

Guidelines for Best Practices in Determining Eligibility Based on Children's Cognitive Development

The goal of these "*Guidelines for Best Practices in Determining Eligibility Based on Children's Cognitive Development*" is to offer support to the evaluation team in their decision-making regarding a child's eligibility for early intervention services based on cognitive development. **(See pages 21-24 for Procedures for Initial Evaluation.)**

In Wisconsin, cognitive is defined in HFS 90 [HFS 90.08 (7)(c)1] as follows:

Cognitive Development, as evidenced by play skills, manipulation of toys, sensorimotor schemes, attention, perceptual skills, memory, problem solving and reasoning.

Preface

Cognitive development focuses on how children learn and process information. Young children initially learn about the world through active, physical exploration and through their experiences. They use all their senses (touch, movement, smell, taste, vision, and hearing) to gather information about their world. Gradually, children learn to think symbolically and logically about their experiences. Cognitive development occurs as children explore and test a variety of ideas and newly learned concepts. As evaluators, it is important to assess the child's ability to organize and make sense of the environment to which he or she is exposed (Rossetti, 1990).

Play, social interactions with parents, family members and caregivers, and exploration of their physical environment are children's first learning experiences. Cognitive development is intertwined with all other areas of development. Consider the following tasks: Putting objects in a container not only requires eye-hand coordination, but also requires the ability to move from the idea of taking things out of a container to putting them back in. Putting items on a string is a fine motor task as well as a problem-solving task. The child's pleasure and motivation increase the likelihood of completing and repeating the tasks.

The understanding of language and the ability to use language are also all related to one's cognitive ability. A child's ability to connect to people and objects in his environment allows him to place meaning to his experiences. A child's ability to perform various cognitive tasks is dependent on his or her motor, social, and language skills.

Theories of Cognitive Development

PIAGET'S STAGES OF COGNITIVE DEVELOPMENT

Jean Piaget's theory of cognitive development is one of the most quoted theories describing the stages of cognitive development. (Atherton, 2003) Many evaluation tools are reflective of his findings. The stages of intellectual development formulated by Piaget appear to be related to major developments in brain growth. (Myers, 2004)

Recent research has found that infants anticipate events, actively search for hidden objects, flexibly vary their sensorimotor schemes, and engage in make-believe play within Piaget's time frame. (Berk, 2003) Yet other capacities, including secondary circular reactions, the emergence of object permanence, deferred imitation, categorization, and analogical problem-solving, seem to show themselves sooner than Piaget expected. (Berk).

Below are listed Piaget's stages of development for the ages birth to three:

Sensory Motor Period (0–24 Months)

Reflexive Stage (0–2 Months) - Simple reflex activity such as grasping and sucking.

Primary Circular Reactions (2–4 Months) - Simple motor habits centered around the infant's own body; limited anticipation of events, stereotypical repetition such as opening and closing fingers repetitively.

Secondary Circular Reactions (4–8 Months) - Repetition of actions to reproduce interesting consequences such as kicking one's feet to move a mobile suspended over the crib; imitation of familiar behaviors.

Coordination of Secondary Reaction (8–12 Months) - Responses become coordinated into more complex sequences. Actions take on an "intentional" character such as the infant reaching behind a screen to obtain a hidden object (object permanence); improved anticipation of events; imitation of behaviors slightly different from those the infant usually performs.

Tertiary Circular Reactions (12–18 Months) - Discovery of new ways to produce the same consequence or obtain the same goal, such as the infant pulling a pillow toward him in an attempt to get a toy resting on it; imitation of unfamiliar behaviors; ability to search in several locations for a hidden object.

Invention of New Means Through Mental Combination (18–24 Months)- Evidence of an internal representational system. Symbolizing the problem-solving sequence before actually responding; deferred imitation; beginning of make believe play.

The Preoperational Period Phase (2–7 Years)

Preoperational Phase (Preconceptual) (2–4 Years) - Increased use of verbal representation but speech is egocentric (cannot take another's perspective). The beginning of symbolic rather than simple motor play. Transductive reasoning (does not generalize from particulars, confuses goals or effects with causes). Can think about something without the object being present by use of language.

Adapted from childdevelopmentinfo.com

Another model in which to view infant-toddler cognition was presented by McCall (1979). In this model performance is thought to change as various stages of cognitive development are reached. This model is similar to Piaget's and is also broken into stages.

MC CALL'S STAGES OF MENTAL PERFORMANCE

Newborn Stage (0-2 months) - Infant primarily exercises endogenous, structural behavioral dispositions and selective but basically responsive attention to certain aspects of the environment.

Subjectivity (2-7 or 8 month) - Infant's world is known by and is indistinguishable from the infant's perceptual-motor and physical action with it. Infant acquires information by exploratory behavior, especially that producing some obvious perceptual consequence.

Separation of Means from Ends (8 months) - At this point infants can distinguish between objects and their actions, but a strong reliance on interaction with objects is needed for the child to really know the object. A more goal-oriented pattern of exploration is observed. Initial attempts at imitation may also be seen at this point.

Entity-entity relations (13 months) - The infant can appreciate the independence of entities and understand that they carry their own properties, including the potential to be independent forces in the environment. It is at this point that the infant can see one object in relation to another object without having to act on these objects. This ability enhances information acquisition by permitting consensual vocabulary, and the infant can also imitate new behaviors not previously seen and not currently in the child's response repertoire.

Symbolic Relations (21 months) - The child can draw symbolic relationships between entities in which one or more of the entities as well as the relationship itself may be symbolically coded. Sequences of actions can be remembered and imitated, and creative two-word utterances are possible.

Adapted from Rossetti, 1990, *Infant-Toddler Assessment*

When examining the evolution and history of cognition there are two additional theories that should be noted: the Core Knowledge Perspective, and Sociocultural Theory.

CORE KNOWLEDGE PERSPECTIVE

According to the Core Knowledge Perspective, infants begin life with innate special-purpose knowledge systems, or core domains of thought, each of which permits a ready grasp of new, related information and therefore supports early, rapid development of certain aspects of cognition (Berk). According to Berk, each core domain has a long evolutionary history, is essential for survival, and develops independently, resulting in uneven, domain-specific changes. Reviews of the accuracy of the Core Knowledge Perspective are mixed.

SOCIOCULTURAL THEORY

Piaget's theory, McCall's stages, and the Core Knowledge Perspective emphasize the biological side of cognitive development. These theories represent the child himself as the most important source when developing cognition. Lev Vygotsky believed that children are active seekers of knowledge, but he did not view them as solitary agents. In his theory, rich social and cultural contexts strongly impact cognitive development (Berk). He coined the label "zone of proximal development," during which a knowledgeable adult or even a proficient child supports the child

only as much as necessary in order for that child to display an emerging behavior. This type of scaffolding results in one ascertaining what kind of supports would be needed for a child to display a skill independently.

Vygotsky believed that children speak to themselves for self-guidance and self-direction. His approach included the influence of significant people in a child's life. He viewed language as the foundation for all higher cognitive processes, including, controlled attention, memorization, and planning. As children get older and tasks become easier, their self-directed speech declines and is internalized as silent inner speech. According to Vygotsky, language development broadens preschoolers' participation in dialogues with more knowledgeable individuals, who encourage them to master culturally important tasks (Berk). Limitations of Vygotsky's theory are thought to be that verbal dialogues are not the only means, or even the most important means through which children learn in some cultures, and that little is said about biological contributions of children's cognition. (Berk)

General Recommendations for Evaluation of Cognitive Development to Determine Eligibility for the Birth to 3 Program

If cognitive development is an area of concern, a teacher should be a member of the team. If a teacher is not on the team one member must have expertise in evaluation of both typical and atypical development and program planning. [HFS 90.08 (3)(a)] **(See pages 20-24 in the Introduction Section for procedures for initial evaluation.)**

In the evaluation of cognitive skills consider the following **components**:

Sensory Stimuli - The ability to respond to sensory stimulation (movement, visual, auditory, tactile, smell, taste) from the environment. The responses to sensory stimulation impacts all future learning for if a child is having difficulty responding to sensory stimuli it becomes challenging to learn from their environment or place meaning to events and happenings. A child may be under-responsive, over-responsive, or defensive to sensory stimuli or have difficulty regulating the information that occurs around them or to them. See Appendix 5 for characteristics that may occur if a child is having difficulty processing sensory stimuli.

Sensorimotor - How a child relates information from his or her sensory systems. This facilitates problem solving and preacademic skills. May include such skills as object permanence (the ability to understand that objects and people continue to exist when they are removed from the child's immediate sensory field), spatial awareness, means end, and causality (the ability to act on objects in order to produce a desired response).

Object Use/Schemes - The ability to use developmentally appropriate actions with objects. Schemes are a Piagetian concept defined as a basic unit of knowledge, a mental structure that represents both the internal and external aspects of the child's world (Rossetti, 1990). Schemes may relate to physical behaviors, mental images or complex belief systems (Rossetti). The development of symbolic use of objects follows the child's ability to use a wide range of schemes, and use them functionally with objects (Linder, 1993) When looking at early object use consider the type and range of schemes, scheme use and generalization, and linking schemes.

Problem Solving - Begins as an infant learns that the parent can solve problems or make interesting events occur, then that his or her own actions cause fun things to happen, and finally that through experimentation, verbal guidance, and/or thinking, he or she can solve problems encountered daily. (Linder) Reasoning and problem solving involve the child's mastery of the spatial environment, memory of events and actions, and the development of procedures or "rules" for action on the environment.

Imitation - The ability to match a visual and/or auditory model by imitating developmentally appropriate speech sounds, words, and motor actions. Imitation is critical skill for development in every domain, and facilitates turn taking, memory, and attention. Imitation is one of the primary ways children learn.

Memory - Ability to retain information. Measures the child's ability to retrieve information when given relevant cues. Allows for skills to be related to each other as information that is retained and is paired to other information (Linder). Requires ability to attend.

Causality - The ability to act on objects in order to produce a desired response.

Conceptual Development - These items measure the child's ability to grasp concepts and draw relationships among objects. May include matching, sorting, discrimination/classification, part/whole relationships (Battelle).

Discrimination/Classification - Often thought of as preacademic skills. The ability to differentiate stimuli and then categorize those stimuli into meaningful sets (Linder). These skills lay the foundation for reading and writing skills as well as higher-level thinking skills (Linder).

One-to-one Correspondence - Can be a part of discrimination/classification. One-to-one correspondence is a preacademic skill, and is demonstrated when a child assigns one object to each of two or more objects and/or people.

Sequencing Ability - The ordering of objects or concepts. Sequencing is related to classification, one-to-one correspondence, and linking of schemes as well as differentiating sensory input (Linder).

Play

- *Exploratory/Functional* - Simple muscular activities and repetitive muscular movements with or without objects are used in functional play; the child repeats or initiates actions (Rossetti, 1990).
- *Constructive* - The child learns the use of play materials and attempts to create something with play materials (Rossetti).
- *Dramatic* - The child takes on a role and pretends to be someone else using real or imagined objects (Rossetti).

Typical Developmental Milestones

Just as one must examine a variety of theories of development and combine components of each to gain a comprehensive and holistic view of the process of the cognitive development of the child, one must also consider various resources when viewing developmental milestones. Three sources of developmental milestone lists are displayed in Appendices 2, 3, and 4 to show differences in perspective and emphasis when using various sources and skill classifications. Milestones only represent overall age trends. Individual differences exist in the precise age at which each milestone is attained. All children do not exhibit all the milestones. Each milestone must be considered as part of the process of development and progression along a continuum of cognitive growth.

The chart of evaluation tools (Appendix 1) lists instruments that reflect different aspects of cognitive development. Appropriate tools should be chosen on an individual basis to address the particular child and the area in question.

MODIFICATIONS AND CLINICAL OBSERVATIONS

By using clinical observation and making modifications or adaptations to learn about how the child learns or is best able to interact and gain meaning from his environment we gain a better chance of identifying future learning challenges. When evaluating the aforementioned components of cognitive development and the milestones that follow, it is essential to look beyond the basic skill or task that is being evaluated. In order to gain an accurate and beneficial assessment of the child it is critical that the evaluator considers various factors that may impact the child's performance and make any needed modifications that may assist the child in completing the requested task. Clinical observation will assist in providing an accurate reflection of the child's abilities. Observations and modifications must be noted in your evaluation reports. Alterations to the evaluation tool must be noted, and scoring completed according to test protocol.

During the initial contact with the family it will be important to learn if there are any factors that may impact the child's ability to complete various evaluation components. Is there a vision, hearing, mobility, language or social/emotional conditions that may impact the child's performance? When factors are identified, it is essential that modifications be made during the evaluation so the child is able to successfully complete the required tasks. Be sure the child is positioned so he can manipulate and see evaluation items. If a child has an expressive language delay offer responses by providing objects/pictures to choose from. If a condition is identified it may impact the evaluation tool that is used. Appendix 1 provides a variety of evaluation tools to choose from.

When the child's attention or sensory processing system is found to impact the child's performance once the evaluation process has begun, modifications can be made during the evaluation. Environmental modifications can be helpful when a child is seen to have difficulty processing or attending to the information provided. Experiment with removing and limiting stimuli and objects, moving the evaluation to a smaller space or table, changing your proximity to the child by moving closer or further away, lowering or softening your voice or singing, using familiar or comforting toys, providing time for the child to process and then respond to request, or using gestures or visual cues.

Observing how the child completes a task or request is helpful. Is the child only able to complete the task when modifications or prompting is provided? After the task has been modeled one time or several? Is lots of reinforcement and encouragement needed? Is the child able to generalize the skill? Observe the child's learning style. Does he learn visually, tacitly, through movement, by being an observer or by doing? Does the child connect meaningful to the idea or is there a rote learned response? Can the child form ideas during play? Is the child's response purposeful?

Identifying learning challenges in the early years of life are based on clinical observation and the emerging research on the developmental pathways involved in early learning and eventual mastery of reading, math, writing and organizing (*Diagnostic Manual for Infancy and Early Childhood* (2005). "These early learning challenges involve emotional and social capacities, auditory processing and language (including memory and retrieval), visuo-spatial processing, perceptual motor and motor planning (including visual memory, sequencing, and what is often referred to as nonverbal learning) capacities and sensory modulation." (ICDL-DMIC pg. 168).

Each of these individual areas, intertwined or separate, are the building blocks to successful learning.

The *Diagnostic Manual for Infancy and Early Childhood* (2005) developed by the Interdisciplinary Council on Developmental and Learning Disorders, defines and identifies learning challenges. Compromises in functional emotional developmental capacities, auditory processing and language, visuo-spatial capacities, regulatory-sensory processing patterns, or a combination of these have an impact on the Emerging Learning Challenges of reading and language arts, math, reading comprehension, written communication, and in organizing capacities (executive function)

By considering these factors during evaluation and assessment activities, we can inform the eligibility decision making process. We will prevent future difficulties for children if we are able to identify the specific areas they are having difficulty with in infancy and childhood and support them to obtain or have successful interactions with their environment so future learning difficulties are lessened or eliminated.

Patterns are identified in Appendix 5. *These tables are meant as guidelines and should not be used as diagnostic tools unless you are trained or certified in that area.*

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- Rossetti, L., (1990). *Infant-Toddler Assessment*, Boston: Little, Brown.

Appendix 1

Evaluation Tools (List is not exhaustive)

Tool	Comments	Authors	Publisher
A Clinical and Educational Manual for Use with the Uzgiris & Hunt scales of Infant Psychological Development	Standardized	Carl Dunst, 1980	Pro-Ed; Austin, TX:
Assessment, Evaluation, and Programming System for Infants and Children, Birth to Three Measurement, Vol. 1. (AEPS).	Criterion-referenced	Bricker, Bricker and Pretti-Frontczak, 1993	Paul H Brookes Publishing
Battelle Developmental Inventory, Second Edition	Norm-referenced Birth – 8	Jean Newborg, 2004	The Riverside Publishing Company
Bayley Scales of Infant Development	Norm-referenced	Nancy Bayley, 1993.	The Psychological Corporation
Carolina Assessment for Infants and Toddlers with Special Needs second edition	Criterion-referenced	Johnson-Martin, Jens, Attermeier & Hacker, 1991.	Paul H. Brookes Publishing Company
Developmental Assessment of Young Children (DAYC)	Norm referenced	J. K. Voress and T. Maddox, 1998	Pro-Ed; Austin, TX
Developmental Profile II (DPII)	Norm-referenced Infancy to 9 ½ years	Alpern G, Boll T, Shearer M., 1986.	Western Psychological Services
Early Intervention Developmental Profile	Criterion-referenced	Rogers, et.al., 1981	University of Michigan Press
Early Learning Accomplishment Profile for Young Children.	Criterion-referenced	1995	Kaplan Early Learning Company
Hawaii Early Learning Profile (HELP)	Criterion-referenced	Furano, et. al., 1994.	VORT Corporation
Infant-Preschool Play Assessment Profile	Criterion-referenced	Sally L. Flagler, 1996	Kaplan Early Learning Company
Infant-Toddler Developmental Assessment (IDA)	Norm-referenced	Sally Provence, Joanna Erikson, Susan Vater, and Saro Palmeri, 1995	The Riverside Publishing Company.
McCarthy Scale of Children's Abilities	Norm-referenced	Dorothea McCarthy, 1972.	The Psychological Corporation
Minnesota Child Development Inventory	Norm-referenced	Harold R. Ireton, 1992.	Behavior Sciences Systems, Inc.
Mullen Scales	Norm-referenced	Ellen M. Mullen, 1995.	American Guidance Services, Inc.
Transdisciplinary Play-Based Assessment (TPBA)	Criterion-referenced	Toni W. Lindner, 1993.	Paul H. Brookes Publishing Company

Appendix 2

Linder's Developmental Milestones

CATEGORIES OF PLAY

Age attained	Milestones
0-24 months	Exploratory of sensorimotor play
9-24 months	Relational or functional play (predominates from 15-21 months)
24 months+	Constructive play (predominates from 36 months on)
21-72 months	Representational/symbolic play
36 months+	Rough and tumble play

EARLY OBJECT USE

Age attained	Milestones
3-6 months	Focus on action performed by objects (banging, shaking)
6-9 months	Begins to explore characteristics of objects; range of schemes expand (e.g. pulling, turning, poking, tearing)
8-9 months	Begins to combine objects, relational play (e.g. objects in container)
9-12 months	Begins to see the relation between complex actions and consequences (opening doors, putting on lids)
12 months+	Acts on objects using a variety of schemes
12-15 months	Links schemes in simple combinations into a meaningful sequence (puts person in car and pushes car)
24-36 months	Links multischeme combinations into a meaningful sequence (puts paste on toothbrush, puts cap on tube, brushes baby's teeth)
36-42 months	Links schemes into complex script

SYMBOLIC AND REPRESENTATIONAL SKILLS

Age attained	Milestones
12-16 months	Simple pretend play directed toward self (eating, sleeping)
12-18 months	Can focus pretend play on animate and inanimate objects and others; combines simple schemes in action out familiar activity
18-24 months	Increased use of nonrealistic objects in pretending (similar to real); can have inanimate objects perform actions (doll washes self)
24-36 months	Can use more abstract representation of object in play; uses multischeme combinations (feed doll with bottle, pat it on back, put it to bed)
36-48 months	Plans out pretend situations in advance, organizing who and what are needed for role-play; events in play are sequenced into scenario that tells story
36-42 months	Can use imaginary objects in play; acts out sequences with miniature dolls (in house, garage, airport, etc)

IMITATION SKILLS

Age attained	Milestones
4-8 months	Imitates vocalizations and actions that are part of his or her repertoire
6-9 months	Imitates actions he or she can see performed that are in his or her repertoire
8-12 months	Imitates sounds and gestures not part of his or repertoire
9-12 months	Imitates unseen patterns composed of familiar actions
12-15 months	Imitates novel movements

IMITATION SKILLS (CONTINUED)

Age attained	Milestones
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12-18 months	Immediate imitation of a model
15-18 months	Imitates drawing of a stroke
18-24 months	Recognizes ways to activate toys in imitation of adult; Deferred imitation
21-24 months	Varies own imitation creatively from that of model
27-30 months	Imitates drawing of face
36-60 months	Demonstrates increasingly complex role imitation

PROBLEM-SOLVING SKILLS

Age attained	Milestones
6-9 months	Finds object after watching it disappear; Uses movement as a means to attain an end; Anticipates movement of objects in space; Attends to environmental consequences of actions; Repeats actions in order to repeat consequences
9-12 months	Demonstrates tool use after demonstration; Uses goal-directed behavior; Performs an action in order to produce result
12-15 months	Uses an adult to achieve a goal; Attempts to activate simple mechanisms; Rotates and examines three dimensional aspects of an object; Uses nonsystematic trial-and-error problem solving
18-21 months	Attends to shapes of things and uses appropriately; Uses some foresight before acting; uses tool to obtain a desired object; invents means to attain a goal through thought processes rather than just trial and error; Operates a mechanical toy; Can foresee effects or infer causes
24-27 months	Discriminates sizes
24-30 months	Can build with blocks horizontally and vertically
27-30 months	Relates one experience to another, using logic and knowledge of previous experiences; Can plan actions in his or her mind without acting them out; Can relate one experience to another using "if...then" logic
36-48 months	Can build vertical block structure requiring balance and coordination (9 blocks); Can put graduated sizes in order; Uses representational thinking in constructions

DISCRIMINATION/CLASSIFICATION SKILLS

Age attained	Milestones
2-6 months	Growing sense of difference between self and mother and mothers of others
6-9 months	Differentiates primary caregiver from others
9-12 months	Combines related objects
15-18 months	Begins to spontaneously cluster objects that share physical or functional similarities; matches objects with relational parts (round lid on tea pot)
16-19 months	Discriminates circle and square on formboard
24-27 months	Matches objects by color, shape and size; Recognizes part/whole relationships (can identify parts and the objects with which they go); discriminates size (can nest four cups)
24-36 months	Discriminates circle, square triangle; Matches object to picture of the object; Matches picture of object to another picture of object
30-33 months	Matches object that have the same function (comb and brush)
36-48 months	Can sort one criterion (shape or color) without getting confused

ONE-TO-ONE CORRESPONDENCE

Age attained	Milestones
24-36 months	Can count by rote to five; Understands concept of one; Can count two or three object
36-48 months	Can count up to five objects

SEQUENCING ABILITIES (SEE EARLY OBJECT USE FOR EARLY SEQUENCING ABILITIES)

Age attained	Milestones
36-42 months	Understands big, little
36-48 months	Understands questions about what is going to happen next
36-52 months	Understands tall, short

Taken from Linder, T (1993) *Transdisciplinary Play-Based Assessment (TPBA)*, Revised.

Appendix 3

Berk's Developmental Milestones

Some Cognitive Attainments of Infancy

Approximate Age	Exploration/ Problem Solving	Object Concept	Imitation
Birth-1 month	Newborn reflexes; Exploration with limited motor skills such as head turning and sucking	Awareness of size and shape constancy	Imitation of adults' facial features
1-4 months	Exploration with better coordinated motor skills, such as kicking, reaching and grasping; Limited anticipation of events	Use of motion and spatial arrangements to identify objects; Some awareness of object permanence	Deferred imitation of adult facial expressions - after 24 hours
4-8 months	Exploration using well-coordinated reaching, grasping, swiping, banging and other manual behaviors	Use of shape, texture and color to identify objects	Deferred imitation of adults' actions on objects after 24 hours
8-12 months	Intentional, or goal-directed behavior; Improved anticipation of events; Problem solving by analogy to other similar problems	Ability to retrieve an object from the first location in which it is hidden	
12-18 months	Exploration of objects by action on them in novel ways; Experimenting with actions when solving problems	Ability to search in several locations for a hidden object (A-B Search)	Deferred imitation across changes in context and after one to several months
18- 24 months	Sudden solutions to problems without overt experimentation with actions	Ability to find an object moved while out of sight (invisible displacement)	Imitation of actions an adult tries to produce, even if these are not fully realized; Deferred imitation of everyday behavior in make-believe play
Cognitive Attainment			
2-4 years	Shows dramatic increase in representational activity, as reflected in the development of language, make-believe, drawing, and understanding dual representation Takes the perspective of others in simplified, familiar situations and in everyday, face-to-face communication Distinguishes animate being from inanimate objects; Denies that magic alters everyday experiences Grasps conservation, notices transformation (reasons by analogy about physical changes), and gives logical causal explanations in simplified familiar contexts Sorts familiar objects into hierarchically organized categories Devises ideas about underlying characteristics (not just perceptual features) that category members share		

Berk, L. (2003) *Child Development, Sixth Edition.*

Appendix 4

Additional Cognitive Skills of Infancy (Kusmierak)

Memory

0-3 months	<p>Alternates glance between two visual stimuli</p> <p>Begins to associate environmental cues (Expects to be fed when held in feeding position)</p> <p>Recognizes parent</p>
3-6 months	<p>Adjusts behavior to visual, positional, or auditory cues (becomes alert upon hearing footsteps)</p> <p>Recognizes familiar object</p> <p>Makes anticipatory adjustment to being lifted</p>
6-9 months	<p>Anticipates when parent is leaving</p> <p>Waits for next step in routine</p> <p>Waves and looks responsively</p>
9-12 months	<p>Abandons goal when directed (plays with string attached to toy out of reach)</p> <p>Anticipates daily routine</p> <p>Readies in response to visual or verbal cue</p> <p>Shows surprise</p>
12-15 months	<p>Maintains goal without being distracted</p>
15-18 months	<p>Performs daily routines</p> <p>Anticipates routine for future events</p>
18-24 months	<p>Keeps goal in mind while shifting locations</p> <p>Uses environmental cues to anticipate future events</p> <p>Observes ongoing activities and recreates them later</p> <p>Avoids dangerous objects</p> <p>Expresses expectancy of an event</p> <p>Increases memory of location</p>
24-30 months	<p>Can think about past events</p> <p>Requests distant and absent objects</p> <p>Uses more subtle environmental cues to anticipate future events</p> <p>Recalls and repeats fragments of songs</p> <p>Follows two part direction</p>
30-36 months	<p>Remembers ideas for play</p> <p>Repeats two digit sequence</p> <p>Can dual focus</p> <p>Recalls and repeats simple songs</p> <p>Reconstructs social sequence appropriately at a later time (picks up phone, says hello, and calls for adult)</p>

Causality

0-3 months	<p>Cries as a signal Smiles contingently Repeats movements which are self pleasing Seeks sound/vision relationship Bats at objects, first accidentally and then with intent</p>
3-6 months	<p>Acts directly on objects to create outcomes (shakes, bangs) Attempts to engage adult when adult face is still and expressionless Perceives that another person can produce stimulation (laughs when tickled) Uses a variety of behaviors to engage others Causes actions that seem likely to continue interesting or pleasing displays</p>
6-9 months	<p>Uses behavior to have an interesting event repeated Attends to consequences of actions with interest Shows interest in how things work (looks for bell) Demonstrates definite attention</p>
9-12 months	<p>Uses gestures to gain attention of another person or make a request Uses objects to get adult attention Demonstrates interest in the actions of objects Repeats behavior to get a response</p>
12-15 months	<p>Attempts to activate a simple mechanism Uses adults as a means (brings wind up toy to adult) Uses purposeful gestures to make wants known</p>
15-18 months	<p>Uses adults as means Knows causes for actions exist outside himself (Lets ball roll down an incline)</p>
18-24 months	<p>Uses others as human means (directs adult hand) Gives directives to adults Approximates reactivation of objects Infers a cause, given its effect (seeks source of rolled ball) Begins to anticipate the outcome of an action</p>
24-30 months	<p>Requests that actions be instigated Recognizes operations of an increasing variety of mechanisms Reconstructs operational sequence at a later time to operate a toy Shows increasing capacity to infer a cause, given only its effects Shows increasing capacity to foresee an effect, given a cause Relates one experience to another using "if/then" logic</p>
30-36 months	<p>Uses adults as a resource when independent attempt fails Recognizes operation of an increasing variety of mechanisms Understands natural consequences</p>

Taken from Kusmierek, A., et al (1995). *Birth to Three Sequenced Team Assessment Resource*.

Appendix 5

Table1: Functional Emotional Developmental Capacities

Functional Emotional Developmental Level	Examples of Importance for Early Learning and Academic Skills
Level 1 Shared attention and Regulation (Begins at 0-3 months)	Necessary for attention to sights and sounds and, later, to words, letters, numbers, etc.
Level 2 Engagement and Relating (Begins at 2-6 months)	Necessary for engaging with the world (not being self-absorbed), learning about “reality,” and mastering all cognitive skills.
Level 3 Two-Way Purposeful Emotional Interactions (Begins at 4-9 months)	Necessary for “cause-and-effect” preverbal and verbal thinking and high level of logical thinking.
Level 4 Shared Social Problem Solving (Begins at 9-18 months)	Necessary for: <ul style="list-style-type: none"> • Pattern recognition, including discriminating quantity (more vs. less or bigger vs. smaller) as well as the recognition of number (quantity) • Recognition of deviation from a patterns and constructing new patterns, such as finding an object that’s hidden and bringing it into one’s visual range. • Multi-step problem solving
Level 5 Creating Ideas (Begins at 18-30 months)	Necessary for forming and using symbols in language, reading, math, planning, and problem solving
Level 6 Building Bridges Between ideas: Logical Thinking (Begins at 30-48 months)	Necessary for all learning, including: <ul style="list-style-type: none"> • Symbolizing quantity concepts • Matching symbols to letter patterns • Comprehending written and oral communication
Level 7 Multi-Cause, Comparative, Thinking (Begins at 4-6 years [48-72months])	Levels 7-9 are necessary for al learning, including: <ul style="list-style-type: none"> • The manipulation of numerical symbols in terms of relativistic gray-area thinking (e.g., multiplication, division) and thinking off an internal standard (e.g., algebra and, later on, calculus. • Comprehending sentences, paragraphs, and essays.
Level 8 Emotionally differentiated gray-area thinking (Begins at 6-10 years)	Being able to construct patterns of ideas at progressively higher levels of creativity and logic.
Level 9 Intermittent reflective thinking, a stable sense of self, and an internal standard (Begins at 9-12 years and beyond)	Self evaluative thinking evidenced in analyzing one’s own or another person’s oral or written communication, considering different options, creating “experiments” to prove or disprove a hypothesis, and using judgment.

“All the basic academic abilities, including reading, math, writing, and organizing, require mastery of these critical abilities to attend to the outside world, engage in interactive relationships, participate in complex social interactions that lead to pattern recognition, construct such meaningful symbols, and connect the different realms of experience together.” ICDL –DMIC pg 173

Table 2: Auditory Processing and Language

Age and Level	Examples of Auditory Processing and Language Skills
0-3 months Shared Attention and Regulation	Attends to the world of speech sounds and their production, e.g., <ul style="list-style-type: none"> • Attention to caregiver’s mouth and tongue actions • Attention to caregiver’s trill sounds and tongue clucking sounds • Attention to additional sounds
2-6 months Engagement and Relating	Synchronous sound productions with increasing capacity to: <ul style="list-style-type: none"> • Discriminate and make sounds (e.g., tonal variation), vowel sounds with synchronous consonant sounds and mouth movements • Synchronize sound and mouth movements with caregiver’s vocal rhythms
4-9 months Two-Way Purposeful Emotional Interactions	Reciprocal exchange of expanding sound productions, e.g., <ul style="list-style-type: none"> • Consonants • Vowels • Syllables, such as “dada” “gaga” “baba,” etc. • Beginning emergence of words up, out, etc.
9-18 months Shared Social Problem Solving	Increasing reciprocal use of vocal patterns, including words, e.g., <ul style="list-style-type: none"> • Expansion of verbs • Expansion of nouns • Use of two-word phrases • Compliance with two-word commands. Beginning comprehension of spoken language. <i>For all, but specifically for math:</i> Coordinates touching and quantifying to judge specific quantity
18-30 months Creating Ideas	Combining words into ideas Begins to form visual images for word meanings. Increasing comprehension of spoken language and, eventually, complex ideas.
30- 48 months Building Bridges Between Ideas: Logical Thinking	Exchanging ideas (e.g., why, how, when, etc.) Perceives the parts/whole concepts of sound patterns in words (e.g., syllables) both receptively and expressively.
4-6 years [48-72 months] Multi-Cause, comparative, thinking	Begins to connect sounds (duration, pitch, and elements) and expressively. Begins to connect sounds, words and shapes, including letters, e.g., <ul style="list-style-type: none"> • Creates a multisensory motor experience of the basic shapes (e.g., walks, pantomimes, or draws straight line, curves, slants as named).
4-6 Years [48-72 months] Multi-Cause, Comparative, Thinking	<ul style="list-style-type: none"> • Identifies, then copies and names shapes and design • Writes some letters • Follows 4-step communication Names and identifies sounds and letters of alphabet in and out of sequence (for all, but specifically for reading and language arts) <u>Between 4 – 5 years:</u> Begins to integrate awareness of auditory, visual, and motor components of speech sounds and place and manner of articulation. <u>5 years (60 months) on:</u> Becomes aware of nature of errors enabling monitoring and self-correction (<i>for all, but specifically for reading and language arts</i>) <i>For all, but specifically for reading comprehension:</i> Comprehension of written language as reading ability develops

“Mounting research supports the importance of the infant and young child’s ability to discriminate and recognize sound patterns, and later the identity, number, and order of individual sounds within words, as the basis for reading and spelling (Calfee, Lindamood, & Lindamood, 1973; Shankweiler & Liberman, 1989; Heilman, Voeller, & Alexander, 1996; Lindamood & Lindamood, 2005.)” ICDL-DMIC Pg 174

Table 3: Summary of Visuospatial Capacities by Age

Visuospatial Capacities Indicate the overall capacity for expected age levels (Note that Year 1 is actually birth to first year, Year 2 is firstbirthday to second birthday, and so on)
<p>1. Body Awareness and Sense Year 1: Purposeful, coordinated movement, guided by vision and sound. Year 2: Purposeful movement for interactive play (rolling a ball back and forth) Year 3: Awareness of body boundaries of self and others Year 4: Awareness of body affecting others in space and time Year 5: Awareness of body for coordinated actions</p>
<p>2. Location of the Body in Space Involves location of own body parts in relationship to each other, location of body as a whole in its immediate surroundings; and location of the body in terms of the broader environment. Year 1: Beginning movement in space Year 2: Observes things move in space in relationship to self Year 3: Purposeful movement in relation to other moving objects Year 4: Planning and organization of movement prior to the action Year 5: Becoming a team player</p>
<p>3. Relation of Objects to Self and Other Objects and People Year 1: Reciprocal interactions with people and things Year 2: Self-control in relation to other people and things Year 3: Development of symbols Year 4: Rules and expectations Year 5: Boundaries and Membership</p>
<p>4. Conservation of Space Year 1: Space is uni-dimensional Year 2: Space is three-dimensional and movement in space is alterable Year 3: Relationship of object in three dimensional space Year 4 Relationship of object to object in space Year 5: Combining time and space</p>
<p>5. Visual Logical Reasoning Year 1: Knowledge through sensorimotor action Year 2: Moving from action knowledge to planning the actions Year 3: Understanding the cause and effect of the action Year 4: Stability of early visuospatial thinking Year 5: Logical thinking to solve problems</p>
<p>6. Representational Thought (Drawing, Thinking, Visualizing) Year 1: Direct representation Year 2: Words, pictures, gestures, and toys Year 3: Early imaginative play Year 4. More purposeful representations Year 5. Matching space to representational thought</p>

“Visuospatial capacities are often attended to in considering early learning and academic skills, but not in the sufficient depth or scope required for a full understanding of their importance. For example, understanding math even at its most elementary level of addition and subtraction requires comprehending one-to-one correspondence. This means that the child doesn’t simply count, but can match the number he says to the number of objects he sees in front of him, and can manipulate these objects and see how a change in their pattern would relate to a change in the number he applies to them.” ICDL-DMIC Pg 177

Sensory Over-Responsivity

Suggested Observation
<p style="text-align: center;">Visual Domain</p> <p>Complex, cluttered, moving, novel, and/or high intensity visual stimuli over-excite, anger or overwhelm Wears sunglasses or caps all the time</p>
<p style="text-align: center;">Tactile Domain</p> <p>Consistently over-responsive to touch (pulls body part away when touched); discomfort when people too close Over-sensitive to certain types of clothing (e.g. labels, long/short sleeves, certain fabrics) or activities of daily living (e.g. hair or hand-washing, bathing)</p>
<p style="text-align: center;">Vestibular/Proprioceptive Domain</p> <p>Avoids/becomes upset in certain positions (e.g., prone, upside down) or uneven surfaces Uncomfortable, insecure when walking with others who may push them</p>
<p style="text-align: center;">Visceral Responses</p> <p>Does the child need to go to the bathroom frequently? Does the child's body go still or seem to shut down when he has an emotional reaction? Shows somatic symptoms indicating physiological over-reactivity (e.g., irritable bowel syndrome, migraines, constant stomach aches)</p>
<p style="text-align: center;">General</p> <p>Shows overt signs of 'fight, flight or freeze' when presented with particular sensory stimuli; may seem irritable, avoidant Withdraws from/tries to escape a toy or sensory input</p>

"Children who are extremely visually over-responsive sometimes find the contrast between dark print on a white page too dramatic and find it difficult to focus in on individual letters, syllables, words or phrases. Over-responsivity to sounds can contribute to making it difficult for some children to discriminate sound patterns and, therefore, connect sounds to letters and eventually words." ICDL- DMIC Pg 178

Sensory Under-Responsivity

<p style="text-align: center;">Suggested Observations</p> <p>Fails to attend or orient to salient stimuli. Fails to respond to name when occupied; overly absorbed. Shuts down; stops interacting. Overly focused to some stimuli (e.g., blinking lights, moving wheels). Investigates new object only briefly; fails to engage. Shows no or limited response to an obnoxious sounding toy. Fails to orient to sounds as expected. Lacks awareness of bodily sensations.</p>

"Children who are under-responsive to sensation such as sound, sight, and touch may tend toward self-absorption (e.g., the teacher's voice doesn't attract their attention) and find it hard to listen or follow directions. In the extreme, self-absorption can compromise attention to the outside world and, therefore, comprehension of reality and logic (e.g., the child escapes into fantasy)." ICDL-DMIC Pg 179

Sensory Seeking

Suggested Observations

Seeks high intensity input in activity; appears unable to get enough; engages with high energy.
 Resists moving from high intensity activity; resists increasing complexity of activity.
 Child seems unaware of potential danger or pain, or the consequences of their actions.
 Increasing sensory input results in increasing impulsivity, behavioral disorganization.
 Responses to input escalate, behavior gets out of control.

“For children who are sensory seekers, the need for constant stimulation is difficult to fulfill and may be particularly problematic in environments where children are expected to sit quietly such as in school...” ICDL-DMIC Pg 86

Sensory Discrimination Disorder

Suggested Observations

Auditory

Fails to orient to most sounds (loud/soft) when otherwise engaged.
 Does not discriminate name from background noise.

Visual

Shows inadequate eye-hand coordination: ability to visually anticipate object movement.
 Fails to scan environment and spot what looking for in near or far space.
 Fails to show age-appropriate figure-ground skills.

Vestibular/Proprioception

Cannot sense direction of movement in space, eyes open and closed.
 Does not change planes of movement in play.
 Shows inappropriate postural and balance reactions in response to movement.
 Poor awareness of movement makes safety a concern.

Tactile/Kinesthetic

Cannot identify objects by feel.
 Unaware of location of bump/bruise; identifies finger touched, vision occluded.
 Senses if socks twisted, shoes on wrong foot, hair needs combing, fingers in wrong place in gloves
 Fails to actively explore tactile characteristics of objects.

Olfactory and Gustatory

Cannot identify typical smells and tastes.
 Has specific preference for different foods for his age (spicy, “pop rocks”).

Proprioceptive

Does not investigate objects with in hand manipulation or adjust to qualities of materials.
 Poorly grades movements and applies inappropriate force.
 Cannot feel where feet/body are without looking.

*“Discrimination requires higher level of cognitive functions than modulation and is not automatic.” ICDL-DMIC Pg 295
 The ability to distinguish shapes or letters, and follow through with tasks or directions may be difficult for a child with discrimination difficulties.*

Postural Disorder

Suggested Observations

Cannot stabilize posture when challenged; sitting on stable or dynamic (unstable) surfaces.
 Difficulty maintaining postural alignment and stability when standing/sitting at desk or in chair completing table top tasks.
 Does not automatically use non-dominant hand to assist dominant hand in fine motor tasks.
 Difficulty maintaining postural alignment and balance while moving body.
 Difficulty with equilibrium, rotation, weight shift, crossing midline.
 Difficulty with stability on different surfaces e.g., climbing, walking on foam, walking on moving surfaces.
 Difficulty with bilateral symmetrical activities.
 Difficulty with bilateral reciprocal movements.
 Muscle tone and strength insufficient to accomplish antigravity activities and functional movement.
 Facial expressions fixed during posturally challenging activities.
 Difficulty with near/far gaze shift.
 Does not have developmentally expected physical fitness as evidenced by endurance, strength measures.

“Postural control provides a stable yet mobile base for refined movement of the head, eyes, trunk, and limbs... For example, when writing at a desk, they (child with postural difficulties) may bend far over the paper or lay their head on their arms as they write” ICDL-DMIC Pg 92 A child with postural control issues needs to focus their energy on moving their body and maintaining their body in space rather than learning from their surroundings.

Dyspraxia

Suggested Observations

Has difficulty with action-based problem solving.
Can figure out what to do but has trouble with how to do it.
Appears clumsy and awkward in gross and/or fine motor tasks.
Has difficulty with motor imitation.
Unable to take small parts to make a whole.
Difficulty replicating space and form in 2D and 3D constructions.
Does not show joy in success; not motivated to persist with somewhat difficult activities requiring active problem solving.
Does not initiate activities, or initiates only when activity is familiar, or is he/she able to initiate creative and novel play.
Is inefficient, ineffective in reaching goal of activity.
Pace/rate of activity is not age-appropriate.
Difficulty adapting to changes in task demand, new task demand, or novel situation.
Difficulty sequencing tasks in an age appropriate manner.
Talks self through motor sequences; tries to get out of doing by talking.

“Children with motor planning problems (dyspraxia) may find it difficult to carry out the sequence of motor actions required for writing, lining up columns in math or following directions.” ICDL-DMIC Pg 179