A Child's World: Infancy through Adolescence

by Papalia, Olds and Feldman

Eleventh Edition

Chapter 13

Cognitive Development: Middle Childhood

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A Prime Time for Learning

- Children in the school years are inquisitive and eager to learn new skills.

PHOTODISC

Grand Theorist

- Jean Piaget developed a thesis of cognitive theory: How children think changes with time and experience, and these thought processes always affect behavior.

Stages of Development

TABLE 2.3 **Piaget's Periods of Cognitive Development**

Age Range	Name of Period	Characteristics of the Period	Major Gains During the Period
Birth to 2 years	Sensorimotor	Infants use senses and motor abilities to understand the world. Learning is active; there is no conceptual or reflective thought.	Infants learn that an object still exists when it is out of sight (*object permanence*) and begin to think through mental actions.
2–6 years	Preoperational	Children use *symbolic thinking,* including language, to understand the world. Thinking is *egocentric,* causing children to perceive the world from their own perspective.	The imagination flourishes, and language becomes a significant means of self-expression and of influence from others.
6–11 years	Concrete operational	Children understand and apply logical operations, or principles, to interpret experiences objectively and rationally. Their thinking is limited to what they can personally see, hear, touch, and experience.	By applying logical abilities, children learn to understand concepts of conservation, number, classification, and many other scientific ideas.
12 years through adulthood	Formal operational	Adolescents and adults think about abstractions and hypothetical concepts and reason analytically, not just emotionally. They can be logical about things they have never experienced.	Ethics, politics, and social and moral issues become fascinating as adolescents and adults take a broader and more theoretical approach to experience.

Piaget's Third Stage

- **Concrete operational thought** is the ability to reason logically about direct experiences and perceptions.

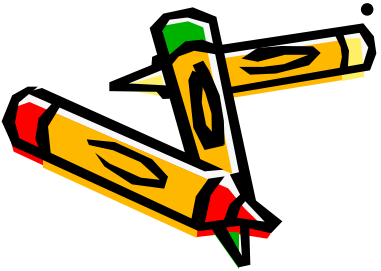
- Children in this stage become more systematic, objective, and scientific thinkers–but only about tangible, visible things.

Piagetian Approach: The Concrete Operational Child

- Cognitive Advances
  - Space and causality
  - Categorization
    - Seriation
      - Arrangement of objects in a series using one or more dimensions
    - Transitive inference
      - Ability to infer a relationship between two objects from the relationship between each of them and a third object
    - Class inclusion
      - Ability to see a relationship between a whole and its parts

Piagetian Approach: The Concrete Operational Child

- Cognitive Advances
  - Inductive reasoning
    - Specific to general
      - E.g.: My dog barks. Sue's dog barks. All dogs must bark
  - Deductive reasoning
    - General to specific
      - E.g.: All dog's bark. Spot is a dog. Spot barks.
    - Does not develop until adolescence



Piagetian Approach: The Concrete Operational Child

- Cognitive Advances
  - Conservation
    - Principle of identity
    - Principle of reversibility
    - Horizontal décalage
      - Inconsistency in the development of different types of conservation

Piagetian Approach: The Concrete Operational Child

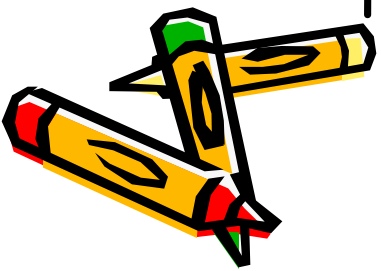
- Cognitive Advances
  - Number and Mathematics
    - By age 6 or 7 many can count in their heads
    - Able to count on
    - More adept at solving simple story problems

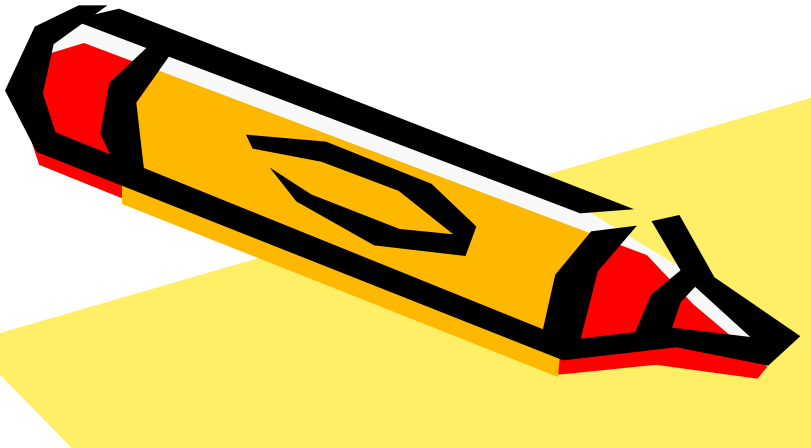
Piagetian Approach: The Concrete Operational Child

- Cognitive Advances
  - Number line estimation
  - Computational estimation
  - Numerosity estimation
  - Measurement estimation

Piagetian Approach: The Concrete Operational Child

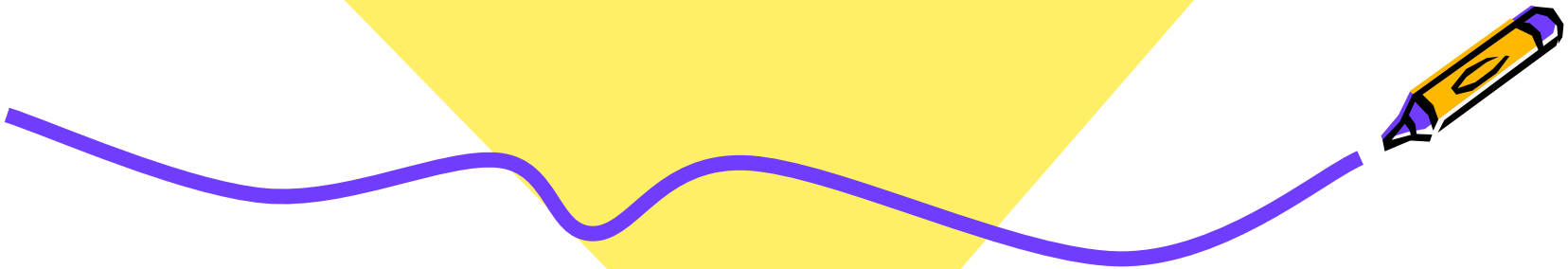
- Influences of Neurological Development and Schooling
  - Logical thinking of older child depends on neurological development and experience
  - Cross-cultural studies support progression from preoperational to operational thought





Moral Development

Group Activity



Piagetian Approach: The Concrete Operational Child

- Moral Reasoning
  - 1st stage
    - Ages 2-7; Corresponds with the preoperational stage
    - Rigid obedience to authority
    - Rules cannot be changed or bent

Piagetian Approach: The Concrete Operational Child

- Moral Reasoning
  - 2nd stage
    - Ages 7-11; Corresponds with the concrete operational stage
    - Increasing flexibility
    - Considers intent
    - Uses a wider range of viewpoints

Piagetian Approach: The Concrete Operational Child

- Moral Reasoning
  - 3rd stage
    - Ages 11 or 12; corresponds with formal operational stage
    - Equity
      - Takes specific circumstances into account

Information Processing

- Analyzes how the mind analyzes, stores, and retrieves information.

- Cognition becomes <u>more</u> <u>efficient</u> in middle childhood.

RUBBERBALL PRODUCTIONS

The Three "Parts" of Memory

- **Sensory register**: registers incoming stimuli for a split second
- **Working memory (short term)**: where current, conscious mental activity occurs
- **Long-term memory** = stores information for minutes, hours, days, months, years
  - Unlimited capacity (!)

Information-Processing Approach: Attention, Memory, and Planning

- Executive Function
  - Conscious control of thoughts, emotions, and actions to accomplish goals or solve problems
  - Can plan and use strategies or deliberate techniques to help them remember

Information-Processing Approach: Attention, Memory, and Planning

- How do Executive Skills Develop?
  - Development of the prefrontal cortex
  - Processing speed improves dramatically
  - Home environment contributes
    - Available resources
    - Cognitive stimulation
    - Maternal sensitivity

Information-Processing Approach: Attention, Memory, and Planning

- Selective Attention
  - Ability to deliberately direct one's attention and shut out distractions
- Inhibitory control
  - Voluntary suppression of unwanted responses
- Working Memory Span
  - Efficiency increases greatly

Information-Processing Approach: Attention, Memory, and Planning

- Metamemory: Understanding Memory
  - Knowledge about the processes of memory
  - Improvements both in processing speed and in storage capacity

Information-Processing Approach: Attention, Memory, and Planning

- Mnemonics: Strategies for Remembering
  - External Memory aids
  - Rehearsal
    - Conscious repetition
  - Organization
    - Mentally placing information into categories
  - Elaboration
    - Associating items with something else

Memory Exercise

Information-Processing Approach: Attention, Memory, and Planning

- Information Processing and Piagetian Tasks
  - Case (1985, 1992) states that as a child's application of a scheme becomes more automatic, space is freed in working memory to deal with new information
  - Improvements in memory may contribute to the mastery of conservation tasks

Speed of Processing

- **Speed of processing** increases during middle childhood.

- This allows a child to process more thoughts quickly, retain more thoughts in memory, and simultaneously process two different thoughts.

Make it Real: Learning a Subject

- *Do you find it easier to learn new material in your major field of interest than in a brand new subject?*

- *Why do think that is?*

Measuring the Mind

- Are grades an important measure of how a child is doing in school?

- However, why might someone want a different assessment in addition to grades?

Objective Tests of Ability

- Achievement Tests: measure what has been taught (given routinely in school).

- Aptitude Tests: measure one's potential

Psychometric Approach: Assessment of Intelligence

- Wechsler Intelligence Scale for Children (WISC-III)
  - Ages 6-16
  - Measures verbal and performance abilities
- Otis-Lennon School Ability Test (OLSAT8)
  - Kindergarten – 12th grade
  - Verbal comprehension; verbal, pictorial, figural, and quantitative reasoning

Psychometric Approach: Assessment of Intelligence

- The IQ Controversy
  - Positive
    - Standardized
    - Extensive information about norms, validity, and reliability
  - Negative
    - Equates intelligence with speed and penalizes a child who works slowly and deliberately
    - Infers intelligence from what children already know

Psychometric Approach: Assessment of Intelligence

- Influences on Intelligence
  - Genes and brain development
    - Pattern of development of prefrontal cortex
  - Influences of schooling in IQ
    - Scores drop during summer vacation
    - Language, spatial, and conceptual scores improve most between October and April

Psychometric Approach: Assessment of Intelligence

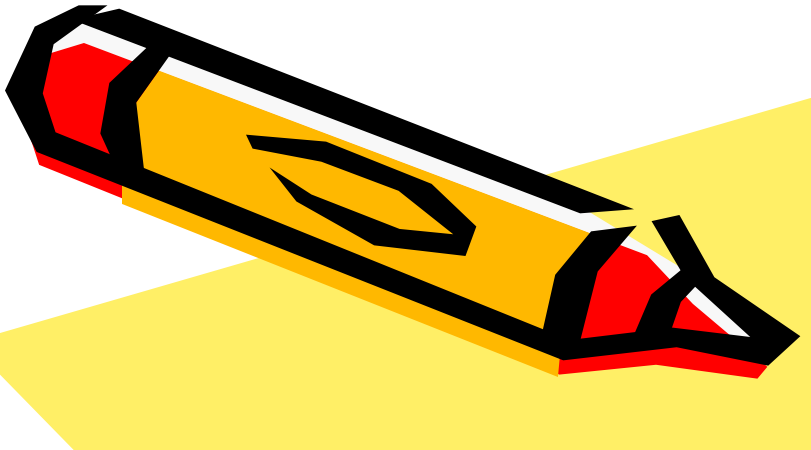
- Influences on Intelligence
  - Influences of Race/Ethnicity on IQ
    - Studies attribute ethnic differences in IQ largely to inequalities in environment -- income, nutrition, living conditions, health, parenting practices, and early childcare

Psychometric Approach: Assessment of Intelligence

- Influences on Intelligence
  - Influences of Culture on IQ
    - Cultural bias
    - Culture-free tests
    - Culture-fair tests
    - Culture-relevant tests

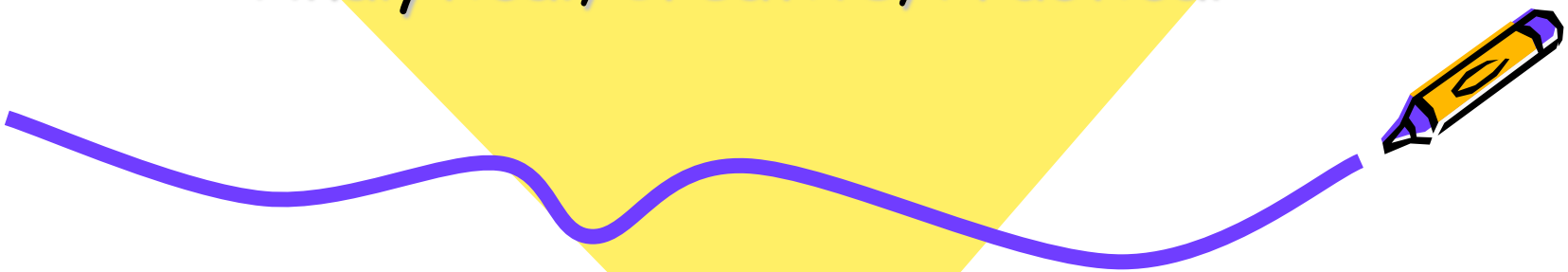
Psychometric Approach: Assessment of Intelligence

- Is There More Than One Intelligence?
  - Gardner's Theory of Multiple Intelligences
    - Linguistic
    - Logical-mathematical
    - Spatial
    - Musical
    - Bodily-kinesthetic
    - Interpersonal
    - Intrapersonal
    - Naturalistic



Intelligence Activity

Analytical, Creative, Practical



Psychometric Approach: Assessment of Intelligence

- Sternberg's Theory of Intelligence
  - Sternberg Triarchic Abilities Test (STAT)
    - Seeks to measure each of the three aspects of intelligence
    - Three domains
      - Verbal
      - Quantitative
      - Figural (spatial)

Psychometric Approach: Assessment of Intelligence

- New Directions in Intelligence Testing
  - Kaufman Assessment Battery for Children (K-ABC-II)
    - Ages 3-18
    - For children with diverse needs
  - Dynamic Tests
    - Contains items up to two years above a child's current level of competence
    - Gives teachers more useful information

Language: New Vocabulary

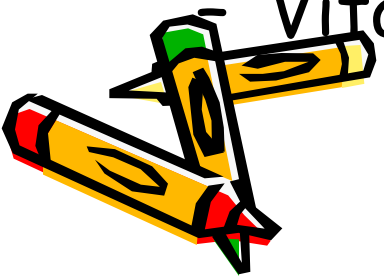
- School-age kids learn up to 20 new words a day.
- They understand metaphors and various uses of words.
  - **Examples**: egg, "walking on eggshells," "last one is a rotten egg," egg salad, etc.

Two "Codes" of Language

- **Formal Code:** used in school and other "formal" situations
  - Extensive vocabulary
  - Complex syntax
  - Lengthy sentences

Two "Codes" of Language *(cont.)*

- **Informal code:** language used with friends
  - Fewer words, simpler syntax
  - Gestures and intonation convey meaning
  - Vital for social acceptance



Code Switching: A Life Saver

- Kids in middle childhood learn that certain words and phrases are okay with friends (informal code), but NOT with teachers or other adults.
- Failure to learn this could result in punishment for calling the teacher "dude"!

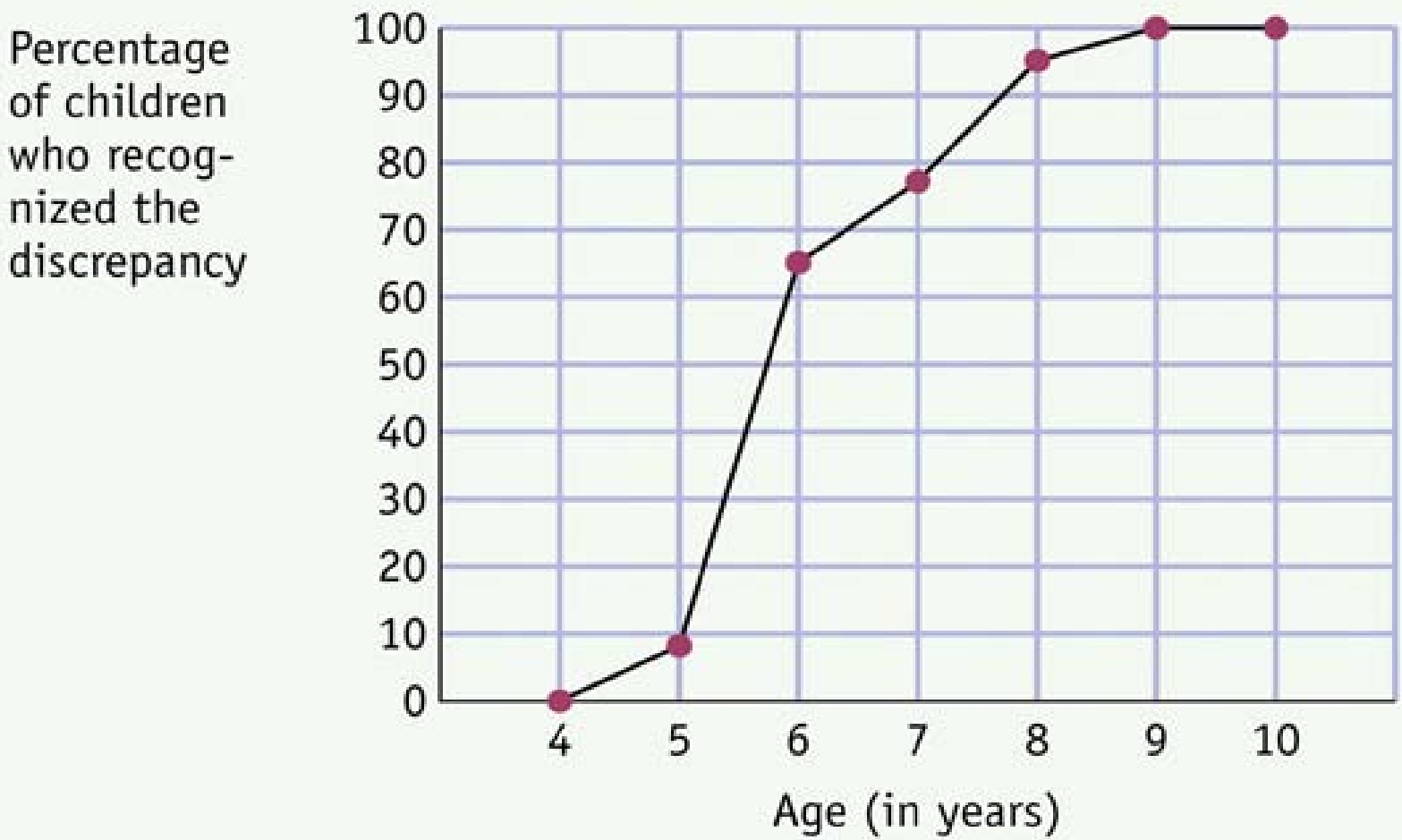
Socioeconomics and Language

- **Lower-income** children tend to have smaller vocabularies, simpler grammar, and more difficulty in reading.
- Two key explanations for this:
  - Exposure to language
  - Parental expectations towards education

Tones and Tricks

- By 10 years of age, children learn to understand the **nuances** of language (tone, sarcasm, puns).
- **Example**: 10 year olds recognized that saying "I lost my money" in a happy voice is strange.

Recognizing a Discrepancy Between Tone and Content of Speech



Source: Morton & Trehub, 2001.

Language and Literacy

- Vocabulary, Grammar, and Syntax
  - Use of precise verbs increases
  - Figures of speech become more common
    - Similes
    - Metaphors
  - Sentence structure becomes more elaborate
    - More subordinate clauses

Language and Literacy

- Pragmatics: Knowledge About Communication
  - Practical use of language to communicate
  - Includes both conversational and narrative skills

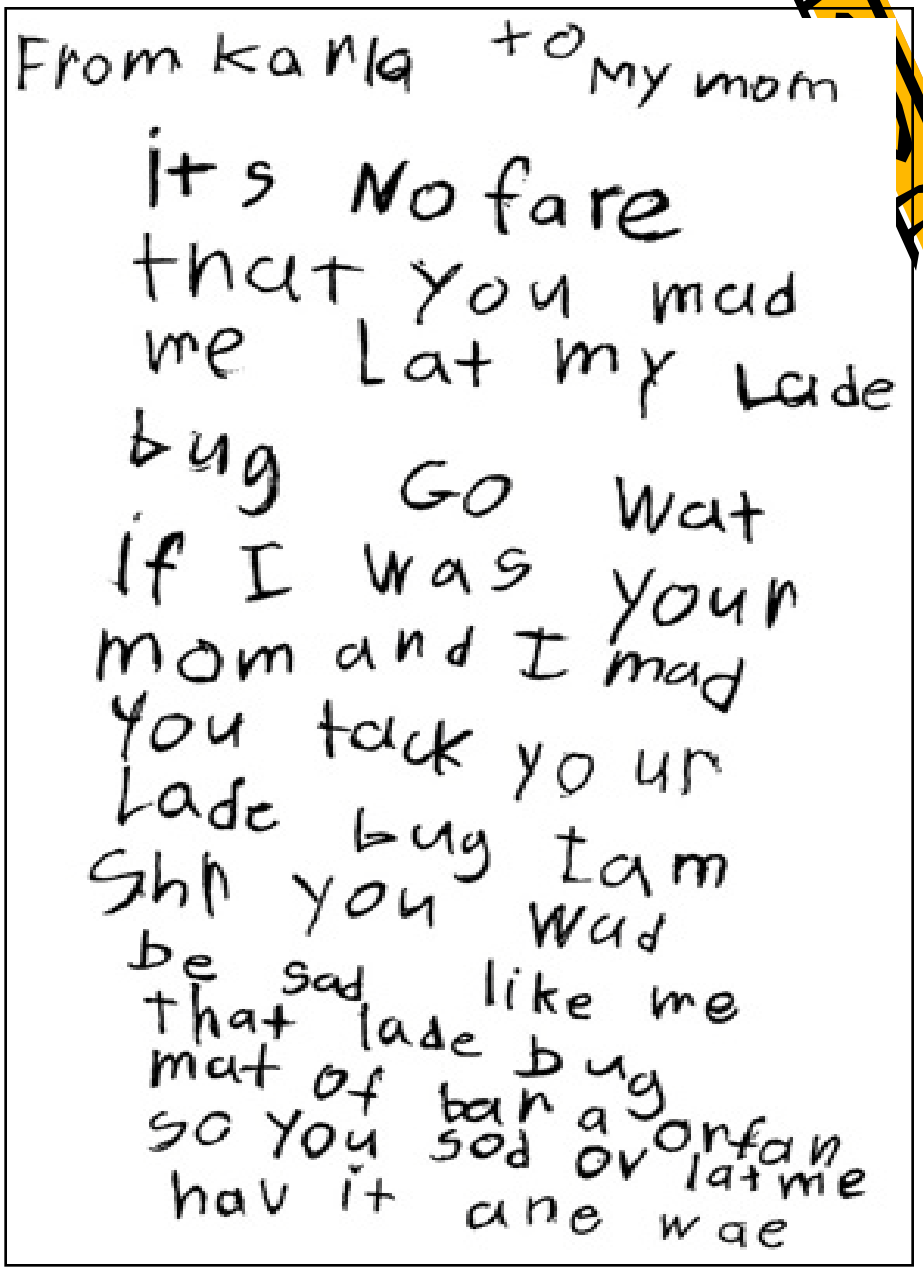
Language and Literacy

- Pragmatics: Knowledge About Communication
  - Reading
    - Decoding
    - Visually-based retrieval
    - Phonetic or code-emphasis approach
    - Whole-language approach

The Reading Wars

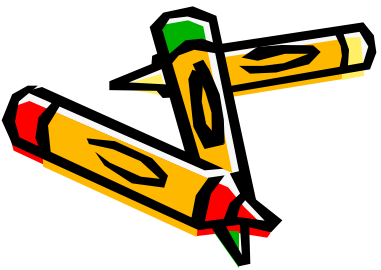
- **Phonics approach**: teaching reading by first teaching the sounds of each letter
- **Whole-language**: teaching reading by early use of all language skills–talking, listening, reading, and writing
- **BOTH** approaches are valuable

Quiz: Which approach is this?



Pragmatics: Knowledge About Communication

- Pragmatics: Knowledge About Communication
  - Writing
    - Is difficult for young children
    - Must be judged independently
    - Constraints
      - Spelling, punctuation, grammar, and capitalization



The Child in School

- Entering First Grade
  - Interest, attention, and active participation are positively associated with achievement test scores
  - Risk of school failure
    - SES
    - Academic, attentional, or behavioral problems

The Child in School

- Influences on School Achievement: An Ecological Analysis
  - Self-efficacy beliefs
  - Gender
  - Parenting practices
  - Socioeconomic status
    - Social capital
  - Peer acceptance

The Child in School

- Influences on School Achievement: An Ecological Analysis
  - Educational system
    - The school environment
  - Current Educational developments
    - Termination of social promotion
    - Computer and internet use

The Hidden Curriculum

- The **hidden curriculum** is the unofficial, unstated rules that influence learning.

- **Examples**: discipline strategies, teacher salaries, class size, testing, schedules, emphasis on sports, segregation by ethnicity, physical condition of the school

Bilingual Education

- About 4 million U.S. children are **English-language learners (ELL).**

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Bilingual Education *(cont.)*

- Middle childhood is an ideal time to teach a second language.
- However, there is considerable debate about when and how to teach a second language.

Types of 2nd Language Programs

- **Total (English) immersion**: all instruction in second language
- **Reverse immersion**: instruction of basic subjects in first language, then second language is taught
- **Bilingual education**: instruction in both languages

Types of 2nd Language Programs *(cont.)*

- **Heritage language classes**: after school classes to connect with native culture
- **English as a second language (ESL)**: exclusive English for a few months, in preparation for "regular" classes

Which type is best?

- Research in Canada found the total immersion approach to be very successful.
- However, there is no one right answer. The goal is to help immigrant children preserve their culture, while learning the new language.

Educating Children with Special Needs

- Children with Learning Problems
  - Cognitively "Mentally" Challenged
    - Significantly subnormal cognitive functioning
    - IQ of about 70 or less
    - Deficiency in age-appropriate adaptive behavior before age 18
      - Communication
      - Social skills
      - Self-care

Educating Children with Special Needs

- Children with Learning Problems
  - Learning disabilities
    - E.g. dyslexia
    - Processing sensory information
    - Language impairment
    - Reading disability
    - Mathematical disability

Educating Children with Special Needs

- Children with Learning Problems
  - Attention-deficit/hyperactivity disorder (ADHD)
    - Persistent inattention
    - Distractibility
    - Impulsivity
    - Low tolerance for frustration
    - Much activity at the wrong time such as in a classroom

Educating Children with Special Needs

- Educating Children with Disabilities
  - Individuals with Disabilities Education Act
    - Ensures a free, individualized public education for all children with disabilities
    - Least restrictive environment
    - Inclusion programs

Educating Children with Special Needs

- Gifted Children
  - Identifying gifted children
    - Score on a general intelligence IQ test of 130 or higher
    - Tends to excluded highly creative children, minorities, and children with specific aptitudes
    - Gardner's multiple intelligences suggests some children may be gifted in different areas

Educating Children with Special Needs

- What Causes Giftedness?
  - Innate characteristics
  - Motivation
  - Hard work
- Lewis M. Terman's longitudinal study

Educating Children with Special Needs

- Defining and Measuring Creativity
  - Convergent thinking
    - Seeks a single correct answer
    - IQ tests
  - Divergent thinking
    - Seeks a wide array of possibilities
    - Creativity

Educating Children with Special Needs

- Educating Gifted Children
  - Enrichment versus Acceleration
    - Enrichment
      - Deepens knowledge and skills through extra classroom activities, research projects, field trips, or expert coaching
    - Acceleration
      - Speeds up their education through early school entrance, grade skipping, placement in fast-paced classes or advanced courses

Educating Children with Special Needs

- Julian Stanley: Seeking and Nurturing the Profoundly Gifted
  - Study of Mathematically Gifted Youth (SMPY) at Johns Hopkins University
  - Gifted 12 and 13 year-olds can take advanced summer courses and can apply for very early college entrance
  - Accepted the top 0.001 percent of gifted young people

Make it Real: The No Child Left Behind Act

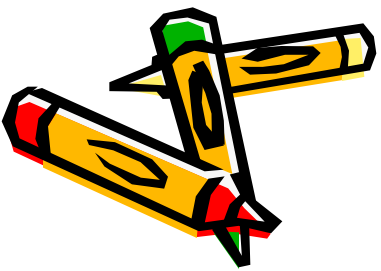
- *This Act requires yearly testing and a certain level of achievement in order for schools to receive federal funding.*
- *Were you affected by this Act? Do you think it is a good idea? Why or why not?*

The No Child Left Behind Act

- The Act is controversial. Some questions include:
  - What about the arts and physical education?
  - Does it punish schools that need funding the most?
  - Should graduation (or not) depend on a test?
  - What about special needs students?

The Math Wars

- Math is an often feared subject, but one of utmost importance.
- **New curriculum** discourages rote learning, emphasizing problem solving, and *understanding* of concepts.
- The focus is on the thought process, not just the final answer.



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