

ESSENTIALS OF LIFE-SPAN DEVELOPMENT

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PHYSICAL AND COGNITIVE DEVELOPMENT IN EARLY CHILDHOOD

5

CHAPTER OUTLINE

- Physical changes
- Cognitive changes
- Language development
- Early childhood education

PHYSICAL CHANGES

- Body growth and change
 - Average growth is 2½ inches and 5-7 pounds per year
 - Gender differences
 - Girls are slightly smaller and lighter than boys
 - Girls have more fatty tissue, boys have more muscle tissue
 - Trunk of the body lengths
 - Body fat shows a slow, steady decline

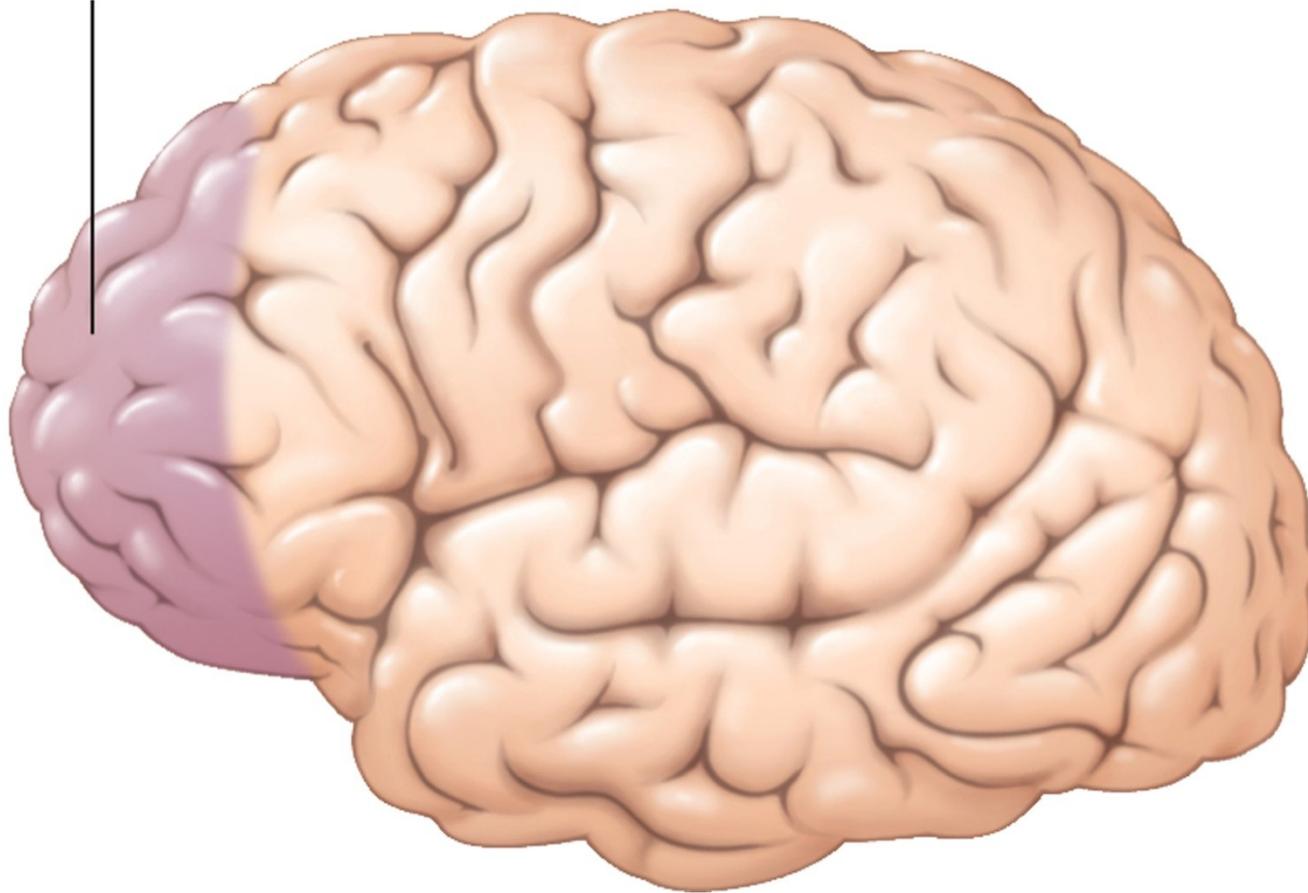
PHYSICAL CHANGES

- The brain
 - Continuing development of brain and nervous system
 - Increasing brain maturation linked to emerging cognitive abilities
 - Rapid, distinct growth spurts
 - Most rapid growth in the *prefrontal cortex* from 3-6 years
 - **Myelination:** Process through which axons are covered with a layer of fat cells
 - Increases the speed and efficiency of information traveling through the nervous system
 - Linked to attention, hand-eye coordination, higher-level thinking skills

FIGURE 5.1 - THE PREFRONTAL CORTEX

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Prefrontal cortex



PHYSICAL CHANGES

- Gross motor skills
 - Simple movements at age 3
 - More adventurous at age 4
 - Hair-raising risks at age 5
- Fine motor skills
 - Still clumsy at 3 years
 - More precise fine motor coordination at 4 years
 - Coordination continues to improve by 5 years

PHYSICAL CHANGES

- Overweight young children
 - Serious health problems in early childhood
 - Strongly influenced by caregivers' behavior
 - Determined by body mass index
 - U.S. has second highest rate of childhood obesity
- Exercise
 - Young children should engage in physical activity every day
 - 2 hours of daily physical activity recommended

PHYSICAL CHANGES

- Illness and death
 - Leading causes of death in early childhood in U.S. are:
 - Accidents
 - Cancer
 - Cardiovascular disease
 - Safety influenced by:
 - Children's own skills and safety-related behaviors
 - Characteristics of their family, home, school, peers, and community
 - Parental smoking is a major danger to children's health

FIGURE 5.2 - CHARACTERISTICS THAT ENHANCE YOUNG CHILDREN'S SAFETY

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Individual

- Development of social skills and ability to regulate emotions
- Impulse control (such as not darting out into a street to retrieve a ball)
- Frequent use of personal protection (such as bike helmets and safety seats)

Family/Home

- High awareness and knowledge of child management and parenting skills
- Frequent parent protective behaviors (such as use of child safety seats)
- Presence of home safety equipment (such as smoke alarms and cabinet locks)

School/Peers

- Promotion of home/school partnerships
- Absence of playground hazards
- Injury prevention and safety promotion policies and programs

Community

- Availability of positive activities for children and their parents
- Active surveillance of environmental hazards
- Effective prevention policies in place (such as pool fencing)

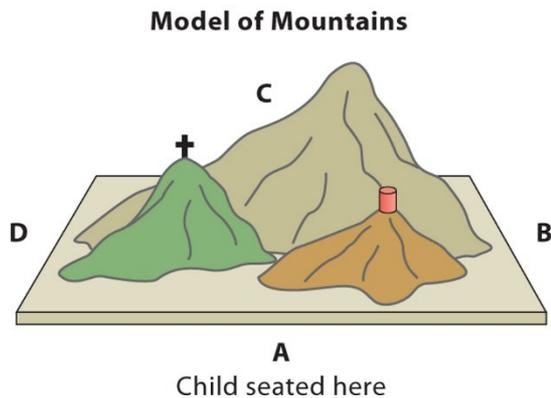
COGNITIVE CHANGES

- Piaget's **Preoperational Stage** (ages 2-7)
 - Children represent the world with words, images, and drawings
 - Form stable concepts and begin to reason
 - Cognitions are dominated by egocentrism and magical beliefs
 - Do not yet perform **operations** – reversible mental actions

COGNITIVE CHANGES

- **Symbolic function substage** (ages 2-4): Child gains the ability to mentally represent an object that is not present
 - Two important limitations:
 - **Egocentrism:** Inability to distinguish one's own perspective from someone else's
 - **Animism:** Belief that inanimate objects have lifelike qualities and are capable of action

FIGURE 5.3 - THE THREE MOUNTAINS TASK



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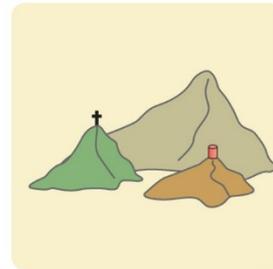


Photo 1
(View from A)

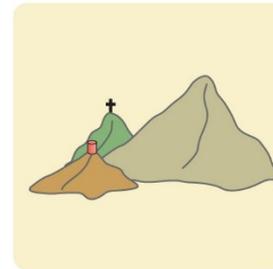


Photo 2
(View from B)

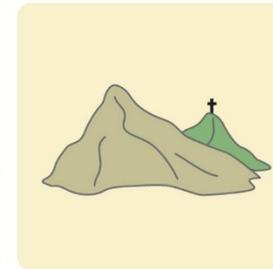


Photo 3
(View from C)

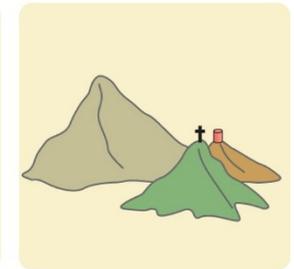


Photo 4
(View from D)

COGNITIVE CHANGES

- **Intuitive thought substage** (ages 4-7): Children use primitive reasoning and want to know the answers to questions
 - “Why?” questions signify an interest in reasoning
 - Two important limitations:
 - **Centration:** Centering attention on one characteristic to the exclusion of all others
 - **Conservation:** Altering a substance’s appearance does not change its basic properties

FIGURE 5.4 - PIAGET'S CONSERVATION TASK

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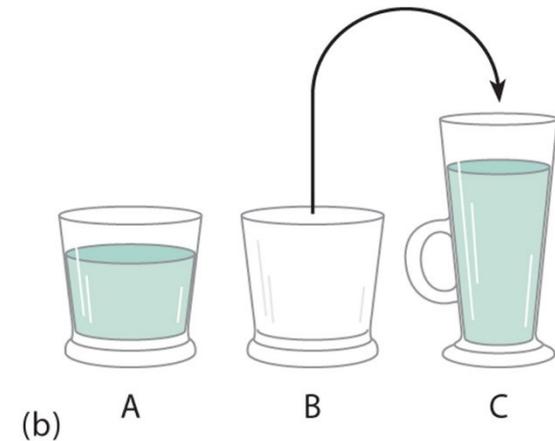
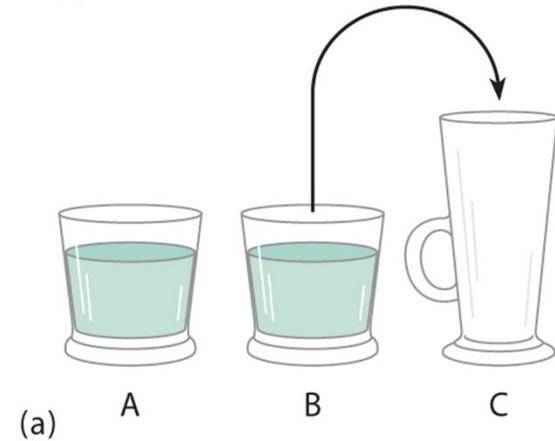
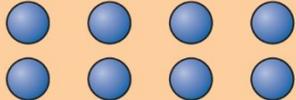
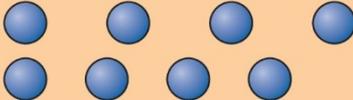
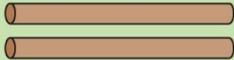
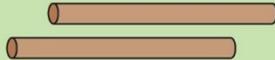


FIGURE 5.5 - SOME DIMENSIONS OF CONSERVATION: NUMBER, MATTER, AND LENGTH

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Type of Conservation	Initial Presentation	Manipulation	Preoperational Child's Answer
Number	 <p>Two identical rows of objects are shown to the child, who agrees they have the same number.</p>	 <p>One row is lengthened and the child is asked whether one row now has more objects.</p>	Yes, the longer row.
Matter	 <p>Two identical balls of clay are shown to the child. The child agrees that they are equal.</p>	 <p>The experimenter changes the shape of one of the balls and asks the child whether they still contain equal amounts of clay.</p>	No, the longer one has more.
Length	 <p>Two sticks are aligned in front of the child. The child agrees that they are the same length.</p>	 <p>The experimenter moves one stick to the right, then asks the child if they are equal in length.</p>	No, the one on the top is longer.

COGNITIVE CHANGES

- Vygotsky's **social constructivist approach**
 - Emphasizes social contexts of learning
 - Construction of knowledge through social interaction
- **Zone of proximal development (ZPD):** Range of tasks that are too difficult for the child alone but that can be learned with guidance
 - *Scaffolding* - Changing the level of support
 - More-skilled person adjusts amount of support to fit child's current performance level

FIGURE 5.6 - VYGOTSKY'S ZONE OF PROXIMAL DEVELOPMENT

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Upper limit

Level of additional responsibility
child can accept with assistance
of an able instructor

**Zone of proximal
development (ZPD)**

Lower limit

Level of problem solving
reached on these tasks by
child working alone



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COGNITIVE CHANGES

- Language and thought
 - Children use speech to communicate socially and to help them solve tasks
 - *Private speech* - Use of language for self-regulation
 - Important tool of thought during early childhood
 - Children internalize inner speech, which becomes their thoughts
 - More private speech = more social competence

FIGURE 5.7 - COMPARISON OF VYGOTSKY'S AND PIAGET'S THEORIES

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	Vygotsky	Piaget
Sociocultural Context	Strong emphasis	Little emphasis
Constructivism	Social constructivist	Cognitive constructivist
Stages	No general stages of development proposed	Strong emphasis on stages (sensorimotor, preoperational, concrete operational, and formal operational)
Key Processes	Zone of proximal development, language, dialogue, tools of the culture	Schema, assimilation, accommodation, operations, conservation, classification
Role of Language	A major role; language plays a powerful role in shaping thought	Language has a minimal role; cognition primarily directs language
View on Education	Education plays a central role, helping children learn the tools of the culture	Education merely refines the child's cognitive skills that have already emerged
Teaching Implications	Teacher is a facilitator and guide, not a director; establish many opportunities for children to learn with the teacher and more-skilled peers	Also views teacher as a facilitator and guide, not a director; provide support for children to explore their world and discover knowledge

(Vygotsky): A.R. Lauria/Dr. Michael Cole, Laboratory of Human Cognition, University of California, San Diego; (Piaget): © Bettmann/Corbis;

COGNITIVE CHANGES

- Evaluating Vygotsky's theory
 - Vygotsky was not specific enough about age-related changes
 - Overemphasized the role of language in thinking
 - How much is too much collaboration and guidance?

COGNITIVE CHANGES

- *Attention* - Focusing of mental resources on select information
 - **Executive attention:**
 - Action planning
 - Allocating attention to goals
 - Error detection and compensation
 - Monitoring progress on tasks
 - Dealing with novel or difficult circumstances
 - **Sustained attention:** Focused and extended engagement with object, task, event, or other aspect of the environment
- Children make advances in both forms of attention
 - Greatest increase in sustained attention during early childhood

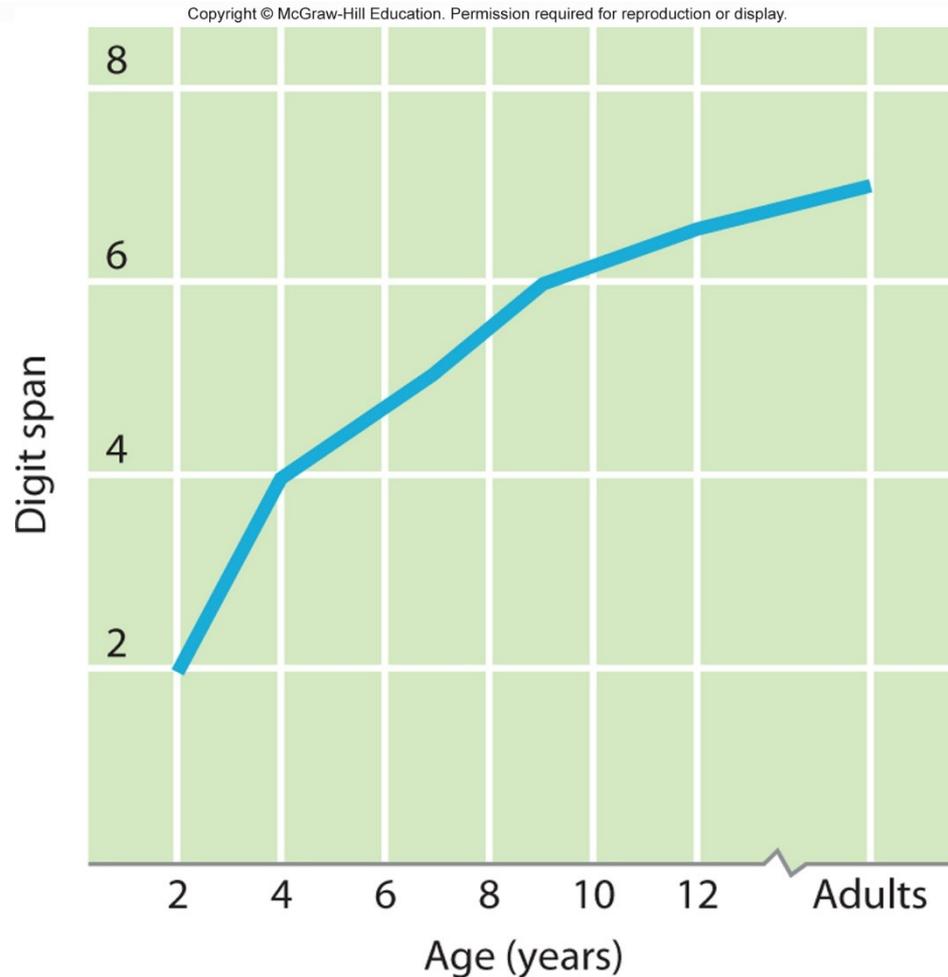
COGNITIVE CHANGES

- Deficiencies in attention
 - Salient versus relevant dimensions
 - Planfulness
- Ability to control and sustain attention is related to school readiness

COGNITIVE CHANGES

- *Memory* - Retention of information over time
 - **Short-term memory:** Individuals can retain information up to 30 seconds with no rehearsal
 - Increases during early childhood
 - Assessed with memory span task
 - Memory span increases with age
 - *Rehearsal* - repeating information after it has been presented
 - Used more often as a memory strategy among older children
 - Speed and efficiency of processing also increases memory span

FIGURE 5.8 - DEVELOPMENTAL CHANGES IN MEMORY SPAN



COGNITIVE CHANGES

- How accurate are young children's long-term memories?
 - Age differences in children's susceptibility to suggestion
 - Individual differences in susceptibility
 - Interviewing techniques can produce substantial distortions in children's reports about highly salient events
- *Autobiographical memory*
 - Memory of significant events and experiences in one's life
 - Young children's memories take on more autobiographical characteristics

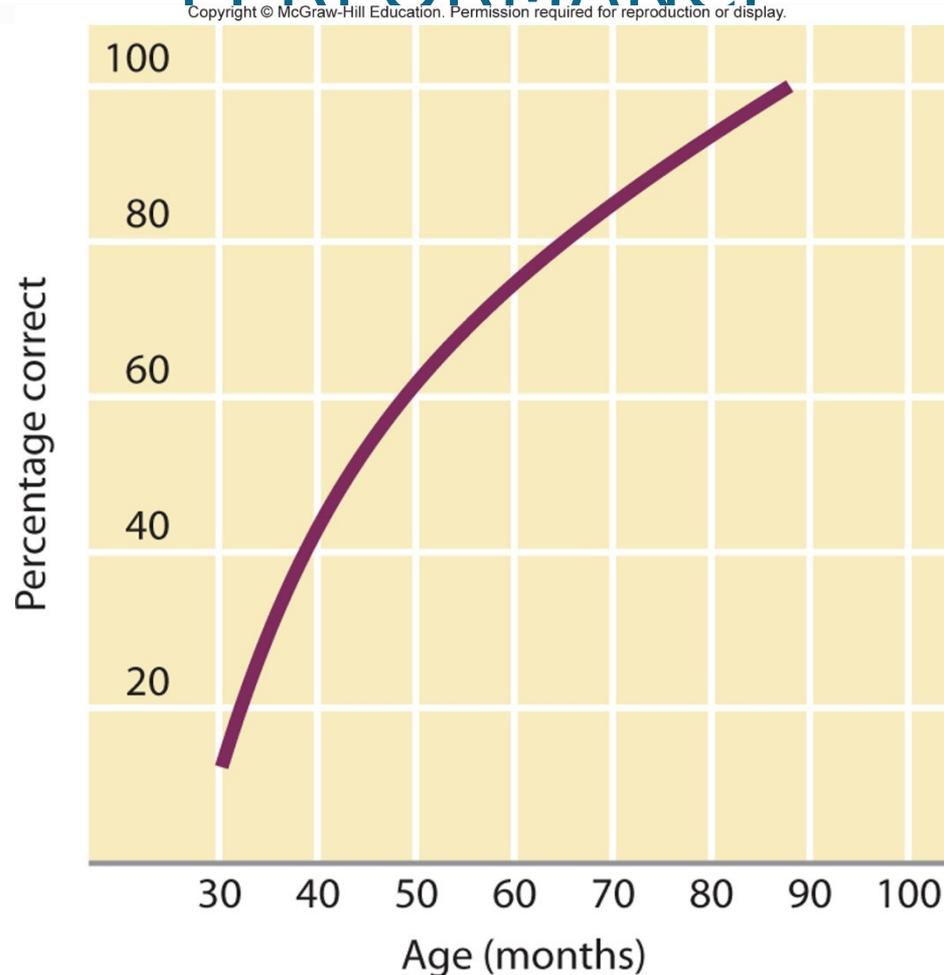
COGNITIVE CHANGES

- **Executive function:**
 - Umbrella-like concept that encompasses higher-level cognitive processes:
 - Managing one's thoughts to engage in goal-directed behavior and self-control
 - In early childhood, there are developmental advances in:
 - Cognitive inhibition
 - Cognitive flexibility
 - Goal-setting
 - Delay of gratification
 - Advances in executive function linked to school readiness

COGNITIVE CHANGES

- **Theory of mind:** Awareness of one's own mental process and the mental processes of others
 - Ages 2 to 3 - Children begin to understand the following three mental states:
 - Perceptions
 - Emotions
 - Desires
 - Ages 4-5
 - Realization that others have *false beliefs*

FIGURE 5.10 - DEVELOPMENTAL CHANGES IN FALSE-BELIEF PERFORMANCE



COGNITIVE CHANGES

- Individual differences in ages in which children reach milestones of theory of mind
 - Parents who talk to children about feelings frequently
 - Children with autism
 - Symbolic skills
 - Language development

LANGUAGE DEVELOPMENT

- **Phonology:** Sound system of a language, including the sounds used and how they may be combined
- During preschool years, children:
 - Become sensitive to the sounds of spoken words
 - Produce all the sounds of their language
 - Demonstrate a knowledge of morphology rules
 - Use plurals, possessives, prepositions, articles, and verb forms
- **Morphology:** Units of meaning involved in word formation

LANGUAGE DEVELOPMENT

- Learn and apply rules of syntax
 - **Syntax:** Involves the way words are combined to form acceptable phrases and sentences
- Growing mastery of complex rules for how words should be ordered
 - **Semantics:** Meaning of words and sentences
 - **Pragmatics:** Appropriate use of language in different contexts

LANGUAGE DEVELOPMENT

- Young children's literacy
 - Parents and teachers provide supportive atmosphere for developing literacy skills
 - Children should participate in a wide range of listening, talking, writing, and reading experiences
 - Instruction should be built on what children already know about language, reading, and writing
 - Strategies for using books effectively with preschool children
 - Use books to initiate conversation
 - Use what and why questions
 - Encourage children to ask questions about stories
 - Choose some books that play with language

EARLY CHILDHOOD EDUCATION

- **Child-centered kindergarten**
 - Emphasizes education of the whole child and promoting physical, cognitive, and socioemotional development
 - Principles of child-centered kindergarten:
 - Each child follows unique developmental pattern
 - Learn best through firsthand experiences with people and materials
 - Play is important in child's total development

EARLY CHILDHOOD EDUCATION

- **Montessori approach**
 - Child is given freedom and spontaneity in choosing activities
 - Seeks to develop “self-regulated problem solvers who can make choices and manage time effectively”
 - Deemphasizes verbal interactions in socioemotional development
- **Developmentally appropriate practice (DAP)**
 - Based on typical developmental patterns of children within a particular age span (age-appropriateness)
 - Uniqueness of each child (individual-appropriateness)

EARLY CHILDHOOD EDUCATION

- Education for young children who are disadvantaged
 - **Project Head Start**
 - Compensatory program designed to provide children from low-income families opportunity to acquire the skills and experiences important for success in school
 - Represents the largest federally-funded program for U.S. children

EARLY CHILDHOOD EDUCATION

- Controversies in early childhood education
 - Early childhood curriculum
 - Child-centered, constructivist approach, along the lines of developmentally appropriate practice
 - Academic, direct instruction approach
 - Universal preschool education