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
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
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