

Appendix

Appendix

Appendix

Exploring Content in Interest Areas

	Blocks	Dramatic Play	Toys & Games	Art	Sand & Water
Literacy	<p>Have paper, markers, and tape available for children to make signs for buildings.</p> <p>Hang charts and pictures with words at children's eye level.</p>	<p>Include books and magazines in the house corner.</p> <p>Introduce print (shopping lists, receipts, message writing, etc.).</p>	<p>Talk about colors, shapes, pictures in a lotto game.</p> <p>Provide matching games for visual discrimination.</p>	<p>Invite children to dictate stories to go with their artwork.</p> <p>Share books about famous artists and their work with children.</p>	<p>Add literacy props to the sand table such as letter molds or road signs.</p> <p>Encourage children to describe how the sand and water feel.</p>
Math	<p>Suggest clean-up activities that involve sorting by shape and size.</p> <p>Use language of comparison such as taller, shorter, the same length.</p>	<p>Add telephones, menus, and other items with numbers on them.</p> <p>Participate in play, talking about prices, addresses, and times of day.</p>	<p>Provide collections for sorting, classifying, and graphing.</p> <p>Have children extend patterns with colored cubes, beads, etc.</p>	<p>Use terms of comparison (the piece of yarn is longer than your arm).</p> <p>Provide empty containers of various shapes for creating junk sculptures.</p>	<p>Provide measuring cups, spoons, containers of various sizes.</p> <p>Ask estimation questions ("How many cups will it take to fill the container?").</p>
Science	<p>Talk with children about size, weight, and balance.</p> <p>Encourage children to experiment with momentum using ramps, balls, and marbles.</p>	<p>Introduce props such as a stethoscope or binoculars.</p> <p>Model hygiene skills by washing "babies" or dishes.</p>	<p>Talk about balance and weight as children use table blocks.</p> <p>Sort, classify, and graph nature items such as rocks, leaves, twigs, and shells.</p>	<p>Describe the properties of materials as they interact (wet, dry, goeey, sticky).</p> <p>Use water and brushes for outdoor painting so children can explore evaporation.</p>	<p>Make bubble solution and provide different kinds of bubble-blowing tools.</p> <p>Put out magnifying glasses and sifters so children can examine different kinds of sand.</p>
Social Studies	<p>Include block people who represent a range of jobs and cultures.</p> <p>Display pictures of buildings in the neighborhood.</p>	<p>Include props related to different kinds of jobs.</p> <p>Add multicultural dolls and props such as cooking utensils, foods, and clothing.</p>	<p>Select puzzles and other materials that include diverse backgrounds and jobs.</p> <p>Play board games that require cooperation, following rules, and taking turns.</p>	<p>Include various shades of skin tone paint, crayons, markers, and construction paper.</p> <p>Encourage children to paint and draw what they saw on a field trip.</p>	<p>Invite children to describe roads and tunnels created in sand.</p> <p>Hang pictures of bodies of water (rivers, oceans, lakes, streams) near the water table.</p>
The Arts	<p>Encourage children to build props, such as a bridge for <i>The Three Billy Goats Gruff</i> for dramatization.</p> <p>Display artwork posters that include geometric shapes and patterns.</p>	<p>Display children's artwork or posters of artists' work in the dramatic play area decor.</p> <p>Provide props for children to dramatize different roles.</p>	<p>Include materials that have different art elements (pattern or texture matching, color games, etc.).</p> <p>Add building toys that encourage creativity such as Legos, Tinker-toys, etc.</p>	<p>Provide different media for children to explore clay, paint, collage, construction, etc.</p> <p>Invite a local artist to share his or her work.</p>	<p>Create sand sculptures; display photographs of sand sculptures created by artists.</p> <p>Use tools for drawing in wet sand.</p>
Technology	<p>Include ramps, wheels, and pulleys.</p> <p>Take pictures (using digital, instant, or regular cameras) of block structures and display in the area.</p>	<p>Include technology props such as old cameras, computers, keyboards, microphones, etc.</p> <p>Encourage children to explore how tools work—eggbeaters, can openers, etc.</p>	<p>Add toys (gears, marble mazes, etc.) that encourage children to explore how things work.</p> <p>Use a light table to explore transparent shapes.</p>	<p>Include recyclable materials for children to create an invention.</p> <p>Use technological tools for creating items such as a potter's wheel or spin art.</p>	<p>Include props with moving parts at the water table—such as waterwheels, eggbeaters, pump, etc.</p> <p>Use toy dump trucks, loaders, cranes for outdoor sand play.</p>



Exploring Content in Interest Areas

Library	Discovery	Music & Movement	Cooking	Computers	Outdoors
<p>Keep an assortment of good children's books on display.</p> <p>Set up a writing area with pens, markers, pencils, paper, stamps, envelopes, etc.</p>	<p>Keep science related books (e.g., insects, plants, seeds, etc.) on hand.</p> <p>Include paper and markers for recording observations.</p>	<p>Write words to a favorite song on a chart.</p> <p>Have children use instruments for the sound effects in stories.</p>	<p>Use pictures and words on recipe cards.</p> <p>Talk about words and letters on the food containers during a cooking activity.</p>	<p>Illustrate and write the steps in using a computer.</p> <p>Use a drawing or simple word processing program to make a book.</p>	<p>Bring colored chalk and other writing materials outside.</p> <p>Have children observe street signs in the neighborhood.</p>
<p>Add number stamps to the writing area.</p> <p>Include books about math concepts: size, number, comparisons, shapes, etc.</p>	<p>Have tools on hand for measuring and graphing.</p> <p>Provide boxes for sorting materials by size, color, and shape.</p>	<p>Play percussion games emphasizing pattern: softer, louder.</p> <p>Use language that describes spatial relationships—under, over, around, through.</p>	<p>Use a timer for cooking.</p> <p>Provide measuring cups and spoons.</p>	<p>Include software that focuses on number concepts, patterning, problem solving, shapes, etc.</p> <p>Use a drawing program to create patterns.</p>	<p>Have children look for patterns in nature.</p> <p>Invite children to make collections on a walk, then sort, classify, and graph the items collected.</p>
<p>Include books about pets, plants, bodies, water, inventions, etc.</p> <p>Provide a variety of objects for experimentation with floating and sinking.</p>	<p>Include pets and plants that children can care for.</p> <p>Include tools such as a magnifying glass and a microscope that children can use to observe the properties of objects.</p>	<p>Set out bottles with different amounts of water so children can investigate the sounds they produce.</p> <p>Use a tape recorder to record children's voices; play them back for children to identify.</p>	<p>Encourage children to taste, smell, touch, listen, and observe at each step of the cooking process.</p> <p>Discuss how heating and freezing changes substances.</p>	<p>Have children observe cause and effect by hitting a key or dragging a mouse.</p> <p>Allow children to observe as you connect computer components.</p>	<p>Take pictures of a tree the children see every day and discuss how it changes during the year.</p> <p>Have children feel their heartbeat after running or exercising.</p>
<p>Include books that reflect diversity of culture and gender.</p> <p>Show children how to use nonfiction books, picture dictionaries, and encyclopedias to find information.</p>	<p>Take nature walks and post the places where collected leaves and flowers were found.</p> <p>Set up a recycling area where children sort paper, glass, and plastic into bins.</p>	<p>Show videotapes reflecting songs and dances of many cultures and languages.</p> <p>Include instruments from different cultures.</p>	<p>Encourage parents to bring in recipes reflecting their cultures.</p> <p>Visit stores that sell foods of different cultures.</p>	<p>Encourage children to work cooperatively on software related to a study topic.</p> <p>Develop rules with the children for using computers and post them in the area.</p>	<p>Take many trips in the neighborhood and talk about what you see.</p> <p>Invite children to make maps of outdoor environments using chalk on concrete.</p>
<p>Talk about art techniques used by illustrators (e.g., torn paper collage by Leo Lionni).</p> <p>Include children's informational books of famous artwork.</p>	<p>Provide kaleidoscopes and prisms and have children draw the designs they see.</p> <p>Use the materials children have collected on nature walks for collages.</p>	<p>Provide a variety of musical instruments to explore.</p> <p>Add scarves, streamers, and costumes to encourage dancing.</p>	<p>Encourage children to be creative while preparing their snacks.</p> <p>Dramatize foods being cooked—a kernel of popcorn being popped; cheese melting.</p>	<p>Include drawing and painting software.</p> <p>Include software that allows children to create musical tunes.</p>	<p>Bring art materials outdoors for creating pictures and sculptures.</p> <p>Provide streamers and scarves for outdoor dance and movement activities.</p>
<p>Set up a listening area with books on tape.</p> <p>Include books about how things work.</p>	<p>Introduce scientific tools and see if children can figure out what they do.</p> <p>Provide clocks, watches, and gears that children can take apart and put together.</p>	<p>Add an electronic keyboard that produces different sounds.</p> <p>Include tape recorders, CD player, headphones, etc.</p>	<p>Cook a recipe in a microwave and a conventional oven and compare cooking times.</p> <p>Examine how different kitchen gadgets work.</p>	<p>Set up a computer area with open-ended software programs for children to use.</p> <p>Add an inexpensive camera to the computer so children can see themselves on the screen.</p>	<p>Point out examples of technology while on a walk in the neighborhood.</p> <p>Provide tools for investigating outdoors such as magnifying glasses, binoculars, periscopes.</p>





Birth to Three Years - Sequences of Developmental Growth

<i>Intellectual Development</i>			
A Four Month Old	An Eight Month Old	A One Year Old	A Two Year Old
<ul style="list-style-type: none"> • Explores objects with mouth. • Plays with fingers, hands, toes. • Reacts to sound of voice, rattle, bell. • Turns head toward bright colors and lights. • Recognizes bottle or breast. 	<ul style="list-style-type: none"> • Cries in different ways to say he is hurt, wet, hungry, or lonely. • Makes noises to voice displeasure or satisfaction. • Recognizes and looks for familiar voices and sounds. • Learns by using senses like smell, taste, touch, sight, hearing. • Focuses eyes on small objects and reaches for them. • Looks for ball rolled out of sight. • Searches for toys hidden under a blanket, basket, or container. • Explores objects by touching, shaking, banging, and mouthing. • Babbles expressively as if talking. • Enjoys dropping objects over edge of chair or crib. • Expands vocabulary from 4,000 to 6,000 words. 	<ul style="list-style-type: none"> • Says first word. • Says da-da and ma-ma or equivalent. • "Dances" or bounces to music. • Interested in picture books. • Pays attention to conversations. • Claps hands, waves bye, if prompted. • Likes to place objects inside one another. 	<ul style="list-style-type: none"> • Enjoys simple stories, rhymes, and songs. • Uses 2-3 word sentences. • Says names of toys. • Hums or tries to sing. • Enjoys looking at books. • Points to eyes, ears, or nose when asked. • Repeats words. • Interested in learning how to use common items.

Birth to Three Years - Sequences of Developmental Growth

<i>Social and Emotional Development</i>			
A Four Month Old	An Eight Month Old	A One Year Old	A Two Year Old
<ul style="list-style-type: none"> • Cries (with tears) to communicate pain, fear, discomfort, or loneliness. • Babbles or coos. • Loves to be touched and held close. • Responds to a shaking rattle or bell. • Returns a smile. • Responds to peek-a-boo games. 	<ul style="list-style-type: none"> • Responds to own name. • Shows fear of falling off high places such as table or stairs. • Spends a great deal of time watching and observing. • Responds differently to strangers and family members. • Imitates sounds, actions, and facial expressions made by others. • Shows distress if toy is taken away. • Squeals, laughs, babbles, smiles in response. • Likes to be tickled and touched. • Smiles at own reflection in mirror. • Raises arms as a sign to be held. • Recognizes family member names. • Responds to distress of others by showing distress or crying. • Shows mild to severe anxiety at separation from parent. 	<ul style="list-style-type: none"> • Imitates adult actions such as drinking from a cup, talking on phone. • Responds to name. • Likes to watch self in mirror. • Expresses fear or anxiety toward strangers. • Wants caregiver or parent to be in constant sight. • Offers toys or objects to others but expects them to be returned. • May become attached to a favorite toy or blanket. • Pushes away something he does not want. 	<ul style="list-style-type: none"> • Plays alongside others more than with them. • Acts shy around strangers. • Likes to imitate parents. • Easily frustrated. • Affectionate - hugs and kisses. • Insists on trying to do several tasks without help. • Enjoys simple make-believe like talking on phone, putting on hat. • Very possessive - offers toys to other children but then wants them back. • Needs considerable time to change activities. • Capable of frequent tantrums, which are often a result of his inability to express himself even though he has ideas. • Can show aggressive behavior and the intent to hurt others. • Can be extremely demanding and persistent. • Destructive to objects around him when frustrated and angry. • Possessive about caregiver's attention; show feelings of jealousy. • Has fears and nightmares. • Has sense of humor; capable of laughter. • Shows interest in dressing, brushing hair and teeth. • Cannot sit still or play with a toy for more than a few minutes.



Birth to Three Years - Sequences of Developmental Growth

Physical Development			
A Four Month Old	An Eight Month Old	A One Year Old	A Two Year Old
<ul style="list-style-type: none"> • Weight: 10-18 pounds. • Length: 23-27 inches. • Sleeps about 6 hours before waking during the night. • Averages 14-17 hours of sleep daily. • Lifts head and chest when lying on stomach. • Holds both eyes in a fixed position. • Follows a moving object or person with eyes. • Grasps rattle or finger. • Wiggles and kicks with arms and legs. • Rolls over (stomach to back). • Sits with support. 	<ul style="list-style-type: none"> • Weight: 14-23 pounds. • Length: 25-30 inches. • First teeth begin to appear. • Drools, mouths and chews on objects. • Needs at least 3-4 feedings per day. • Reaches for cup or spoon when being fed. • Drinks from a cup with help. • Enjoys some finely-chopped solid foods. • Closes mouth firmly or turns head when no longer hungry. • May sleep 11-13 hours at night although this varies greatly. • Needs 2-3 naps during the day. • Develops a rhythm for feeding, eliminating, sleeping, and being awake. • True eye color is established. • Rolls from back to stomach and stomach to back. • Sits alone without support and holds head erect. • Raises up on arms and knees into crawling position; rocks back and forth, but may not move forward. • Uses finger and thumb to pick up an object. • Transfers objects from one hand to the other. • Hair growth begins to cover head. 	<ul style="list-style-type: none"> • Weight: 17-27 pounds. • Length: 27-32 inches. • Sleeps 11-13 hours at night. • Some babies will stop taking a morning nap; others will continue both morning and afternoon naps. • Begins to refuse bottle or weans self from breast during day. • Needs 3 meals a day with 2 snacks in between. • Enjoys drinking from a cup. • Begins to eat finger foods. • Continues to explore everything by mouth. • Enjoys opening and closing cabinet doors. • Crawls well. • Pulls self to a standing position. • Stands alone holding onto furniture for support. • Walks holding onto furniture or with adult help. 	<ul style="list-style-type: none"> • Weight: 22-38 pounds. • Height: 32-40 inches. • Has almost a full set of teeth. • Walks up and down stairs by holding onto railing. • Feeds self with spoon. • Experiments by touching, smelling, and tasting. • Likes to push, pull, fill, and dump. • Can turn pages of a book. • Stacks 4-6 objects. • Scribbles vigorously with crayons or markers. • Many children (but not all) will learn to use toilet. • Walks without help. • Walks backwards. • Tosses or rolls a large ball. • Stoops or squats. • Opens cabinets, drawers. • Can bend over to pick up toy without falling.
		<div style="border: 1px solid black; padding: 5px;"> <p>Reprinted with permission from the National Network for Child Care - NNCC. Oesterreich, L. (1995). <i>Ages & stages - newborn to 1 year</i>. In L. Oesterreich, B. Holt, & S. Karas, <i>Iowa family child care handbook</i> [Pm 1541] (pp. 192-196). Ames, IA: Iowa State University Extension.</p> </div>	

Three to Five Years - Sequences of Developmental Growth

<i>Language and Communication Development</i>			
A Three Year Old	A Four Year Old	A Five Year Old	A Kindergarten Age Child
<ul style="list-style-type: none"> • Shows a steady increase in vocabulary, ranging from 2,000 to 4,000 words. • Tends to over generalize meaning and make up words to fit. • Uses simple sentences of at least 3-4 words to express needs. • Pronounces words with difficulty. • May have difficulty taking turns in conversation; changes topic quickly. • Likes simple finger plays and rhymes. • Asks many who, what, where, and why questions but shows confusion in responding to some questions; especially why, how, and when. • Uses language to organize thought; overuses such words as but, because, and when. • Can retell a simple story but must redo the sequence to put an idea into the order of events. • Rarely makes appropriate use of such words as before, after, or until. 	<ul style="list-style-type: none"> • Expands vocabulary from 4,000 to 6,000 words. • Usually speaks in 5 to 6 word sentences. • Likes to sing many songs; knows many rhymes and finger plays. • Uses verbal commands to claim many things. • Likes to tell others about family and experiences. • Expresses emotions through facial gestures and reads others for body cues • Can control volumes of voice for periods of time if reminded. • Begins to read context for social clues. • Uses more advanced sentence structures (“She’s nice, isn’t she?”) and experiments with new constructions. • Tries to communicate more than his/her vocabulary allows. • Learns new vocabulary quickly if related to own experience. • Can retell a 4 or 5 step directive or the sequence in a story. 	<ul style="list-style-type: none"> • Employs a vocabulary of 5,000 to 8,000 words. • Pronounces words with little difficulty, except for particular sounds. • Uses fuller, more complex sentences. • Takes turns in conversations. • Listens to another speaker if information is new or interesting. • Shares experiences verbally. • Likes to act out other’s roles. • Remembers lines of simple poems, repeats full sentences. • Uses nonverbal gestures (facial expressions). • Can tell and retell stories with practice. • Enjoys repeating stories, poems, and songs. • Enjoys acting out plays or stories. • Shows growing speech fluency in expressing ideas. 	<ul style="list-style-type: none"> • Is curious, interested, eager, and active. • Learns through firsthand experiences...exploring, manipulation materials, asking questions, making discoveries. • Is capable of “losing self” in an activity that is of high interest. • Assimilates information more readily when learning is presented in familiar context. • Needs concrete experiences rather than abstract ideas. • Needs many opportunities to share ideas with peers and adults in order to develop oral speaking and listening skills. • Gains understanding of relationships through dramatic play, dramatization of stories, planning and constructing small group projects, and interacting in small group learning centers. • Interactions with people and materials helps develop reasoning and memory.

Three to Five Years - Sequences of Developmental Growth

<i>Social and Emotional Development</i>			
A Three Year Old	A Four Year Old	A Five Year Old	A Kindergarten Age Child
<ul style="list-style-type: none"> • May look on from the sidelines or engage in associative play patterns (playing next to a peer, chatting, etc.) • Shows difficulty taking turns and sharing objects. • Lacks ability to solve problems well among peers; usually needs help to resolve a social situation. • Plays well with others and responds positively if there are favorable conditions in terms of materials, space, and supervision. • Acts more cooperatively than does toddler and wants to please adults • Can follow simple requests. • Likes to be treated as an older child at times but may still put objects in mouth that can be dangerous or may wander off. • Expresses intense feelings, such as fear and affection; shows delightful, silly sense of humor. 	<ul style="list-style-type: none"> • Still engages in associative play but begins true give-and-take, cooperative play. • Shows difficulty sharing but begins to understand turn taking and plays simple games in small groups. • Becomes angry easily if things don't go his/her way. • Most often prefers to play with others. • Begins to spontaneously offer things to others; wants to please friends. • Exhibits occasional outbursts of anger but is learning that negative acts bring negative reactions. • Knows increasingly what self-regulation behaviors are expected but shows difficulty following through on a task; becomes easily distracted. • Likes to dress self. • Unable to wait very long regardless of the promised outcome. • Shows greater ability to control intense feelings like fear/anger. 	<ul style="list-style-type: none"> • Enjoys dramatic play. • Cooperates well; forms small groups that may choose to exclude a peer. • Understands the power of rejecting others; verbally threatens to end friendships or select others. • Enjoys others and can behave in a warm and empathetic manner; jokes and teases to gain attention. • Shows less physical aggression; more often uses verbal insult or threatens to hit. • Can follow requests; may lie rather than admit to not following procedures or rules. • May be easily discouraged or encouraged. • Dresses and eats with minor supervision. • Reverts easily to young behaviors when group norms are less than appropriate 	<ul style="list-style-type: none"> • Searches for fairness, trust, and understanding. • Needs positive support in resolving peer conflicts. • Is somewhat self-centered and needs adult assistance in learning to share and take turns. • Respects rules when involved in their development. • Functions more effectively in small groups. • Is in the process of developing an awareness that others do not perceive situations from the same perspective. • Enjoys talking and responds to sincere listeners. • Needs opportunities to interact with peers in a variety of settings. • Accepts guidance and authority when the purpose is understood and reasonable. • Exhibits regressive behavior when over-stimulated, extremely tired, or not feeling well. • Needs success to help build a positive self-image.

Three to Five Years - Sequences of Developmental Growth

<i>Fine-Motor Development</i>			
A Three Year Old	A Four Year Old	A Five Year Old	A Kindergarten Age Child
<ul style="list-style-type: none"> • Places large pegs into pegboards. • Strings large beads. • Pours liquids with some spills. • Builds block towers. • Easily does puzzles with whole objects represented as a piece. • Fatigues easily if much hand coordination is required. • Draws shapes, such as circle; begins to design objects, such as a house or figure; draws objects in some relation to each other. • Holds crayons or markers with fingers instead of the fist. • Undresses without assistance but needs help getting dressed; unbuttons skillfully but buttons slowly. 	<ul style="list-style-type: none"> • Uses small pegs and boards. • Strings small beads (or may do in a pattern). • Pours sand or liquid into small containers. • Builds complex block structures that extend vertically. • Shows limited spatial judgment and tends to knock things over. • Enjoys manipulating play objects that have fine parts. • Likes to use scissors. • Practices an activity many times to gain mastery. • Draws combinations of simple shapes; draws persons with at least four body parts and objects that are recognizable to adults. • Dresses and undresses without assistance. • Brushes teeth and combs hair. • Spills rarely with cup or spoon. • Laces shoes/clothing but can not tie. 	<ul style="list-style-type: none"> • Hits nail with hammer head. • Uses scissors and screwdrivers unassisted. • Uses computer keyboard. • Builds three dimensional block structures. • Does 10-15 piece puzzles with ease. • Likes to disassemble and reassemble objects and dress and undress dolls. • Has basic grasp of right and left but mixes them up at times. • Copies shapes; combines more than two geometric forms in drawing and construction. • Draws persons. • Prints letters crudely but most are recognizable by an adult. • Includes a context or scene in drawing. • Prints first name. • Zips coat; buttons well; ties shoes with adult coaching; dresses quickly. 	<ul style="list-style-type: none"> • Has good locomotor control. • Is in the process of developing small muscle control. • Tires easily when movement is restricted. • Has established eye, hand, and foot dominance. • Enjoys participating in physical activities. • Needs freedom of movement when pursuing learning activities. • Needs opportunities for motoric exploration when working. • Needs opportunities to develop rhythmic control of body. • Needs activities that continue to refine fine muscle control. • Needs experiences that develop responsibility for care and safety of body. • Needs adult guidance in finding acceptable outlets for tension and emotions.

Three to Five Years - Sequences of Developmental Growth

Gross-Motor Development			
A Three Year Old	A Four Year Old	A Five Year Old	A Kindergarten Age Child
<ul style="list-style-type: none"> • Walks without watching feet; walks backwards. • Runs at an even pace; turns and stops well. • Climbs stairs with alternating feet, using hand rail for balance. • Jumps off low steps or objects. • Shows improved coordination; begins to move arms and legs to pump a swing or ride a trike. • Perceives height and speed of objects but may be overly bold or fearful, lacking a realistic sense of own ability. • Stands on one foot unsteadily; balances with difficulty on the low balance beam and watches feet. • Plays actively and then needs rest; fatigues suddenly and becomes cranky if overly tired. 	<ul style="list-style-type: none"> • Walks heel-to-toe; skips unevenly; runs well. • Stands on one foot for 5 seconds or more; masters the low balance beam (4 inch width) but has difficulty with 2 inch wide beam. • Walks down steps; alternating feet; judges well in placing feet on climbing structures. • Develops sufficient timing to jump rope or play games requiring quick reactions. • Begins to coordinate movements to climb on a jungle gym or jump on a small trampoline. • Shows greater perceptual judgment and awareness of own limitations and/or consequences of unsafe behaviors. • Exhibits increased endurance with long periods of high energy; still needs supervision in protecting self in certain activities. • Sometimes becomes overexcited and less self-regulated in group activities. 	<ul style="list-style-type: none"> • Walks backwards quickly. • Skips and runs with agility and speed. • Can incorporate motor skills into a game. • Walks a two inch balance beam well. • Jumps over objects. • Hops well; maintains an even gait in stepping. • Jumps down several steps. • Jumps rope. • Climbs well; coordinates movements for swimming or bike riding. • Shows uneven perceptual judgment; acts overly confident at times but accepts limit setting and follows rules. • Displays high energy levels; rarely shows fatigue; finds inactivity difficult and seeks active games and environments. 	<ul style="list-style-type: none"> • Has good control of large muscles. • Tires easily when movement is restricted. • Enjoys participating in physical activities. • Tends to play vigorously and fatigue easily but seldom admits being tired. • Needs freedom of movement when pursuing learning activities. • Needs opportunities for motoric exploration when working. • Needs opportunities to develop rhythmic control of body. • Needs activities that continue to nurture large muscle development. • Needs experiences that develop responsibility for care and safety of body. • Needs adult guidance in finding acceptable outlets for tension and emotions.



Policy Statement—Media Education

abstract

FREE

The American Academy of Pediatrics recognizes that exposure to mass media (eg, television, movies, video and computer games, the Internet, music lyrics and videos, newspapers, magazines, books, advertising) presents health risks for children and adolescents but can provide benefits as well. Media education has the potential to reduce the harmful effects of media and accentuate the positive effects. By understanding and supporting media education, pediatricians can play an important role in reducing harmful effects of media on children and adolescents. *Pediatrics* 2010;126:1012–1017

THE AMOUNT OF TIME SPENT WITH MEDIA

Children and teenagers spend more time engaged in various media than they do in any other activity except for sleeping. A 2010 Kaiser Family Foundation survey of more than 2000 8- to 18-year-olds revealed that children and teenagers in the United States spend an average of more than 7 hours/day with a variety of different media.¹ By the time today's young people reach 70 years of age, they will have spent the equivalent of 7 to 10 years of their lives watching television.² There are more homes in America that have a TV than those that have indoor plumbing, and today's child lives in an environment with an average of 4 TVs, nearly 3 DVD players or VCRs, 1 DVR, 2 CD players, 2 radios, 2 video game consoles, and 2 computers.¹ Preadolescents and adolescents can download racy videos, send sexual text messages or explicit photographs to their friends, buy cigarettes and beer on the Internet, and post enticing profiles on Facebook. Yet, across all ages, TV remains the predominant medium. TV-viewing is also beginning at increasingly younger ages. The latest national report revealed that on a typical day, nearly two-thirds of children and infants younger than 2 years are watching TV for an hour and a half.³ More than 70% of American teenagers have a TV in their own bedrooms, half have a VCR or DVD player, half have a video game console, and one-third have a computer and Internet access.¹ Time spent with media often displaces involvement in creative, active, or social activities.

THE EFFECTS OF MEDIA VIOLENCE ON AGGRESSIVE BEHAVIOR

Results of more than 2000 scientific studies and reviews have shown that significant exposure to media violence increases the risk of aggressive behavior in certain children and adolescents, desensitizes them to violence, and makes them believe that the world is a “meaner and scarier” place than it is.^{4–9} Violence appears in various forms of media entertainment such as movies, video games, and TV news. For example, nearly 90% of the top-grossing PG-13–rated films of 1999–2000 contained violence.¹⁰ Research has shown that

COUNCIL ON COMMUNICATIONS AND MEDIA

KEY WORD

media

ABBREVIATION

AAP—American Academy of Pediatrics

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news reports of bombings, natural disasters, murders, and other violent crimes have the potential to traumatize young children.^{5,11}

SEXUAL CONTENT IN THE MEDIA

American media—both programming and advertising—are highly sexualized in their content. On prime-time TV, more than 75% of shows contain sexual content, yet for only 14% of sexual incidents is any mention made of risks or responsibilities of sexual activity.^{12,13} In the first 10 months of 2004, the makers of erectile-dysfunction drugs spent nearly \$350 million on advertising, which makes sex seem like a harmless recreational activity.¹⁴ Major networks remain extremely reluctant to advertise birth control pills, condoms, or emergency contraceptives, which could avert thousands of unwanted adolescent pregnancies and elective abortions by adolescents each year.^{15–17} Research is beginning to show that all of this sexual content may contribute to early sexual intercourse among teenagers.^{18–20}

TOBACCO, ALCOHOL, AND ILLICIT DRUGS

Increasingly, media messages and images normalize and glamorize the use of tobacco, alcohol, and illicit drugs. Tobacco manufacturers spend more than \$12 billion per year and alcohol manufacturers spend nearly \$6 billion per year to entice youngsters into “just saying yes.”^{21,22} Smoking and drinking are frequently glamorized and are portrayed as normative behavior on TV and in movies. A new study of top-grossing movies from 1991 to 2009 showed that smoking scenes in movies peaked in 2005 but have decreased significantly since then. However, in 2009, more than half of PG-13 movies still contained smoking scenes.²³ A meta-analysis of 4 studies estimated that 44% of all smoking initiation among children and young teenagers could be

attributed to viewing smoking in movies.²⁴ Alcohol remains the number 1 drug portrayed on American TV, with 1 drinking scene every 22 minutes.²⁵ More than one-third of drinking scenes are humorous, and negative consequences are shown in only 23% of them.²⁶ Through popular music, the average teenager is exposed to nearly 85 explicit drug references each day.²⁷ Again, the behavioral effects are increasingly clear in the research: children and teenagers exposed to more movie images of smoking are at greater risk of smoking,^{24,28} and alcohol advertising, in particular, is adept at convincing teenagers to begin drinking.^{29–34}

EFFECTS OF MEDIA ON OBESITY AND SCHOOL PERFORMANCE

Increased TV use is documented to be a significant factor leading to obesity^{35–39} and may lead to decreased school achievement as well.^{40–42} New research is also investigating whether there might be a relationship between overstimulation from high levels of media use and attention-deficit/hyperactivity disorder,^{43,44} sleep disorders,⁴⁵ and eating disorders.³⁷

NEW TECHNOLOGY

The Internet and cellular phones have become important new sources of sexual information, pornography, “sexting” (sending sexual text messages and/or explicit images), and social networking. In a recent study, nearly one-quarter of MySpace profiles referenced sexual behaviors.⁴⁶ In another study, 20% of teenagers reported having sent or posted nude pictures or videos of themselves (sexting).⁴⁷ Parents, schools, and law enforcement officials are sometimes in a quandary about how to deal with the new social networking sites and with sexting.^{48,49} Web sites that promote anorexia nervosa are also putting teenagers at risk of eating disorders.⁵⁰

VALUE OF MEDIA EDUCATION

Media education has the potential to reduce harmful media effects.^{51,52} In the past 2 centuries, to be “literate” meant that a person could read and write. In the new millennium, to be “literate” means that a person can successfully understand and decode a variety of different media.⁵³ Given the volume of information transmitted through mass media as opposed to the written word, it is now as important to teach media literacy as it is to teach print literacy. The prime tenets of media education are as follows⁵²:

- All media messages are constructed.
- Media messages shape our understanding of the world.
- Individuals interpret media messages uniquely.
- Mass media have powerful implications.

A media-educated person will be able to limit his or her use of media; make positive media choices; select creative alternatives to media consumption; develop critical thinking and viewing skills; and understand the political, social, economic, and emotional implications of all forms of media.⁵² Results of recent research suggest that media education may make young people less vulnerable to negative aspects of media exposure.⁵² Media education programs have resulted in less aggressive attitudes⁵⁴ and behaviors,^{54–58} increased sophistication about advertising,⁵⁹ fewer requests for commercial products,^{60,61} less alcohol and tobacco use or intentions to use,^{62–66} better nutritional habits^{67,68} and less obesity,^{69,70} better body self-image,^{71–73} fewer sexual disclosures on social networking sites,⁷⁴ and less overall TV-viewing.^{69,70,75} Many countries, including Canada, Great Britain, Australia, and some Latin American countries, mandate media education in their school curricula. However, media edu-

cation should not be used as a substitute for careful scrutiny of the media industry's responsibility for its programming. In addition, simply reducing children's and adolescents' screen media use has been shown conclusively to have beneficial health effects.^{69,70,75}

RECOMMENDATIONS

The American Academy of Pediatrics (AAP) recommends the following:

1. Pediatricians need to become educated about the public health risks of media. Given the impact that media have on the health of children and adolescents, AAP chapters and districts, as well as medical schools and residency training programs, should ensure that ongoing education in this area is a high priority.⁷⁶
2. Pediatricians should ask at least 2 media-related questions at each well-child visit:
 - How much entertainment media per day is the child or adolescent watching? The AAP recommends that children have less than 2 hours of screen time per day.
 - Is there a TV set or Internet access in the child's or adolescent's bedroom?⁷⁷

Children or teenagers who are showing aggressive behavior, have academic difficulties, or are overweight or obese should have additional history taken. A recent study revealed that office-based counseling regarding media is effective and could result in the parents of nearly 1 million additional children learning about the AAP recommendation to limit media time to 2 hours/day.⁷⁸ Advice to parents should include the following:

- Encourage a careful selection of programs to view.
 - Co-view and discuss content with children and adolescents.
 - Teach critical viewing skills.
 - Limit and focus time spent with media. In particular, parents of young children and preteens should avoid exposing them to PG-13- and R-rated movies.^{19,23,24,79-81}
 - Be good media role models; children often develop their media habits on the basis of their parents' media behavior.
 - Emphasize alternative activities.
 - Create an "electronic media-free" environment in children's rooms.
 - Avoid use of media as an electronic baby-sitter.
3. Pediatricians should continue to urge parents to avoid TV- and video-viewing for children younger than 2 years. Increasing amounts of research have shown that infants and toddlers have a critical need for direct interactions with parents and other regular caregivers for healthy brain growth.⁸²⁻⁸⁴ In addition, the results of 7 studies have shown that infants younger than 18 months who are exposed to TV may suffer from a delay in language development, and 1 study revealed that infant videos may delay language development.⁸⁵⁻⁹¹ No studies have documented a benefit of early viewing.⁹²
 4. Pediatricians should serve as role models for appropriate media use by limiting TV and video use in waiting rooms and patients' rooms, using educational materials to promote reading, and having visits by volunteer readers in waiting rooms. Pediatricians should also offer in-office reading programs,

such as Reach Out and Read, and promote active play.⁹³

5. Schools need to begin implementing media education in their curricula. The simplest way to do this would be to incorporate principles of media education into existing programs on drug prevention and sex education.
6. Congress should consider mandating and funding universal media education in American schools.
7. The federal government and private foundations should dramatically increase their funding of media research, particularly in the areas of media education, violence prevention, sex and sexuality, drugs, obesity, and early brain development.

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A joint position statement of the National Association for the Education of Young Children and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College

Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8

Television was once the newest technology in our homes, and then came videos and computers. Today's children are growing up in a rapidly changing digital age that is far different from that of their parents and grandparents. A variety of technologies are all around us in our homes, offices, and schools. When used wisely, technology and media can support learning and relationships. Enjoyable and engaging shared experiences that optimize the potential for children's learning and development can support children's relationships both with adults and their peers.

Thanks to a rich body of research, we know much about how young children grow, learn, play, and develop. There has never been a more important time to apply principles of development and learning when considering the use of cutting-edge technologies and new

media. When the integration of technology and *interactive media* in early childhood programs is built upon solid developmental foundations, and early childhood professionals are aware of both the challenges and the opportunities, educators are positioned to improve program quality by intentionally leveraging the potential of technology and media for the benefit of every child.

Interactive media refers to digital and analog materials, including software programs, applications (apps), broadcast and streaming media, some children's television programming, e-books, the Internet, and other forms of content designed to facilitate active and creative use by young children and to encourage social engagement with other children and adults.

This statement is intended primarily to provide guidance to those working in early childhood education programs serving children from birth through age 8. Although not developed as a guide for families in the selection and use of technology and interactive media in their homes, the information here may be helpful to inform such decisions.

NAEYC and the Fred Rogers Center do not endorse or recommend software, hardware, curricula, or other materials.



This 2012 position statement reflects the ever-changing digital age and provides guidance for early childhood educators about the use of technology and interactive media in ways that can optimize opportunities for young children's cognitive, social, emotional, physical, and linguistic development. In this position statement, the definition of technology tools encompasses a broad range of digital devices such as computers, tablets, multitouch screens, interactive whiteboards, mobile devices, cameras, DVD and music players, audio recorders, electronic toys, games, e-book readers, and older analog devices still being used such as tape recorders, VCRs, VHS tapes, record and cassette players, light tables, projectors, and microscopes.

Throughout the process of researching and writing this position statement, we have been guided by the legacy of Fred Rogers. By appropriately and intentionally using the technology of his day—broadcast television—to connect with each individual child and with parents and families, Fred Rogers demonstrated the positive potential of using technology and media in ways that are grounded in principles of child development.

Statement of the Issues

Technology and interactive media are here to stay. Young children live in a world of interactive media. They are growing up at ease with digital devices that are rapidly becoming the tools of the culture at home, at school, at work, and in the community (Kerawalla & Crook 2002; Calvert et al. 2005; National Institute for Literacy 2008; Buckleitner 2009; Lisenbee 2009; Berson & Berson 2010; Chiong & Shuler 2010; Couse & Chen 2010; Rideout, Lauricella, & Wartella 2011). Technology tools for communication, collaboration, social networking, and user-generated content have transformed mainstream culture. In particular, these tools have transformed how parents and families manage their daily lives and seek out entertainment, how teachers use materials in the classroom with young children and communicate with parents and families, and how we deliver teacher education and professional development (Rideout, Vandewater, & Wartella 2003; Roberts & Foehr 2004; Rideout & Hamel 2006; Rideout 2007; Foundation for Excellence in Education 2010; Gutnick et al. 2010; Barron et al. 2011; Jackson 2011a, 2011b; Wahi et al. 2011). The pace of change is so rapid that society is experiencing a disruption almost as significant as when there was a shift from oral language to print literacy, and again when the printing press expanded access to books and the

printed word. The shift to new media literacies and the need for *digital literacy* that encompasses both technology and media literacy will continue to shape the world in which young children are developing and learning (Linebarger & Piotrowski 2009; Flewitt 2011; Alper n.d.).

The prevalence of electronic media in the lives of young children means that they are spending an increasing number of hours per week in front of and engaged with screens of all kinds, including televisions, computers, smartphones, tablets, handheld game devices, and game consoles (Common Sense Media 2011). The distinction among the devices, the content, and the user experience has been blurred by multitouch screens and movement-activated technologies that detect and respond to the child's movements. With guidance, these various technology tools can be harnessed for learning and development; without guidance, usage can be inappropriate and/or interfere with learning and development.

There are concerns about whether young children should have access to technology and screen media in early childhood programs. Several professional and public health organizations and child advocacy groups concerned with child development and health issues such as obesity have recommended that passive, *non-interactive* technology and screen media not be used in early childhood programs and that there be no screen time for infants and toddlers. NAEYC and the Fred Rogers Center are also concerned about child development and child health issues and have considered them carefully when developing this position statement.

The term *digital literacy* is used throughout this statement to encompass both technology and media literacy.

Non-interactive media include certain television programs, videos, DVDs, and streaming media now available on a variety of screens. Noninteractive technology tools and media are not included in the definition and description of effective and appropriate use in this statement unless they are used in ways that promote active engagement and interactions. Noninteractive media can lead to passive viewing and overexposure to screen time for young children and are not substitutes for interactive and engaging uses of digital media or for interactions with adults and other children.

The American Academy of Pediatrics (2009, 2010, 2011a, 2011b) and the White House Task Force on Childhood Obesity (2010) discourage any amount or type of screen media and screen time for children under 2 years of age and recommend no more than one to two hours of total screen time per day for children older than 2 (Funk et al. 2009; Campaign for a Commercial-Free Childhood 2010). The Early Childhood Obesity Prevention Policies (Birch, Parker, & Burns 2011; Institute of Medicine of the National Academies 2011) recommend that child care settings limit screen time (including television, videos, digital media, video games, mobile media, cell phones, and the Internet) for preschoolers (age 2 through 5) to fewer than 30 minutes per day for children in half-day programs or less than one hour per day for those in full-day programs. The report further encourages professionals to work with parents to limit screen time to fewer than two hours per day for children age 2 through 5. These recommendations to limit children's exposure to screen time are related to two factors potentially contributing to early childhood obesity: the food and beverage marketing that children may experience when they are watching television or interacting with other media and the amount of overall screen time to which they are exposed (Birch, Parker, & Burns 2011; Institute of Medicine of the National Academies 2011). The Let's Move! Child Care initiative recommends that caregivers allow no screen time for children under 2 years of age. For children 2 and older, caregivers are encouraged to limit screen time to no more than 30 minutes per week during child care, and parents and caregivers are advised to work together to limit children to one to two hours of quality screen time per day (Schepper 2011; White House 2011). Early childhood educators need to be aware of all these concerns and understand the critical role that they as educators play in mediating technology and media use and screen time for young children.

All screens are not created equal. The proliferation of digital devices with screens means that the precise meaning of "screen time" is elusive and no longer just a matter of how long a young child watches television, videos, or DVDs. Time spent in front of a television screen is just one aspect of how screen time needs to be understood and measured. Children and adults now have access to an ever-expanding selection of screens on computers, tablets, smartphones, handheld gaming devices, portable video players, digital cameras, video recorders, and more. Screen time is the total amount of time spent in front of any and all of these screens (Common Sense Media 2011; Guernsey 2011c). As digital technology has expanded in scope beyond linear, non-interactive media to include interactive options, it is evident that each unique screen demands its

own criteria for best usage (Kleeman 2010). The challenge for early childhood educators is to make informed choices that maximize learning opportunities for children while managing screen time and mediating the potential for misuse and over-use of screen media, even as these devices offer new interfaces that increase their appeal and use to young children.

There is conflicting evidence on the value of technology in children's development. Educators and parents have been cautioned about the negative impact of background television (Kirkorian et al. 2009; AAP 2011b), passive use of screen media (AAP 2011b), and the relationship between media use and child obesity (White House Task Force on Childhood Obesity 2010; Birch, Parker, & Burns 2011; Schepper 2011). Possible negative outcomes have been identified, such as irregular sleep patterns, behavioral issues, focus and attention problems, decreased academic performance, negative impact on socialization and language development, and the increase in the amount of time young children are spending in front of screens (Cordes & Miller 2000; Appel & O'Gara 2001; Christakis et al. 2004; Anderson & Pempek 2005; Rogow 2007; Vandewater et al. 2007; Brooks-Gunn & Donahue 2008; Common Sense Media 2008, 2011; Lee, Bartolic, & Vandewater 2009; Campaign for a Commercial-Free Childhood 2010; DeLoache et al. 2010; Tomopoulos et al. 2010; AAP 2011a, 2011b).

However, research findings remain divided and therefore can be confusing to educators and parents. Some children's media researchers have found no evidence to support the belief that screen media are inherently harmful. The evidence from public broadcasting's Ready To Learn initiative suggests that when television shows and electronic resources have been carefully designed to incorporate what is known about effective reading instruction, they serve as positive and powerful tools for teaching and learning (Pasnik et al. 2007; Neuman, Newman, & Dwyer 2010; Corporation for Public Broadcasting 2011). Similarly, Wainwright and Linebarger (2006) concluded that while critics have issued many warnings against television and computers and their negative effects on children's learning, the most logical conclusion to be drawn from the existing scholarly literature is that it is the educational content that matters—not the format in which it is presented (Wainwright & Linebarger 2006). In short, there are some educationally valuable television shows, websites, and other digital media, and there are some that are less valuable or even educationally worthless.

The amount of time children spend with technology and media is important (Christakis & Garrison 2009; Vandewater & Lee 2009; Tandon et al. 2011), but how children spend time with technology must also be taken into account when

determining what is effective and appropriate (Christakis & Garrison 2009; Tandon et al. 2011). The impact of technology is mediated by teachers' use of the same developmentally appropriate principles and practices that guide the use of print materials and all other learning tools and content for young children (Van Scoter, Ellis, & Railsback 2001; Clements & Sarama 2003a; Plowman & Stephen 2005, 2007).

The appeal of technology can lead to inappropriate uses in early childhood settings. Technology and media are tools that are effective only when used appropriately. The appeal of technology and the steady stream of new devices may lead some educators to use technology for technology's sake, rather than as a means to an end. Technology should not be used for activities that are not educationally sound, not developmentally appropriate, or not effective (electronic worksheets for preschoolers, for example). Passive use of technology and any type of screen media is an inappropriate replacement for active play, engagement with other children, and interactions with adults. Digitally literate educators who are grounded in child development theory and developmentally appropriate practices have the knowledge, skills, and experience to select and use technology tools and interactive media that suit the ages and developmental levels of the children in their care, and they know when and how to integrate technology into the program effectively. Educators who lack technology skills and digital literacy are at risk of making inappropriate choices and using technology with young children in ways that can negatively impact learning and development.

Issues of equity and access remain unresolved. The potential of technology and interactive media to positively influence healthy growth and development makes it important for early childhood educators to carefully consider issues of equity and access when they select, use, integrate, and evaluate technology and media. Early childhood educators have an opportunity to provide leadership in assuring equitable access to technology tools and interactive media experiences for the children, parents, and families in their care.

In the early 1960s, Head Start and other early childhood programs targeted the differences in access to print media for children from differing economic backgrounds. Today, educators face similar challenges with regard to technology tools, media, and broadband access to the Internet. Children growing up in affluent families more often have access

to technology tools and broadband connections to the Internet in their homes, begin using the Internet at an early age, and have highly developed technology skills and beginning digital literacy when they enter school. Children in families with fewer resources may have little or no access to the latest technologies in their homes, early childhood settings, schools, or communities (Becker 2000; Burdette & Whitaker 2005; Calvert et al. 2005; National Institute for Literacy 2008; Cross, Woods, & Schweingruber 2009; Common Sense Media 2011).

Young children need opportunities to develop the early "technology-handling" skills associated with early digital literacy that are akin to the "book-handling" skills associated with early literacy development (National Institute for Literacy 2008). The International Society for Technology in Education (2007) recommends basic skills in technology operations and concepts by age 5. Early childhood settings can provide opportunities for exploring digital cameras, audio and video recorders, printers, and other technologies to children who otherwise might not have access to these tools. Educators should also consider the learning and creative advantage that high-quality interactive media can bring to children, especially when combined with skillful teaching and complementary curriculum resources that work together to accelerate learning and narrow the achievement gap between children from low-income families and their more affluent peers.

When educators appropriately integrate technology and interactive media into their classrooms, equity and access are addressed by providing opportunities for all children to participate and learn (Judge, Puckett, & Cabuk 2004; Cross, Woods, & Schweingruber 2009). In such an environment, accommodations are made for children with special needs to use technology independently (Hasselbring & Glaser 2000), and technology strategies to support dual language learners are in place.

Issues of equity and access also have implications for early childhood professionals and policymakers. Some early childhood educators face the same challenges in their own access to technology tools and Internet broadband at work or home as do the families of children in their care. Research and awareness of the value of technology tools and interactive media in early childhood education need to be shared with policy makers who are interested in issues of access and equity for children, parents, families, and teachers.

The Position

It is the position of NAEYC and the Fred Rogers Center that:

Technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators, within the framework of developmentally appropriate practice (NAEYC 2009a), to support learning goals established for individual children. The framework of developmentally appropriate practice begins with knowledge about what children of the age and developmental status represented in a particular group are typically like. This knowledge provides a general idea of the activities, routines, interactions, and curriculum that should be effective. Each child in the particular group is then considered both as an individual and within the context of that child's specific family, community, culture, linguistic norms, social group, past experience (including learning and behavior), and current circumstances (www.naeyc.org/dap/core; retrieved February 2, 2012).

Children's experiences with technology and interactive media are increasingly part of the context of their lives, which must be considered as part of the developmentally appropriate framework.

To make informed decisions regarding the intentional use of technology and interactive media in ways that support children's learning and development, early childhood teachers and staff need information and resources on the nature of these tools and the implications of their use with children.

NAEYC and the Fred Rogers Center offer the following principles to guide the use of technology and interactive media in early childhood programs.

Principles to Guide the Appropriate Use of Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8

Above all, the use of technology tools and interactive media should not harm children. The healthy cognitive, social, emotional, physical, and linguistic development of the whole child is as important in the digital age as ever. Access to technology tools and interactive media should not exclude, diminish, or interfere with children's healthy communication, social interactions, play, and other developmentally appropriate activities with peers, family members, and teachers. Technology and media should never be used in ways that are *emotionally damaging, physically harmful, disrespectful,*

degrading, dangerous, exploitative, or intimidating to children.

This includes undue exposure to violence or highly sexualized images (NAEYC 1994; AAP 2009).

Just as early childhood educators always have been encouraged and advised to monitor and apply the latest research findings in areas such as health and child development, so too should they continually monitor and assess research findings on emerging issues related to technology, including 3D vision and eye health, exposure to electromagnetic fields and radiation from cellular phones (EMR Policy Institute 2011), toxins from lead paint or batteries, choking hazards involving small parts, child obesity, screen time, or any other potentially harmful, physiological, or developmental effects or side effects related to the use of technology.

Developmentally appropriate practices must guide decisions about whether and when to integrate technology and interactive media into early childhood programs. Appropriate technology and media use balances and enhances the use of essential materials, activities, and interactions in the early childhood setting, becoming part of the daily routine (Anderson 2000; Van Scoter, Ellis, & Railsback 2001; Copple & Bredekamp 2009; NAEYC 2009a). Technology and media should not replace activities such as creative play, real-life exploration, physical activity, outdoor experiences, conversation, and social interactions that are important for children's development. Technology and media should be used to support learning, not an isolated activity, and to expand young children's access to new content (Guernsey 2010a, 2011b).

For infants and toddlers, responsive interactions between adults and children are essential to early brain development and to cognitive, social, emotional, physical, and linguistic development. NAEYC and the Fred Rogers Center join the public health community in discouraging the use of screen media for children under the age of 2 in early childhood programs. Recognizing that there may be appropriate uses of technology for infants and toddlers in some contexts (for example, viewing digital photos, participating in Skype interactions with loved ones, co-viewing e-books, and engaging with some interactive apps), educators should limit the amount of screen time and, as with all other experiences and activities with infants and toddlers, ensure that any use of technology and media serves as a way to strengthen adult-child relationships. Early childhood educators always should use their knowledge of child development and effective practices to carefully and intentionally select and use technology and media if and when it serves healthy development, learning, creativity, interactions with others, and relationships. This is especially true for those working with infants and toddlers.

Professional judgment is required to determine if and when a specific use of technology or media is age appropriate, individually appropriate, and culturally and linguistically appropriate. Early childhood educators are the decision makers in whether, how, what, when, and why technology and media are implemented through applying their expertise and knowledge of child development and learning, individual children's interests and readiness, and the social and cultural contexts in which children live. The adult's role is critical in making certain that thoughtful planning, careful implementation, reflection, and evaluation all guide decision making about how to introduce and integrate any form of technology or media into the classroom experience. Selecting appropriate technology and media for the classroom is similar to choosing any other learning material. Teachers must constantly make reflective, responsive, and intentional judgments to promote positive outcomes for each child (NAEYC 2009a).

Developmentally appropriate teaching practices must always guide the selection of any classroom materials, including technology and interactive media. Teachers must take the time to evaluate and select technology and media for the classroom, carefully observe children's use of the materials to identify opportunities and problems, and then make appropriate adaptations. They must be willing to learn about and become familiar with new technologies as they are introduced and be intentional in the choices they make, including ensuring that content is developmentally appropriate and that it communicates anti-bias messages.

When selecting technology and media for children, teachers should not depend on unverifiable claims included in a product's marketing material. In the selection process, program directors and teachers should consider the allocation of limited resources and cost effectiveness, including initial cost, the ongoing costs of updating and upgrading hardware and software, and other nonspecified costs such as additional items needed to use the product. Other considerations include durability for active use by young children and replacement costs if the device is dropped or damaged. Incentives for children to use the product or buy more products from the vendor should be reviewed and considered carefully. If developers and publishers of technology and media commit to using research-based information in the development, marketing, and promotion of their products, the selection of technology and interactive media tools will be less driven by commercial concerns and will become less mysterious and easier to choose for teachers and parents (Buckleitner 2011a; Fred Rogers Center n.d.).

Appropriate use of technology and media depends on the age, developmental level, needs, interests, linguistic background, and abilities of each child. There is a developmental progression in children's use of tools and materials, typically moving from exploration to mastery and then to functional subordination (using the tools to accomplish other tasks). Anecdotal evidence suggests this same progression is evident in the ways that children interact with technology tools. Children need time to explore the functionality of technology before they can be expected to use these tools to communicate. Just as we encourage children to use crayons and paper well before we expect them to write their names, it seems reasonable to provide access to technology tools for exploration and experimentation.

Certainly, most technology and media are inappropriate for children from birth to age 2 (at the time of this writing), and there has been no documented association between passive viewing of screen media and specific learning outcomes in infants and toddlers (Schmidt et al. 2009). Infants and toddlers need responsive interactions with adults. Yet mobile, multitouch screens and newer technologies have changed the way our youngest children interact with images, sounds, and ideas (Buckleitner 2011b). Infant caregivers must be sure that any exposure to technology and media is very limited; that it is used for exploration and includes shared joint attention and language-rich interactions; and that it does not reduce the opportunities for tuned-in and attentive interactions between the child and the caregiver. Preschoolers have varying levels of ability to control technology and media, but with adult mediation they can demonstrate mastery of simple digital devices and are often seen using the tools as part of their pretend play. School-age children who are more proficient in using technology can harness these tools to communicate ideas and feelings, investigate the environment, and locate information. As devices and apps become more user-friendly, younger children are becoming increasingly proficient in using technological tools to accomplish a task—making a picture, playing a game, recording a story, taking a photo, making a book, or engaging in other age-appropriate learning activities. Technology tools and interactive media are one more source of exploration and mastery.

Effective uses of technology and media are active, hands-on, engaging, and empowering; give the child control; provide adaptive scaffolds to ease the accomplishment of tasks; and are used as one of many options to support children's learning. To align and integrate technology and media with other core experiences and opportunities, young children need tools that help them explore, create, problem solve, consider, think, listen and view criti-

cally, make decisions, observe, document, research, investigate ideas, demonstrate learning, take turns, and learn with and from one another.

Effective technology tools connect on-screen and off-screen activities with an emphasis on co-viewing and co-participation between adults and children and children and their peers (Takeuchi 2011). These tools have the potential to bring adults and children together for a shared experience, rather than keeping them apart. For example, a caregiver may choose to read a story in traditional print form, as an interactive e-book on an electronic device, or both. When experienced in the context of human interaction, these different types of engagements with media become very similar. Early book reading and other joint adult-child exploration can include co-viewing and co-media engagement. Growing concerns that television viewing and computer games are taking time away from physical activities and outdoor play can be offset by the use of technology and interactive media that encourage outdoor exploration and documentation of nature or that integrate physical activity and encourage children to get up and be mobile rather than sit passively in front of a screen.

Technology and media are just two of the many types of tools that can be used effectively and appropriately with young children in the classroom. As with many things, technology and media should be used in moderation and to enhance and be integrated into classroom experiences, not to replace essential activities, experiences, and materials.

When used appropriately, technology and media can enhance children's cognitive and social abilities. Technology and media offer opportunities to extend learning in early childhood settings in much the same way as other materials, such as blocks, manipulatives, art materials, play materials, books, and writing materials. Screen media can expose children to animals, objects, people, landscapes, activities, and places that they cannot experience in person. Technology can also help children save, document, revisit, and share their real-life experiences through images, stories, and sounds.

The active, appropriate use of technology and media can support and extend traditional materials in valuable ways. Research points to the positive effects of technology in children's learning and development, both cognitive and social (Haugland 1999, 2000; Freeman & Somerindyke 2001; Heft & Swaminathan 2002; Clements & Sarama 2003a, 2003b; Fischer & Gillespie 2003; Rideout, Vandewater, & Wartella 2003; Greenfield 2004; Kirkorian, Wartella, & Anderson 2008; Linebarger, Piotrowski, & Lapierre 2009; Adams 2011). Additional research is needed to confirm the positive outcomes of technology tools on children's language and

vocabulary development, logical-mathematical understanding, problem-solving skills, self-regulation, and social skills development.

Interactions with technology and media should be playful and support creativity, exploration, pretend play, active play, and outdoor activities. Play is central to children's development and learning. Children's interactions with technology and media mirror their interactions with other play materials and include sensorimotor or practice play, make-believe play, and games with rules. Therefore, young children need opportunities to explore technology and interactive media in playful and creative ways. Appropriate experiences with technology and media allow children to control the medium and the outcome of the experience, to explore the functionality of these tools, and to pretend how they might be used in real life. Increasingly, educational media producers are exploring the learning power of interactive games and collaborative play involving children and their family members or teachers. Digital games fall into a similar category as board games and other self-correcting learning activities, with the same opportunities and cautions related to children's developmental stages.

Technology tools can help educators make and strengthen home-school connections. With technology becoming more prevalent as a means of sharing information and communicating with one another, early childhood educators have an opportunity to build stronger relationships with parents and enhance family engagement. Early childhood educators always have had a responsibility to support parents and families by sharing knowledge about child development and learning. Technology tools offer new opportunities for educators to build relationships, maintain ongoing communication, and exchange information and share online resources with parents and families. Likewise, parents and families can use technology to ask questions, seek advice, share information about their child, and feel more engaged in the program and their child's experiences there.

Technology tools such as smartphones, mobile devices, and apps offer new and more affordable ways for busy family members to communicate, connect to the Internet, and access information and social media tools to stay in touch with their families and their child's teachers and caregivers. Internet-based communication tools offer new opportunities for video calling and conferencing when face-to-face meetings are not possible; these same technology tools can connect children to other family members who live at a distance. As they do for young children, educators have a

responsibility to parents and families to model appropriate, effective, and positive uses of technology, media, methods of communication, and social media that are safe, secure, healthy, acceptable, responsible, and ethical.

Technology tools can support the ways educators measure and record development, document growth, plan activities, and share information with parents, families, and communities. Teachers can use digital portfolios that include photographs as well as audio and video recordings to document, archive, and share a child's accomplishments and developmental progression with families in face-to-face conferences or through communication and social media tools. Displaying photos in the classroom of children's drawings or block buildings, along with narratives dictated by the children or explanations of why these types of play are important, can help families understand the critical role of play in early childhood development. Sending weekly, monthly, or even daily updates through social media or e-mail can help families feel more connected to their children and their activities away from home. Inviting children to take a picture of something they have done and helping them upload the photo to a file that can be e-mailed promote children's understanding of ways to communicate with others while also contributing to their learning more about the functions of reading and writing.

Most educators understand the value of writing down or recording notes that a child may want to give to parents. Using e-mail, educational texting, or other communication tools demonstrates the same concept about communication and helps to build digital literacy skills at the same time. If information is stored on a computer, the photos and notes can be printed and given to families who do not use technology to send or receive messages (Edutopia 2010).

Modeling the effective use of technology and interactive media for parent communication and family engagement also creates opportunities to help parents themselves become better informed, empowers them to make responsible choices about technology use and screen time at home, engages them as teachers who can extend classroom learning activities into the home, and encourages co-viewing, co-participation, and joint media engagement between parents and their children (Stevens & Penuel 2010; Takeuchi 2011).

Technology and media can enhance early childhood practice when integrated into the environment, curriculum, and daily routines. Successful integration of technology and media into early childhood programs involves the use of resources such as computers, digital cameras, software applications, and the Internet in daily classroom practices (Edutopia 2007; Technology and Young Children Interest Forum 2008; Hertz 2011). True integration occurs

when the use of technology and media becomes routine and transparent—when the focus of a child or educator is on the activity or exploration itself and not on the technology or media being used. Technology integration has been successful when the use of technology and media supports the goals of educators and programs for children, provides children with digital tools for learning and communicating, and helps improve child outcomes (Edutopia 2007).

Careful evaluation and selection of materials are essential in early childhood settings. For example, one of the earliest and most familiar technologies in early childhood settings is Froebel's use of blocks. Montessori materials are another example of what we consider to be traditional early childhood supplies. Felt-tipped markers brought a new way for children to explore graphic representation that fell somewhere between paintbrushes and crayons.

As the lives of children, parents, families, and educators are infused with technology and media, early childhood classrooms can benefit from the possibilities of extending children's learning through judicious use of these tools. As part of the overall classroom plan, technology and interactive media should be used in ways that support existing classroom developmental and educational goals rather than in ways that distort or replace them. For example, drawing on a touch screen can add to children's graphic representational experiences; manipulating colorful acetate shapes on a light table allows children to explore color and shape. These opportunities should not replace paints, markers, crayons, and other graphic art materials but should provide additional options for self-expression.

With a focus on technology and interactive media as tools—not as ends in and of themselves—teachers can avoid the passive and potentially harmful use of non-interactive, linear screen media that is inappropriate in early childhood settings. Intentionality is key to developmentally appropriate use. One must consider whether the goals can be more easily achieved using traditional classroom materials or whether the use of particular technology and interactive media tools actually extends learning and development in ways not possible otherwise.

Exciting new resources in today's technology-rich world, such as 3D-rendered collaborative games and immersive world environments, represent the next frontier in digital learning for our youngest citizens, leaving it to talented educators and caring adults to determine how best to leverage each new technology as an opportunity for children's learning in ways that are developmentally appropriate. Careful evaluation and selection of materials is essential for the appropriate integration of technology and media in early childhood settings.

Assistive technology must be available as needed to provide equitable access for children with special needs.

For children with special needs, technology has proven to have many potential benefits. Technology can be a tool to augment sensory input or reduce distractions. It can provide support for cognitive processing or enhancing memory and recall. The variety of adaptive and assistive technologies ranges from low-tech toys with simple switches to expansive high-tech systems capable of managing complex environments. When used thoughtfully, these technologies can empower young children, increasing their independence and supporting their inclusion in classes with their peers. With adapted materials, young children with disabilities can be included in activities in which they once would have been unable to participate. By using assistive technology, educators can increase the likelihood that children will have the ability to learn, move, communicate, and create.

Technology has supported inclusive practices in early childhood settings by providing adaptations that allow children with disabilities to participate more fully. Augmentative communication devices, switches, and other assistive devices have become staples in classrooms that serve children with special needs. Yet, with all of these enhanced capabilities, these technologies require thoughtful integration into the early childhood curriculum. Educators must match the technology to each child's unique needs, learning styles, and individual preferences (Behrmann 1998; Muligan 2003; Sadao & Robinson 2010). It is critically important that all early childhood teachers understand and are able to use any assistive technologies that are available to children with special needs in their classrooms and to extend similar or comparable technology and media-based opportunities to other children in their classrooms.

Technology tools can be effective for dual language learners by providing access to a family's home language and culture while supporting English language learning.

Research has shown that access to information in the home language contributes to young children's progress both in their home language and in English (Espinosa 2008). Digital technologies allow teachers to find culturally and linguistically appropriate stories, games, music, and activities for every child when there may be no other way to obtain those resources (Uchikoshi 2006; Nemeth 2009). Because every child needs active practice in the four domains of language and literacy (speaking, listening, writing, and reading), technology resources should support active learning, conversation, exploration, and self-expression. Technology should be used as a tool to enhance language and literacy, but it should not be used to replace personal interactions. The role of language in developing self-esteem and social

skills must also be considered in making technology plans for diverse classrooms.

Digital technologies can be used to support home languages by creating stories and activities when programs lack the funds to purchase them or when languages are hard to find. Technology can be used to explore the cultures and environments that each child has experienced, and it allows children to communicate with people in their different countries of origin. Technology may be needed to adapt existing materials; for example, by adding new languages to classroom labels, translating key words in books and games, or providing models for the writing area. With technology, adults and children can hear and practice accurate pronunciations so they can learn one another's languages. If teachers do not speak a child's language, they may use technology to record the child's speech for later translation and documentation of the child's progress. As linguistic and cultural diversity continues to increase, early childhood educators encounter a frequently changing array of languages. Appropriate, sensitive use of technology can provide the flexibility and responsiveness required to meet the needs of each new child and ensure equitable access for children who are dual language learners (Nemeth 2009).

Digital literacy is essential to guiding early childhood educators and parents in the selection, use, integration, and evaluation of technology and interactive media.

Technology and media literacy are essential for the adults who work with young children. The prevalence of technology and media in the daily lives of young children and their families—in their learning and in their work—will continue to increase and expand in more ways than we can predict. Early childhood educators need to understand that technology and media-based materials can vary widely in quality, and they must be able to effectively identify products that help rather than hinder early learning (NAEYC 2009a).

For the adults who work with young children, digital literacy includes both knowledge and competence. Educators need the understanding, skills, and ability to use technology and interactive media to access information, communicate with other professionals, and participate in professional development to improve learning and prepare young children for a lifetime of technology use. Digital and media literacy for educators means that they have the knowledge and experience to think critically about the selection, analysis, use, and evaluation of technology and media for young children in order to evaluate their impact on learning and development. Digital and media literacy for children means having critical viewing, listening, and Web-browsing skills. Children learn to filter the messages they receive to make wise choices and gain skills in effectively

using technology and technology- and media-based information (NAMLE 2007; Rogow & Scheibe 2007; ISTE 2008a, 2008b; Center for Media Literacy 2010; Hobbs 2010). These habits of inquiry transfer to all areas of the curriculum and to lifelong learning.

Using technology to support practice and enhance learning requires professional judgment about what is developmentally and culturally appropriate (Hobbs 2010). Early childhood educators who are informed, intentional, and reflective use technology and interactive media as additional tools for enriching the learning environment. They choose technology, technology-supported activities, and media that serve their teaching and learning goals and needs. They align their use of technology and media with curriculum goals, a child-centered and play-oriented approach, hands-on exploration, active meaning making, and relationship building (Technology and Young Children Interest Forum 2008). They ensure equitable access so that all children can participate. They use technology as a tool in child assessment, and they recognize the value of these tools for parent communication and family engagement. They model the use of technology and interactive media as professional resources to connect with colleagues and continue their own educational and professional development.

Digital citizenship is an important part of digital literacy for young children. Digital citizenship in the context of early childhood programs refers to the need for adults to help children develop an emerging understanding of the use, misuse, and abuse of technology and the norms of appropriate, responsible, and ethical behaviors related to online rights, roles, identity, safety, security, and communication. Adults have a responsibility to protect and empower children—to protect them in a way that helps them develop the skills they need to ultimately protect themselves as they grow—and to help children learn to ask questions and think critically about the technologies and media they use. Adults have a responsibility to expose children to, and to model, developmentally appropriate and active uses of digital tools, media, and methods of communication and learning in safe, healthy, acceptable, responsible, and socially positive ways.

The term *digital citizenship* refers to the need for adults and children to be responsible digital citizens through an understanding of the use, abuse, and misuse of technology as well as the norms of appropriate, responsible, and ethical behaviors related to online rights, roles, identity, safety, security, and communication.

Young children need to develop knowledge of and experiences with technology and media as tools, to differentiate between appropriate and inappropriate uses, and to begin to understand the consequences of inappropriate uses. Issues of cyber safety—the need to protect and not share personal information on the Internet, and to have a trusted adult to turn to—are all aspects of a child’s emerging digital citizenship that can begin with technology and media experiences in the early years. Children need to be protected by educators and parents against exploitation for commercial purposes. A child’s image should never be used online without parental consent (ISTE 2007). Digital citizenship also includes developing judgment regarding appropriate use of digital media; children and adults need to be able to find and choose appropriate and valid sources, resources, tools, and applications for completing a task, seeking information, learning, and entertainment.

Early childhood educators need training, professional development opportunities, and examples of successful practice to develop the technology and media knowledge, skills, and experience needed to meet the expectations set forth in this statement. In recent years, smartphones, tablets, apps, game consoles and handheld game devices, streaming media, and social media have found their way into the personal and professional lives of early childhood educators; into early childhood programs serving young children, parents, and families; and into the homes of young children (Donohue 2010a, 2010b; Simon & Donohue 2011). Early childhood educators, parents, and families need guidance to make informed decisions about how to support learning through technology and interactive media, which technology and media tools are appropriate, when to integrate technology and media into an early childhood setting and at home, how to use these tools to enhance communication with parents and families, and how to support digital and media literacy for parents and children.

To realize the principles and recommendations of this statement, early childhood educators must be supported with quality preparation and professional development. Early childhood educators need available, affordable, and accessible professional development opportunities that include in-depth, hands-on technology training, ongoing support, and access to the latest technology tools and interactive media (Appel & O’Gara 2001; Guernsey 2010b, 2011a; Barron et al. 2011). Educators must be knowledgeable and prepared to make informed decisions about how and when to appropriately select, use, integrate, and evaluate technology and

media to meet the cognitive, social, emotional, physical, and linguistic needs of young children. Educators also need to be knowledgeable enough to answer parents' questions and steer children to technology and media experiences that have the potential to exert a positive influence on their development (Barron et al. 2011; Guernsey 2011b, 2011c; Takeuchi 2011).

Teaching in the age of digital learning also has implications for early childhood teacher educators in how they integrate technology tools and interactive media in the on-campus and online courses they teach, how well they prepare future early childhood teachers to use technology and media intentionally and appropriately in the classroom with young children and how well future teachers understand and embrace their role with parents and families (NAEYC 2009b; Rosen & Jaruszewicz 2009; Barron et al. 2011). Teacher educators need to provide technology-mediated and online learning experiences that are effective, engaging, and empowering and that lead to better outcomes for young children in the classroom. This requires knowledge of how adults learn and of how technology can be used effectively to teach teachers (NAEYC 2009b; Barron et al. 2011).

Current and future early childhood educators also need positive examples of how technology has been selected, used, integrated, and evaluated successfully in early childhood classrooms and programs. To implement the principles and recommended practices contained in this statement, educators need access to resources and online links, videos, and a professional community of practice in which promising examples and applications of emerging technologies and new media can be demonstrated, shared, and discussed.

Research is needed to better understand how young children use and learn with technology and interactive media and also to better understand any short- and long-term effects. The established body of research and literature on the effects of television viewing and screen time on young children, while foundational, does not adequately inform educators and parents about the effects of multiple digital devices, each with its own screen. As multitouch technologies and other emerging user interface possibilities become more affordable and available, new research is needed on what young children are able to do and how these tools and media can be integrated in a classroom. Research-based evidence about what constitutes quality technology and interactive media for young children is needed to guide policy and inform practice and to ensure that technology and media tools are used in effective, engaging, and appropriate ways in early childhood programs.

Recommendations

NAEYC and the Fred Rogers Center recommend that early childhood educators

1. Select, use, integrate, and evaluate technology and interactive media tools in intentional and developmentally appropriate ways, giving careful attention to the appropriateness and the quality of the content, the child's experience, and the opportunities for co-engagement.
2. Provide a balance of activities in programs for young children, recognizing that technology and interactive media can be valuable tools when used intentionally with children to extend and support active, hands-on, creative, and authentic engagement with those around them and with their world.
3. Prohibit the passive use of television, videos, DVDs, and other non-interactive technologies and media in early childhood programs for children younger than 2, and discourage passive and non-interactive uses with children ages 2 through 5.
4. Limit any use of technology and interactive media in programs for children younger than 2 to those that appropriately support responsive interactions between caregivers and children and that strengthen adult-child relationships.
5. Carefully consider the screen time recommendations from public health organizations for children from birth through age 5 when determining appropriate limits on technology and media use in early childhood settings. Screen time estimates should include time spent in front of a screen at the early childhood program and, with input from parents and families, at home and elsewhere.
6. Provide leadership in ensuring equitable access to technology and interactive media experiences for the children in their care and for parents and families.

Summary

This statement provides general guidance to educators on developmentally appropriate practices with technology and interactive media. It is the role and responsibility of the educator to make informed, intentional, and appropriate choices about if, how, and when technology and media are used in early childhood classrooms for children from birth through age 8. Technology and interactive media should

not replace other beneficial educational activities such as creative play, outdoor experiences, and social interactions with peers and adults in early childhood settings. Educators should provide a balance of activities in programs for young children, and technology and media should be recognized as tools that are valuable when used intentionally with children to extend and support active, hands-on, creative, and authentic engagement with those around them and with their world.

Educators should use professional judgment in evaluating and using technology and media, just as they would with any other learning tool or experience, and they must emphasize active engagement rather than passive, non-interactive uses. To achieve balance in their programs and classrooms, they should weigh the costs of technology, media, and other learning materials against their program's resources, and they also should weigh the use of digital and electronic materials against the use of natural and traditional materials and objects.

Support for early childhood professionals is critically important. Educators need available, affordable, and accessible technology and media resources as well as access to research findings, online resources and links, and a professional community of practice. Preservice and professional development opportunities should include in-depth, hands-on technology experiences, ongoing support, and access to the latest technology tools and interactive media. To improve and enhance the use of technology and interactive media in early childhood programs, educators also need positive examples of how technology has been selected, used, integrated, and evaluated successfully in early childhood classrooms and programs.

Further research is needed to better understand how young children use and learn with technology and interactive media and also to better understand any short- and long-term effects. Research also is needed to support evidence-based practice for the effective and appropriate uses of technology and interactive media as tools for learning and development in early childhood settings.

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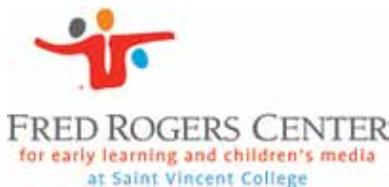


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Establishing Accounts for Early Education Settings to use the ISTAR-KR Online Assessment

scrawford@doe.in.gov

317-234-5596

- Contact Sally Reed Crawford for an “Introduction to ISTAR-KR” presentation
- ISTAR-KR Account set-up forms can be emailed to the Early Childhood Director:
 - School Creation Request Form
 - Employee Roster
 - Preschool Roster
 - Parent Consent, Cover Letter
 - Parent Brochures
- Early Childhood Director completes School Creation Request Form and email back to Sally
- Early Childhood Director distributes parent materials to families
- Early Childhood Director collects parent consents and forwards duplicate copies to Sally
- Early Childhood Director completes Preschool Roster and email to Sally
- Sally processes account set-up paperwork, e.g. to assign Department of Education (DOE) School Number, User Accounts, and Student Test Number (STN), and forwards to DOE
 - School Creation Request
 - Preschool Roster
 - Parent Consents
- Sally and Early Childhood Director schedule a Teacher Training to learn the ISTAR-KR software applications
- Sally and Early Childhood Director set an ongoing follow-up schedule for technical assistance

ISTAR-KR Research and Technical Information

In 2006, the Indiana Department of Education, Family and Social Services Administration, Ball State University and Pike Township were awarded a federal General Supervision Enhancement Grant in order to conduct a reliability and validation research study using the ISTAR Assessment tool. The purpose of the research study was to strengthen the comprehensive assessment and service provision for children with special needs, birth to age five.

Throughout the development and implementation process of ISTAR from 2003 to 2008, stakeholder groups have assembled to examine various design and validity questions and design important aspects of the assessment process. These groups have been integral to the quality of the modifications to ISTAR. Their work resulted in the most recent version of ISTAR, known as ISTAR-KR. Currently, a range of early childhood education programs use ISTAR-KR, including Head Start and Early Head Start programs, child care centers, preschools, and faith-based early education settings. The availability of ISTAR-KR to community/private early childhood education programs supports the services provided to all children birth to age five.

The Validity Argument for ISTAR-KR is best described in the simplest terms, the application of the results of an assessment can be considered valid if the assessment reliably measures what it is expected to measure and the interpretations of the results are reasonably defensible. The process of determining validity requires building a sound argument as to the degree to which evidence supports using the results as intended. It is misleading to proclaim that any assessment in and of itself is valid. The tool is just the mechanism that serves to support valid conclusions. Validation involves outlining the purposes, contexts and conditions of interpretation that can be defended based on scientific research.

To build a validity argument around using ISTAR-KR to measure the progress of children in early childhood programs, the investigation centered on how well the items address the key skills expected of children before they enter kindergarten. Because of the federal requirement that the instrument measure growth, the score patterns must be able to chart a continuum of progress. The results must be useful in planning instruction as well as being meaningful for program evaluation.

There are many dimensions to building a validity argument. For this study, a number of key investigations were pursued through the analysis of reliability, alignment, concurrent validity, discriminant-groups validity, and construct validity. In addition, a robust standardization study produced information to allow the instrument to be calibrated into three month increments of growth. To say that an instrument is reliable is to say that it will consistently be expected to produce the same score when variables are stable. On a reliability scale, the number 1 would signify a perfectly reliable instrument while numbers approaching 0 would be considered increasingly less reliable. Using Cronbach's α on the ISTAR subscale scores, the following reliability estimates were obtained: Language (0.978), Math (0.988) and Functional (.0923). These ratings would be considered exceptionally strong. However, reliability alone is not enough. Two clocks, for example, could reliably show the same time hour after hour with neither ever displaying the correct time.

Another set of studies were conducted to align the items in ISTAR with Indiana Academic

Standards for kindergarten, with the three early childhood outcome statements required for federal reporting, and internally within the continuum of items themselves. Verifying that an assessment is aligned to the intended content in terms of in range of knowledge and balance of representation is critical. For these investigations, early childhood experts rated every item in terms of depth of knowledge on a scale of five. Additionally, for each item in ISTAR, raters identified the standards and outcome categories that these were judged to measure. Categorical concurrence was used to eliminate any item that did not have adequate alignment to the standards and outcomes that the instrument was intended to measure, thus assuring that only the strongest items representing a continuum of development were used in ISTAR-KR. In the end, the process produced a core set of items organized in alignment to each other and ultimately aligned to kindergarten readiness. In addition, items sets were identified which were determined to measure each of the three OSEP (Office of Special Education Programming, US DOE) outcome areas: (1) social skills, (2) acquisition of knowledge, and (3) behaviors to meet needs.

An analysis of concurrent validity was done to correlate a tested measure to a known measure so as to provide additional information on if the assessment is measuring what it is supposed to measure. In this case, ISTAR was correlated with AEPS (Assessment, Evaluation, and Programming System), an established measure of early childhood skills. Children who did well on AEPS generally did well on ISTAR. The correlation of AEPS social subscale to the ISTAR social subscale was 0.487 and to the ISTAR Listen/Speak was .0544. Under acquisition of knowledge, the AEPS communication subscale correlated with the ISTAR language arts at 0.404. The AEPS adaptive scale correlated with the ISTAR physical care/personal care subscales at 0.459. This considered solid concurrent validity.

As part of this study, the scores of the group of children who were progressing typically were compared to the group of children who had been identified as having special needs. Controlling for age, there was a significant difference between the typical and identified groups ($\alpha=0.05$) on all subscales. In all cases, the typical group had a higher mean values than the identified group meaning that the instrumentation was able to distinguish these groups as expected.

Improvement areas in the design of the assessment were also discovered through this research. First, significant gaps were found to exist in the social emotional items. The structure of the assessment promoted some false assumptions in that all skills below a selected rating had been accomplished. Some of the language of the items was determined to be irrelevant to the activities of small children. Finally, some items appeared to add unnecessary bulk without serving a statistical or aligned purpose. The resulting improvements to the instrument were then vetted through a structured expert review and retested for alignment.

In the most recent study, over 500 typically developing children were assessed using ISTAR-KR. These subjects represented the racial and geographical population of children across the state grouped by age in three month increments. The resulting variance analysis projected a standardized score pattern for each age group from birth to 60 months old. A team of early childhood experts examined the results of this study and, using a bookmarking procedure, confirmed the lowest acceptable score to be considered “age-appropriate” for each age group on each of the performance matrices in ISTAR-KR.

Appendix

The result of this effort is an assessment that can reasonably give information as to how a student is performing compared to typically developing peers on a continuum of skills leading to success in kindergarten. This score can be examined in terms of the three OSEP outcomes or in terms of the areas of pre-academics and can be used in the planning of effective instruction.

**US Department of Education Office of Special Education (OSEP)
Indicator 7 Early Childhood Special Education Outcomes**

OSEP Outcome 1: Positive Social-Emotional Skills = Relating to adults; relating to peers; following rules related to groups and interacting with peers

ISTAR-KR assessment performance threads that provide evidence for Outcome 1 data include:

Social-Emotional Matrix	English/language Arts Matrix
<ul style="list-style-type: none"> • sense of self and others • manages emotions • interpersonal skills • responsibility • problem-solving • learning 	<ul style="list-style-type: none"> • receptive language • expressive language

AGE RANGE	PERFORMANCE LEVEL DESCRIPTOR
<p><i>The performance level descriptors below are descriptions of child behaviors corresponding to the age-range in the left column, and focus on the primary developmental changes in the areas of development cited above. The behavior descriptions are compounding from one age-range to the next. Subsequent age-ranges include enhancements of behaviors found in the previous age-range, but will also include some characteristics of behavior changes.</i></p>	
4-6 months	<p>Infants in this age-range typically demonstrate positive social-emotional skills by crying, fussing, observing and smiling to bring a caregiver to them and communicating their needs, feelings, and moods. In the latter half of this age-range, infants begin to show interest and curiosity and attempt to investigate their environment by first discovering their hands, toes, and caregiver’s faces as they reach to touch and grasp with their hands, and will turn toward and physically attend to something new in their environment.</p>
7-9 months	<p>Intentionality of interactions and investigation of things characterizes infants within this age-range. Their expressive communication now includes a purpose for the social connection, not simply to say “feed me” or “change me”. Reciprocal interactions have emerged, as it is common to observe infants participating in and enjoying pat-a-cake and peek-a-boo. Objects within their reach are appealing to infants as they reach to grasp and hold onto them to investigate (i.e., caregivers’ eye glasses, necklace or earrings). When they do get a grasp an object, their mouth becomes a primary mode of exploration as they bring the object to their mouth. Familiar routines have been learned and now they may quiet or respond using facial expressions or sounds to demonstrate recognition of the steps to a familiar routine i.e., being fed or the return of an object/person they desire. Infants now use their body, facial expressions, gestures, and voice to communicate fear, surprise, frustration, and excitement. New physical strength has resulted in infants’ ability to roll and possibly creep and is a strategy used to satisfy their curiosity and attempts to attain desired</p>

	items and explore their environment.
10-12 months	A wider range of emotional expression, communication using gestures, and new enthusiasm to explore their environment due to increased physical control are the developmental changes in this age-range. Older infants continue to use their body, facial expressions, gestures, and voice to communicate fear, surprise, anger, frustration, satisfaction, and excitement. Imitation has become a strategy used to satisfy their curiosity, as they now mimic the actions of others (shaking a toy, clapping, banging an object). Their new physical strength has become a problem-solving strategy as older infants find ways to get at things and experiment with them (i.e., crawling or pulling to stand onto furniture to attain something).
13-15 months	Often by this age-range, communication skills begin to burst as the physical skill of walking has been achieved by most children. Their gestures and sounds communicate stronger intentionality as they point to express preferences and defend possessions. Object permanence has developed and is demonstrated by their exploration to find an object that has rolled out of sight, or “calling” for a caregiver when out of sight. Young toddlers have begun to display an interest in peers by observing them, moving to be near one, playing beside them, showing them an object, and imitating their actions.
16-18 months	Communication is increasing in intentionality, but is not always understood, and some word approximations are now included in their babbling (stringing sounds together). It is common for toddlers to show intense frustration now, as their understanding of words surpasses their expressive abilities, and their desire to do more with their body is also higher than their ability. Completion of familiar routines with caregivers may go more smoothly, as toddlers understand the steps and what is coming next, and they can now follow simple one step directions (bring me your cup for more juice). Problem-solving with objects is more complex as they demonstrate a strong desire to see how things work (i.e., remove and replace rings on a stack, place shapes into a shape sorter, and demonstrate how to make a sound toy work). Simple pretend play can be observed as toddlers imitate the work of the caregiver (i.e., cooking, cleaning, and feeding the dog, with small versions of real life objects). They show strong preferences to be with their preferred caregiver; therefore, separations are a challenge during this

	age-range.
19-21 months	Older toddlers continue to explore their environment with great enthusiasm, but they continue to need help in maintaining safety. The addition of single words is now part of toddlers' communication skills and brings them a new sense of control. Daily routines go more smoothly because now they want to help with the steps or may insist on completing steps, and their understanding of gestures and words has also increased. They have a new interest in recreating activities they see around them, which represents their growing independence (i.e., "writing" and drawing with markers and crayons, figuring out how clothes go on and are taken off, and turning the pages of a book). They are willing to spend time practicing new skills to widen their understanding of cause and effect (their impact on things and the environment). Older toddlers respond to familiar gestures and words, yet still understand many more words than they can communicate.
22-24 months	Near or new two year-olds have a budding interest in peers and are building an understanding of the social rules of sharing, as they have difficulty waiting for a turn without assistance. Communication may still be frustrating, but compliance is assisted when adults label toddlers' wants, needs, and feelings. Children in this age group have a strong preference for independence, but do comply with limit-setting and consistent routines when provided assistance.
25-27 months	The biggest achievements of toddlers in this age-range are control of emotions and increased control of language (i.e., blending more sounds into words, and putting two words or signs together into sentences). Separation from a loved one can be more successful, as they can hold the image of that person in their mind and understand they will come back. They now can easily express their preferences, and will strongly protest to protect their possessions. "No" is a favorite new word for the two year-old child. Some toddlers will demand they complete many tasks independently.
28-30 months	Increased language expression of using two-word phrases now allows older two year- old children to demonstrate more control in peer situations and interactions. Cooperation during daily routines is now evident and their emotions are managed with some assistance from adults. Knowledge of how things work in their everyday world has grown, as you can observe the older two year-old in routines (i.e., appropriately using the remote control, dressing/undressing, self-feeding, and following familiar directions). Pretend play has taken on more imagination (i.e., "reading" a book, cooking, feeding and putting dolls to bed, parents going off to work, and block structures can become a house).
31-33 months	In this age-range the independence of two and a half year-old children is demonstrated by communicating preferences and dislikes, using "Mine" and taking on roles in their pretend. Children in this age-range can display some self-control and may consistently display an understanding of expectations. They can also interpret the feelings of others and are in tune to an adult's opinion of them.

34-36 months	Near or new three year-olds can often be observed to have a “special” friend whom they interact and play with consistently. Although they demonstrate higher abilities to complete tasks and follow routines, needing help with managing emotions is still evident. They consistently recognize the letters in their own names, familiar signs and logos. Their understanding of rules has developed and they may include simple grammar in their communication. New fears may be displayed because of their inability to differentiate between reality and fantasy, causing bedtime to be a challenge.
37-39 months	At this age, children now communicate by using longer phrases that include nouns, verbs, pronouns, and adjectives, and they demonstrate the ability to read familiar symbols (logos, food containers, and letters in their name). Pretend play with peers is a favorite past time and includes assignment of roles, dress-up, and re-enactments of events in their lives (i.e., shopping, going to a restaurant, a doctor visit).
40-42 months	Play skills take center stage in this age range, with new problem-solving occurring in children (i.e., using reasoning, trying indirect ways to find solutions). These new skills also result in their ability to now sustain attention to challenging tasks. Three and a half year-olds may try to use a strategy to manage their emotions and to follow rules.
43-48 months	Four year-old children now compare the different sounds within words and enjoy rhyming words. They now focus on the print in books, and will elaborately retell stories or events. These children are able to apply rules to new situations (i.e., complete tasks independently, put materials away when finished).
49-52 months	Four and a half year-olds are motivated to “write” and will practice by copying letters. They produce “story” pictures with scribbled messages, demonstrating that “writing” is for communicating. Now they can follow an unfamiliar directions, and their play skills now include creativity, as they produce original work and will try difficult tasks. Socially, they show an understanding of others’ feelings and property, and will remind others of the rules. They have a cooperative spirit and will advocate for their needs. Their expressive communication includes plurals and longer sentences, and these children will tell their age and birth date when asked.
52-60 months	New five year-olds want to apply a variety of approaches to tasks (i.e., using a variety of materials and strategies). They are now able to recognize and name capitol and lower case letters in print found in everyday life (i.e., books, street signs, papers, and the alphabet). Five year-olds enjoy re-enacting stories that now include fantasy, and respond to questions about a story. The communication skills of these children include good understanding of directions with multiple steps and descriptive language, and their expressive communication include sentences with varied grammar (i.e., conjunctions, pronouns, verbs).

61-72 months	Five year-olds include creativity in their activities, will stay with a challenge and work on alternate strategies to solve it, and make effective cooperative play partners, demonstrating respect of others' property and feelings. Their language includes lengthy sentences with appropriate grammar, including conjunctions, helper verbs and possessive pronouns. When they share information, it is characterized with descriptions of people, places, and things, and they are able to maintain a conversation. Their receptive language includes following two-step directions with multiple descriptors (i.e., "Walk slowly, and bring me the big dinosaur book, please").

**US Department of Education Office of Special Education (OSEP)
Indicator 7 Early Childhood Special Education Outcomes**

**OSEP Outcome 3: Taking Appropriate Action to Meet Needs =
*Taking care of basic needs (showing hunger, feeding, dressing, toileting, etc.; contributing to own health and safety; getting from place to place and using tools***

ISTAR-KR assessment performance threads that provide evidence for Outcome 3 data include:

Physical Matrix	Personal Care	Social-Emotional Matrix	English/Language Arts Matrix
<ul style="list-style-type: none"> • sensory integration • physical stability • gross motor skills • object control • precision hand skills 	<ul style="list-style-type: none"> • oral motor skills • self-feeding • dressing/undressing • care of face, hands, nose • toileting 	<ul style="list-style-type: none"> • sense of self and others • manages emotions • interpersonal skills • responsibility • problem solving • learning 	<ul style="list-style-type: none"> • awareness of sounds • awareness of symbols • uses print for pleasure and information • comprehends details, events, main ideas • writes for specific purpose and audience • uses writing implements • receptive language • expressive language

AGE RANGE	PERFORMANCE LEVEL DESCRIPTOR
<p><i>These performance level descriptors are compounding, the previous age-range descriptor will apply to the next age-range with some additional behaviors. This means that with each successive age-range the range of behaviors seen in the prior age-range are present with the addition of new behaviors that are more mature.</i></p>	
4-6 months	<p>Infants in this age-range typically demonstrate actions to get their needs met in the following ways: use of all five senses to respond to sensory input in their environment (i.e., alert to sounds, control their head purposefully, move their body [rolling]); respond to their name; explore their body; reject something undesirable; calm to a caregiver’s voice or touch; recognize caregiver; and discriminate strangers. The communication skills of infants encompass crying, fussing, smiling, and waving their arms or legs to demonstrate their emotions. By this age-range, successful feeding is demonstrated by good sucking and swallowing ability. Curiosity about the people and objects around these children is shown by intent observation and responses to what is happening around them (i.e., familiar people, reaching and grasping objects within their reach, watching a speaker’s face, or turning to or attempting to move toward something interesting).</p>

7-9 months	<p>In this age-range, new skills primarily have to do with an increased understanding of routines and a growing understanding of how these older infants can impact their world with their voice and body (i.e., cry, fuss, or smile to bring an adult to them; quiet attention during meal times; possibly placing hands on bottle when fed or holding the bottle; focus on familiar pictures; and moving [creep, crawl] to attain and/or investigate a desired object). If an object is attained, older infants learn about it by holding it and putting it in their mouth. Added control in handling objects is now assisted with growing strength in supported sitting.</p>
10-12 months	<p>Expanded communication and growing motor skills characterize this age-range. These infants now use cooing and other sounds to hear their own voice, bring someone to them, or communicate dislikes. Physically, new strength allows for independent sitting and an interest in standing when supported by an adult or furniture. This upright position makes their view of the world wider and their ability to reach things greater. Imitation has now become an important strategy to learn about objects, as experimentation includes repetitive actions as these infants connect their action to a reaction (i.e. banging two objects together makes a sound). Children in this age-range show new understanding and tolerance of steps within routines. They may hold up an arm when being dressed/undressed, and may wait when they see or hear steps in routines occurring that will meet their needs (i.e., to be picked up, to be fed).</p>
13-15 months	<p>Intentional communication and strength in using their bodies are characteristic of this age-range. New control is achieved by combining babbling with gesturing, emphasizing their needs (wanting more cracker), desires (want something), and emotions (want you, don't go). The increased ability of these children to move with more control and confidence inspires their interest in and motivation to explore their environment (i.e., some are walking independently, some are crawling on top of or around furniture or moving up and down a few steps, all to know about their world). Problem solving with toys has now taken on more purpose, as these children now often replace putting objects in their mouth with using their finger to poke and their hand to push or pat at levers on toys. Practice and repetitive actions with objects is the common past time of toddlers.</p>
16-18 months	<p>Increased maturity of communication and physical skills characterize this age-range and can be noted by the toddlers who exude power—some examples include imitating new words, trying new toys/activities, displaying interest in exploring play equipment to climb. Even though there is new evidence of physical competence, understanding depth and safety issues is not developed, so adults are needed to protect when the toddlers go into unsafe areas. Additionally, their feelings of disappointment have taken on a more powerful expression, and adults are needed to assist toddlers in calming down when they are upset. This occurrence of frustration is common, resulting from toddlers understanding many more words than they can express and their great desire to do more than they are able. One area that may provide satisfaction is meal time. Toddlers can now feed themselves finger foods (solid foods are part of their menu), and using a</p>

	<p>closed cup has been achieved and may have been given a higher value by some toddlers, as it looks more like the drinking containers used by adults or siblings. Separations from beloved caregivers are difficult during this period and also can reflect the ambivalence toddlers feel toward newfound independence, clearly wanting that adult nearby and in view, but also wanting to explore away from that adult.</p>
19-21 months	<p>Increased use of single words and word approximations brings more control to older toddlers. Predictable schedules and routines also provide these children a source of security and control. Problem solving with toys/objects continues to be filled with motivation for older toddlers to try new activities (i.e., “writing” with markers or crayons, attempting to dress and undress, and using small riding toys).</p>
22-24 months	<p>New skills in this age-range include use of more recognizable words, interest in using a spoon, and using open cups. A new interest has emerged—fascination with peers. These children attempt interactions with peers (i.e., showing a toy, grabbing a toy, observing their play and imitating their actions). They are great defenders of “their” toys/objects, and they will make sure everyone hears their “No” or “Mine”.</p>
25-27 months	<p>Interest and attention span with books has developed as children in this age-range now recognize and label pictures of familiar things (animals, people, and everyday items) by repeating the word or pointing to the picture when asked. Physically, these children are experimenting with ball play (throwing, catching, and kicking). In terms of increased independence, two year-olds cooperate with personal care routines throughout the day by completing some of the steps, and they experience expanded success in assisting with getting some clothing on or off.</p>
28-30 months	<p>Two-and-a-half year-olds have expanded communication to include two words/signs together. They use words to identify steps in a routine, and they easily follow a familiar direction. Their concept development in measurement has increased to include understanding the location of objects and some of their attributes (size, temperature). Many toddlers scribble messages on drawings to give to others as a way of communicating through “writing” and displaying their knowledge of the function of writing. Social-emotionally, they show increased understanding of “rules”, and they share when prompted (though they may not like it). Toddlers use feeling words when given to them, which assists them in managing those strong feelings.</p>
31-36 months	<p>Older two year-olds have a stronger interest in books, and they focus on imitating writing strokes. They label familiar pictures, recognize print (letters, numbers), and now examine the details in pictures. Following routines without much assistance occurs consistently by this age-range.</p>

37-42 months	Recognition of familiar symbols is a highlight of this age-range (i.e., boxes of favorite foods, restaurants, street signs). These children like to communicate about the content of familiar books (characters, settings). Expressive communication includes longer sentences, which incorporate some simple grammar rules (plurals, past verbs). Independence now includes interest in serving self food and drink, participating in some of the toileting steps, and experiencing greater success with dressing/undressing. These children can follow some rules (inside voices, walking inside), and they may remind others of the rules. Children of this age-range look for more than one way to solve problems, which assists them in sustaining attention to more challenging activities.
43-48 months	The areas of the largest developmental changes in this age-range are in math concept development and social-emotional skills. These children have begun to understand addition and subtraction by making sets larger or smaller when asked, and their knowledge of how time is measured has increased to understand minute, day, hour, and week, year, and month. Expanded knowledge of the attributes of objects (i.e., more shapes, colors, and sizes) are recognizable now, as the children group objects according to one attribute or to similarities, and they understand more about opposites. Children in this age-range demonstrate their independence by their ability to use a strategy to manage their emotions, to engage in cooperative play with peers by assigning roles, and to follow unfamiliar directions. Independent completion of tasks and putting materials away appropriately is common in this age-range.
49-54 months	Four year-old children understand quantity and numbers, as reflected in their drawings, and they like to use measuring tools (ruler, scales, and measuring cups) correctly. Children in this age-range find pleasure in identifying words that rhyme and like to follow words in a book as a story is read or listened to. Their practice “writing” now contains strings of shapes that look like letters or numbers. These children follow unfamiliar directions and spend much time in physical activity (running, riding a bike, climbing, tumbling stunts). It is common for children in this age-range to complete all personal care needs, including dressing/undressing and toileting.
55-60 months	Four-and-a-half year-olds and new five year-olds have now developed good comprehension and better memory skills, as reflected in their retelling of stories and events in their life. They include details of main characters, places and experiences, and often use objects symbolically in imaginary play. Their understanding of numbers and quantity has increased, and that knowledge helps them to describe or use objects. Socially they encourage others and can advocate for themselves and others.
61-66 months	A variety of math and early literacy concepts are now present in the expressive

	<p>communication of children in this age-range (i.e., units of amounts [most, least, some, none]), and these children order objects up to 10 and count to 20. Letter recognition now includes identification of capital and lower-case letters. These children specifically choose books for information and write phonetically, still including pictures with letters.</p>
<p>67-72 months</p>	<p>Children in this age-range read common or simple words (e.g. cat, dog, stop, go, etc). Mathematically, they compare sets of objects to identify differences and make direct comparisons of objects/things in terms of size, weight, quantity, and length. Their writing now takes on accurate spacing of letters and some correct shaping of letters. These children communicate in coherent sentences, embedding descriptions, locations, and actions.</p>

**US Department of Education Office of Special Education (OSEP)
Indicator 7 Early Childhood Special Education Outcomes**

**OSEP Outcome 2: Acquiring and Using Knowledge and Skills =
*Thinking, reasoning, remembering, problem-solving; understanding symbols;
understanding the physical and social worlds***

ISTAR-KR assessment performance threads that provide evidence for Outcome 2 data include:

Math Matrix	English/Language Arts Matrix	Social-Emotional Matrix	Physical Matrix	Personal Care
<ul style="list-style-type: none"> • counting and quantity • computation • time • location • length, size, weight • sorting and classifying 	<ul style="list-style-type: none"> • awareness of sounds • awareness of symbols • uses print for pleasure and information • comprehends details, events, main ideas • writes for specific purpose and audience • uses writing implements • receptive language • expressive language 	<ul style="list-style-type: none"> • sense of self and others • manages emotions • interpersonal skills • responsibility • problem solving • learning 	<ul style="list-style-type: none"> • sensory integration • physical stability • gross motor skills • object control • precision hand skills 	<ul style="list-style-type: none"> • oral motor skills • self-feeding • dressing/undressing • care of face, hands, nose • toileting

AGE RANGE	PERFORMANCE LEVEL DESCRIPTOR
<p><i>These performance level descriptors are compounding, the previous age-range descriptor will apply to the next age-range with some additional behaviors. This means that with each successive age-range the range of behaviors seen in the prior age-range are present with the addition of new behaviors that are more mature.</i></p>	
4-6 months	<p>Infants in this age-range demonstrate knowledge of the environment, as well as physical, social, and emotional skills in the following ways: they use crying, smiling, eye contact, facial expressions and some sounds to communicate needs and emotions to caregivers. Young infants use all five senses to demonstrate their curiosity of objects, their body, and people (i.e., turning toward, reaching for, raking at, and grasping to learn about it). They exhibit good head control while looking around, and when supported to sit, have a wider view to observe. By this age-range, feeding goes smoothly, as the infants can suck and take in pureed food without choking, and they recognize their bottle or the feeding position and now associate it with soon being fed. Infants in this age-range will</p>

	consistently and independently regulate their senses or feel comforted by being picked up and held by a caregiver, and they may also show some self-regulation by expressing their needs (hunger, sleep, physical contact) at predictable times.
7-9 months	Infants in this age-range now show how they can impact and learn from their world in a more deliberate way (i.e., they investigate objects by bringing them to their mouth to suck on and will randomly drop them to go onto the next item). Caregivers know that daily routines have become familiar to infants as their responses to the steps in those care giving routines demonstrate understanding (i.e., quieting when held for feeding, waving arms and possibly fussing when they see they are about to be picked up, and crying when asked to wait to be fed or held). Interactive games or songs are appealing now, as they smile at a caregiver and attend to the actions and words. The infants participate using gestures and vocalizations, and by smiling. Motivation to access things they want and are evident by how their curiosity is now facilitated by increased physical strength (i.e., rolling or creeping). Imitation of some adult actions has now been added to their repertoire of strategies to investigate and problem-solve with objects (i.e., banging two together, or putting objects into a container). These infants have learned to tolerate lumpy foods and will cooperate at meal time.
10-12 months	During this age-range, infants have learned and are motivated to successfully move solid foods in their mouth and swallow, and to actively engage in daily routines (i.e., feed themselves a cracker, may bring a closed cup to their mouth and drink, and hold up arms in dressing/undressing). They can now sit alone, and some will move upright with support (i.e., pulling up to a table/surface and moving around it by taking steps as they hold on). Certainly, crawling with speed occurs now. New strength allows for moving up and down a few stairs, and some young toddlers will “walk” with support. These young toddlers demonstrate preferences of objects and will show displeasure at losing particular objects. Communication skills are characterized by expressing a variety of sounds and recognizing familiar people, objects, and pictures in book or photographs. These children respond to familiar cues and sounds that have been learned (i.e., face brightens, attends to and looks to familiar voices, door bell, phone, and pets).
13-15 months	A biggest new skill for children in this age-range is the accomplishment of independent walking. Walking now means navigating their environment has taken on new parameters and possibilities. However, their new found independence requires oversight, as they can get into situations that are not safe, but entirely appealing. These children have begun to anticipate familiar routines in their daily schedule, and respond now to familiar gestures or words. Play with objects is now demonstrated with more purpose and complexity as they have learned to use additional strategies other than mouthing an object that now includes poking, patting, pushing, dropping or throwing . Discovery of peers is of interest, both in person and in picture books. These children show recognition of others’ emotions by mimicking the emotion or patting a person who is sad.

16-18 months	Toddlers have added single words to the expressive communication, using a variety of familiar nouns. Imitation skills have increased by this age-range; toddlers imitate peers and adults, and pretend play with real-life objects has emerged (i.e., draw with markers, “talk” on the telephone, or kiss a doll/teddy bear). These children prefer to feed themselves, use a cup, and practice using a spoon. Physical stability is characterized by balance and control, which aides the children in climbing and walking.
19-21 months	Older toddlers now follow familiar routines without much assistance (i.e., they respond to their name, and will greet others when prompted). Their understanding of words and simple math concepts has increased, as these toddlers may look to or go find an object in a requested location, and they may request more of something. Their use of sounds and single words has increased and has now has taken on a conversational tone, with inflection and great intentionality. However, high frustration is common now, as they understand more words than are able to express, and they desire to do more than they can safely accomplish. Physical coordination is increasing as toddlers can be observed creatively climbing, running, moving on riding toys, and trying to jump.
22-24 months	New two-year olds now have control of expressing more recognizable words, which provides new emotional control. Children in this age-range now sustain attention to preferred play activities (i.e., explores quantity by indentifying which amount is more, will name or point to pictures in a book [animals, toys, everyday objects], match same objects either in play or when cleaning-up toys). New word acquisition includes words that describe steps in routines (i.e., next, one more time). Pretend play or re-enacting familiar events has begun and is a display of independence in this age-range (i.e., “reading” a book, making food for a dolly or a play partner). In addition, these children follow familiar routines (i.e., assist in the steps to get ready for bed/bath, a meal, small group circle time). Two year-old children are known for aggressively defending toys and protesting when something doesn’t go their way; “No” and “Mine” are common refrains of these toddlers. Purposeful play is characterized by a variety of experimentation with objects and tasks (i.e., putting objects together, searching for something out of sight).
25-27 months	The primary new skills for two year-olds fall into the categories of communication skills, self-care, and social-emotional skills. Two year-olds now demonstrate new skills in socialization with others and the learning of rules (i.e., control of language to understand and follow directions, assist with dressing/undressing, and may show an awareness of toileting cues). These toddlers want to participate with peers and adults in group activities, will initiate engagement with peers, can share when prompted, and use language with peers and adults. However, they still have a strong desire to control toys and have their way. The concepts of size and temperature in their everyday life have now developed, and they can distinguish between big/little or hot/cold.

28-30 months	Expressive communication, social-emotional skills, and physical skills show the biggest changes during this age-range. These children now use two-word phrases to express themselves when they describe objects or events. Physically, two-and-a-half-year-old children have begun to purposefully throw, catch, and kick a ball with some control. These children now can manage separations from loved ones more easily, and their feelings can be managed when adults help them by giving a label to those feelings, redirecting their behavior, and setting reasonable limits of inappropriate behavior (grabbing toy from peer, using hands to express feelings). Predictable schedules, forecasting what is coming next and allowing for reasonable choices (which shirt of two, which cup of two) are successful strategies that help this age group to manage their days.
31-36 months	Developmental changes for two-and-a-half year-old children are primarily demonstrated in the following areas: enhanced communication skills, pre-math skills, early literacy skills, and social-emotional skills. These children enjoy matching objects, understand the sequence of events that occur in their daily routines, and differentiate differences in objects by size, temperature, color and shape. Their language contains more recognizable phrases; they identify their name in print, and they enjoy relating the details in pictures or stories. The drawings of these children often include scribbling to convey a message as they understand the purpose of writing. They have a desire to complete some of the steps of dressing/undressing, and may show an interest in practicing use of a potty. Socially, they have a high desire to engage with peers and to please adults by helping them, and they have begun to identify positive attributes of others. These children spend time engaged in pretend play and exploring a variety of activities, such as putting construction toys together, looking at books, and using writing implements.
37-42 months	Children who are three years old demonstrate increased skills that primarily are focused on increased independence in self-care tasks and focus their attention on problem solving with more challenging tasks. Children in this age group easily complete dressing/undressing, personal care tasks, and toileting. They are now able to attend to more challenging tasks (i.e., sorting by opposite attributes, including comparing size, weight, capacity), and they follow rules. These children speak in sentences that contain at least four words and include some simple grammar, pronouns, and verbs. They indicate numbers to describe and appropriately use past tense to tell about characters in stories or experiences they have had. Three year-olds recognize familiar symbols, such as restaurant logos and containers of favorite foods, in addition to letters and numbers.
43-48 months	Children in this age-range typically show developmental changes in the areas of pre-math skills, cooperative play, and independent management of emotions. They now have knowledge of the term morning, as well as the terms yesterday, today, tonight, and tomorrow. Being able to compare and sort by more than one attribute is a new skill (i.e., identify shapes, group by similar attribute, compare by number of corners). These children independently manage their emotions by using a strategy, and they can also apply rules in a variety of situations. Taking turns in play with peers is mostly independently-managed with prompts from

	<p>adults. Conversations are maintained with a peers, and these children like to identify a “best” friend. Phonemic understanding has increased as they now identify words that sound alike by rhyming, and they follow words from left to right on a printed page.</p>
49-54 months	<p>Four year-olds continue to expand their concept development in early math skills and language expression (i.e. understands “all of”, “the rest of”, and what number is next in a series of numbers), and they use measuring tools (measuring cup, ruler, scale) appropriately. These children enjoy retelling stories and accurately include the beginning, middle, and end. Children in this age-range have begun to use writing to share a message that often includes some recognizable letters, and they may draw a picture and ask someone to write their dictated story.</p>
55-60 months	<p>The language of near five year-olds now includes prepositions to describe location and is expressed with increased intelligibility. Comprehension of stories and events is demonstrated not just with retelling, but also incorporates the identification of main characters and places in a story. These children easily use the pictures in a story to understand the content. They follow two-step unrelated directions, use objects symbolically in imaginative play, and consider and try alternate solutions when solving problems. Socially, these children want to help and encourage others and will speak up for themselves and others.</p>
61-66 months	<p>Children in this age-range continue to build on their knowledge of math concepts (i.e., count to 20; use “most”, “least”, “some”, and “none”; and order objects up to 10). Units of measuring time have become part of their communication expression (i.e., week, month, hour, and minute). Grouping items by function, not just attributes, is evident now. These children have mastered number and letter recognition, and they can also order numbers and letters. Books now are chosen for the information they contain, and titles and authors can be identified. The writing of these children includes phonetically-spelled words.</p>
67-72 months	<p>Five-and-a-half year-olds and new six year-olds demonstrate the biggest developmental changes in the following categories: math concepts of addition and subtraction, writing skill enhancement, and expressive language. These children can now compare sets of objects up to 10 and determine if they are equal, and divide sets of objects up to 10 into equal groups. These children can also make direct comparisons of length, weight and temperature. In terms of writing skills, these children now record and order their ideas for writing, space letters correctly, and use correct shaping of capital and lower-case letters. The expressive communication of these children is intelligible most of the time, and includes coherent sentences comprised of descriptions, locations, and actions.</p>

PARENT RESOURCES

1. Indiana Helpline 1 800 433-0746
2. Care Line/Stress Line 1 800 244-5373
3. Child Care Resource & Referral 1 888 463-5473 www.iaccrr.org
4. Indiana Transition Initiative for Young Children and Families www.indianatransition.org
5. Prevent Child Abuse Indiana 1 800 244-5373
6. Legal Services Organization 1 800 869-0212
7. First Steps 1 800 441-7837 www.state.in.us/fssa/first_step/index.html
8. About Special Kids (ASK) 1 800 969-4746 www.aboutspecialkids.org
9. Department of Education – Special Education 1 317 232-0570
10. Indiana Children’s Special Health Care Services 1 800 475-1355
11. Zero to Three: <http://zerotothree.org>
12. Reading Rockets: literacy resources for parents:
<http://www.readingrockets.org/audience/parents/>
13. Get Ready to Read: <http://www.getreadytoread.org>
14. American Association of Pediatricians: <http://www.aap.org>
15. Center for Early Literacy Learning, family activity suggestions for infants, toddlers and preschool children: <http://earlyliteracylearning.org>
16. Power of the Ordinary, Everyday Times Newsletter for parents to make the ordinary moments extraordinary learning opportunities: <http://www.poweroftheordinary.org/>
17. Possibilities: Spotlights Newsletter to assist families in mapping child interests to expand learning, Orlena Puckett Institute: <http://experiencethepossibility.info>
18. IN Source, Resource Center for families with children with special needs: <http://insource.org>

Early Childhood Educator Resources

1. IAIEYC: <http://www.iaeyc.org>
2. Early Childhood Meeting Place: <http://www.earlychildhoodmeetingplace.org>
3. Infant Toddler Specialists of Indiana (ITSI): <http://www.cfs.purdue.edu/itsi/>
4. Council for Exceptional Children (CEC): <http://www.cec.sped.org>
5. National Association for the Education of Young Children (NAEYC): <http://www.naeyc.org>
6. Orlena Hawks Puckett Institute: Engaging in activities to enhance child, parent and family functioning: <http://www.puckett.org>
7. Frank Porter Graham Child Development Institute, University North Carolina:
<http://www.fpc.unc.edu>
8. Indiana Institute Disability and Community: <http://iidc.indiana.edu>
9. Indiana First Steps Early Intervention: <http://fssa.in.gov.us>
10. Indiana Department of Education: <http://idoe.in.gov>
11. Early Childhood Research and Practice (ECRP): <http://ecrp.uiuc.edu>

Appendix

12. Zero to Three: <http://zerotothree.org>
13. Technical Assistance Center for Social Emotional Intervention (TACSEI):
<http://www.challengingbehavior.org/>
14. Get Ready to Read: <http://www.getreadytoread.org>
15. National Center for Early Childhood Transition: <http://nectc.org>
16. Center for Early Literacy Learning: <http://earlyliteracylearning.org>
17. Colorado Department of Education, Results Matter:
<http://www.cde.state.co.us/resultsmatter/RMVideoSeries>
18. Center on the Developing Child, Harvard: <http://developingchild.harvard.edu>
19. Indiana Association Infant Toddler Mental Health (IAITMH): <http://iniatmh.org>