
*Developed by a panel of national experts in early childhood education and reviewed by the Carnegie Corporation of New York. Underwritten by McGraw-Hill Education. Educators and teachers may download and/or print the document, located online at www.ctb.com.*

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# To the Users of this Document

This is an exciting time to be in education. The support for initiatives at both state and federal levels has never been stronger. The No Child Left Behind legislation highlights the serious commitment being made to assure that our nation's schools work for all children. Its focus on the early years supports the mounting research evidence that early learning holds the key to continuing achievement for students in this country.

The standards movement in US education has had a remarkable effect on student achievement. States have risen to the challenge of articulating what it is that students should know and be able to do at key benchmark grades. Students and teachers have risen to the challenge as well, striving for the higher academic achievements specified in the standards.

While there is a national focus and emphasis on learning in the early years, there has been little systematic success in articulating standards for young children, in ways that are consistent with their unique place in the educational process. The Standards document covers a broad span of content areas, emphasizing wherever possible the integrated nature of early learning. It describes what students need to be able to do in each of the areas, what kinds of experiences they need to have in order to achieve success, and how this achievement is manifest in clear and specific learning benchmarks. In addition, a set of vignettes is provided; these show how high quality programs can foster growth in each of the areas.

This document was developed with the advice and input from a panel of experts, who have graciously and generously steered this project for several years. Dr. Carol Seefeldt, at the University of Maryland, wrote the material under the direction of the panel, whose members were Dr. Amy Driscoll, from the California State University at Monterey Bay; Dr. Sharon Lynn Kagen, at Columbia and Yale Universities; Dr. Augusta Kappner, from Bank Street College; and Dr. Dorothy Strickland, from Rutgers University. . Dr. Doug Clements from the State University of New York at Buffalo, and Dr.Juanita Copley, from the University of Houston, provided additional input, especially related to mathematics.

This material was collected and written as part of a public domain project underwritten by the McGraw-Hill Companies. In addition, the Carnegie Corporation of New York provided advice and support in the form of recommendations of candidates for the expert panel, participation in panel discussion and review, and reimbursement of travel expenses for some panel members. Dr. Dan Fallon served as my co-chair of the panel, Dr. Michael Levine, formerly with the Carnegie Corporation and now the Executive Director, Education at the Asia Society, had great input to the initial vision for this work and its subsequent development. The overall coordination and production of the document was undertaken by staff and consultants to CTB/McGraw-Hill, particularly Ms. Jane Forsberg, Dr. Betsy Taleporos and Dr.Janet Wall.

It has been a great pleasure to work with these individuals, and I am very proud of the work that has emerged. The standards are provided to any and all who can make use of them, in the hope that they will positively affect the lives of our nation's youngest students, and the parents and teachers who are privileged to work with them.

The standards can be found on the CTB/McGraw-Hill website at www.ctb.com. We invite your comment and observations. Please let us know by sending an email to Betsy Taleporos (Btaleporos@ctb.com). We are hoping to make final revisions based on comments received up to May 1, 2003. Thank you for your input. The standards may be reproduced in whole or in part, free of charge, provided that appropriate acknowledgment is given to CTB/McGraw-Hill. I hope you will find them interesting and useful.

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## Overview

*Pre-Kindergarten Standards: Guidelines for Teaching and Learning (Pre-Kindergarten Standards)* provides a conceptual vision of what children between the ages of three and five can and should learn during their preschool years. *Pre-Kindergarten Standards* describes the social and motivational skills, symbol systems, and knowledge base children between the ages of three and five need to enable them to live fully and become successful learners in the future.

Teachers of young children face great challenges. Given the current trends for increased academics, teachers at every age and grade level are pressured to articulate what they are teaching and what children are learning. *Pre-Kindergarten Standards* provides clarity about what today's three-, four-, and five-year-old children should be learning. With agreement about what young children should learn during the preschool years, this document can empower teachers to plan, implement, and assess early learning programs of the highest quality.

*Pre-Kindergarten Standards* is based upon theory and current research on child growth development and learning. The introduction discusses the significance of this publication, and is followed by the principles of child growth, development, and learning that underpinned the development of the text's contents. Each section consists of goals, experiences children need in order to achieve the goals, and benchmarks that demonstrate children have achieved the goals. Vignettes illustrating appropriate teaching and authentic assessment, follow. Appendix C includes a listing of the Panel Members and Advisors, national standards, and the associations and organizations developing these that guided the production of *Pre-Kindergarten Standards*.

## Significance of *Pre-Kindergarten Standards*

The early years are critical learning years (NAEYC, 2001; NRC, 2001a). Research shows that what children learn during the first years of life lays the foundation for all later learning (Lazar & Darlington, 1982; Oden, Schweinhart, & Weikart, 2000). Early enriching experiences directly affect the neurological development of the brain and will have lasting implications for children's capacity to learn (Shore, 1997).

Fortunately, preschool children are like very active learning machines. Biologically wired for learning and emotion (NRC, 2001a; Shonkoff & Meisels, 2000), children actively pursue learning. During the first five years of life children learn to organize the information they take in through looking, listening, tasting, touching, taking apart and putting together again (Hunt, 1963; Piaget & Inhelder, 1969; Vygotsky, 1986).

Through interactions with their environment, children will learn basic numeration skills and the location of things, and will gain a great deal of informal knowledge about their world, knowledge of self and others, and will acquire a motivation to learn.

Attuned to language, children learn to communicate. They will learn thousands of words and many of the rules for putting them together in sentences by the time they are four or five years old (Vacca, Vacca, & Gove, 2001). By four or five most preschool children will have learned an impressive number of songs, poems, and stories they can sing or tell you about.

Additionally, children progress rapidly in developing knowledge about themselves and others. Children learn to develop expectations for themselves and the motivation to learn. Social skills are gained, and by five years of age most children are able to interact effectively with peers and adults (Howe, 1996; Ladd, 1990).

  

Regardless, far too many preschool children fail to attain the knowledge, attitudes, and skills that will provide them with the foundation they need to become successful learners in the future (Kagan, 2000; NRC & IM, 2000; NRC, 2001a; Ramey & Ramey, 1998). For optimum growth and learning to occur, children require optimal environmental conditions (NRC, 2001a; Shore, 1997). The human brain is uniquely constructed to benefit from experiences and good teaching during the early years of life (NCRa, 2001; Shore, 1997). Children who experience enriched educational environments, as opposed to those without these experiences, demonstrate gains through high school (Reynolds, Temple, Robertson, & Mann, 2001) and even beyond (Weikart & Schweinhart, 1992).

Whether at home or in a preschool center, all children have the right to experience enriched educational environments. To foster optimal learning environments, the National Association for the Education of Young Children has delineated developmentally appropriate methods and practices of teaching. Developmentally Appropriate Practice in Early Childhood Programs (Bredekamp & Copple, 1997) and Reaching Potentials: Appropriate Curriculum and Assessment for Young Children Vol I & II (Bredekamp & Rosegrant, 1992, 1997) have guided the planning and implementation of enriched early educational experiences.

Educators and scientists have developed standards in specific domains that guide the teaching of older children, those in elementary and secondary schools. The National Council for the Teachers of Mathematics, the Consortium of National Arts Education Associations, the National Center for History in the Schools, the National Academy of Sciences, and others have developed standards that describe what students should learn and know once they reach elementary school.

What young children can and should learn during their preschool years has, however, remained unclear. With the exception of the National Council of Teachers of Mathematics Standards 2000 Project, which includes Pre-K to 2, the standards developed by other associations generally fail to address teaching and learning during the early years of life, those prior to kindergarten.

*Pre-Kindergarten Standards* is designed to bridge the gap between our knowledge of developmentally appropriate practices and what preschool children should know and learn. It presents specific goals, delineates what children need to experience to achieve the goals, and describes the benchmarks indicating achievement of the goals.

## *Pre-Kindergarten Standards* is Unique

While this text does describe what children should learn during the preschool years, it also:

- Presents a unified and integrated approach to preschool teaching and learning;
- Begins with guidelines for the development of self-knowledge, knowledge of others, and achievement motivation;
- Describes what children will need to experience in order to achieve benchmarks;
- Includes vignettes that illustrate the teaching, learning, and authentic assessment strategies appropriate to achieving goals and benchmarks; and
- Recognizes the importance of family in children's achievement.

  

## Principles Directing the Development of *Pre-Kindergarten Standards*

This publication was developed for application with preschool children in any childcare, Head Start, part-time nursery or preschool, and for full- and half-day or part-time programs. The standards within are based on the latest research and theory on early childhood development and education. The principles that guided the development of the standards are:

**Children are active learners.**

Children are not passive recipients of knowledge. On the contrary, they construct their own knowledge through physical, social, and mental activity (Piaget & Inhelder, 1969; Bredekamp & Copple, 1997). Because children learn through firsthand actions with objects and things in their world, their learning is mediated and linked to the sociocultural context (Vygotsky,1986).

As active learners, young children need opportunities to observe things and events in their here-and-now world, form their own hypotheses, try them out, find out what happens, and formulate their own answers (Dewey, 1944; Glassman, 2001).

Play is children's mode of finding out. All types of play_manipulative play, play with games, rough-and-tumble play, and socio-dramatic play_provide children with the opportunities to try things out, see what happens, and learn (Rubin, Bukowski & Parker, 1998).

Organizing children's learning spaces through centers of interest is an efficient way to meet children's active mode of learning. Centers are clearly delineated, organized, thematic play and work areas. Centers encourage children to make decisions, learn new skills, practice skills previously gained, as well as interact with others.

Centers offer children and teachers a great deal of flexibility. Because they do so, centers may support the needs of children, especially those who have special needs. For example, the needs of children

**Children are active learners.** continued

with physical disabilities may be accommodated by providing pathways, low tables, or other necessary adjustments. Those children who need shielding from intrusion or stimulation can be offered quiet, protected centers, and spaces for active learning.

**Development and learning are interrelated.**

Learning about self, developing social skills and achievement motivation cannot be separated from intellectual development, learning content and skills, or from physical health and development. Children's ideas about themselves affect not only interactions with others, but also how they perceive themselves as learners (Ladd, 1990). In turn, children's intellectual abilities and their control over language are highly correlated with how they relate and interact with peers. Children who can use language efficiently to negotiate social situations, or those who have the intellectual ability to consider another's point of view, are more likely to be those with strong social skills.

Likewise, learning to write and read depends in great part on how children feel about themselves and their ability to achieve (Bandura, 1997). Children who believe they can learn, and expect to achieve, do so (Seefeldt, Denton, Galper, & Younosai, 1999).

**Growth and learning are sequential.**

Growth and learning proceed in a relatively orderly sequence (Berk, 2001). For instance, learning generally proceeds from the concrete to the abstract. The early years are the time children can deepen and broaden ideas about their world through concrete, firsthand experiences. These firsthand experiences will form the base from which children are able to gain symbolic knowledge and express their ideas through drawing, painting, and verbal and written descriptions (Bredekamp & Copple, 1997; Piaget & Inhelder, 1969).

  

**Each child is an individual learner.**

Each child is an individual. Each will grow, develop, and learn at his or her own pace. Because children's development is the result of the interaction between biological maturity and the environment, the rate of their development and learning varies. Thus, chronological age is not a good indicator of developmental maturity or what a child can learn.

Even though development and learning proceed in an orderly way, development is often uneven. Some children will spurt ahead in language learning while lagging behind in motor development. Others will demonstrate a skill one day and not repeat it for another month.

A child's genetic makeup may predict healthy growth and development, but an environment deprived of adequate nutrition or optimum language experiences may negate healthy growth. Severe disabilities affect normal growth and development as well. Children with disabilities may benefit more from early intervention than those without these disabilities.

**Development and learning are embedded in culture.**

Culture, the social context in which children learn, grow, and develop, is defined as a complex whole of language, knowledge, beliefs, art, morals, laws, customs, and ways of living that are passed on to future generations (Cole, 1999). Social groups, the family, neighborhood, religious or ethnic groups within a society, explicitly or implicitly pass on their customs, values, or moral principles to the young.

Beginning at birth, the culture socializes children to become members of a society. But children are not just products of the culture they grow in. As children grow, they pick and choose selectively from the cultural influences they are exposed to, shaping their own cultural context over time (NRC & IM, 2001).

**Family involvement is necessary.**

The close attachment between young children and their families demands family involvement. Consideration of each child's unique circumstances, respect for each family, and cooperative involvement between families and preschools is also critical to children's academic success and later school achievement (NRC, 2001a).

Family members and teachers must work together to create continuity of learning. Preschool experiences build on and extend what children learn at home. In turn, children's learning in school is extended and continued in the home.

**Children's learning can be clarified, enriched, and extended.**

Appropriate early educational experiences can extend, expand, and clarify the ideas, concepts, language, and social skills children gain spontaneously. With the guidance of highly knowledgeable, trained, and skilled adults who understand both children and the knowledge, skills, and attitudes children need to acquire, children can learn more than they could on their own (Vygotsky, 1986).

  

## Organization of *Pre-Kindergarten Standards*

*Pre-Kindergarten Standards* is organized around three domains that are key to children's learning. These domains are subdivided into twelve guidelines. Together, the twelve guidelines present a comprehensive and integrated approach to the early childhood curriculum.

**DOMAIN 1**
**Self-Knowledge, Social Skills, and Motivation to Learn**

Guideline I Children Will Develop Knowledge of Self.

Guideline II Children Will Develop Knowledge of Others and Social Skills.

Guideline III Children Will Gain Intrinsic Motivation for Learning.

**DOMAIN 2**
**Basic Symbol Systems of Each Child's Culture**

Guideline IV Children Will Gain Literacy and Language Learning.

Guideline V Children Will Possess Concepts of Mathematics.

Guideline VI Children Will Gain Initial Knowledge of World Languages.

**DOMAIN 3**
**Knowledge of the World in Which They Live**

Guideline VII Children Will Gain Foundational Knowledge of Scientific Inquiry.

Guideline VIII Children Will Gain Foundational Knowledge of the Physical, Life, and Earth Sciences.

Guideline IX Children Will Gain Foundational Knowledge of Technologies.

Guideline X Children Will Gain Foundational Knowledge of the Social Sciences.

Guideline XI Children Will Gain Foundational Knowledge of Health and Physical Education.

Guideline XII Children Will Gain Foundational Knowledge of Visual Arts, Theater, and Music.

**Guidelines**

Each of the guidelines is preceded by an introduction presenting the research and theory supporting the guideline and its significance. How children best gain knowledge of the specific guideline is discussed. Production of this document was guided by the standards and position papers previously developed by national associations and professional organizations. They are recognized in Appendix A.

  

**Goals**

Within each guideline are multiple goals. These goals define specific knowledge, skills, or attitudes that, together, constitute the broader guideline.

**Objectives**

The objectives delineate, with increasing specificity and complexity, the knowledge, skills, or attitudes children are expected to gain between the ages of three and five. Because of the variability in children's development, age alone is not a good predictor of what children can do and learn. Thus the objectives are not divided by children's ages. Teachers should choose objectives that match the needs, level of understanding, background of experiences, and degree of maturity of each child. The description of normal developmental stages that follows can guide educators in selecting guidelines and benchmarks for individual children as well as for the group.

**What Children Will Need to Experience**

Specific experiences children need to enable them to achieve individual goals are listed.

**Benchmarks**

What children should know and be able to do to show they have achieved the goals.

**Vignettes**

Vignettes of appropriate classroom practices and authentic assessment illustrate the principles underlying the development of the guidelines. The vignettes are recorded observations of actual incidences that occurred in Head Start programs, childcare centers, and preschools in inner cities and rural and suburban areas of our nation. These programs include full-day, half-day, and part-time programs.

The vignettes are not meant to be models for behavior, but they illustrate how typical teachers in a variety of settings have implemented and evaluated the guidelines and goals listed in this document. Since the incidences took place in actual classrooms, they also illustrate how teachers integrate the curriculum. Thus, vignettes describing math practices might illustrate how children use language, or vignettes of children practicing motor skills might revolve around children using mathematics.

  

## Developmental Stages

### Three-Year-Olds

In just three years the helpless infant, equipped with a few built-in reflexes, has grown to become a rather self-sufficient three-year-old who can walk and run. Three-year-olds have lost their "baby straddle" walk and look more like children than babies. This doesn't mean, however, that they've given up babyhood entirely. Threes still need a great deal of care. They need help in dressing, and although they feed themselves efficiently, may need reminders to continue eating, or to use a specific utensil.

Physically, three-year-olds are very active. Some call it the "run about" age because three-year-olds seem to be constantly on the move (Gesell, Ilg, & Ames, 1971). Their physical movements are developing from control of large muscles and large movements, to more specific, finer movements (NASPE, 2002).

Three-year-olds' art, their drawing and painting, is more a physical, exploratory activity than an art activity. In the pre-schematic stage of art, three-year-olds produce uncontrolled scribbles in paint, crayon, and marker. They may use both hands as they scribble, and hold markers or crayons in a tight, overhand grip.

Cognitively, three-year-olds are in the period of pre-operational thought (Piaget & Inhelder, 1969). Their thought is egocentric, dominated by perception and animism. Still, threes have established object permanence, and can recall past events, even though they do not understand the meaning of the words "yesterday," "today," or "tomorrow." They may count to three and then they may get confused. Rarely can they count objects with one-to-one correspondence.

Eager to learn, three-year-olds are full of "why," "how," and "when" questions. They want to take on the world to learn everything about it. Three-year-olds can solve problems. One three saw wrapped boxes on a top shelf of her closet. She ran and got the bench from the bathroom and stood on it to reach the boxes. When she found she still couldn't reach them she went and got her broomstick horse and tried to push the boxes off the shelf using the horse—until her mother intervened.

Language is growing by leaps and bounds, with children achieving over 2000 words during the year. Threes often talk in monologue as if practicing language. They still have difficulty taking turns in conversation. They love to listen to stories and can tell a simple story, but not in sequence. They often forget the point of the story, focusing on favorite or remembered parts.

Three-year-olds can adapt their speech and style of non-verbal communication to listeners in culturally accepted ways, but need to be reminded of context (Bredekamp & Copple, 1997).

Threes also know the difference between writing and drawing. One three-year-old whose father was a jockey, was asked to draw his father. He drew a line back and forth, back and forth, saying "My daddy rides fast, and faster." He was then asked to write his daddy's name, and he produced a horizontal line-like scribble that resembled letters.

Socially, three-year-olds often play by themselves, but enjoy being with others, playing side-by-side rather than with each other. Each child has his or her own toys and plays happily without interacting with each other. The pleasant, peaceful play ends, however, should one of the children take something belonging to another. Cooperating and sharing aren't what three-year-olds are all about. Nevertheless, three-year-olds will show sympathy for others. One three-year-old, who had just bitten another, put her arms around the child she had just bitten saying, "Don't cry, don't cry."

### Four-Year-Olds

There doesn't seem to be much baby left in a four-year-old. Fours have an extremely high energy level, darting and dashing everywhere. Their rapidly developing large muscle control, coupled with their high energy level, has given fours the label "out of bounds" (Gesell, Ilg, & Ames, 1971). Four-year-olds can run smoothly, stop suddenly, play tag, climb on the jungle gym, walk a balance beam,

  

and enjoy riding bikes and trikes. Now they are beginning to learn to catch and throw a ball.

Four-year-olds develop fine motor control, enabling them to control their scribbling, repeating circles, lines, and other forms. They will hold drawing and writing tools more like an adult. Fours, who know some letter names, will begin to incorporate letters and pretend writing in their drawings and paintings. As they draw, fours will repeat forms or schema that lead them to think of something, and they'll name their drawing. If asked what they are drawing they may reply, "Well, I don't know yet, I'm not finished."

Cognitively, four-year-olds are still in the preoperational stage of thinking. Fours think semi-logically, unable to keep more than one relationship in mind at a time. Thus they can solve a problem that requires a distinction between objects that are bipolar, e.g., heavy vs. light or where the only task is to count a small array of numbers (Case & Sandieson, 1987).

Four-year-olds are beginning to generalize. Four-year-old Carlos helped his mother plant flowers in her garden. His mother explained that she loved flowers because they beautified her entire world and made her smile inside and out. The next day Carlos was outside playing with friends in a neighbor's yard filled with flowers. He picked as many as he could and ran home to present them to his mother. "Here," he said proudly, "You love flowers."

Four-year-olds can add and subtract one or two objects when they are personally and concretely involved: "You took one away, I need one more." They understand that words such as one and two stand for numbers and can represent the quantity of objects, and they can usually count to ten. They still, however, are not capable of understanding conservation of number, quantity, or matter.

Language is exploding. Four-year-olds have increased their vocabulary by another 2000 to 4000 words and learn new vocabulary quickly when the words are directly related to their experiences. They've mastered nearly 90% of phonetics and syntax of language but still over-generalize verb tenses, plurals, and pronouns. Sometimes fours try to communicate more than their vocabulary allows, extending words to create new meaning: "We piled all the stuff in the baby stroller, oh I mean the cart." Carrying on a conversation for fours is rather difficult; they can take turns, but they really want to talk about themselves and the things they did. They can talk in front of a group, but with some reticence.

Fours seem to be testing limits. Just as their physical development is often "out of bounds," so is their language. Having discovered that some words have shock value. Perhaps fours use what preschool teachers call "bathroom" language simply because rhyming words are fun to say, or to test the limits of cultural appropriateness, or just to shock adults.

Socially, fours are out of bounds as well. One moment they're all smiles and full of love, the next they're bossy, resistant, and aggressive. Fours still play side-by-side with others, sometimes cooperating and sharing. They might for instance build something together, like a road on the play yard, but then play separately on the roadway.

**Five-Year-Olds**

Five-year-olds are more like adults than like babies. They are very self-sufficient, eager to learn, and seem to be at home in the world, feeling secure and capable. Instead of fives being labeled "out of bounds," or "run abouts," their age is called "the golden age" (Gesell, Ilg, & Ames, 1971) because they so want to please. Five-year-olds want the approval of adults and will even ask permission to do something.

Physically, five-year-olds are agile and have strength in arms and legs. They continue to refine large and small muscle development, learning to skate, jump, gallop, jump, ride bikes, and manage a slide. Depending on the cultural context, five-year-olds may learn to swim, do gymnastics, skate, or begin to play organized sports. Fine motor skills are being refined as well, and children begin to form written letters and numerals. Fives can dress

  

themselves, handle buttons, some can tie their shoes and feed themselves, and all can, and are even happy to, help with household or school chores with competence.

Five-year-olds are more than ready to learn. Cognitively they have expanded their knowledge of the world and the universe, and are interested in learning more and more. Fives can persist at tasks, and will experiment and invent solutions in order to solve problems. They understand a variety of cause-and-effect relations, and can form loosely held analogies, rather than coherent theories; the rain cycle is explained as "raining up" and "raining down," not in terms of evaporation.

Children's cognitive growth is reflected in their art and music. Five-year-olds are using schema to represent reality. Their drawings and paintings are becoming increasingly representational. Fives will be able to sing a number of songs by heart, have favorite songs, and know the names of several musical instruments. Now they can actually move to music, dancing by themselves or with others.

Fives also are eager to achieve academically. They are becoming aware of the purposes of the written word and are figuring out symbols, letters, and words. Language growth continues. Most five-year-olds have a vocabulary of 5000 to 8000 words. Their speaking ability has also increased. Five-year-olds speak in longer and more complex sentences than they did at four. Still, fives over-generalize rules, for example using "foots" instead of "feet" but correcting themselves when they do so. They can retell stories in sequence, have favorite stories, and can recognize the work of familiar authors, compose stories themselves, and enjoy acting out stories and poems. Some fives will be able to read familiar books, especially those with predictable texts. They know the names of several letters and their sounds, as well as the conventions of print. Five-year-olds can take turns in conversations; however, they still interrupt to talk about themselves, but not as frequently as they did at four.

Math and numbers fascinate five-year-olds, who are interested in writing numerals and copying numbers. They can count to ten and through the teens. They still, however, may make mistakes in sequence and may use words like "five teen" which illustrates that they have an initial concept of base-ten. They are beginning to count using one-to-one correspondence with concrete objects. When working with the concrete, they are able to perform simple number operations, taking away and adding objects. Fives know and can name common shapes, and are developing the language of measurement and both the concepts and language to express locations, such as under and over, in and out.

Socially five-year-olds have developed a firm sense of self. They know who they are and what they can do. They have over-defined gender roles, with a tendency to stereotype what boys and girls can do. Five-year-olds enjoy playing cooperatively, and especially enjoy socio-dramatic play. They often create play themes that continue for several days. After a visit to a woodworking shop, a group of fives set up a woodworking shop themselves. With the help of the teacher who provided tools, wood, and some patterns, the children set up a rather informal assembly line to build boats and cars that they then sold to the fours, using the money to restock their fish aquarium.

Generally, five-year-olds can share well and even figure out ways of sharing one tricycle or other object. Although five-year-olds may argue and fight, they are more likely to use verbal insults than physical aggression. "You can't do that here. Are you stupid or something? Don't you know the rule?" a five-year-old told another child who was splashing water on the floor.

  

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*Published by CTB/McGraw-Hill LLC, a subsidiary of The McGraw-Hill Companies, Inc., 20 Ryan Ranch Road, Monterey, California 93940-5703.* 

# Domain I

## Children Will Be Equipped with Self-Knowledge, Social Skills, and Motivation to Learn

### Guideline I
### Children Will Develop Knowledge of Self

Far too often early education is thought of only as a program of mathematics, reading and writing. The report of The National Academies, Eager to Learn (NRC, 2001a), clearly demonstrates that children cannot be successful learners without confidence in themselves as learners, the skills of interacting with peers and adults, and the motivation necessary to achieve. Likewise, the first recommendation of the report From Neurons to Neighborhoods (NRC & IM, 2000) is that resources on par with those focused on teaching reading, writing, and mathematics be devoted to fostering children's self-knowledge, social, and motivational skills.

Although self-knowledge and social skills have their roots in family interactions, once in an early educational setting, peers and other adults influence children's development of self-regulation and self-knowledge (Kagan, 2000). Responsive adults, who nurture children's developing self-concept and foster independence and self-control, are necessary. Consistently, the early childhood literature points out that an emotionally warm and positive approach to learning is necessary if children are to become successful achievers (Berk, 2001).

The development of concepts of self, self-esteem, self-efficacy, and social skills is central to early educational experiences and later school success (Katz & McClennan, 1997; Ladd, 1990). The abilities to engage and work collaboratively with others and to resolve conflict are affected by the quality of early teacher/child relationships (NRC & IM, 2000).

Achievement motivation, which consists of a desire to learn and the expectations that one will learn, is equally as important. Young children who have learned to be helpless, who experience failure or think of themselves as failures, are believed at risk for later school failure (Cain & Dweck, 1995; Smiley & Dweck, 1994). In contrast, children who experience early academic success are those who are future successful learners.

### Guideline I, Goal 1
### Self-Knowledge

What children think of themselves, what they think they are capable of doing, as well as what they think others think of them, constitutes their self concept (Coopersmith, 1969; Harter, 1998). Three- to five-year-olds know themselves primarily in terms of their physical characteristics or possessions (Berk, 2001). In fact, some believe children who define themselves in terms of what they have, saying "That's mine," are demonstrating the beginnings of defining themselves (Levine, 1983).

Another sense of self is self-esteem. Self-esteem refers to judgments children make about their worth or how they value themselves. Typically, young children regard themselves overly optimistically. They believe they did extremely well on tasks, even if they failed (Dweck & Elliott, 1983). Part of the role of the preschool is to enable children to build realistic self-esteem as well as realistic self-concepts.

Self-efficacy differs from self-concept or esteem. Self-efficacy is the belief that one can achieve a task by using one's own capabilities. Children can have good self-concepts and realistic self- esteem, yet not be able to succeed without the belief that they can, in fact, do so (Bandura, 1997). As self-concept and self-esteem are highly related to children's later academic and social success, they should be fostered in preschools.

  

**Guideline I, Goal 1, Objective 1**
**Children Will Develop Healthy Self-Concepts**

Children Will Need to Experience:

Teachers who know children's names and use them frequently.

Adults who recognize children's physical growth and development: "You're getting taller."

Mirrors, so children can see themselves, keep records of physical growth.

Talk about children's physical, social, and academic accomplishments: "You learned to use scissors: Good job!"

Opportunities to try out, practice, and develop physical, social, and academic skills.

**Benchmarks**

Children Should Be Able To:

Tell you their first names, and by age five, their given and last name.

Recognize their physical growth and development: "How tall am I? I'm growing."

Develop responsibility for self and their things. Hanging up clothes, washing, toileting, eating by themselves.

Gradually develop the ability to self-regulate, expressing emotions appropriately, knowing when they need to rest.

Talk about their specific abilities and characteristics, including physical growth. "Look, I can write my name."

Develop a sense of personal identity, knowing what they can do and what they have yet to learn.

**Vignette**

Four-year-old Domingo was having trouble putting a new puzzle together. After several tries, his teacher sat with him, saying, "Let's see what we can do with this." Holding up a piece she said, "This piece is mostly red and has this little bump here. Where else is there something red that this piece would go with?" Domingo looked at the puzzle pieces again and said, "Here, it goes here, it's red here and here's the place the bump goes." "Yes," replied the teacher. You're a good learner."

"I know," said Domingo. "I'm learning a lot. I can ride a bike, and run and jump and skip, and next year I'll learn to do all the puzzles and I'll learn to read too."

Supported by his teacher and family members, Domingo demonstrated that he knows something of his physical abilities, what he can do now, and what he expects to do in the future.

  

**Guideline I, Goal 1, Objective 2**
**Children Will Develop Healthy Self-Esteem**

Children Will Need to Experience:

Patient and responsive teachers and family members who hold children in high regard as individuals.

Realistic acknowledgement of children's achievements by significant adults. "You are learning to use the scissors. Good job."

Teachers who offer children a range of choices so children develop a sense of being in control of their own lives.

Adults who encourage children to develop independence. "You did well—you pushed the peddles of the bike. Next time you'll ride further."

Opportunities to express themselves, their ideas and emotions, and likes and dislikes, through language, the arts, and movement and other ways at home and school.

**Benchmarks**

Children Should Be Able To:

Know they are loved, respected, and talked about, and know the names of people who care for them.

Make independent choices of what to do, how to do it, and with whom, developing a sense of control.

Move from other overly optimistic judgments of self-esteem, "I'm the best," to realistically judge themselves as worthy individuals.

Express their emotions and feelings, ideas and experiences, freely through language, art, movement, dance, music, and play.

**Vignette**

Three-year-old Chanelle stood, thumb in mouth, watching the others in the group make decisions about which center to work in and what to do. The teacher, wanting Chanelle to make her own choices, watched for a moment. When Chanelle moved to sit at an empty table, the teacher went and sat with her. Patiently, and with sensitivity, the teacher put her at ease. Once Chanelle was at ease the teacher began discussing the choices that were available, asking her which she wanted to choose. Chanelle, still unable to make a choice from so many opportunities, put her thumb back in her mouth.

The teacher, recognizing that Chanelle had not yet developed the sense of self or self-esteem that would enable her to make choices, suggested that Chanelle begin by making a choice between the housekeeping area where the children were playing restaurant and needed someone to serve, or to work at the puzzle table. Chanelle chose to be the customer in the restaurant. Once in the restaurant, Chanelle fulfilled her role as customer, pretending to eat, asking for things, and getting paper and pencil and scribbling a bill to pay for her meal.

Chanelle's teacher recorded the event to include in Chanelle's observational record. She noted that Chanelle had good social skills, she entered into the play, but still needed help in developing sufficient self-esteem to be able to make choices for herself.

  

**Guideline I, Goal 1, Objective 3**
**Children Will View Themselves as Efficacious, Capable Individuals Who Can Set Goals and Achieve Them**

Children Will Need to Experience:

Tasks that challenge yet are achievable.

Opportunities to solve problems and the time to do so.

The guidance of adults who inform children of their past successes. "You put the puzzle together yesterday."

Teachers who model and teach the use of self-talk when faced with problems. "I can fix that. First I'll…"

Peers and adult models who face challenges and are able to meet them.

Adults who understand and accept children's mistakes, informing children that they can try again.

**Benchmarks**

Children Should Be Able To:

Persevere when faced with challenging or new tasks.

Take the time to try to solve problems.

Use self-talk, "I think I can," or "Put this here, then I'll hold that."

Handle defeats and errors with security.

Accept challenges and take risks to learn more.

**Vignette**

Four-year-old Jenni, as well as Domingo, was having trouble with the new puzzles the teacher had added to the manipulative area. No one could miss noticing that Jenni was having a difficult time. She pounded on a piece trying to make it fit, and then loudly dumped all the puzzle pieces on the tabletop. The teacher turned her attention to Jenni. Without saying a word, she picked the puzzle pieces up and began arranging them on the table. Jenni watched her. Putting two pieces of the puzzle in the frame the teacher said, "Now it's your turn." Jenni picked up a puzzle piece and looked at it. "Good, Jenni," the teacher said, "you're really looking at the piece. That will help you put it where it belongs." Jenni, encouraged by the teacher's specific feedback, put two pieces together, saying, "I did it! I did it! I knew I could do it!" "Yes," the teacher responded, "I knew you could do it too."

  

## Guideline II
## Children Will Develop Knowledge of Others and Social Skills

With a strong sense of who they are and what they can do, children rapidly develop skills of interacting with and relating to others. Social skills have their beginnings in children's developing awareness of others. It was once thought that children could not take the view of another. More recent research, however, suggests that children do know that others have feelings, and can recognize and empathize with the feelings of others (Eisenberg & Fabes, 1998).

Even though children empathize with others, preschoolers still have difficulty getting along with others (Howe & Matheson, 1992). Their social skills are learned gradually.

Both social and nonsocial behaviors increase dramatically during the preschool years. Three- and four-year-olds engage in more nonsocial behaviors than in social behaviors, and even among five-year-olds arguments occur and solitary and parallel play take up as much time as does social play (Berk, 2001). While in an early childhood setting, children gain the skills of playing and working with others, cooperating, sharing, and negotiating.

### Guideline II, Goal 1
### Awareness of Others

As children grow and mature, they increasingly seek out peers to play and be with (Ladd & Burgess, 1999). Even though children want to be with peers, their ability to be aware of others and understand that others have feelings develops gradually (Berk, 2001). As children mature and have experiences with others, they begin to recognize others. With increasing maturity, preschoolers are able to not only recognize others, but realize that others have ideas and feelings and will begin to respond appropriately to these (Eisenberg, 1998).

### Guideline II, Goal 1, Objective 1
### Children Will Develop Awareness of Others

Children Will Need to Experience:

Teachers and family members who respond to children with sensitivity, encouraging prosocial behaviors and empathy.

Teachers and family members who are warm and encouraging, who display empathy and sympathy to others.

Models, in books, videos, CDs, who display empathy and sympathy to others.

#### Benchmarks

Children Should Be Able To:

Begin to recognize others. Look at peers when they are talking. Talk to others.

Develop respect for other children's things and work. Asking for a toy that belongs to another, hanging up a coat, and so on.

Begin to respond appropriately to the feelings of others.

#### Vignette

Regrettably, in a childcare center one child yelled at another, "I hate you! I hate you!" The child being yelled at started sobbing. A three-year-old bystander walked over to the sobbing child, put his arms around her and said soothingly, "It be all right, it be all right, I love you, I love you," patting her as he spoke, demonstrating that even very young children do have, and can display, appropriate feelings for one another.

  

**Guideline II, Goal 1, Objective 2**
**Children Will Develop the Social Skills of Sharing and Cooperating with Others**

Children Will Need to Experience:

Opportunities and time to interact freely and play with other children.

Time and materials for solitary, parallel, socio-dramatic, constructive, and cooperative play at home and school

**Benchmarks**

Children Should Be Able To:

Advance from onlooker to parallel, associative, cooperative, and play that involves rules.

Begin to share equipment and toys, as well as the time and the attention of the teachers, aides, and other adults.

Gain initial skills in cooperating and sharing.

Initiate play activities with others.

Help keep dramatic play moving along. "I'll be the teacher you be the kids." "Here are the pancakes . . . now you eat them."

Accommodate the special needs of other children.

**Vignette**

Development of social skills parallel children's cognitive maturity and development. While teachers focus on teaching children to share and cooperate, they must also recognize the natural development of children's social skills and accept it.

Three children were fighting over who would ride a new tricycle. As the fighting accelerated, one of the teachers went to the group asking "What's the trouble here?" "There's no trouble," one of the four-year-olds said, "we're sharing." Another child said, "You taught us to share," and the others agreed, "We're sharing." The teacher stepped back—she had after all led the children in a lesson about sharing using puppets. Staying close enough to stop serious aggression, she carefully watched the children as they reached conclusions by themselves as to how to share the trike.

  

**Guideline II, Goal 1, Objective 3**
**Children Will Develop the Ability to Solve Conflicts**

Children Will Need to Experience:

Teachers who give children the freedom to get into and out of arguments and fights by themselves.

Sufficient toys, materials, and space that serve to negate arguments and fights.

Guidance of sensitive adults when children cannot settle disagreements themselves, for example: "Tell her what you want," "Use your words . . ." "If you ask him . . ."

**Benchmarks**

Children Should Be Able To:

Quickly move from outbursts and arguments, restarting their play.

Develop the ability to tell others what they want or what they are thinking.

**Vignette**

"Ms. Daniels, Ms. Daniels, he took my block," screamed four-year-old Misha, who then ripped the block out of Claire's hands. Now both Misha and Claire were screaming. Ms. Daniels hurried to the block area only to find that the two children, now laughing and smiling together, had resumed their play. The teacher, without blaming or scolding, simply reminded Misha and Claire that there were plenty of blocks that could be used for their building.

An observer asked Ms. Daniels why she didn't reprimand both children. Claire had, after all, taken Misha's block first, and Misha in turn had taken it back instead of getting another block. Ms. Daniels explained that three- and four-year-old children are quick to anger, but once the outbursts are over, are just as quick to forget and move on with their play. Ms. Daniels explained, "If teachers stopped what they were doing each time an argument arose in a preschool, that's all they would do. Research shows that the number of conflicts that occur in a preschool are more numerous than the number of prosocial acts. If you try to do a lot of explaining, children just look at you as if they are wondering what you're talking about. As with Claire and Misha, most of the arguments children get into are settled without us."

  

## Guideline III
## Children Will Gain Intrinsic Motivation for Learning

The desire to achieve at difficult tasks and to avoid failure is called achievement motivation (Dweck & Elliot, 1983). Young children often have high and unrealistic expectations for their achievement, no matter what the problem or task. Most young children, perhaps because they are used to failing and then achieving sudden breakthroughs—unable to zip their coats one day and able to the next—seem to have the motivation to keep on trying (Harter, 1998). This optimistic view seems to change as children mature and are faced with challenging academic tasks. The role of good schools for young children is to foster the achievement motivation of children, enabling them to maintain their natural incentive to work hard and be successful.

### Guideline III, Goal I
### Motivation to Learn

Motivation, thought to be present at birth, can increase or diminish over time. When children receive support and encouragement to explore, to find out more about their world, their motivation to learn increases (Harter, 1998). On the other hand, when children experience repeated disapproval or indifference from the adults in their lives, their motivation to learn decreases (Ziegler & Trickett, 1978). Motivation to learn varies by skill or the content being learned. Some children may be motivated to learn to read or to learn mathematics, others find it difficult to do so, but may be motivated to gain concepts and ideas of science, the social sciences, or the arts.

### Guideline III, Goal 1, Objective 1
### Children Will Develop Achievement Motivation

Children Will Need to Experience:

Success in learning new skills and gaining knowledge.

Teachers and family members who believe children can and will learn.

Joy in learning for its own sake, intrinsic rather than extrinsic rewards.

### Benchmarks

Children Should Be Able To:

Elect challenging tasks rather than easier ones.

Delay gratification, working on something until they feel satisfaction.

Try again when faced with failure.

Express satisfaction and joy when accomplishing tasks and achieving goals.

### Vignette

A group of three- and four-year-olds was given two large refrigerator-sized cardboard boxes along with an assortment of other sized cardboard boxes. The first day the children just played with the boxes, moving them around, hiding in them and exploring what they could do with the boxes. The second day a group of children decided to build a fort from the boxes. They tried a number of ways to join the boxes. Other children joined in with ideas. All of the children at one time or another contributed some idea or scheme for building the fort.

The third day the children asked the teacher for "a lot of tape, lots and lots." Providing the tape she joined the discussion, offering several possibilities for turning the boxes into a fort. Finally, on the fourth day, the boxes were joined. Then the teacher suggested the children could paint the boxes. They named the colors they wanted. Every child spent a great deal of time painting his or her "fort." Throughout the experience the children had persevered at a difficult task, delaying gratification, and in the end they were the ones to experience the satisfaction of successfully solving multiple problems by staying with a challenging task.

  

### Guideline III, Goal 1, Objective 2
### Children Will Believe They Can Learn to Read and Expect to Do So

Children Will Need to Experience:

Success in their experimentation with writing and reading.

Recognition for their accomplishments.

Pleasure in writing and reading.

**Benchmarks**

Children Should Be Able To:

Elect to spend time with books and writing- and reading-related activities.

Enjoy trips to the library.

Reflect on stories and other literature by acting out themes in their play.

**Vignette**

When children say, "Read it again," after hearing a best-loved story, you know they are gaining the motivation to learn to read for themselves.

### Guideline III, Goal 1, Objective 3
### Children Will Be Motivated to Learn Mathematics

Children Will Need to Experience:

An environment that supports their play, active explorations, questioning, and problem solving activities.

Success in using number and number concepts.

**Benchmarks**

Children Should Be Able To:

Demonstrate their confidence in using number concepts in their everyday experiences: "Her boots are bigger than mine," "You get one, I get one, then you get one until they're gone."

Ask questions about numbers to find out or help them solve problems.

Elect to play with math games.

Spontaneously use the vocabulary of mathematics as they play.

Choose to look at counting books.

**Vignette**

A group of four-year-olds huddled over a board game. They tossed the dice and took turns moving their markers around the board. Each time they did so, however, they entered into detailed discussions about how many spaces the marker was to be moved, who moved the farthest, who wasn't playing fair because they moved too many spaces, and how many more turns it would take to catch up with the winner. Their math concepts and interest in learning about mathematic principles were clear from their intense, sometimes heated, discussion.

  

### Guideline III, Goal 1, Objective 4
### Children Will Be Motivated to Use the Scientific Processes in Exploring the Physical, Life, Social Sciences, and Technology

Children Will Need to Experience:

Time, psychological safety, materials, and teachers who themselves use the scientific processes of inquiry.

**Benchmarks**

Children Should Be Able To:

Sense a problem.

Ask questions designed to answer or solve the problem.

Collect and organize data and information.

Gain meaning from the evidence to reach conclusions.

Communicate their conclusions to others.

**Vignette**

Four-year-old Misha collected pebbles from the play yard in a box. He took the box under a tree and began sorting the pebbles. "Here are brown ones, here's my white ones." The teacher affirmed that he had all kinds of pebbles. Misha made clear that when teachers foster scientific inquiry, children collect and organize data, sense a problem, and ask questions.

### Guideline III, Goal 1, Objective 5
### Children Will Be Motivated to Develop Their Physical and Motor Skills

Children Will Need to Experience:

Time, freedom, space and appropriate equipment for outdoor play.

Psychological safety to gain new skills.

**Benchmarks**

Children Should Be Able To:

Actively explore space and equipment, using a variety of motor skills.

Persevere at a motor task, repeatedly practicing developing skills until mastery is achieved.

Use suggestions and input of others to achieve success with difficult motor tasks such as riding trikes or bikes, balancing, climbing, throwing and catching balls.

**Vignette**

Sensitive teachers know when to step in and how to enable children to experience success. Three-year-old Arilee brought a ball her grandfather had given her to the preschool, along with a catcher's mitt. Arilee tried over and over to catch the ball as others tossed it to her. The teacher, sensing Arilee's frustration, stepped in. "Arilee," she said, "come and practice over here with me. We'll sit on the ground. Spread your legs like this." Then the teacher and Arilee rolled the ball back and forth to each other catching it between their legs. As Arilee developed this skill, the teacher then asked her to catch the ball with her hands while still sitting. When success was achieved with this task, the teacher had Arilee put the mitt on to catch the ball, and in this way Arilee experienced success.

  

**Guideline III, Goal 1, Objective 6**
**Children Will Be Motivated to Create Through the Visual and Musical Arts**

Children Will Need to Experience:

Time to master a variety of media.

First-hand experiences to represent through the arts.

Freedom to select materials and methods for creative expression.

Psychological safety and freedom to express their ideas, emotions, and reflections fully and freely.

**Benchmarks**

Children Should Be Able To:

Express themselves freely using a variety of media and methods.

Elect to express themselves through the visual and musical arts.

Request materials that will enable them to give greater expression to their ideas.

**Vignette**

Shamel, a four-year-old, began painting on an easel set up in the play yard. He painted the entire play time. When the teacher said it was time to go back inside, he asked if he could take the painting inside so he could finish it later. Recognizing Shamel's motivation to express himself through the visual arts, the teacher helped him transfer a very wet painting to an inside easel so he would be able to finish his creative work

  

# Domain 2

## Children Will Be Equipped with Their Culture's Basic Symbol Systems

### Guideline IV
### Children Will Gain Literacy and Language Learning

Language and literacy learning are emphasized throughout early educational programs (NRC, 2001a; NRC & IM, 2000; Burns, Griffen, & Snow, 1999). Research has demonstrated that children with foundational skills of listening and speaking, familiarity with print and books, knowledge of story structure, and the purposes of writing will benefit more from reading instruction, learn to read sooner, and read better than children with fewer of these skills (Strickland & Morrow, 2000; Wasik, Bond, & Hindman, 2001; Whitehurst & Longman, 1998).

Effective schools for young children immerse children in literacy-rich environments. The environment is rich in oral language, listening, and speaking, and emphasizes vocabulary development (Newman, Copple, & Bredekamp, 2000). It is equally as rich with print, interactive bookreading activities (Whitehurst & Longman, 1998), and phonemic and grapheme awareness (NRC, 2001a).

Literacy and language learning are complex processes involving the mastery of multiple skills and knowledge. But they are also joyful experiences (New Standards, 1999). Children who fall in love with language, who fall in love with books, who want to hear the same stories over and over again, will have the motivation and desire necessary to accept the challenges involved in learning to read (Fisher, 1991; NAEYC & IRA, 1998).

### Guideline IV, Goal 1
### Listening

Building on their prior listening experiences children can develop the abilities to identify sounds in their environment and distinguish between and among them. Children listen actively, attending to what they hear with purpose, and so gain meaning and understanding. Children learn that listening to others—to stories, poetry, and songs—brings them joy and pleasure.

Phonemic awareness is the knowledge that words are made up of sounds and that speech can be broken down into even smaller units, phonemes. "The smallest units of speech that correspond to letters of an alphabetic writing system are called phonemes." (Adams, Foorman, Lundberg & Beeler, 1998, p.1) Phonological awareness is the ability to pick out and manipulate sounds in words. Phonics is the relationship between letters and sounds, the idea that the letter b makes the sound /b/ (NRC, 2001a). The understanding that speech is a series of sounds is a powerful predictor of children's later reading achievement (Adams, 1992). Knowledge of letter-sound correspondence is directly related to successful reading, but children only need to learn a few letter-sound correspondences to get the idea that the printed letter is related to specific sounds (Adams, 1992).

  

### Guideline IV, Goal 1, Objective 1
### Children Will Discriminate Between Sounds in Their Environment

Children Will Need to Experience:

Listening to sounds in their environment.

Creating sounds.

Singing and listening to music.

**Benchmarks**

Children Should Be Able To:

Identify sounds in their environment such as animal sounds, traffic noises, music, human speech.

Create sounds by singing and making music.

**Vignette**

A group of crows landed in some trees surrounding the play yard. Excited over something or other, the crows cawed and cawed. It was quite a cacophony. Taking advantage of the cawing, the teacher sat on a bench next to three-year-old Joshua. She said, "Listen to those crows! What a racket!"

Joshua looked up at the crows and replied, "They fighting, they fighting." "The crows are fighting?" inquired his teacher. "Yep," Joshua said as the crows continued their cawing. "They fighting—they using fighting voices." Joshua was demonstrating his ability to identify sounds and discriminate between environmental sounds.

### Guideline IV, Goal 1, Objective 2
### Children Will Listen Attentively

Children Will Need to Experience:

An environment in which free expression of ideas, feelings, and emotions is fostered and children are encouraged to talk, listen, discuss, and even argue with each other.

Listening to a variety of stories, poetry, songs, chants.

Arrangements for family members to read, sign, recite the same stories, poetry, songs, and chants.

**Benchmarks**

Children Should Be Able To:

Listen to each other with attention, and by age five, without distraction or interruption.

Make judgments about what they hear, telling parts of stories they liked or that frightened them.

Recognize the purpose of listening, noting details by using new ideas and information in their play.

**Vignette**

"Ms. Johnson, Ms. Johnson, come look at our city," pleaded four-year-old Juanita, who was finishing building a city of blocks. After Ms. Johnson agreed that Juanita and her friends had indeed built a marvelous block city, Ronald asked, "Now where are the lights, Ms. Johnson, now we need lights." "Why do you need lights?" asked Ms. Johnson. "Because we're building the city that goes to bed hanging lights all around its head. We need lights." Ms. Johnson, who often read Langston Hughes' poem The City in which the "city goes to bed hanging lights around its head," realized that these children were listening attentively and incorporating details of their listening into their play, building a city of blocks.

  

**Guideline IV, Goal 1, Objective 3**
**Children Will Listen for Pleasure and Enjoyment**

Children Will Need to Experience:

Listening as others read and tell, and reread a variety of stories, poems, songs, and chants.

Teachers who engage children in talking about repeatedly read or told stories, poems, and chants. "Did it frighten you when Max saw the wild things?"

Listening to a variety of types of music including songs, chants, and instrumental music.

Families who share their cultures' chants, songs, music, poems, and stories.

**Benchmarks**

Children Should Be Able To:

Request specific stories, poems, songs, and other music.

Repeat parts of stories and poems.

Show pleasure and enjoyment during listening activities, smiling, laughing, and responding in appropriate ways.

Talk about and discuss familiar stories, poems, and chants.

Increase their listening attention span from a moment or two to listening to an entire story, poem, or chant.

**Vignette**

Three-year-old Shaval, running outside to play, was heard singing "Trip, trap, trip trap, tripety trap, trap, trip-trapety, trip," illustrating that she was familiar with the folk tale Three Billy Goats Gruff and could repeat parts of a story with enjoyment and pleasure.

  

**Guideline IV, Goal 1, Objective 4**
**Children Will Develop Phonemic Awareness**

Children Will Need to Experience:

Listening to and learning a great many nursery rhymes, chants, and poems.

Teachers who themselves play with language, making up chants and rhymes.

Singing songs that segment words or accent beginning sounds, and with the teacher, clapping to the syllables.

Listening to stories, poems, and songs that use alliteration.

**Benchmarks**

Children Should Be Able To:

Fill in the rhyming words in familiar poems, songs, stories, and informational books.

Hear specific letter sounds (such as the beginning, middle, and end of words).

Be aware of syllables by clapping to these in words, songs, or poems.

Be able to recite nursery rhymes, poems, or sing songs.

Make up and chant their own rhymes.

**Vignette**

The room was filled with laughter. The teacher was leading the children in reciting silly poems. She started with chanting No More Monkeys Jumping on the Bed. Then she changed the rhyme to "No More Monkeys Jumping on my HEAD."

The children continued giggling and laughing as they changed the rhymes of others poems and songs.

  

**Guideline IV, Goal 1, Objective 5**
**Children Will Be Able to Identify Letter-Sound Relationships**

Children Will Need to Experience:

Listening to alphabet books.

Explicit teaching of letter names and sounds in a meaningful context: "Look, this word on your shoes says Nike—it begins with an N—just like your name, Nicholas.

Hearing and recalling numerous rhymes, poems, chants, and alliteration.

**Benchmarks**

Children Should Be Able To:

Identify the letter that begins their name and its sound.

Pick out other words that begin with the same letter/sound as their names.

Begin to identify a few consonant letter/sound correspondences in words in familiar rhymes, poems, and chants, including those with alliteration.

**Vignette**

"Look," said Carl's teacher as four-year-old Carl was hanging his coat in his cubby shortly after he had joined the preschool group. Your name begins with a C just like coat and cubby." "Oh," said four-year-old Carl, "I know that C, C, C, Carl, cubby, cup."

  

**Guideline IV, Goal 2**
**Complex Speech**

Speech is fostered in the preschool program. The more children are able to talk and speak to one another, the greater their academic success (Newman, Copple, & Bredekamp, 2000). From the way the room is arranged with centers of interest in which children work and play together, speaking and listening are nurtured. Children are asked to use speech to solve problems, relate and communicate with each other, and express themselves. Vocabulary is developed, and children's abilities to talk and communicate with each other, with adults, in small groups, or in front of the total group, are encouraged.

**Guideline IV, Goal 2, Objective 1**
**Children Will Experience Steady Vocabulary Growth**

Children Will Need to Experience:

Meaningful conversations with adults at home and at school.

Opportunities to talk and converse with peers throughout the day.

Entering into discussions about books and stories being read to them.

Teachers who focus on vocabulary new to children while reading a book, pointing to a picture of the new word, defining it while reading, or using the word in context after the reading (Wasik, Bond & Hindman, 2001).

Active experiences that demand the knowledge and use of new words.

Explicit introduction of vocabulary new to them.

Family members who reinforce children's vocabulary learning with first-hand experiences, conversations, and interactive book reading.

**Benchmarks**

Children Should Be Able To:

Use new vocabulary introduced through book reading or through explicit experiences as they work and play: "Pretend these are the goggles."

Ask questions to extend their ideas of words. "What's a huddle?"

Link new experiences to vocabulary they already know. "A mouse is a part of the computer, but a mouse is also an animal."

Use increasingly complex sentence structures.

**Vignette**

A teacher of three-year-olds frequently defined words new to children as she read to them. She also used the words in context after the book was read. The teacher selected Goggles (Keats, 1969) to read to the children. Knowing the word goggles was new to the children, she pointed to the picture as she read the word goggles. The next time the word appeared, without stopping the flow of her reading, she defined goggles. She read "goggles," and added, "goggles are like glasses but they protect your eyes instead of helping you see."

During outdoor play she added a pair of goggles to the bike riding area. She subsequently overheard many children asking for goggles, talking about them, or if the goggles were in use, saying, "Pretend I have goggles on." Children's spontaneous use of the word goggles informed the teacher that focus on vocabulary during book reading was an effective method of increasing children's vocabulary.

  

**Guideline IV, Goal 2, Objective 2**
**Children Will Increase Their Conversation Skills**

Children Will Need to Experience:

- Opportunities to play and work with others in small groups.
- Adult conversations around meaningful topics.
- Listening to narrative stories with conversations between characters.
- Playing with puppets to converse and carry on conversations.
- Opportunities to speak in small groups and to the total group.

**Benchmarks**

Children Should Be Able To:

- Talk about what they are doing, what they did, and how they did it.
- Engage peers in conversations that become increasingly complex.
- Extend and expand conversations with others.
- Use puppets to create conversations.
- Express themselves through speaking in small groups and in front of the whole group.

**Vignette**

Three children, cooking with playdough in the housekeeping area, demonstrated how conversations with other children extend and expand language growth. One child, from Eastern Europe, was busy making pierogies, another from South America said, "No, not that, not that. We're making tamales," and the third, folding over another piece of playdough, said "There now it's right, we making wontons." "Oh wontons, tamales, pierogies, we're making wontons, tamales, pierogies" they sang, illustrating that children can learn new vocabulary through informal play and conversation.

  

**Guideline IV, Goal 3**
**Print Awareness**

A first step in learning to read is understanding the relationship between speech and the written word. To young children, speech seems like a steady stream of sounds that flow from one to another (Vacca, Vacca & Gove, 2000). Children need to gain the understanding that this speech can be written, as well as learn the conventions of print (words, capital letters, punctuation marks, we read from left to right) that were created to better represent the spoken language in print.

Even very young children seem to know that print carries a message. Implicitly children scribble on paper and ask you to send the note to Grandma. They will not, however, implicitly learn the conventions of print, the difference between a letter and numeral, when a word ends, or how to print words. To make knowledge of print explicitly understood is one of the most critical roles of preschool teachers (Strickland & Morrow, 2000).

**Guideline IV, Goal 3, Objective 1**
**Children Will Understand that Print Carries a Message**

Children Will Need to Experience:

A meaningful print-rich environment.

Shared book-reading experiences including big books.

Adults, teachers, and family members who take dictation, writing down the words they speak, then reading the words back to the children.

Adults around them using print to gain meaning and understanding both at home and at school.

**Benchmarks**

Children Should Be Able To:

Play at reading, pretending to read to themselves and others.

Engage in paper and pencil activities that include various forms of scribbling and written language.

Associate the spoken word with the written. "This says I Love You" said three-year-old Rachelle, pointing to a line of scribbling on her paper.

Ask "What does this say?"

Recognize logographic signs and symbols in their environment, such as stop signs, fast food and familiar brand name logo's.

**Vignette**

Three-year-old Shalini was having trouble getting her baby doll to sleep in the housekeeping area. "Ok," she said firmly to the doll she was holding, "I know what you need." Carrying the doll she went to the library corner, picked out a book of nursery rhymes, sat down in the rocker and said with force, "This should do it." Then she started to pretend reading to the doll. Doing so she demonstrated that she understood that books carry a message—in this case rhymes that will help her baby fall asleep.

  

**Guideline IV, Goal 3, Objective 2**
**Children Will Develop Grapheme Awareness**

Children Will Need to Experience:

Alphabet books.

Discussion of letter names in the context of daily, meaningful activities.

Linking letter names to writing their own names.

**Benchmarks**

Children Should Be Able To:

Name the letters that begin their names.

Notice and be able to name letters that begin names of friends and family members, and common logographics.

Recognize and begin writing their own names, demonstrating that letters are grouped to form words.

**Vignette**

Children in one group learned to read their names and the names of other children as well as the names of letters that began their names. The teacher made a practice of listing children's names. She made a list of "We Are in the Red Room," followed by a list of "We Are Going to the Apple Orchard," another "Our Halloween Parade," and so on. Children gathered around the list of names, finding theirs, pointing out letters that were the same, those that were different, and reading the names they knew.

  

**Guideline IV, Goal 3, Objective 3**
**Children Will Develop Book Familiarity**

Children Will Need to Experience:

Adults at home and at school who introduce books to children, stating the titles and authors.

Adults who use the language of literacy, demonstrating the meaning of words such as "book," "line," "sentence," "letter," "end," and "beginning."

Listening and having access to a variety of books, including factual and informational.

Big books so children can actually take part in turning pages, and the left to right sweep.

Adults who frame individual words in charts, or in big books with their hands.

**Benchmarks**

Children Should Be Able To:

When given a book upside down, turn it right side up.

Turn pages from the front of the book to the back.

Use left to right directionality, making the left to right sweep when turning pages.

Select favorite stories.

Know the titles and by age five, the authors of favorite books.

Pretend to read.

Around five years of age, know they can be authors themselves, engaging in making books.

Identify specific words in books by framing them with their hands.

Demonstrate knowledge of the concept of "book," "line," "sentence," "letter," "end," and "beginning."

**Vignette**

Daniel, a young three-year-old, ran to the library area of his room. He started looking through the books on the shelf asking, "Where's my digger book?" "Where's my digger book?" The teacher, recognizing that Daniel was asking for the book Dig, Dig, Digging (Mayo, 2000), found it and handed it to him. "Read it to me," asked Daniel, turning the book right side up, "Read it again," illustrating his familiarity with books.

  

**Guideline IV, Goal 4**
**Story Structure**

Knowledge of story structure is another strong predictor of reading success. Children who are familiar with stories and who can tell their own personal stories, or retell narratives, are those who seem to experience success when learning to read (Neuman, 2001).

By listening to stories, acting them out, and drawing, writing, or dictating their own stories, children are gaining knowledge of the function of the written word as well as building a foundation of knowledge of the world in which they live (Lapp, Flood, & Roser, 2000).

Simple stories can be very complex. Knowing the story setting, understanding the characters' intentions and personalities, the events that occur, and the story plot itself, are all filled with complexities. Still, young children can become familiar with the idea that stories do have unique themes, characters, and events.

**Guideline IV, Goal, 4, Objective 1**
**Children Will Become Increasingly Familiar with Narrative Story Forms**

Children Will Need to Experience:

Listening to the reading or telling of a variety of narrative stories.

Performances of stories, acting out stories using flannel boards to tell them.

Creating or acting out their own stories.

When they need to, consult factual or informational books that are not story narratives.

**Benchmarks**

Children Should Be Able To:

Identify the beginning and end of the story.

Retell the events of the story.

Predict the endings of stories.

Ask appropriate questions about stories.

Act out familiar stories, including the beginning, events in the middle, and the ending, through dramatic play, using puppets or flannel boards.

Tell their own personal narratives or stories of their day and life.

**Vignette**

Listen as young children tell the story of their day. Three-year-olds will randomly string together a number of events. "I got up, Sammy almost caught a bird . . . he didn't. I had chocolate milk. Mommie said 'Don't walk on my floor.' Five-year-olds will tell the story of their day in sequence. "I woke up, I ate breakfast, then I went to school, then I came home."

  

**Guideline IV, Goal 4, Objective 2**
**Children Will Be Able to Identify Story Elements of Setting, Plot, Characters, And Events**

Children Will Need to Experience:

Discussions about the plot, theme, characters, and events of stories.

Readings of well-written stories.

**Benchmarks**

Children Should Be Able To:

Identify the main characters in familiar stories.

Talk about the characteristics of the characters.

Tell where and when the story takes place.

**Vignette**

After repeated readings of stories, Ms. Bond would often ask children what they thought of different characters. After reading Why the Spider Spins Tales (Palazzo-Craig & Albers, 1996), one child said "I don't know why spider got to tell the tales, his wife told him what to do," demonstrating ability to identify major characters, the plot, and understand the events of a story.

**Guideline IV, Goal 5**
**Beginning Writing Skills and Knowledge**

The ability to print letters develops gradually. Children's fine motor skills and eye-hand-muscle coordination develops gradually during the preschool years. In preschools, children's initial ideas of the writing process and their eagerness to write is fostered.

Children's drawings, paintings, and writing are one and the same during the preschool years. As children draw and paint they incorporate letters and pretend writing in their artwork. When children experiment with writing, asking how a word is spelled, or if this word looks OK, they are encouraged to think about the sounds of the letters and invent their own spelling. According to the research, children who are asked to figure out words by themselves become better spellers than children who are told how to spell words (Short, 2002). Doing so seems to develop children's ability to reflect on their own thoughts, organize their ideas, and express themselves with print. Children who invent their own spelling are active thinkers; they form hypotheses, and learn to segment words into phonemes and syllables (Adams, 1992).

  

**Guideline IV, Goal 5, Objective 1**
**Children Will Understand that Writing Has a Purpose**

Children Will Need to Experience:

Family members and teachers using purposeful writing, making lists, writing messages, news, letters, and using writing for other meaningful purposes.

Observing family members and teachers who write labels, messages in English as well as their home language so they can make the connection between the spoken word and the written.

An environment containing a variety of writing tools and media.

Opportunities to include pretend writing in their play.

**Benchmarks**

Children Should Be Able To:

Begin incorporating letter-like scribbles in their drawings and other artwork.

Make their name using rubber stamp alphabet blocks, plastic, wooden, or flannel board letters, construct their name using play dough, type it on a computer, or write it.

Play at making lists and pretend to write other messages.

Gain meaning from printed news, messages, and labels such as logographics.

Take part in dictating labels, messages, and news so they see that the words they say can be written and then read to others.

Use pretend writing in their play by writing notes and signs to post in the play area, including dramatic play, writing telephone messages, writing orders in the restaurant, signing credit card receipts in the store.

Use what they know about letter-sound relationships to invent their own spelling as they pretend to write in both their home language and English.

**Vignette**

Three-year-old Alice and four-year-old Rocia were busily working away in the writing center. Rocia was scribbling and Alice was making "words" on a cookie sheet with plastic letters. Rocia, scribbling away, said, "I'm writing 'I'm coming Grandma. I'm coming on a plane and I'm coming.'" Her scribbles were in lines, looking something like writing. Alice responded saying, "I'm making cookies out of ABCs." Pointing to a group of letters she placed in a pile she said, "My cookies are chocolate cookies." Both girls were demonstrating knowledge of different levels of beginning writing. Four-year-old Rocia knew that words could be written, while three-year-old Alice knew letters were involved in making words.

  

**Guideline V**
**Children Will Possess Concepts of Mathematics**

The early years are critical for mathematical knowledge (NRC, 2001b). Children's early knowledge of mathematical concepts will form the basis for later learning, not just in mathematics, but for learning in other domains as well. Knowledge of the physical and life sciences, social sciences, and the humanities is dependent on basic knowledge of mathematics (NCTM, 2000).

The National Council of Teachers of Mathematics indicates that mathematical concepts begin early in life. Even babies possess some informal knowledge of numeracy (Canfield & Smith, 1996). Early experiences with identifying relationships and patterns in objects and events, and developing a sense of number lead children to developing rather complex ideas of mathematics and reasoning skills (Baroody, 1987; Clements, 1999; Copley, 2000).

With the focus on doing—actually experiencing concepts of numbers and mathematical skills through play and interaction with others—children develop informal concepts of number and mathematics (Bredekamp & Copple, 1997; Copley, 2000).

Building on the curiosity and enthusiasm of children, these initial concepts and vocabulary of number, number, algebra, geometry, measurement, and problem solving are clarified, expanded, and extended by adults who understand the goals for mathematical learning and how to introduce these to children.

**Guideline V, Goal 1**
**Language of Mathematics**

To learn mathematics, children must be able to understand and use the vocabulary of mathematics. Children will need to develop an understanding of many words. As they work and play together with objects and things in their environment, they begin to develop mathematical ideas. This results in the need to understand and use words such as more, less, smaller than, bigger than, different than—words that help them describe the size and shape of objects, and the relationships of objects to one another. Thus, the language of mathematics is developed.

Because children do not typically use mathematical vocabulary spontaneously, they can be reminded that they want "half" a sandwich, or "one quarter" of an apple, that the window is a "rectangle," and that a yield sign is a "triangle" (Seefeldt & Wasik, 2002). Children also need to hear more difficult words such as straight, angle, eleven, within the context of their experiences.

  

**Guideline V, Goal 1, Objective 1**
**Children Will Develop the Language of Mathematics**

Children Will Need to Experience:

A mathematically rich environment with a variety of materials through which children can explore math concepts and use the vocabulary of mathematics.

Explicit guidance in learning and using mathematical vocabulary.

Children's literature that reinforces mathematical vocabulary such as counting books, books about sorting, and shapes and sizes.

Family members who understand the goals of the preschool and use new vocabulary with their children in the context of their home. "Set the table; put one fork at each plate."

**Benchmarks**

Children Should Be Able To:

Use words to describe mathematical concepts such as smaller than, bigger than, and different than, and words that describe the dimensions/attributes of objects to one another and the relationship of objects to one another.

Begin to learn the names of numbers and use them in their play and in connection with their experiences. "I need two more blocks."

**Vignette**

Young children were overheard using words to describe mathematical relationships of smaller than or bigger than. "Germs are the smallest thing I know," said four-year-old Ronaldo. "Germs are so small they get on your fingers and you lick your fingers and then you get sick."

  

**Guideline V, Goal 2**
**Counting**

Learning to count is foundational and essential. Most young children do not have an understanding of true cardinality, therefore they need many opportunities to count and expand their sense of quantity and understanding of one-to-one correspondence (NCTM, 2001b).

**Guideline V, Goal 2, Objective 1**
**Children Will Develop Concepts of Number**

Children Will Need to Experience:

Manipulatives to play with that can be counted, sorted, and ordered.

Listening to stories that involve counting and numerals.

Active engagement with counting in the context of experiences.

Explicit guidance in understanding the differences between numerals and print.

The need to use number concepts for a purpose, both at home and at school.

Hand-held calculators for play and actual counting.

Computer programs that reinforce concepts of number.

**Benchmarks**

Children Should Be Able To:

Engage in meaningful counting activities in the context of their daily lives. "One glass, one napkin," said four-year-old Shanelle as she set the table for her snack.

Identify numerals and distinguish these from print.

Recognize numbers and their names.

Compare "more" or "less" when working with manipulatives.

**Vignette**

One school director arranged for math tables in each room. The tables held clear plastic boxes of seashells, nuts and bolts, acorns, and large buttons; sorting boards constructed of clear plastic cups glued to the boards; and scales—a balance scale, and a standard scale for the five-year-olds.

The table in the three-year-old room contained fewer boxes, and only a balance scale and clear boxes for sorting. The threes enjoyed playing with the objects, sorting them in random ways, just getting the feel of number, "more" and "less." One child counted the buttons, "One, two, five, seven."

Fours and fives used the table to count and sort objects by color, size, and shape. They used the balance scale to find out how many acorns equaled or bettered the weight of a handful of nuts and bolts. As they counted, the five-year-olds used clipboards, paper, and markers to record their findings with pictures, sketches, and other marks.

  

**Guideline V, Goal 3**
**Number Operations**

Children extend and expand on their sense of number by performing operations with numbers. During the preschool years children can make comparisons, classify, experience part to whole, and do simple adding and taking away operations (NCTM, 2000; NCTM & NAEYC, 2002).

**Guideline V, Goal 3, Objective 1**
**Children Will Develop the Ability to Do Number Operations**

Children Will Need to Experience:

An environment rich with mathematical experiences that involve children in purposeful counting and number manipulation such as one-to-one correspondence, part-to-whole, comparisons, adding, and taking away.

Collections of objects to count, sort, compare, and order.

Finger plays that involve adding and taking away.

Number books that include making comparisons, ordering and classifying.

Matching objects that are alike.

Enjoying playing board games that involve numbers and counting, at home and school.

**Benchmarks**

Children Should Be Able To:

Perform simple operations of adding to and taking away when working with concrete objects or events. "I need two more blocks." "Take all these away."

At about age five, begin to count objects using one-to-one correspondence.

**Vignette**

Demonstrating her ability to perform simple operations of adding to and taking away, four-year- old Le Jung, sitting at a snack table with three other children, took charge of sharing a plate of four cookies. She took two cookies, and passing the plate to the others, said, "Now you share." Pondering how to make two cookies stretch to three children, the group began arguing. Ms. Corbin stepped in asking the children to count the number of cookies, then the number of children. "OK," the children concluded, "four cookies, four children, we each get one—that's four."

  

**Guideline V, Goal 4**
**Seeing Patterns**

The ability to see and create patterns helps children organize their world and develop a sense of sequence and relationships. An understanding of patterns facilitates children's abilities to make generalizations about number combinations, counting strategies, and problem solving.

Children who see patterns in their world, and connect them to mathematics, are better able to remember what they have learned and transfer the knowledge to new situations or problems (Copley, 2000).

**Guideline V, Goal 4, Objective 1**
**Children Will Develop Concepts of Pattern**

Children Will Need to Experience:

- Observing patterns in their everyday daily environment.
- Manipulating objects into and out of patterns.
- Creating visual art using a variety of media to make patterns.
- Observing patterns in the artwork of others.

**Benchmarks**

Children Should Be Able To:

- Sort objects, pictures, and things in groups.
- Recognize patterns in their environment.
- Create patterns through art, blocks, and other things in their environment.
- Describe patterns found in their environment, such as plaid, striped, checked clothing; patterns on the floor and wall; and other patterns found in their environment.
- Represent patterns through movement and symbols.

**Vignette**

Ms. Hey was in the habit of pointing out repeated patterns in children's everyday environment and activities. The children had identified patterns in the tile floor of the bathroom, the tiles in the hallway, as well as in the sounds children made when clapping to chants. Ms. Hey also encouraged children to focus on repeated patterns by displaying several necklaces she had constructed using different shaped wooden beads. She added several shoelaces and a box of the beads to the table. After the children had explored making necklaces, she asked them to choose one of the necklaces and to make a necklace using the same pattern of beads.

Ms. Hey knew that the four-year-olds were thinking of patterns when Claire came into the classroom one rainy day. Claire, pointing to the trail of mud her wet, muddy boots had made on the floor, said, "Look at the cool pattern my boots made!"

  

**Guideline V, Goal 5**
**Geometry Concepts**

Geometry is the area of mathematics that involves shape, size, position, direction, and movement. Principles of geometry are related to spatial sense and are necessary for interpreting, understanding, and appreciating our inherently geometric world (NCTM, 2000).

Concepts of geometry stem from children's firsthand experiences exploring space. Running, climbing in and out, building, constructing, taking apart and putting together again, children develop embryonic concepts of geometry. Nearly every area of the curriculum—art, science, the social studies, music and reading—includes children in concepts from the field of geometry.

Preschool experiences in geometry are designed to bridge children's informal knowledge of the world in which they live with more conventional, formal knowledge. Beginning with what children are already familiar with, the preschool curriculum adds the vocabulary of geometry and increasing formal knowledge.

**Guideline V, Goal 5, Objective 1**
**Children Will Develop Concepts of Geometry**

Children Will Need to Experience:

Explorations of their world, both in the classroom and surrounding community, to identify space, shape, size, position, direction, and movement.

The vocabulary of geometry in connection with their experiences.

Themselves in space, crawling under, over, in and out, climbing up, and sliding down.

Plenty of building and constructing with blocks and other materials.

**Benchmarks**

Children Should Be Able To:

Recognize and name common shapes and by age five, begin to describe shapes.

Compare, match, and sort according to shape.

Locate themselves and objects within the space of their room and play yard.

Use the vocabulary of geometry, describing their actions as they go in, out, climb up, down, over, and through.

Manipulate objects using the computer.

**Vignette**

A teacher of three-year-olds engaged the children in chanting and acting out the motions of Going on a Bear Hunt. When the children went outside she set up an obstacle course, arranging boxes, barrels, and some potted plants to create a bear hunt. She told the children they could use this obstacle course to go on a bear hunt. The children went over and under the boxes, through the barrels, all the while chanting "in," "out," "under," and identifying shapes, sizes, space, and direction.

  

**Guideline V, Goal 6**
**Measurement**

Preschool children are not ready to understand concepts of conventional measurement such as foot, yard, pounds, and degrees. Preschoolers will use arbitrary measures—their hands, feet, a piece of rope—in order to learn the meaning of the processes of measuring and to gain an awareness of the size of things. Measuring activities are integrated throughout the entire curriculum, adding additional meaning to children's understanding of measurement. While measuring themselves, the ingredients needed to make bread, or the size paper they need to complete a project, children are learning that knowledge of mathematics is useful in everyday life (Copley, 2000; NRC, 2001b).

**Guideline V, Goal 6, Objective 1**
**Children Will Develop Initial Concepts of Measurement**

Children Will Need to Experience:

Observing family members and teachers measuring things in the environment.

Water and sand play to experience weight, mass, and volume.

Use of arbitrary measures, such as hands, feet, pieces of string or sticks to measure things in their room, center, and play yard.

Measuring with a purpose, such as cooking.

Using balance and other types of scales.

**Benchmarks**

Children Should Be Able To:

Begin to develop the process of measuring.

Measure to find out which is heavier/lighter, taller/shorter, longer/shorter, big/little, less/more, or which container holds less or more.

Develop the vocabulary of measurement, using words such as more/less, tall/short, and so on.

Use arbitrary measuring tools such as their feet, hands, piece of string as they play, construct, build, create, or weigh objects.

Play freely with sand and water, using the vocabulary of weight, mass, and volume.

**Vignette**

A group of four-year-olds visited a nearby farm. The farmer told the children that one of the horses was sixteen hands high. Back in the classroom the children discussed their visit to the farm. The horse seemed to be one of the major attractions. The children talked about how tall the horse was. One of the children said the horse was hands high, asking "How many hands high are we?" The teacher then said, "Well, let's find out." The children measured each other with their hands. Together with the teacher a graph was constructed. Using their hands they measured themselves, the tables, chairs, width of the doors, and so on throughout the room. Their graph was titled "The farmer measures horses with hands. We measure with hands." The children showed the graph to their parents, talking about the highest things they measured. This exercise demonstrated that children were able to gain an understanding of measurement and gain meaning from a graph through a practical experience.

  

**Guideline V, Goal 7**
**Data Analysis and Probability**

Opportunities to measure, sort, classify, and count prepare children with the tools they need to develop beginning understandings of data analysis and probability. Collecting, organizing, describing, and interpreting data, as well as making decisions occurs daily in the early childhood classrooms.

In good schools for young children, data analysis and probability are evident in nearly every early childhood classroom. Graphs can be used to show a variety of things, for example: how much children weigh; their eye and hair color; the pets they own; or how many wear shoes with buckles.

**Guideline V, Goal 7, Objective 1**
**Children Will Develop Beginning Ideas of Data Analysis and Probability**

Children Will Need to Experience:

Making and constructing graphs using real objects such as blocks.

Reading and discussing graphs.

Taking part in, creating, and discussing surveys.

Using clipboards and markers to record information.

**Benchmarks**

Children Should Be Able To:

Construct graphs using objects such as blocks or other objects.

Create pictorial graphs.

Pose questions about graphs.

Place marks on graphs indicating their choice.

Describe and compare data on graphs and surveys.

Use graphs to reach conclusions.

**Vignette**

Sorayo was looking at a graph the teacher used to take attendance. Each child's name appeared on an individual block. "Look," three-year-old Sorayo exclaimed, "everyone is here today except Enjun." Sorayo was interpreting information from the graph and reaching a conclusion.

  

**Guideline V, Goal 8**
**Problem Solving**

According to the National Council of Teachers of Mathematics (NCTM, 2000; NRC & IM, 2000), problem solving is a hallmark to mathematical activity and a significant means of developing mathematical knowledge. For young children, problem solving is a natural activity because so much of the world is new to them. In children who are healthy, well nourished, and cared for, curiosity leads them to identifying problems and trying to solve them (NRC, 2001b).

Most young children are full of questions—they want to find out more about the world in which they live. They actively explore their environment, taking apart and putting together again, in an attempt to try to understand how things work.

This natural problem-solving ability is used by teachers wwhoho introduce concepts and content of mathematics, enabling children to be successful in their search to understand.

**Guideline V, Goal 8, Objective 1**
**Children Will Engage in Problem-Solving Activities**

Children Will Need to Experience:

Play with plenty of raw materials such as boxes, planks, art supplies, blocks, and other materials.

Freedom to explore and experiment.

An adult who responds to children's questions and engages them in activities to answer their questions—one who introduces vocabulary, asks "what if…," "why…" and "what would happen…?"

Teachers or other adults who model problem solving using number and mathematical concepts.

An environment in which they can experiment with materials—one that is set up with potential problems.

**Benchmarks**

Children Should Be Able To:

Recognize a problem, "How can I make a train from these boxes?"

Use measurement, counting, and numbers to solve problems.

Monitor their progress in solving a problem: "We still need four wheels."

Reflect and think about the problem they've solved.

**Vignette**

Making frames as a gift for their families seemed like a good idea to the five-year-olds who had worked with wood frequently in the past. A group eagerly began sawing and hammering only to be confronted with frames that didn't work. The teacher agreed with the group that they had some problems. She questioned why the frames were lopsided and asked the children to think about a solution. "OK, OK, I know," said one child. "We have to measure and then count so the sides are the same." The children began work again, this time creating their own process, thinking, measuring, and counting, correcting, and helping one another as they made the frames. This teacher demonstrated how to set up situations that would engage children in experimenting with materials and solving problems. By backing off and letting children face challenges, make attempts, fail, try again, and finally experience the joy of success, she was fostering children's thinking and problem-solving abilities.

  

**Guideline VI**
**Children Will Gain Initial Knowledge of World Languages**

Our diverse society is rapidly becoming more diverse. It is estimated that by the year 2010, the number of children of immigrants will rise to 9 million, representing over one-fifth of the school age children in our nation (Washington & Andrews, 1998). As diversity increases, teachers of young children are faced with the challenge of educating even more linguistically and culturally diverse children (McLaughlin, 1995).

While the challenges of teaching young children who have limited English skills are great, the research suggests that there are benefits to being bilingual (Ovands & McLaren, 1999). Children who have the opportunity to learn or become acquainted with two languages, appear to have cognitive, cultural, and economic advantages (Hakuta & Pease-Alvarez, 1992).

Three-, four-, and five-year-old children just learning English will find quality preschool programs highly beneficial. Because language flourishes in preschools, children speaking limited English will have many opportunities to learn a new language while maintaining their home language. The flexibility of the preschool, its emphasis on listening, speaking, writing, and reading, and the interaction with peers, enables children new to the United States to experiment with and learn English, as well as teaching English-only children to become aware of world languages.

**Guideline VI, Goal 1**
**Speaking and Writing English**

Research shows that peer interaction that involves language is one of the most effective ways of fostering a new language (Fassler, 1998). The preschool environment, which encourages children to work and play together in centers of interest, to talk with one another, argue, and solve problems, write and read with one another, is the perfect environment for learning another language.

When first entering a preschool group, children just learning English may be reluctant to talk at all. Once they feel a measure of security, however, they will begin to interact with others and enter into groups, speaking their home language and experimenting with English. Thus, the first step in fostering second language learning is to make certain that children feel welcome and secure in the group.

  

**Guideline VI, Goal 1, Objective 1**
**Children Who Are Just Learning English Will Interact Freely with Other Children**

Children Will Need to Experience:

Teachers who consult with children's families in order to learn a few key words in each child's home language, beginning with pronouncing the child's name correctly, so children feel comfortable and secure within the group.

Encouragement to enter into play groups of children speaking English only. "Natasha, you sit here and be the customer."

Time to talk and listen to other children about meaningful, common experiences.

Freedom, security, and encouragement to use their home language as they learn and practice English.

**Benchmarks**

Children Should Be Able To:

Enter into play and work with others, using both their home language and English.

Greet others in English or their home language.

Teach each other names of objects, actions, and events in their home language.

Say a few key words in English, or in the case of English only children, in the home language of other children.

**Vignette**

Children in one Head Start class began to tease Ronaldo, a four-year-old from Central America, who had just joined the group. Rather than admonishing the children, the teacher chose to be a model. He chose a book with a few Spanish words to read during story time. When he came to the Spanish words, he asked Ronaldo to teach him how to pronounce them correctly and how to roll his r's. Later in the day he observed any number of children working with Ronaldo, who was teaching them how to say words in Spanish, complete with rolling their r's (Seefeldt & Barbour, 1992). Ronaldo not only became one of the group, but a valued expert consultant as well. The teacher recognized that all children need to feel secure—those just learning English like Ronaldo, as well as those hearing another language for the first time.

  

**Guideline VI, Goal 1, Objective 2**
**Children Just Learning English Will Gradually Become Familiar With the Sounds, Patterns, and Use of English**

Children Will Need to Experience:

Repetition of nursery rhymes, chants, and poems—especially those they can move to.

Opportunity to fill in rhyming words in familiar poems, chants, and songs, in English or their home language.

Listening to stories that reflect their culture, families, and home language.

Interactive book reading with teachers.

Joining in singing with the group, or repeating refrains of poems, stories, or chants in a group.

Feelings of success and security when they use their home language or English in group singing, story time, or interactive reading.

**Benchmarks**

Children Should Be Able To:

Recognize and join in chanting, singing, repeated rhymes, poems, and chants in their home language and English.

Ask to hear favorite rhymes, songs, chants, and stories.

Fill in missing rhyming words in a familiar chant.

**Vignette**

During music time Ronaldo, enjoying singing with the group, asked "Now the little frog song." And he began chanting the refrain from Ten Speckled Frogs, demonstrating that through music and chanting, children just learning English have the opportunity to add to their English vocabulary.

  

**Guideline VI, Goal 1, Objective 3**
**Children Just Learning English Will Increase Their English Vocabulary; English Only Children Will Increase Their Other Language Vocabulary**

Children Will Need to Experience:

Naming things, motions, events in their environment, using their home language and English words.

Teachers who informally define and demonstrate words new to children as children use objects: "This is a sieve, see how the water sifts through, sieve."

Interactive reading of picture or single concept books, preferably in the child's home language and in English.

**Benchmarks**

Children Should Be Able To:

Name an increasing number of familiar things or events in their environment in English and in their home language.

Ask for the English names of objects, events, and other things in their environment.

Test out use of new English vocabulary.

**Vignette**

After reading Brown Bear, Brown Bear (Martin, 1969) to the group, the teacher asked the children, many of whom were just learning English, to tell what they saw in the room. The children named venetian blinds, desks, cabinets, window sills, faucets, and other things in the room. The teacher suggested they make their own class book, with each child contributing a page, using their names and telling what they saw. She gave the example: "Ronaldo, Ronaldo, what do you see? Ronaldo sees a table." After the book was constructed the children enjoyed "reading" it together in the library area. The teacher made copies of the book to send to the children's families.

  

**Guideline VI, Goal 1, Objective 4**
**Children Will Become Familiar with the Conventions of English Print**

Children Will Need to Experience:

Seeing their name written in their home language and in English.

Signs, labels, other functional print in both their home language and in English.

Interactive reading of big books and adults who use big books to point out and talk about conventions of print such as use of capitals, punctuation marks, words, and sentences.

The Language Experience Approach, observing as the words they say are written and then read back to them.

**Benchmarks**

Children Should Be Able To:

Recognize their names in English and in their home language.

Use big books or other books, demonstrating the understanding that English is read from left to right.

Begin to pick out logographics and a few familiar letters and words printed in English.

**Vignette**

Ronaldo and his friends were discussing a display of their visit to a woodworking shop. The teacher had labeled photos of the children and had written what each was doing, along with their names. Ronaldo and his friends found each of their names printed in English. They read their names to one another, and then read each other's names. They demonstrated that even though English was new to Ronaldo and some of his friends, they were learning the conventions of English print by recognizing their names printed in English.

  

**Guideline VI, Goal 1, Objective 5**
**Children Will Begin to Incorporate Print into Their Drawings and Other Art Work**

Children Will Need to Experience:

Observing teachers and family members writing in English for a variety of purposes.

Many opportunities to draw, paint, and express themselves through making art.

Observing other children using invented spelling.

**Benchmarks**

Children Should Be Able To:

Use markers, paints, crayons to draw, incorporating letter-like forms in their home language and in English, and using scribbling to represent writing.

Around five years of age, begin to print their name using markers, pencils, or the computer, or assemble their name with plastic or wood letters.

**Vignette**

Ronaldo sat in the writing center picking away at the keyboard of a computer. The teacher had chosen an early writing software program for the day. As Ronaldo randomly picked at the keys, he watched the computer screen with interest. He then hit an R and an O more or less together. "Ms. Daniels, my name!" Ms. Daniels affirmed for him that he had begun his name. Together they talked about the other letters in his name and with just a bit of the teacher's' guidance, Ronaldo was able to type his entire name. After his name was printed, he carried the paper around the room showing every child his printed name.

  

**Guideline VI, Goal 2**
**Other Languages**

In the global, pluralistic society of today, everyone needs some understanding of other languages. The National Standards in Foreign Language Education Project (ACTFL,1996) states that "The United States must educate students who are linguistically and culturally equipped to communicate successfully in a pluralistic American society and abroad" (p. 1).

Children speaking English only will benefit from learning, interacting, playing, and working with children who are just learning English. As children interact, play, and work with children just learning English, they too learn a new language. They may learn a few words or phrases of several different languages, but most of all, they will learn to value and respect the diversity of language and people in the world.

**Guideline VI, Goal 2, Objective 1**
**Children Will Be Able to Learn a Few Words of Another Language**

Children Will Need to Experience:

Playing and interacting with children just learning English.

Opportunities to practice saying words in another language.

**Benchmarks**

Children Should Be Able To:

Engage in conversations with children just learning English.

Understand and respond to a few words in another language.

Say a few words in another language.

**Vignette**

Four-year-old Claire was puzzling over how to write a number. Ronaldo sat with her and showed her how to write the numeral two. "Oh," said Claire, "Now I know, uno,dos, tres." Not only had Claire learned to say a few works in Spanish, but she and the other children were frequently overheard conversing, using some Spanish words as they played with Ronaldo.

  

**Guideline VI, Goal 2, Objective 2**
**Children Will Learn Songs, Stories, Chants or Poems in English and Another Language**

Children Will Need to Experience:

Listening to poems, chants, or rhymes in another language.

Singing songs in another language.

**Benchmarks**

Children Should Be Able To:

In a group, sing, chant songs, recite poems in another language.

Repeat familiar refrains in another language.

**Vignette**

Daniel came home from preschool singing Roses are rojo, violets are blue, sugar is sweet and so are you. His mother asked what was rojo. He said "Oh, don't you know, roses are red, and in Spanish rojo means red." He then chanted the entire refrain in Spanish. Daniel's teacher frequently introduced children to Spanish words by singing, chanting, and reciting songs, chants, and poems in Spanish and English. As the children sang and recited frequently repeated refrains in both languages, they began to incorporate new Spanish and English words into their vocabulary.

  

# Domain 3

## Children Will Be Equipped with Knowledge of the World in Which They Live

### Guideline VII
### Children Will Gain Foundational Knowledge of Scientific Inquiry

Curious to learn about the world in which they live, young children are like scientists and mathematicians (NRC, 2001b)—perhaps not in the conventional sense, but research shows young children actively process their experiences to form ideas about the way things are (NRC, 1996). As they do so, they use all of the same processes of inquiry and thinking that are the tools of the scientist and mathematician (Dewey, 1944; NRC, 2001b).

As scientists, young children's questions are endless. "What's this? That?" Preschoolers look and listen, observing their world with intensity. With equal concentration they feel, taste, take apart and put together again, all in an attempt to find out how their world and the things in it work (Harlan & Rivkin, 1995).

Teachers build on the natural drive of young children, fostering the skills of scientific and mathematical inquiry by encouraging and building on children's curiosity and their desire to master their world (AAAS, 1998). Through everyday experiences, children's abilities to 1) question; 2) observe; 3) collect and organize information; and 4) reflect and reach conclusions are extended and expanded. In good schools for young children teachers encourage children to think about what they want to know, and to question in order to better understand reality.

The process of inquiry is not complete until conclusions are reached and reflection takes place (Dewey, 1944; NRC, 1996). Young children's conclusions will be tentative and will reflect their preoperational, often anthropomorphic and magical thinking (Piaget & Inhelder, 1969). Andrew, who told his teacher that the snow melted because it wanted to, illustrates the anthropomorphic thinking of preschool children.

### Guideline VII, Goal 1
### Questioning

The naturally scientific, curious three-, four-, and five-year-old children's questions are frequent, and at times overwhelming. Children's abilities to question progress through several stages. The questions of three-year-olds are generally spontaneous and unfocused. Threes seem to question just to keep the conversation going. They rarely wait for a response, moving from "Why is the grass green?" to "Why do birds fly?" It is as if children are asking questions simply to express their pure wonder and astonishment at the world they find themselves in (Piaget & Inhelder, 1969). At other times young children's why questions have to do with disappointment, "Why can't I have ice-cream?" or "Why isn't it my birthday?"

Four- and five-year-olds, while still asking "why?" begin to do so to find out. They really want to know the why of causal relations and explanations: "Why do cows have milk?" "Why is it so heavy?" And they want to know the why of an action or a psychological state: "Why are you going away?" "Why are you angry?"

Regardless of the purpose of their questions, in the preschool, children's questions are taken seriously. Teachers listen to children's questions. Then they try to find out what children are really asking and what they really want to know. Teachers model asking questions that can be answered through the process of inquiry. Spontaneously, teachers question, "What will happen if . . . " "Why do you think that happened?" "Could you make it happen again?" At times, teachers plan questions for the group to answer. "Which seeds will sprout first?" "Why did your building fall?" "How can you join these two boards?" Other times teachers ask questions designed to engage children in mathematical thinking such as "Do you need more . . .? "What shape fits here?" "How many do you have?"

  

**Guideline VII, Goal 1, Objective 1**
**Children Will Learn to Question**

Children Will Need to Experience:

Teachers and family members who listen to children's questions with respect and answer them seriously.

Psychological safety so children feel comfortable and free to express their own ideas.

A background of first-hand experiences and knowledge. Without knowledge, it is very difficult to question.

Teachers and family members who model questioning, asking "What would happen if?" "Why do you think so?" "How could you do that?" "How did you do that?"

**Benchmarks**

Children Should Be Able To:

Sense and identify a problem. "Why is it wet?"

Tell others about the problem. "It keeps coming down."

Ask "why?" moving from the superficial to asking "why" for a causal explanation.

Ask questions that can be answered through their own observations. "Why is it sticky?"

**Vignette**

Three-year-old Shawn took a cup with him to the block area. When he put the cup down, it fell over and the juice poured on the block rug. Questioning, Shawn felt the wet rug, took a sip from the cup, then put the cup down. Then he tipped it over again, felt the resulting wet spot on the rug, and realizing that the wetness came from the cup, took the cup back to the snack center. Shawn, without actually asking a question, illustrated the questioning attitude of young children.

  

**Guideline VII, Goal 1, Objective 2**
**Children Will Learn to Question for Specific Group Purposes**

Children Will Need to Experience:

Purposes for asking questions, such as "What will happen when we add milk to the flour?" "Why do you think . . .?" "Can you make that happen again?"

Problems that challenge children to question.

Literature that leads children to asking questions as a group.

**Benchmarks**

Children Should Be Able To:

Recognize problems and ask questions in an attempt to solve them.

Listen to stories and form questions designed to find out more, clarify, or extend the story or information given.

Think of and record by dictating or drawing what they want to ask while on a field trip.

**Vignette**

The teacher engaged the children in making one-cup lemonade on a hot afternoon. One-cup cooking (Foote-Johnson, 2001) involves each child in making their own cup of lemonade. There is a chart with pictures and words for the children to follow, and all the materials they need are available. With a teacher supervising, each child puts an ice cube in the cup, then the right amount of lemon juice and sugar, finishing by filling the cup with water and stirring to make lemonade. One four-year-old asked, when he put the ice cube in his cup, "Why does the ice melt?" Others gathered around asking "Why?" The teacher, recognizing a teachable moment, followed the children's interest by getting more ice cubes, putting aside the task of making lemonade. The children played around with the ice melting in their hands. Attempting to engage children in experimenting with the ice by asking "Where will it melt faster?" the teacher found that the children were content to simply handle the ice, watching and feeling the water on their hands and watching the ice cubes getting smaller. The teacher, after asking children several times what was happening to the ice and getting only squeals of "It's cold, it's cold," made a note of their observations. She planned to follow up with additional experiences as the children matured, were able to ask "Why?" and sustain interest in finding out the answer.

The teachable moment over, the children resumed making their own cups of lemonade.

  

**Guideline VII, Goal 2**
**Observational Skills**

We all observe. Whether a child or an adult, we observe without realizing it. For example, when we drive we observe our own behavior, where we are, where others are, and what others are doing, all this without a thought. Children too, observe all the time. Driven by their sense of wonder with their world and all they want to learn, children observe intently as well as spontaneously. With rapt attention, they will watch a spider climbing a wall, listen to the sound of sand under their feet, or cruise through the room fingering and handling everything they can find.

To fulfill the goals of scientific inquiry, teachers follow children's natural proclivity to observe. Using the natural here and now environment as a source for children's observations, as well as children's sense of wonder at the world, teachers support children's early attempts to observe, teaching them to use all their senses for a purpose, with focus and objectivity.

**Guideline VII, Goal 2, Objective 1**
**Children Will Gain Observation Skills through Learning to Look**

Children Will Need to Experience:

Teachers who ask them to look and look again, asking children to concentrate, for example "What else do you see?" "Is it larger than . . .?"

Teachers who keep the rest of the world out for a few moments to let children focus their observations.

Trips around the center, school, play yard, and neighborhood for the purpose of observing specific things, or events during which children are asked to observe by looking.

Vicarious experiences, books, pictures, and CDs as sources of information that can be used to extend, expand, and clarify their here and now observations.

**Benchmarks**

Children Should Be Able To:

Increase their ability to visually attend to things in their environment.

Focus their observations on specific details. "Look, it's furry," said a child watching a spider.

Increase the length of the time spent looking and attending.

Be willing to go back and observe again to learn more.

Name and describe the things they've observed.

Learn to use books and authorities as a means of extending their observations.

**Vignette**

One teacher gave the children hoops to take outside. She had them place the hoops on the ground and observe, by looking at all the living things within the hoop. Some children found and named grass, ants, and spiders. The children moved their hoops to different places to observe more life.

  

**Guideline VII, Goal 2, Objective 2**
**Children Will Gain Observation Skills through Listening**

Children Will Need to Experience:

Opportunities to learn through listening to natural environmental sounds.

Teachers who ask children to listen as they look. "What do you hear?" "Listen to the sound of the wings," as a means of finding out more.

Practice in filtering out extraneous sounds in order to focus their observations to gain information by listening.

**Benchmarks**

Children Should Be Able To:

Gain information about their world and the things in it by observing through listening.

Focus their hearing on the sounds of specific objects, things, and life in the environment.

Identify and describe environmental sounds—soft/loud, fast/slow, and heavy/light.

**Vignette**

One afternoon, a group of three-year-olds and a teacher sat quietly under a shade tree. As they did so they listened to the sounds of different vehicles driving by. Closing their eyes they listened to trucks, vans, cars, and buses passing by their school. They found they could recognize large vehicles just by listening to the sounds of their engines and tires on the pavement. "That's a big truck," said three-year-old Shalini. "Listen to it vroom, vroom!" "I see it," said Jose. "Shalini is right, look at the big, big truck."

  

**Guideline VII, Goal 2, Objective 3**
**Children Will Gain Observation Skills through Touching and Handling**

Children Will Need to Experience:

Adults who monitor children's explorations so they are not permitted to handle anything that could cause them harm.

Freedom to explore through touching and handling under the supervision of an adult.

A variety of materials with differing textures, and the opportunity to feel and handle them.

Teachers and family members who help children focus observations through handling and manipulation. "How does it feel?" "Is it furry, soft, smooth, rough, slippery?"

Alternative ways to find out about things that cannot be handled, including consulting books, computers, and videos.

**Benchmarks**

Children Should Be Able To:

Gain information about their world through touching and handling objects and things that can be manipulated.

Feel free to explore things in their world.

Focus on handling, manipulating, and observing one object at a time.

Describe things in their world in terms of texture, rough/smooth, soft, hard, slippery.

**Vignette**

Three-year-olds were sitting under a tree digging in the dirt. One leaned against the trunk of the tree. "Owee, Owee," he said. Observing nearby, the aide walked over saying, "What hurt you, Quentin?" "The tree," Quentin replied. "Feel the trunk with your hands," the aide suggested. The children started to feel the trunk. "It's rough," said the aide. "The trunk is rough." "It rough, it hurts," Quentin said.

  

**Guideline VII, Goal 2, Objective 4**
**Children Will Learn to Use All Five Senses in Observing**

Children Will Need to Experience:

Practice in using all their senses: looking, listening, smelling, tasting, and touching to learn about the world.

Talking about what they can learn using individual senses.

The continual supervision of adults who prevent children from touching, smelling, and tasting any substance that could be harmful.

**Benchmarks**

Children Should Be Able To:

Understand that they can learn about the world in which they live by using their senses.

Follow guidance in what is safe to touch and handle, and what cannot be handled.

Use each sense individually to find out more about people, places, and things.

Talk about how two or more senses work together. "I couldn't see the bird but I could hear it."

Around age five, be able to name the senses they use when observing.

**Vignette**

During one morning meeting the teacher's goal was to introduce the meaning of more or less. "Now," said the teacher after the group had counted a basket of apples, "how many red apples are there? Are there more red than green apples?"

Just then a child yelled out, "Look, Ms. Favretto, there's a big, big spider on the wall." Some of the children screamed and moved away, others started to giggle and sing The Itsy Bitsy Spider, and all of them were fascinated watching the large, black, furry spider on the wall. Putting the apples aside, Ms. Favretto asked the children to watch how the spider climbed. "With legs," the children replied. "How many legs does the spider have?" "Six," said one child, "all bugs have six legs, you told us so." Counting the legs over and over the children found the spider had eight legs.

The spider, perhaps sensing the children's excitement, froze. "Let's sketch the spider while we're watching it," suggested the teacher, and the children got clipboards, paper, and blank booklets and started sketching. From this observation, children gained skills in observing by using only one sense. By using their vision, they gained an understanding that they could learn just by looking.

Before their interest waned, the teacher extended the observation by asking children to dictate a list of questions they wanted to ask about spiders and insects. Motivated by their questions, she invited an expert from a nearby high school to show the children her collection of spiders. The expert also supplied them with factual books as well as folk tales about spiders, and suggested appropriate web sites where children could learn more about spiders.

In the end, this exercise more than fulfilled the teacher's goal of having children gain concepts of more and less. Listing the experiences that took place over a month, Ms. Favretto was able to document children's achievement in mathematics, the life sciences, language, mathematics, literature, and art.

  

## Guideline VII, Goal 3
## Collecting and Organizing Information

As they observe, children collect amazing amounts of information. All these bits and pieces, however, can be easily forgotten or become confusing if they are not organized in some way. Children need to put the pieces together and organize their thinking.

Research suggests that children begin this necessary organization or classifying of information by making groups of things that belong together (Piaget & Inhelder, 1969; Gelman, 2002). Children naturally sort, group and regroup buttons, sticks, stones, toys, and other objects as they play with them. Their initial classifications may be arbitrary, on a basis known only to them, or based on something unique to the child. "All these are like Grandma," explained one child who had put a number of objects in a box.

Soon children begin to classify objects on the basis of a common characteristic. "All of these are brown," and as they grow and mature, are able to classify on more than one property: "All these are brown and round stones." Regardless, in the process of making a group or classifying, children compare and contrast, summarizing and interpreting bits and pieces of information they've accumulated through their observations.

More formal ways of organizing the information children gain from observing take place in the preschool. Teachers provide materials, perhaps plastic sandwich bags for children to collect things in, or sorting trays and boxes. They make charts and graphs, and show children how to conduct and record information, all with the goal of providing children with opportunities to compare, contrast, and make classifications.

### Guideline VII, Goal 3, Objective 1
### Children Will Move from Classifying on the Basis of One Property to Classifying on the Basis of More Than One

Children Will Need to Experience:

Handling raw materials such as stones, sticks, non-toxic seed pods, shells, and other objects.

Opportunities to sort, organize, count, compare and contrast and group a variety of objects—small parquet blocks, nuts and bolts, sea shells, pine cones, leaves and so on.

#### Benchmarks

Children Should Be Able To:

Compare and contrast objects in their here and now world.

Move from arbitrary classification to classifying by one, then two or more properties.

#### Vignette

Three-year-olds were given plastic zip top baggies to hold the leaves and seeds they were collecting while walking around the schoolyard. Because the children were only three years old, no directions were given as to what should be collected in their bag. Some selected only leaves or seeds and others picked up things that caught their eye. Back in the classroom the teacher labeled each baggie with the child's name, taped it to a doorframe, and wrote a title, "Look at Our Collections." Not only did she create a lovely frame for the door, but the children and their families could later talk about the contents of the baggies, discussing what they had found and where they had found the objects.

  

**Guideline VII, Goal 4**
**Reflecting and Reaching Conclusions About Their Work and Experiences**

Scientific inquiry is the process of problem solving or thinking. It begins with asking questions and ends with reaching conclusions. Skillful teachers lead children to begin to 1) see relationships between their experiences and make generalizations; 2) reflect on their experiences and reach conclusions based on the evidence at hand; and 3) communicate their ideas to others.

Seeing relationships and making generalizations involve the process of connecting one idea with another. First-hand experiences with their environment are necessary if children are to be able to generalize from these.

Reflecting and reaching conclusions also stem from children's first-hand experiences with their world. To be able to focus on a past event or experience, to think about it, and to thoughtfully consider different aspects of the event, are skills that can be fostered throughout children's early years. Finally, children are asked to conclude, to mentally reach an end, summing up what they think about the experience and communicating it to others.

**Guideline VII, Goal 4, Objective 1**
**Children Will See Relationships Between Events and Objects and Begin to Generalize**

Children Will Need to Experience:

Teachers and family members who encourage children to question, collect data, consider their ideas and the ideas of others.

Reoccurring events such as weather, routines such as washing hands as opportunities to make connections between one event and another.

Opportunities to solve problems that stem from their first-hand experiences.

**Benchmarks**

Children Should Be Able To:

Talk about reoccurring events in terms of similarities, cause and effect. "Before lunch we wash our hands . . . after lunch we wash our teeth!"

Identify patterns of events. "Every day we go outside—not when it's rainy . . .but every day."

Describe connections between different objects, events and experiences. "It's raining—we can go outside with our umbrellas."

Make generalizations about different objects, events, and experiences.

**Vignette**

While painting at the easel Anjeli seemed delighted just to splash brightly colored paints on paper. Stopping for a moment she said, "Look, paint and mud are just alike, they're both wet and slippery." Anjeli could not have made this generalization connecting the wet, slippery nature of both mud and paint, had she not experienced the sensations
of both.

  

**Guideline VII, Goal 4, Objective 2**
**Children Will Reflect on Experiences and Events, Reaching Conclusions**

Children Will Need to Experience:

Teachers and family members who ask children to think about and reflect on their past experiences.

Teachers who explicitly model reaching conclusions from evidence at hand.

Teachers who, with the children, construct graphs, charts, and summaries of surveys in order to consider evidence.

Observing displays of their work, documentation of their experiences.

Opportunities to think and talk about experiences with others.

Resources, books, pictures, and other first-hand materials to test out their ideas.

**Benchmarks**

Children Should Be Able To:

Look at and consider evidence presented in graphs, charts, or other documentation of their work and experiences.

Use mathematical knowledge to reach conclusions. "Look, there's more of us," said Ronaldo, pointing to a chart graphing how many children liked chocolate or vanilla pudding the best.

Based on the evidence of their observations, recollections, and reflection, reach conclusions about the evidence at hand. "Ronaldo's corn grew the tallest." "The car with the battery went the farthest."

**Vignette**

A three-year-old group studied babies. As a part of their study they tasted baby cereal and the cereal they now ate. The teacher charted their preferences for baby cereal or regular cereal. Given a chart picturing both types of cereals, and note cards with their names, all of the children placed their names under the picture of regular cereal. Several children were gathered about the chart; they giggled together and laughed, saying "Icky, icky, only babies like baby cereal. We don't." "Look," said one running her hand down the list of names, "all of us eat really good cereal, no baby stuff."

  

**Guideline VII, Goal 4, Objective 3**
**Children Will Communicate Their Findings to Others**

Children Will Need to Experience:

Opportunities for expressing their ideas through art, talking, writing, mathematics, music, and movement.

**Benchmarks**

Children Should Be Able To:

Present their ideas to others whether through drawings, paintings, telling, music, or movement.

Tell others about their findings and conclusions.

Use mathematical processes and ideas to communicate findings to others.

**Vignette**

Four-year-old children in a Head Start classroom collected a number of chrysalises. While the children waited for the butterflies to emerge, they made predictions of when the butterflies would arrive, what they would look like, and how many there would be. They also listed questions they wanted to find out about butterflies and chrysalises, such as where they lived and how. "In the first place," said one child, "what are those things anyway?" They consulted books and invited an entomologist to come to their group and tell them more about butterflies.

Fortunately, the children were in the room when swallow-tailed butterflies began to emerge. The teacher recorded the experience with a digital camera.

The next day children sketched butterflies and used different papers, paints, and fabric to create their own butterflies as they reflected on their experiences. After the butterflies had been freed to fly, the children danced and moved, imitating butterflies.

Two years later, six-year-old Emile illustrated how first-hand science experiences are remembered and reflected on even years later. Emile told his first grade teacher, "Once, a long time ago, when I was in Head Start, we watched all the beautiful butterflies come out of their chrysalises. They were so beautiful. Then we made the most beautiful butterflies. I wonder where all the beautiful butterflies are now."

  

**Guideline VIII**
**Children Will Gain Foundational Knowledge of the Physical, Life, and Earth Sciences**

Children seem to know a lot about life around them. They may have planted or pulled up plants, or enjoyed watching animal life in their yard or nearby park. They may even know the names of common flowers, plants, or trees. Animal life is also familiar to them. Children learn the names of common animals, the sounds they make, and can even tell you where they live.

Children are equally as familiar with the physical sciences. In their everyday lives children examine and explore the physical properties and the structure of objects or matter. They know that materials and objects can be observed and described. They observe how materials change, and use heat and cold to change matter. Children manipulate objects, pushing, tossing, rolling, and dropping their toys. Building with blocks, riding wheeled toys, and playing with other toys, children can construct pre-concepts of force and motion (NRC, 1996). Aware of the fact that some toys need batteries, five-year-olds may be ready to formulate ideas of energy.

The National Science Education Standards (NRC, 1996) suggests that the informal knowledge of the physical and life sciences that young children bring to schools can be expanded and extended. Encouraging the processes of inquiry, teachers provide children with materials to manipulate and tools to measure, weigh, or magnify life and objects around them. Comparisons are made between and among objects and different forms of living things. Children will sort, describe, and ask questions in order to find out more about the world in which they live. Doing so, children will develop initial concepts of 1) properties of objects and materials; 2) position and motion of objects; and 3) energy.

**Guideline VIII, Goal 1**
**The Physical World**

The content of the physical sciences revolves around concepts of the atomic structure of matter, conservation of energy, and scientific concepts of light, heat, electricity, and magnetism (NRC, 1996). It will not be until children are nearly twelve years old and in the beginning stages of formal thinking that they will be able to more fully understand and use these abstract concepts.

Regardless, the concepts children gain from their early explorations, questions, observations, and descriptions of their physical world will serve as the foundation on which they will build the abstract and scientific concepts of their physical world. The opportunities children have to experiment with and explore the properties of objects and materials in their here and now world will also give them a way to avoid magical thinking. Children learn that blocks do not fall up, water pours, and sand fills and spills, developing a belief in some general limits and ideas of how their physical world works.

  

**Guideline VIII, Goal 1, Objective 1**
**Children Will Become Familiar with Physical Materials and Objects and How They Can Use Materials.**

Children Will Need to Experience:

A wide variety of physical objects, some made of multiple materials for children to handle, play with, stack, sort, and move about.

An environment that fosters exploration, questioning, and exploring.

Teachers and family members who ask, "Why?" "What will happen if . . ." and other questions to stimulate children's own questioning, observing, collecting information, and reaching conclusions.

Tools such as magnifying glasses, rulers, scales, and thermometers.

Teachers who describe objects in terms of height, weight, shape, color, temperature, size, and so on.

**Benchmarks**

Children Should Be Able To:

Move and change positions of objects, relating the changes to their pushing, pulling, lifting and so on.

Talk about their actions on objects, "I turned it and the Jack came out of the box."

Observe objects, measuring and weighing to find out more about them.

Question and experiment finding out what will happen if they react to objects in different ways. "I wonder what will happen if . . . "

Describe objects in terms of weight, size, height, temperature, shape, and color.

**Vignette**

One childcare center equipped the play yard with smooth wooden planks with cleats attached at each end, and wooden boxes with slats that held the planks. Because the materials were open-ended, they appealed to children of all ages. The boxes and planks required that children work together. As three-year-olds pushed the boxes together to make houses or forts, they talked about shapes and weight. The fours were more explicit in describing the planks as long, longer than or shorter than others, and the boxes as heavier or lighter. The five-year-olds began their play by planning a fort they wanted to build, dividing up jobs. All ages, however, were experimenting with matter, using language to describe the materials and their actions on them, applying mathematical knowledge, and identifying the physical properties of the wood and boxes.

  

**Guideline VIII, Goal 1, Objective 2**
**Children Will Become Familiar With the Concept that Materials Can Exist in Several States**

Children Will Need to Experience:

How matter changes by taking part in cooking experiences.

Observing and discussing how matter changes when liquid, heat or cold is added.

Factual books, CDs, and pictures about matter and how it changes.

**Benchmarks**

Children Should Be Able To:

Take part in cooking experiences, observing and describing what happens to matter when liquid, heat, or cold is added.

Observe and discuss the effects of heat on everyday materials. Feel the heat on the sidewalk on a sunny day, experiment by putting crayon pieces or bits of ice in hot and sunny places and in shady places, describing the results.

Use refrigerators and freezers to change matter from liquid to solid. Talk about the effects of cold on some materials.

Experiment with dissolving different materials in water.

Consult factual books about matter and how it changes to extend and expand their first-hand knowledge or give them ideas for additional experiments.

**Vignette**

Together a class of children made one-cup pudding (Foote-Johnson, 2001), voting on whether they would make chocolate or vanilla pudding. While the two groups made one-cup pudding, the teacher called attention to what happened to the dry pudding mix when milk was added, and to what happened to the pudding as it was stirred.

  

**Guideline VIII, Goal 1, Objective 3**
**Children Will Explore Art Materials to Expand Concepts of Changes in Materials**

Children Will Need to Experience:

A variety of art materials in different forms. Powdered paints, clay, etc.

Opportunities to mix dry materials with water.

Opportunities to mix colors using paints and other materials.

Time and freedom to explore art media.

**Benchmarks**

Children Should Be Able To:

Develop beginning ideas of mixing materials to make different substances.

Talk about changes that occur when water is added to dry materials.

Describe the nature of art materials, "Paint is slippery," "Pound, pound, my clay, poke, poke, poke the clay."

Gain control over different forms of art materials, developing control over fluid and solid materials.

**Vignette**

During morning arrival time, the teacher set up a table covered with plenty of newspapers, dry paints, empty paint cans, small pitchers of water, measuring spoons and cups, and small wooden stirring paddles. As children entered the room, they were asked if they would like to help mix paints. The children measured dry paint into the cans, carefully measured and added water, and stirred and stirred. Some mixed colors together. "I made a new color," exclaimed Craig, "It's my own color, blue and red." Other children carefully stirred until "It's just right! This is just right paint!" Throughout, the children and teacher discussed what happened to the powder when water was added, what happened when too much water was added, and how different forms of paint looked, felt, and could be used. One child, when asked what happened to the dry powdered paint when he added water said, "It disappeared! And now there's paint. It's magic. I made magic." He illustrated that preschool children, still in the preoperational stage of thinking, find it difficult to give up their beliefs in magic even when engaged in actual experiences with different forms of matter.

  

**Guideline VIII, Goal 1, Objective 4**
**Children Will Gain Initial Ideas of Energy**

Children Will Need to Experience:

Playing with toys that have a source of energy such as batteries, springs, those powered by air, and playing with those that do not have a source of energy such as wooden cars, trains, and dolls.

Opportunity and time to play with a variety of toys and objects, taking them apart, putting them together again to find out what makes them work.

Family members and teachers who discuss the energy sources of various toys with children.

**Benchmarks**

Children Should Be Able To:

Observe how different types of toys move.

Identify toys powered by battery, spring, or air.

Wind up spring toys, turn on battery-powered toys, and use air or wind as energy to move pinwheels, kites, parachutes, and other toys.

Talk about different toys and the different sources of energy.

**Vignette**

Three-year-old Enjun and four-year-old Amy were playing with a box of toy cars, trucks, and other vehicles. "Hey," said Enjun calling to the teacher, "these stuffs have no batteries. Where are the batteries to make them go?" The teacher joined the two children and engaged them in observing the variety of vehicles. Together they sorted those that were indeed battery powered, and those that required them to provide the energy or force to make them move.

  

**Guideline VIII, Goal 2**
**The Life Sciences**

The life sciences are defined by the National Science Foundation as the study of the characteristics of organisms and the environment necessary to sustain life (NRC, 1996). Early childhood curriculum content about life forms that surround children can complement their natural interest in studying the world. As with the physical sciences, children's encounters with the life sciences are exploratory. They begin with children observing and questioning "Why?" "How?" and "What?" about the life around them, continue with collecting and organizing data, and end with reaching conclusions, reflecting and thinking about their experiences.

Even though children are highly interested in living things, their thinking about life is preoperational. Well into the primary grades, children generally attribute life to anything that moves or has the potential to harm, such as poison.

To develop accurate concepts of living organisms, children's experiences must be first-hand and concrete. Books, pictures, and CDs can be used to extend and expand first-hand experiences, but children's knowledge of the life sciences has its foundations in children's experiences with the variety of life around them (Bredekamp & Copple, 1997).

Through their first-hand experiences children will begin to learn to 1) distinguish living from nonliving things; 2) become familiar with the wide variety of plant and animal life around them; and 3) to recognize the basic needs to support life.

Plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying (NRC, 1996). These cycles differ for different organisms. Even though many of the concepts of life and death seem magical to young children, they do know something of the life cycle of both plants and animals. For instance they know that plants and animals will resemble their parents (Gelman, 2002). Given a seed of corn, children can predict that the seed will grow into a corn plant.

Children's interest in the life cycle of plants and animals guides teachers in planning their introduction to the concepts of continuity of life forms, from seed to plant, from infant to elder.

**Guideline VIII, Goal 2, Objective 1**
**Children Will Begin to Distinguish Between Living and Nonliving Things**

Children Will Need to Experience:

Observing living and nonliving things.

Discussing the differences between inanimate and living things.

**Benchmarks**

Children Should Be Able To:

Ask questions revolving around the characteristics of living and non-living things.

Describe the characteristics of living things, talking about growth, the need for food, and special environments.

Around five years of age, begin to move from believing anything that moves has life to identifying living and nonliving things.

**Vignette**

"Watch out, watch out, it's going to get you," screamed Carl, moving out of the path of a windup toy car. "It can't get you," said Lindsay, "it's not real, you wound it up, it's going to stop." Together these children illustrate the transition from believing anything that moves has life, to realizing that all things that move are not necessarily alive.

  

**Guideline VIII, Goal 2, Objective 2**
**Children Will Learn and Talk About the Wide Variety of Plant Life in Their Immediate Environment**

Children Will Need to Experience:

Walking field trips through the school, on the play yard, and in the immediate neighborhood, to directly observe plant life.

Focusing on the diversity of plants around them to foster the understanding that life on this Earth is diverse.

Books, pictures, stories, videos, and computer programs that extend and expand children's first-hand experiences with the variety of plant life on our planet.

**Benchmarks**

Children Should Be Able To:

Ask questions about plants in their immediate environment. "What's this?" asked a three-year-old, pointing to a flower.

Learn the names of common plant life around them. "Those are daisies."

Describe the characteristics of plant life in their environment.

Compare and contrast the characteristics of different plants. "This one sticks you," said a child picking a rose.

Become aware of the diversity of plant life in their preschool setting, play yard, neighborhood, and community.

Draw, write, paint, and chart plant life they observe in their immediate environment.

**Vignette**

In a school in Baltimore, teachers took four-year-old children on a walk around the school building. The purpose of the walk was to find and name plants that were growing around the school building.

There were so many plants growing in cracks in the sidewalks and around the building itself, that the teacher couldn't name them all. She then asked children to find the three most common plants found in just one area of the sidewalk. Back in the classroom books were consulted and the plants were named. Going outside again, the children sketched the plants. Before they did so, however, the teacher and children looked at how leaves grew on different plants. The children found plants with leaves growing opposite each other, and others with leaves alternating on the stems. Children's drawings illustrated that children were observing differences in plants, noticing how the leaves grew differently on each, and noting the different sizes and shapes of the leaves.

  

**Guideline VIII, Goal 2, Objective 3**
**Children Will Learn and Talk About the Wide Variety of Animal Life in Their Immediate Environment**

Children Will Need to Experience:

Observing and caring for animal life in their classroom and play yard.

Observing common animal life in their homes and neighborhoods.

Visiting zoos or other places where they can observe animal life from different areas of the world.

**Benchmarks**

Children Should Be Able To:

Ask questions about animals in their immediate environment, as well as those distant from them.

Learn the names of common animal life around them.

Describe the characteristics of animals in their environment.

Compare and contrast the characteristics of plant and animal life.

Draw, write, paint, chart, and move like animals in their immediate environment.

**Vignette**

In one classroom the teacher involved the children in setting up a terrarium as well as an aquarium. One day the teacher showed children a sign she had made. She read it to the children during morning meeting, saying: "This sign reminds you to count the new fish in the aquarium. It says 'Count the fish.' " She then gave the children paper with spaces in which to record the number of fish they saw. Another day she placed books about fish next to the aquarium and asked children to find out more about how the fish lived. She did the same with the plants in the terrarium. By doing so, the teacher extended children's observations and questions about water life and life out of water.

  

**Guideline VIII, Goal 2, Objective 4**
**Children Will Learn the Needs of Living Things**

Children Will Need to Experience:

Focused observations on the need of living things in their environment for air, water, and food.

Observations of the different things animals and plants require in order to sustain life.

Books, stories, and CDs about how and where plants and animals common to their environment live, and why.

**Benchmarks**

Children Should Be Able To:

Observe life around them, e.g., birds, squirrels, and other living things.

Identify and talk about the differing living environments animal life requires.

Feed and care for living things in their environment.

Draw, write, build, chart, or represent in some other form the environments of different living things in their immediate surroundings.

**Vignette**

Following a study of plant and animal life in the school and immediate environment, a group of five-year-olds was guided in creating a mural to sum up their findings. The teacher told them the name of the mural was "Life in the Sky and on the Earth."

Reviewing the plant and animal life they had observed and where and how different forms of life lived, the teacher asked the children to paint the sky and the ground. She provided them with large sponges and pans of different colored paint. Using the sponges, the children painted the top of the mural blue and the bottom a combination of green to represent grass, blue for ponds and lakes, and brown for places without grass. After the mural dried, children thought about the life they knew, drew or painted plant and animal life, cut out the drawings, and pasted them on the mural. Children drew birds and pasted them on the blue sky of the mural, others drew trees and plants, pasting these on the bottom along with animals, including fish in the ponds and lakes, reptiles, insects, and other life forms.

  

**Guideline VIII, Goal 2, Objective 5**
**Children Will Begin Building Foundation Knowledge of the Life Cycle**

Children Will Need to Experience:

- Observing the life cycle of seeds and plants.
- Observing the life cycle of differing species of animals.
- Observing the life cycle of humans.

**Benchmarks**

Children Should Be Able To:

- Plant seeds and predict what will grow.
- Observe and attend to the sprouting seeds and growing plants.
- Understand that a baby animal will grow to resemble its parents.
- Understand that they were once babies, and will grow to be teenagers, adults, and elders.

**Vignette**

A teacher of three-year-olds told children they were planting bean seeds. As the children dug in the earth and planted the scarlet runner bean seeds, the teacher informally asked each child: "What will grow from your seed?" The children each replied, "Beans, we're planting beans." Some said "Beans, beans, we'll eat beans!" The children illustrated that, even though only three years old, they understood the concept that bean seeds will produce bean plants.

  

**Guideline VIII, Goal 3**
**The Earth Sciences**

The Earth, the place we live, is also of high interest to young children. The soil, sand, and stones, the sky with its clouds, rainbows, sun, moon, and stars fascinate children (Fromboluti & Seefeldt, 1999). Many of children's "Why?" questions have to do with the Earth. "Why," they ask, "are stones hard?" "Why is the sky blue?" "Why does it rain?" "Why is the sun gone?"

Experiences in the preschool are designed to respond to children's questions about their Earth, the place they live. These experiences are not meant to teach children abstract, scientific knowledge of geography or meteorology, but rather to focus their observations on the nature of the world in which they live. Through their early experiences children will build foundational, embryonic concepts of the characteristics and nature of the surfaces of the Earth, develop awareness of the sky and the atmosphere that surrounds the Earth, and observe changes in the Earth and sky.

**Guideline VIII, Goal 3, Objective 1**
**Children Will Become Familiar With Their Physical World through Sand and Water Play**

Children Will Need to Experience:

Sand and water available in and out of doors.

A variety of funnels, boxes, jars, tubing, and other material to use in sand and water boxes.

Teachers who introduce the vocabulary of physical properties and mathematics as children play, for example "weight," "volume," and "mass."

**Benchmarks**

Children Should Be Able To:

Play freely, exploring properties of both sand and water.

Talk about what they are doing, describing weight, volume, mass, texture, and other words describing the physical properties of sand and water.

Begin to make generalizations about the properties of sand and water, for example: Both flow, fill, and spill.

**Vignette**

"I'm making apple pie," three-year-old William said as he mixed sand and water in a bowl. When he was finished, he dumped the sand pie on the edge of the sand box and said, "Who wants apple pie?" He made more pies as children came and pretended to eat the pies. When it was time to go inside, William told the teacher he was leaving his pies so they could play with them later. After his nap, William excitedly returned to the sand box, only to find that his once moist, compact pies were now piles of dry sand. William nearly started to cry, when the teacher stepped in and asked, "What could have happened?" "A bad boy came and messed them up," said William. "Well, I doubt that," said the teacher. "Let's make new pies. First you'll need some water to hold the sand together." She and William got the water and he soon became busily involved in making new apple pies.

When asked why she didn't tell William that the water had dried in the sun, making the sand pies crumble, the teacher replied, "Let's wait and see if William will figure it out for himself. I'll plan a number of repeated experiences with wet and dry for all the children. With repeated experiences, children often figure the problem out for themselves." In this case they would come to the conclusion that water is needed to keep sand moist.

  

**Guideline VIII, Goal 3, Objective 2**
**Children Will Name and Describe the Surfaces of the Earth in Their Immediate Environment**

Children Will Need to Experience:

Walking field trips in and around their school and play yard to observe, name, and become acquainted with the different surfaces of the Earth.

Playing with and exploring sand, soil, stones, water, and other surfaces of the Earth, including those made by humans, like concrete, black top, or synthetic matting.

Exploring different surfaces, and finding out which are easiest to ride their trikes on, run on, and stop on.

Examining life that lives in or under different surfaces.

Books, pictures, CDs, videos to extend and expand children's concepts of different surfaces in their immediate environment.

**Benchmarks**

Children Should Be Able To:

Identify different surfaces of their play yard and talk about what and how they can play on each. "I like to run on the grass. It's soft."

Question to find out more about the surfaces of the Earth. "Why is this slippery?"

Recognize surfaces that are made by humans, e.g., concrete.

Reflect on their experiences by categorizing and organizing their observations of surfaces of the Earth.

Reach conclusions about which surfaces are easiest to walk and ride over, and about the life that lives on and under different surfaces.

Draw, paint, write, or otherwise express their ideas about the surfaces of the Earth.

**Vignette**

Three-year-olds are amazingly attuned to the surfaces of the Earth. They adjust their gait to the surface they are walking on and stoop down to explore surfaces—to scratch in sand, rub their hands over a smooth surface, or pick up and handle pebbles in a gravel driveway.

One three, leaving school after a winter storm, came to the shiny surface of a puddle just turning to ice. She stopped. Squatting down and feeling the icy water, she proceeded to crawl through the puddle. She demonstrated that threes, when unsure of whether the surface is sturdy, will often get down and crawl. These initial observations and predictions about the sturdiness of the surfaces of the Earth are the foundation of later scientific inquiry (Gibson, 1970; NRC & IM, 2000).

  

**Guideline VIII, Goal 3, Objective 3**
**Children Will Become Acquainted with Different Landforms That Are in Their Immediate Environment**

Children Will Need to Experience:

Field trips to observe different landforms that are in their immediate community. They may find different landforms such as hills, ponds, deserts, flat lands.

Naming landforms such as ponds, rivers, mountains, and so on.

Walking up and down hills, playing in water, experiencing different landforms for themselves.

Observing how living things use and live on and around differing landforms. Which animals live in water, which on dry land, which in mountains?

Using vicarious experiences of others to begin to realize the Earth is covered with a variety of landforms.

Consulting books, photos, CDs, videos, and movies.

**Benchmarks**

Children Should Be Able To:

Name landforms in their community, such as ponds, rivers, hills, and so on.

Describe the similarities and differences in these forms.

Name and discuss the life that inhabits differing landforms.

**Vignette**

On a lovely spring day a teacher asked, "What will you do when we go out to play?" "We know what we want to do," said a group of children giggling together, "We're going to roll down the hill and climb back up again," demonstrating that they were learning about land forms common to their own play yard, naming them, and adjusting their behavior to the particular form of a small hill.

  

**Guideline VIII, Goal 3, Objective 4**
**Children Will Develop Awareness of the Sky**

Children Will Need to Experience:

Observations of the sky. Ask children to observe the clouds, describe them, and imagine what they see.

The effects of the sun. Children should NOT directly observe the sun. Looking directly into the sun could damage children's eyes. Children can, however, observe the results of the sun, playing with shadows, drying things in the sun and feeling its heat, measuring the sun's heat with thermometers.

Opportunities to observe the night sky. Ask parents to find the first star of the evening, look at the shape of the moon, or count the stars they see together.

Factual stories, poetry, chants, books, CDs, and videos about things in the sky that extend children's observations. Books that ask children to imagine what clouds are like or look like.

**Benchmarks**

Children Should Be Able To:

Identify and name sky, clouds, sun, moon, and stars.

Explore the effects of the sun on their lives, measuring the temperature, charting shadows, drying doll clothes in the sun, moving from sunny areas to shady to cool off.

Write, draw, and paint their own stories about the things in the sky.

**Vignette**

After reading It Looked Like Spilt Milk (Shaw, 1993), Ms. Hey took the three-year-olds outside and asked them to look at the clouds and think about what the clouds looked like. She provided large blue paper and white paint on easels arranged under the eaves of the school so children could represent their ideas of clouds through painting.

  

## Guideline IX
## Children Will Gain Foundational Knowledge of Technologies

Today's world is rapidly and increasingly becoming ever more dependent on technology (NRC, 2001a). To successfully function in the world of today and the future, children must be prepared to use and understand technology (NRC, 1996). Gaining foundational knowledge of technology begins by developing children's understanding that humans create things and develop systems to solve their problems and meet their needs.

The National Science Foundation (NRC, 1996) suggests that young children should become aware of the human made world and build foundational knowledge of technological systems close to them. As is the case with the science standards, the technology standards advocate that children become involved in inquiry, develop thinking skills and processes, and take part in solving elementary design problems.

Understanding their technological world is not easy for young children. Children under the age of seven or eight think in a preoperational manner. Young children have difficulty developing conventional ideas about their technological world. When watching television or a computer screen, it is difficult to discern reality from magic. When children observe, for example, a seed grow and blossom into flowers in a second, it can lead children to believe in things that are not factually correct.

Nevertheless, children should become familiar with the study of technologies found in their everyday world, and should learn to use them (Clements, 2002). They can learn to name and use objects and materials made by humans. They can begin to acquaint themselves with the computer and its many uses. Furthermore, children can develop a disposition toward creative thought, learning to take the initiative and to develop and design things that will help them in their everyday lives.

### Guideline IX, Goal 1
### Human Made Objects and Systems

In the three, four, or five short years they have lived on this Earth, children have learned a great deal. Regardless, young children are generally unfamiliar with the idea that some things in the world are natural while others have been created by humans to solve problems, improve the quality of life, and increase human productivity. Starting with objects children use on a daily basis, teachers can begin naming materials made by humans, and those that are natural.

### Guideline IX, Goal 1, Objective 1
### Children Will Name Materials and Objects Made by Humans

Children Will Need to Experience:

> Objects made of a variety of objects or materials created by humans.
>
> Teachers and family members naming and comparing and contrasting natural materials with human made materials.

**Benchmarks**

Children Should Be Able To:

> Begin to recognize that some materials such as plastic, glass, and metals are created by humans.
>
> Describe objects in terms of the materials they are made of.
>
> Talk about the properties of wood, metal, glass, plastic, and other natural or human made objects.

**Vignette**

Ms. Smith set up a recycle area in her four-year-old kindergarten classroom in a public school. She created three bins labeled with pictures and words, PLASTIC, PAPER, and OTHER. Children, who were proud of being given responsibilities they could fulfill, had no trouble identifying the different properties of plastic, paper, or other materials.

  

**Guideline IX, Goal 2**
**Computers**

Computers and other technology will not replace the traditional and valued early learning materials of books, blocks, art, and play in the early childhood environment. Technology will, however, need to become an integral part of all early childhood classrooms.

**Guideline IX, Goal 2, Objective 1**
**Children Will Become Familiar With Computers and Their Uses**

Children Will Need to Experience:

The computer area as a place for observing, discussing, and cooperative work.

Time to explore the computer as a tool, not a toy.

Teachers and family members who engage children in problem solving using the computer, asking children "What will happen if . . ." or "How could you . . ." questions.

**Benchmarks**

Children Should Be Able To:

Hunt and use specific keys instead of randomly hitting keys.

Use the mouse.

Begin to understand that their actions control what the computer does.

**Vignette**

Three-year-old Tasha was playing in the computer area. She took a block from the block area and began hitting the keyboard with it. Lakeshi, watching her for a moment said, "Tasha, Tasha, don't do that!" Taking the block from Tasha's hand she continued, "It's a computer. You do this," and proceeded to demonstrate how to hit one key at a time. Both girls illustrated how young children approach the computer. Those unfamiliar with computers may treat it as another toy, while those who have experienced computers have developed the understanding that computers are tools, not toys, and are to be treated as such.

  

**Guideline IX, Goal 2, Objective 2**
**Children Will Use the Computer for a Variety of Purposes**

Children Will Need to Experience:

Observing teachers and family members using the computer for specific purposes.

Using the computer to connect first-hand experiences with abstract computer experiences.

Seeing their computer work displayed.

**Benchmarks**

Children Should Be Able To:

Use the computer for enjoyment, playing games, watching CDs.

Use the computer drawing programs to create and design.

Use computer programs to work with numbers, and at around age five, execute number operations.

Use the computer for writing.

Work with others to solve problems with the computer, listen to music, and play games.

**Vignette**

Three-year-old Aishling and Molly were involved with the computer. Aishling was drawing on the computer, and Molly, sitting next to her, was trying to copy the drawing. "You draw on the computer," said Molly, "and I draw on paper," demonstrating that even three-year-olds can learn the vocabulary of the computer, know of its uses, and compare the computer with other first-hand experiences.

  

**Guideline IX, Goal 3**
**Communication Systems**

Children can study the communication systems in their own world. They can learn to use the telephone, computer, duplicating machines, and the mail, or can fax a picture to a friend. Books, parts of newspapers, watching snippets of news—perhaps of a space shot, the Olympic games, or some other news event of interest to and appropriate for young children—can be used to illustrate how ideas travel.

**Guideline IX, Goal 3, Objective 1**
**Children Will Begin to Learn How Ideas Travel**

Children Will Need to Experience:

Observing the use of office machines to communicate with others.

Using telephones, email, and a fax machine.

A visit to the local post office or mail sorting room in their school.

**Benchmarks**

Children Should Be Able To:

Learn how to use telephones.

Use a disconnected phone to dial 911, and around age five, their own phone number.

With the help of a teacher use email to send a message to a friend.

With the guidance of a teacher, fax a picture or message to their family, friend, or relative.

Mail themselves a drawing or letter, and mail one to a friend or relative.

**Vignette**

A four- and five-year-old group was learning their phone numbers and addresses. As a part of the lesson the teacher asked children to draw a picture or write a note to themselves. She helped them address the envelopes and then the group went to the post office to buy stamps and mail their letters. Two days later the children arrived at school with their letters in hand, enthusiastically saying, "I got mail!" "Look at my letter!" "I just love to get mail." The simple act of mailing a letter to themselves not only thrilled them but taught them something of the way ideas travel.

  

**Guideline IX, Goal 4**
**Creativity, Problem Solving, and Design**

Openness to the new, to solving problems and thinking of new ways of doing things are not impossible for young children. Whether building a police car or making up an imaginary machine, young children are developing the disposition and knowledge that they are creative beings.

Children can begin by pondering questions such as "What did people do to close their coats before zippers were invented?" These and other questions and comments introduce young children to the idea that many of the things they use daily were invented or created by people just like them (NRC, 1996). Understanding that people designed and created the technologies they use, leads to the idea that children too, can create, design, and invent.

**Guideline IX, Goal 4, Objective 1**
**Children Will Become Aware that Humans Created the Tools They Use**

Children Will Need to Experience:

A variety of tools used over time.

Using tools in their room, for example a hand pencil sharpener and an electric one.

Teachers and family members who compare early tools with later tools and discuss them with the children.

**Benchmarks**

Children Should Be Able To:

Understand the purpose of tools in general.

Develop the understanding that humans create tools to improve their lives.

**Vignette**

A four-year-old class was given the task of beating eggs for a cake with an old hand held eggbeater, a newer beater with ball bearings, and an electric beater. The children made comparisons between the beaters, concluding that they preferred the electric one "Because it beat better." The teacher used the experience to relate the evolution of the beater to humans who kept wanting to find better and better ways of cooking.

  

**Guideline IX, Goal 4, Objective 2**
**Children Will Learn to Use Tools**

Children Will Need to Experience:

A woodworking bench equipped with small saws, hammers, screwdrivers, nails and screws and other tools that actually work.

Safety goggles.

An assortment of different sizes and lengths of soft wood.

Continual adult supervision when working with tools.

**Benchmarks**

Children Should Be Able To:

Learn the names and appropriate way to handle and use hammers, saws, screwdrivers, and other tools safely in order to construct and build objects.

Construct an object of wood using nails or screws to join the pieces.

When five years old, design a plan for something to build from wood— a boat, car, toy, or other object— and follow the design as they work with wood.

**Vignette**

The teacher of a group of three- and four-year-olds decided to include a woodworking area in the room. To do so, she introduced children to a wooden boat another group had created. She told them that they could learn to design and create with wood as well. Each day she showed children a tool, named the tool, and arranged for each child to learn how to safely use the tool. Each was asked to saw, hammer a nail, and screw two pieces of wood together. When the children had gained the skills involved in using each tool safely, she asked the group to think of something they wanted to make at the woodworking bench. As children designed plans, they took turns working with the wood. Many of the youngsters simply nailed or screwed pieces of wood together, naming their creation after they were finished. Other children, however, with the help of the teacher, did design and build simple boats, cars, and a bird feeder. Throughout, the children were using thinking skills, counting, solving mathematical problems, and using language.

The teacher kept the woodworking available throughout the year so children could continue to master the tools and use the wood to create ever more complex and complete objects.

  

### Guideline IX, Goal 4, Objective 3
### Children Will Use Manipulatives to Create Designs

Children Will Need to Experience:

A wide variety of small unit blocks, wheels and spokes, and other objects that they can create, design, and build with.

Teachers who challenge children to create designs. For example, teachers could ask children to use the play logs or to design a house big enough for a small or large toy; to design a pattern for a necklace and bracelet; to design the perfect play house for the play yard; or to create any other design with the manipulatives.

**Benchmarks**

Children Should Be Able To:

Create their own designs using a variety of manipulatives.

Use manipulatives to design specific things, perhaps those suggested by teachers as well as those they want to create themselves.

Gain the concept of creating a design.

**Vignette**

A group of four-year-olds was playing around with small parquet blocks. They randomly moved the blocks around on the table, chatting together as they did so. The teacher sat down with them and began to move a group of blocks around. As she did so, she said, "I'm designing a garage for a car." One of the children, modeling after her, said "I'm designing a house for Winky, my doll." Another said, "I'm going to design my swimming pool." With just one suggestion from the adult the children moved from random play to designing with a plan in mind.

### Guideline IX, Goal 4, Objective 4
### Children Will Begin to Design Products

Children Will Need to Experience:

The need for a product that will solve a problem or do something efficiently.

Opportunities to express themselves throughout the curriculum.

Models, teachers and family, who find ways to solve problems using tools and come up with new solutions.

**Benchmarks**

Children Should Be Able To:

Recognize a problem and the need for a solution.

Plan ways to solve the problem.

Create and/or design something that they can use.

**Vignette**

Teachers may use children's first-hand experiences and needs to create or design new technologies. One five-year-old group found the sun was too bright in the afternoon. With the teacher's help and a developmentally appropriate array of tools and materials, the children designed different hats and sunshades.

  

**Guideline X**
**Children Will Gain Foundational Knowledge of the Social Sciences**

The primary purpose of the social sciences is to help young children develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse democratic society in an interdependent world (NCSS, 2000a). Somehow it seems unacceptable to ask children between the ages of three and five to learn all the knowledge, skills, and attitudes necessary to become citizens of an interdependent world. But children have been studying their social world from the moment of birth. By three and four children are becoming increasingly sophisticated in their study of the social world (Chard, 1998). Driven by the need to know, children eagerly use the processes of inquiry to learn more about the Earth they live on, the people who live on the Earth, the study of their histories, and the skills they will need as citizens of a democracy.

The preschool classroom is the perfect laboratory for children to learn the knowledge, skills, and attitudes required to live in an interdependent democratic society. In the small democracy of the early childhood program, children live the skills they will need as citizens of a democracy. Children are supported as they perfect their skills of cooperating and sharing. They begin to learn to vote, and by age five accept the will of the majority.

Knowledge of children's social world is extended and expanded through children's study of this world. Themes, identified by the National Council for the Social Studies (1994), guide children's study. The themes of Culture and Cultural Diversity; Time, Continuity, and Change; People, Places, and Environment; Civic Participation and Production; and Distribution and Consumption serve to organize children's studies for young children (NCSS, 2000b).

**Guideline X, Goal 1**
**Their Own Culture and the Culture of Others**

With cultural diversity surrounding them, children must develop respect for their own and other cultures, races, and ethnicities. Children are aware of racial and ethnic differences at a very early age. Clark and Goodman's (1939) early studies, which have been replicated over the years (Walker, 2001), suggest that children as young as two or three are aware of their own race/ethnicity, and that of others.

Just as early, children begin the process of stereotyping, recognizing that some differences make a difference and others don't matter. As children attach meaning to these differences they go about forming the intricate maze of knowledge and values related to culture (Phillips, 1992).

By presenting a multifaceted, anti-bias curriculum each day, teachers can help children through this maze of knowledge and values. Displaying and modeling attitudes of respect for diversity and actively challenging stereotypes, prejudice, bias, and negative decisions made about persons on the basis of race, ethnicity, language, gender, and ability, teachers begin the process of helping children respect themselves and others who may differ from them (Seefeldt & Galper, 2001). Since children are already aware of racial and ethnic differences, a focus on similarities between and among all people is suggested.

  

**Guideline X, Goal 1, Objective 1**
**Children Will Demonstrate Respect for Others**

Children Will Need to Experience:

Teachers and family members who themselves exhibit attitudes and behaviors that reflect respect for persons from all races and ethnicities.

Teachers and family members who actively challenge children's stereotypic or prejudicial responses to those who may differ from them.

Teachers and family members who provide children with images of persons representing all racial and ethnic groups involved in a variety of recreational and family activities and at work. These can be provided through photographs, toys, equipment, books, computer programs, illustrations, paintings, and so on.

**Benchmarks**

Children Should Be Able To:

Play with children of differing racial/ethnic groups equally.

Begin to become aware of stereotypes found in books, greeting cards, and other media.

Begin developing ideas of and practice fairness and justice, cooperating with all members of their group.

**Vignette**

"This girl Pretty," said four-year-old Sabrina, pointing to an African-American girl on the cover of Honey, I Love (Greenfield, 1986). "She looks just like my friend Annette!" Sabrina continued, making clear the importance of children seeing many kinds of children portrayed in books, toys, and other school material.

  

**Guideline X, Goal 1, Objective 2**
**Children Will Gain Knowledge of the Similarities Between/Among All People**

Children Will Need to Experience:

Songs and music from a variety of cultures, including their own.

Books, stories, folk-tales, and poetry reflecting the culture, race, and ethnicity of a variety of cultures including their own.

Recognizing the similarities and differences in folk-tales from differing cultures.

Playing with materials that represent their home culture and other cultures: chopsticks, serapes, mukluks, saris, clogs, dashikis, berets, turbans, and other materials from the home culture of children in the group.

Artwork from the cultures of children in the group.

**Benchmarks**

Children Should Be Able To:

Learn songs and chants from a variety of cultures, recognizing that every culture, racial and ethnic group has music.

Enjoy listening to the literature and poetry of a variety of racial and ethnic groups.

Enter into socio-dramatic play using materials and tools from differing cultures.

Around age five begin to recognize the similarities and differences among folk-tales told in differing cultures.

Around age five begin to recognize similarities and differences in art forms representing a variety of cultures.

**Vignette**

After the children had enjoyed listening to the Swedish version of The Three Billy Goats Gruff and had taken turns acting out the roles of the three billy goats and the wicked troll, the teacher told them the Mexican story of the little billy goat and the coyote. The four-year-olds were able to identify how the stories were similar and how they differed.

**Guideline X, Goal 2**
**Knowledge of History**

"Is today tomorrow?" asked four-year-old Thomas, who had been told over and over the day before that tomorrow the group would visit the fire station. Thomas illustrated that three- to five-year-old children have limited concepts of time, continuity, and change (Seefeldt, 2001). Research also illustrates that children's concepts of time are vague and incomplete (Piaget & Inhelder, 1969). Further, their anthropomorphic thinking, the belief that anything that moves has life, and their preoperational ideas of justice and punishment, lead children to explain continuity and change as something magical. One child, seeing an elderly man slowly crossing the street, explained to her mother, "I guess he got old because he was bad." Regardless, the study of history is important for young children. The National Center for History in the Schools (2002) maintains that history, along with literature and the arts, provides one of the most enriching studies in which young children can be engaged.

This study, however, is not that of learning dates of long past events. The study of history involves children in the processes of scientific inquiry as children become little historians themselves. As they study the history of each day, of their own lives, of their family and immediate neighborhood, they will question, collect, and analyze data and reach conclusions. As a result, the study of history in the preschool "connects each child with his or her roots and develops a sense of personal belonging in the great sweep of human experiences." (NCHS, 2002, p. 2)

  

**Guideline X, Goal 2, Objective 1**
**Children Will Develop Initial Concepts of Time**

Children Will Need to Experience:

Established routines for their day at school and at home. Outdoor play is scheduled prior to lunch, brushing teeth occurs after lunch.

Teachers and family members measuring time and its passage and using the vocabulary of time.

Arbitrarily measuring time, marking special days on the calendar, setting timers, using an hourglass.

Books about the passage of time, day and night.

**Benchmarks**

Children Should Be Able To:

Know and follow the established routines of the day.

Begin initial and arbitrary or nonstandard measures of time, cleaning up before the sand empties from the top of an hourglass, knowing their birthday, understanding that day follows night.

Begin to use time words like day and night, this morning and this afternoon.

**Vignette**

One teacher brought a couple of stopwatches to school. She obtained them from the coaching department of a nearby university. They were given to her because they no longer kept time accurately. The children, however, enjoyed using the stopwatches in their dramatic play even though they had limited concepts of time. Children would pretend to set the watches to see how fast they could run, or when playing race car with their wheeled toys. On another day the teacher showed the children how to use the stop watches to measure how long they could hop on one foot, jump, or how far they could run in a given time.

Other teachers use hourglasses with sand or other timers for children to measure events in the classroom. Children turn the glasses over to see if they can clean up before the sand empties into the next chamber, or how many times they can hop or jump, or how far they can run before the sand runs out.

  

**Guideline X, Goal 2, Objective 2**
**Children Will Develop Concepts of Change**

Children Will Need to Experience:

Changes that take place as children grow. Children need to experience photos of themselves over time, and measurements of height and weight over time, to allow them to track their growth.

Tracking and talking about changes that take place in their families.

Observing changes that take place over time in their immediate environment.

Trees, plants being replaced by new ones; changes in the school or neighborhood.

Observing the life cycle of living plants and animals.

Listening to stories, narratives of the life cycle of humans.

**Benchmarks**

Children Should Be Able To:

Recognize photos of themselves taken in the past and present and talk about the changes that have occurred in themselves over time.

Talk about changes in their family, the addition of a new baby, the aging of a grandparent or other family members.

Record, through photos or sketches, changes that take place over time in the plants, trees, around their school.

Observe and talk about the life cycle of plants and animals.

Begin to talk about their life cycle, the fact that they were once infants, and will grow to be teenagers and adults.

**Vignette**

The three-year-old group that was studying babies examined baby clothes and clothes the group currently wore. The teacher included a diaper. Some of the children tried to put on the little sweaters and booties, trying to think back to when they themselves were babies. One child, handling the diaper, said with disgust, "I'm glad I'm not a baby. I'm grown up," and she tossed the diaper aside.

  

### Guideline X, Goal 2, Objective 3
### Children Will Gain Knowledge of the Continuity of Their Family

Children Will Need to Experience:

Family members telling stories of their past and narratives of their families.

Listening to factual and narrative stories of families, near as well as far away in place and time.

**Benchmarks**

Children Should Be Able To:

Recognize that their parents were once children.

Observe changes in their families.

Talk about change and continuity in their family. A family member moves away or changes a job, but she is still a member of the family.

Begin to develop the generalization that although families differ and change, there is still continuity to family life.

**Vignette**

Four-year-olds were sitting around a table, drawing with markers. One of the children said, "I'm drawing my family—here's my mommy and daddy," as she scribbled circles on her paper. Another child, William, said, "I'm drawing my pop pop." As William drew circle and stick people, he said, "My pop pop used to live with us. Now he lives in a big, really big house and there's an elevator. But he's still my family." William demonstrated that he understood the continuity and change that had occurred in his family.

### Guideline X, Goal 2, Objective 4
### Children Will Gain Knowledge of the Continuity of Life

Children Will Need to Experience:

The idea that although life constantly changes, there is continuity to life.

Continuity in their own classroom.

Intergenerational contacts within the family or with friends of the family.

**Benchmarks**

Children Should Be Able To:

Begin to develop the concept that even though they are constantly changing and growing, they are still the same person.

Observe and recognize change and continuity in their classroom. A child moves into the group, another leaves, but continuity remains.

Understand that elderly people were once children.

**Vignette**

A child's grandmother volunteered to work with the children. She observed and helped out as needed. One day she brought a piece of string and showed the children how she played Cat's Cradle as a child. Another day she brought a hoop, one that her daughter had played with when she was a child. The children enjoyed playing hoop, using it in many different ways. The grandmother also brought photographs of herself when she was three and four years old. In the discussions that followed, the teacher and volunteer pointed out that even though life brings changes, some things, like the enjoyment of playing with hoops, stay the same.

  

**Guideline X, Goal 3**
**People, Places, and Environment**

Children's early experiences in the preschool are designed to respond to children's questions about their Earth, the place people live. These experiences are not meant to teach children abstract, scientific knowledge of the Earth, but to enable them to become aware of how people live, travel, locate themselves in space, and use and modify the Earth on which they live.

**Guideline X, Goal 3, Objective 1**
**Children Will Develop Knowledge That the Earth is the Place People Live**

Children Will Need to Experience:

Walking field trips around the neighborhood to see where and how people live.

Comparing different types of homes—single family homes, apartments, trailers, shelters, duplexes, and so on.

**Benchmarks**

Children Should Be Able To:

Describe the type of home their family lives in.

Name and describe other types of homes in their immediate neighborhood.

Begin to generalize that families live together in different types of homes.

**Vignette**

Children in a four-year-old group took clipboards and markers with them as they took a walk around their neighborhood. Their task was to see how many different kinds of homes they could find. The teacher would stop from time to time and point out different types of homes, and the children would sketch them on their clipboards. They found town houses, apartment buildings, a trailer park, and single-family homes, reaching the conclusion that families live in different types of homes.

**Guideline X, Goal 3, Objective 2**
**Children Will Compare How They Travel to and from Preschool**

Children Will Need to Experience:

Charting the different ways they travel to school.

Graphing the different methods of travel they've used.

**Benchmarks**

Children Should Be Able To:

Describe how they have traveled to school.

List ways of traveling on land, water, and in the air.

**Vignette**

When the four-year-olds first came to their Head Start program located in a public school, they seemed nervous about how they would get home. The teacher made a graph of which children rode which bus, and which children's parents picked them up after school. Together, the teacher and individual children consulted the graph during the day. In addition to reassuring children who were riding buses for the first time that they would get on the right bus, the children were becoming acquainted with the idea of organizing information and gaining meaning through a graph.

  

**Guideline X, Goal 4**
**Civic Ideals and Participation**

Young children learn what they live. There is no better way to introduce very young children to the ideals of participation in a democratic society than for them to live and participate in a democratic society (NCSS, 1994; Galston, 2001). The Center for Civics Education (1994) advocates that classrooms be governed by constitutional values and principles, with teachers worthy of emulation and students who are held accountable for fair standards of behavior and for respecting the rights and dignity of others. In the ideal early childhood program, children do learn the basic principles of democracy as they live. Children learn that, regardless of their origins, they are all Americans. And as Americans they embrace the ideals and values inherent in a democratic society. Children learn to value diversity and equality, and to understand civic values, rights, and responsibilities as well as initial political participation skills. In the early childhood classroom children begin the process of patriotism. They learn to recognize and respect the American flag and to take part in patriotic rituals, group goal setting and planning, and to develop the skills involved in voting.

Children can learn to recognize and respect the American flag. The Pledge of Allegiance, because of its abstract wording, is not appropriate to teach young children. Instead of repeating the Pledge of Allegiance by rote, however, children learn respect for the flag by seeing it displayed on special occasions. Having the American Legion or Boy or Girl Scout group demonstrate proper care of the flag helps children gain an understanding of its importance. Singing songs about the flag, marching holding the flag, and saluting the flag on special occasions helps all children feel allegiance to America (Seefeldt, 2001).

Learning to give up some of one's individuality for the good of the group is a necessary part of living in a democratic society (Dewey, 1944). Young, egocentric children, who think of others as toys or objects, are clearly not able to understand this principle. Yet they do participate in group goal and rule setting, and begin initial group planning.

Decision making is encouraged in good schools for young children (Bredekamp & Copple, 1997). Children are asked to choose the center they will work in, and what they will do and with whom, while in the center. They choose whether to make a cup of lemonade or of chocolate milk, and what games they will play. They are in charge of deciding what and how they will paint, draw, or construct, and they choose whom they will play with. With this strong background of making choices and experiencing the consequences of their choices, children are ready to move to participation in voting activities (Seefeldt & Galper, 2001).

When first introduced to voting, every child will be able to have his or her own preference. Voting to play Mulberry Bush or Duck, Duck, Goose, each child will play the game they favor. After children are used to voting, they might vote and follow the group's will. One group voted for the food they would serve at a family party. They narrowed the vote to pizza and carrot cake, and when the final vote was taken, pizza had won.

  

**Guideline X, Goal 4, Objective 1**
**Children Will Learn to Give Up Some of Their Individuality to Become Members of the Group**

Children Will Need to Experience:

Respect for their individuality, needs, ideas, and individual personalities.

Teachers who share control with children, and who focus on how children are feeling, reacting, and learning.

Discipline that is consistent, but does not revolve around force, threat, or coercion.

Freedom to think and express themselves.

Never being overwhelmed by the power of others.

Playing and working with others.

Becoming part of the group, setting rules, and sharing responsibilities for themselves and others.

**Benchmarks**

Children Should Be Able To:

Think for themselves, expressing themselves in a variety of ways.

Take part in rule setting and keeping.

Develop responsibility for self and others.

Learn not to let others overwhelm them.

Initiate play with others, inviting others to join them.

**Vignette**

In one three- and four-year-old group, things were out of control. Too many children were screaming at each other. Others darted and dashed around the room, and too many were tossing toys around. One morning the teacher called a meeting. She told the group that these behaviors could not continue. She then asked the children to develop responsibility for themselves saying, "What should we do?" The children replied, "Rules, we need rules," and began listing all of the rules they should have. The list grew and grew with each child contributing more rules than any adult could even imagine. Finally, as the list continued to grow, Ronaldo said, "I know, the rule is be nice." "Yes," chimed in the children, "just be nice." Later in the day and throughout the year the teacher overheard children telling one another, "Remember our rule, BE NICE."

  

**Guideline X, Goal 4, Objective 2**
**Children Will Participate in Group Goals, Rule Selecting, and Planning**

Children Will Need to Experience:

Group meetings devoted to establishing goals for the day.

Taking part in establishing group rules.

Making plans with the group, for example, thinking about what they will want to do when they go out to play or how they will get ready for a walking field trip.

**Benchmarks**

Children Should Be Able To:

Listen, think, and respond appropriately as others speak during group meetings.

Participate in setting group goals and rules.

Follow the will of the group.

**Vignette**

During morning meeting the teacher reviewed the choices for work time and introduced materials new to the children. "Today, there will be four new puzzles at the game table." Holding up one of the puzzles she explained, "Each of these puzzles tells a story. When you put the puzzle together, think about the story it tells. Then you can tell us the story when we meet after work time." One of the children, recalling their rule about using new materials, said, "Don't forget to put the signup clipboard by the puzzles so we won't fight over taking turns," showing how four-year-olds can take part in thinking about goals for the day and can recall group rules.

  

**Guideline X, Goal 4, Objective 3**
**Children Will Gain Skills Learning to Vote**

Children Will Need to Experience:

Making choices throughout the day.

Choosing between two choices.

Participating in making group decisions through voting.

**Benchmarks**

Children Should Be Able To:

Make decisions and choices and accept the consequences of these.

Decide between two choices.

With many experiences in decision making and voting, accept the idea that the majority vote will be followed by the entire group.

**Vignette**

In a four-year-old group, the teacher taught the children to vote. He began with voting in ways that every child could have their choice. For example, children were given a choice of playing Duck, Duck, Goose, or Little Sally Waters. The children voted for the game they wanted, and both games were played with the aide supervising one and the teacher the other. Throughout the year the teacher continued giving children the opportunity to make decisions, with children voting for their choice in snacks, whether they wanted to rest or continue playing, and so on.

By the end of the year children were used to voting and the teacher introduced the idea of the majority getting their choice. The group voted for snacks they wanted for a birthday celebration, for a new piece of equipment for the play yard, and made group decisions about how they would celebrate moving to kindergarten next year. In this way, the four-year-olds were beginning the habit of voting, and some were getting used to the idea of majority wins.

  

**Guideline X, Goal 5**
**Production and Consumption**

As they live, children experience all the concepts inherent in the study of production, distribution, and consumption. It's no secret, children are consumers. As young as three, children are observed studying catalogs or advertisements, informing their families of what they want. And their play scripts involve pretending to purchase goods and use money to obtain services (Pramling, 1991). Further, children's wants, as those of adults, are generally more than they need. They are told "we can't afford it," and are learning that resources place limits on what we want, or even need.

In the preschool, children are asked to think about the differences between what they want and what they really need. To begin developing the idea of scarcity, children are taught to conserve materials, food, and other things. They are asked, "Is this something you really need?" "Is this something you'll still want tomorrow?"
Ideas of producer and consumer are slow to develop, especially those of producer. At four and five years of age children believe shopkeepers get their goods from some other shop, which gives these away without asking for money (Berti & Bombi, 1988). When asked where milk comes from, one four-year-old said "From the store." Nevertheless, through their experiences in producing art, designing, building and constructing, children are introduced to the idea of production.

Research suggests that it will not be until age nine or so that children understand the value of money (Pramling, 1991). Still, three-year-olds can distinguish between money and other objects and are generally aware that you need money to purchase things (Berti & Bombi, 1988).

  

**Guideline X, Goal 5, Objective 1**
**Children Will Develop Ideas of Want and Need**

Children Will Need to Experience:

Being able to make choices and decisions, choosing one kind of sandwich or one toy to play with.

Adults who ask them to think about what they want and need, asking "Is this something you'll want tomorrow?" "Is this something you really need?"

Long-term planning and saving for a special trip or event at home and in the preschool. "We'll save this for the trip to the ice-cream store."

Conserving goods and materials.

**Benchmarks**

Children Should Be Able To:

Make decisions and choices about what they want.

Begin to develop an understanding that they can not have everything they want.

Begin to be able to delay gratification, waiting and saving for a special treat or event.

Begin to learn to conserve materials and goods. Children can learn to place scrap paper in a scrap paper box, care for paints, wash paint brushes, use a collection of recycled junk (tops of dried markers, plastic cookie trays, empty boxes, discarded ribbon) to create and build with, and select only the amount of food they can eat.

**Vignette**

Four-year-olds were busily cutting and pasting different color papers on pieces of cardboard. Shanelle picked up a large piece of shiny paper. She started to cut through the middle, thought for a moment, then cut a small piece off the bottom. "I don't waste," Shanelle said proudly to no one in particular, adding as if for emphasis, "I don't waste."

Shanelle, at the young age of four, had begun the process of understanding the need to use only the things, or parts of things, that she really needed.

  

**Guideline X, Goal 5, Objective 2**
**Children Will Begin Understanding the Idea of Consumer**

Children Will Need to Experience:

Socio-dramatic play, playing as if they were customers and shopkeepers.

Field trips to study local shops.

Actually purchasing and consuming products.

**Benchmarks**

Children Should Be Able To:

Demonstrate knowledge of consumers through socio-dramatic play.

Make purchases at a store.

**Vignette**

A group of three-year-olds were involved in a study of clothing. They were especially interested in shoes. They found that their shoes closed with buckles, shoestrings, tapes, or had no closing at all. The children charted the type of closings their shoes had by making a graph. Then the children were taken to a local shoe store. They enjoyed measuring their feet, looking at all of the shoes and picking out their favorites. They also observed people paying for their purchases, and purchased a pair of shoes for the dramatic play area.

The next day Ms. Sacchetti placed a bunch of shoes and shoeboxes, a toy cash register, and a foot measure with the hollow blocks. The children, with a little help from Ms. Sacchetti, constructed a shoe store. They arranged and rearranged shoes on different shelves, measured their feet, and tried on shoes. After a while the play waned and Ms. Sacchetti, taking on the role of a customer, entered into the play. She said, "I'd like to buy these shoes, who will help me?" The children then took on the role of shopkeeper. They soon realized that something was missing. "We don't have any money Ms. Sacchetti," they said. "We can't buy shoes without money."

Ms. Sacchetti then brought out some green and brown paper, markers, and scissors and some of the children busily began making "money." They gave other children bunches of money, and the play turned to buying shoes. Another child made "credit cards," and happily handed these out to the children.

Ms. Sacchetti, who entered into the play from time to time, once to keep the play under control, and another time to use the word purchase, mainly observed children play. She recorded new vocabulary they used, and the concepts of consumer reflected in children's play. She also recorded children's knowledge of money by observing their money-making experience, as well as their understanding that you can purchase things with a credit card. Later, Ms. Sacchetti told an observer that this type of observation gave her a great deal of information about children's knowledge of purchasing and consuming, their vocabulary, as well as mathematical concepts. "Actually," Ms. Sacchetti said, "observing children's free play, especially socio-dramatic play, is one of the most fruitful ways of assessing and evaluating children's learning."

  

**Guideline X, Goal 5, Objective 3**
**Children Will Begin Understanding the Idea of Producer**

Children Will Need to Experience:

Meeting those who work in their center or school.

Visiting their families at work.

Becoming producers themselves, designing and producing art, block buildings, and other constructions; cooking and baking for the group or for a family meeting night.

Adults who talk about their work, what they produce or which services they offer.

**Benchmarks**

Children Should Be Able To:

Talk about the work in which family members are engaged.

Talk about the services their center or school staff can provide.

Become producers themselves by designing and constructing art and other products.

**Vignette**

One teacher of four-year-olds made a point of taking children on a field trip to her apartment at the end of the year. The children were amazed that their teacher had a home other than that of the center. They thought she lived at the center. The teacher explained that the trip to her home was important for a number of reasons. It gave children another opportunity to use a map, because they followed a map she had drawn of the trip from school to her home. Children pointed out specific landforms and landmarks pictured on the map as they traveled. Also, planning for the trip involved oral and written language. Nevertheless, the primary purpose of the trip was to acquaint children with the idea that people who work at the center work for pay, and have homes and a life separate from the center.

  

**Guideline XI**
**Children Will Gain Foundational Knowledge of Health and Physical Education**

Children cannot learn if they are not physically healthy. The National Research Council and the Institute of Medicine (NRC and IM, 2000) indicate that health services must be made available in culturally appropriate ways for all our nation's children. Further, the National Research Council (NRC, 2001a) strongly advocates that programs for young children include health education and physical activities.

Knowledge and habits of healthful living begin early in life. While young children are not in charge of providing themselves with a healthy environment and lifestyle, they can begin the life-long processes of developing habits of healthy living and physical activity.

The relation between healthful living and physical activity has been clearly established for adults as well as young children in the Surgeon General's Report on Physical Activity and Health and Healthy People (U.S. Department of Health and Human Services, 1996). Thus, the National Association for Sports and Physical Education (NASPE, 2002) advocates that physical education begin during the period of early childhood. The NASPE suggests that all young children from birth through age five engage in at least sixty minutes of physical activity daily, designed to promote health-related fitness and movement skills. Recognizing that preschoolers are naturally active individuals, the NASPE suggests that the "duration, frequency and intensity of movement and physical activity depends on the child's age, developmental status, ability level, personal interest, prior experience, and normal tendency to alternate short bursts of activity with intervals of rest and recovery" (2002, p. 8).

**Guideline XI, Goal 1**
**Habits of Healthful Living**

Children learn as they live. Every program for young children needs to have established routines involved in healthy living. Children are able to choose from healthy snacks and lunches, and begin to recognize the necessity of food and water for life. Habits of washing hands, brushing teeth, and keeping their environment clean, safe, and healthy, are established during the period of early childhood. While children are actually eating, washing their hands, or brushing their teeth, teachers interact, informally introducing information and facts about healthy living. "Brushing your teeth keeps them clean and healthy."

  

**Guideline XI, Goal 1, Objective 1**
**Children Will Develop Habits of Healthful Living**

Children Will Need to Experience:

- Balanced meals and snacks.
- Freedom to drink water throughout the day.
- Freedom to use the bathroom whenever necessary.
- Utilizing appropriate ways of brushing teeth and hand washing.
- Taking part in keeping their environment safe and clean.

**Benchmarks**

Children Should Be Able To:

- Select from a variety of foods, eating a balanced diet.
- Have initial ideas that food is necessary for health and growth.
- Learn to drink water frequently.
- Care for their own toileting needs.
- Wash their hands frequently and properly.
- Brush their own teeth appropriately.
- Calm themselves when tired and be able to rest during the day.
- Be active participants in keeping their environment safe and clean, picking up after themselves and informing the teacher of any observed hazards.

**Vignette**

"It's easy," said Tonja who was washing her hands in a sink next to a child new to the center. "First you get your towel, tuck it under your arm like this. Then you turn on the water and wet your hands, then you put soap on your hands. Now wash your hands, top and bottom, inside and out and don't stop till you sing all of the happy birthday song." Together they sang Happy Birthday to themselves. Tonja, still in control, said, "Now take your towel, turn off the faucet with the towel, and dry your hands. There, you did it!"

  

**Guideline XI, Goal 2**
**Physical Movement**

Preschoolers are normally physically active. They dart and dash about the room or play yard, and never seem to be still. The National Association for Sports and Physical Education suggests that, in addition to children's enjoyable active free play in and out of doors and moving to music, children need to experience explicit teaching in order to learn a variety of movement skills, initially as individuals, then with partners, and finally in a small group (NASPE, 2002).

Beginning with freedom to run, jump, climb, and do other physical activities in and out of doors, children are introduced to exploring different ways they can move. Problems may be given to children, such as "Jump high and hold one part of your body low." While solving these problems, children are learning the names of different movements, and developing specific movement skills (Sanders, 2002). Simple noncompetitive games, those with rules as well as those that involve children in imaginative thinking, are introduced.

**Guideline XI, Goal 2, Objective 1**
**Children Will Move Freely In and Out of Doors**

Children Will Need to Experience:

At least sixty minutes of daily structured physical activity.

Indoor and outdoor areas designed for large muscle activity.

Planks, wooden boxes, hollow blocks, and other open-ended materials for children to move, rearrange, and build their own environment.

Adults, teachers and parents, who work together to provide for and facilitate children's free physical play.

A play yard that is safety checked daily for loose parts, sharp edges, and other hazards.

**Benchmarks**

Children Should Be Able To:

Freely explore large outdoor equipment, including wheeled toys and other play yard equipment.

Run, climb, balance, hang, jump, hop, and swing.

Use open-ended materials to move about, build, and construct with.

**Vignette**

The play yard, with over seventy-five square feet of space for each child and organized around centers or areas for different activities, was filled with busy children. The sand and water areas were fully utilized. A group of three-year-olds repeatedly pushed and pulled empty cardboard boxes up and down a hill. The five-year-olds began a game of shadow tap, tagging each other by stepping on each others' shadows. Individual children tried out different climbing and hanging equipment and a group claimed the climbing platform as their "own fort." The teachers circulated around the play yard, observing, guiding, and teaching as they interacted with the children.

  

### Guideline XI, Goal 2, Objective 2
### Children Will Interact with Moveable Objects

Children Will Need to Experience:

Playing with a variety of balls.

Playing with other safe objects to roll, kick, throw, and catch.

**Benchmarks**

Children Should Be Able To:

Bounce balls.

While sitting, catch a rolling ball between their legs.

Roll the ball to another child.

Progress to being able to kick and throw a ball.

By five years of age, catch a large ball.

**Vignette**

Three-year-olds sat in a circle with legs extended, touching each others' legs. A child in the middle rolled a ball to the other children, who caught it between their legs and rolled it back. At the end of the day Rachel said to her mom, "Guess what I learned today? I learned to catch and throw a ball." Rachel demonstrated that when teachers plan physical activities that are successfully achieved, children feel pride in their accomplishments.

### Guideline XI, Goal 2, Objective 3
### Children Will Explore a Variety of Movements

Children Will Need to Experience:

Teachers who challenge them with movement problems to solve— "Hop high, hop low," "Jump and land softly," and examine the various ways children solve the problem.

Space, time, and explicit instruction in order to learn specific movement skills.

**Benchmarks**

Children Should Be Able To:

Gain skills in running, hopping, stopping, jumping.

Learn to skip, balance, and support body weight with their hands.

Express themselves with controlled movements.

**Vignette**

On a rainy day a teacher put a "sunbeam" (a piece of masking tape) on the floor. She said, "We need some sun in our room today—let's walk on a sunbeam." Different children walked back and forth, balancing as they walked. Then the teacher challenged children to gain specific balancing and movement skills, asking children to walk on tip toes, like butterflies, to walk backwards, or to find a new way of walking on the sunbeam.

  

### Guideline XI, Goal 2, Objective 4
### Children Will Take Walks Around the Neighborhood

Children Will Need to Experience:

Walking field trips in and around the school.

**Benchmarks**

Children Should Be Able To:

Increase the distance they are able to walk.

**Vignette**

Equipped with small bottles of water and a map created by the teacher, a four-year-old group went for a walk to a nearby public park. As they walked along they sang marching songs. Halfway to the park they stopped and rested under a tree. Here they checked the map with the teacher, estimated how much further they had to walk, and enjoyed drinking from their own water bottles. This group demonstrated that young children can enjoy and can take extended walks.

### Guideline XI, Goal 2, Objective 5
### Children Will Learn to Play Organized Games

Children Will Need to Experience:

Singing, chanting to circle games such as Ring Around the Rosie, Hokey Pokey, Did You Ever See a Lassie?, Mulberry Bush, Looby Loo, and so on.

Being able to join and leave circle and other games at will.

**Benchmarks**

Children Should Be Able To:

Learn the words and how to play familiar circle games.

Begin to initiate circle games without a teacher.

**Vignette**

"Come on," called Betsy grabbing Doug to come with her. "We're playing Looby Loo." Ajoke, Janet, and Ronaldo joined them as they played together for a few minutes. As they played, Janet left to join a group building with cardboard boxes and Madeline took her place, illustrating that young children do learn simple games and can initiate playing them.

  

**Guideline XI, Goal 2, Objective 6**
**Children With Special Needs Will Participate in Appropriate Physical Activities**

Children Will Need to Experience:

Play yards and equipment modified to accommodate the individual requirements of children with special needs.

Teachers and volunteers to facilitate involvement of children with special needs.

**Benchmarks**

Children Should Be Able To:

Based on individual needs, children will participate in appropriate physical activities.

Gain new skills as appropriate.

**Vignette**

Clarice, a five-year-old with spina bifida, walked with the use of crutches. When it was time to go out to play, Richie, modeling after the teacher, spontaneously handed Clarice one of the crutches. He walked with her to the play yard. Once on the play yard, Clarice stood watching the children. She did not stand alone for very long. Two girls ran to her and asked Clarice to join them playing "fort." With the teacher's assistance, Clarice climbed three steps on the fort to take her place as "lookout girl." When she tired of the game, Clarice made her way down the steps, with one of the children helping with the crutches. Throughout the playtime, Clarice initiated activities and joined others as she was able.

  

**Guideline XII**
**Children Will Gain Foundational Knowledge of Visual Arts, Theater, and Music**

What should children learn during the preschool years? In Eager to Learn: Educating Our Preschoolers (2001), The National Research Council answers this question by saying children will learn language, mathematics, and the sciences. These "privileged domains" (NRC, 2001a, p. 9) do seem to dominate the preschool curriculum. This may be due to the large research foundation for the teaching and learning of math, reading, and the sciences, or to the current focus on academic achievement in general (Schoenfeld, 2002). Nevertheless, the National Research Council also states that this does not imply that the arts and crafts common in quality preschools are of less importance (NRC, 2001a, p. 9).

The arts are equally as critical to the curriculum as any other content area. First, children are whole beings. They cannot be divided into separate pieces for learning to read or compute numbers, or learning to listen to, move to, and create music. Thus, the curriculum is integrated and whole, with music and movement integral and integrated with the rest of the curriculum.

Making art, music, and dance are social activities. Art reflects social, intellectual, and emotional life. By viewing the art of others far removed from them in time and place, children are awakened to their own culture and to the culture of others. Art connects children to other cultures and to those who have gone before (CNAEA, 1994).

Research shows that children, while making art and participating in drama, music, and movement, must make choices (Althouse, Johnson, & Mitchell, 2003). They themselves are the ones who think of an experience, feeling, or idea, struggle internally to find symbols or ways to express these, and find the tools and methods to do so. And because they are in charge of setting their own goals and planning to attain these, the children are the ones who gain the satisfaction and joy of achievement.

**Guideline XII, Goal 1**
**Visual Arts**

Children naturally gravitate to making art. Children the world over seem driven to leave their mark through art. In the high Andes of Peru children draw with sticks in the sand, in the low Amazon basin children draw with sticks in the mud. Children in Kiev and New York City draw on the sidewalks with pieces of soft stone or chalk.

Three-, four-, and five-year-olds revel in making art. "Painting is the best thing ever," said one girl when asked what she liked best about preschool. The fluidity of paint, the bright colors of markers and the waxy ease of crayons appeal to children as they seek ways to leave their own mark.

Research documents the power of the arts to promote academic achievement. Making, talking about, and appreciating the visual arts are other ways of knowing, other symbolic modes of thought and expression (Althouse, Johnson, & Mitchell, 2003). The thought and control required to draw or paint a picture or construct a building of blocks, strengthens children's cognitive skills (Seefeldt, 1995).

Through the visual arts children have greater opportunities to express their ideas, reflect on their experiences, release emotions, and begin to understand their feelings (Althouse, Johnson, & Mitchell, 2003). Looking at the artwork of others, children begin to understand that others have views that may differ from their own.

The visual arts involve a wide range of subject matter (CNAEA, 1994). Children will experience a wide range of methods and media in preschool, using a variety of tools, techniques, and processes. They will communicate ideas and feelings, leaving their mark with crayons, markers, paints, modeling and construction material and other media. Additionally, children will learn the concept of artist, learning that they and others are artists. Respect and appreciation for art is developed as teachers and children recognize the work of others, and talk about their own art and that of others.

  

**Guideline XII, Goal 1, Objective 1**
**Children Will Explore and Gain Mastery Over a Variety of Art Media**

Children Will Need to Experience:

Exploration of a wide variety of media, markers, crayons, paints, modeling and construction materials.

The time, freedom, and psychological safety to learn to use the unique characteristics of different media and explore how these are best used to express their ideas.

Using the same media over time in order to gain control and learn to master a variety of art media.

**Benchmarks**

Children Should Be Able To:

Use crayons and markers to scribble and draw.

Learn to use paints to express their ideas, feelings, and experiences.

Gain skills in cutting and pasting.

Discover how to use clay and other modeling materials to express ideas.

Know that they can use a variety of materials to construct with and express their ideas.

**Vignette**

Moving their entire bodies as they scribbled together, the fours were fully engaged in making marks. So engaged, they scribbled over their papers, onto the table, and even onto each other at times. The teacher, recognizing that the scribbling of three- and four-year-olds is often a sensory motor activity, one in which children are exploring what they can do with markers and crayons, did not comment on the children's products, but rather on their movement. "Shawn, you're moving your whole arm as you draw," she said to the child. "I can see your arm moving in these lines," she said to another.

  

**Guideline XII, Goal 1, Objective 2**
**Children Will Be Able to Use a Variety of Media to Express Themselves through Art**

Children Will Need to Experience:

Optimal, continually first-hand experiences with their world. Children cannot express ideas or feelings through art if they have a paucity of ideas or experiences to represent through art.

Teachers who understand the stages of drawing and value children's scribbles and first attempts at representation.

Families who are involved in children's early educational experiences and value children's initial expressions because they have learned to understand the importance of children's initial scribbles and first attempts at representation.

**Benchmarks**

Children Should Be Able To:

Move from uncontrolled scribbling to using schema to represent their ideas, experiences, and feelings.

Represent their ideas and feelings, using a variety of media.

Talk about the story or meaning of their artwork.

Connect their artwork to their past experiences or their emotions, feelings or thoughts.

**Vignette**

"I don't know what I'm painting," said four-year-old Claire when asked what her painting was about. "I'm not finished yet." Claire illustrated that four-year-olds can control their scribbling and do have ideas that what they draw represents something. Often, however, a line or shape they've scribbled reminds them of something and they'll continue drawing and scribbling to represent the thing the line reminded them of.

  

**Guideline XII, Goal 1, Objective 3**
**Children Will Be Able to Recognize Their Own Work and the Work of Others**

Children Will Need to Experience:

Teachers who introduce the concept of artist, telling children the names of artists who illustrate their books, or who painted the pictures that decorate their room.

Use the word artist to discuss and display children's work.

**Benchmarks**

Children Should Be Able To:

Recognize their own work.

Use the word artist to discuss the creator of the work.

Recognize the artwork in familiar children's books.

Recognize the artwork of each other.

**Vignette**

"I know Molly loves to come to the center. Most of all she loves drawing and painting," began a parent, "but what I want to know is when is she going to learn to color in the lines and follow directions if you just let her draw and paint without directions?"

"I understand," said the teacher, getting some of Molly's work from her portfolio. "A lot of parents worry about their children being able to control drawing tools and follow directions. Be assured that when children draw or paint, they typically draw an outline, then fill it in. And as for following directions, when children are in a group we think there are far too many directions they have to follow.

"Let's look at some of Molly's beginning work. This drawing is when she first came to the center and you can see she's really exploring what she can do with the materials. Here's a later painting. You can see the repeated patterns in this painting. This means Molly has learned to control the medium and is able to repeat shapes she has created. Now here's one of Molly's current drawings. Here are the children, represented in circles and sticks, and here's the center, represented in this square. This is the beginning of representational art.

"In our center we believe children need many opportunities to learn to think and express their ideas. We believe that by creating art, children are thinking and problem solving. They are the ones who have to search their memory for an idea to draw or paint. Then they are the ones who have to search for symbols to represent their ideas. They are the ones who set goals, plan for ways to achieve these, and monitor their own progress. And they are the ones to receive the joy and satisfaction of achieving their own goals," finished the teacher.

  

**Standard XII, Goal 1, Objective 4**
**Children Will Be Able to Talk About the Visual Aspects of Their Own Artwork and the Work of Others**

Children Will Need to Experience:

Teachers who use the vocabulary of art to discuss children's work as they describe form, shape, color, mass, line, and use of space.

Opportunities to discuss their own art and the work of others, talking about form, shape, color, mass, line, and use of space.

**Benchmarks**

Children Should Be Able To:

Describe their work in terms of use of line, shading, the use of color, space, and texture.

Talk about the works of others, using the vocabulary of art.

**Vignette**

"Here's a picture of the red bird I saw on the way to school," said four-year-old Tim showing his teacher a bird, cut and pasted out of paper. "I made it out of collage, it has red feathers and a yellow beak, just like Eric Carle made his red bird."

Tim's teacher made a habit of naming the title of the book she was reading, and also its author and illustrator. After the children were familiar with the book they often discussed how the artist who illustrated the book worked. In this case, Eric Carle used cut paper to create the things Brown Bear saw. Tim was able to describe his red bird, the technique he used, and the name of an artist who used the same technique.

  

**Guideline XII, Goal 2**
**Drama and Theater**

Young children cannot write scripts for plays, sustain characterization, or critically direct or interpret dramatic performances. They can, however, take part in socio-dramatic play, taking on the role of others as well as taking on the role of characters they have come to know through narratives and poetry.

**Guideline XII, Goal 2, Objective 1**
**Children Will Participate in Socio-Dramatic Play**

Children Will Need to Experience:

Extended time to engage in socio-dramatic play.

Centers equipped with household items, clothing, and household tools reflecting a variety of cultures so they can reenact their life at home.

Other socio-dramatic areas, such as stores, restaurants, the post office, where they can take on the role of others.

**Benchmarks**

Children Should Be Able To:

Enter into socio-dramatic play groups.

Take on a role in socio-dramatic play, cooperating and negotiating roles with others.

Sustain and extend play with language, additional ideas, or props.

**Vignette**

A child in one group, Rocio, had a number of medical conditions as well as developmental delays and emotional outbursts. As a result, she was constantly in one physician's office after another. One day Rocio pushed hollow blocks to form a doctor's office. She had a doctor's table, chair, and desk. Obtaining a couple of clipboards with paper and markers from the writing area, she took on the role of doctor, convincing other children to be patients. In charge, she handed the patients clipboards telling them to "Fill this out—each and every line." Then, with her clipboard in hand, she called various patients to sit on the table and tell her what was wrong with them, while she recorded their complaints on her clipboard, showing how four-year-olds take on roles and cooperate to sustain socio-dramatic play.

  

**Guideline XII, Goal 2, Objective 2**
**Children Will Engage in Creative Dramatics**

Children Will Need to Experience:

Stories, nursery rhymes that they can reenact.

**Benchmarks**

Children Should Be Able To:

As part of a group each child will take on the role of a nursery rhyme character, such as pretending to be either Jack or Jill, acting out the role they've chosen as the teacher reads all the verses of Jack and Jill.

With the teacher as the narrator, take on the role of story characters, such as the monkeys or the peddler in Caps for Sale (Slobodkina, 1987).

**Vignette**

After reading and rereading the story of the Little Red Hen the teacher organized children to put on a play. As she narrated the story to keep the action moving along, the children took on the role of the hen, asking others: "Who will help me bake my bread?" Other children took on the roles of the cow, the dog, and other animals, refusing to help her make bread. At the end, the child playing the Little Red Hen told all the children they "couldn't eat her bread because they didn't help make it." The children took turns taking on the role of the hen and other animals. "This was a good play," said Rocio, "we should make plays again."

  

## Guideline XII, Goal 3
## Music and Movement

Music and movement, like the visual arts, have intrinsic value in and of themselves. Since early times, music has described, defined, and deepened human experiences (CNAEA, 1994). Foundational knowledge of music will allow children to live life with meaning, today as well as in the future.

Music is a joy. In the early childhood classroom children enter to a song greeting them. Working together in centers children spontaneously burst into singing. During the day they take time to gather around the piano, singing together, learning new songs, and exploring music. And when they leave the center, they sing good-bye to each other.

But singing is just one part of the music curriculum. Music in the curriculum includes listening to music with joy and appreciation as well as moving and dancing to music. Singing, dancing, making and moving to music are fundamental in the preschool curriculum. As music ability is believed to stabilize around age nine, the early years are critical to developing music appreciation and abilities (Gordon, 1990).

Music is also integral to learning in other domains. In Learning to Read Through the Arts (O'Brien, 1999) the relationship between music and reading is delineated. Music fosters children's auditory discrimination and memory, vocabulary development, understanding of syntax and grammar, story sequence, phonological awareness, and word segmentation.

## Guideline XII, Goal 3, Objective 1
## Children Will Listen to and Enjoy a Variety of Music

Children Will Need to Experience:

Listening to a wide variety of music—folk, classical, children's chants.

Observing people playing musical instruments, becoming acquainted with the sounds of various instruments.

A music center where they can listen to music on tapes, CDs, or listening stations.

An environment with a variety of instruments, and space to use them.

### Benchmarks

Children Should Be Able To:

Become acquainted with sources of musical sounds.

Discover the joy, satisfaction, and relaxation involved in listening to music.

Identify the mood communicated through music. "The music was fast and made me want to dance."

Develop and demonstrate a preference in music, asking to listen to folk songs, instrumental music, or dances.

### Vignette

"Can we sing Hey Betty Martin again?" asked Anjeli. "I like to hear the ding, ding when you hit the triangle and we sing 'Tippy toe, tippy toe' and walk around on our tippy toes." Anjeli effectively demonstrated that children in the four-year-old group were learning to discover the joy of music, recognize the source of musical sounds, as well as develop a preference for different types of music.

  

**Guideline XII, Goal 3, Objective 2**
**Children Will Develop the Ability to Control and Execute Rhythmic Movements**

Children Will Need to Experience:

Teachers who respond to children's natural movements, following the movements with drum beats, tapping rhythm sticks, or clapping hands.

Time to listen to and explore the rhythm of a variety of music, clapping, stomping feet, moving, or tapping with rhythm sticks.

Opportunities to explore the movements they and their bodies can make.

**Benchmarks**

Children Should Be Able To:

Develop an awareness of their own movement capabilities.

Increase control over their own movements, progressing from controlled movements to expressive.

Experience a wide range of movement moods.

**Vignette**

A teacher of three-year-olds began introducing children to moving to music by following their motions. She used a drum to follow children walking around the room, beating faster when they walked faster and slowing the beat as they slowed. She repeated the experience a number of times.

Once children were used to the idea that their footsteps could be matched with drumbeats, the teacher asked children to follow the drum beats. Many of the threes continued moving around the room to their own rhythm, others were able to match their movements to the beat. The teacher said, "Next I'll introduce them to moving to music, and with maturity and experience, by the time they're four, they'll be accomplished, rhythmic dancers!"

  

### Guideline XII, Goal 3, Objective 3
### Children Will Be Able to Listen to Music, Execute Rhythmic Movements and Put the Two Together

Children Will Need to Experience:

- Listening to a wide range of music.
- Learning to control movements.
- Activities in which they make music and rhythms.

**Benchmarks**

Children Should Be Able To:

- Learn to move to music, matching their movements to the rhythm and mood of the music.
- Make patterns as they move to music.
- Learn to work together in shared dance and movement activities.

**Vignette**

Ms. Daniels gave the four-year-olds a variety of scarves to use while they danced with music. Several of the children found that by working in teams, they could fill the scarves with air. With the children holding different corners of the scarves and swooping low, then reaching high, they filled the scarves with air as they danced to the music. "Look, Ms. Daniels, look," they said, "we're dancing just like the kites we flew up to the top of the sky on that really windy day."

### Guideline XII, Goal 3, Objective 4
### Children Will Learn to Use Their Voices to Make Music

Children Will Need to Experience:

- Teachers who sing to them throughout the day.
- Listening to and singing along with adults.
- Time to learn new songs as a group.

**Benchmarks**

Children Should Be Able To:

- Create pleasing sounds with their voices.
- Create, sing, and enjoy chants.
- Develop the ability to match pitch and increase their singing range.
- Sing alone or with others.
- Develop a repertory of songs, selecting and recognizing songs.

**Vignette**

A group of three-year-olds was busy working in different centers of interest. One began chanting "Love somebody, love somebody, love somebody, yes, yes, yes." The teacher, as she walked around the room, often sang refrains from songs children were learning. One of the songs she had sung the day before was Love Somebody. Soon nearly all the children chimed in singing "Love somebody, yes I do, love somebody, but I won't say who," showing they were learning to sing together, make up their own chants, and use their voices to make pleasing sounds.

  

# Appendix A: Summary of Developmental Stages

## Summary—Three-Year-Olds' Normal Developmental Stages

### Self, Social, and Motivational Development

Three-year-olds . . .
- Do not describe themselves in terms of traits, but know their own name and, when asked to talk about themselves, will talk about the toys they have or what these toys do.
- Try new things, ride new toys, and will persist until they have mastered the task.
- Engage primarily in solitary and parallel play.
- Are beginning of independence.
- Are becoming aware of racial and gender differences.
- Are gaining growing control over emotions.
- Are egocentric in thought; treat others as objects or toys.

### Language and Mathematics

Three-year-olds . . .
- Achieve rapid growth in vocabulary, gaining an average of 2000 words during the year.
- Talk in monologue, as if practicing language.
- May have difficulty taking turns in conversation.
- Can tell a simple story but not in sequence, and often forget the point of the story, focusing on favorite or remembered parts.
- Know the difference between writing and drawing.
- Ask many "why" questions, as well as "how" and "when."
- Can adapt their speech and style of nonverbal communication to listeners in culturally accepted ways, but need to be reminded of context (Bredekamp & Copple, 1997).
- Have intuitive ideas of numeracy. For example, most threes know the meaning of "more."
- Distinguish one from many.
- Know how old they are and how old they will be next year.
- Can count 1, 2, 3. Classify using arbitrary rules. When asked why they put things in a group, they respond by saying "I like it," "I don't know," or some other reason often not understood by the adult.
- Know objects exist even when not present.
- Have a sense of time, remember events, and have some sense of today and tomorrow.
- Are unable to conserve number, matter, or quantity.

### Scientific Inquiry and Knowledge of the World

Three-year-olds . . .
- Are preoperational, bound to perception in their thinking
- Are egocentric in their thinking, e.g., "The moon follows me around."
- Have an abundance of "Why" questions.
- Attribute life (intent) to things that move, e.g., "The ball stopped because it was tired"; however, they know that machines are different from either animals or inanimate objects.
- Understand that specific seeds produce mature plants.
- Have ideas about animate and inanimate objects.
- Are beginning the initial phases of inquiry, for example, they'll stack blocks to knock them down, roll crayons in their hands to find out what crayons can do.

### Large and Fine Motor Skills

Three-year-olds . . .
- Can walk, turn, and stop efficiently.
- Are able to jump off low steps or objects.
- Play actively and tire easily.
- Can pour liquids, put large pegs in holes, build with blocks.
- Dress without assistance, but need help with buttons and so on.
- Hold crayons with fingers instead of fist.

  

### Development in Art and Music

Three-year-olds . . .
- When unfamiliar with materials, may spend time simply exploring art materials, dumping markers or crayons on the table, rolling them around, or cutting snippets of paper just to find out how to use the scissors.
- In the pre-schematic stage of art, produce uncontrolled scribbles in paint, crayon and marker, documenting that the art of three-year-olds is partially a sensory motor activity.
- May use both hands as they scribble.
- Hold crayons, markers in a tight, overhand grip.
- Express rhythmic movements that develop from large muscle, gross movements to specific and finer movements.
- Express chants as a foundation for singing.
- Just experiment with the idea of singing.

## Summary—Four-Year-Olds' Normal Developmental Stages

### Self, Social, and Motivational Development

Four-year-olds . . .
- Are moving from solitary to parallel play, sometimes engaging in give-and-take.
- Show a growing sense of initiative and self-reliance.
- Still describe themselves in terms of what they have or are doing, e.g., "I'm building a fort."
- Can express emotions, e.g., "I happy."
- Have occasional outbursts of anger that pass quickly.
- Begin trying to please others, offering things to others, complimenting others.
- Still have difficulty sharing, but are beginning to understand taking turns.

### Language and Mathematics

Four-year-olds . . .
- Have increased their vocabulary by another 2000 to 4000 words and learn new vocabulary quickly when directly related to their experiences. Language is exploding.
- Sometimes try to communicate more than their vocabulary allows, extending words to create new meaning; "We piled all the stuff in the baby stroller, oh I mean the cart."
- Frequently misuse or confuse words, e.g., "I'm going to the hospital to have my tubes tied," said a four-year-old who was having tubes put in her ears the next day.
- Find taking turns in conversations is difficult. Fours can take turns but they really want to talk about themselves and the things they do.
- Are pushing the boundaries of language, enjoying the use of "bathroom" language for the fun of it, to shock as well as to test and learn what is culturally appropriate.
- Have mastered nearly 90% of phonetics and syntax of language but still over-generalize verb tense, plurals, and pronouns.
- Can talk in front of a group, but with some reticence.
- Know the names of a few letters, recognize familiar logographics, and incorporate letters and pretend writing in their drawings and paintings.
- Understand that words such as one and two stand for numbers and can represent the quantity of objects.
- Can usually count by memory in sequence from one to ten.
- Can identify some numerals such as 4, their age.
- Can perform simple number operations, e.g., "You took one away, I need one more."
- Are still not capable of understanding conservation of number, quantity or matter.
- Think semi-logically, unable to keep more than one relationship in mind at a time. They can solve a problem that requires a distinction between objects that are bipolar, e.g., heavy vs. light, or where their only task is to count small arrays of numbers (Case & Sandieson, 1987)
- Are learning the names of simple shapes such as circle and square.
- Make comparisons, e.g., "She has a bigger piece of cake than I do."

  

### Scientific Inquiry and Knowledge of the World

Four-year-olds . . .
- Continue to be preoperational, bound by perception in their thinking.
- Persist at a task, trying out different hypotheses until a solution is reached.
- Learn quickly to use tools, for example to reach objects.
- Classify and make inferences about objects.
- Give animistic answers to some questions, e.g., "Why does the sun rise?" "Because I get up," and rational, mechanical answers to others, e.g., "Why does a tire go flat?" "Because it got a hole in it."

### Large and Fine Motor Skills

Four-year-olds . . .
- Build complex block structures.
- Can string small beads and complete puzzles.
- Use scissors and other tools.
- Walk, run, and jump with skill.
- Can engage in long periods of active play and exercise.

### Development in Art and Music

Four-year-olds . . .
- Control scribbles, repeating circles, lines, and other forms.
- Name their drawings or paintings after they have completed them.
- Hold implements more like an adult.
- Move to music with increased smoothness.
- Discover joy and relaxation through listening to music.
- Are directional in tone when they sing, their voices going either up or down.
- Can learn songs that have repetition, echo, and also cumulative songs.

## Summary—Five-Year-Olds' Normal Developmental Stages

### Self, Social, and Motivational Development

Five-year-olds . . .
- Have a firmer sense of self.
- Are becoming refined in their gender roles, often with a tendency to stereotype.
- Enjoy cooperative play with others, especially socio-dramatic play.
- Cooperate and generally share well.
- Use verbal insults or threaten to hit, but use less physical aggression.
- Persist at tasks for longer periods.
- Can plan out an activity and return to the same activity the next day.

### Language and Mathematics

Five-year-olds . . .
- Are continuing to expand their language growth, with a vocabulary of 5000 to 8000 words.
- Increase their sentence length; and sentence structure is becoming more complex.
- Still over-generalize rules, using "foots" instead of "feet" but correct themselves when they do so.
- Can retell stories in sequence.
- Have favorite stories, recognize the work of familiar authors, compose stories themselves, and act out stories and poems.
- Use nonverbal gestures to communicate ideas.
- Placed in a bilingual environment, will begin to use familiar words in another language, for example Claire told her mother, "Rosa is red in Spanish."
- Take turns in conversations, still interrupting to talk about themselves, but not as frequently.
- Can count to ten and through the teens. Are interested in learning to write numerals; begin copying numbers.
- Have a sense of time, but still mainly their own, knowing when events close to them take place.
- Begin to learn to classify on the basis of one characteristic such as color or size, and can articulate why they place things together.
- Can identify common shapes.

  

- Are developing language of measurement, and both the concepts and language to express locations such as under and over, in and out.
- Are still unable to conserve matter, number, and quantity.
- Begin counting using one-to-one correspondence, placing one cup and one napkin at a place.
- Perform simple number operations, taking away and adding objects to make more or less.

**Scientific Inquiry and Knowledge of the World**

Five-year-olds . . .
- Begin to question conservation of amount and length.
- Benefit from language and experiences that provide opportunities to use methods of science.
- Experiment and invent solutions to solve problems.
- Understand a variety of cause-and-effect relations.
- Form loosely held analogies, rather than coherent theories; the rain cycle is explained as "raining up" and "raining down," not in terms of evaporation.
- Have well-formed theories about physical objects.

**Large and Fine Motor Skills**

Five-year-olds . . .
- Use tools, scissors, hammers, drawing and painting tools with efficiency.
- Assemble and disassemble objects.
- Can walk backward, skip, balance on walking beam, hop, jump, and climb well.
- Have high, sustained physical energy.

**Development in Art and Music**

Five-year-olds . . .
- Are familiar with and able to use a wide variety of art materials.
- Develop forms and schema to represent their world, e.g., a circle with sticks extending from it is a mother, a circle and stick is a tree, and so on.
- Produce schema that are fairly representational.
- Make decisions about what they are drawing, painting, modeling, before they begin.
- Recognize their work and the work of others.
- Have voices ranging from middle C to middle B.
- Correlate singing with a range of interests and skills.

  

# Appendix B: References


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# Appendix C: References

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