Here is a major new work on human infancy written by one of the country's leading developmental psychologists and two distinguished colleagues. At its core is the long-awaited report of the authors' six-year study of infant daycare.

Sign up now Infant development: Birth to 3 months Infant development begins at birth. Expect your baby to grow and develop at his or her own pace. As you get to know your baby, consider these general infant development milestones. What to expect At first, caring for your baby might feel like an endless cycle of feeding, diapering and soothing. But soon your baby will be able to lift his or her head and chest while lying on his or her stomach, as well as stretch and kick his or her legs in that position. If you offer a toy, your baby might grasp it and hold on tight for a few moments. Your infant will be sensitive to noise levels. Expect your baby to begin responding to the sound of your voice by smiling and gurgling back at you. He or she will also begin turning toward the direction of sounds. Your baby will probably focus on your face, particularly your eyes, during feedings. At age 1 month, your baby will prefer to look at bold patterns in sharply contrasting colors or black-and-white. Soon your baby will begin to recognize familiar objects and people at a distance. By age 2 months, your baby might coo and repeat vowel sounds when you talk or gently play together. This can help your newborn feel safe, secure and loved. Let your baby grasp your little finger and touch your face. Simple conversation lays the groundwork for language development. Read a story out loud. Remember that your tone of voice communicates ideas and emotions as well. Hold your baby facing outward. With close supervision, place your baby on his or her tummy to play. Hold a colorful toy or make an interesting noise to encourage your baby to pick up his or her head. Many newborns get fussy or frustrated on their tummies, so keep these sessions brief at first just a few minutes at a time. If drowsiness sets in, place your baby on his or her back to sleep. Respond quickly to tears. For most newborns, crying spells peak about six weeks after birth and then gradually decline. Whether your baby needs a diaper change, feeding session or simply warm contact, respond quickly. Your care will help build a strong bond with your baby and the confidence he or she will need to settle down without your help one day. The earlier a problem is detected, the earlier it can be treated.
Important in its own right, this experiment becomes the occasion for a wide-ranging discussion of cognitive and emotional processes in infancy, of the effects of early experience on later growth, and of the deep-seated cultural and historical assumptions that underlie our views of human development.

Size and Shape Constancy: To accurately perceive objects, we must translate changing retinal images into a single representation. Both of these perceptual capacities appear to be innate and assist babies in detecting a coherent world of objects. Perception of Objects as Distinct, Bounded Wholes: The movement of objects relative to one another and to their background enables infants to construct a visual world of separate objects. At first, motion and spatial arrangements help infants identify objects. Intermodal perception combines information from more than one modality, or sensory system. Recent evidence indicates that babies perceive the world in an intermodal method from the beginning. Key Piagetian Concepts 1. Piaget believed children move through four stages of development between infancy and adolescence. During the sensorimotor stage, infants and toddlers "think" with their eyes, ears, hands, and other sensorimotor equipment. What Changes With Development: Schemes are action-based at first and later will move to a mental level. How Cognitive Change Takes Place: Organization 1 Organization is an internal process of rearranging and linking together schemes to form an interconnected cognitive system. The Sensorimotor Stage 1. Piaget based the sensorimotor stage on his observations of his own children. Reflexive Schemes - a. Piaget regarded newborn reflexes as the building blocks of sensorimotor intelligence. At first, babies suck, grasp, and look in much the same way, no matter what the circumstances. Infants develop simple motor skills and change their behavior in response to environmental demands. Circular reactions of this substage are secondary in that the infants repeat actions that affect the environment. Infants can imitate actions that they have practiced many times. Coordination of Secondary Circular Reaction - a. Intentional, or goal directed, behavior is the combination of schemes to solve problems. Piaget regarded mean send action sequences as the first sign that babies appreciate physical causality. Object permanence is the understanding that objects continue to exist when they are out of sight; it is not yet complete in this substage. AB search errors are committed by infants in this substage. Infants 8- to months-old only look for an object in hiding place A after the object is moved from A to hiding place B. Experimentation leads to a more advanced understanding of object permanence. Toddlers no longer make the AB search error. Mental representations are internal images of absent objects and past events. The toddler can now solve problems through symbolic means instead of trial-and-error. Representation allows deferred imitation-the ability to copy the behavior of models who are not immediately present. Functional play is motor activity with or without objects during the first year and a half in which sensorimotor schemes are practiced. At the end of the second year, representation permits toddlers to engage in make-believe play. This region of immediate potential is the zone of proximal development. The paper concludes that cooperative learning is an effective formal education strategy for presenting social and cultural experiences in a systematic manner. There are three Theories of Language Development 1. This perspective regards language development as entirely due to environmental influences. Imitation combines with reinforcement to promote language development. This view assumes that children are born with a biologically-based system-called the language acquisition device -for mastering language. Can Great Apes Acquire Language? Findings reveal that the ability of chimps to acquire a human like language system is limited. Language Areas in the Brain: Humans have evolved specialized regions in the brain that support language skills. Limitations of the Nativist Perspective: Research indicates that language acquisition is not immediate but occurs in a steady and gradual manner. This view emphasizes that language achievements emerge through the interaction of innate abilities and environmental influences. A great deal of evidence supports the interactionist position. Getting Ready to Talk 1. Around 2 months, babies make vowel-like noises called cooing. Babies must hear human speech for babbling to develop further. Adult-infant interaction increases the amount of spoken language a baby is exposed to. The adults label what is seen. Simple infant games such as pat-a-cake and peek-a-boo demonstrate conversational turn-taking. Under extension is a vocabulary error in which a word is applied to a smaller
number of objects and events than is appropriate. In contrast, over extension occurs when a word is applied to
a wider collection of objects and events than is appropriate. The Two-Word Utterance Phase 1. Vocabularies
slowly build from age 12 to 18 months. However, between 18 and 24 months, children may add from 10 to 20
new words a week. Telegraphic speech is the two-word utterance phase of toddlers which leaves out smaller
and less important words. Comprehension versus Production 1. Production is the words and word
combinations that children use. Comprehension is the language that children understand. At all ages,
comprehension develops ahead of production. The social smile—the smile evoked by the stimulus of the human
face-first appears between 6 and 10 weeks. Laughter first appears around 2 to 4 months in response to active
stimuli. Anger is expressed during the first months when babies cry in response to unpleasant experiences.
Both fear and anger rise during the second half of the first year. Stranger anxiety is an expression of fear in
response to unfamiliar adults. Social referencing provides infants with a method of learning about the
environment through indirect experience. Emergence of Self-Conscious Emotions Self-conscious emotions
appear at the end of the second year. They involve injury to or enhancement of the sense of self and include
shame, embarrassment, guilt, envy, and pride. Self-conscious emotions assist children in acquiring socially
valued behaviors and goals. Beginnings of Emotional Self-Regulation 1. Emotional self-regulation refers to
the strategies used to adjust emotional states to a comfortable level of intensity. Infant boys get more training
in hiding their unhappiness than do girls. Temperament refers to stable individual differences in quality and
intensity of emotional reaction, activity level, attention, and emotional self-regulation. Thomas and Chess
initiated the New York Longitudinal Study which was a comprehensive examination of temperament. The
Structure of Temperament 1. Three types of children described the majority of the Thomas and Chess sample:
Slow-to-warm-up children are inactive, have mild, low-key reactions to stimuli, and adjust slowly to new
experiences. The difficult temperamental type places children at risk for adjustment problems. Parent ratings
have been criticized for being biased and subjective. Assessments of Physiological Reactions: Inhibited, or
shy, children react negatively to and withdraw from novel stimuli. Stability of Temperament 1. However, the
changes shown by children suggest that temperament can be modified by experience. Findings of twin studies
reveal that identicals are more similar than fraternals across a wide range of temperamental traits and
personality measures. About half of the individual differences among us can be traced to differences in our
genetic make-up. Chinese and Japanese infants tend to be less active, irritable, and vocal than Caucasian
infants. Boys tend to be more active and daring than girls. Some differences in early temperament are
encouraged by cultural beliefs and practices. Parents more often encourage infant sons to be physically active
and daughters to seek help and physical closeness.
October 30, iStock. Their primary responsibilities include producing eggs and secreting sex hormones that promote fertility. In this way, the future of humanity depends on them. Read on to learn more about these tiny but mighty organs. It actually refers to the reproductive glands of both sexes: When an embryo is in the early stages of development around the seventh week, its gonads have the potential to develop into either female or male sex organs through a process called sexual differentiation. By this point, the sex has already been pre-determined by chromosomes XX or XY, and in the absence of a Y chromosome, the gonads turn into ovaries. One study of adult mice found that ovaries could be turned into testes by deleting a single gene called FOXL2, which is constantly working to suppress the development of male anatomy in mammals. The hypothalamus and pituitary gland both play pivotal roles in ensuring the ovaries function as they should. Neither is located anywhere near the ovaries, though. Essentially, the hypothalamus tells the pituitary gland to send hormones to the ovaries, and the ovaries respond by secreting their own batch of hormones. A signal is then sent back to the hypothalamus to let it know if the levels of estrogen and progesterone are too high or too low. In the latter case, scientists have been looking at different genetic markers in an attempt to predict when the ovaries will shut down the processes of menstruation and ovulation—otherwise known as menopause—but "nothing is definitive" right now, according to Mary Jane Minkin, an obstetrician-gynecologist in New Haven, Connecticut, who also teaches at the Yale School of Medicine. However, family history and age offer some clues. The average age for menopause in the U.S. is 51. Women who have had hysterectomies may also go through menopause one or two years earlier than they normally would, even if they have otherwise healthy ovaries. Ovaries get bigger and morph into the shape of an almond when girls reach adolescence, eventually reaching roughly 1.5 inches long. Many of these eggs die off before a girl reaches reproductive age, though. By the time she starts going through puberty, she has about 600,000 left. About or so eggs are lost each month after that. Research in recent years has suggested that ovarian stem cells could someday be used to grow new egg cells, or to delay or stop menopause in women. Both of these tasks have already been successfully carried out in mice. For now, women faced with a diminishing supply can have their unfertilized eggs frozen through the process of cryopreservation. Those ovaries were then filled with follicles containing immature egg cells, which allowed the mice to give birth to healthy babies. Scientists hope this technique will someday be used to restore fertility to women whose ovaries have been damaged by cancer treatments. Oral contraceptives prevent ovulation by providing all the estrogen and progesterone that the body needs. The ovaries are also less exposed to naturally occurring hormones that may promote the growth of cancer. One of the most common problems affecting the ovaries are cysts. Fortunately, these cysts often go away on their own. They only become a problem if they grow, or multiple cysts form. Strange things can happen, though. In one recent case, surgeons found a cyst containing a miniature skull and brain tissue inside the ovary of a year-old girl. Yes, you read that right. Another disorder that can sometimes affect the ovaries is endometriosis. It can attach to the bladder, bowel, ovaries, or other areas. Symptoms may be minimal, severe, or somewhere in between, and the tissue can be removed through a minor surgery if needed. Ovulation may not go as smoothly, periods can be irregular, and cysts can develop. The main active ingredient was alcohol. Unlike their dinosaur ancestors, birds have only their left ovary. Scientists theorize that birds lost an ovary over the course of evolution because it helped reduce their weight, making it easier for them to fly. This explains why dinosaurs laid loads of eggs, but birds lay just a few at a time. This is because they have both mature testes and immature ovaries, the latter of which can develop if the alpha female in a school of fish dies. As Business Insider points out, a scientifically accurate Finding Nemo would have been significantly more disturbing. Parrotfish can change sex as well—mostly from female to male. During this transition, the ovaries dissolve and testes are grown.
Psychosexual development Sigmund Freud believed that we all had a conscious, preconscious, and unconscious level. In the conscious, we are aware of our mental process. The preconscious involves information that, though not currently in our thoughts, can be brought into consciousness. Lastly, the unconscious includes mental processes we are unaware of. He believed there is tension between the conscious and unconscious because the conscious tries to hold back what the unconscious tries to express. To explain this he developed three personality structures: The id, the most primitive of the three, functions according to the pleasure principle: The first is the oral stage, which occurs from birth to 12 months of age. The second is the anal stage, from one to three years of age. During the anal stage, the child defecates from the anus and is often fascinated with their defecation. During the phallic stage, the child is aware of their sexual organs. The fourth is the latency stage, which occurs from age five until puberty. Stage five is the genital stage, which takes place from puberty until adulthood. During the genital stage, puberty starts happening. He used Socratic questioning to get children to reflect on what they were doing, and he tried to get them to see contradictions in their explanations. Piaget believed that intellectual development takes place through a series of stages, which he described in his theory on cognitive development. Each stage consists of steps the child must master before moving to the next step. He believed that these stages are not separate from one another, but rather that each stage builds on the previous one in a continuous learning process. He proposed four stages: Though he did not believe these stages occurred at any given age, many studies have determined when these cognitive abilities should take place. The pre-conventional moral reasoning is typical of children and is characterized by reasoning that is based on rewards and punishments associated with different courses of action. Conventional moral reason occurs during late childhood and early adolescence and is characterized by reasoning based on rules and conventions of society. Mistrust" takes place in infancy. The second stage is "Autonomy vs. Shame and Doubt" with the best virtue being will. This takes place in early childhood where the child learns to become more independent by discovering what they are capable of where if the child is overly controlled, they believe to feel inadequate on surviving by themselves, which can lead to low self-esteem and doubt. The third stage is "Initiative vs. The basic virtue that would be gained is the purpose and takes place in the play age. This is the stage where the child will be curious and have many interactions with other kids. They will ask many questions as their curiosity grows. If too much guilt is present, the child may have a slower and harder time interacting with other children. The fourth stage is "Industry competence vs. The basic virtue for this stage is competency which happens at the school age. This stage is when the child will try to win the approval of others and fit in and understand the value of their accomplishments. The fifth stage is "Identity vs. The basic virtue gained is fidelity which takes place in adolescence. The sixth stage is "Intimacy vs. Isolation", which happens in young adults and the virtue gained is love. In not doing so, it could lead to isolation. The seventh stage is "Generativity vs. This happens in adulthood and the virtue gained would be care. We become stable and start to give back by raising a family and becoming involved in the community. The eighth stage is "Ego Integrity vs. This happens during maturity and wisdom is gained. When one grows old and they contemplate and look back and see the success or failure of their life. This is also the stage where one can also have closure and accept death without fearing anything. The Model of Hierarchical Complexity MHC is not based on the assessment of domain-specific information, It divides the Order of Hierarchical Complexity of tasks to be addressed from the Stage performance on those tasks. The order of hierarchical complexity of tasks predicts how difficult the performance is with an R ranging from 0. In the MHC, there are three main axioms for an order to meet in order for the higher order task to coordinate the next lower order task. Axioms are rules that are followed to determine how the MHC orders actions to form a hierarchy. Ecological systems theory[ edit ] Main article: The four systems are microsystem, mesosystem, exosystem, and macrosystem. Each
system contains roles, norms and rules that can powerfully shape development. The microsystem is the direct
environment in our lives such as our home and school. Mesosystem is how relationships connect to the
microsystem. Exosystem is a larger social system where the child plays no role. Macrosystem refers to the
cultural values, customs and laws of society. The mesosystem is the combination of two microsystems and
how they influence each example: The exosystem is the interaction among two or more settings that are
indirectly linked example: The macrosystem is broader taking into account social economic status, culture,
beliefs, customs and morals example: Lastly, the chronosystem refers to the chronological nature of life events
and how they interact and change the individual and their circumstances through transition example: As a
result of this conceptualization of development, these environments"from the family to economic and
political structures"have come to be viewed as part of the life course from childhood through to adulthood.
This adult role is often referred to as the skilled "master," whereas the child is considered the learning
apprentice through an educational process often termed "cognitive apprenticeship" Martin Hill stated that
"The world of reality does not apply to the mind of a child. Constructivism psychological school
Constructivism is a paradigm in psychology that characterizes learning as a process of actively constructing
knowledge. Individuals create meaning for themselves or make sense of new information by selecting,
organizing, and integrating information with other knowledge, often in the context of social interactions.
Constructivism can occur in two ways: Individual constructivism is when a person constructs knowledge
through cognitive processes of their own experiences rather than by memorizing facts provided by others.
Social constructivism is when individuals construct knowledge through an interaction between the knowledge
they bring to a situation and social or cultural exchanges within that content. Piaget proposed that learning
should be whole by helping students understand that meaning is constructed. Evolutionary developmental
psychology Evolutionary developmental psychology is a research paradigm that applies the basic principles of
Darwinian evolution, particularly natural selection, to understand the development of human behavior and
cognition. It involves the study of both the genetic and environmental mechanisms that underlie the
development of social and cognitive competencies, as well as the epigenetic gene-environment interactions
processes that adapt these competencies to local conditions. Attachment theory Attachment theory, originally
developed by John Bowlby, focuses on the importance of open, intimate, emotionally meaningful
relationships. A child who is threatened or stressed will move toward caregivers who create a sense of
physical, emotional and psychological safety for the individual. Attachment feeds on body contact and
familiarity. Later Mary Ainsworth developed the Strange Situation protocol and the concept of the secure
base. Theorists have proposed four types of attachment styles: It is characterized by trust. Anxious-avoidant is
an insecure attachment between an infant and a caregiver. Anxious-resistant is an insecure attachment between
the infant and the caregiver characterized by distress from the infant when separated and anger when reunited.
Some babies are raised without the stimulation and attention of a regular caregiver or locked away under
conditions of abuse or extreme neglect. The possible short-term effects of this deprivation are anger, despair,
detachment, and temporary delay in intellectual development. Long-term effects include increased aggression,
clinging behavior, detachment, psychosomatic disorders, and an increased risk of depression as an adult.
Attachment is established in early childhood and attachment continues into adulthood. An example of secure
attachment continuing in adulthood would be when the person feels confident and is able to meet their own
needs. An example of anxious attachment during adulthood is when the adult chooses a partner with
anxious-avoidant attachment. Please help improve this article by adding citations to reliable sources.
Unsourced material may be challenged and removed. April Learn how and when to remove this template
message Nature vs nurture[ edit ] A significant issue in developmental psychology is the relationship between
innateness and environmental influence in regard to any particular aspect of development. This is often
referred to as "nature and nurture" or nativism versus empiricism. An empiricist perspective would argue that
those processes are acquired in interaction with the environment. Today developmental psychologists rarely
take such polarised positions with regard to most aspects of development; rather they investigate, among many
other things, the relationship between innate and environmental influences. One of the ways this relationship
has been explored in recent years is through the emerging field of evolutionary developmental psychology.
One area where this innateness debate has been prominently portrayed is in research on language acquisition. A major question in this area is whether or not certain properties of human language are specified genetically or can be acquired through learning. The empiricist position on the issue of language acquisition suggests that the language input provides the necessary information required for learning the structure of language and that infants acquire language through a process of statistical learning. From this perspective, language can be acquired via general learning methods that also apply to other aspects of development, such as perceptual learning. The nativist position argues that the input from language is too impoverished for infants and children to acquire the structure of language. Linguist Noam Chomsky asserts that, evidenced by the lack of sufficient information in the language input, there is a universal grammar that applies to all human languages and is pre-specified. This has led to the idea that there is a special cognitive module suited for learning language, often called the language acquisition device.
Chapter 5: Growth Stages 1: Infancy and Early Childhood - Science NetLinks


If you find any problem, click the Report a Problem link located at the bottom right corner of the website. Its Place in Human Development: By Jerome Kagan, Richard B. Kearsley, and Phillip R. Harvard University Press, pp. Welcome to PEP Web! Viewing the full text of this document requires a subscription to PEP Web. If you are coming in from a university from a registered IP address or secure referral page you should not need to log in. Contact your university librarian in the event of problems. If you have a personal subscription on your own account or through a Society or Institute please put your username and password in the box below. Any difficulties should be reported to your group administrator. Once there you need to fill in your email address this must be the email address that PEP has on record for you and click "Send. If this does not work for you please contact your group organizer. Not already a subscriber? Order a subscription today. Journal of the American Psychoanalytic Association, Research concerning psychological development during infancy has proceeded so rapidly during the past decade that this report of the Harvard-connected Day Care Project, begun in and discontinued several years later, might well have been outdated by now. To the contrary, however, some of the findings of this project provoke a rethinking of current views of early development, particularly since they were unexpected in part. Furthermore, they tend to support certain psychoanalytically based theoretical ideas, in spite of the fact that the authors tend to view development primarily from a cognitive standpoint. The study was planned to clarify two major issues: Both issues are extremely complex ones, and the variables which have to be considered are discussed at great length and most lucidly by Kagan in the chapters that constitute almost the first two thirds of the book. Incidentally, an excellent review of pertinent literature is included in this portion. One example of the complexity of the research issues is the question of what actually constitutes psychological development; this is determined at least in part by the cultural and professional biases of the particular researchers, as Kagan indicates. In this project, one index of psychological development was the degree of separation anxiety and when it appeared. The research design consisted of a group of 33 infants, either first- or second-born, the products of full-term normal pregnancies, without serious physical disorders, and between three and one half and five and one half months of age at time of entry. No other selection criteria were applied, each child being admitted in turn as applications were received from parents who lived in the community and learned of the project through their neighbors. These [This is a summary or excerpt from the full text of the book or article. The full text of the document is available to subscribers.]
Chapter 6: Infancy and Toddlerhood - Stages of Human Development


Developmental milestones are things most children can do by a certain age. Children reach milestones in how they play, learn, speak, behave, and move like crawling, walking, or jumping. In the first year, babies learn to focus their vision, reach out, explore, and learn about the things that are around them. Cognitive, or brain development means the learning process of memory, language, thinking, and reasoning. Listening, understanding, and knowing the names of people and things are all a part of language development. During this stage, babies also are developing bonds of love and trust with their parents and others as part of social and emotional development. The way parents cuddle, hold, and play with their baby will set the basis for how they will interact with them and others. Positive Parenting Tips Following are some things you, as a parent, can do to help your baby during this time: Talk to your baby. She will find your voice calming. Answer when your baby makes sounds by repeating the sounds and adding words. This will help him learn to use language. Read to your baby. This will help her develop and understand language and sounds. Sing to your baby and play music. This will help your baby develop a love for music and will help his brain development. Praise your baby and give her lots of loving attention. Spend time cuddling and holding your baby. This will help him feel cared for and secure. Watch your baby closely for signs of being tired or fussy so that she can take a break from playing. Take care of yourself physically, mentally, and emotionally. Parenting can be hard work! It is easier to enjoy your new baby and be a positive, loving parent when you are feeling good yourself. Look around your home for things that could be dangerous to your baby. As a parent, it is your job to ensure that you create a safe home for your baby. It also is important that you take the necessary steps to make sure that you are mentally and emotionally ready for your new baby. Here are a few tips to keep your baby safe: Babies have very weak neck muscles that are not yet able to support their heads. If you shake your baby, you can damage his brain or even cause his death. Make sure you always put your baby to sleep on her back to prevent sudden infant death syndrome commonly known as SIDS. Read more about new recommendations for safe sleep for infants here. Protect your baby and family from secondhand smoke. Do not allow anyone to smoke in your home. Place your baby in a rear-facing car seat in the back seat while he is riding in a car. Prevent your baby from choking by cutting her food into small bites. Never carry hot liquids or foods near your baby or while holding him. Because children can get serious diseases, it is important that your child get the right shots at the right time. Between 6 and 12 months of age, your baby will learn about new tastes and textures with healthy solid food, but breast milk should still be an important source of nutrition. Breastfeeding is the natural way to feed your baby, but it can be challenging. If you need help, you can call the National Breastfeeding Helpline at or get help on-line at http: You can also call your local WIC Program to see if you qualify for breastfeeding support by health professionals as well as peer counselors. Or go to http: Keep your baby active. Getting down on the floor to move helps your baby become strong, learn, and explore. Try not to keep your baby in swings, strollers, bouncer seats, and exercise saucers for too long. Limit screen time to a minimum.
Study of Death and Dying

Physical Development: Age 0–2

Infants birth to age 1 and toddlers ages 1 to 2 grow quickly; bodily changes are rapid and profound. Physical development refers to biological changes that children undergo as they age. Important aspects that determine the progress of physical development in infancy and toddlerhood include physical and brain changes; development of reflexes, motor skills, sensations, perceptions, and learning skills; and health issues. The first 4 weeks of life are termed the neonatal period. Male babies are generally slightly heavier and longer than female babies. Infants who arrive before their due date are preterm or premature, and these babies may or may not have a low birthweight. Infants who arrive 2 or more weeks after their due date are postmature. Physical growth is especially rapid during the first 2 years. Fetal and neonatal brain developments are also rapid. The lower, or subcortical, areas of the brain responsible for basic life functions, like breathing develop first, followed by the higher areas, or cortical areas responsible for thinking and planning. Most brain changes occur prenatally and soon after birth. By the end of the second year, the brain weighs about 80 percent; by puberty, it weighs nearly percent of that of an adult brain. Reflexes are automatic reactions to stimulation that enable infants to respond to the environment before any learning has taken place. For instance, babies automatically suck when presented with a nipple, turn their heads when a parent speaks, grasp at a finger that is pressed into their hand, and startle when exposed to loud noises. Some reflexes, such as blinking, are permanent. Others, such as grasping, disappear after several months and eventually become voluntary responses. Common infant motor reflexes appear in Table 1. Motor skills, or behavioral abilities, develop in conjunction with physical growth. In other words, infants must learn to engage in motor activities within the context of their changing bodies. At about 1 month, infants may lift their chins while lying flat on their stomachs. Within another month, infants may raise their chests from the same position. By the fourth month, infants may grasp rattles, as well as sit with support. By the fifth month, infants may roll over, and by the eighth month, infants may be able to sit without assistance. At about 10 months, toddlers may stand while holding onto an object for support. At about 14 months, toddlers may stand alone and perhaps even walk. Motor development follows cephalocaudal center and upper body and proximodistal extremities and lower body patterns, so that motor skills become refined first from the center and upper body and later from the extremities and lower body. For example, swallowing is refined before walking, and arm movements are refined before hand movements. Sensation and perception Normal infants are capable of sensation, or the ability to respond to sensory information in the external world. These infants are born with functioning sensory organs, specialized structures of the body containing sensory receptors, which receive stimuli from the environment. Sensory receptors convert environmental energy into nervous system signals that the brain can understand and interpret. For example, the sensory receptors can convert light waves into visual images. The human senses include seeing, hearing, smelling, touching, and tasting. Newborns are very nearsighted, but visual acuity, or ability, develops quickly. Although infant vision is not as good as adult vision, babies may respond visually to their surroundings from birth. Depth perception also comes within a few months. Newborns may also respond to tastes, smells, and sounds, especially the sound of the human voice. In fact, newborns may almost immediately distinguish between the primary caregiver and others on the basis of sight, sound, and smell. Infant sensory abilities improve considerably during the first year. Perception is the psychological process by which the human brain processes the sensory data collected by the sensory organs. Visually, infants are aware of depth the relationship between foreground and background and size and shape constancy the consistent size and shape of objects. This latter ability is necessary for infants to learn about events and objects. Learning Learning is the process that results in relatively permanent change in behavior based on experience. Infants learn in a variety of ways. In classical conditioning Pavlovian , learning occurs by association when a stimulus that evokes a certain response becomes associated with a different stimulus that originally did not cause that response. For instance, in psychologist John B. Babies younger than
age 3 months generally do not learn well through classical conditioning. Reinforcements increase behaviors, while punishments decrease behaviors. Positive reinforcements are pleasant stimuli that are added to increase behavior; negative reinforcements are unpleasant stimuli that are removed to increase behavior. Because reinforcements always increase behavior, negative reinforcement is not the same as punishment. Shaping is the gradual application of operant conditioning. For example, an infant who learns that smiling elicits positive parental attention will smile at its parents more. Babies generally respond well to operant conditioning. In observational learning, learning is achieved by observing and imitating others, as in the case of an infant who learns to clap by watching and imitating an older sibling. This form of learning is perhaps the fastest and most natural means by which infants and toddlers acquire new skills. Less than 1 percent of babies experience birth trauma, or injury incurred during birth. Longitudinal studies have shown that birth trauma, low birth weight, and early sickness can affect later physical and mental health but usually only if these children grow up in impoverished environments. Nevertheless, some children are born with or are exposed to conditions that pose greater challenges. For example, phenylketonuria PKU is an inherited metabolic disorder in which a child lacks phenylalanine hydroxylase, the enzyme necessary to eliminate excess phenylalanine, an essential amino acid, from the body. Failure to feed a special diet to a child with PKU in the first 3 to 6 weeks of life will result in mental retardation. Currently, all 50 states require PKU screening for newborns. Poor nutrition, hygiene, and medical care also expose a child to unnecessary health risks. Parents need to ensure that their infant eats well, is clean, and receives adequate medical attention. For instance, proper immunization is critical in preventing such contagious diseases as diphtheria, measles, mumps, Rubella, and polio. Infant mortality refers to the percentage of babies that die within the first year of life. In the United States today, about 9 babies out of every 1,000 live births die within the first year – a significantly smaller percentage than was reported only 50 years ago. This decrease in infant mortality is due to improvements in prenatal care and medicine in general. However, minority infants tend to be at a higher risk of dying, as are low birthweight, premature, and postmature babies. The leading causes of infant death are congenital birth defects, such as heart valve problems or pregnancy complications, and sudden infant death syndrome SIDS. SIDS is the unexpected and unexplained death of an apparently healthy infant. Postmortem autopsies of the SIDS infant usually provide no clues as to the cause of death. As far as authorities know, choking, vomiting, or suffocating does not cause SIDS. Two suspected causes include infant brain dysfunction and parental smoking, both prenatally and postnatally.
Language is commonly defined as an organized way of combining symbols in order to communicate. It may consist of words. Think about it for a moment. Language is an important medium of thought. Growth in the knowledge and skills of children is correlated with growth in the number of words. In this section, the primary focus will be on the development of language skills during infancy. The continued development of these skills during childhood will be covered in another section. Click here if you wish to read about language development during childhood. One of the first things to know about spoken language is that its purpose is to communicate. This is important to keep in mind because spoken language is only one of several means employed by infants to communicate. At first, infants do not understand the importance of words and they attempt to communicate with their gestures, tone of voice, and nonspeech sounds. This has prompted Kathleen Berger to observe that the intent of infants is to communicate rather than use words. This is also referred to as becoming "literate". In addition, children must become proficient in the use of nonverbal forms of communication, as these constitute significant channels of information. By adolescence, children come to understand that the nonverbal aspects of the message may actually reverse the meaning of the verbal message. Psychologists make a distinction between receptive speech and productive or expressive speech. Receptive speech refers to speech that is understood. Productive speech refers to speech that is be produced. In general, infants tend to do better at receptive speech than productive speech. They same is true of adults learning a foreign language or Psychology. That is, our ability to recognize sounds and words tends to exceed our ability to actually produce those sounds and words. As a result, infants tend to understand verbal communications better than they can produce them. At birth, human infants tend to be attracted to the sound of the human voice, especially the voice of their mother. They also come equipped with a voice of their own, and hopefully a pair of healthy lungs. Interestingly, human adults also tend to find the sound of an infant crying to be one of the most disturbing of all sounds. Since most communications during the first year or so of life tend to be nonverbal, communications during this period are said to be "prelinguistic". Neonates begin expressing themselves vocally literally within seconds of being born. In fact, many doctors consider crying at birth to be a sign of a healthy baby. During the first few days, human neonates display the capacity to discriminate between, and produce, a wide range of sounds. For instance, researchers have discovered that by the end of the first month of life, most infants can discriminate between all of the different sounds that humans can vocalize in any language. The first types of communication displayed by human neonates are usually reflexive. The first type of noncrying vocalization produced by typical neonates is cooing. Cooing includes a variety of basic speech sounds, such as ooosoooh, eeeeee, and aaaaah. Many of these sounds are produced accidently at first, since neonates are not born with the ability to intentionally produce specific speech sounds. However, with practice, and in response to reinforcement, infants tend to continue to produce the speech sounds of their native language. Between months infants begin to babble. This is often in response to the sounds made by other people. Hearing others communicate vocally inspires infants to reciprocate with vocalizations of their own. This has been referred to as "mutual contagion". Some recent research suggests that this tendency may be innate, and mediated by special nerve cells called "mirror neurons". This is an important factor for caregivers to consider as they teach babies how to speak. Babbling continues for several months. However, by about seven months infants add the capacity for repetitive babbling. In repetitive babbling infants repeat the same speech sounds over and over again, e. During this period most babies will learn how to say, "dada" before "mama". However, the reality is that infants tend to say, "dada" before "mama" for the simple reason that "dada" is easier to learn. What is most important about repetitive babbling is that it consists of infants practicing making deliberate and precise sounds. They are gaining control of their lips, lungs, and vocal chords, and learning how to make them work together to produce distinctive sounds at will. At the same time that infants are engaging in babbling, they are also making progress in the pragmatic aspects of verbal
communication. For instance, between months of age infants begin to display a preference for speech with normal pauses. By eight months of age infants can distinguish rising from falling intonations. This is important for distinguishing statements from questions. Between months of age infants develop the ability to vary their own pitch, as though making statements or asking questions. And between months of age infants increasingly coordinate their pointing and babbling. Between months of age, infants begin to use protowords. These are sounds that are similar to but are not quite words. Common examples of protowords are mama, dada, and baba. Protowords are different from repetitive babbling in at least two important ways. First, while repetitive babbling involves repeating sounds over and over again e. While it is clear that in repetitive babbling the infant is just producing sounds, once they use protowords they are more closely approximating speech. Second, babbling has no correspondence to objects in the world. Protowords, on the other hand, generally correspond to something concrete, e. Thus, each protoword is used consistently to refer to the same object. Once protowords begin to appear infants make a transition from prelinguistic to linguistic communication. The first real word is typically uttered between months of age. The first words used by English speaking children tend to be nouns, normally referring to nearby, meaningful, objects, such as mommie, or ball. The onset of linguistic communication presents a new set of challenges. Each child must learn not only a large number of new words, but also the limits of the meaning of each word. It is common for children to underextend and overextend the meanings of words. In underextension, children underestimate the meaning of words. They may believe that the word for a particular category e. When such a child sees a Collie they may think it is not a dog because it does not look like the poodle they associate with the word "dog". Similarly, children tend to also overestimate the meanings of words. A child may come to believe that the word "dog" refers to four-legged creatures. When such a child sees a cow for the first time they may turn to their parents and say something like, "Mommie, look at that big doggie". These errors are very common. They are normally corrected by caregivers, or spontaneously through experience, by about 10 years of age. Between months of age many children display expressive jargon. This is when a child communicates verbally by making a series of speech-like sounds that give the impression of conversation, but that do not make any sense. Expressive jargon is similar to speech in its intonation, rhythm, and flow, but is not actually speech. Shortly after the appearance of the first words children begin to use holophrases. A holophrase is a single word utterance that is intended to convey a more complex thought. It is commonly accompanied by some sort of body language, such as pointing. Holophrases are also highly dependent on available contextual cues. For instance, an infant may point at a nearby bottle and say, "mine". Caregivers who are around that child quickly learn what the child means. This has prompted many guests to claim that proud parents are overestimating the language skills of their infants who use holophrases. Finally, simple sentences begin to appear between months of age. These simple sentences typically contain words. They sound a lot like telegraphs, which has prompted some researchers to refer to this as "telegraphic speech". For instance, a child might say something like, "Gimme dat", or "Mine ball", usually accompanied by relevant gestures. One of the most important ways to nurture language development is to simply speak with your child. In general, the more parents speak with their children the greater the opportunities for children to learn vocabulary, and a slew of other cognitive skills. Recall that between months of age infants display "mutual contagion", in which they tend to reciprocate speech sounds. Parents who wish to nurture the language development of their children should engage in this type of behavior. In real life it comes across as the baby making nonspeech sounds and the parent responding with speech sounds. It would be a mistake to conclude that because the baby cannot understand your words, and is not producing words of their own, this is a useless exercise. Not only does parental speech during this period help the infant learn to recognize speech sounds it is also how infants learn to take turns in conversations, and to raise or lower their pitch. One of the most common "techniques" caregivers use to nurture verbal communication with infants is known as speaking "motherese".
Context This lesson is the first of a two-part series aimed at introducing students to the different stages of physical growth and development in human beings from birth to 18 years of age. In these lessons, students become familiar with the four key periods of growth and human development: Conversely, they also learn that it is very natural and normal for children to reach these markers at different times. Infancy and Early Childhood helps students become better aware of all of the natural physical stages of growth children experience in the first five years of life. In Growth Stages 2: Middle Childhood and Early Adolescence, students focus on the kinds of physical changes that children in their age range begin to undergo during puberty. Research shows that films and stories about early stages of human development fascinate children and they are particularly intrigued by comparisons of themselves now and earlier. It may be helpful at this level to inform students about changes that will take place in them during adolescence, since when they reach puberty, they may be too embarrassed to talk to adults about it. The importance for growth of adequate rest, proper food, regular checkups, and shots to prevent disease should be supported by some science behind the advice. Benchmarks for Science Literacy, p. For more background information and research, see the Growth 1: Human Development teacher sheet. Ideas in this lesson are also related to concepts found in the following benchmark: Motivation As a way to get students to begin thinking about growth and development, start the lesson by asking a few thought-provoking questions like these: Does anyone here have a baby brother or sister? In general, do babies or little children grow quickly or slowly? What kinds of things cause babies and little kids to grow quickly? Does everyone grow at the same speed? Why or why not? Accept all reasonable answers, encouraging students to elaborate on their responses. Then, to answer these and other related questions, students should use the How My Body Grows student esheet to view the slide show. When they are finished viewing the slide show, or during it, hold a general discussion and then, when finished, reinforce that children and teenagers grow at different rates and to different extents based on how much their parents grew genetics and good food, good health, exercise, and regular checkups. The student sheet covers key physical milestones from birth to five years. After passing out the materials, take time to read over the physical milestones. It may be important to emphasize again that not all people grow at the same rate nor do they reach these milestones at the same time i. After reading the student sheet, review questions may include: At what age are most children first able to walk? At what age can most children catch and throw a ball? When can they balance on one foot without help? Then emphasize that the physical abilities of a one-year-old are much different than the abilities of a five-year-old. Ask students to describe some of the differences using a comparison chart like the one below you can either draw this chart on the blackboard or on newsprint.