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Curriculum and Developmental Assessment Research Foundation

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LEARNING BEYOND PAPER RESEARCH FOUNDATION

The Learning Beyond Paper (LBP) curriculum is built upon a solid foundation of best practices in the fields of child development and early childhood education. This research foundation summarizes contemporary research and theories that are central to the core of LBP. These elements provide context for our curriculum and serve as a basis for the skills introduced and developed progressively throughout the LBP scope and sequence. We recognize that development and learning are dynamic processes that reflect the multifaceted relationship between a child's biological characteristics, cumulative experiences, and their environment. Each component influences the other and impacts future development (National Association for the Education of Young Children, 2020).

The purpose of this document is to explicitly outline the theories and research that undergird the LBP curriculum. We believe that children are ready to learn from birth and are equipped to actively explore and develop an understanding of their world (National Research Council, 2005; Shonkoff & Phillips, 2000). Our curriculum prioritizes skills and activities that organize and incorporate diverse aspects of learning across subject areas, bridging children's classroom experiences with their lives. Our theoretical roots can be traced to the writings of Dewey, Piaget, and Vygotsky. These philosophers maintained that knowledge is built upon experience, and active engagement is a necessary ingredient for optimal learning. They stressed the importance of learning with purpose.

Dewey viewed education as an ongoing process built upon real-life experiences. He maintained that curriculum should consist of opportunities to practice and experience real-life situations that reflect the culture and values of the child's family and community. Dewey asserted that to be considered educational, an experience must build upon a child's prior knowledge, increase the child's understanding of their world, and prepare them to live a more complete life (Dewey, 1938).

The belief that children learn through active engagement and experimentation with authentic materials and experiences was central to Dewey's philosophy (Mooney, 2000). The National Research Council and Institute of Medicine (2000) echo these sentiments by suggesting that early childhood curriculum be both authentic and meaningful. They assert that thicker and more numerous connections are made within a young child's brain when multiple channels of sensory stimulation are presented through genuine experiences. Dewey (1916) posited that children should be actively and collaboratively involved in the learning process. Truly educational experiences, according to Dewey, must increase a child's awareness of their world. He held to the fundamental ideals that education should be child-centered, active, interactive, and involve social interactions (Mooney, 2000).

Piaget's theories build upon the belief that the developing child constructs knowledge as they interact with, and assign meaning to, people, places, and objects in their environment (Mooney, 2000). His cognitive developmental constructivist theory emphasizes the significance of a child's active involvement with materials and the value of experience as an avenue to learning (Hendrick & Weissman, 2006). Piaget stressed the importance of problem-solving, suggesting that discovery is key to learning and understanding. He maintained that discovery and rediscovery are central to the process of knowledge construction. Because children do not receive knowledge passively, they must actively encounter meaningful problems to solve (Piaget, 1973).

Vygotsky (1978) further emphasized the active role of learners. One of the overriding themes in his work is that children receive knowledge from their culture and through interaction with adults and peers (Vygotsky, 1962). He maintained that the substance and disposition of a child's developing cognitive functions are formed by the people and cultural connections in their environment (Bodrova, 2003). His sociocultural constructivist theory proposes that learning is a two-step process. It first occurs socially as a result of interpersonal interactions and then transpires psychologically as the child internalizes the information. Vygotsky further suggested that social and cognitive development act in conjunction with one another, making learning a communal process (Mooney, 2000).

The Learning Beyond Paper Research Foundation outlines the latest research and theories in early childhood education, providing the essential basis for the skills reinforced throughout the Learning Beyond Paper assessment. Recognizing that child development is a gradual and continuous process influenced by cumulative experiences over time, this foundation helps educators understand the principles and research underlying how and why a child's knowledge and abilities develop. It also provides insights into the skills, concepts, and approaches to learning that most effectively support the overall growth and development of each child.

At Learning Beyond Paper, our curriculum philosophy is deeply rooted in the understanding that each child is a unique individual, growing and learning within the context of their family, community, and cultural background. We believe that children learn best through play-based, hands-on experiences that engage their natural curiosity and creativity. This philosophy is reflected in our assessment framework, which is designed to nurture the whole child—cognitively, socially, emotionally, and physically.

The Learning Beyond Paper assessment framework is aligned with our curriculum's core principles:

1. **Child-Centered Learning**: Our curriculum and assessment prioritize the needs and interests of the child, recognizing that children learn best when they are actively engaged and interested in what they are learning. The assessment tracks each child's developmental progress across multiple domains, ensuring that learning experiences are tailored to support individual growth.
2. **Play-Based Learning**: We embrace the power of play as a primary method of learning. Through play, children explore the world, experiment with new ideas, and develop critical thinking skills. Our assessment is designed to observe and measure the developmental milestones that occur naturally during play, providing educators with a comprehensive view of each child's growth.
3. **Whole-Child Approach**: Our curriculum is designed to support the development of the whole child. We understand that cognitive development is interconnected with social, emotional, and physical growth. The Learning Beyond Paper assessment reflects this holistic approach by encompassing all areas of development, ensuring that each child's needs are met in a balanced and integrated manner.
4. **Cultural Responsiveness**: We value the cultural diversity of the children and families we serve. Our assessment framework is designed to be inclusive and respectful of diverse cultural practices, languages, and traditions. By emphasizing cultural reciprocity, we ensure that the curriculum and assessment are relevant and meaningful to all children, fostering a sense of identity and belonging.
5. **Family Engagement**: We believe that families are vital partners in the educational process. Our curriculum encourages ongoing communication and collaboration with families, and the assessment system provides a tool for educators and families to work together to support each child's development. Through individualized child

portfolios, we document each child's learning journey, creating a shared understanding of their progress and achievements.

This document highlights the developmental skills that research has validated as being critical for success in school and later in life. These skills are presented on a developmental continuum, reflecting the ongoing process of growth and development. The continuum also represents the behavioral shifts that occur over time, leading to a reorganization of the child's cognitive, social, emotional, and physical processes (Beers, 2019). These skills and developmental benchmarks are embedded within all components of the Learning Beyond Paper assessment and curriculum.

The Learning Beyond Paper assessment framework is organized into seven key developmental domains:

Developmental Domain	**Subdomains**	**Total Skills Monitored**
Physical Development	● Health & Well Being ● Use of Senses ● Motor Skills	7
Approaches to Play and Learning	● Initiative and Exploration ● Attentiveness and Persistence ● Play	12
Social Development	● Developing a Sense of Self ● Self-Regulation ● Developing a Sense of Self with Others	10
Language and Emergent Literacy	● Receptive Language (Listening) ● Expressive Language ● Early Reading ● Early Writing	15
Cognitive Development- Mathematics	● Numbers and Quantity ● Measurement and Comparison ● Geometry and Spatial Thinking	12
Cognitive Development-Science	● Scientific Skills and Methods ● Earth and Space ● Living Things ● Physical Science ● Interaction With the Environment	13

Creative Development	• Creative Movement and Dance • Visual Arts • Music • Drama	12
Cognitive Development-Cognitive Processes	• Thinking Skills • Problem-solving • Engineering and Technology	12

Each domain is designed to reflect the critical areas of early childhood development, encompassing cognitive, social, emotional, and physical growth. These domains are aligned with best practices in early childhood education and are supported by a robust body of research that emphasizes the importance of a comprehensive approach to early learning.

The Learning Beyond Paper assessment identifies key skills and learning goals within these domains, with observable benchmarks that track ongoing development from infancy through pre-kindergarten. The assessment framework is designed to be flexible and responsive, allowing educators to scaffold learning goals according to each child's developmental stage and individual needs. This approach is grounded in Vygotsky's (1978) theory of the "zone of proximal development," where learning occurs most effectively with the right level of support and challenge. This theory is well recognized within early childhood learning and developmental literature (Irshad et al., 2021; Shabani, et al., 2010; Silalahi, 2019).

The Learning Beyond Paper assessment and curriculum system offers educators, families, and educational institutions a comprehensive and multidimensional view of a child's learning journey. It maps the child's progress along a developmental continuum of skills, documenting this journey through individualized portfolios. The system is designed to be used in conjunction with the Learning Beyond Paper curriculum or any developmentally appropriate curriculum, providing a flexible tool that supports collaboration between educators and families.

The Learning Beyond Paper assessment also emphasizes the importance of cultural reciprocity, which is based on mutual respect, communication, and collaboration in acknowledging and valuing culturally based beliefs, values, and assumptions (Day & Parlakian, 2003; Gonzalez-Mena, 2014). The framework is inclusive of all children, including those who are developmentally advanced, those with developmental delays or disabilities, and those who are dual-language learners.

This research foundation, intertwined with our curriculum philosophy, ensures that the Learning Beyond Paper assessment remains a robust and effective tool for supporting the holistic development of young children, helping them achieve their full potential in a diverse and ever-changing world.

Physical Development Domain

The Physical Development domain in the Learning Beyond Paper assessment encompasses the essential growth and coordination of a child's body, focusing on gross and fine motor skills, sensory processing, and overall health and well-being. This domain is critical in supporting children's ability to engage with their environment, develop independence, and establish lifelong healthy habits (Cameron et al., 2016).

The assessment is structured around three key subdomains:

1. **Health and Wellbeing:** This subdomain emphasizes the importance of establishing healthy habits and safe practices from an early age. Skills in this area include the development of routines for sleep, active play, self-care, and safety awareness. Research indicates that consistent sleep patterns and regular physical activity are crucial for children's cognitive and physical development (Mindell et al., 2017; Timmons et al., 2019). Children's ability to recognize and respond to their own health needs, as well as understand and follow safety rules, is vital for their overall development and well-being (Morrongiello et al., 2014).
2. **Use of Senses:** Sensory experiences are integral to how children explore and understand the world around them. This subdomain assesses children's ability to process and respond to sensory information, such as sight, touch, hearing, smell, and taste. The development of sensory awareness and body orientation in space is crucial for coordinating movements and interacting effectively with people and objects (Bremner & Lewkowicz, 2019). Early sensory experiences are essential for the development of motor skills and cognitive abilities, as they help children make sense of their environment and learn how to navigate it (Adolph & Hoch, 2019).
3. **Motor Skills:** The Motor Skills subdomain focuses on the development of both gross and fine motor skills. Gross motor skills involve the use of large muscles for activities such as crawling, walking, and running, while fine motor skills require precise movements of smaller muscles, such as those in the hands and fingers, for tasks like grasping, drawing, and manipulating objects. These skills are foundational for children's physical independence and their ability to participate in more complex activities as they grow (Logan et al., 2015; Goodway et al., 2020). Proper development of these motor skills is also linked to future academic success, as they are closely tied to the ability to focus, control impulses, and engage in structured learning activities (Cameron et al., 2016).

The Learning Beyond Paper assessment includes a comprehensive approach to evaluating seven key skills across these three subdomains, ensuring that children are supported in their physical development from infancy through pre-kindergarten. By fostering growth in these areas, the assessment helps children build the necessary physical abilities to explore their world, take care of themselves, and engage in learning experiences with confidence and competence.

Health and Wellbeing Subdomain

The Health and Wellbeing subdomain is central to a child's early development, encompassing the establishment of healthy habits, understanding of safety, and recognition of personal health needs. In early childhood, developing healthy sleep patterns, regular physical activity, and self-care routines are critical for long-term physical and mental health. Research shows that adequate sleep is directly linked to cognitive functioning and physical growth, while regular physical activity promotes motor skill development and strengthens muscles (Mindell et al., 2017; Timmons et al., 2019).

As children grow, their ability to recognize and respond to safety cues becomes increasingly important. This skill helps them navigate their environment safely, fostering independence and confidence (Morrongiello et al., 2014). Furthermore, early participation in self-care routines fosters a sense of autonomy and personal responsibility, laying the foundation for more complex routines and habits in later childhood (Cermak & Dahlin, 2015).

By the time children reach the preschool and pre-kindergarten stages, they should be able to independently carry out self-care routines and understand basic safety rules. These skills are crucial indicators of readiness for more structured learning environments and social interactions, ensuring that children are equipped with the knowledge and habits necessary for lifelong health and safety (Cermak & Dahlin, 2015; Morrongiello et al., 2014).

Key Skills in the Health and Wellbeing Subdomain

- **Infant Stage:**
    - Sleeps well and shows alertness during waking periods
    - Initiates active play and engages in some physical activity
    - Responds to verbal or physical signals of danger
    - Shows beginning awareness of personal health and self-care needs by participating when their hands and face are cleaned after a meal, or by participating during dressing routines
- **Young Toddler Stage:**
    - Sleeps well and shows alertness during waking periods
    - Initiates active play and engages in some physical activity
    - Responds to safety words such as "Stop!" or "Hot!"
    - Reacts to simple directions to support safety
    - Shows beginning awareness of personal health and self-care needs by attempting to clean their hands and face after a meal, or by assisting in putting away personal belongings (e.g., bibs to the hamper or shoes by the door)
    - Puts out arm or leg to help with dressing
    - Starts to use objects correctly, such as drinking from a cup or brushing their hair
    - Begins to remove clothing (e.g., pulls off socks and shoes)

- **Older Toddler Stage:**
    - Actively participates in physical activity for three to five minutes at a time
    - Identifies and tries to avoid dangers with assistance
    - Makes adults aware of health and self-care needs and seeks assistance
    - Distinguishes between food and non-food items
    - Shows interest in and tries new foods
- **Preschool 3 Stage:**
    - Begins to initiate self-care and personal hygiene routines with adult support
    - Verbalizes simple safety rules
    - Cooperates with adults when in unsafe situations
- **Pre-Kindergarten Stage:**
    - Initiates and carries out self-care and personal hygiene routines with minimal adult support
    - Reminds peers and adults of established safety rules in the classroom, on the playground, and in the community
    - Shows awareness of dangerous situations and responds with some knowledge of established safety procedures

Use of Senses Subdomain

The Use of Senses subdomain is crucial in early childhood as it underpins how children explore, understand, and interact with their environment. Sensory experiences—such as sight, touch, hearing, smell, and taste—are among the first ways that children gather information about the world around them. These sensory inputs are vital for cognitive and motor development, as they help children make sense of their surroundings and develop the necessary skills to interact effectively with people, objects, and spaces (Bremner & Lewkowicz, 2019).

As children grow, their ability to process and integrate sensory information becomes more refined. This sensory processing is fundamental for developing motor skills and coordinating movements, which are essential for tasks such as reaching, grasping, walking, and navigating spaces without bumping into objects. Proper development of sensory processing during early childhood is linked to the child's ability to perform more complex tasks later in life, including academic activities that require focus and fine motor precision (Adolph & Hoch, 2019).

The Learning Beyond Paper assessment focuses on assessing how children use their senses to explore their environment, how they demonstrate body awareness, and how they interact with objects and people around them. By fostering these abilities, the assessment helps ensure that children develop the sensory-motor integration needed for successful learning and interaction within their environment.

Key Skills in the Use of Senses Subdomain

- **Infant Stage:**
    - Moves body through space
    - Exhibits body awareness and starts to move intentionally
    - Turns head towards sounds
    - Responds to faces and touch with smiles
    - Follows moving objects with eyes
    - Reaches out to grasp and hold an object
    - Explores objects with mouth and hands
    - Responds to what they see, hear, touch, taste, and smell
    - Manipulates objects to see what will happen

- **Young Toddler Stage:**
    - Moves body through space
    - Exhibits body awareness and starts to move intentionally
    - Begins some imitation of hand play such as waving bye-bye and clapping hands

- Responds to what they see, hear, touch, taste, and smell
- Manipulates objects to see what will happen
- Enjoys a greater variety of smells and tastes

- **Older Toddler Stage:**
  - Acts and moves with intention and purpose with some adult assistance
  - Uses trial and error to discover how the body fits and moves through space
  - Engages in sensory experiences with some adult assistance
- **Preschool 3 Stage:**
  - Utilizes sensory input and body awareness to understand how the body interacts with people and objects
  - Shows purpose and coordination when interacting with people and objects
  - Participates in a variety of sensory experiences that combine two or more senses together (seeing and hearing, feeling, and tasting, etc.)
- **Pre-Kindergarten Stage:**
  - Shows purpose and coordination when interacting with people and objects
  - Moves around the learning environment with intention and recognizes differences in direction, distance, and location
  - Demonstrates awareness of their own body in space
  - Demonstrates awareness of their own body in relation to others' body space and stationary objects
  - Actively participates in sensory experiences and combines multiple senses to intentionally learn about objects/materials

Motor Skills Subdomain

The Motor Skills subdomain is foundational to a child's physical development and overall ability to interact with the world. Motor development begins at birth and continues through early childhood, with children progressing from simple movements to more complex tasks that require coordination and control. This subdomain encompasses both gross motor skills, which involve the large muscles used in activities such as crawling, walking, and running, and fine motor skills, which involve the smaller muscles used for precise tasks such as grasping objects, drawing, and using utensils (Logan et al., 2015).

Gross motor skills are essential for children's physical health, as they allow them to engage in activities that build strength, coordination, and endurance. These skills are crucial for play and physical activities, which are important not only for physical fitness but also for social interaction and cognitive development (Goodway et al., 2020).

Fine motor skills, on the other hand, are critical for tasks that require precision and control, such as writing, cutting, and buttoning clothes. These skills are closely linked to cognitive development and academic success, as they support children's ability to focus, control impulses, and engage in structured learning activities (Cameron et al., 2016).

The Learning Beyond Paper assessment focuses on evaluating how children develop and demonstrate these motor skills at different stages of early childhood. By supporting the development of both gross and fine motor skills, the assessment ensures that children build the necessary physical abilities for independence, learning, and overall well-being.

Key Skills in the Motor Skills Subdomain

Develops/Demonstrates Gross Motor Skills

- **Infant Stage:**
    - Develops control of head and back, progressing to arms and legs
    - Demonstrates beginning coordination and balance, often with support
    - Rolls over in both directions (front to back, back to front)
    - Begins to use hands and feet to bat or kick at objects
    - Begins to sit without support
    - When standing, supports weight on legs and might bounce
    - Rocks back and forth, sometimes crawling backward before moving forward
- **Young Toddler Stage:**
    - Develops control of head and back, progressing to arms and legs
    - Demonstrates beginning coordination and balance, often with support
    - Gets to a sitting position without help
    - Pulls up to stand

- Walks holding on to furniture
- May take a few steps without holding on
- May stand alone

- **Older Toddler Stage:**
  - Gains control and coordination of body movements
  - Develops emerging coordination and balance
- **Preschool 3 Stage:**
  - Shows increased balance, coordination, and endurance
  - Maintains balance and posture when moving from one position to another during indoor and outdoor play
- **Pre-Kindergarten Stage:**
  - Coordinates the use of large muscles
  - Demonstrates balance, coordination, and endurance
  - Coordinates the use of large muscles to perform more complex tasks
  - Demonstrates balance, coordination, and endurance and builds muscle strength and flexibility

Develops/Demonstrates Fine Motor Skills

- **Infant Stage:**
  - Begins to develop eye-hand coordination
  - Develops grasp reflex
  - Uses a raking grasp to pull objects closer and can hold toys and move them from one hand to another
- **Young Toddler Stage:**
  - Coordinates motions using eyes and hands
  - Grasps objects and toys and explores them with fingers, hands, and mouth to figure out what they can do
  - Develops grasp reflex and may use a spoon to scoop food
  - Drops or places small items in a container

- **Older Toddler Stage:**
  - Gains control of hands and fingers
  - Demonstrates eye-hand coordination and participates in a variety of activities to enhance coordination

- Uses tools and different actions on objects

- **Preschool 3 Stage:**
  - Coordinates the use of hands and fingers
  - Adjusts hands, arms, and fingers to increase precision with tasks that require hand-eye coordination
- **Pre-Kindergarten Stage:**
  - Coordinates the use of hands and fingers to manipulate smaller objects with increasing control
  - Adjusts arms, hands, and fingers to refine grasp and manipulate tools and objects with increased precision
  - Coordinates the small muscles in the face (lips, cheeks, tongue) to carry out increasingly complex oral-motor skills
  - Coordinates the use of wrists, hands, and fingers to manipulate small objects with ease
  - Adjusts arms, wrists, hands, and fingers to refine grasp and perform tasks that require small-muscle strength and control
  - Coordinates the small muscles in the face (lips, cheeks, tongue) to carry out increasingly complex oral-motor skills

Approaches to Play and Learning Domain

The Approaches to Play and Learning domain in the Learning Beyond Paper assessment is focused on nurturing the intrinsic curiosity, initiative, persistence, and creativity that children naturally exhibit as they engage with their world. This domain is vital for supporting children's cognitive, social, and emotional development, providing a foundation for lifelong learning and adaptability. Through play and exploration, children develop essential skills that enable them to understand their environment, solve problems, and face new challenges with confidence and resilience (Whitebread, et al., 2017).

The assessment is structured around three key subdomains:

Initiative and Exploration: This subdomain emphasizes the importance of children taking the lead in their learning experiences. It includes skills related to how children initiate activities, explore their surroundings, and seek out new experiences. When children are encouraged to take initiative and explore, they develop stronger problem-solving abilities, creativity, and a deeper sense of autonomy (Gopnik, 2016). These skills are foundational for academic success and lifelong learning, empowering children to engage actively and confidently in their educational journeys.

Attentiveness and Persistence: Persistence and the ability to focus on tasks are critical components of effective learning. This subdomain assesses how children maintain attention, stay focused on activities, and demonstrate perseverance in completing tasks, even when faced with challenges. Research has shown that children who develop strong attentiveness and persistence are better equipped to overcome obstacles and achieve their goals, laying the groundwork for academic achievement and personal success (Duckworth & Gross, 2014).

Play: Play is a fundamental aspect of childhood that fosters creativity, social skills, and cognitive development. This subdomain recognizes play as a critical avenue through which children learn to navigate social interactions, experiment with new ideas, and express themselves freely. Engaging in play helps children build the cognitive and social-emotional skills necessary for interacting with others and understanding the world around them. Play is not just a leisure activity; it is a vital part of learning and development (Fleer, 2021; Pellegrini, 2013).

The Learning Beyond Paper assessment includes a comprehensive approach to evaluating key skills across these three subdomains, ensuring that children are supported in their exploratory learning, focus, and creative play from infancy through pre-kindergarten. By fostering growth in these areas, the assessment helps children build the cognitive, social, and emotional abilities they need to engage with their world, develop problem-solving skills, and approach learning opportunities with enthusiasm, persistence, and creativity.

Initiative and Exploration Subdomain

The Initiative and Exploration subdomain focuses on fostering children's natural curiosity and desire to explore their environment. This subdomain is crucial for helping children develop a sense of agency and autonomy as they engage with new experiences and challenges. Research indicates that when children are encouraged to take initiative and explore, they develop stronger problem-solving skills, greater creativity, and a deeper understanding of their world (Gopnik, 2016).

Children who take the initiative in their learning are more likely to be motivated and engaged, leading to better cognitive and emotional outcomes. This subdomain emphasizes the importance of allowing children to guide their learning experiences, which supports the development of self-confidence and the ability to set and achieve personal goals.

Key Skills in the Initiative and Exploration Subdomain

- **Infant Stage:**
    - Exhibits interest in people and things in their environment
- **Young Toddler Stage:**
    - Demonstrates a desire to complete more complex tasks
- **Older Toddler Stage:**
    - Initiates play independently and maintains focus on tasks
- **Preschool 3 Stage:**
    - Initiates new tasks independently and maintains engagement
- **Pre-Kindergarten Stage:**
    - Takes initiative to learn new concepts and try challenging tasks

Attentiveness and Persistence Subdomain

The Attentiveness and Persistence subdomain is integral to a child's ability to focus on tasks and sustain effort over time. These skills are critical for effective learning and are strongly associated with later academic and personal success. Children who develop the ability to focus and persist through challenges are better equipped to overcome obstacles and achieve their goals (Duckworth & Gross, 2014).

This subdomain emphasizes the importance of helping children develop self-regulation and the ability to stay engaged in activities, even when they encounter difficulties. By fostering these skills, educators can help children build resilience and a growth mindset, which are essential for lifelong learning.

Key Skills in the Attentiveness and Persistence Subdomain

- **Infant Stage:**
    - Sustains attention to a specific person or object for a short period
- **Young Toddler Stage:**
    - Focuses on and completes simple tasks with adult support
- **Older Toddler Stage:**
    - Demonstrates persistence in solving problems or completing tasks
- **Preschool 3 Stage:**
    - Maintains focus on tasks for increasing periods of time, even with distractions
- **Pre-Kindergarten Stage:**
    - Persists in completing tasks or solving problems, showing resilience in the face of challenges

Play Subdomain

The Play subdomain recognizes play as a vital component of early childhood development. Play is not just a leisure activity; it is a crucial avenue through which children learn about the world, develop social skills, and express their creativity. Research underscores the importance of play in supporting cognitive development, social interaction, and emotional regulation (Fleer, 2021; Pellegrini, 2013).

Through play, children experiment with new ideas, explore social roles, and engage in imaginative activities that help them understand their environment. This subdomain highlights the significance of providing children with ample opportunities for free, unstructured play, which is essential for their overall development and well-being.

Key Skills in the Play Subdomain

- **Infant Stage:**
    - Engages in simple play activities, such as reaching for and grasping toys
- **Young Toddler Stage:**
    - Participates in parallel play alongside other children
- **Older Toddler Stage:**
    - Engages in more complex, pretend play, often involving others
- **Preschool 3 Stage:**
    - Participates in cooperative play, sharing ideas and roles with peers
- **Pre-Kindergarten Stage:**
    - Engages in imaginative and rule-based play, demonstrating an understanding of social roles and norms

Social and Emotional Development Domain

The Social and Emotional Development domain in the Learning Beyond Paper assessment is focused on fostering a child's ability to understand themselves, manage their emotions, and build positive relationships with others. This domain is essential for supporting children's overall well-being and success in both academic and social environments. Through developing a strong sense of self, learning to regulate emotions, and interacting effectively with peers and adults, children build the foundational skills needed for lifelong emotional health and social competence (Denham, Bassett, & Zinsser, 2012; Housman, 2017).

The assessment is structured around three key subdomains:

Developing a Sense of Self: This subdomain emphasizes the importance of self-awareness and self-confidence in a child's development. It includes skills related to how children perceive themselves, recognize their abilities, and build a sense of identity. A strong sense of self is associated with positive self-esteem, resilience, and the ability to set and achieve personal goals. These skills are foundational for personal growth and are essential for navigating social interactions and challenges (Harter, 2015).

Self-Regulation: Self-regulation involves the ability to manage emotions, behaviors, and attention in various situations. This subdomain assesses how children learn to control their impulses, follow rules, and maintain focus on tasks, even in the face of challenges. Effective self-regulation is linked to positive outcomes in both academic and social domains, as it enables children to navigate their environment successfully and build healthy relationships (Blair & Raver, 2015).

Developing a Sense of Self with Others: Social skills and the ability to interact positively with others are crucial components of early childhood development. This subdomain focuses on how children engage with peers and adults, understand social norms, and build empathy. Early social interactions are key predictors of later social competence and relationship-building skills, which are essential for success in school and life (Rubin et al., 2015).

The Learning Beyond Paper assessment includes a comprehensive approach to evaluating key skills across these three subdomains, ensuring that children are supported in their social and emotional development from infancy through pre-kindergarten. By fostering growth in these areas, the assessment helps children build the self-awareness, emotional regulation, and social skills they need to thrive in their relationships and navigate the complexities of the social world with confidence and empathy.

Developing a Sense of Self Subdomain

The Developing a Sense of Self subdomain focuses on how children perceive themselves and develop self-awareness. This subdomain is crucial for helping children understand their own identity, recognize their abilities, and build self-confidence. Research shows that a strong sense of self is associated with positive self-esteem, resilience, and the ability to set and achieve personal goals (Harter, 2015).

As children grow, they begin to differentiate themselves from others and develop an understanding of their own strengths, preferences, and emotions. This self-awareness forms the foundation for personal growth and is essential for navigating social interactions and challenges.

Key Skills in the Developing a Sense of Self Subdomain

- **Infant Stage:**
    - Responds to an image of self
    - Engages in self-expression
- **Young Toddler Stage:**
    - Shows knowledge of their own abilities and competencies
- **Older Toddler Stage:**
    - Uses pronouns such as I, me, and mine
    - Identifies self in a mirror or photograph
- **Preschool 3 Stage:**
    - Recognizes self as a unique individual
    - Demonstrates awareness of own characteristics and preferences
- **Pre-Kindergarten Stage:**
    - Recognizes self as a unique member of a specific community (e.g., family, classroom, cultural group)

Self-Regulation Subdomain

The Self-Regulation subdomain addresses a child's ability to manage their emotions, behaviors, and attention in various situations. This subdomain is critical for helping children develop the self-control needed to navigate social interactions, focus on tasks, and cope with challenges. Effective self-regulation is linked to positive outcomes in both academic and social domains (Blair & Raver, 2015).

Developing self-regulation involves learning to identify and manage emotions, follow rules, and delay gratification. These skills are foundational for maintaining attention, achieving goals, and building healthy relationships.

Key Skills in the Self-Regulation Subdomain

- **Infant Stage:**
    - Begins to calm self when upset (with adult support)
    - Responds to soothing actions or words
- **Young Toddler Stage:**
    - Shows ability to wait briefly for needs to be met
    - Begins to follow simple rules and routines
- **Older Toddler Stage:**
    - Demonstrates emerging self-control in familiar situations
    - Uses simple strategies to manage strong emotions (e.g., hugging a favorite toy)
- **Preschool 3 Stage:**
    - Follows established rules and routines with minimal reminders
    - Begins to use language to express emotions and resolve conflicts
- **Pre-Kindergarten Stage:**
    - Manages emotions and behaviors in a wider range of settings
    - Uses strategies to stay focused and on task

Developing a Sense of Self with Others Subdomain

The Developing a Sense of Self with Others subdomain focuses on how children interact with peers and adults, understanding their place within social groups. This subdomain is essential for building social skills, empathy, and cooperative behaviors. Research shows that early social interactions are key predictors of later social competence and relationship-building skills (Rubin et al., 2015).

Children learn to recognize the feelings and perspectives of others, share, take turns, and work collaboratively. These skills are critical for forming positive relationships and contributing to a supportive community environment.

Key Skills in the Developing a Sense of Self with Others Subdomain

- **Infant Stage:**
    - Responds to familiar people with smiles or coos
    - Enjoys interactive games (e.g., peek-a-boo)
- **Young Toddler Stage:**
    - Shows interest in and awareness of other children
    - Begins to engage in simple social play with peers
- **Older Toddler Stage:**
    - Participates in parallel play and begins to engage in cooperative play
    - Shows understanding of sharing and taking turns
- **Preschool 3 Stage:**
    - Demonstrates ability to play cooperatively with others
    - Shows empathy towards peers and offers comfort
- **Pre-Kindergarten Stage:**
    - Engages in group activities and shows leadership in play
    - Resolves conflicts with peers using appropriate strategies

Language and Emergent Literacy Domain

The Language and Emergent Literacy domain is foundational for a child's ability to communicate effectively, understand others, and engage with written language. This domain supports the development of both oral and written language skills, which are critical for later academic success and lifelong learning. Research consistently shows that strong language skills in early childhood are linked to better outcomes in reading, writing, and overall academic achievement (Anderson et al., 2021; Dolean et al., 2021; Roulstone et al., 2011; Snow et al., 1998).

Language development begins from birth as children listen to the sounds and rhythms of speech, gradually learning to understand and produce language themselves. Emergent literacy refers to the skills, knowledge, and attitudes that precede learning to read and write. These include recognizing letters, understanding that print carries meaning, and beginning to write (Barratt-Pugh & Rohl, 2020; Whitehurst & Lonigan, 1998). The Learning Beyond Paper assessment ensures that children are supported in developing these crucial skills from infancy through pre-kindergarten.

The assessment is structured around four key subdomains:

Receptive Language (Listening): This subdomain focuses on how children understand and process spoken language. Receptive language skills are essential for effective communication and are closely linked to cognitive development and social skills. Children who develop strong receptive language abilities are better equipped to understand instructions, follow conversations, and build a robust vocabulary (Fernald et al., 2013; Kim et al., 2022).

Expressive Language: This subdomain assesses how children use spoken language to express their thoughts, needs, and emotions. Developing expressive language skills is crucial for social interaction, emotional expression, and participation in classroom activities. As children's speaking abilities progress, they become more adept at engaging in conversations, telling stories, and conveying complex ideas (Rahiem, 2021; Rescorla, 2002).

Early Reading: This subdomain addresses the foundational skills necessary for reading, such as recognizing letters, understanding that print carries meaning, and beginning to identify words. Early reading skills are critical for later literacy development and academic success. Research shows that early exposure to books and reading activities significantly enhances a child's ability to read proficiently in later years (National Early Literacy Panel, 2008; Niklas et al., 2016).

Early Writing: This subdomain focuses on the development of writing skills, beginning with scribbling, and progressing to letter formation and simple word writing. Early writing is closely tied to reading development, as it helps children understand the relationship between spoken and written language. Encouraging writing from an early age fosters literacy and supports the development of fine motor skills (Puranik & Lonigan, 2012; Tortorelli et al., 2022).

The Language and Emergent Literacy domain is supported by extensive research demonstrating the importance of early language and literacy experiences. Strong language skills and early exposure to literacy are foundational for later academic achievement and lifelong learning.

Receptive Language (Listening) Subdomain

Receptive language refers to a child's ability to understand spoken language. This subdomain focuses on how children listen, comprehend, and process the language they hear. Developing strong receptive language skills is essential for effective communication, as it lays the foundation for vocabulary development, social interaction, and later literacy skills. Research has shown that children with well-developed receptive language skills are better equipped to follow directions, understand complex sentences, and engage in meaningful conversations (Fernald et al., 2013; Kim et al., 2022).

Key Skills in the Receptive Language (Listening) Subdomain

- **Infant Stage:**
    - Reacts to environmental sounds and verbal communication, showing awareness of different sounds.
- **Young Toddler Stage:**
    - Listens and responds to language during conversations and activities, indicating an understanding of simple words and phrases.
- **Older Toddler Stage:**
    - Engages in multiple back-and-forth communication exchanges, demonstrating an understanding of more complex language structures.
- **Preschool 3 Stage:**
    - Engages in purposeful communicative interactions, understanding and responding to complex sentences and instructions.
- **Pre-Kindergarten Stage:**
    - Demonstrates understanding of conversations, stories, and instructions by responding appropriately, showing readiness for more structured learning environments.

Expressive Language Subdomain

Expressive language involves a child's ability to produce spoken language to communicate thoughts, needs, and emotions. This subdomain assesses how children use words, phrases, and sentences to express themselves. Developing strong expressive language skills is crucial for effective social interaction, emotional expression, and participation in learning activities. Children with well-developed expressive language skills can engage in conversations, ask questions, and convey complex ideas, which are essential for academic success and social relationships (Rahiem, 2021; Rescorla, 2002).

Key Skills in the Expressive Language Subdomain

- **Infant Stage:**
    - Uses sounds or gestures to communicate needs and feelings, such as cooing, babbling, or pointing.
- **Young Toddler Stage:**
    - Begins to use simple words and phrases to communicate basic needs and observations.
- **Older Toddler Stage:**
    - Expands vocabulary and begins to form simple sentences, expressing more complex ideas and emotions.
- **Preschool 3 Stage:**
    - Uses more complex sentences and begins to engage in extended conversations with peers and adults.
- **Pre-Kindergarten Stage:**
    - Communicates effectively in a variety of contexts using complex language, showing readiness for storytelling, explanations, and more formal communication.

Early Reading Subdomain

The Early Reading subdomain focuses on the foundational skills necessary for reading, such as recognizing letters, understanding that print carries meaning, and beginning to identify words. These skills are critical for developing strong reading abilities, which are linked to academic success in later years. Early reading skills include recognizing letters of the alphabet, understanding the relationship between sounds and letters (phonemic awareness), and beginning to read simple words. Research shows that children who develop these skills early are more likely to become proficient readers and perform better academically (National Early Literacy Panel, 2008; Niklas et al., 2016).

Key Skills in the Early Reading Subdomain

- **Infant Stage:**
    - Shows interest in books and printed materials by looking at pictures and turning pages.
- **Young Toddler Stage:**
    - Begins to recognize and name familiar objects in books, showing early awareness of print.
- **Older Toddler Stage:**
    - Recognizes some letters and begins to understand that print carries meaning, laying the groundwork for reading.
- **Preschool 3 Stage:**
    - Begins to write letters and recognizes some words by sight, demonstrating early reading skills.

- **Pre-Kindergarten Stage:**
    - Reads simple words and sentences, showing readiness for more advanced reading activities.

Early Writing Subdomain

The Early Writing subdomain focuses on the development of writing skills, beginning with scribbling, and progressing to letter formation and simple word writing. Writing is a critical aspect of literacy development and is closely linked to reading skills. Early writing experiences help children understand the connection between spoken and written language, support fine motor skill development, and foster creativity. Encouraging writing from an early age lays the foundation for future academic success and literacy (Puranik & Lonigan, 2012; Tortorelli et al.,2022).

Key Skills in the Early Writing Subdomain

- **Infant Stage:**
    - Explores with fingers and hands, engaging in early scribbling activities.
- **Young Toddler Stage:**
    - Begins to make marks on paper, starting to understand that writing represents language.
- **Older Toddler Stage:**
    - Attempts to write letters or simple shapes, showing emerging writing skills.
- **Preschool 3 Stage:**
    - Writes letters and begins to write simple words, demonstrating early literacy skills.
- **Pre-Kindergarten Stage:**
    - Writes sentences and uses writing to convey meaning, showing readiness for more formal writing instruction.

Cognitive Development - Mathematics Domain

The Cognitive Development - Mathematics domain is vital for developing early numeracy and mathematical reasoning in young children. This domain encompasses the understanding and application of key mathematical concepts, such as numbers, measurement, and geometry. Research consistently shows that early mathematical skills are among the strongest predictors of later academic achievement, influencing not only math performance but also success in other areas of learning (Duncan et al., 2007; Ten Braak et al., 2022).

From an early age, children begin to develop mathematical understanding through everyday interactions. They learn about numbers and quantities by counting objects, explore measurement by comparing sizes, and develop spatial awareness by interacting with their environment. The Learning Beyond Paper assessment ensures that children are supported in building these foundational math skills from infancy through pre-kindergarten, preparing them for future academic success.

The assessment is structured around three key subdomains:

Number and Quantity: This subdomain focuses on children's understanding of numbers and their ability to count and compare quantities. Early number sense, including skills like subitizing (instantly recognizing small quantities without counting), counting, and basic arithmetic, forms the foundation for more advanced mathematical operations. Developing a strong sense of numbers and quantities is crucial for children's future success in mathematics (Clements & Sarama, 2009; Sophian, 2017).

Measurement and Comparison: This subdomain assesses how children understand and apply concepts related to measurement, such as size, length, weight, and volume. Children learn to compare objects, recognize differences, and use measurement language (e.g., bigger, smaller, heavier, lighter). These skills are essential for understanding the relationships between objects and for solving real-world problems involving measurement (Lehrer, 2003; Montague-Smith et al., 2017).

Geometry and Spatial Thinking: This subdomain focuses on children's understanding of shapes, spatial relationships, and geometry. Skills in this area include recognizing and naming shapes, understanding spatial terms (e.g., above, below, next to), and beginning to explore the properties of geometric figures. Developing spatial thinking is closely linked to success in mathematics, science, and technology (Atit et al., 2022; Mix & Cheng, 2012).

The Cognitive Development - Mathematics domain is supported by a robust body of research that underscores the importance of early mathematical experiences. Strong early math skills are not only predictive of later success in mathematics but also contribute to overall academic achievement.

Number and Quantity Subdomain

The Number and Quantity subdomain focuses on how children understand numbers and their relationships to quantities. This subdomain is essential for developing early numeracy skills, including counting, comparing quantities, and understanding basic arithmetic concepts such as addition and subtraction. Early number sense is a critical predictor of later mathematical achievement and is foundational for more complex mathematical operations (Clements & Sarama, 2009; Sophian, 2017).

Children begin to explore numbers and quantities through everyday experiences, such as counting objects, identifying more or less, and recognizing numbers in their environment. As they progress, they develop the ability to count in sequence, subitize (recognize the number of objects in a small group without counting), and perform basic arithmetic operations. Mastery of these skills is essential for future success in mathematics and other related fields.

Key Skills in the Number and Quantity Subdomain

- **Infant Stage:**
    - Shows awareness of different quantities by reacting to changes in the number of objects.
- **Young Toddler Stage:**
    - Begins to count small sets of objects and recognizes differences in quantity.
- **Older Toddler Stage:**
    - Counts in sequence and begins to compare quantities using terms like more and less.
- **Preschool 3 Stage:**
    - Subitizes small groups of objects (up to 4) and begins to perform simple addition and subtraction.
- **Pre-Kindergarten Stage:**
    - Counts beyond 10, performs basic arithmetic with small numbers, and understands the concept of zero.

Measurement and Comparison Subdomain

The Measurement and Comparison subdomain focuses on how children understand and apply concepts related to measurement, such as size, length, weight, and volume. This subdomain is critical for helping children develop the ability to compare objects, recognize differences, and use measurement language in everyday contexts. Understanding measurement concepts is crucial for problem-solving and applying mathematical knowledge to real-world situations (Lehrer, 2003; Montague-Smith et al., 2017).

Children explore measurement through hands-on activities, such as comparing the sizes of toys, filling, and emptying containers, and using non-standard units (like blocks or hands) to measure objects. As they grow, they begin to understand more complex measurement concepts and use standard units of measurement. These skills lay the groundwork for future learning in mathematics, science, and other disciplines that rely on accurate measurement and comparison.

Key Skills in the Measurement and Comparison Subdomain

- **Infant Stage:**
    - Begins to explore and differentiate between objects of different sizes.
- **Young Toddler Stage:**
    - Starts to compare sizes and uses simple measurement language (e.g., big/small).
- **Older Toddler Stage:**
    - Engages in activities that involve measuring and comparing, such as filling and emptying containers.
- **Preschool 3 Stage:**
    - Measures objects using non-standard units (e.g., hands, blocks) and understands terms like longer/shorter.
- **Pre-Kindergarten Stage:**
    - Uses standard and non-standard units to measure objects, and compares and orders them by size, length, and weight.

Geometry and Spatial Thinking Subdomain

The Geometry and Spatial Thinking subdomain focuses on how children understand shapes, spatial relationships, and geometry. This subdomain is essential for developing spatial reasoning, which is closely linked to success in mathematics, science, technology, and engineering (Mix & Cheng, 2012; Atit et al., 2022). Spatial thinking involves recognizing and naming shapes, understanding spatial terms (e.g., above, below, next to), and exploring the properties of geometric figures.

Children begin developing spatial awareness through activities like stacking blocks, fitting shapes into puzzles, and navigating their environment. As they progress, they learn to identify and describe shapes, understand spatial relationships, and explore more complex geometric concepts. These skills are foundational for problem-solving and logical reasoning in a variety of contexts.

Key Skills in the Geometry and Spatial Thinking Subdomain

- **Infant Stage:**
    - Begins to recognize and explore basic shapes and spatial relationships by reaching for objects and exploring their environment.
- **Young Toddler Stage:**
    - Identifies and names simple shapes, and begins to understand spatial relationships (e.g., in, on, under).
- **Older Toddler Stage:**
    - Recognizes and categorizes shapes, and understands basic spatial concepts (e.g., near/far).
- **Preschool 3 Stage:**
    - Identifies more complex shapes and begins to explore the properties of geometric figures.
- **Pre-Kindergarten Stage:**
    - Recognizes and describes the attributes of shapes, and applies spatial reasoning to solve simple puzzles and problems.

Cognitive Development - Science Domain

The Cognitive Development - Science domain is fundamental for nurturing a child's natural curiosity about the world and fostering their ability to think scientifically. This domain supports the development of foundational scientific skills, such as observation, inquiry, and experimentation, and encourages children to explore the natural world, understand physical phenomena, and engage with their environment. Research has shown that early engagement with scientific concepts promotes critical thinking, problem-solving, and a lifelong interest in science (Eshach & Fried, 2005; Lin et al., 2021).

Children are innately curious, and through exploration and experimentation, they begin to develop a deeper understanding of the world around them. The Learning Beyond Paper assessment ensures that children are supported in developing essential scientific skills and knowledge across five key subdomains, from infancy through pre-kindergarten.

The assessment is structured around five key subdomains:

Scientific Skills and Methods: This subdomain focuses on the processes children use to explore their world scientifically. It includes skills such as observing, predicting, experimenting, and drawing conclusions. These skills are foundational for scientific inquiry and help children build a systematic approach to understanding their environment (Eshach & Fried, 2005; Lin et al., 2021).

Earth and Space: This subdomain covers children's understanding of the earth, space, weather, and the environment. Through observation and exploration, children learn about the earth's resources, weather patterns, and the basic concepts of astronomy. Developing an understanding of these concepts fosters a sense of wonder and appreciation for the natural world (Chawla, 2021; National Research Council, 2012).

Living Things: This subdomain addresses children's understanding of living organisms, including plants, animals, and humans. Children explore the characteristics, needs, and life cycles of living things, fostering an early appreciation for biology and ecology (Melis et al., 2020; Patrick & Tunnicliffe, 2011).

Physical Science: This subdomain focuses on children's understanding of physical properties and processes, such as matter, energy, force, and motion. Through hands-on exploration, children learn about the properties of materials, how objects move, and the basics of cause and effect. Understanding these concepts is essential for grasping more complex scientific ideas later in life (Brenneman et al., 2009; Pereira et al., 2020).

Interaction with the Environment: This subdomain emphasizes how children interact with and impact their environment. It includes understanding concepts related to conservation, sustainability, and the interdependence of living and non-living things. By engaging with their environment, children learn the importance of caring for the world around them (Ardoin & Bowers, 2020; Wilson, 2012).

The Cognitive Development - Science domain is supported by research that emphasizes the importance of early scientific exploration. Engaging children in science from a young age encourages critical thinking, curiosity, and a deep understanding of the natural world, which are essential for future learning in science and related fields.

Scientific Skills and Methods Subdomain

The Scientific Skills and Methods subdomain is foundational for developing a systematic approach to exploring and understanding the world. This subdomain focuses on how children use scientific methods, such as observing, predicting, experimenting, and drawing conclusions, to make sense of their environment. These skills are crucial for building critical thinking and problem-solving abilities, which are essential for success in science and other academic disciplines (Eshach & Fried, 2005; Lin et al., 2021).

Children naturally engage in scientific inquiry from a young age, exploring their surroundings and asking questions about how things work. As they grow, they begin to use more structured methods to investigate and learn, such as conducting simple experiments and recording their observations. Developing these skills early helps children build a strong foundation for future scientific learning.

Key Skills in the Scientific Skills and Methods Subdomain

- **Infant Stage:**
    - Observes and explores objects using all senses, such as touching, tasting, and listening to different sounds.
- **Young Toddler Stage:**
    - Uses simple tools (e.g., a spoon or a cup) to explore and investigate the environment, such as scooping and pouring.
- **Older Toddler Stage:**
    - Begins to make simple predictions based on observations, such as expecting a toy to fall when dropped.
- **Preschool 3 Stage:**
    - Uses senses to observe and explore, making predictions, asking questions, and starting to experiment with materials.
- **Pre-Kindergarten Stage:**
    - Engages in simple experiments, records findings through drawings or verbal explanations, and begins to draw conclusions from observations.

Earth and Space Subdomain

The Earth and Space subdomain covers children's understanding of the earth, space, weather, and the environment. This subdomain helps children develop a sense of wonder and curiosity about the natural world by observing and exploring phenomena such as weather patterns, day and night, and the characteristics of the earth and sky. Understanding these concepts is essential for fostering a deeper appreciation of the environment and the world around them (Chawla, 2021; National Research Council, 2012).

Through activities such as observing the weather, talking about the seasons, and exploring the outdoors, children begin to understand the basic principles of earth and space sciences. These early experiences lay the groundwork for more advanced learning in these areas.

Key Skills in the Earth and Space Subdomain

- **Infant Stage:**
    - Reacts to environmental changes, such as light, temperature, and sound, showing awareness of different natural phenomena.
- **Young Toddler Stage:**
    - Notices and talks about changes in the environment, such as the weather or differences in daylight.
- **Older Toddler Stage:**
    - Recognizes and talks about weather patterns, day and night, and the characteristics of the natural world.
- **Preschool 3 Stage:**
    - Begins to understand basic concepts of weather, seasons, and the earth's resources, such as water and soil.
- **Pre-Kindergarten Stage:**
    - Demonstrates understanding of basic concepts of weather, seasons, the earth's resources, and the importance of taking care of the environment.

Living Things Subdomain

The Living Things subdomain focuses on children's understanding of living organisms, including plants, animals, and humans. This subdomain helps children explore the characteristics, needs, and life cycles of living things, fostering an early appreciation for biology and ecology. By learning about the diversity of life and how living things interact with their environment, children develop a foundation for understanding more complex biological concepts later on (Melis et al., 2020; Patrick & Tunnicliffe, 2011).

Through activities like observing animals, planting seeds, and discussing the needs of living things, children begin to understand the basic principles of life sciences. These experiences also help children develop empathy and a sense of responsibility toward other living beings.

Key Skills in the Living Things Subdomain

- **Infant Stage:**
    - Shows interest in living things by observing and reaching for animals or plants.
- **Young Toddler Stage:**
    - Identifies and names familiar living things, such as pets, plants, or animals seen in books.
- **Older Toddler Stage:**
    - Explores the characteristics and needs of living things, such as feeding animals or watering plants.
- **Preschool 3 Stage:**
    - Observes and describes the life cycle of plants and animals, such as watching a plant grow from a seed.
- **Pre-Kindergarten Stage:**
    - Understands the interdependence of living things and how they interact with their environment, recognizing that plants and animals depend on their environment to meet their needs.

Physical Science Subdomain

The Physical Science subdomain focuses on children's understanding of physical properties and processes, such as matter, energy, force, and motion. This subdomain is crucial for helping children develop an understanding of the physical world through exploration and experimentation. Concepts such as how objects move, how materials change, and the basics of cause and effect are foundational for future learning in physics and other related sciences (Brenneman et al., 2009; Pereira et al., 2020).

Children learn about physical science through hands-on activities, such as pushing and pulling objects, mixing substances, and observing changes in materials. These early experiences help children build the cognitive skills necessary for understanding more complex scientific concepts.

Key Skills in the Physical Science Subdomain

- **Infant Stage:**
    - Explores physical properties of objects, such as texture, weight, and how objects move when pushed or pulled.
- **Young Toddler Stage:**
    - Explores how objects move and interact, such as rolling balls or stacking blocks.
- **Older Toddler Stage:**
    - Engages in activities that demonstrate cause and effect, such as mixing water and sand or watching how objects fall.
- **Preschool 3 Stage:**
    - Experiments with different materials to see how they change, such as mixing, heating, or cooling substances.
- **Pre-Kindergarten Stage:**
    - Demonstrates understanding of basic physical properties, such as density, buoyancy, and magnetism, through hands-on experiments.

Interaction with the Environment Subdomain

The Interaction with the Environment subdomain emphasizes how children interact with and impact their environment. This subdomain includes understanding concepts related to conservation, sustainability, and the interdependence of living and non-living things. By engaging with their environment, children learn the importance of caring for the world around them and begin to develop a sense of responsibility for environmental stewardship (Ardoin & Bowers, 2020; Wilson, 2012).

Through activities such as recycling, gardening, and learning about natural resources, children develop an understanding of how their actions affect the environment. These early experiences foster a sense of connection to the natural world and lay the foundation for responsible environmental behavior.

Key Skills in the Interaction with the Environment Subdomain

- **Infant Stage:**
    - Begins to interact with natural elements, such as water, sand, or leaves, exploring their textures and properties.
- **Young Toddler Stage:**
    - Participates in simple activities that involve nature, such as watering plants or collecting leaves.
- **Older Toddler Stage:**
    - Begins to understand the need for taking care of living things, such as helping to feed pets or water plants.
- **Preschool 3 Stage:**
    - Participates in simple conservation activities, such as recycling or turning off lights to save energy.
- **Pre-Kindergarten Stage:**
    - Recognizes the importance of conservation and engages in activities that promote environmental stewardship, such as planting trees or learning about protecting wildlife.

Cognitive Development - Social Studies Domain

The Cognitive Development - Social Studies domain is vital for helping children understand their place in the world, including their relationships with family, community, and society. This domain fosters the development of a child's social identity and awareness of cultural diversity, community roles, and historical events. Research shows that early exposure to social studies concepts helps children develop a sense of belonging, respect for others, and a deeper understanding of their environment and the world (Barton & Levstik, 2004; Mindes & Newman, 2021).

Children begin learning about social studies through their everyday interactions with family and community members. As they grow, they develop an understanding of social norms, cultural practices, and the roles of people in their community. The Learning Beyond Paper assessment ensures that children are supported in developing these essential social studies skills, preparing them for future learning and responsible citizenship.

The assessment is structured around three key subdomains:

Family and Culture: This subdomain focuses on children's understanding of their family structure, cultural practices, and traditions. It includes recognizing family members, understanding cultural celebrations, and appreciating the diversity of family structures and cultural practices. Early exposure to diverse cultural experiences helps children develop respect for others and a sense of identity within their own culture (Garces-Bascal, 2022; Gonzalez-Mena, 2008).

People and Community: This subdomain addresses children's understanding of the roles of people in their community, such as family members, teachers, and community helpers. Children learn about the different jobs people do, the services provided by community members, and the importance of working together for the common good. These skills are foundational for understanding social roles and responsibilities (Edwards, 2010; Melendez, 2015).

History and Events: This subdomain introduces children to the concepts of time, history, and significant events. Children begin to understand the past, present, and future, and how events and people shape the world. Understanding history helps children appreciate the continuity of life and the impact of historical events on their own lives and communities (Mindes & Newman, 2021; Seefeldt, 2005).

The Cognitive Development - Social Studies domain is supported by research that emphasizes the importance of early social studies education. Engaging children in social studies helps them develop a sense of identity, respect for others, and an understanding of their role in the community and the world.

Family and Culture Subdomain

The Family and Culture subdomain focuses on children's understanding of their family structure, cultural practices, and traditions. This subdomain is essential for helping children develop a sense of identity and belonging within their family and cultural community. By recognizing and participating in family routines and cultural celebrations, children begin to understand their place in the world and develop respect for cultural diversity (Garces-Bascal, 2022; Gonzalez-Mena, 2008).

Through interactions with family members and participation in cultural activities, children learn about the values, beliefs, and traditions that shape their cultural identity. This early exposure to diverse cultural experiences helps children develop an appreciation for the differences and similarities among people, fostering empathy and respect for others.

Key Skills in the Family and Culture Subdomain

- **Infant Stage:**
    - Experiences family celebrations, foods, and cultural practices, showing awareness of family routines and traditions.
- **Young Toddler Stage:**
    - Participates in family celebrations and begins to understand and ask about family traditions and cultural practices.
- **Older Toddler Stage:**
    - Identifies family members and family practices, showing an understanding of family roles, relationships, and cultural traditions.
- **Preschool 3 Stage:**
    - Identifies self in relation to the family and culture, and begins to appreciate the diversity of family structures and cultural practices.
- **Pre-Kindergarten Stage:**
    - Describes family structures and cultural practices, demonstrating an understanding of cultural diversity and respect for others.

People and Community Subdomain

The People and Community subdomain addresses children's understanding of the roles of people in their community, such as family members, teachers, and community helpers. This subdomain is crucial for helping children learn about the different jobs people do, the services provided by community members, and the importance of working together for the common good. Understanding these roles helps children develop social awareness and a sense of responsibility within their community (Melendez, 2015; Edwards, 2010).

By learning about community helpers and participating in community activities, children begin to understand the interconnectedness of society and the importance of collaboration and mutual support. These experiences lay the foundation for responsible citizenship and social participation.

Key Skills in the People and Community Subdomain

- **Infant Stage:**
    - Responds to familiar people and begins to recognize roles within the family and immediate community.
- **Young Toddler Stage:**
    - Begins to identify familiar people in the community and understand their roles (e.g., teacher, doctor).
- **Older Toddler Stage:**
    - Begins to understand the roles of various community helpers and participates in community-related activities.
- **Preschool 3 Stage:**
    - Engages in role-playing community helpers and begins to understand the importance of working together in a community.
- **Pre-Kindergarten Stage:**
    - Demonstrates understanding of the roles of various community helpers and begins to participate in community service activities.

History and Events Subdomain

The History and Events subdomain introduces children to the concepts of time, history, and significant events. This subdomain helps children understand the past, present, and future, and how events and people shape the world. Understanding history helps children appreciate the continuity of life and the impact of historical events on their own lives and communities (Mindes & Newman, 2021; Seefeldt, 2005).

By discussing family history, personal experiences, and significant historical events, children begin to develop an understanding of how the past influences the present and future. These early experiences with history help children build a sense of identity and a deeper connection to their community and society.

Key Skills in the History and Events Subdomain

- **Infant Stage:**
    - Begins to understand daily routines and sequences of events, such as mealtimes and bedtime.

- **Young Toddler Stage:**
    - Recognizes and anticipates daily routines and simple sequences of events, such as getting dressed or going to bed.
- **Older Toddler Stage:**
    - Begins to understand the concepts of past and present through discussions about family history and personal experiences.
- **Preschool 3 Stage:**
    - Begins to understand and discuss significant events, both personal and historical, and their impact on people's lives.
- **Pre-Kindergarten Stage:**
    - Understands the sequence of events and begins to recognize the significance of historical events and their impact on the present.

Creative Development Domain

The Creative Development domain is essential for fostering a child's imagination, self-expression, and creativity. Through engagement in various forms of art, movement, music, and drama, children explore and express their ideas, emotions, and individuality. Creative activities not only support cognitive and emotional growth but also enhance fine motor skills, problem-solving abilities, and social skills (Gandini, 2012; Garaigordobil et el., 2022).

Creative development in early childhood is about more than just creating art; it's about encouraging children to think critically, explore their emotions, and communicate their thoughts in diverse ways. The Learning Beyond Paper assessment ensures that children are supported in developing these creative skills from infancy through pre-kindergarten, laying the foundation for future learning and self-expression.

The assessment is structured around four key subdomains:

Creative Movement and Dance: This subdomain focuses on how children use their bodies to express creativity through movement and dance. It includes participating in dance activities, moving to music, and using movement to express emotions and ideas. Engaging in creative movement and dance helps children develop physical coordination, rhythm, and an understanding of spatial relationships (Lobo & Winsler, 2006; Yoshimi et al., 2021).

Visual Arts: This subdomain emphasizes children's exploration and creation of visual art forms, such as drawing, painting, sculpting, and crafting. Through visual arts, children express their creativity, explore materials, and develop fine motor skills. Engaging in visual arts activities encourages children to think critically and creatively, experiment with different materials, and visually express their ideas (Becker, 2020; Katz & Chard, 2000).

Music: This subdomain focuses on children's engagement with music, including singing, playing instruments, and listening to various types of music. Music activities help children develop auditory discrimination, rhythm, and an appreciation for different musical genres. Participating in music also supports language development, memory, and emotional expression (Hallam & Himonides, 2022; Standley, 2008).

Drama: This subdomain involves children in dramatic play and theater activities, where they use their imagination to create and act out stories. Drama helps children develop social skills, empathy, and an understanding of different perspectives by allowing them to explore roles, scenarios, and emotions. Engaging in drama encourages creative thinking and improves communication skills as children express themselves through dialogue and action (Stephenson, 2023; Wright, 2003).

Creative Movement and Dance Subdomain

The Creative Movement and Dance subdomain focuses on how children use their bodies to express creativity through movement and dance. It includes participating in dance activities, moving to music, and using movement to express emotions and ideas. Engaging in creative movement and dance helps children develop physical coordination, rhythm, and an understanding of spatial relationships (Lobo & Winsler, 2006; Yoshimi et al., 2021).

Key Skills in the Creative Movement and Dance Subdomain

- **Infant Stage:**
    - Responds to music and rhythmic patterns with body movements.
- **Young Toddler Stage:**
    - Begins to move to music, using simple movements like clapping or swaying.
- **Older Toddler Stage:**
    - Participates in simple dance routines and begins to express emotions through movement.
- **Preschool 3 Stage:**
    - Engages in more structured dance activities, demonstrating coordination and rhythm.
- **Pre-Kindergarten Stage:**
    - Creates and performs simple dance sequences, using movement to convey stories and emotions.

Visual Arts Subdomain

The Visual Arts subdomain emphasizes children's exploration and creation of visual art forms, such as drawing, painting, sculpting, and crafting. Through visual arts, children express their creativity, explore different materials, and develop fine motor skills. Engaging in visual arts activities encourages children to think critically and creatively, experiment with varied materials, and visually express their ideas (Becker, 2020; Katz & Chard, 2000).

Key Skills in the Visual Arts Subdomain

- **Infant Stage:**
    - Explores different textures and colors with hands and fingers.
- **Young Toddler Stage:**
    - Begins to make marks on paper with crayons or paint, experimenting with shapes and colors.
- **Older Toddler Stage:**
    - Creates simple drawings and starts to explore more complex shapes and forms.
- **Preschool 3 Stage:**
    - Uses various art materials to create more detailed drawings, paintings, and sculptures.
- **Pre-Kindergarten Stage:**
    - Combines different art techniques and materials to create complex and expressive art projects.

Music Subdomain

The Music subdomain focuses on children's engagement with music, including singing, playing instruments, and listening to various types of music. Music activities help children develop auditory discrimination, rhythm, and an appreciation for different musical genres. Additionally, participating in musical activities supports language development, memory, and emotional expression (Stephenson, 2023; Wright, 2003).

Key Skills in the Music Subdomain

- **Infant Stage:**
    - Reacts to sounds and rhythms, showing interest in music.
- **Young Toddler Stage:**
    - Begins to sing simple songs and play with basic musical instruments, such as drums or shakers.
- **Older Toddler Stage:**
    - Sings along to familiar songs and explores playing different instruments.
- **Preschool 3 Stage:**
    - Participates in group music activities, keeping rhythm and experimenting with melodies.
- **Pre-Kindergarten Stage:**
    - Engages in more structured music activities, creating simple rhythms and melodies with instruments.

The Creative Development domain is supported by research that emphasizes the importance of nurturing creativity and self-expression in early childhood. Engaging children in creative activities fosters cognitive, emotional, and social development, helping them express their individuality and develop a lifelong appreciation for the arts.

Cognitive Development - Cognitive Processes Domain

The Cognitive Development - Cognitive Processes domain is essential for building a foundation in critical thinking, problem-solving, and understanding cause and effect. This domain focuses on how children think, learn, and use information to navigate their world. Early cognitive development is crucial as it lays the groundwork for more advanced cognitive functions that are essential for academic success and lifelong learning (Garon et al., 2008; Gkintoni & Dimakos, 2022).

Children begin to develop cognitive processes from a young age through exploration, experimentation, and interaction with their environment. The Learning Beyond Paper assessment supports children in developing these crucial skills from infancy through pre-kindergarten, preparing them for future learning and problem-solving.

The assessment is structured around three key subdomains:

Thinking Skills: This subdomain focuses on children's ability to understand cause and effect and use prior knowledge to build new knowledge. Thinking skills are foundational for all areas of learning and involve recognizing that actions lead to outcomes, making connections between experiences, and applying learned information to new situations (Diamond, 2013; Heard et al., 2020).

Problem Solving: This subdomain emphasizes children's ability to approach challenges and find solutions, both independently and with support. Problem-solving skills involve experimenting with different strategies, asking questions, and testing possibilities to determine the best solution to a problem. These skills are critical for developing resilience and cognitive flexibility (Berk, 2013; Nabors et al., 2021).

Engineering and Technology: This subdomain introduces children to the use of simple tools and understanding basic engineering concepts, such as stability and motion. As children grow, they begin to explore how everyday objects can be used to solve problems and how technology plays a role in everyday life. These early experiences are foundational for later learning in STEM (Science, Technology, Engineering, and Mathematics) fields (National Research Council, 2009; Moomaw, 2024).

The Cognitive Development - Cognitive Processes domain is supported by research that emphasizes the importance of early cognitive development for building a strong foundation in critical thinking, problem-solving, and technological literacy. These skills are essential for success in both academic and everyday contexts.

Thinking Skills Subdomain

The Thinking Skills subdomain focuses on how children develop the ability to understand cause and effect and use prior knowledge to build new knowledge. These skills are foundational for cognitive development and are critical for all areas of learning. Through exploring their environment and interacting with objects and people, children begin to recognize that their actions can lead to specific outcomes. They also start making connections between past experiences and new situations, which helps them to learn and adapt more effectively (Diamond, 2013; Heard et al., 2020).

As children grow, their ability to think critically and reason improves, enabling them to engage in more complex problem-solving and learning activities. The Thinking Skills subdomain supports children in developing the cognitive flexibility necessary to process new information, make predictions, and draw conclusions.

Key Skills in the Thinking Skills Subdomain

- **Infant Stage:**
    - Acts on an object to produce a pleasing sight, sound, or motion; begins to understand simple cause and effect.
- **Young Toddler Stage:**
    - Explores objects in different ways (e.g., shaking, throwing) to observe effects; begins to use prior experiences to explore new situations.
- **Older Toddler Stage:**
    - Repeats actions to achieve desired outcomes; makes simple connections between objects and ideas.
- **Preschool 3 Stage:**
    - Explores how simple actions affect objects; uses clues to make predictions with adult support.
- **Pre-Kindergarten Stage:**
    - Intentionally carries out actions with an understanding of their effects; makes predictions and inferences based on prior knowledge.

Problem Solving Subdomain

The Problem Solving subdomain emphasizes children's ability to approach challenges and find solutions, both independently and with support. Problem-solving skills are essential for cognitive and social development, as they enable children to navigate everyday situations and overcome obstacles. Through experimentation, children learn to test different strategies, ask questions, and evaluate possible solutions to determine the most effective approach (Berk, 2013; Nabors et al., 2021).

Developing strong problem-solving skills helps children build resilience and confidence in their ability to tackle new and unfamiliar tasks. These skills are critical for success in school and life, as they promote adaptive thinking and encourage a proactive approach to challenges.

Key Skills in the Problem Solving Subdomain

- **Infant Stage:**
    - Interacts with objects to understand their properties; reaches for toys that are out of reach.
- **Young Toddler Stage:**
    - Finds hidden objects easily; begins to solve simple problems with adult support.
- **Older Toddler Stage:**
    - Experiments with familiar objects to solve problems; begins to solve problems using different approaches.
- **Preschool 3 Stage:**
    - Asks questions and tests different possibilities to solve problems; begins to use objects in various ways to solve challenges.
- **Pre-Kindergarten Stage:**
    - Uses objects creatively to solve problems; tests different solutions and adjusts strategies as needed.

Engineering and Technology Subdomain

The Engineering and Technology subdomain introduces children to the use of simple tools and basic engineering concepts, such as stability and motion. As children explore how everyday objects can be used to solve problems, they begin to understand the role of technology in their daily lives. This subdomain is foundational for developing early STEM (Science, Technology, Engineering, and Mathematics) skills, which are increasingly important in a technology-driven world (National Research Council, 2009; Moomaw, 2024).

Children's experiences with simple tools and machines help them understand the principles of design, construction, and problem-solving. By experimenting with different materials and exploring how things work, children develop critical thinking skills and a curiosity about the world around them.

Key Skills in the Engineering and Technology Subdomain

- **Infant Stage:**
    - Not typically observed at this stage.
- **Young Toddler Stage:**
    - Begins to understand that everyday objects can be used as tools (e.g., using a blanket to pull a toy closer).
- **Older Toddler Stage:**
    - Uses simple tools during play, such as using a spoon to scoop or a toy with wheels to move objects.
- **Preschool 3 Stage:**
    - Explores stability and motion when constructing simple structures; begins to understand the basic use of simple machines (e.g., wheels, levers).
- **Pre-Kindergarten Stage:**
    - Designs simple tools or structures to solve problems; demonstrates an understanding of stability and motion in construction.

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