ignore black and white

Strengths of a Digital Native Brain

- Reading visual images
- 3-dimensional space, visual/spacial skills
- Mental maps or paper-folding
- Inductive discovery - hypotheses, etc.
- “Attention deployment” (multi-tasking)
- Fast response to both expected and unexpected stimuli

Attention Span

Selective attention span

- One example:
- 5 year old Sesame Street viewers
- Group with toys watched 47%
- Group without toys watched 87%
- Results of testing:
- Identical

Concerns about Digital Natives

- Can students reflect?
- Are they critical thinkers?
- Do they consider ethics and respect?
- Does their health suffer?
- Are they too often bored and tuned out?
- Can they function in a community?

Concerns about Digital Immigrants

UR2old!

Neuroplasticity

- Stimulation changes brain structures
- Affects the way people think
- Transformations go on ***throughout life***
- Brain is constantly reorganized
- Our supply of brain cells is constantly replenished

Recent brain research

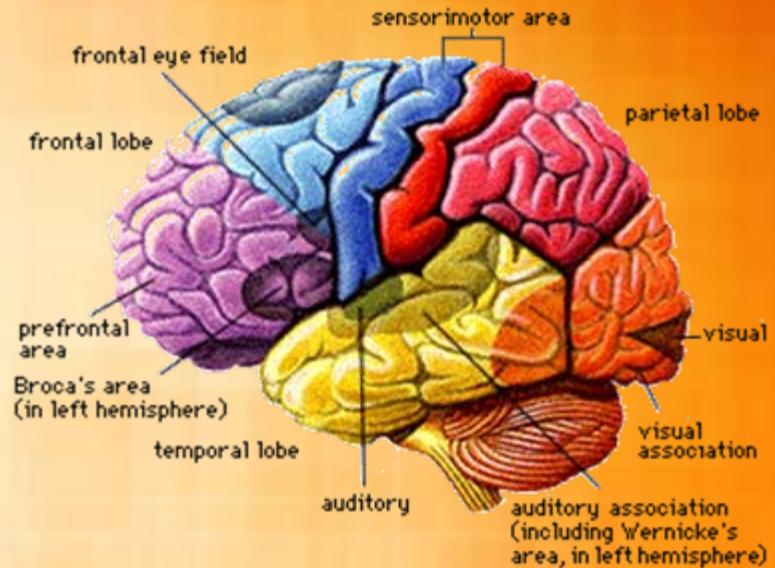
- Rewiring in animals: brain accommodates new inputs from seeing to hearing nerves
- Learning Braille lights up visual brain areas
- Deaf people use auditory cortex to read signs
- Learning a second language as an adult goes to a different brain area than one learned as a child.

Reading Research

- Intensive reading instruction after age 10 creates lasting chemical changes in the brain
- Carnegie Mellon research, August, 2008: “The brain can permanently rewire itself and overcome reading deficits. . . With intensive instruction.”

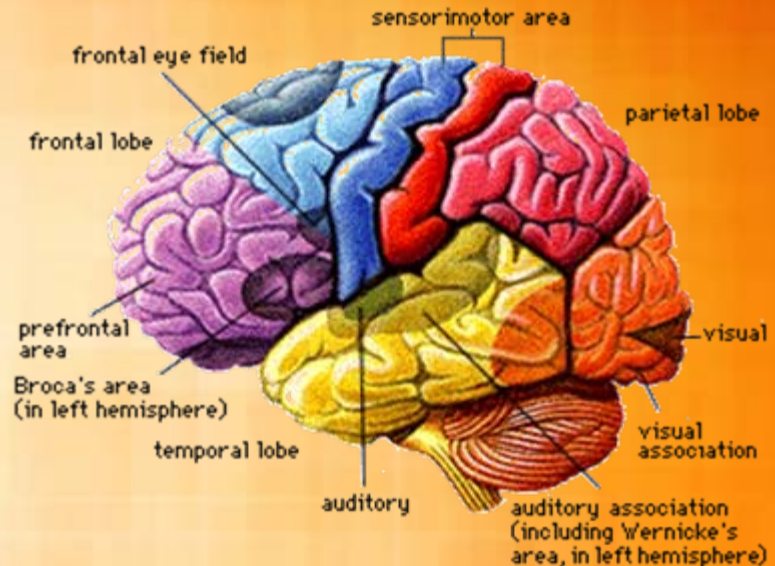
Brain Research with Reading Difficulties

- Frontal lobe controls speech, reasoning, emotions
- Broca's area organizes language



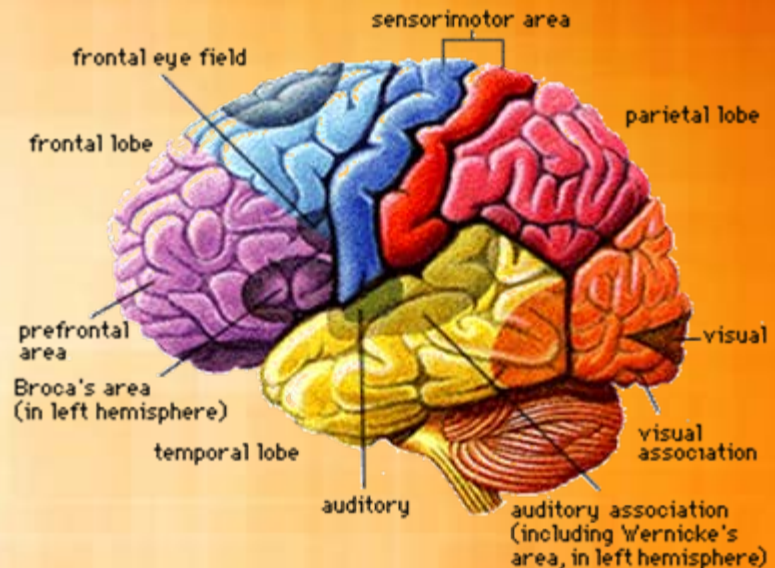
Reading Difficulties

- Parietal lobe controls sensory perceptions and links language to memory, giving it meaning
- Occipital lobe - primary visual cortex - identifies letters



Reading Difficulties

- Temporal lobe controls verbal memory, language processing
- Pareitotemporal system - decoding
- Occipitotemporal area - fluency



Structural Brain Differences

- Gray Matter/White Matter differences may influence processing information and phonological awareness
- Hemispherical asymmetry may cause reading/spelling problems

Functional Brain Differences

- Poor readers have underactivation in many areas, overactivation in others as compensation, so the system is less efficient
- Good readers have more activation in all areas involved with reading
- Most of the research involves fMRI technology

Improving Reading

- Change doesn't happen overnight
- It's not easy, casual, or arbitrary
- Learners must pay attention to sensory inputs and the task at hand
- Example: Biofeedback uses at least 50 sessions
- Many programs available

Time for Reading

By age 21, digital natives spent:

- 10,000 hours - video games
- 200,000 emails
- 20,000 hours - TV
- 10,000 hours - cell phone
- Under 5,000 hours - reading
- Pitching coach - 10,000 hours of practice to master a craft, or 3 hours per day for 10 years

So what do we do?

- Teach reading at all levels in all areas
- Teach reading strategies (KWL, HUG)
- Teach metacognition
- Be a mentor and model reading
- Control the competition
- Give them choices and control
- Practice, practice, practice
- Use technology when appropriate

“Turn on the Lights”

- Give students opportunities to use technology at school
- Find out how students want to be taught
- Connect students to the world
- Understand where kids are going and help them get there

Marc Prensky

Bibliography

- Abram, Stephen. *The New Scholar: How are they different and how are libraries changing?* Jan. 8, 2008 National Association of Independent Schools, Powerpoint. SirsiDynix.
- Collection Chamber: A Playground for the Mind. <http://imagineatrium.blogspot.com/2008/08/put-your-brain-to-test.html>
- Hudson, Roxanne F., Leslie High, and Stephanie Al Otaiba. "Dyslexia and the brain: what does current research tell us? " *The Reading Teacher* 60.6 (March 2007): 506(10). *Expanded Academic ASAP*. Gale. Blue Earth Area Public Schools. 2 Oct. 2008.
- Meyler A, Keller TA, Cherkassky VL, Gabrieli JD, Just MA. "Modifying the brain activation of poor readers during sentence comprehension with extended remedial instruction: a longitudinal study of neuroplasticity." Center for Cognitive Brain Imaging, Department of Psychology, Carnegie Mellon University, *Neuropsychologia*. 2008 Aug;46 (10):2580-92. <http://www.ncbi.nlm.nih.gov/pubmed/18495180>
- Prensky, Marc. "Engage me or Enrage me: what today's learners demand." *Educause Review*. September/October 2005. <http://net.educause.edu/ir/library/pdf/ERM0553.pdf>.
- Prensky, Marc. Digital Natives, Digital Immigrants.
<http://marcprensky.com/writing/PrenskyDigitalNatives,DigitalImmigrants Part1.pdf>
- Prensky, Marc. Digital Natives, Do They Really Think Differently?
<http://marcprensky.com/writing/PrenskyDigitalNatives,DigitalImmigrantsPartII.pdf>
- "Remedial Instruction Rewires Dyslexic Brains, Provides Lasting Results, Carnegie Mellon Study Shows; Researchers Say Findings Could Usher in New Era of Neuro-Education.(Report)." *Ascribe Higher Education News Service* (August 5, 2008): NA. *Expanded Academic ASAP*. Gale. Blue Earth Area Public Schools. 2 Oct. 2008.
- Slavin, Robert E., Anne Chamberlain, Celia Daniels. "Preventing Reading Failure." *Educational Leadership*, Oct. 2007, 22 – 27.