Developmental Milestones

CHILD DEVELOPMENT is different from child growth. Child development milestones monitor learning, behavior, and skills that most children achieve at a specific age. In contrast, growth refers to a child becoming larger in size. Yet child development encompasses cognitive skills, physical development of gross and fine motor skills, social skills, and communication skills. Developmental milestones denote skills that most children tend to perform at a certain age. However, not all children develop at the same pace. Development is influenced by genetics, culture, nutrition, education, and environment.

Objectives:

1. Identify cognitive developmental milestones.
2. Describe physical developmental milestones.
3. Explain social-emotional developmental milestones.
4. Evaluate communication developmental milestones.

Key Terms:

baby sign language
concrete operations
fine motor skills
formal operations
gross motor skills
mouth feel
parallel play
preoperational
sensorimotor
tummy time

Cognitive Developmental Milestones

Cognitive developmental milestones are thinking skills that help children learn, understand, remember, reason, and solve problems. Young children are eager to explore their surroundings to actively learn before they can express themselves with language. Newborns explore with their five senses: sight, sound, touch, smell, and taste.

SIGHT PROVIDES KNOWLEDGE

Newborns can see as soon as they are born, though vision is fuzzy and mostly in shades of gray. They can see only 8 to 12 inches from their eyes—about the distance of a mother's face when babies are nursing. By two months, their eyes should work in tandem, can focus, and are able to maintain eye contact for short periods of time.

By three months, color recognition is fully mature, so babies are drawn to bright primary colors. Depth perception develops, and hand-eye coordination begins as babies reach and grasp. Babies recognize faces, follow objects with their eyes, and imitate facial expressions. By five months, babies can stare at objects and enjoy playing peek-a-boo, understanding that objects exist even when the objects are out of their sight. By eight months, sight is almost fully developed, with 20/20 vision. By nine months, babies can pick up and move objects.

FIGURE 1. Nine-month-old infants are learning to feed themselves by picking up food and moving it to the mouth.

SOUND STIMULATES LEARNING

Three-month-old babies respond to music and may look directly at you when you speak. They turn toward the origin of sounds and may gurgle in an attempt to talk back, especially to their mother's voice. By four months, babies may smile when they hear voices and may watch mouths intently and/or try to copy sounds (e.g., "m" and "b"). Nine-month-old babies realize where sounds originate and may create sounds themselves by dropping toys. In addition, 10-month-old babies may respond to their name and familiar sounds (e.g., a ringing telephone). Meanwhile, one-year-old babies may try to join in on favorite songs and repeat sounds made by other people.

TOUCH ENHANCES DEVELOPMENT

At birth, the sense of touch is fully developed. Touch teaches babies a lot about their surroundings. At first babies are looking for comfort. Soon, however, infants start exploring their personal environment by bringing whatever is touched to their mouths. **Mouth feel** is part of the touch sense used by young children.

Four-month-old babies like to feel their thumb and fingers. Meanwhile, six-month-old babies pick up items and explore them in their hands and mouths. Yet nine-month-old babies understand that objects still exist without touching or seeing them. They are able to experi-

ment by placing objects into a container and turning over the container to retrieve the objects. Toddlers, at about 13 months of age, continue to explore by touch and enjoy turning pages in books. The sense of touch teaches toddlers their limits when they fall or touch things that are too hot, too cold, or too rough.

FIGURE 2. A mother and daughter are reading a book together. The baby touches the pages as the mother reads aloud to her.

SMELL DEVELOPMENT BEGINS BEFORE BIRTH

The amniotic fluid that has surrounded babies exposes them to smells before birth. Almost instantly after birth, the sense of smell enables babies to identify their mothers. Just hours after birth, babies will turn away from unpleasant odors (e.g., rotten eggs) and will smile at the pleasant odor of bananas. Babies will continue to use smell to identify preferred foods. Sense of smell influences a lot of baby behaviors.

TASTE PREFERENCES CHANGE WITH DEVELOPMENT

Immediately after birth, infants can taste sweet, sour, and bitter. Sweetness is preferred. Bitter or sour tastes may make babies grimace or frown. Taste preference continues to develop throughout the first year of life, and it is thought that foods consumed by the mother during pregnancy influence future taste preferences. Yet texture influences taste appeal.

At four months of age, babies develop a taste for salty foods as salt receptors on the tongue develop. Extreme preferences for sweetness diminish over time. One-year-old children will eat one-fourth of an adult serving, but they may prefer to eat one kind of food at a time.

PIAGET: FOUR STAGES OF COGNITIVE DEVELOPMENT

Jean Piaget was a Swiss psychologist who lived from 1896 to 1980. He determined that cognitive development traces how a person perceives the environment and how a person processes that information. His studies explore the intellectual development of children as they transform into adults. Piaget observed that children are as intelligent as adults, but their thought process is quite different. The cognitive ability of children improves slowly, and each child develops at his or her own pace, depending on environment and genes. Piaget's observations

charted four stages of cognitive development where each stage is characterized by different behavior.

Sensorimotor

The first stage, sensorimotor, is the period from birth to age two. **Sensorimotor** is a stage in which children use motor and reflex action in trial and error experiments. They realize objects exist, even when they cannot see them. Yet they cannot perform abstract thinking and must hold up fingers to show their age. Behavior is limited to motor responses caused by sensory stimuli of sight, sound, touch, smell, and taste. After a few weeks, babies follow movement and learn to cause movement by manipulating their own arms and legs. They realize that objects continue to exist when they are not seen or heard. This phase of development—object permanence—is one of the most important steps in the sensorimotor stage. Abstract thinking has not developed as shown by a child's need to visibly hold up fingers to tell his or her age.

Preoperational

The second stage covers age two to seven. **Preoperational** is a stage that uses fantasy and extended pretend activities. The children have difficulty understanding time and will often ask: "How long until we get there?" In this stage, children must physically manipulate objects to learn and believe everyone thinks the way they do. Children in this development stage pick up language skills. They perceive things from only their point of view and use fantasy and pretend activities to explain their world. Understanding time is difficult. Yet children learn much by manipulating objects.

Concrete Operations

The third stage covers ages 7 to 12. **Concrete operations** is a stage in which thoughts are related to real-life situations rather than with abstract thoughts. Children realize their opinions are not shared by everyone. The children do not have to physically manipulate objects to learn but can mentally organize their thoughts. Thinking becomes more logical, and children grasp a better understanding about space and time. They can understand the perspectives of other people and can entertain more than one complex idea at a time. They learn to solve problems at this stage and can mentally organize ideas without physically manipulating objects.

Formal Operations

The fourth stage covers ages 13 through adulthood. **Formal operations** is a stage in which reasoning becomes abstract or relates to concrete objects. Children are able to think scientifically to test hypotheses by manipulating variables and holding other variables constant. They understand the mathematical proportional reasoning of ratios, fractions, percentages, and decimals.

DIGGING DEEPER...

UNCOVERING ADDITIONAL FACTS: Piaget's Theory of Moral Development

Jean Piaget studied stages of moral development in children. He concluded that children before the age of five or six experience a pre-moral judgment stage and have no concept of rules or morality.

Piaget's second moral development stage (moral realism) occurs between the ages of five and nine. Children at this stage follow rules without challenge, just because they exist. Morality is judged from the consequences and is considered fixed.

The third stage (moral relativity) begins around eight or nine years of age. Children learn that rules are not fixed and that they can be manipulated. In addition, they create their own ideas of morality.

Physical Development Milestones

Physical development milestones involve strengthening and learning to use small and large muscles. Development in the first two years is influenced more by biology than environment. The greatest amount of change occurs in infancy as babies gain control over their bodies. Beginning at birth, babies explore their surroundings using their senses and their developing muscles.

GROSS MOTOR SKILLS

Gross motor muscles are in the back, neck, arms, and legs. **Gross motor skills** are abilities that include the use of large groups of muscles to walk, sit upright, stand, lift, jump, reach, run, and maintain balance.

At birth, babies can hold their heads up for only a few seconds. By three months, the back and neck muscles develop enough for babies to hold their heads steady and lift their heads while lying on their stomachs. Time on the stomach is called **tummy time**—a period in which infants are

FIGURE 3. A baby experiencing tummy time explores a toy bear.

awake and are looking around the room. Tummy time gives infants a different view of the world. In addition, as babies lift their heads, the neck and upper back muscles are strengthened. These muscles help babies roll over, sit up, and crawl.

Between six and nine months of age, babies should be able to sit up without support, roll over from their backs to their stomachs, pull themselves upright (with assistance), and push their weight off the floor to rock back and forth, which is a prelude to crawling.

Around one year of age, infants typically are crawling with great speed and can pull themselves up to stand while holding onto furniture. Before the age of two, babies should be able to walk unaided and kick or roll a ball. By the third year of age, children generally can go up and down stairs unaided and can balance on one foot.

FIGURE 4. This two-year-old boy enjoys rolling a ball.

FINE MOTOR SKILLS

Fine motor muscles are in the hands, fingers, eyes, and lips. **Fine motor skills** are abilities that utilize small muscles found in the hands and fingers. These skills are used to write, draw, create works of art, coordinate hand-eye movements, pick up small objects between the fingers, dress, and tie shoes.

Three-month-old babies use small muscles in their hands and fingers to open and shut their hands. Arm muscles develop as babies reach out for objects. Typically, six-month-old babies reach and grasp objects to bring them to their mouths. Before nine months, babies develop the eye and hand coordination needed to pick up objects and transfer things from one hand to the other.

Between 9 and 12 months, infants can pick up food with their thumb and index finger, hold an item in each hand simultaneously, and practice dropping things. Between one and two years of age, children use utensils (often spoons) to feed themselves. Two-year-old toddlers scribble with crayons, and three-year-old children can use safety scissors.

ACTIVITIES CAN IMPROVE COORDINATION

Gentle tug-of-war with the baby can help develop muscle control. At the age of four months, infants can be pulled up with their fingers into a sitting position. Fine motor skills activities for children are the best way to promote the most functional use of hands. Useful activities are tying shoes, zipping and unzipping, drawing, painting, coloring, manipulating

small objects (e.g., coins), using scissors, turning pages in a book, using locks and keys, and doing puzzles.

FIGURE 5. A young child develops muscle coordination while playing with a colorful stacking toy.

Social-Emotional Developmental Milestones

Social-emotional developmental milestones happen as children interact with other people. According to "ABCs of Child Development—Developmental Milestones for Your Child's First Five Years," social and emotional milestones are "often harder to pinpoint than signs of physical development. This area emphasizes many skills that increase self-awareness and self-regulation." In addition, research shows that "social skills and emotional development (reflected in the ability to pay attention, make transitions from one activity to another, and cooperate with others) are a very important part of school readiness." The earliest emotions can be seen at four months when infants smile at a familiar face or voice. Also, babies demonstrate social behavior when they cry, coo, kick, and laugh to attract attention.

SIX TO NINE MONTHS

Between six and nine months, the feelings of infants can be influenced by your tone of voice, and they can relate to others with joy. Babies will smile when they are happy, cry when they are unhappy, and may experience anxiety around strangers.

TEN TO TWELVE MONTHS

When they are 10 to 12 months old, babies grow more sociable as they respond to their name, imitate simple actions of others, display separation anxiety when apart from the primary caregiver, develop a sense of humor, demonstrate affection, and show curiosity. Typically, at one year of age, babies like to play patty cake, peek-a-boo, and other social games.

ONE TO TWO YEARS

One to two-year-old babies recognize themselves in mirrors, begin showing signs of independence, help put toys away, engage in social laughter, and may hit or bite in frustration. The more babies hear the word "no," the more they will say "no," though the correct answer may

be "yes." During this age, imaginary play is displayed when children ride a broom for a horse, play house (imitating adult behavior), and dance in motion to music. Vocabulary may begin with the following words: "mama," "dada," and "bye-bye."

TWO YEARS

Two-year-old children begin to **parallel play**—engaging in an activity next to, but not with another child. At this age, they know gender identity, have a complete range of emotions, and may be prone to temper tantrums. As many as 50 words may be understood, and they begin putting two words together, such as "want cookie." The children can recognize names of body parts and will identify familiar objects that you name.

THREE YEARS

By the age of three, most children can share toys and begin to form friendships with other children. Play may be with dolls or imaginary companions, and children are eager to please. The children can answer simple questions (e.g., who, what, and where). Halfway to four years of age, children may show signs of self-will, may refuse to obey, and may express inconsistent behaviors.

SUPPORT FOR SOCIAL-EMOTIONAL DEVELOPMENT

Children develop social confidence in response to eye contact and smiles. Research suggests that quick responses to crying help children gain a sense of security. The emotional attachment and special relationship between babies and their parents, especially mothers, has a huge influence on their later achievement of such social and emotional milestones as security and friendliness.

OBSERVABLE EMOTIONAL REACTIONS

There are many skills that denote social and emotional milestones. Among them is the ability to identify and understand one's own feelings and accept emotional reactions from other people. Children must learn to manage their emotions and to express them in a constructive manner. Generally, children who control their own behavior and develop compassion for other people will establish and maintain relationships.

Children can have a range of emotions (e.g., happiness at overcoming obstacles, anger from having a goal blocked, and sadness due to a loss). Embarrassment or being self-conscious begins to develop at 18 months of age. Yet infants respond to the emotions of others (e.g., when infants cry because they hear other infants crying). Young children respond to another person's distress in hopes of making that person happy, such as when a child brings a favorite toy to an adult who is crying.

Evaluate Communication Development Milestones

Communication development milestones measure the ability of children to speak and understand language. In a few short years, children progress from newborns without language to creative communicators. Language development is a key element to every child's academic, emotional, and mental well-being. Children develop language skills in a predictable pattern, but the age at which they reach specific milestones varies.

LANGUAGE DEVELOPMENT

Language development begins at birth. Newborns express language by cooing, babbling, and crying. Eventually, the primary caregiver recognizes the various cries for food, attention, and a diaper change.

Two to Four Months

Somewhere between two and four months, infants can make such sounds of pleasure as sighs, grunts, and coos. Laughter often begins at about four months. Yet between three and six months of age, babies use high-pitched squeals to practice vowel sounds and may use body language to communicate.

Six to Nine Months

At six to nine months, infants blow bubbles to practice the "b" sound and make gestures to communicate simple gestures, such as "hi" and "bye-bye."

Nine to Twelve Months

At nine to twelve months, infants begin pointing to communicate and understand when they hear their name.

One to Three Years

Typically, first words begin around a child's first birthday. By the age of three, caregivers understand 75 percent of the child's speech, and 50 percent is understood by strangers. University of Pennsylvania experts estimate that children learn 10 new words a day and that they have a vocabulary of 900 to 1,000 words by age three.

HELPING INFANTS LEARN TO COMMUNICATE

Talking constantly to newborns helps build their foundation for communication. Caregivers should talk to their babies when they are being fed, bathed, and dressed. The more speaking the babies hear, the sooner they will develop language skills. Repetition of words and phrases helps. Babies should be encouraged to repeat simple words, and their attempts at speech should be praised.

BROADENING AWARENESS...

AMAZING ASPECTS:
Music Influences Language Skills

Health and educational professionals agree that music improves language skills. Like language, music has structure and rules. Music ensures that the words are sequenced in a predictable order and can teach new words and concepts through repetition. As a result, music helps language development. Nursery rhymes, singing, and dancing are important parts of childhood learning.

Music encourages taking turns, just as in conversation. The rhythm and rhyme of music encourages children to be aware of word sounds and meanings. Music helps teach new words, and they are more easily remembered when associated with a tune.

A baby creates music and develops muscle coordination skills during play time.

Music aids attention and listening skills. In addition, music with gestures and movement improves physical development and coordination skills. Music aids emotional development by motivating children to socialize. Also, musical involvement enhances self-esteem and confidence.

Singing songs and lullabies and reading nursery rhymes helps children develop communication skills. Also, exchanging facial expressions and sounds with children as well as listening when infants coo are early communication activities. Reading books and playing "Where is the…?" in pictures helps enhance active language skills. Pointing at items in a storybook from left to right helps introduce reading skills.

BABY SIGN LANGUAGE

As early as six months of age, baby sign language may be used. **Baby sign language** is the process of using hand gestures to communicate such words as mommy, daddy, milk, and eat. For instance, using baby sign language every time you give your baby milk (using the American Sign Language milk sign) will reinforce the meaning of the gesture and teach the baby to communicate the word. Infants develop the fine muscles in their hands before their vocal cords mature. Therefore, hand gestures allow young children to communicate as much as six months before they are able to speak.

Summary:

Child development milestones monitor the learning, behavior, and skills that most children achieve during a specific age range, though not all children develop at the

same pace. Cognitive developmental milestones are thinking skills that help children learn, understand, remember, reason, and solve problems. Newborns explore with their five senses: sight, sound, touch, smell, and taste.

Physical development milestones involve strengthening and learning to use small and large muscles. Gross motor muscles are in the back, neck, arms, and legs. In contrast, fine motor muscles are in the hands, fingers, eyes, and lips.

Social-emotional developmental milestones happen as children interact with other people. They are often harder to pinpoint than physical development milestones. Communication development milestones measure the ability of children to speak and understand language. Language development is a key element to academic, emotional, and mental well-being.

Checking Your Knowledge:

1. What are cognitive development milestones?
2. Which of the five senses are fully developed at birth?
3. Where are gross motor muscles, and where are minor motor muscles?
4. What milestone developments relate to interaction with people and to understanding and controlling one's emotions?
5. How do babies communicate before they learn to speak?

Expanding Your Knowledge:

Learn to use American Sign Language. Sign language is the use of hand gestures and facial expressions to communicate. Babies can be taught to communicate with sign language as much as six months before their vocal cords develop. Do you think sign language is a good skill to teach babies?

Web Links:

Child Development
http://www.howkidsdevelop.com/developSkills.html

Cognitive Stages
http://www.learningrx.com/cognitive-stages-for-child-development.htm

Social Skills
http://www.meddybemps.com/7.27.html

How Children Develop
http://www.howkidsdevelop.com/developSkills.html